NICHES AS WELL AS NESTS pdf

1: Nest | Niche Wiki | FANDOM powered by Wikia

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Theoretical and Review Papers Narvaez, D. Evolution, Early Experience and Human Development: From Research to Practice and Policy pp. The Future of human nature: Implications for research, policy, and ethics. Child environments and flourishing. Culture, Childrearing and Social Wellbeing pp. The flourishing of young Children: Evolution, family and society pp. Young child flourishing as an aim for society. Journal of Moral Education, 45 3 , The Evolved Development Niche: Longitudinal effects of caregiving practices on early childhood psychosocial development. Early Childhood Research Quarterly, 28 4 , â€" The Evolved Developmental Niche and sociomoral outcomes in Chinese three-year-olds. European Journal of Developmental Psychology, 10 2 , Early experience and ethical orientation. Protectionism, engagement and imagination pp. Wellbeing and sociomoral development in preschoolers: The role of maternal parenting attitudes consistent with the Evolved Developmental Niche. Evolution, family and society Evolved Developmental Niche History: Relation to adult psychopathology and morality. Applied Developmental Science, 4, Past moral action and ethical orientation. The neurobiology of moral sensitivity: Evolution, epigenetics and early experience. Developing moral sensitivity across the curriculum pp. The co-construction of virtue: Epigenetics, neurobiology and development. Evolution, Early Experience and Moral Becoming.

2: Nest Site Selection

A species's niche includes the physical environment to which it has become adapted as well as its role as producer and consumer of food resources. niche Past participle: niched.

Bring fact-checked results to the top of your browser search. The process of succession Primary and secondary succession both create a continually changing mix of species within communities as disturbances of different intensities, sizes, and frequencies alter the landscape. The sequential progression of species during succession, however, is not random. At every stage certain species have evolved life histories to exploit the particular conditions of the community. This situation imposes a partially predictable sequence of change in the species composition of communities during succession. Initially only a small number of species from surrounding habitats are capable of thriving in a disturbed habitat. As new plant species take hold, they modify the habitat by altering such things as the amount of shade on the ground or the mineral composition of the soil. These changes allow other species that are better suited to this modified habitat to succeed the old species. These newer species are superseded, in turn, by still newer species. A similar succession of animal species occurs, and interactions between plants, animals, and environment influence the pattern and rate of successional change. Stratification and gradation Community structure can become stratified both vertically and horizontally during the process of succession as species become adapted to their habitat. Gradations in environmental factors such as light, temperature, or water are responsible for this fractionation. The vertical stratification that occurs within forests results from the varying degrees of light that the different strata receive: Three or more vertical strata of plantsâ€”an herb layer, a shrub layer, a small tree layer, and a canopy tree layerâ€"often are found in a forest. Animals are affected by this stratification of plant life. Although they can move from one layer to another quite easily, they often adhere closely to a specific layer for foraging, breeding, or other activities. Horizontal patterns among species also can emerge from gradients in the physical environment. Differences in the amount of water or nutrients over a region can affect the distribution of animal and plant species see biogeographic region. On a mountain, plant and animal species vary at different elevations as well as among the north, south, east, and west slopes. Drastic differences in certain factors over a very short distance can create sharp boundaries between communities, whereas gradual differences can produce a more integrated flow of species. These gradients help to maintain regional biodiversity. Ecotones Ecosystems are almost always a patchwork of communities that exist at different successional stages. The sizes, frequencies, and intensities of disturbances differ among ecosystems, creating differences in what is called the patch dynamics of communities. Along the edges of each of the patches are areas called ecotones. These junction zones often contain species of each of the overlapping communities as well as some species that have become adapted specifically for living in these zones. In many cases, the number of species and the population density are greater within the ecotone than in the surrounding communities, a phenomenon known as the edge effect. In North America the parasitism of bird nests by brown-headed cowbirds Molothrus ater is particularly frequent in ecotones between mature forests and earlier successional patches. Cowbirds lay their eggs in the nests of other birds and are active mainly in early successional patches. Forest birds whose nests are deep within the interior of mature forests are less likely to be attacked than those within ecotones. The cutting of mature forests has increased the extent of ecotones, concomitantly increasing the rate of cowbird parasitism across North America. Ecological niches An ecological niche encompasses the habits of a species. Essentially it refers to the way a species relates to, or fits in with, its environment. As a species adapts to the physical parameters and biota within the community, natural selection favours the development of specialized features that allow the species to uniquely exploit the surrounding resources. Physical conditions of the regionâ€"such as temperature, terrain, or nutrient availabilityâ€"help to mold the niche, and biological constraints such as predation , competition, or lack of resources limit the ways in which a species exploits its environment. For example, plant species differ in their requirements for light, nutrients, and microorganisms, as well as in their ability to fend off competitors and herbivores. Herbivore species can eat only a subset of the plants available within a community, and predators can capture only some of the many potential prey species.

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It nests only among young jack pines Pinus banksiana that are 2 to 4 metres 6. These trees are exposed to periodic fires, necessary for germination of the jack pine seeds. These fires also continuously provide extensive new regions of young trees, allowing the warblers to shift their nesting sites over the years to remain within stands of jack pine that are of the preferred height. The niche of a species evolves as physical and biological factors in the community changeâ€”provided that such changes are slow enough to allow species to adapt to them. The main constraint on this evolution is that no two species in a community can have the same niche. Specialized modes of existence thus provide a selective advantage to coexistent species, offsetting direct competition for available resources. Biodiversity and the stability of communities As species adapt to one another and to their communities, they form niches and guilds. The development of more complex structures allows a greater number of species to coexist with one another. The increase in species richness and complexity acts to buffer the community from environmental stresses and disasters, rendering it more stable.

3: Bird nest - Wikipedia

Material is the resource needed to build nests; building a new nest costs 10 materials and repairing a degraded nest costs 3 materials. At the beginning of a game, the player always starts with 10 materials.

By Editors Ecological Niche Definition In ecology, a niche is the role or job of a species in a habitat. Ecological niches have specific characteristics, such as availability of nutrients, temperature, terrain, sunlight and predators, which dictate how, and how well, a species survives and reproduces. A species carves out a niche for itself in a habitat by being able to adapt and diverge from other species. According to the competitive exclusion principle, two species cannot occupy the same ecological niche in a habitat if they are competing for the same resources. When species compete in a niche, natural selection will first move to lessen the dependence of the species on the shared resources. If one species is successful, it reduces the competition. If neither evolves to reduce competition, then the species that can more efficiently exploit the resource will win out, and the other species will eventually become extinct. Jack pine forests with areas of over 80 acres are ideal for this species. Specifically, these forests must have dense clumps of trees with small areas of grass, ferns and small shrubs in between. When the tree reaches about feet tall, the lower branches start to die, and the bird will no longer nest beneath the tree branches. The consistent availability of young jack pines for nesting was generated by naturally occurring wildfires in this habitat. The species population reached its peak from Humans began to alter this niche by fighting and putting out forest fires. Large areas of jack pine forest were designated for habitat management via logging, burning, seeding and replanting in the s, and the species recovered. Dung Beetle As the name implies, dung beetles eat dung, both as adults and as larvae. They live on all continents except Antarctica. Dung is plentiful throughout the world, and over time, the dung beetle has learned to exploit it as a resource, and create its own niche. Dung beetles are known for the way in which they roll dung into a ball before transporting it. These balls area buried in an underground burrow to either be stored as food or used as brooding balls. The female lays eggs in the brooding ball and the larvae hatch inside. When they reach adult size, the beetles dig out of the ball and work their way to the soil surface. The actions of dung beetles serve several important functions in their habitat. Digging burrows and tunnels turns over and aerates the soil. The buried dung releases nutrients into the soil that benefits other organisms. Xerophytic Plants Xerophytic plants have developed several adaptations to living in dry ecological niches. The adaptations evolved to help save water stored in the plant and to prevent water loss. Examples of xerophytes are cacti and aloe vera, also called succulents. These plants have thick fleshy leaves that store water, and long roots to reach water deep underground. Other adaptations that xerophytic plants use include the ability to move or fold up their leaves, dropping their leaves during dry periods, a waxy coating to prevent evaporation called the cuticle and thick hairy leaf coverings. The surface of plant leaves features stomata, which are tiny mouth-like structures that take in carbon dioxide and release oxygen and water. Plants usually open their stomata during the day and close them at night. Succulents do the opposite in order to reduce water loss during the heat of the day. Extremophiles Organisms can create ecological niches in some of the most inhospitable places on earth. Extremophiles are organisms, primarily eukaryotes, adapted to and thriving in areas of environmental extremes. The suffix -phile comes from the Greek word philos, which means loving. The type of extreme environment describes these organisms. Some organisms, called polyextremophiles, have adapted to more than one extreme. The study of extremophiles is important to the understanding of how life originated on earth and what life could be like in other worlds. Extremophiles are also important in biotechnology because their enzymes called extremozymes are used under extreme production conditions.

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4: Types of Ecological Niches | Biology Dictionary

NICHES Study N eurodevelopment and I mproving C hildren's H ealth Following E nvironmental Tobacco S moke Exposure (NICHES) is a research study at Duke University that you are eligible for as a participant of the NEST Study.

Recently, some biologists have argued that niche construction is an evolutionary process that works in conjunction with natural selection. The effect of niche construction is especially pronounced in situations where environmental alterations persist for several generations, introducing the evolutionary role of ecological inheritance. This theory emphasizes that organisms inherit two legacies from their ancestors: A niche constructing organism may or may not be considered an ecosystem engineer. Ecosystem engineering is a related but non-evolutionary concept referring to structural changes brought about in the environment by organisms. Earthworms physically and chemically modify the soil in which they live. Only by changing the soil can these primarily aquatic organisms live on land. They live in the trunks of Duroia hirsuta trees found in the Amazonian rain forest of Peru. Lemon ants use formic acid a chemical fairly common among species of ants as a herbicide. These activities modify nutrient cycling and decomposition dynamics, influence the water and materials transported downstream, and ultimately influence plant and community composition and diversity. This changes the physical state of the sand which allows other organisms such as the amphipod Corophium volutator to colonize the area. The benefit of this activity is facilitated by an adaptation for fire resistance which benefits them relative to their competitors. This fermentation process in turn attracts fruit flies that it is closely associated with and utilizes for transportation. As creatures construct new niches, they can have a significant effect on the world around them. The common cuckoo illustrates such a consequence. It parasitizes other birds by laying its eggs in their nests. This had led to several adaptations among the cuckoos, including a short incubation time for their eggs. Another adaptation it has acquired is that the chick mimics the calls of multiple young chicks, so that the parents are bringing in food not just for one offspring, but a whole brood. The development of many organisms, and the recurrence of traits across generations, has been found to depend critically on the construction of developmental environments such as nests by ancestral organisms. Ecological inheritance refers to the inherited resources and conditions, and associated modified selection pressures, that ancestral organisms bequeath to their descendants as a direct result of their niche construction. Niche construction has important implications for understanding, managing, and conserving ecosystems. An early advocate of the niche construction perspective in biology was the developmental biologist, Conrad Waddington. He drew his attention to the many ways in which animals modify their selective environments throughout their lives, by choosing and changing their environmental conditions, a phenomenon that he termed "the exploitive system". In the s and s Lewontin wrote a series of articles on adaptation, in which he pointed out that organisms do not passively adapt through selection to pre-existing conditions, but actively construct important components of their niches. Modeling niche construction[edit] Niche Construction in Evolutionary Time. The organism both changes its environment and adapts to it. These analyses suggest that niche construction is of considerable importance. For instance, niche construction can: However, human scientists have been attracted to the niche construction perspective because it recognizes human activities as a directing process, rather than merely the consequence of natural selection. Niche construction theory emphasizes how acquired characters play an evolutionary role, through transforming selective environments. This is particularly relevant to human evolution, where our species appears to have engaged in extensive environmental modification through cultural practices. Mathematical models have established that cultural niche construction can modify natural selection on human genes and drive evolutionary events. This interaction is known as gene-culture coevolution. There is now little doubt that human cultural niche construction has co-directed human evolution. A well-researched example is the finding that dairy farming created the selection pressure that led to the spread of alleles for adult lactase persistence. The lactose persistence example may be representative of a very general pattern of gene-culture coevolution. Niche construction is also now central to several accounts of how language evolved. For instance, Derek Bickerton describes how our ancestors constructed scavenging niches that required them to communicate in order to recruit sufficient individuals to drive off predators away from megafauna corpses. Researchers differ over to what extent niche construction requires changes in understanding of the evolutionary process. Many advocates of the niche-construction perspective align themselves with other progressive elements in seeking an extended evolutionary synthesis , [31] [32] a stance that other prominent evolutionary biologists reject. A collaboration between some critics of the niche-construction perspective and one of its advocates attempted to pinpoint their differences. The skeptics dispute this. For them, evolutionary processes are processes that change gene frequencies , of which they identify four natural selection , genetic drift , mutation , migration [ie. They do not see how niche construction either generates or sorts genetic variation independently of these other processes, or how it changes gene frequencies in any other way. In contrast, NCT adopts a broader notion of an evolutionary process, one that it shares with some other evolutionary biologists. Although the advocate agrees that there is a useful distinction to be made between processes that modify gene frequencies directly, and factors that play different roles in evolution The skeptics probably represent the majority position: Advocates of NCT, in contrast, are part of a sizable minority of evolutionary biologists that conceive of evolutionary processes more broadly, as anything that systematically biases the direction or rate of evolution, a criterion that they but not the skeptics feel niche construction meets. Further controversy surrounds the application of niche construction theory to the origins of agriculture within archaeology. In a review, archaeologist Bruce Smith concluded:

5: Niche construction - Wikipedia

Nests, nodes and niches: A system for process monitoring, information exchange and decision making for multiple stakeholders. as well as the outcomes, as part of.

Journal of Experimental Zoology Part B: This article has been cited by other articles in PMC. ABSTRACT This paper introduces a conceptual framework for the evolution of complex systems based on the integration of regulatory network and niche construction theories. It is designed to apply equally to cases of biological, social and cultural evolution. Within the conceptual framework we focus especially on the transformation of complex networks through the linked processes of externalization and internalization of causal factors between regulatory networks and their corresponding niches and argue that these are an important part of evolutionary explanations. In essence, this controversy is about how to integrate recent empirical and theoretical advances within evolutionary biology and related fields into the core of evolutionary theory and how to broaden its explanatory scope. These advances include insights from molecular and developmental biology that have led to the concepts of developmental and regulatory evolution and genomic regulatory networks Davidson, ; Davidson, ; Materna and Davidson, ; Carroll, ; Shubin, ; Davidson, ; Davidson, ; Krakauer et al. Another challenge has been to expand evolutionary explanations to human psychology, sociality, language, culture, technology, economics and medicine Piaget, ; Carroll, ; Boyd and Richerson, ; Richerson and Boyd, ; Stearns and Koella, ; Nesse et al. Further debates involve patterns of evolutionary change Grant, ; Grant and Grant, ; Minelli, ; Erwin and Valentine, , the causal mechanisms that generate phenotypic variation Carroll, ; Peter and Davidson, or the levels of selection Okasha, Innovation, the generation of novel characters or behaviors, as opposed to standard patterns of variation and adaptation, involves not only the transformation of regulatory systems, but also the kind of interactions between systems and their environment that have been described as niche construction Laland et al. Rather we also need to understand how systems actively construct their relevant niches or how technologies create demand and how these constructed niches, in turn, affect the possibilities of future transformation of these systems. Technically this is a question about the structure of search spaces for evolutionary dynamics Barve and Wagner, Of the competing viewsâ€”one that defines a search space abstractly as the sum of all possible combinations at a particular level of the biological hierarchy, such as a sequence space for RNA or DNA molecules of a particular length or sum of all possible metabolic interactions within a particular pathway; the other that argues that in the case of complex systems the search space of future possibilities is actively constructed by the actions and properties of currently existing systemsâ€”we clearly argue for the latter. For us, within the current extended landscape of evolutionary biology the challenge of explaining evolutionary innovations thus translates into the need to integrate the complex transformations of regulatory networks and their elements mentioned above with niche construction perspectives. A focus on regulatory networks, such as gene regulatory networks, helped to discover causal mechanisms that control the development of specific phenotypic characters. Furthermore, comparative studies of different species and of normal and pathological conditions have shown how specific transformations of either regulatory network structures or individual elements within those networks are responsible for observed phenotypic variation Carroll, ; Wagner et al. In practice, however, detailed reconstructions of such extended causal networks are still rare and specific contextual effects are generally subsumed under a generalized environmental contribution to the partition of variance and in any case are considered to be a factor that is independent from the genomic, cellular or organismal system. Niche construction theory Laland et al. In this view, the niche is not something that exists out there in nature waiting to be discovered or filled by an organism. Furthermore, constructed niches often persist longer than any of their individual inhabitants, which allow these niches to store important hereditary and regulatory information. Niche construction theory thus includes the notion of expanded and multiple inheritance systems from genomic to ecological, social and cultural. In part this is a consequence of the formal structure of variance decompositions the famed Price equation that is the foundation of much of niche construction theory. But it also reflects a tendency within niche construction theory to focus on multiple broadly defined factors and quantify their relative importance within evolutionary dynamics. What both of these approaches are missing is a clearly defined conception of how systems at multiple scales interact with each other, where some are defined as internal to the organizational level of study and some are defined as context or environment. A precise definition of the nature of these interactions is, however, a prerequisite for a causal model of the evolution of complex systems and also for understanding innovation across scales. This requires us to clearly define the relevant elements of these systems and their properties. Without conceptual precision it will be impossible to define the measurements and metrics needed to turn integrative conceptual ideas into formal models and to specify the criteria for empirical validation. Another challenge is to trace the consequences of causal interactions at different scales through an iterative sequence of historical stages. The conceptual framework we propose here begins with a conceptual clarification of the properties of extended systems that include both regulatory and niche elements. In our conception, regulatory and niche elements are parts of an extended network of causal interactions. For the case of genetic systems Linksvayer and Wade have proposed a model of indirect genetic effects that can be seen as a specific instance of such an extended model. It introduces an expanded conception of genetic effects that includes contributions from different individuals in the context of a behaviorally linked system, such as a colony of social insects or other socially interacting systems. Our framework allows us to go beyond the idea of indirect genetic effects in that it i includes a broader range of causal factors, including those that are often subsumed under ecological inheritance Laland et al. The Problems of Homology and Innovation The linked problems of, on the one hand, homology, or sameness of structures and behaviors across a wide range of species, social systems or cultures, and, on the other hand, innovation, i. Homology has traditionally been seen as a consequence of genealogy and inheritance Laubichler, Simply put, complex phenotypes are the same because they inherited the same genes or other types of hereditary information. This historical conception of homology does, however, not account for the observed patterns of sameness and stability as we often see more gradual divergence in genes or other parts of the hereditary material than in the resulting phenotypic characters. In response to these challenges a regulatory conception of homology was proposed that explains the stability of phenotypic characters through time as a consequence of conserved structures in regulatory developmental systems or networks Wagner, ; Wagner et al. In the context of this developmental view, conserved elements of regulatory networks referred to in the literature either as kernels or character identity networks establish the identity or sameness of specific characters or structures while other more downstream parts of the network allow for the adaption of these characters to specific functions Davidson, ; Wagner, ; Davidson, ; Wagner, These variants of recognizable characters are called character states. The reason for the existence of conserved parts of networks is found in the interdependencies between elements in these complex regulatory networks where changes to certain parts of the network would cause a large number of dramatic and often lethal consequences. Any explanation of stability or homology also provides implicitly an explanation of novelty. We define novelty as the emergence of a new character as opposed to the transformation of an existing character into a new character state. There are, of course, several ways how novelties can emerge. These are currently the subject of intense debates within developmental evolution. Most prominently is the argument about the importance of changes in coding vs regulatory regions Carroll, ; Laland et al. As evidence exists that each type of change can play a role in specific instances of novelty Khalturin et al. Such a rearrangement can be caused by the addition of new elements for instance through gene duplication or lateral gene transfer, if we focus on genomic systems or by the emergence of new links and regulatory relationships among already existing elements. In any case, novelties or inventions in the context of technological change are understood as the consequence of a specific type of transformation of regulatory networks. In the context of evolution or history, the eventual fate of these novelties or inventions is determined by the selective conditions of the environment, markets or domains of implementation. Only a successful novelty or invention is then called an innovation sensu Schumpeter Erwin, ; Davidson and Erwin, ; Krakauer et al. However, this relationship between novel variants and their selective environment can be quite complex, as we have to also account for the role of processes summarized under the general label of niche construction in this process. And most importantly, we need to be able to account for how transitions between regulatory states can actually be viable within specific evolutionary lineages, a problem that has not yet been fully resolved. Our conceptual framework suggests ways how an emphasis on the interactions between these two kinds of processes can contribute to a better understanding of the evolutionary dynamics of homology and innovation. While others have done this for some specific cases and within the conceptual structure of either evolutionary genetics Linksvayer et al. We see this not as an exercise in grandiose theory or abstraction, but rather as a logical consequence of the internal dynamics of such integrated systems. One aspect of this is the role of coarse graining for theory development within biology Krakauer et al. In the context of our proposed framework this implies to generalize from individual cases while at the same time provide enough specificity to be able to apply the framework to a number of specific cases. The extensions of the causal networks to include both internal and external environmental factors also allows us to focus on those cases that are characterized by multiple kinds of elements, such as cases of social and cultural evolution that include a number of different factors biological, social, cultural. In this section we provide an abstract formulation of our framework that will be the basis of future modeling. We begin by defining an internal system as a network of agents capable of persisting through time and reproducing its structure. The agents form the nodes of this network while their causal interactions constitute the links. Such systems may span multiple scales. Therefore an agent or node at one scale can be a network of agents at a different scale. Both persistence and reproduction typically require control and coordination of actions not only within and among the agents constituting the internal system, but also interactions between the system and other systems and their environment. An extended network includes the environment as part of the network structure. All aspects of the environment that causally affect these interactions form the structured niche of the internal system. Together, system and structured niche constitute the extended regulatory network. The structured niche has itself a network structure induced by the primary network constituted by the internal system. Its nodes are those aspects of the environment that condition, mediate or become the target of actions, in short the environmental resources of the internal system. Its links are causal relations among these resources and between the resources and the internal network structures. The niche for an internal network at one scale can be part of the internal network at another scale. These distinctions are thus always process specific and also pragmatic. In modeling a specific type of causal interaction it often makes sense to treat some aspects of these extended causal networks as internal or as context or environment. Actions are regulated by the structure of the extended regulatory network and may be directed at the environment or at other agents changing their states so as to affect their actions. Actions realize functions related to the possible states of a system and its environment. Actions always involve environmental resources, constituting the material conditions or the targets of their realization. But actions also do not leave the system itself indifferent and constantly change its internal structure. The internal structures of actors are the result of iterative through evolutionary and individual time scales transformations of such action networks. Here the agents correspond to individuals and the networks to populations. The internal structures of these agents include units of inheritance and the system of developmental interactions. The latter turns these agents into units of interaction and establishes the range of behaviors for each agent. Based on the internal complexity of these agents, they can also adapt their behaviors through interaction with the environment. The key regulative structure of interactions at the level of the population network is, however, selective reproduction. It includes the effects of random variation at the level of the internal genetic and developmental system and, as a consequence, heritability across generations. Interactions with the environment take multiple forms. These include the construction of individual niches through interactions between possible internal states and environmental resources and conditions. As a consequence, internal states are externalized into the environment. It also includes selection among the units of inheritance in intergenerational transitions. Recasting the standard dynamics of natural selection this way allows us to see it as a special case of evolutionary network transformation. This is captured by the idea of multiple inheritance systems within niche construction theory. In particular, regulatory network structures may expand by incorporating interactions with other units as well as features of the environment, or the extended network in our model. Within our model of extended networks these externalized factors can become an important part of the regulatory structures governing the behavior of agents and, if they are stable enough, also have substantial evolutionary consequences. In biological evolution, this extension may at first happen, within a single generation, only at the developmental and behavioral level. Still, it will enlarge the set of regulative networks on which natural selection can act, possibly turning a transient extended regulatory structure into a heritable feature. The dynamics between externalization and internalization is particularly relevant for explanations of evolutionary innovations. Regulatory evolutionary changes of different kinds Peter and Davidson, leading to genuine novelty or innovation can be explained as a consequence of the creation of additional regulatory modules or network transformations. Again, there are many concrete ways how this can actually be realized Carroll, ; Khalturin et al. These often operate upstream of the highly canalized structures that control normal development and organismal function.

6: Status Affliction | Niche Wiki | FANDOM powered by Wikia

We further researched the best species match for the La Brea bees by examining the historic environmental niche space of the La Brea Litomegachile relative to the contemporary environmental niche of M. gentilis and M. onobrychidis, the species whose nest cell morphology, distribution, size, and nesting behavior is closest to M. gentilis.

Published online Apr 9. Koch Find articles by Jonathan B. Erwin Find articles by Diane M. The authors have declared that no competing interests exist. Conceived and designed the experiments: Received Jan 24; Accepted Mar This article has been cited by other articles in PMC. Violin plots of eight bioclimatic variables associated with the distributions of M. The width along each violin plot represents the frequency of specimen records associated with a measurement of the bioclimatic variable under observation. Wider widths reflect a higher frequency of specimen records, whereas thinner widths reflect a lower frequency of specimen records. Contemporary habitat suitability distribution of M. Kendall rank correlation coefficient estimates for M. Natural history records of M. All specimens of each species present in the U. National Pollinating Insect Collection Database are presented in the table. Megachile brevis onobrychidis has been synonymized as M. The former name is retained in the data table. Duplicate specimen records for each species per unique locality were removed for the final analyses. Rotating video nest of opaque to transparent nest cell containing male pupa. Rotating video nest of opaque to transparent nest cell containing female pupa. Rotating dorsal to ventral video of male pupa. Rotating dorsal to ventral video of female pupa. Rotating lateral video of male pupa. Rotating quarter edge of nest cell. This video shows cross-sections of leaves from different angles. Less researched are insects, even though these specimens frequently serve as the most valuable paleoenvironemental indicators due to their narrow climate restrictions and life cycles. Our goal was to examine fossil material that included insect-plant associations, and thus an even higher potential for significant paleoenviromental data. Here identified as best matched to Megachile Litomegachile gentilis Cresson Hymenoptera: The result of complex plant-insect interactions, they offer new insights into the environment of the Late Pleistocene in southern California. The remarkable preservation of the nest cells suggests they were assembled and nested in the ground where they were excavated. The four different types of dicotyledonous leaves used to construct the cells were likely collected in close proximity to the nest and infer a wooded or riparian habitat with sufficient pollen sources for larval provisions. Consequently, it provides a pre-modern age location for a Nearctic group, whose phylogenetic relationships and biogeographic history remain poorly understood. Nevertheless, the broad ecological niche of M. Introduction Megachile Latreille [1] is a large, worldwide genus of approximately 1, species of largely leafcutting, solitary bees. In the Western Hemisphere they inhabit temperate, arid, and tropical regions extending from Alaska to Tierra del Fuego [2]. There are species native to North America [2]. The abundance of megachilids in California is not surprising given the wide diversity of habitats and microclimates [3] , [4]. Leafcutter bees are named for their use of leaf pieces in nest building. Their nesting sites are found under the bark of dead trees, in stems, in the burrows of wood-boring insects or in burrows self-dug in loose soil or those made by other animals [2] , [5] , [6]. The females use their sharp, serrated, scissor-like mandibles to cut oblong and circular leaf pieces, most likely from plant sources near the nest [2] , [5]. They line the nest cavities with overlapping layers of the oblong-shaped leaf disks. The leaf edges are compressed to extrude sap that, in combination with saliva, creates a glue-like substance that keeps the cells sealed and intact [2]. Each cell is provisioned with pollen and nectar by the female before she deposits a single egg on the food mass. After a few weeks, depending upon species, the eggs hatch, and the larvae develop through multiple instars and feed on the provisions. Mature larvae spin cocoons of two or more layers of silk and diapause as prepupae. This application binds the silk mesh and makes the cocoon extremely durable. The larvae subsequently pupate and emerge as adults by chewing their way out through the cap. That females may spend the majority of their time collecting pollen and nectar to provision their young [2] and construct intricate nests with specific materials indicates a very complex and highly evolved plant-insect interaction, and strongly suggests a long evolutionary history [8]. The use of leaf disks of various sizes, shapes, and textures also reflects highly complex and evolved behavior

[2] , [8] , [9] , [10]. As currently known, the megachilid fossil record is restricted to the Cenozoic based on body fossils preserved as compressions and three-dimensionally preserved in amber, as well as trace evidence from fossil angiosperm leaves whose margins show smooth-edged oblong and circular cutouts [8] , [11] , [12]. Engel [13] â€” [15] and Engel and Perkovsky [11] have compiled the evolutionary history and an overview of the body fossil record, respectively. Morphological data body fossils and leaf cutouts attributed to Megachile and molecular data do not always agree on the time divergence of the genus [8] , [11] â€” [14] , [16] â€” [22]. Although the phylogenetic relationships and evolutionary history of the genus have become clarified as more studies incorporate molecular data [23] , the fossil record remains incomplete and some specimens assigned to Megachilidae may need revision. For example, molecular data suggest that Megachilidae arose in the Cretaceous about â€” mya, but the genus Megachile is estimated to have originated only 22 mya [23]. However, leafcutters are derived species of Megachile and therefore, the fossil record based on leaf cutouts from the Early to middle Eocene in North American and Europe [16] â€” [20] suggests that basal divergences in the Megachilini occurred earlier in the Paleocene or Latest Cretaceous [11]. Though geologically young, this is the first report of three-dimensionally preserved Megachile nest cells that shows rare preservation and life-stages. By setting specimens within a geological as well as an ecological context, Quaternary fossils are shown to be valuable precursors to modern biota [27]. Although the asphaltic deposits at Rancho La Brea are most often associated with vertebrate remains from saber-toothed cats and mammoths, the insects and plants found there are also significant fossils because they are original material, and thus, intact, three-dimensional, and structurally complex. As such they can provide the most valuable paleoenvironmental information for the richest Ice Age fossil locality. Our goal was to synchronize data by identifying both nest cell insect and plant material in order to make the significant paleoenvironmental inferences possible. This research also resulted in new information on M. In additional to its role as a sensitive paleoenvironemental indicator and providing new information on M.

7: Niched | Define Niched at www.enganchecubano.com

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After a long migration northward from the Gulf Coast, a hen pintail has finally arrived on the prairies of North Dakota in late April. She and her mate have established a territory on a shallow wetland in the middle of several square miles of native grassland. She has spent many days feeding and carefully inspecting potential nest locations in the surrounding pasture. Now she is ready to nest. The hen pintail lands at her chosen site, scrapes out a shallow depression in the soil next to a clump of little bluestem grass, and lays her first egg. If she has chosen a good nest site and luck is with her, her eggs will hatch, and she will lead a brood of ducklings to a nearby wetland in three to four weeks. Selecting a nest site is an important decision in the annual cycle of ducks. Nest site choice can influence whether the female survives the nesting season and her eggs survive to hatch. A poor choice might expose the nesting female and her eggs to predators, destruction by machinery, or flooding. This aspect of nesting behavior is shaped over time by natural selection, reflecting strategies that have been effective for the species. Ducks generally use three strategies for nest site selection. Notwithstanding the occasional mallard that nests in a backyard apple tree, most ducks can be categorized as either upland nesters, overwater nesters, or cavity nesters. Upland nesters include the familiar puddle ducks like mallards and pintails as well as some divers like white-winged scoters and lesser scaup. Overwater nesters include many diving ducks including canvasbacks, ruddy ducks, redheads, greater scaup, and ring-necked ducks. Cavity nesters are wood ducks, buffleheads, goldeneyes, and mergansers although the common and red-breasted mergansers will also nest on the ground. Upland Nesters Pairs of upland-nesting ducks begin arriving in the Prairie Pothole Region just after ice out. They settle on shallow, seasonal wetlands, many of which are less than one acre in size and are embedded in cropland, pasture, hay meadows, and perennial grassland. The females feed heavily on protein-rich invertebrates in these shallow wetlands, and pairs of breeding ducks establish wetland territories that are defended by drakes to ensure their mates have sufficient food resources to recover from migration and begin nesting. Most mallards and pintails establish breeding territories on wetlands from mid-April to early May. Once the birds have established territories and acquired adequate nutrient reserves, upland-nesting ducks begin prospecting for potential nest sites. Where upland-nesting ducks ultimately nest varies among species. Blue-winged teal, which have a smaller home range than other species, build their nests close to wetlands. Bluewings are also willing to nest in rather sparse cover compared to many other species. In contrast, mallards have large home ranges, and hens sometimes nest more than a mile from their wetland territory. In addition, mallards typically nest in some of the thickest nesting cover available. Overwater Nesters Overwater nesters make their nests on floating mats of emergent vegetation like cattails and bulrush. Their preferred nesting sites are semipermanent wetlands with relatively deep water and dense stands of emergent vegetation. Ideally, females select nest sites that provide cover and protection as well as an easy escape route if they have to flee the nest. Once a suitable overwater nest site is located, females create a platform of nesting material on which to safely deposit their eggs. Redheads and canvasbacks, which largely breeding in the Prairie Pothole Region, typically establish breeding territories on relatively deep, semipermanent wetlands ringed by a thick wall of tall cattails. The bottom third of these six- to eight-foot plants is often underwater. Female redheads and canvasbacks make floating nest bowls by folding cattails down into a cup-shaped raft. Cavity Nesters Not surprisingly, nesting sites are more limited for cavity nesters than they are for upland- and overwater-nesting ducks. Nesting cavities are often made in trees by the excavations of pileated woodpeckers or are created by decay caused by old age or damage from wind or lightning. Although tree cavities are relatively safe from most predators, female ducks must select a nest site that has an entry hole large enough for the birds to enter and a cavity roomy enough to hold a clutch of eggs. As a result, cavity nesters must carefully explore and scout for suitable cavities before making a decision about a nest site. Perhaps the most well known cavity-nesting species is the wood duck. Hooded mergansers, which are also cavity nesters and share many of the same habitats with wood ducks, will also lay eggs in wood ducks nests. In some cases, as many as 50 eggs can be deposited in a single wood duck nest, forcing the residing female to abandon the nest. The development of "life history characteristics" like nest site selection behavior in waterfowl is influenced by survival and successful reproduction of many generations of nesting females. Over time, the process of natural selection leads to consistent patterns of behavior that maximizes individual reproductive success on average. To determine the past effects of natural selection on present nest site selection behavior in ducks, waterfowl biologists compare where ducks nest in a particular area to mathematical projections of where the birds would nest if they selected nest sites randomly. For example, mallards will typically nest in some of the densest vegetation in a particular field and will generally avoid nesting in surrounding sparse vegetation. But natural selection is a never-ending process. Waterfowl biologists can identify the current effects of natural selection on duck nest site selection by measuring and comparing the survival of nests in different cover types. Recent research has confirmed that mallard hens tend to hatch more nests in dense vegetation than in sparse vegetation. Thus, waterfowl researchers infer that this behavior among mallards is the product of both past and ongoing natural selection. Natural selection also helps explain why the three basic nest site selection behaviors developed over time among waterfowl. The ground-nesting dabbling ducks tend to nest in areas where the birds are most vulnerable to predators. Consequently, these species renest persistently and disperse farther between successive nesting attempts. Overwater-nesting ducks build their nests in areas that are well-protected from many types of mammalian and avian predators. Hence, they are generally less persistent renesters and do not disperse as far between nesting attempts. They will also defer breeding entirely in dry years. Cavity-nesting species like wood ducks also nest in relatively secure places, so they tend to lay large clutches, which typically result in higher production. Where the birds attempt to renest is determined by the availability of suitable nesting cavities. By pursuing different nest site-selection behavior, ducks are able to occupy different habitats and use different resources. Collectively, different species occupy diverse ecological niches, helping ducks become one of the most common groups of birds on Earth. An Ecological Trap Nest site selection behavior that once had a beneficial or neutral effect on waterfowl reproductive success can be detrimental in a changing landscape or environment. The nesting behavior of pintails in Prairie Canada is a prime example. They seem to be much more concerned about getting an early start on the nesting season on landscapes where there are large numbers of highly productive, shallow wetland basins holding water. Unfortunately, the same landscapes that are attractive to nesting pintails are also well suited for cultivation, and today there is very little perennial grassland left in many of these areas. Grain stubble is often the predominant residual vegetative cover on the landscape when breeding pintails return in spring. In the past, a significant proportion of the cropland in Prairie Canada was left idle during the growing season in a practice known as "summer fallowing. Today, almost all the cropland in Prairie Canada is cultivated every spring, and pintails nesting in spring-cultivated cropland generally have poor nesting success and are at high risk of being killed by machinery.

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identify regions of nest niche singularity for theVinaceous- breasted Parrot in the Atlantic Forest of Argentina. Because there is a well-established positive correlation.

Nests are a crucial breeding resource. Pregnant females are unable to give birth until they sit on a nest overnight. Current pictures are outdated Contents Permanent Nests A permanent nest Permanent nests can be found while exploring. They are indestructible and can not be built, moved, or destroyed. Temporary Nests Temporary nests will decay over time and need to be repaired. Creation Nests can only be created by pregnant females, and are built on the tile they are standing on. Doing so requires 10 materials and 1 action point. Degraded nests can be repaired by any creature. Doing so costs 3 materials and 1 action point. After three days, degraded nests will disappear. Harvesting Creatures can harvest a degraded nest for 5 material, and a non-degraded one for 7 material. You cannot harvest permanent nests, and any creature with gems cannot harvest a nest. A degraded nest Material Material is the resource needed to build nests; building a new nest costs 10 materials and repairing a degraded nest costs 3 materials. At the beginning of a game, the player always starts with 10 materials. Collection By harvesting a grass tile, there is a chance to gain 1 material. By destroying Berry bushes, you will gain materials. Regrowing Grass An overgrown grass tile Grass beggining to grow Some tiles have special, slightly paler grass. Harvesting these tiles will always grant 1 material, and the grass will regrow a few days after it is gathered. Tips In the beginner island, gather as much material possible for later, since this island is small and there are plenty of permanent nests to use. Do not create a nest on the beginner island due to its small size and its abundance of permanent nests. Continue to save material for later islands as nests will be harder to find.

9: The Speculative Dinosaur Project | Speculative Biology Wiki | FANDOM powered by Wikia

We further show that early-summer temperature anomalies are correlated with nest success in a continental-scale database of bird nests, suggesting avian thermal niches might be broadly limited by temperatures during nesting.

Also, you might add images from the site or the yahoo club if permission is offered. In this world, dinosaurs have survived as the eerie mass extinction that killed them off in our Earth never occured, and evolved during the 65 million years that composed the ever changing Cenozoic. Under a stronger evolutionary pressure than ever before, the end result was a world that, while familiar, is still quite different from the late Cretaceous. List of animals in The Speculative Dinosaur Project The Horned Molok, an example of a theropod in Spec The most successfull linage of dinosaurs, these are divided into two main modern groups, Abelisauria and Coelurosauria though historically, during the Paleogcene, allosaurs did exist in Australia and South America, before dying out in the Eocene due to environmental changes. Abelisaurs are represented by the huge abelisaurs, represented by huge predators restricted to the tropical and subtropical latitudes of Africa and Asia; the noasaurs, represented by a malagasy carnivore the Cain, Cain cursor and weird ant-eating dinosaurs known as kagrus derived from Masiakasaurus. All modern ceratosaurs are of Gondwannan ancestry, having evolved in Africa and India and later invaded south Eurasia; they are all restricted to the tropical latitudes of the Old World, being absent from Australia and the Americas. Coelurosaurs are way more diverse, thanks to their fuzzy covering that allowed them to conquer colder zones. Archeoplumes are the most basal modern forms, being ancient critter that evolved on Africa or India and that are found exclusively on these landmasses, being restricted to a few opportunistic small predators covered in quills. Mostly represented as small opportunistic predators not unlike foxes, with a few larger ornithomimid like species. However, in spite of the presence of these several basal coelurosaurs, the most diverse linage of modern dinosaurs are maniraptors, the feathered clade that produced birds. At the base of the linage there are the ratite like alvarezsaurids, which have their arms reduced to small claws and that occupy insectivorous ant-eating niches in the tropical and subtropical areas of Asia, Madagascar, Australasia and South America. Right after come therizinosaurs, a very unusual herbivorous linage that dates from the Jurassic, and that nowdays occupies giant sloth, panda, mammoth and camel niches, being quite uncommon in Africa and South America due to the diversity of sauropods and the presence of gorillabirds keep reading in Africa and of large herbivorous troodonts in South America. Oviraptors as a whole became a very successfull linage, being divided in two main groups: Troodontids also survived to the modern days, though mostly reduced to an ibis like wading creature from Eurasia and a few ratite like species from South America. Dromeosaurs are present as the large predatory draks, which are typical dromeosaurs that evolved from Velociraptor like forms and that occupy large feline niches, as well as by the smaller unenlagiine mattiraptors, which occupied the niches of the typical troodontids in the Old World and the Americas, leaving them only specialised niches. Arboreal forms known as arbros from a polyphyletic collection of arboreal forms that evolved three times from unenlagiines, microraptorines and Bambiraptor , while the winged rahonavids still roam Africa and Madagascar note that they might be bobunked however , and likely are closely related to the flightless mattiraptors. Out of all maniraptors, birds are the most diverse clade. At the base of the phylogenetic tree perch the Xenornithes, descendents of Confusiusornis that became diverse as the small winged bunglebirds and the flightless arboreal parrot like carpos from the Old World. Enantiornithes are still a common clade, present as the grebe like ebergs, the predatory "avisaurs" which might not be end up related to Avisaurus as originally intended, due to the fact that said bird was closely related to the toothless Gobipteryx and because it is only known from leg bones it might had been beaked , the finch and parrot like allospiziformes, the passerine like twitiaviformes and the hoatzin like gondwanaviformes. Euornithes are represented by the pigeon like descendents of Apsaravis and by the diverse sea bird clades known as Ichthyornithes and Hesperornithes, the first occupying albatross, gannet, skimmer, auk, tern, flamingo and New World vulture niches and the later diversifying as cormorant and loon like birds and as flightless marine predators. Neornithes, while obviously less diverse than on our world, are nonetheless common, though their diversity occured in different ways from that in our world. Paleognaths, for instance, restricted to ratites on our world, are common as rail, shorebird, crane, quail, ibis and bustard like forms, with several flightless species in islands and a linage of winged predators known as rocs. Galliformes, while occuring as ground birds where the oviraptorian bantams and quail like paleognaths and screamers are less common, are more diverse as arboreal forms; anseriformes are more common than on our world, though anatidae is represented mostly by ducks, as geese and swan niches were taken by relatives of magpie-geese and merganser niches were taken by ebergs; screamers produced several galliforme like forms, specially on Australia, as well as huge moa like birds in New Zealand. Pseudodontorns occupy seagull and Old World vulture niches, whereas heron like relatives of the sunbitterns occur widespread across the tropics and penguins diversified on the southern seas, ranging from "normal" forms to weird species like the screaming ninja penguins of death. Within it there are the typical browsing gihugrongos, which occur in temperate or tropical dry forests in the Old World and North America, the grazing grassbags, represented by an african species and a few insular ones in the Mediterranean, and by the aquatic mokeles, the most successfull linage, which are a clade of aquatic armoured herbivores present in Africa, Asia, Australia and any islands around or between those landmasses, from the Mediterranean and Indonesian islands to Madagascar. Older ornithischian clades have declined somewhat; pachycephalosaurs are all but gone, ankylosaurs are restricted to the Caribean islands, and ceratopsians, while having success during the Oligocene and Miocene periods, are curently reduced to tropical giants on Asia, Africa and South America; one linage, the undaurs, became large forest browsers, which evolved thanks to the fact titanosaurs are absent from dense tropical rainforests. Hadrosaurs are also largely gone, being reduced to tropical giants on South America and Australia, but ornithopods as a whole are a very successfull linage. In South America, the disappearence of sauropods allowed huge browsers known as false-sauropods to evolve, while Australasia and Madagascar have several species of small ornithopods, and their closest relatives are the most successfull ornithopod linage ever, Laurasiornithopoda. At the base of Laurasiornithopoda lie duckgongs and vanguards, the first being aquatic seagrass eaters from tropical waters and thus the first aquatic ornithischians and the later are browsing ankylosaur analogues from Asia and the Americas. More advanced laurasiornithopods are represented by jackalopes and formosicorns; the first are two legged runners analogous to gazzeles and pronghorns, while the later are vaguely hadrosaur like forms represented by the american singers, the eurasio-american "typical" formosicorns, the Old and New World clade vaguely ceratopsian like catoblepines and the african and south asian ungulapedes. Like laurasiornithopods they have throat pouches to guard the eggs on. A particular clade of land crocs inhabits South America, the viriosaurids, which evolved from Effigia like ancestors that converged heavily on ornithopods note that they were originally supposed to be ornithopods themselves, but eventually all ornithopods bu hadrosaurs and false-sauropods were erased from pre-Ishtmus South America. Pterosaurs, originally extinct in the first version of the project, are now well present, both as the nightjar like anurognathid descendents and as azhdarchids, mostly present as stork like forms but also as hornbill like frugivores and also as fligthless predators known as carnocursorids, that dominate Australia alongside rhynchoraptors. Other oddities, like frigatebird like pteranodontids, might or might not be accepted. Other reptiles Edit Choristoderes are represented as gharial like animals that occupy the niche of dyrosaurids in the Americas, while sphenodontians became a somewhat diverse clade on Ocenia, ranging from typical tuataras to armoured scavengers and iguana like herbivores with beaks. Plesiosaurs still exist as a few freshwater and marine species of elasmosaurids, while turtles are mostly aquatic reptiles, with meolanids being the main terrestrial tortoises; some produced massive ankylosaur like forms, that avoid competition with vanguards, are mostly grazers. Squamates so far are the most diverse clade of non-dinosaurian reptiles, with a few unusual groups such as treeguanas originally intended to be arboreal ornithopods and obviously the marine mosasaurs, now represented as freshwater eel like forms and marine shark like forms, a few quite similar to ichthyosaurs. Mammals Edit The Bunyip is closely related to the platypus, and it lives in Australia Since the Mesozoic that mammals seem to have had tendencies of diversifying in spite of the reign of the dinosaurs, and thus its no wonder that, in Spec, mammals became bigger and more diverse. Monotremates, rather than just being oddballs, are actually a major mammal group, represented by several species on Australia and New Zealand and occupying several insectivorous niches there. A particular linage, Cancridontia, became fully marine and now comepete with waldos and mollusc eating crocodillians over molluscivore niches, and produced some cetacean like forms akin to beaked whales. However, the most diverse mammal linage is Theria, which includes metatherians and eutherians. Metatherians are represented by canine and wolverine like descendents of stagodonts, the mustelid and seal like deltatheroids, several mole and shrew like groups, the arboreal South American sparassodonts and the vaguely primate like polydolopoidomorphs and the australian bandicoots, which became diverse to the point of occupying most rodent niches on the continent. Eutherians, aside from a few primitive malagasy forms, are exclusively represented by the ever so successfull placentals. Xenarthrans are represented by armadillos and the bipedal bastard-sloths, and Xernarthra is itself part of Antarctitheria, which also includes the small, ungulate like south american un-gulates, the australian tingamarroids and the marine gloops, which compete with the dinosaurian duckgongs. Primates, aside from lemurs and galagos, are represented both as the raccoon like pokemuroids and by the flying elphabas, the late being the only mammals with wings made of feather like fur. Other lifeforms Edit The Ktulu Spawn is a Baleen Squid that feeds on clams and worms during the night Squids and octupi are less common in Spec than on our world and restricted to deeper waters; instead, the shallower seas are dominated by ammonites and belemnoids, the later spawned an impressive linage of cephalopods that took over filter feeding niches on Spec, the baleen squids.

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