DOWNLOAD PDF THE FIRST TO LAND

Chapter 1 : The First Land Plants

The First Land Herald is a publication dedicated to the current events of Zoluren, the "first land".When possible, it may also report on other events throughout Kermoria.

I am proud to report here their near complete success. The only mystery that remains is the location of the corpse of Ciriasa , the unfortunate woman whose body was nearly overtaken by the Demon. To begin, I must first confess, dear reader, my sheer inadequacy in telling this tale. I expect I will only be able to barely scratch the surface. There were too many parts, too many roles played, for a single Bard such as myself to know them all, even with my own extensive observation and interviewing practices. Thus I hope you will read with understanding, and feel yourself free to publish your own additional details or request addenda. In the beginning, a small, Zoluren-based group called the Anduwen Watch made the decision to perform the raid. Their name comes from the anlas of Anduwen , the first anlas of the new day and also a dark, midnight anlas. Their stated desire is to fight for the breath of civilization across Elanthia, to herald the new day even among the darkest of times. They chose this raid in order to strike back against a festering Demon presence which has long situated itself in the Zaulfung swamp: Maelshyve, the green-eyed beast, symbolized by the triple-tined claw. For the uninitiated, Demons are not simple nor small monsters, nor even mortal enough to be called something like "monsters". They do not live and breathe as we do, but instead are more akin to gods, their presence and power expansive, although extraplanar. We are only protected from them by their difficulty in manifesting in our Plane of Abiding, though their lust for all things Divinely created means that they will forever scrabble against our figurative door. During the planning phase, the Watch became aware that the Demon was stirring. For how long this had been occurring, no one can be certain. The group intended to utilize vials of liquid inimical to Maelshyve, which would expel her from her potential vessels. When the day of the raid came, the Watch was joined at the Riverhaven Temple by a horde of capable adventurers, with the official support of the Order of the Black Fox. The Order of the Dragon Shield pronounced to me afterward that they were against the raid and asked to be quoted: Mother Whiteburn exclaimed to us all, "This is a night of power. A night of glory. Today, I espied a red buzzard flying over the swamps of the Zaulfung. The early morning sun haloed the holy bird in a corona of blood. Those supporting the raid split into three groups: The forward team was sent into the Fortress well in advance in order to stymy the plans of any cultists. This team consisted of Mazrian , Qiyan , Saragos , and Seldaren , who traversed ahead to the main chokepoint within the Fortress: There they worked tirelessly to prevent entry of known Necromancers. Saragos reported that the team engaged several such Necromancers and was able to successfully destroy them without incurring losses. Team members also threw themselves upon the unstable rope in order to knock down any interlopers who made it to the bridge, risking their own lives and falling in the process. Maltris arrived and was particularly adept at such acrobatics, eagerly leaping toward the enemy. Qiyan also reported that an occasional great wind would pick up and blow people clear across the area. There we were greeted by none other than a unicorn, surrounded by motes of Divine light, which could be none other than a servant of the great Mother Hodierna, Protector of Life. Although bolstered by this appearance, our group quickly encountered its first obstacle: Fighters could enter only at a trickle of two at a time, every minute or so. The patience shown by those present was nothing less than astonishing as the group slowly reformed inside. Some pressed forward while others remained to be led. My own role was to sound the horn and provide Sanctuary as we traversed the murky caverns below. Thanks to such dampening magics, we made it to the charred caves without much incident. However, there we encountered the first more serious minions of Maelshyve: The lesser vessels in particular were disturbing, their Humanity clearly encroached upon by unhealthy patches of scales. Ethereal shield was enough to protect us from the explosive flames of the dying cinder beasts, and the unicorn and warriors made short work of the other enemies. As if these attacks were not enough, we also tasted the first of many Incursions of the Demon into our own persons. Not only did many of us report hearing her voice whispering to us, but beginning at that point, we felt her true weight upon us as invisible talons crushed our heads, cracking skulls. Such attacks would continue periodically throughout the raid, and so from that point forward, the

Empaths would be taxed by taking so many similar wounds. I said a silent prayer of thanks to Hodierna for remembering to bring a full remedy kit. Furthermore, the vessels emitted dusky blue fumes which could penetrate into party members. I now believe these fumes caused necromantic corruption , which was occasionally abated by the love of our favored gods. Once we reached the bridge, although it was a point of safety, we were again slowed severely by the need to cross one at a time. During this time, much loud discussion was had in my mind over whom to send next. Empaths were called back and forth as our heads continued to be crushed. At times things felt desperate as we were repeatedly assaulted by the invisible talons. Eventually I made it across and discovered that we had managed to set up a banner and field hospital near the obelisk, south of the Halls. However, I learned via gweth that the forward group had pressed north into the Inner Sanctum, past the Hall of Malice, where the true threat lay. I was tasked with setting up a new, forward field hospital in the Sanctum. There we encountered Ciriasa. Unlike the lesser vessels we had seen before, who were merely patched with scales, Ciriasa was clearly in the full throes of metamorphosis. She was covered in thick, midnight-blue scales from head to toe and bore daggerlike talons on her fingertips and menacing fangs dripping with venom. Plated wings allowed her to take flight, and she often attacked by flicking them outward, sending ichor-coated barbs into her opponent. I saw her attack him again and again, barbs building in the cracks of his armor, claws rending through his breastplate. At one point she swooped down from above, landing on him with terrible force and pinning him to the ground as she tore him apart. To my amazement, he managed to whisper the final words of the Banner of Truce spell just before he fell unconscious, dying in my arms. The area was safe! I traversed back south through the traps and led the rear group to the new safe area, where the triage party immediately got to work on the wounded and fallen. Throughout our fighting, I spotted the unicorn moving to support different warriors, attacking Maelshyvean foes and Necromancers alike, and Seldaren reported it even once stopped to resurrect him directly. The final battle unfolded before me. An enormous number of warriors engaged Ciriasa or participated in triage at our field hospital. The best throwers were given vials to target the prime vessel. I also witnessed a dark-skinned Elothean and a hooded Prydaen, both Necromancers, fighting against her, each with his own concoction. It appears that even among the Necromancers, there are those who would battle demons. The projectiles often missed their mark, spilling across the floor, or were knocked away by her wings. However, when they did connect, the spray of liquid caused her to reel back in shock, black energy erupting from the droplets and causing a massive concussive blast that blew everyone backwards. The battle was harried and brutal, as hierophants and blood wraiths swarmed, and three or four foul Necromancers brought forth deadly glass constructs at the same time. Despite these trials, our warriors prevailed. She was stunned, and in that moment of weakness, Seldaren made the final connection, his mastery clear as the vial struck perfectly her frozen form. She collapsed to her knees then, reality itself warping violently in the area as waves of distortion rippled outward from her. The green glow in her eyes dimmed, and she shouted in a desperate plea, "Help me, warriors, please, while her grasp is weakened! Master, do not abandon me, I will destroy these fools here and now! We heard an unnatural hissing as she fell over in a heap, convulsing. The scent of filth reached my nostrils as her scales and wings began to dissolve, melting off her form in a sickly blue ichor. When it was done, she was left in Human form. Included here is a detailed painting showing an energetic battle scene. Just off center looms the feminine monstrosity Ciriasa, bat-like wings captured mid-flight in a turbulent extension, with one scaled arm outstretched and a single, wicked talon pointing across the field toward a determined Human Paladin, his shield upraised and bearing numerous barbs sunk into its frame. A swirl of action is portrayed around the two figures, unbalanced poses and restless composition lending a sense of feverish urgency to the fight. Alight in one corner is a blonde Elothean man surrounded by a maelstrom of fire and ice, his figure leaping to the side as one arm is outstretched in release, a tiny glowing vial soaring toward Ciriasa. According to Mazrian, in the heat of battle, with the surge of bloodlust all around and the press of warriors, some were not able to comprehend the transformation and pushed toward the now Human Ciriasa with attacks, wounding the woman. Mazrian dragged her away to be healed, but she bled out before the work could be done. There were some tense moments of discussion over the body, but then Osven , a man I earlier identified as a Necromancer, dragged away the corpse. Frustrated at the loss of the corpse and unable to find her,

eventually we decided to move on to our final task: Although we heard naught of Him, the Divine Unicorn spoke to us thusly: Seek her if you wish, save her if you can. The gods are pleased with your deeds this day, and I, the servant of Hodierna, ask no more of you. A sense of peace settled upon us, and I felt distinctly as if Hodierna had blessed our place.

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Chapter 2 : First Man () - IMDb

Evidence of the emergence of embryophyte land plants first occurs in the mid-Ordovician (~), and by the middle of the Devonian (~), many of the features recognised in land plants today were present, including roots and leaves.

The First Person on the Moon NASA It was Kennedy was the president of the United States. He wanted to land humans on the moon. The United States had just started trying to put people in space. Was NASA ready to go to the moon? The president and NASA knew they could do it. They were ready to put people on the moon. They also had to come back to Earth safely. Apollo 11 blasted off on July 16, Four days later, Armstrong and Aldrin landed on the moon. They landed on the moon in the Lunar Module. It was called the Eagle. Collins stayed in orbit around the moon. He did experiments and took pictures. The sign the astronauts left on the moon says, "Here men from the planet Earth first set foot upon the moon July , A. We came in peace for all mankind. He and Aldrin walked around for three hours. They picked up bits of moon dirt and rocks. They put a U. They also left a sign on the moon. The two astronauts returned to orbit, joining Collins. On July 24, , all three astronauts came back to Earth safely. It took less than 10 years. Humans had walked on the moon.

Chapter 3 : Who owns the very first Land Rover? | calendrierdelascience.com

Never underestimate moss. When the simple plants first arrived on land, almost half a billion years ago, they triggered both an ice age and a mass extinction of ocean life. The first land plants.

Click here for its general facilities guide. Picnic Shelters The picnic area is equipped with drinking water, fire grills, refuse disposal, tables and restroom facilities. A large picnic shelter is available for rent on a first-come, first-served basis by calling the Customer Service Center at PARK. Click here for park fees. It can be rented from 8 a. Parking fees are not included in shelter rental. No refund within 14 days before reserved date. The shelter is in the main picnic area, which is not on the beach side of the park on same side of Shore Drive as the Trail Center. The shelter can accommodate about 80 people under the shelter. Seating for larger groups is available around the shelter in the main picnic area. The picnic area as a whole is not reserved and the general public will be permitted to use the other tables around the shelter. Other facilities, including a courtyard, gazebo and amphitheater, can be rented for weddings, conferences, special events and seminars. Call the park at for details. This park has a snack bar in season. Soap, other laundry products and change are available at the Bay Store. A visitor information center at the park also has information on area tours and attractions. First Landing, with its beach and other offerings, is also the perfect place to get married. It has packed clay gravel. Read bathhouse has a universally accessible shower and toilet and a concrete walkway. There is also an accessible playground with access over hard packed dirt. The Trail Center is universally accessible with accessible restroom facilities. There is a paved walkway from road to center. All areas are accessed via paved sidewalks from the parking lot and passages in between. Paved ramp with wheelchair seating, access by paved sidewalk use visitor center restrooms. Paved sidewalk to universally accessible gazebo use vistor center restrooms. Dune crossover behind the visitor center. There is no universally accessible access across the beach to water. Although motorized vehicles are not permitted on park trails, electric wheelchairs and electric scooters that meet the federal definition for wheelchairs are allowed to enable people with disabilities to use the trails. A specialized beach wheelchair is available. Call for details. Large clubs, school groups and community organizations can request specific historical, cultural and environmental programming related to their educational goals. Your Backyard Classrooms, a activity curriculum guide used by K- 12 teachers and home-school coordinators. Concessions operate daily with the following schedule: March to Memorial Day, 9 a. Sunday through Thursday and 9 a. The store also rents bikes, fishing equipment and crabbing gear, and sells bait, souvenirs, cold sandwiches, hot dogs, nachos and T-shirts. It was dedicated June 15, They went on to settle Jamestown. In , the park hosted a re-enactment of the first landing. Friends of First Landing State Park is an organization that supports the park through fund-raising and volunteer efforts. The plans are updated at least once every 10 years thereafter. Three public meetings are held during the initial development of each plan.

Chapter 4 : What Were the First Animals to Walk on Land? (with pictures)

Italian explorer Christopher Columbus sets foot on the American mainland for the first time, at the Paria Peninsula in present-day Venezuela. the expedition sighted land, probably Watling.

Success â€" returned photos, crash impact Pioneer missions Three different designs of Pioneer lunar probes were flown on three different modified ICBMs. The first, a mission managed by the United States Air Force , exploded during launch; all subsequent Pioneer lunar flights had NASA as the lead management organization. None of the four spacecraft built in this series of probes survived launch on its Atlas ICBM outfitted with an Able upper stage. The interplanetary versions were known as Mariners ; lunar versions were Rangers. JPL envisioned three versions of the Ranger lunar probes: Block I prototypes, which would carry various radiation detectors in test flights to a very high Earth orbit that came nowhere near the Moon; Block II, which would try to accomplish the first Moon landing by hard landing a seismometer package; and Block III, which would crash onto the lunar surface without any braking rockets while taking very high resolution wide-area photographs of the Moon during their descent. Ranger missions See also: Ranger program The Ranger 1 and 2 Block I missions were virtually identical. Such practice was deemed vital to be assured of capturing high-bandwidth television transmissions from the Moon during a one-shot fifteen-minute time window in subsequent Block II and Block III lunar descents. Both Block I missions suffered failures of the new Agena upper stage and never left low Earth parking orbit after launch; both burned up upon reentry after only a few days. The first attempts to perform a Moon landing took place in during the Rangers 3, 4 and 5 missions flown by the United States. This lander code-named Tonto was designed to provide impact cushioning using an exterior blanket of crushable balsa wood and an interior filled with incompressible liquid freon. Weight was distributed in the payload sphere so it would rotate in its liquid blanket to place the seismometer into an upright and operational position no matter what the final resting orientation of the external landing sphere. After landing, plugs were to be opened allowing the freon to evaporate and the payload sphere to settle into upright contact with the landing sphere. The batteries were sized to allow up to three months of operation for the payload sphere. Various mission constraints limited the landing site to Oceanus Procellarum on the lunar equator, which the lander ideally would reach 66 hours after launch. No cameras were carried by the Ranger landers, and no pictures were to be captured from the lunar surface during the mission. The camera was designed to transmit a picture every 10 seconds. Other instruments gathering data before the mother ship crashed onto the Moon were a gamma ray spectrometer to measure overall lunar chemical composition and a radar altimeter. The radar altimeter was to give a signal ejecting the landing capsule and its solid-fueled braking rocket overboard from the Block II mother ship. On Ranger 3, failure of the Atlas guidance system and a software error aboard the Agena upper stage combined to put the spacecraft on a course that would miss the Moon. Attempts to salvage lunar photography during a flyby of the Moon were thwarted by in-flight failure of the onboard flight computer. This was probably because of prior heat sterilization of the spacecraft by keeping it above the boiling point of water for 24 hours on the ground, to protect the Moon from being contaminated by Earth organisms. Heat sterilization was also blamed for subsequent in-flight failures of the spacecraft computer on Ranger 4 and the power subsystem on Ranger 5. Only Ranger 4 reached the Moon in an uncontrolled crash impact on the far side of the Moon. Six cameras were designed to take thousands of high-altitude photographs in the final twenty-minute period before crashing on the lunar surface. Camera resolution was 1, scan lines, far higher than the lines found in a typical U. While Ranger 6 suffered a failure of this camera system and returned no photographs despite an otherwise successful flight, the subsequent Ranger 7 mission to Mare Cognitum was a complete success. Breaking the six-year string of failures in U. Subsequent successes with Ranger 8 and Ranger 9 further buoyed U. Soviet unmanned soft landings â€" Model of Luna 16 Moon soil sample return lander Model of Soviet Lunokhod automatic moon rover The Luna 9 spacecraft, launched by the Soviet Union , performed the first successful soft Moon landing on 3 February, Both returned panoramic photographs that were the first views from the lunar surface. This mission was later successfully repeated by Luna 20 and Luna 24 In and two Lunokhod "Moonwalker" robotic lunar rovers were delivered to

the Moon, where they successfully operated for 10 and 4 months respectively, covering These rover missions were in operation concurrently with the Zond and Luna series of Moon flyby, orbiter and landing missions.

Chapter 5 : First Landing State Park

The OG Land Rover, and I mean the first one which had been missing for decades, has apparently been found. Land Rover's restoration specialists say it was hanging out in a garden down the road.

His objective was to sail west until he reached Asia the Indies where the riches of gold, pearls and spice awaited. His first stop was the Canary Islands where the lack of wind left his expedition becalmed until September 6. Once underway, Columbus benefited from calm seas and steady winds that pushed him steadily westward Columbus had discovered the southern "Trades" that in the future would fuel the sailing ships carrying goods to the New World. However, the trip was long, longer than anticipated by either Columbus or his crew. The first log was kept secret. Columbus headed off disaster by promising his crew that if land was not sighted in two days, they would return home. The next day land was discovered. However, we do have an accurate abstract of the journal written by Bartolome de las Casas in the s. Throughout the account, Columbus refers to himself in the third person as the "Admiral": They saw sand-pipers, and a green reed near the ship. Those of the caravel Pinta saw a cane and a pole, and they took up another small pole which appeared to have been worked with iron; also another bit of cane, a land-plant, and a small board. Everyone breathed afresh and rejoiced at these signs. The run until sunset was 27 leagues. After sunset the Admiral returned to his original west course, and they went along at the rate of 12 miles an hour. As the caravel Pinta was a better sailer, and went ahead of the Admiral, she found the land, and made the signals ordered by the Admiral. The land was first seen by a sailor named Rodrigo de Triana. He did so, and saw it. The Admiral said the same to Rodrigo Sanchez of Segovia, whom the King and Queen had sent with the fleet as inspector, but he could see nothing, because he was not in a place whence anything could be seen. After the Admiral had spoken he saw the light once or twice, and it was like a wax candle rising and failing. It seemed to few to be an indication of land; but the Admiral made certain that land was close. When they said the Salve, Salve Regina which all the sailors were accustomed to sing in their way, the Admiral asked and admonished the men to keep a good look-out on the forecastle, and to watch well for land; and to him who should first cry out that he saw land, he would give a silk doublet, besides the other rewards promised by the Sovereigns, which were 10, maravedis to him who should first saw it. At two hours after midnight the land was sighted at a distance of two leagues. Presently they saw naked people. The Admiral took the royal standard, and the captains went with two banners of the green cross, which the Admiral took in all the ships as a sign, with an F and a Y and a crown over each letter, one on one side of the cross and the other on the other. Having landed, they saw trees very green, and much water, and fruits of diverse kinds. The Admiral called to the two captains, and to the others who leaped on shore, and to Rodrigo Escovedo, secretary of the whole fleet, and to Rodrigo Sanchez of Segovia, and said that they should bear faithful testimony that he, in presence of all, had taken, as he now took, possession of the said island for the King and for the Queen his Lords, making the declarations that are required, as is now largely set forth in the testimonies which were then made in writing. The natives reciprocated with gifts of parrots, cotton and other goods. In describing the natives, Columbus wrote: They are very well made, with very handsome bodies, and very good countenances. The "league" used by Columbus is estimated by modern researchers to measure 2. The exact location and name of the island where Columbus first made landfall is in dispute. We do know that it is in the Bahamas and that Columbus spent 5 days exploring the area before sailing to Cuba. Because of limited space on the remaining ships, Columbus was forced to leave about 40 of his crew on the island of Hispaniola in a fort built from the remains of the wrecked ship.

Chapter 6 : Land Rover - Wikipedia

It was John F. Kennedy was the president of the United States. He wanted to land humans on the moon. The United States had just started trying to put people in space. Was NASA ready to go to the moon? The president and NASA knew they could do it. They were ready to put people on the moon.

Co-operative interactions with fungi may have helped early plants adapt to the stresses of the terrestrial realm. Cladogram of plant evolution Plants were not the first photosynthesisers on land. These spores, known as cryptospores , were produced either singly monads , in pairs dyads or groups of four tetrads , and their microstructure resembles that of modern liverwort spores, suggesting they share an equivalent grade of organisation. This resistance is closely associated with having a desiccation-resistant outer wallâ€”a trait only of use when spores must survive out of water. They could only survive when the land was waterlogged. Modern bryophytes either avoid it or give in to it, restricting their ranges to moist settings, or drying out and putting their metabolism "on hold" until more water arrives, as in the liverwort genus Targionia. Tracheophytes resist desiccation, by controlling the rate of water loss. They all bear a waterproof outer cuticle layer wherever they are exposed to air as do some bryophytes , to reduce water loss, but since a total covering would cut them off from CO2 in the atmosphere early tracheophytes used variable openings, the stomata , to regulate the rate of gas exchange. Tracheophytes also developed vascular tissue to aid in the movement of water within the organisms see below , and moved away from a gametophyte dominated life cycle see below. Vascular tissue ultimately also facilitated upright growth without the support of water and paved the way for the evolution of larger plants on land. A snowball earth , from around mya, is believed to have been caused by early photosynthetic organisms, which reduced the concentration of carbon dioxide and increased the amount of oxygen in the atmosphere. Charcoalification is an important taphonomic mode. Wildfire or burial in hot volcanic ash drives off the volatile compounds, leaving only a residue of pure carbon. This is not a viable food source for fungi, herbivores or detritovores, so is prone to preservation. It is also robust, so can withstand pressure and display exquisite, sometimes sub-cellular, detail. Evolution of life cycles[edit] Angiosperm life cycle All multicellular plants have a life cycle comprising two generations or phases. The pattern in plant evolution has been a shift from homomorphy to heteromorphy. The algal ancestors of land plants were almost certainly haplobiontic , being haploid for all their life cycles, with a unicellular zygote providing the 2N stage. All land plants i. It has been proposed that the basis for the emergence of the diploid phase of the life cycle as the dominant phase, is that diploidy allows masking of the expression of deleterious mutations through genetic complementation. As the diploid phase was becoming predominant, the masking effect likely allowed genome size , and hence information content, to increase without the constraint of having to improve accuracy of replication. The opportunity to increase information content at low cost is advantageous because it permits new adaptations to be encoded. This view has been challenged, with evidence showing that selection is no more effective in the haploid than in the diploid phases of the lifecycle of mosses and angiosperms. The interpolation theory also known as the antithetic or intercalary theory [31] holds that the interpolation of a multicellular sporophyte phase between two successive gametophyte generations was an innovation caused by preceding meiosis in a freshly germinated zygote with one or more rounds of mitotic division, thereby producing some diploid multicellular tissue before finally meiosis produced spores. This theory implies that the first sporophytes bore a very different and simpler morphology to the gametophyte they depended on. Increasing complexity of the ancestrally simple sporophyte, including the eventual acquisition of photosynthetic cells, would free it from its dependence on a gametophyte, as seen in some hornworts Anthoceros , and eventually result in the sporophyte developing organs and vascular tissue, and becoming the dominant phase, as in the tracheophytes vascular plants. The observed appearance of larger axial sizes, with room for photosynthetic tissue and thus self-sustainability, provides a possible route for the development of a self-sufficient sporophyte phase. Since the same genetic material would be employed by both the haploid and diploid phases they would look the same. This explains the behaviour of some algae, such as Ulva lactuca, which produce alternating phases of identical sporophytes and gametophytes. Subsequent adaption to the

desiccating land environment, which makes sexual reproduction difficult, might have resulted in the simplification of the sexually active gametophyte, and elaboration of the sporophyte phase to better disperse the waterproof spores. The earliest land plants did not have vascular systems for transport of water and nutrients either. Aglaophyton , a rootless vascular plant known from Devonian fossils in the Rhynie chert [35] was the first land plant discovered to have had a mycorrhizal relationship with fungi [36] which formed arbuscules , literally "tree-like fungal roots", in a well-defined cylinder of cells ring in cross section in the cortex of its stems. Like other rootless land plants of the Silurian and early Devonian Aglaophyton may have relied on arbuscular mycorrhizal fungi for acquisition of water and nutrients from the soil. Xylem To photosynthesise, plants must absorb CO2 from the atmosphere. However, this comes at a price, since making the tissues available for CO2 to enter allows water to evaporate. Early land plants transported water apoplastically , within the porous walls of their cells. Later, they evolved the ability to control water loss and CO2 acquisition through the use of a waterproof outer covering or cuticle perforated by stomata , variable apertures that could open and close to regulate evapotranspiration. Specialised water transport vascular tissues subsequently evolved, first in the form of hydroids , then tracheids and secondary xylem , followed by vessels in flowering plants. This transition from poikilohydry to homoiohydry opened up new potential for colonisation. As CO2 was withdrawn from the atmosphere by plants, more water was lost in its capture, and more elegant water acquisition and transport mechanisms evolved. Even today, water transport takes advantage of the cohesion-tension property of water. Water can be wicked along a fabric with small spaces, and in narrow columns of water, such as those within the plant cell walls or in tracheids, when molecules evaporate from one end, they pull the molecules behind them along the channels. Therefore, transpiration alone provides the driving force for water transport in plants. The bands are difficult to see on this specimen, as an opaque carbonaceous coating conceals much of the tube. Bands are just visible in places on the left half of the image. During the early Silurian, they developed specialized xylem cells, with walls that were strengthened by bands of lignification or similar chemical compounds [43] This process was followed by cell death, allowing the cell contents to be emptied and water to be passed through them. The early Devonian pretracheophytes Aglaophyton and Horneophyton have unreinforced water transport tubes with wall structures very similar to the hydroids of modern moss sporophytes, but they grew alongside several species of tracheophytes, such as Rhynia gwynne-vaughanii that had well-reinforced xylem tracheids. The earliest macrofossils known to have xylem tracheids are small, mid-Silurian plants of the genus Cooksonia. Thickened bands on the walls of tubes are apparent from the early Silurian onwards [45] are adaptations to increase the resistance to collapse under tension. These, the "next generation" of transport cell design, have a more rigid structure than hydroids, preventing their collapse at higher levels of water tension. This is an important role where water supply is not constant, and indeed stomata appear to have evolved before tracheids, since they are present in the sporophytes of mosses and the non-vascular hornworts. The endodermis can also provide an upwards pressure, forcing water out of the roots when transpiration is not enough of a driver. Once plants had evolved this level of controlled water transport, they were truly homoiohydric , able to extract water from their environment through root-like organs rather than relying on a film of surface moisture, enabling them to grow to much greater size. Pits in tracheid walls have very small diameters, preventing air bubbles from passing through to adjacent tracheids. By the Carboniferous, Gymnosperms had developed bordered pits , [49] [50] valve-like structures that seal the pits when one side of a tracheid is depressurized. Defunct tracheids were retained to form a strong, woody stem, produced in most instances by a secondary xylem. However, in early plants, tracheids were too mechanically vulnerable, and retained a central position, with a layer of tough sclerenchyma on the outer rim of the stems. Tracheids end with walls, which impose a great deal of resistance on flow; [46] vessel members have perforated end walls, and are arranged in series to operate as if they were one continuous vessel. An embolism is where an air bubble is created in a tracheid. This may happen as a result of freezing, or by gases dissolving out of solution. Once an embolism is formed, it usually cannot be removed but see later ; the affected cell cannot pull water up, and is rendered useless. End walls excluded, the tracheids of prevascular plants were able to operate under the same hydraulic conductivity as those of the first vascular plant, Cooksonia. The branching pattern of megaphyll veins may indicate their origin as webbed,

dichotomising branches. The megaphyllous leaf architecture arose multiple times in different plant lineages Leaves are the primary photosynthetic organs of a modern plant. The origin of leaves was almost certainly triggered by falling concentrations of atmospheric CO2 during the Devonian period, increasing the efficiency with which carbon dioxide could be captured for photosynthesis. Based on their structure, they are classified into two types: It has been proposed that these structures arose independently. However, Wolfgang Hagemann questioned it for morphological and ecological reasons and proposed an alternative theory. Axes such as stems and roots evolved later as new organs. Thus, James [60] concluded that "it is now widely accepted that In fact, it is simply the timing of the KNOX gene expression! This spread has been linked to the fall in the atmospheric carbon dioxide concentrations in the Late Paleozoic era associated with a rise in density of stomata on leaf surface. Increasing the stomatal density allowed for a better-cooled leaf, thus making its spread feasible, but increased CO2 uptake at the expense of decreased water use efficiency. The early to middle Devonian trimerophytes may be considered leafy. This group of vascular plants are recognisable by their masses of terminal sporangia, which adorn the ends of axes which may bifurcate or trifurcate. These are small, spiny outgrowths of the stem, lacking their own vascular supply. Around the same time, the zosterophyllophytes were becoming important. This group is recognisable by their kidney-shaped sporangia, which grew on short lateral branches close to the main axes. They sometimes branched in a distinctive H-shape. However, none of these had a vascular trace, and the first evidence of vascularised enations occurs in the Rhynie genus Asteroxylon. A fossil clubmoss known as Baragwanathia had already appeared in the fossil record about 20 million years earlier, in the Late Silurian. Lycopods bear distinctive microphylls , defined as leaves with a single vascular trace. Microphylls could grow to some size, those of Lepidodendrales reaching over a meter in length, but almost all just bear the one vascular bundle. An exception is the rare branching in some Selaginella species. The more familiar leaves, megaphylls , are thought to have originated four times independently, in the ferns, horsetails, progymnosperms and seed plants. When stomata open to allow water to evaporate from leaves it has a cooling effect, resulting from the loss of latent heat of evaporation. It appears that the low stomatal density in the early Devonian meant that evaporation and evaporative cooling were limited, and that leaves would have overheated if they grew to any size. The stomatal density could not increase, as the primitive steles and limited root systems would not be able to supply water quickly enough to match the rate of transpiration. Secondary evolution can also disguise the true evolutionary origin of some leaves. Some genera of ferns display complex leaves which are attached to the pseudostele by an outgrowth of the vascular bundle, leaving no leaf gap. The popular belief that plants shed their leaves when the days get too short is misguided; evergreens prospered in the Arctic circle during the most recent greenhouse earth. Seasonal leaf loss has evolved independently several times and is exhibited in the ginkgoales , some pinophyta and certain angiosperms. High trees rarely have large leaves, because they are damaged by high winds. Similarly, trees that grow in temperate or taiga regions have pointed leaves,[citation needed] presumably to prevent nucleation of ice onto the leaf surface and reduce water loss due to transpiration. Herbivory , by mammals and insects , has been a driving force in leaf evolution. An example is that plants of the New Zealand genus Aciphylla have spines on their laminas, which probably functioned to discourage the extinct Moas from feeding on them. Other members of Aciphylla, which did not co-exist with the moas, do not have these spines. This is brought about by ARP genes, which encode transcription factors. The ARP function appears to have arisen early in vascular plant evolution, because members of the primitive group Lycophytes also have a functionally similar gene.

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Chapter 7 : First Life on Land? - Scientific American

A look at the life of the astronaut, Neil Armstrong, and the legendary space mission that led him to become the first man to walk on the Moon on July 20,

Military uses include light utility vehicle; communications platform; weapon platform for recoilless rifles , Anti-tank e. The Discovery has also been used in small numbers, mostly as liaison vehicles. Two models that have been designed for military use from the ground up are the Forward Control from the early s and the Lightweight or Airportable from the late s. The latter was intended to be transported under a helicopter. In , the colour scheme was changed to green with yellow stripes. More recently, vehicles have been painted white, and are issued with fittings similar to civilian UK Mountain Rescue teams. An adaptation of Land Rovers to military purposes is the "Pink Panther" models. For desert use they were often painted pink, hence the name. The vehicles were fitted with among other gear a sun compass , machine guns, larger fuel tanks and smoke dischargers. Series and Defender models have also been armoured. The first of these were delivered in to the Royal Ulster Constabulary , the Northern Ireland police force. By , there had been more than 1, produced. These were originally based on heavy-duty V8 chassis but some have recently been re-mounted on new chassis from Otokar of Turkey and fitted with diesel engines and air-conditioning for Iraq. The most radical conversion of a Land Rover for military purposes was the Centaur half-track. A small number was manufactured, and they were used by Ghana, among others. The Land Rover is used by military forces throughout the world. The current generation of Land Rover used by British Army, the Snatch 2, have upgraded and strengthened chassis and suspension compared to civilian-specification vehicles. The WMIK consists of a driver, a raised gun, usually a Browning heavy machine gun or a grenade machine gun, this used for ground support, and a GPMG general-purpose machine gunner located next to the driver, this used for vehicle protection. Now, Land Rover has its own G4 challenge. The factory centres at Solihull and Halewood have manufacturing tours, while Gaydon has an engineering tour. Safety Model-by-model road accident statistics from the UK Department for Transport show that the Land Rover Defender is one of the safest cars on British roads as measured by chance of death in two-car injury accidents. Other four-wheel-drive vehicles scored equally highly, and collectively these vehicles were much safer for their passengers than those in other classes such as passenger cars and MPVs. These figures reflect the fact that drivers of large mass vehicles are likely to be safer, often at the expense of other drivers if they collide with smaller cars. This original association fell away when the company merged with British Leyland. There are many Land Rover clubs throughout the UK and internationally. Land Rover clubs break down into a number of groups of varying interests. Special Vehicle Clubs â€" At various times Land Rover have produced vehicles for specific events or on a specific theme, most notable are the Camel Trophy and G4 Challenge vehicles which have been sold on to the general public, and a range of Defenders that were loosely based on the custom vehicles produced for the Tomb Raider motion picture. Regional Clubs in the UK break down into two groups, competitive and non-competitive. Competitive clubs are a phenomenon almost exclusively found within the UK, who as well as the non-competitive activities detailed above run competitive events such as Tyro, Road Taxed Vehicle RTV and Cross Country Vehicle CCV trials, winch and recovery challenges or speed events such as Competitive Safaries. All UK competitive events are run within the framework of rules created by the Motor Sports Association MSA with further vehicle specific rules applied by the host club or association. Outside of the UK regional clubs are independent and mostly non-competitive. A number of clubs are affiliated to the Association of Land Rover Clubs ALRC , [50] formerly known as the Association of Rover Clubs ARC the association applies its own vehicle regulations to all of its member clubs who have the opportunity to compete together at regional events and an annual national event with vehicles approved to the same standard. In recent years some non-competitive clubs have dropped their affiliation fifth ALRC. Land Rover owners were also early adopters of virtual clubs that are entirely based online. Also, an agreement was generated to allow other clubs to use the Land Rover green oval logo under licence. Brand extensions Bicycles In , Land Rover endorsed the production of a hand-made bicycle using its logo. Two more models immediately followed: In

June , Land Rover released a comprehensive 25 model range of bicycles. The three main ranges are the "Defender", the "Discovery", and the "Freelander", each with different attributes. The "Discovery" is an all-rounder bicycle suited to a variety of terrains, "Defender" is most suited to rugged terrain and off-road pursuits, whereas the "Freelander" is designed for an urban lifestyle. All bikes are made from lightweight aluminium. In the range was relaunched in conjunction with British manufacturer 2x2. The design reflected the heritage of the marque, with a light metal frame with canvas seating, held together with push-studs and tough simple parts like brakes and hinges. They could be collapsed completely flat, with wheels removed in seconds. The basic frame could be adapted with modules to allow a baby to lie flat or a bubble windscreen to completely enclose the child. The frame also came in long or short-handled versions, and could be repaired with home tools. The design was simple, light, and rugged and able to travel in all terrains hence the ATP for all-terrain pushchair. It came in three military looking colours: Production was discontinued in

Chapter 8 : Toyota â€œJeep,â€• The First Land Cruiser

Voskhod 1 was the first spacecraft to carry a multi-person crew, and the two-day mission was also the first flight performed without read more General Interest

Their society was devastated on a level so deep it literally had to be remade from the ground up. It was far more than just dealing with the results of the major loss of population and infrastructure from the war. After decades of indoctrination by a totalitarian regime, the Japanese people had to completely change their way of thinkingâ€”about themselves and their place in the world. It was a remarkable feat that reforged the country identity and helped lead Japan into a leading position in the manufacture of cars and SUVs. In , Toyota, a car company that would eventually grow into worldwide dominance, had an year history building motor vehicles. Toyota returned to producing commercial vehicles not long after the war ended, but it was an uphill struggle with so much damage to infrastructure and manpower shortages. When a call went out in for the design and production of a home-built 4x4 utility for the Police Reserve Force predecessor to the current Japanese Defense Force , the Toyota Motor Company answered. The design work began in August with a prototype available for tests by January The designers had been charged with using as much existing hardware as possible, so the platform began with the chassis of SB-Series 1-ton truck. The SB was a compact 4x2 with a cc four-cylinder engine and a Toyota retained that wheelbase and used the chassis as-is, more or less, converting the stout 9. If you are starting to scratch your head pondering how much help a single-speed T-case connected to a cc engine would be off-road, stop. Toyota got out the big guns to power the new right: With 85 hp and lb-ft of torque, it was reckoned to have more than enough grunt without a low range, especially when combined with 4. Yes, the legend is true! While the engines remained similar, the Toyota-built engines diverged as unique changes and upgrades were applied over many years. The body resembled the wartime jeep, a vehicle the Japanese loved as much as anyone, and it was boxy for simple manufacture with minimal tooling. Because it had a longer wheelbase than the jeep, it also was a bit roomier. Some of the extra room was eaten up by that long six under the hood, and the rest was designated as cargo space, so the driver was a bit cramped by Western standards. Because it was intended as a military utility vehicle, it had a soft top and very spartan features. So what did they call this new little buggy? It came to a head in This is one of the most interesting and humorous faux pas in automotive history, even though it was purely an innocent mistake. When capitalized and trademarked, as Willys did in , it becomes an infringement case. It never went beyond a legal nastygram from Willys and a subsequent apology from Toyota. He was surer it was a first shot across the bow of Land Rover, whose strong markets in Africa and Australia Toyota would gradually take away. The early Toyota BJ was built in several styles: You see some later models with a long tail extension for expanded cargo space, and you also see some with special-purpose bodies. The standard BJ was designed for police and military-like use and was configured accordingly. The BJ was available to the civilian market, but it appears sales were minimal in that venue. More inroads were made commercially, where they were sold to government agencies and companies needing a light 4x4. Production of the BJ continued into with few major changes. The much more refined and civilian-friendly Series had the new F-Series hp 3. A version of the BJ remained in the lineup through , called the BJ It was slightly more civilized and stylized but left the lineup after They were never imported into the U. Less than a handful made it over here, which now rest with collectors. The BJ holds the record for the first production short-wheelbase, compact 4x4 to have a six-cylinder engine, The Details:

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Chapter 9 : NASA - The First Person on the Moon

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On October 12, the expedition sighted land, probably Watling Island in the Bahamas, and went ashore the same day, claiming it for Spain. Later that month, Columbus sighted Cuba, which he thought was mainland China, and in December the expedition landed on Hispaniola, which Columbus thought might be Japan. He established a small colony there with 39 of his men. He was the first European to explore the Americas since the Vikings set up colonies in Greenland and Newfoundland in the 10th century. Landfall was made in the Lesser Antilles in November. Returning to Hispaniola, he found the men he left there slaughtered by the natives, and he founded a second colony. Sailing on, he explored Puerto Rico , Jamaica, and numerous smaller islands in the Caribbean. Columbus returned to Spain in June and was greeted less warmly, as the yield from the second voyage had fallen well short of its costs. Isabella and Ferdinand, still greedy for the riches of the East, agreed to a smaller third voyage and instructed Columbus to find a strait to India. In May , Columbus left Spain with six ships, three filled with colonists and three with provisions for the colony on Hispaniola. This time, he made landfall on Trinidad. He explored the Orinoco River of Venezuela and, given its scope, soon realized he had stumbled upon another continent. Columbus, a deeply religious man, decided after careful thought that Venezuela was the outer regions of the Garden of Eden. Returning to Hispaniola, he found that conditions on the island had deteriorated under the rule of his brothers, Diego and Bartholomew. In , Spanish chief justice Francisco de Bobadilla arrived at Hispaniola, sent by Isabella and Ferdinand to investigate complaints, and Columbus and his brothers were sent back to Spain in chains. He was immediately released upon his return, and Ferdinand and Isabella agreed to finance a fourth voyage, in which he was to search for the earthly paradise and the realms of gold said to lie nearby. He was also to continue looking for a passage to India. Attempting to return to Hispaniola, his ships, in poor condition, had to be beached on Jamaica. Columbus and his men were marooned, but two of his captains succeed in canoeing the miles to Hispaniola. Columbus was a castaway on Jamaica for a year before a rescue ship arrived. In November , Columbus returned to Spain. Queen Isabella, his chief patron, died less than three weeks later. Although Columbus enjoyed substantial revenue from Hispaniola gold during the last years of his life, he repeatedly attempted unsuccessfully to gain an audience with King Ferdinand, whom he felt owed him further redress. Columbus died in Valladolid on May 20, , without realizing the great scope of his achievement: He had discovered for Europe the New World, whose riches over the next century would help make Spain the wealthiest and most powerful nation on earth.