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## Reviews

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## REVIEWS

**Dan Freeman.** ELEPHANTS: THE VANISHING GIANTS. G.P. Putnam's Sons, New York, 192 pp., 1980. Price \$20.00.

In my opinion, the strongest message regarding the conservation of the "Vanishing Giants" appears on p. 160: "...because it is not when an animal population reaches zero that it becomes extinct. It happens before then, when numbers fall below a level from which a species can never recover." This is what biologists and conservationists call the "critical number," below which social interaction, avoidance of inbreeding and perpetuation of the species cannot be accomplished.

The book is readable; the thoughts flow well and they are interdigitated with scientific facts. Natural history, including evolution in the fossil record, general anatomy, reproduction (including musth), captive and wild elephants, famous elephants, harnessing elephants for work and their contribution in war, conservation, myths, legends and lore - all are subjects well synthesized - depicting the mystic nature of the elephant. Additionally, the book is amply and tastefully illustrated (174 illustrations in 192 pages). I thoroughly enjoyed the engravings, particularly the one on p. 95 where a mature Asian elephant is shown "...entrusted with the care of small children."

The concept of natural selection is well illustrated in a number of places, e.g. page 56, where the author explains that older elephants have contributed their genes for the perpetuation of the species and "...perhaps it should not, live any longer than is necessary, because its continued existence means that food and space are denied to others of a younger age." In discussing reproduction, the author also stresses the importance of avoiding inbreeding (e.g., pages 67 and 85) because inbreeding is generally not successful in evolutionary terms.

Upon reading this book one learns that the association of man and elephant in recorded history dates back 5,000 to 6,000 years. We also learn that probably the most important aspect of elephant training was, and still is, the assignment of the responsibility of training and care of an individual elephant to one man, the mahout or oozie (page 102). Working Asian elephants work only nine months a year; the warm/hot months are for rest. During the working months only 18 days per month are working days, 12 are for rest; animals work three days in succession and rest two days. Each working day lasts about eight hours, thus an elephant works on the average 1,300 hours a year, during which he transports 100 tons of timber from the forest to the transporting river.

The intelligence and the ability of the elephant to remember well are alluded to in a number of places (e.g., pages 144, 164, and 186). The observation that elephants pull tusks from skulls of dead elephants, carry them away and smash them against a rock or a tree trunk (observations first made by Arthur Neumann, p. 144), led to the belief that elephants know that tusks

are precious commodities and that their companions are being killed for their ivory - they, therefore, smashed the tusks, so that no one may benefit from it. This is merely a belief - there is no evidence to support such a statement.

Famous elephants and mammoths are also among the many subjects covered in this book. These elephants include: the Berezovka mammoths (not mentioned by name), the baby mammoth Dima, Ahmed, Jumbo, the Fenykovi elephant, and Ma Shwe. Ahmed, Jumbo, and the Fenykovi elephant are all male African elephants. The Fenykovi elephant is claimed to be the largest elephant ever recorded ("13 feet and 2 inches shoulder height, weighing about 12 tons when alive"; see page 182). The account on Ma Shwe ("Miss Gold") is by J. H. Williams from his book Elephant Bill. It is a story of how a mother Asian elephant jeopardized her life to save her calf. It is an episode described as "...one of the most intelligent he (Williams) has ever witnessed an elephant perform. It is also an act of true courage and one of love between mother and child that might mistakenly be considered the sole prerogative of human beings" (pages 73 and 76-77).

The few errors in the book (and the various items which annoyed me) do not detract from the overall accuracy of the information. These errors are not major and could possibly pass by many readers without notice. For the sake of completeness and providing correct information, I found it necessary to list these errors that I encountered while reading and to add some comments as needed. The list is written in chronological order: page 6 - "The elephant is now a threatened species." A more correct statement would be: "The African elephant is listed as a Threatened Species and the Asian elephant as an Endangered Species." Page 6 - The order Proboscidea includes the elephant and elephant-like mammals; it does not include the hyraxes, manatees and dugongs as Freeman stated. The hyraxes are placed in the order Hyracoidea and the manatees and dugongs in the order Sirenia; all three orders are placed in the superorder Paenungulata ("near the ungulates"). Pages 10-15 - I have not seen the word Paleomastodon spelled this way in any scientific literature; it has been spelled Palaeomastodon. Pages 10-11 - According to some authors, Moeritherium and Deinotherium may be excluded from the Proboscidea; Gomphotheridae should be spelled Gomphotheriidae; Mastodontidae should be Mammutidae or Palaeomastodontidae, the time scale at the bottom of the evolutionary chart should be compared to others for differences; the rock hyrax is a close relative to the elephant but in my opinion and the opinion of other workers, the manatees and dugongs are closer to the elephants than the hyrax. Page 15 - For a reader who is not familiar with V.J. Maglio's work (Origin and evolution of the Elephantidae. Trans. Amer. Philos. Soc., vol. 63, part 3: 1-149, 1973) or with the evolution of the Elephantidae, the diagram is confusing for a number of reasons, not to mention the spelling errors of some of the scientific names: lybicus should be syrticus, gomphtheroides should be gomphotheroides, and sublanifrons should be subplanifrons. The following are some of the articles in this diagram that I believe may confuse or mislead some readers. The different colors in the chart are not explained, a fact that subsequently leads to misinterpretation of the evolutionary splitting branches. Does the "S." in "S. lybicus" (sic) stand for Stegotetabelodon or for Stegodibelodon? What

does "African Elephas lineage" mean? Also, on page 15 just above the diagram to the right, the Asian elephant is drawn above the African elephant and the scientific names of their genera (Elephas and Loxodonta) are written below the figures, while on page 11 the names are written above the figures of these two elephants. Which silhouette represents Elephas and which Loxodonta? Page 16 - The figure seems to be of a mastodon not a mammoth. Page 18 - I know of no printed account of scientists eating mammoth meat. Page 29 - The caption to the photograph indicates that the "small baby elephant ...bravely imitates its elders." I think this is an anthropomorphic statement. Other anthropomorphisms with respect to "love," "sex" and "...perhaps reminded him of his youthful rejection" are found on pages 85-86. Page 38 - In all of the scientific literature that I consulted, I found no reports and no photographic evidence for sweat glands in elephants. Page 48 - According to Sikes, S. K., page 82 (The Natural History of the African Elephant, Weidenfeld and Nicolson, London, 397 pp., 1971), elephant ivory is a non-cellular matrix, composed mainly of dentine - a calcified connective tissue and organic matter - but not cartilage (cartilage is cellular), as Freeman stated. Page 75 - 21% of fat content in an elephant's milk is a high value, the range is from 0.63% to 19%. To complete this list of comments, one may add that in a few places (for example, pages 141, and 183), the name of an author was mentioned in the text but there was no reference given in the bibliography.

The concept of conservation discussed several times in the book becomes even more profound when we are dealing with large terrestrial mammals, such as the elephant. I believe that reserving area for the protection of large species implies providing suitable habitat for smaller species as well, and the whole ecosystem may be preserved. The reverse may or may not be true; that is, not all nature reserves for smaller species can support the larger ones.

While reading this book, especially the chapter "The Living Elephant," I could not stop thinking about the book Elephants: a short account of their natural history, evolution and influence on mankind by Richard Carrington (Penguin, London, 285 pp., 1958). Dan Freeman's book contains information updating that in Carrington's book, which was the first non-fiction book I read on elephants, a book that introduced me to some of the fascinating aspects of elephants' natural history. Dan Freeman's Elephants: the vanishing giants is a timely updated contribution to the biology and natural history of elephants, written in a language that everyone with a high school education can follow and enjoy.--**Jeheskel (Hezy) Shoshani**, Department of Biological Sciences, Wayne State University, Detroit, Michigan 48202 USA.