

## ZOO VIEW

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### Count de Lacepède: Renaissance Zoo Man

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“IF DESTINY BRINGS YOU TO THE FAR END OF THE GLOBE, NATURE WILL SURROUND YOU CONSTANTLY WITH ITS PRODUCTION, ITS PHENOMENON, AND MARVELS. DO NOT EVER RENOUNCE GOING TO THE PUREST OF ALL SOURCES.”

“WHEN SCIENCE WILL HAVE SPREAD ITS DOMAIN, MAN WILL INTERROGATE NATURE IN THE NAME OF TIME AND TIME IN THE NAME OF NATURE. SO MANY FERTILE COMPARISONS WILL COME TO MIND.”

BERNARD-GERMAIN-ÉTIENNE DE LA VILLE-SUR-ILLON, COMPTE DE LACEPÈDE (1798 AND 1800)

“THE CUBE, INDEED A STRAIGHT LINE OF ANY KIND, IS UNBIOLOGICAL.”

HEINI HEDIGER (1970:21) ON ARTIFICIAL SHAPES SUCH AS CUBICAL CAGES IN ZOOS

Carl Hagenbeck (1844–1913) opened his Tierpark at Stellingen, Germany in 1907 and developed the first exhibits without bars for zoos (Kreger 2001; Reichenbach 1996). He served as a design consultant for zoos throughout the world and his philosophies are incorporated even today when new animal displays are planned. In the zoo and aquarium community, the Hagenbeck name is associated with naturalistic exhibitry and there is a perception that he was the first to envision a zoo without bars, nestled in a naturalistic setting. In reality, over a century earlier, Bernard-Germain-Étienne de la Ville-sur-Illon, Comte de Lacepède<sup>1</sup> (1756–1825; Fig. 1), the French naturalist known for his herpetological work, published several seminal papers on zoo history, philosophy, and design that discussed open exhibits and spaces. These publications are virtually unknown. To give Count de Lacepède the recognition he deserves, we have translated por-



FIG. 1. Portrait of Count de Lacepède.  
Courtesy of Kraig Adler.

tions of his papers from French to show how enlightened he was at the beginning of the nineteenth century. It is interesting that zoo managers struggle today to grasp and implement concepts identified by Lacepède so long ago.

Lacepède was disturbed by the way animals had been treated in the past and how little proper care had improved. He wrote, “It is only very recently that liberty and reason have started to reign over a part of Europe; almost all the menageries that we see on that portion of the globe are still similar to those of the Roman despots. . . . They counted among the attributes of the empire, those narrow edifices, those tight lodges where they are kept, mutilated, degraded, denatured.”

Lacepède had a clear idea of the proper mission of zoos and the three roles that these institutions should play: “Three objects are the principal aim of an establishment. The first is to satisfy the curiosity of the public by giving an easy and durable instruction without seeming so to show the habits of animals, to portray the species that Pliny, Linné, and Buffon transmitted to us, to substitute the attitudes of constraint to movements with a sort of independence. The second of those three objectives is to give to the naturalist the true means to perfect zoology by means of the menageries, and the third, to serve society most directly by acclimatizing wild animals reclaimed from the wild.” An important point here is that Lacepède understood that zoo visitors could have a pleasant experience and learn something about animals in a non-threatening way. The choice of the words “. . . to serve society most directly by acclimatizing wild animals reclaimed from the wild” and “greatest utility for man” used below suggests that he was an early thinker about the notion that zoos could be used as acclimatization facilities for wild species that might be domesticated or tamed and be of some “utilitarian” use for humans. The world’s first acclimatization society was the Société Zoologique d’Acclimatation, founded in Paris in 1854 (Gillbank 1996). The founding president was Isidore Geoffroy Saint-Hilaire, professor of zoology at the Muséum national d’histoire naturelle and director of the Ménagerie (created in 1793). In 1860 Isidore and his son, Albert Geoffroy Saint-Hilaire, opened Jardin Zoologique d’Acclimatation, west of Paris (Osborne 1996). With reptiles, Henry Fitch (1980) warned captive managers about changes induced by captivity: “Thus, captivity will result in intensive selection, molding the animal in a manner quite different from that followed in its natural environment. The final product will be an animal much better adapted to live in close association with humans, in the home or laboratory, but less well adapted for life under natural conditions.” Clearly, the effects of captivity on amphibians and reptiles, especially when reintroductions or other interventions are considered, need to be carefully investigated beforehand (see Chiszar et al. 1993; Dodd and Seigel 1991).

Lacepède was associated with La Ménagerie at the Muséum. Most herpetologists are familiar with Lacepède’s name through his monumental tome which was the first to cover amphibians and reptiles of the world, “Histoire Naturelle des Quadrupèdes Ovipares et des Serpens,” published in 1788–1789. Based in part on his experiences at the Ménagerie, he formulated a plan for the ideal menagerie: “One will be able to compare this enormous menagerie with the outdoors where the different animal species enjoy all the liberty that it is possible to give them without danger for the numerous spectators, who are also often imprudent, where

they will find a roof and care and where living among plants and trees of their country, shaded at least by vegetation as similar as that that can be found in their country, where they can play and their movement unimpeded, where they do not feel the exile nor the lack of their independence, where they will present to the observer the true picture of what they are like in their environment in the most remote countries of the globe.”

Lacepède understood the integration of scientific inquiry into the operations of a zoo, as made clear by several selected passages in his 1801 publications: “It is through the help of such menageries that we will be able to create the science of animal physiognomy more real than that of human physiognomy because their pantomime does not express ideas and only depicts sensation and not ever being altered by pretenses is simpler, stronger, and truer.” He continues. . . “The more or less great sensibility to the climatic conditions, to the different elements, the odor, the color, the sonorous impression, the mode of breeding, the time of the pregnancy, the duration of incubation, etc. . .” It is important to remember that the science of ethology did not exist at that time. What is also remarkable is that he understood how observations on behavior, reproduction, nutritional needs, and longevity could be accomplished in a zoo, for he said “. . . Let us keep species which can be of the greatest utility for man and let us give them wide living quarters, durable and best suited for their habits so that they can be observed fruitfully so that one can find the most adaptable nourishment which is most suited to their organs. Also, so that one can find their breeding habits, the number of their litter, the nature of their affection, the violence of their appetite, the length of their life span.” Interestingly, Nobel laureate Konrad Lorenz reinforced Lacepède’s vision a century and a half later (1952:73): “By keeping a living thing in the scientific sense we understand the attempt to let its whole life cycle be performed before our eyes within the narrower or wider confines of captivity.”

Zoo workers should maximize the utility of their living collections by preserving specimens upon death and placing them in a suitable depository. Lacepède addresses this issue: “When an animal dies, it is immediately brought to the laboratory of anatomy. There the skin is taken and sent to the laboratory of zoology where the professor has it mounted if it is not yet on exhibit. Then we prepare the pan, and we put in one pan all the fleshy parts which one intends to preserve. We do not even neglect to look if there is not in the body of the animal some intestinal worms, which could



FIG. 2. Undated illustration, possibly around mid-1870s, of interior of reptile building at La Ménagerie Jardin des Plantes in Paris. Credit: provided by Jean-Luc Berthier, Jardin des Plantes Archives.



FIG. 4. Cover of “Le Monde Illustré” published 24 October 1874 showing reptile display and inhabitants at La Ménagerie Jardin des Plantes in Paris. Courtesy of Jean-Luc Berthier, Jardin des Plantes Archives.

lead to new observations.” In this passage, Lacepède offers suggestions to the zoo pathologist as well. According to Kirchshofer (1968:288), Max Schmidt, a veterinarian and director of the Frankfurt Zoo from 1859 to 1885, “initiated the post mortems (sic) on zoo animals.”

Consider how stunning Lacepède’s ideal zoo would be if it were ever actualized in totality: “The garden spreads over a surface which is rectangular and measures more or less thirty-six acres and offers a few elevations. Two little artificial rivers cross the terrain for all its length and end in a series of little lakes of irregular contours. Between the two sinuous little rivers an elevated path is used by the visitors; on each side of the bed of the double river the terrain rises slightly and irregularly and is provided with small hills and rocks. The park is planted with trees and appropriate bushes. Some parts are covered with sand. The slopes are divided in several enclosures of irregular dimensions surrounded by fences which go down to the water and are hidden by vegetation. The river is enlarged in front of those enclosures to allow animals to bathe and the edge is a little inclined in order to facilitate their access to the water. The night lodges for carnivores are hidden by rocks. For most of the species shelters are provided. The bird cages



are spacious and contain small trees and artificial rocks. There are lakes for fishes, aquatic turtles, sea lions, and especially aquatic birds, which are also allowed on certain parts of the rivers. Place is even provided for the breeding of worms and mollusks.

The zoological park so conceived is not an accumulation of buildings or birdcages or cages with bars but it constitutes a true scenery. The plantations offer plenty of natural habitats of most of these exhibited animals. As much as possible one will use as enclosures natural obstacles, among others, a combination of water surface and of different levels, for instance, an elevated path. Thanks to the sloping terrain the animals are not in moats but are the same level or almost the same level as the spectators." The Count identified an important issue relevant to zoo herpetologists. Presently, many zoo administrators are enamored with the rare and expensive – the so-called charismatic mega-vertebrates – so places for breeding worms and mollusks are rarely incorporated into master plans; amphibians and reptiles suffer the same fate. To prove this point, consider how few new herpetological facilities are being planned or significant resources directed into herpetological programs. Accordingly, there is a disturbing trend for building unimaginative and uninspiring zoogeographic exhibits with an occasional python, crocodilian, giant tortoise, or large lizard added as an afterthought. Retired director William Conway from the Wildlife Conservation Society in New York published a thought-provoking paper (1968, 1973) suggesting that the common bullfrog—widespread, small, inexpensive and ectothermic— can enlighten and educate the visitor very effectively. Today, a bullfrog display could be used as the perfect example to highlight amphibian biology, decline of amphibian populations worldwide, and the danger of introducing alien species. Unfortunately, zoo herpetologists have been rather ineffective in convincing their superiors that amphibians and reptiles are incredibly interesting and deserve a prominent place within the zoological garden or aquarium.

Lacépède was unable to implement his ideas, owing to the unstable political climate during the French Revolution and the lack of funds (Van den bergh 1962). His plans for outdoor displays at the Ménagerie in Paris would have been suitable for some Temperate Zone animals, including amphibians and reptiles, but exotic taxa require indoor exhibits with stable temperatures. During 1870–1874, a reptile building with a pavilion and two large center exhibition halls was constructed (Figs. 2–3). This beautiful edifice exists today, still used as a reptile building.

Biographies of Lacépède, appointed the Grand Chancellor of the Legion of Honor by Napoleon, are available (Adler 1989; Van den bergh 1962).

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Footnote: <sup>1</sup>We follow Adler (1989) in spelling Lacépède without the acute accent on the first *e*.

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## ARTICLES

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### A Note on the Identity of Chuckwallas Inhabiting Isla Danzante, Baja California Sur

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There is disagreement concerning the taxonomic identity of chuckwallas inhabiting Isla Danzante, Baja California Sur. Isla Danzante is a land bridge island situated at 25°47'07"N latitude, and 111°14'59"W longitude, 2.61 km from the coastline of the Baja California peninsula and south of Isla Carmen. It has an area of about 4.64 km<sup>2</sup> (Murphy et al. 2002). In a systematic revision of the genus *Sauromalus*, Hollingsworth (1998) placed the continental *S. obesus* and the peninsular *S. australis* in the synonymy of *Sauromalus ater*. He also classified the chuckwallas from the southern gulf islands, including Isla Danzante, as *S. ater*. In a study of body size evolution and biogeography of chuckwallas, Petren and Case (1997) sequenced the cytochrome *b* gene from a number of continental and insular populations of chuckwallas. Their analysis revealed that a single chuckwalla from Isla Danzante was genetically similar to their samples of *S. slevini* from Islas Carmen and Monserrate (*S. slevini* also occurs on Isla Coronados, but that island was not sampled by the authors).

Grismer (1999, 2002) listed Isla Danzante among the islands inhabited by *S. ater*. Murphy and Aguirre-Leon (2002) called attention to the discrepancy between Grismer's classification of the chuckwallas from Isla Danzante and the molecular genetic evidence from Petren and Case (1997), and chose to recognize this insular population as *S. slevini*. The purpose of my study is to compare nuchal scalation and other characteristics in a limited number of specimens to determine whether the Isla Danzante popu-

lation is more similar to *S. ater* or *S. slevini*.

*Sauromalus slevini* is considered to be generally intermediate in scalation between the spiny chuckwalla, *S. hispidus*, and the smaller-scaled *S. ater* from the southern gulf islands (Shaw 1945). In *S. slevini*, the nuchal scales are much larger than the median dorsal scales and are conical to strongly spinose (Grismer 2002; Shaw 1945). Also, above and slightly forward of the shoulder, there is a skin fold bearing a patch of enlarged, subconical scales (Hollingsworth 1998; Shaw 1945). In contrast, the nuchal scales in *S. ater* are usually tuberculate, flattened, or spinose, but only slightly larger than the largest median dorsal scales. Also, the antehumeral fold lacks a group of enlarged, subconical scales; instead the scales are subequal.

*Sauromalus slevini* and *S. ater* cannot be distinguished on the basis of meristic scale characters. The range limits of eight meristic characters overlap substantially between the two taxa (compare Tables 13 and 19 in Hollingsworth 1998). Discriminant functions analysis (based on these eight meristic characters) did not separate chuckwallas from Isla Danzante from the insular samples of *S. ater*. The sample from Isla Danzante fell within the dispersion polygon of the sample from Isla San Francisco (see Fig. 51 in Hollingsworth 1998).

I examined two specimens from Isla Danzante (BYU 34494–95, female and male respectively), and compared them with a series of seven *S. slevini* from Isla Carmen, and eight *S. ater* from Isla San Francisco. The two specimens from Isla Danzante are very similar to specimens of *S. slevini*, having nuchal scales that are conical to strongly spinose, especially in the male (Fig. 1). However, many of the nuchal scales in the male specimen show damage, and examination under a dissecting microscope revealed that they were abraded. During life, the lizard may have frequently used a rock crevice with abrasive surfaces, perhaps for predator escape. The scales on the antehumeral fold are conical in the male specimen, and merge with more spinose scales in adjacent areas of the dorsum. The female specimen lacks differentiated scales on the antehumeral fold of the left side, and the scales are only feebly enlarged on the right side.

The male specimen from Isla Danzante has a snout–vent length of 193 mm, which greatly exceeds maximum SVL of *S. ater* from the southern gulf islands, and falls within the upper decile SVL of *S. slevini*. Hollingsworth (1998, Table 4) provides maximum SVLs for these insular samples as follows: Isla Espiritu Santo (169 mm), Isla Partida Sur (171 mm), Isla San Diego (134 mm), Isla San Francisco (145 mm), Isla San Jose (156 mm), Isla San Marcos (164 mm), and Isla Santa Cruz (166 mm). Hollingsworth (1998) gives maximum SVLs for three populations of *S. slevini* as follows: Isla Carmen (188 mm), Isla Los Coronados (202 mm), and Isla Monserrate (209 mm). Petren and Case (1997, Table 2) provide upper decile SVLs for these populations as follows: *S. ater* from the southern gulf islands (163 mm; N = 111) and *S. slevini* from Isla Carmen (181 mm; N = 22).

There appears to be ontogenetic as well as sexually dimorphic variation in the development of the enlarged, spinose nuchal scales in *S. slevini*. The largest male examined (CAS 16127; 190 mm SVL) has greatly enlarged, spinose nuchal scales giving the lizard a more bristly appearance compared with smaller males (143–179 mm SVL). Three females examined (127–154 mm SVL) also have spinose nuchal scales that are less developed when compared with