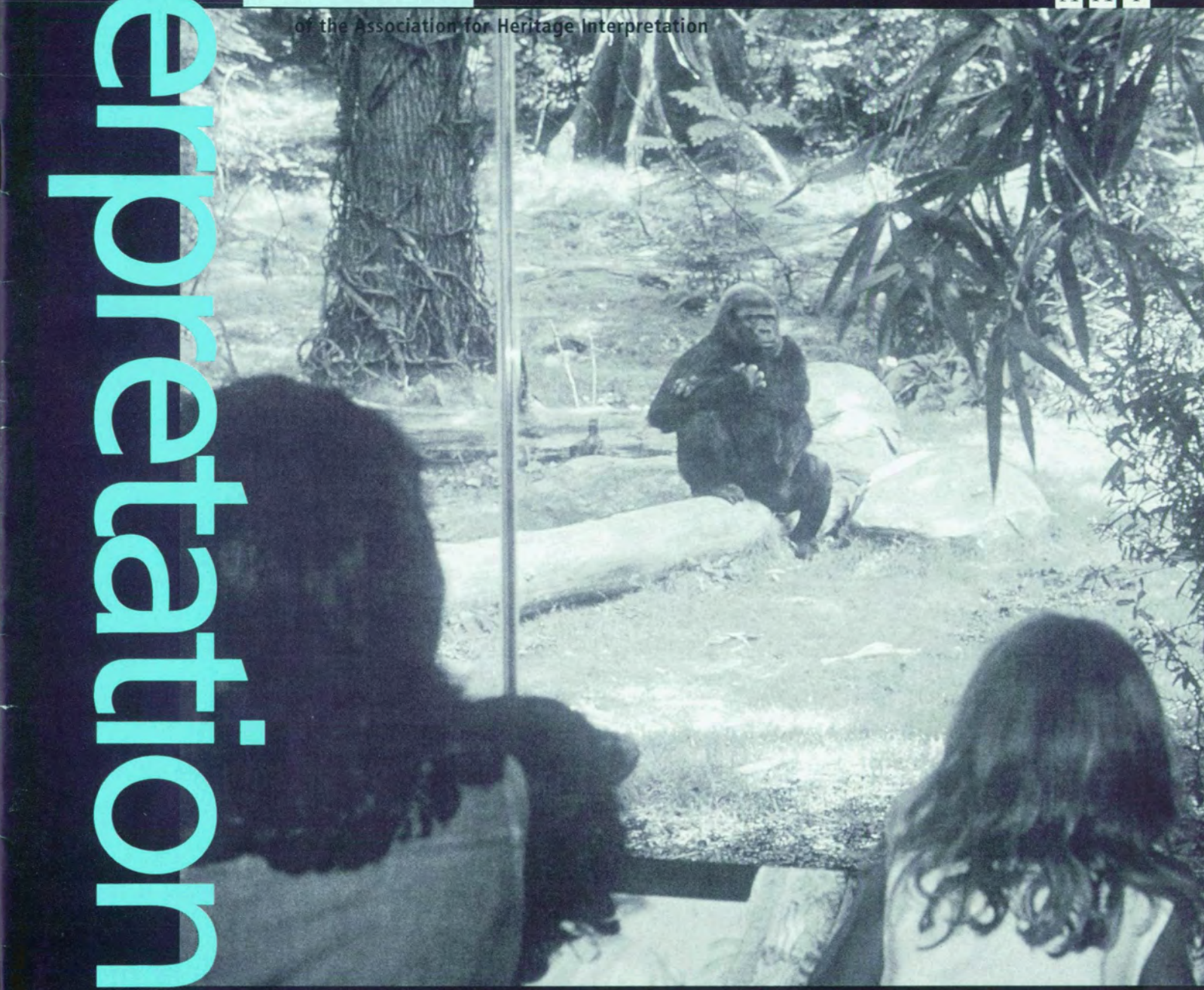
August 2000 / Volume 5 / *Number* 3

interpretation

journal

of the Association for Heritage Interpretation

AHI



Interpreting animal exhibits

The role of interpretation in the public understanding of animal life

Published by AHI

ISSN 1357 9401

Guest Editor:
Sue Dale Tunnicliffe

Managing Editor:
Elizabeth Newbery
Tel: 01865 793360
Fax: 01865 793375
E-mail:
emnewbery@connectfree.co.uk

Design **Nicole Griffin/Lucy Ward**

Printed by **Dataprint, Oxford**

Cover photograph: **New York Wildlife Conservation Society / Dennis DeMello**

Interpretation is published tri-annually in Spring, Summer and Autumn

Visit the Association website at:
http://www.quinion.com/ahi/index.htm

Contents

The next issue will look at:
Interpreting landscapes
Due out: *Autumn 2000*

Foreword

Animals are part of our environment and form some of the first words in our vocabulary. Indeed, children learn about animals in a whole variety of ways. Direct observations of pets, farm animals and wild animals can be important, while toys and other representations, books, films and school materials play significant roles.

Zoos and museums – which children have been visiting ever since these establishments opened their doors to the public – have an important role to play in the development of the public understanding of biological science, particularly of conservation biology. However, before conservation ideas are properly understood, people need to learn about the range of animals, their form and functions and their interrelationships with other organisms and the environment.

Animal exhibits these days come in many diverse forms. The articles in this issue give an idea of the range and variety of animal exhibits and the opportunities they offer for deepending public understanding of the natural world.

Sue Dale Tunnicliffe

Membership Rates:

Fellow	£55
Full	£45
Associate	£25
Student	£14
Corporate	£38 - £104

For more information about the Association for Heritage Interpretation (AHI) telephone 01653 698889 or write to the Membership Administrator, PO Box 6541, Warley B65 0AP

Personal members can join the Association as a Full member by election depending on qualification and/or experience, or as an Associate or Student member.

All members will receive interpretation journal, *a bi-monthly newsletter and other mailings, and have the opportunity to participate in a range of Association events*

From Regents Park to the Bronx: a history of zoos

Ken Kawata

From 19th century London to 21st century New York, zoos have undergone dramatic changes but retain the same essential purpose.

Zoos represent a form of association between humans and animals. In a zoo in any country, the visiting public walks past to look at creatures in enclosures, large and small, of varying designs and sophistication. Zoos date back thousands of years, to ancient Egypt and China before they came into the picture in the Western world.

Exotic animal collections prior to the arrival of the modern zoo should really be termed "menageries" and were built mainly to express the power and wealth of kings and emperors. Illustrations from those days show animal houses set in formal gardens designed for royalty. Among them was Tiergarten Schonbrunn in Vienna, established in 1752 by the Holy Roman Emperor Francis I for his wife Maria Theresa, Queen of Hungary and Bohemia and Arch-Duchess of Austria (Fisher, 1966). It is still in operation today and is the oldest existing zoo in the world.

In this account we will focus on modern zoos, which have a history of approximately two hundred years (Brown, 1996). Many would agree that the institution which provided the model for developing today's zoos was the Zoological Society of London. In fact, the very word "zoo" originated in London. The Society opened the Zoological Gardens in Regent's Park in 1827 (Vevers, 1976).

Birth of the modern zoo

It all began when colonial administrator Sir Stamford Raffles suggested that a collection of animals from various parts of the world should be established for zoologists to study. The Royal Charter stated the aims and objects of the Society as the advancement of zoology, and the introduction of new and curious subjects of the animal kingdom. At a time when more and more new species of animals were being discovered in the colonies, the term "curious" probably carried a refreshingly different connotation. It is in the area of science that Regent's Park exercised a major influence on the world's zoos.

However, another zoo also had a profound effect on modern zoos. Carl Hagenbeck (1844-1913), an international animal dealer, circus man and zoo man, was a true revolutionary (Street, 1965). He opened an epoch-making zoo in Stellingen, Germany, in 1907, to the amazement of the public and zoo professionals as well. Hagenbeck liberated zoo animals, which had lived in cages lining the walls of buildings, into a wide-open vista. Instead of metal bars and cement walls, he used deep moats and artificial rocks as the barrier; animals from the same region, such as Africa, were grouped together in panoramic exhibits. The visitor was given the impression that the lion and the zebra could mingle together, while in reality, hidden moats separated the hunter from the hunted, and the animals from the visitor.

The once fashionable school of zoo architecture, which produced a replica of an Egyptian temple to housing giraffes, or a stylised Oriental temple for elephants, was becoming a thing of the past. However, not every zoo could afford to pattern its exhibits after Hagenbeck. Also, his exhibit system was hardly applicable to some of the zoo animals, such as song birds and nocturnal small mammals.

In many zoos, animals still lived in cages resembling display cases in an orthodox natural history museum. Such an exhibit arrangement served the zoos' purpose well. Up until a few decades ago, one of the yardsticks to measure the excellence of a zoo was the number of animal species on exhibit. That meant that zoos were expected to keep as many different species as possible, often showcasing the rarity of the species. In order to achieve this, zoos with limited spaces and resources resorted to displaying one or two specimens per species. As a result, the exhibit, consisting of rows of cages, came to resemble a postage stamp collection.

In those days sanitation was the key to zoo animal health, and cleanliness became the byword of zoo housekeeping. To keep animals' living quarters clean, concrete floors and walls were the norm; they were easier to scrub and hose down. Consequently, animals were frequently housed in unattractive and unnatural captive environment.

Changes in thinking

For many cities, modern zoos became a focus of civic pride. In the period following World War II, economic prosperity brought zoos increased popularity. In the meantime, new ideas began to take hold in terms of animal collections and exhibits. Many would agree that the change started to arrive in the 1960s. In an era of awakening ecological concern, people no longer expected to see zoo animals in "naked cages" like prison inmates. Thanks to the

4 *Behind bars: animals are still exhibited this way in some zoos*

SD TUNNICLIFFE

advancement of veterinary medicine, animals no longer had to be confined in a sterile environment. Also, the day of anthropomorphic exhibits came to an end. Today, few zoos dress up young great apes like human charicatures for a tea party.

Another trend was that more zoos began to maintain a group instead of one or two specimens of each species. Thus, social animals such as the baboon were seen in family groups in a larger space, often in an open, outdoor facility. The quality of space itself was going through a change, to enrich the enclosures. Artificial trees, rocks and live plants were utilised in attractively landscaped, spacious exhibit areas, to simulate the animals' home in their native lands. The total number of species held by each zoo began to decline, as zoos no longer prided themselves on the large number of species they exhibited. Another trend was to mix together various species of animals; for instance, antelopes were often exhibited in the same yard with zebras and vultures.

New exhibit ideas developed in the 1960s, including the safari park, where visitors were confined in their own motor vehicles, driving through a park with roaming herds of animals (Chipperfield, 1975). Longleat in Wiltshire, England, was the first safari park. A few zoos built facilities featuring non-traditional groups of animals such as insects and other land invertebrates. It is commendable that they focused on groups of animals that had often been neglected. However, "bugs" have yet to acquire a bona fide citizenship in the zoo world.

In terms of overall zoo design, the mainstream approach in the old days was to arrange exhibits in accordance with taxonomic groupings of animals, such as the bear grotto, primate section, bird house and reptile building. Another method was to follow a geographical theme, dividing a zoo into regions such as Africa, tropical Asia and Australia. A more recent development is to present a simulated habitat type. This exhibit system shows the animal and its environment in a package; the underlying idea is that an animal should not be featured as independent of nature, cut off from its original "home". The tropical rainforest building, which became quite fashionable in American zoos in the 1970s, represents this new approach. Some believe that ultimately, zoos will become environmental parks (Conway, 1967), bioparks (Robinson, 1989) and environmental resource centres (Rabb, 1994).

Behind the scenes

In the meantime, more behind-the-scenes changes were taking place in zoos. Some were rather slow, while others came rapidly. Thanks to improved husbandry methods, animals began to breed more frequently than before, to the point where many species have established self-sustaining zoo populations. Tigers and gorillas, once believed to be "difficult" mammals, now reproduce routinely in captivity. Along with this welcome trend came closer co-operation between zoos, both nationally and internationally, to breed captive animals. Major zoos in the world are now engaged in international management programs of various species.

All this came not a moment too soon, because zoos began to face ever-increasing national laws and international treaties regarding transfer of animals. International commercial traffic in wild animals, especially, has come under close scrutiny. Under stricter control, the wholesale exportation and importation of wild animals have become a thing of the past.

Zoos around the world have also taken a more active roles in educational programmes, and this has influenced the way animals are presented to the public. Even in years past, classroom and laboratory teaching, lectures and tours had been a part of the zoo's function. In more recent years, exhibit design itself has been more accommodating to educators' needs. Multi-media devices and interactive, participatory exhibits are quite common, to stimulate curiosity and to help visitors learn about animals and their environment. As expected, computers are often utilised to aid dissemination of information to the public.

State of the art

In 1999, the Bronx Zoo in New York opened its Congo Gorilla Forest, a multi-million-dollar exhibit complex. It features a variety of animals, from high profile mammals such as the gorilla, okapi and mandrill, all the way down to insects. Gone are the "hard barriers" such as metal bars and thick chain-link fencing, to be replaced with glass partitions,

NEW YORK WILDLIFE CONSERVATION SOCIETY / DENNIS DEMELLO

Face to face: many zoos now enable visitors to look at directly at animals

near-invisible wire mesh and moats. Visitors must be alert in order not to miss some of the fine details, including artificial animal droppings on a rock, footprints on the trail and an animal nest in a tree a few metres away.

Graphics of extraordinary quality abound throughout the complex, along with interpretive, participatory and interactive devices such as flip-up panels, computers and a movie. An abundance of plant life helps to complement the live animals, and enhances the ambience of the tropical forest. Most of all, visitors find themselves immersed in this environment; as they walk through the narrow, winding trail, the division between "them" (animals) and "us" (people) begins to blur.

Near the end of this facility visitors are led to a hall to see a film, intended to convey a message about today's environmental crisis. When the movie ends and the screen is raised, visitors are surprised to find a family group of gorillas in a forest clearing set-up. No metal, concrete or any other artificial object can be seen in the lushly planted enclosure. A large glass partition allows visitors an almost nose-to-nose encounter with a gorilla. The Congo Gorilla Forest represents a summary of the innovations in exhibition techniques and other achievements made by zoos up to the close of the 20th century.

If Congo Gorilla Forest exemplifies an ultimate form of the zoo exhibit, it also raises the question: where do zoos go from here? Animal exhibits in zoos have gone through something of a metamorphosis in the last two centuries. Thanks to modern technology, exhibit systems have expanded with unprecedented sophistication and complexity. The animals' role has also changed, from objects of curiosity, to ambassadors for their wild relatives (Curry-Lindahl, 1965), to representatives of an ecosystem.

The coming century will no doubt bring about new approaches and emphases, but fundamentally, these changes do not really alter the essence of zoos, which is the contact between the public and captive wild animals. Perhaps it's true that the more things change, the more they stay the same.

References

Brown, Tim. (1996), Gone but not forgotten, *Zoo!* 2

Chipperfield, Jimmy (1975), *My Wild Life*, Putnam & Sons, New York

Conway, William (1967), quoted by Livingston, Bernard in *Zoo: Animals, People, Places*, Arbor House, New York

Curry-Lindahl, Kai (1996), Conservation of nature - a duty for zoological gardens, *International Zoo Yearbook* 5

Fisher, James (1996), *Zoos of the World*, Aldus Books, London

Rabb, George (1994), The changing roles of zoological parks in conserving biological diversity, *Amer Zool* 34

Robinson, Michael (1989), No longer a zoo, but a biopark, *Zoogoer* 18(3)

Street, Philip (1965), *Animals in Captivity*, Faber & Faber, London

Vevers, Gwynne (1976), *London's Zoo*, The Bodley Head, London

Ken Kawata has worked in zoos since 1959, first in his native Japan and then in the USA, as a keeper and a curator. He is now General Curator of Staten Island Zoo, New York.

Listening and learning: the role of bioacoustics

Lauren Dewey Platt and Bernard Krause

Sound is an integral part of the natural world, but is only just beginning to be used in animal exhibits.

With few exceptions, exhibiting natural history in zoos, aquariums and museums is a visual affair (Dewey Platt, 1998a). Indeed, most zoo habitat designers dedicate their efforts to creating landscapes to depict natural environments (Coe, 1985). Yet very few, if any, living creatures - including humankind - live in habitats devoid of sound. So why, then, do these so-called "immersion" exhibits in zoos and aquariums continue to be regarded as creative simulations of real-world environments?

In this article, we hope to articulate why current zoo practice limits true understanding of natural environments and suggest ways in which these limitations can be addressed.

Bioacoustics in zoos

The fields of bioacoustics and acoustic ecology are far from unknown to zoo professionals. In fact, an understanding of animal vocalization is frequently used in zoos and research centres as a method of determining reproductive state, emotional state, and sex, particularly in birds without sexual dimorphism (Volodina and Volodin, 1999). In New York, Moscow, and Stuttgart, to give just a few examples, zoos are applying what they know about animal calls to determine optimum conditions for reproduction (Gibbons and Lockwood, 1985; Aich et al., 1987). According to Volodina and Volodin (1999), understanding why, when, and how animals vocalize increases the options available for non-invasive monitoring of captive populations. Zoo breeders widely acknowledge the importance of sound in the social milieu of animal environments.

But this recognition has yet to be reflected in the typical zoo exhibit. In fact, the types of human-induced sound most commonly experienced by captive animals and visitors is undiscriminated and non-correlated noise while otherwise profoundly quiet in terms of beneficial soundscapes. Hence, soundscapes that may reduce the pathological effects of captive behaviour and engage the visitor by establishing a sense of place are mostly non-existent, resulting in an experientially defective environment.

In all likelihood, the reason for the silent zoo exhibit relates partly to the fact that most exhibit designers are former architects and landscape designers. As a result, the land-based "built" environment is expressed, and the multidimensional "heard" component, the soundscape, is all but forgotten. Another part of the equation involves the animals themselves. Because vocalizing behaviour among animals is, for the most part, socially motivated (Hart, 1996), the largely asocial lives of captive animals obviates the need for them to communicate.

Moreover, in addition to the limited opportunities zoo exhibits present for social interaction, many animals become bored and, without specially designed forms of stimulation, exhibit inappropriate behaviour (Markowitz, 1982). And finally, part of the reason lies in the fact that many zoo exhibits are openly exposed to the distractions of noisy urban environments. However, even where exhibits are located in enclosed spaces, the basic problem remains.

Real-world sound

As a component of any environment, the soundscape is the aural equivalent of a landscape (Schafer, 1977). In the real world, the territories that animals defend are not only land-based but sound-based as well (Krause, 1992). Because humans in Western culture have evolved into a species that is dependent largely on visual cues, we have lost touch with the sonic environment; this phenomenon is best understood by acknowledging the rapid increase in the levels of noise in our cities, masking the natural soundscape (Schafer, 1977).

Other animals have evolved in divergent ways, and for some species, particularly birds and marine mammals, the quality of the aural environment is critical to their survival. Krause (1992) observed that animal species survive better if their voices are not masked. A creature whose voice is masked is no longer heard by others of its kind and is therefore unable to successfully compete for mates or defend territories.

In fact, the integrity of the soundscape for many species is as important as the health of the landscape, yet most zoo exhibits that aim to educate visitors about natural history make no attempt whatsoever to reveal the significance of the soundscape in natural environments. Furthermore, of the few sites that offer well-delivered sound, only one currently makes an attempt to identify what is being heard for the visitor.

SD TUNNICLIFFE

See and hear: sound makes looking at animals a much more authentic experience

Listening in Lisbon

At Oceanário de Lisboa in Lisbon, Portugal, we designed a programmed soundscape as part of the presentation (Dewey Platt, 1998b). When visitors enter the various simulated coastal habitats, which centre around the theme of "One Ocean", they hear the kinds of sounds they might hear in the real-world habitat: coastal and pelagic animals from the Atlantic, Pacific, Indian and Southern Oceans.

We believe that the inclusion of sound adds to the educational value of the visual exhibit and to the richness of the overall experience, provided it is correlated to descriptive material of the audio. Indeed, in light of the knowledge that has been gained about acoustic ecology and the role that sound plays in natural environments, we believe any natural history exhibit designed today which excludes a sound component, or which contains loops or unassociated audio material, must be deemed significantly incomplete.

How zoo animals react to programmed sound is largely unknown. Given that the use of bioacoustics in zoo habitats is not widespread, substantive research on its impact on the animals is currently non-existent. Indeed, although taped recordings of conspecific calls can be used to stimulate reproductive behaviour and decrease aggression in some animals (Tichonoff et al., 1988), transmission of pre-recorded animal vocalisations should be handled with great care, since animals' reactions to them are unpredictable (Volodina and Volodin, 1999). Anecdotal evidence strongly suggests that inappropriate sound, or a delivery system with mismatched components, may lead to increased levels of stress behaviour in captive animals. However, the opposite is indicated if the elements are correctly calibrated.

Enhancing visitors' experience

When all the exhibit components are in balance, the experience for the visitor is greatly improved. In terms of learning, visitors retain more information about a particular exhibit when the presentation is multimodal (Borun and Massey, 1994). The fact that visitors find audiovisual exhibits more intriguing is no surprise.

Many exhibits in natural history museums provide visual, audio, and tactile opportunities to their visitors and have been doing so for decades (Wonders, 1989). Natural history museums do a better job than zoos of educating visitors, especially children, about ecology and, perhaps more importantly, about what an "animal" is and what it is not (Bell, 1981; Bell and Barker, 1982).

Zoos, where controlled environments allow, would do well to follow the model of the natural history museum by using multimedia in creative ways to educate visitors about wildlife (Tunnicliffe, 1996). Indeed, the value of multimedia as an educational tool is now being embraced by zoo directors (Robinson, 1997). However, along with incorporating the new technologies, zoos should be prepared to discard methods now proved to be ineffective, such as redundant push-button systems.

Because zoos and aquariums house live animals, effects of programmed sound on the animals' well-being should be studied. Equally important is the need for more research on how programmed soundscape influences the visitor experience, particularly from an educational standpoint. If zoos wish to be true to their mission of education, they can no longer disregard the soundscape, for it is an essential component of the real-world habitats that zoos portray.

References

Aich, H., Moos-Heilen, R. and Zimmermann, E. (1990), Vocalizations of adult gelada baboons (Theropithecus gelada): acoustic structure and behavioural context, *Folia Primatologica* 55.

Bell, B. (1981), When is an animal not an animal? *Journal of Biological Education* 15(3).

Bell, B. and Barker, M. (1982), Towards a scientific concept of "animal", *Journal of Biological Education* 16(3).

Borun, M. and Massey, C. (1994), New ways to look at learning, *Journal of Museum Education* 19(2).

Coe, J. (1985), Design and perception: making the zoo experience real, *Zoo Biology* 4.

Dewey Platt, L. (1998a), Sensing exhibits: use of programmed sound in zoos and aquariums, AZA *Regional Conference Proceedings* (paper and presentation).

Dewey Platt, L. (1998b), Listening to nature's voices, *Lisbon World Exposition Official Catalogue*.
Gibbons, J. and Lockwood, R. (1985), The use of vocalizations in the determination of heterosexual compatibility in the white-handed gibbon (Hylobates lar), *Zoologische Garten* 55.
Hart, S. (1996), *The Language of Animals*, Henry Holt & Co, New York.
Krause, B. (1992), The niche hypothesis: a hidden symphony of animal sounds, *Literary Review* (Farleigh Dickinson University) 36(1).
Markowitz, H. (1982), *Behavioral Enrichment in the Zoo*, Van Nostrand Reinhold, New York.
Robinson, M. (1997), Multimedia in living exhibits: now and then, *Museum News* 76(4).
Schafer, R. M. (1977), *The Soundscape: Our Sonic Environment and the Tuning of the World*, Destiny Books, Rochester VT.
Tichinoff, A., Morenkoff, A. and Phokin, S. (1988), *Behaviour and Bioacoustics of Birds*, Moscow University Press.
Tunnicliffe, S. D. (1996), A comparison of conversations of primary school groups at animated, preserved and live animal specimens, *Journal of Biological Education* 30(3).
Volodina, E. and Volodin, I. (1999), Bioacoustics in zoos: a review of applications and perspectives, *International Zoo News* 46(4).
Wonders, K. (1989), Exhibiting fauna: from spectacle to habitat group, *Curator* 32(2).

Lauren Dewey Platt is a museum exhibit developer, designer and writer who has contributed to natural history exhibits in museums and aquariums around the world. She is currently Executive Director of the Scholars in Clinical Science Programme at Harvard Medical School.

Bernard Krause has travelled the world for 25 years capturing natural sounds for scientific research and for use in museums, zoos, aquariums and other public spaces. He has a backgrund in popular music and also makes environmental record albums.

Real-life events: a new approach to zoo interpretation

Elin Kelsey

An exciting new approach piloted in Vancouver interprets animal behaviour as it happens.

The sense of excitement and intimacy that comes from watching an animal as it is actually does something is intense, inspiring and memorable. Yet there remains a great tendency for zoos and aquariums to present general biological information, with content and format independent of the animals' observable activities.

Animals are generally portrayed as living illustrations of their species, to inspire public interest in the biological topics being presented, rather than living individuals of inherent interest. Observable behaviour - such as breeding, territorial displays, nest-building and skin-shedding - that the animals themselves initiate is rarely profiled. Instead, the presentation of animal behaviour is most often limited to generalised statements on graphic panels or scripted narrations of trained behaviour featured in animal shows.

This "predetermined" interpretive style uses a field guide approach to public education. Graphics, shows, narrators, videos and so on tell visitors what animal they are looking at and provide generalised natural history facts about the species. The predetermined approach fails to address a critical aspect of human motivation. Unless people know enough to be able to see something of interest in an exhibit, they are unlikely to develop enough of an interest to pay attention to the natural history information provided.

The predetermined approach fails to address the kind of information visitors are wondering about,

W HOUSEMAN / SD TUNNICLIFFE

(Above left) What are these animals doing? Why are they doing that? (Middle) The spontaneous approach: talking about animal behaviour as it occurs. (Right) Do labels and signs help visitors understand animal behaviour?

such as: "What is that animal doing? Why are those animals doing that? Is there anything worth watching here?" Because it doesn't address the visitors' experience or agenda, it is unlikely to stimulate their motivation.

The spontaneous approach

"Spontaneous behaviour interpretation" is a public education strategy that teaches people how to look at living animals. It complements the activities that visitors themselves naturally engage in during their visits. Visitors to zoos and aquariums spend most of their time interacting with other members of their own group of family or friends and talking about what the animals are doing.

The next most common observed group behaviour, also involving adults and children, is pointing. People point to help others locate hidden animals, to direct others to interesting behaviour or physical features of the animals, or to focus attention on signs or exhibit characteristics. Pointing appears to be an important way for visitors to share their interests and attitudes with others and to teach others about animal appearance and behaviour.

Behaviour that the animals themselves initiate is more realistic than trained behaviour. Thus the interpretation of spontaneous behaviour is designed to draw visitors' attention to animal behaviour they might not expect or notice, and results in surprise discoveries.

This approach probably couldn't have happened two decades ago. At that time, animals were essentially displayed as artefacts, often as single or paired specimens in architectural settings that appealed to human conceptions of attractiveness. Today, living exhibits are designed to mirror as closely as possible the animals' natural habitats. The animals themselves are displayed in social groupings more reflective of their natural ecology.

Visitors to a modern aquarium, for example, are now able to watch damsel fish compete for territories on a reef, because these fish are displayed in large schools in a simulated reef environment. The closer the living exhibit parallels an actual wild habitat, the greater the variety of real animal events, and thus interpretive opportunities. This presents a winning approach for both the animals and the visitors.

Natural care

Increasing numbers of zoos and aquariums are extending this naturalistic approach into their animal care practices. Traditionally, animals were fed and trained on schedules determined by the staff. Given that the average length of time visitors spend at a zoo or aquarium is between 1.5 and 3 hours, animal feeding sessions, animal care demonstrations and shows were scheduled at regular intervals throughout the day so that each visitor would be likely to see one of these sessions during their visit.

A schedule of events makes sense in a museum, art gallery or science centre where the display items are inanimate. Here, the schedule has no impact on the exhibits themselves and may well have a positive value for visitors. But is this so when the display objects are living?

There has been a growing recognition within the zoo and aquarium community of the importance of environmental enrichment. Knowledge about animals in their wild environment and their response to different environmental stimuli in captivity is fundamental. The most effective strategies appear to be those that are integrated into the animal care programme.

These naturalistic animal care strategies demand increased flexibility. In the same way that the physical design of naturalistic exhibits is now based on the natural needs of the animals rather than a human conception of architecture, an animal-centred approach to animal care is based on the natural behaviour of the animals, rather than on a human-imposed schedule.

Innovation in Vancouver

Encouraging visitors to watch for ongoing, spontaneous events throughout a zoo or aquarium is vastly different from the standard approach of presenting a fixed schedule of pre-determined events. It requires a completely different orientation system. Between 1990 and 1995, the Vancouver Aquarium pioneered an effective strategy of spontaneous behaviour interpretation in its public galleries.

We developed an integrated two-way radio network through which animal care staff and naturalists could communicate current activities to staff and volunteers positioned at the main entrance and information desk. This enabled us to alert visitors

to animal behaviour, training sessions, research activities or animal care activities as they happened. Animal behaviour or staff activities that lasted for at least a day were listed on quick-change information boards at the entrance and throughout the Aquarium.

We also developed a system of white-boards which enabled us to alert visitors to current happenings, without increasing the number of naturalist staff working in the galleries. The naturalists used hand-written white-boards to describe observable animal behaviour in individual exhibits. Through experimentation with different formats, we found it was important that the white boards maintained their hand-written, spontaneous appearance so that visitors recognised them as being current. The response from visitors has been extremely positive.

Reports by fax also provide a vital link between the Aquarium and the outside world. The interpretive staff developed an extensive network of people working in wild environments along the British Columbian coastline and around the world. Fax reports were used not only to follow Aquarium researchers but to follow wildlife, such as killer whales, along the coast of British Columbia. This current information is critical to enhancing the visitors' understanding of links between the animals at the Aquarium and animals in wild environments. It is only with this understanding that people develop the desire to understand and protect such complex ecosystems .

Secrets of success

Given the benefits for visitor learning and enjoyment and animal care and husbandry, it may seem difficult to understand why more zoos and aquariums have not built their public gallery programmes around the interpretation of real, spontaneous animal behaviour. Two factors, in particular, appear to have a significant influence.

First there is the pervasive belief, within the entertainment paradigm that pervades zoo and aquarium activities, that visitors must have predictable, scheduled, entertaining experiences. There is a fear that the natural behaviour of animals would be too sporadic or not spectacular enough to hold visitor interest or to be entertaining. We did not find this to be the case. A survey of visitor satisfaction (Angus Reid, 1991) revealed that visitors preferred spontaneous behaviour interpretation.

Secondly, zoos and aquariums typically fill their public interpretation positions with volunteers or summer students who lack the experience, skills and ongoing familiarity with the animals in the collection, which is necessary to recognise and interpret animal behaviour. In order to achieve the spontaneous behaviour interpretive approach, we employed a full-time staff of professional naturalists, who moved through the entire Aquarium, interpreting interesting animal behaviour as it occurred.

An intimate understanding of the facility and its activities and events, and how these relate to a particular animal exhibit or Aquarium function, is essential to this style of interpretation. The naturalists developed a strong communication network across all the departments of the Aquarium as they gathered information daily from animal care staff, researchers and research associates. This information was shared with Aquarium visitors directly, and with other Aquarium staff working in admissions, education, communication and animal care, who then used it in their daily activities.

Because the naturalists were constantly in touch with activities of animals in the Aquarium and the interests of the public, they became a vital resource for television, newspaper and radio interviews and membership newsletters. They formed the matrix of an Aquarium-wide information system that enabled us to translate current, observable animal events not only into visitor experiences but also into media stories, graphics and special events. In the end, staffing these positions on a full-time basis proved to be more effective in terms of cost and quality than the seasonal staff approach we had used previously.

References:

Angus Reid Group, *Public Attitudes Towards Cetaceans at the Vancouver Aquarium*, 1991.

Elin Kelsey is a communications and educational consultant for international and local conservation initiatives. She was formerly Director of Interpretation & Exhibits at the Vancouver Aquarium, where she introduced spontaneous behaviour interpretation.

Zebras won't stand by the "Zebra" sign

Wendy Houseman

Interpreting wildlife in a safari park presents a different kind of challenge.

Woburn Safari Park was officially opened in 1970 but the history of animals on the Woburn Abbey Estate goes back much further. A private menagerie of exotic animals at Woburn was first recorded in 1811, during the time of the 6th Duke of Bedford. The family's interest in the collection continued and the 11th Duke of Bedford was President of the Zoological Society of London, from 1899 to 1939.

Woburn Abbey is perhaps most famous for its extensive deer park. The books kept by the 11th Duke's wife record 45 species of deer and 18 species of antelope and gazelle roaming in the 3,000 acre deer park at that time. Included in this list is the milu or Pere David deer, which was saved from extinction at Woburn. In 1985 and 1986 the present Marquess of Tavistock returned a breeding group of 50 of these animals to Beijing, where they are once again successfully breeding in their native land. Today, there are ten species of deer resident at Woburn and the family are highly involved in the conservation work at Woburn Safari Park.

The interpretation of a safari park, rather than a zoo, can be a difficult process. Our visitors are constantly on the move as they drive through the reserves and they do not have the opportunity to stop for long periods of time, leave their vehicle and read detailed information about the animals. It has been important for us to consider interpretation of the reserves not only whilst visitors are driving through them but also before they enter and after they have left the reserves to explore our large Leisure Area on foot.

What do visitors want to know?

We have had to consider what we want visitors to learn about the animals and perhaps more importantly, what visitors themselves actually want to know and can absorb on a visit to the park. We see no point in providing signs that go to great lengths to explain the genetic make up of the rhesus macaque when all the visitor wants to know, and is likely to absorb, about the animal are points such as: "What is it?", "Where does it come from?" and "What does it eat?"

Sue Dale Tunnicliffe has carried out extensive research into this field (Tunnicliffe 1995, 1996a/b/c/d/e/f, 1997, 1998, Tunnicliffe, Lucas and Osborne 1997) . Obviously our visitors come from diverse backgrounds and for the animal enthusiast or researcher we provide specialist talks and written documentation to satisfy their need for more detailed knowledge.

Market research is clearly an important issue with reference to interpretation. Through exit surveys we know that our visitors want to be educated but they also want to be entertained. A large proportion of our visitors choose Woburn Safari Park, rather than a traditional zoo, because of the mixture of education and leisure facilities. They enjoy the way information is presented in a fun, entertaining way during our popular animal talks and demonstrations (which take place in our "walk round" Leisure Area).

Current signage in our animal reserves is very simple, consisting of an outline of the animal with its common and Latin name, and for many visitors this information is adequate. Obviously they bring with them to the park prior knowledge of exotic animals from sources such as television, books and foreign holidays. One major problem, in practice, is where exactly to erect the signs. You rarely get a zebra standing right next to the "Zebra" sign! Animals causing damage to signs can also be a problem, as can the placement of signs so as not to detract from the natural environment.

Going further

For visitors who would like to know more about our animals, we offer further forms of interpretation.

The most simple is our guidebook. The guidebook is currently on sale for people to buy in certain local, high street retailers, which means that it can be read before a visit to the park. Teachers are also given opportunities to buy the book beforehand and this proves popular, as they can read up and improve their own knowledge and help to increase the quality of the experience for their class on the day of the school trip.

The guidebook gives information and coloured photographs about the majority of our reserve animals and families will often buy a copy. Some choose to use it in an interactive way, with parents and children reading out facts to each other as they go around. Others keep the book and look at it after their visit, back at home.

As Kelly (1999) discovered from her research into cathedral visitors, learning facts and figures is not a

Visitors like to see zebras roaming free, but it's hard to find the right place for the sign!

W HOUSEMAN

first concern for visitors. They will buy a book from the shop but read it later. They don't walk around with it, because then they end up looking at the book and may miss something. As a former primary school teacher, I would rather the children enjoyed the first-hand experience of observing exotic animals, rather than filling in copious worksheets and missing the monkey climbing right up to their window!

An ongoing problem with guidebooks is making them as current as possible. Our animal stock often changes and we now have to consider separate inserts to update our visitors on new animals, rather than regularly reprinting the main guidebook which is a costly exercise.

We've got it taped

At Woburn we're constantly trying to make learning an interactive, rather than passive, experience for our visitors. Hence one of our more recent forms of interpretation is our Safari Audiotour. This is a specially written tour of the reserves, narrated by actors Linda Bellingham and Christopher Biggens, which takes the visitor on a guided tour of the animals. The script has been carefully structured to combine interesting facts about the animals with a humorous delivery. The tape is easy to use and visitors are told exactly where to stop and pause before moving on. Brightly coloured Audiotour signs are dotted around the reserves.

To cater for different levels, Side A contains the basic tour, geared towards a family with young children. Side B contains more in-depth information, including an interview with our vet and various keepers. Also included with the tape is a "treasure trail" booklet for children to complete as they move around the animals. Feedback from visitors has been very positive and they feel that the tape really brings the reserves alive. They enjoy hearing the different voices and personalities of the keepers and seeing if they can guess which one is on patrol as they drive around!

Early teething problems with the tape included people clogging up the entrance whilst they loaded and listened to the tape introduction. Like the guidebook, the tape is hard to update as we change animals. However, we decided to use a tape rather than an acoustic audio tour as we did not want queues of traffic caused by people handing back their handsets. We were also worried about handsets going missing.

A third and more recent way of increasing the quality of visitor interpretation around the reserves is by offering special VIP visits for small parties. During a VIP tour visitors can go off road and get closer to the animals and enclosures. The guide is a trained animal keeper who can really bring the reserves to life, giving anecdotes about the different animals or more background information, depending what the visitor wants. This is a quality experience and alas, something we cannot offer to every visitor. Current staffing levels make it impossible to provide a guided ranger on every coach trip.

Once visitors have left the reserves our programme of animal shows and demonstrations in the Leisure Area, such as the popular Elephant Encounter, helps to interpret what the visitors have observed driving around. Shows feature an educational commentary with facts and figures about the animals, presented in a fun way. Volunteers are often called upon from the audience in order to make the shows more interactive. It's much more effective to actually feel what an elephant is like than to read facts about the thickness of its skin.

Learning through play

In addition to the shows, information about the reserve animals is consolidated for children in our large indoor adventure playground. The Adventure Ark features several colourful information panels about our many reserve animals, promoting our philosophy of "learning through play". This philosophy is carried through into our Junglies gift shop, which supplies a range of books, CD-roms and educational toys.

Finally, interpretation of the reserves is also achieved by having a team of enthusiastic and knowledgeable keepers working in the Leisure Area, who are on hand to answer any questions about our animals that people may have. As visitors cannot access keepers to talk to whilst driving around the reserves, they enjoy the opportunity to interact with them in the Leisure Area.

(Far right) On the move: the drive-through safari park enables people to see animals at close quarters.

So, what of the future with regards to interpreting the animals in our drive-through reserves? We need to continue looking at ways in which we can develop interpretation not only whilst visitors are driving through but also before they enter and after they have left the reserves. We also need to address areas such as interpretation for foreign visitors and interpretation for people with special needs. One important factor will be how we develop the My World Education Centre, our new educational facility opening in March 2000, which will conjure up a whole new range of interpretation issues.

References

Kelly, L. (1999), The interpretation of cathedrals: what the vistors really say, *Interpretation* 4 (2).
Tunnicliffe, S. D. (1996a), Zoo talk/Live animals as exhibits, *Journal of the International Association of Zoo Educators* 32
Tunnicliffe, S. D. (1996b), Conversations within primary school parties visiting animal specimens in a museum and zoo, *Journal of Biological Education* 30 (2)
Tunnicliffe, S. D. (1996c), A comparison of conversations of primary school groups at animated, preserved and live animal specimens, *Journal of Biological Education* 30 (3)
Tunnicliffe, S. D. (1998), Boy talk, girl talk: is it the same at animal exhibits? International *Journal of Science Education* 20 (7)
Tunnicliffe, S. D., Lucas, A. M. & Osborne, J. F. (1997), School visits to zoos and museums: a missed educational opportunity? *International Journal of Science Education* 19 (9)

Wendy Houseman is Education Officer at Woburn Safari Park.

The park is open daily from March to October, and at weekends during the winter. For more information call 01525-290407 or e-mail WobSafari@aol.co.uk.

A moving experience: the role of robotics

Sue Dale Tunnicliffe

Robotic models can bring a new dimension to animal exhibits, but are they always used to best effect?

Robotic or animatronic models have increasingly become a feature of animal exhibits. The movements of such models are sequential and repetitive and often tell a story, such as carnivores eating a herbivore. Children find such exhibits fascinating. If they watch for several cycles, they can predict the sequence of movements and elaborate on the story. However, the use of robotics raises several issues. Firstly, are all robotic models of equal value as animal exhibits? Secondly, should visitors view live animals and robotics together, or should live animals be seen in zoos and models in museums? The following article is based on research into children's response to robotic animals at the Natural History Museum and London Zoo.

Museum models

There are two robotic animal exhibits in London's Natural History Museum. One is a lizard-like animal in a case which looks like a tank, situated near the exit to the Dinosaur Gallery. The model is programmed to make a sequence of movements in a regular cycle, stretching its back leg, moving its tail, opening its eyes and breathing. There is no

SD TUNNICLIFFE

(Far right) Family groups visiting the Dinosaur Gallery, the Natural History Museum, London

interpretation accompanying this exhibit, but the aim is to stimulate visitor discussion about how similar to modern reptiles the dinosaurs were.

The other robotic animals are in a diorama halfway through the Dinosaur Gallery, between the high walkway and the ground-level exhibits. The path past the diorama is a sloping ramp which links the two levels of the gallery. Visitors approach from the high-level walkway, and enter the gallery at the back of the exhibit where there is a viewing window. They proceed down the slope in semi-darkness, around a right-angled bend, and then they are able to view the diorama. The visitor is separated from the exhibit by a barrier on which there are several identical signs, spaced at intervals, with the names of the animals and a brief explanatory text. Visitors continue down the ramp, turn another corner, walk past the last side of the exhibit, and out into the main Dinosaur Gallery at ground floor level.

The diorama shows a reconstruction of landscape and scenery as it is believed to have been when the animals portrayed were alive. It contains four robotic dinosaurs. One of these, Terontosaurus, is lying on the ground. It is being attacked by three smaller dinosaurs called Deinonychus. The models make movements in a regularly repeated sequence, and there is a loud, regular sound-effect as part of the cycle, as well as insect noises.

This exhibit is a bi-sensory experience in terms of the triangle of sensory perceptions (Tunnicliffe, 1995b). Visitors are largely passive participants, or voyeurs, in a flash-back scene which they perceive through sight and sound. There is no opportunity for them to interact with the exhibit in any way other than "talking" to it.

The zoo experience

In 1994, London Zoo staged an exhibition about extinction which featured nine animated prehistoric animals displayed around the zoological gardens, as well as several living specimens such as chiclids in the aquarium and the Arabian oryx. There was a "Tomb of Animals" designed to inform visitors about extinction and the importance of conservation.

The centrepiece of the animatronic exhibits was a Tyrannosaurus rex housed in a large marquee on the zoo's lawn. The tent also contained a smaller dinosaur, Diplophasaurus. A Glyptodon was sited at the entrance to the tunnel which connects the main zoo to the extension across the road.

Other species shown as animatronics included a Smilodon (sabre tooth tiger), sited in the middle of the Lion Terraces, a mammoth family in the Elephant and Rhino Pavilion and a Deinonychus dinosaur near the exit to the Reptile House. A Protoceratops was guarding her eggs in a nest and was being threatened by Veloceraptors. Visitors could obtain a "passport" booklet into which they could stamp an inked impression at each exhibit. All the exhibits had lengthy text signs which contained the scientific name of the animal.

How children respond

The remarks of children and accompanying adults were collected by recording their conversations. The teachers in charge were asked for permission to listen to the children. The recorded conversations are totally anonymous and there is no way the speakers can be traced. The 73 conversations collected at the zoo were compared with a previous study of 422 exchanges collected over a number of weeks at the animatronic exhibits in the Natural History Museum. This was a typical conversational exchange involving nine- to ten-year-olds:

Boy: *See that, horns, ugh!*
Girl: *Ugh!*
Teacher: *Why don't you like it? It's a dinosaur.*

These exchanges were collected, transcribed, coded according to topic category and analysed using a systemic network (see Tunnicliffe 1995, 1996 for further details of methodology). Counts of the categories yielded totals. The total number of conversations in which topics about the animal are mentioned at least once were counted.

In the zoo study, comments about anatomical features form the largest category, although such comments are made in only about a third of all conversations. Comments about behaviour are the next largest category, followed by comments about name. Within the anatomical category, comments were made most about the "front end" of the animal: its head, its face and other features such as ears. Within the behaviour category, "attractor" behaviour – actions other than straightforward

The Natural History Museum, London

movement or locomotion – was most often mentioned. This behaviour includes actions such as fighting and pawing the air, but not feeding, which is regarded as a separate category. Within the naming category, placing the animal in a group (eg "cats") was the most frequent comment, followed very closely by providing the animal with an identity or name.

However, children in the museum study commented on anatomical features in almost 75% of their conversations. The dimensions, size, shape and colour of the models was the largest category mentioned, followed closely by features like tails and legs, which disrupt the outline of the body. Well over 75% of conversations also mentioned an aspect of behaviour, and over 50% mentioned movement. Not surprisingly, because the main exhibit focused on the feeding of carnivores, 30% of conversations mentioned feeding at least once. Names were mentioned in just under 50% of the conversations in the museum, and few comments mentioned the category of animals (reptiles) to which the models belonged.

When the two sets of results are compared, there are some striking differences in what the groups talked about. The zoo models elicited significantly fewer comments about anatomical features and behaviour, but more about naming. More conversions in the zoo were concerned with the group (order, class or genus) to which the animal was thought to belong ("cats", "elephants" etc). This is not however a totally unexpected finding because of the greater variety of categories represented by the zoo models.

It is important to note that the museum's dinosaur diorama featured the robotic models moving, feeding and interacting in an attention-attracting manner. In contrast, the zoo models showed behaviour which was often aimless and without a clear context. The Glyptodon, for example, just moved its head for no apparent purpose.

Movement and observation

Movement is a powerful feature which catches the observer's attention. However, the movements of live animals, when apparent, appear to distract children and accompanying adults from observing unfamiliar anatomical parts (Tunnicliffe 1995). Live animal movements are unpredictable, infrequent and do not recur, so children may not pay particular attention to either the action or the animal's anatomy, because neither are reinforced by repetition.

In contrast, the repeated movements presented by animated models appear to encourage visitors to observe and comment upon both the anatomy and the actions of the models. Children can learn the sequence and predict what will happen next. Repeated movements are effective in drawing visitors' attention to the action and to the associated parts of the animal's body. However, the action has to have a clear sequence that the children can recognise and follow. Not all animatronic models possess this. Movements that are small and uninteresting do not attract children.

Visitors are initially attracted to animatronic models because the movement catches their attention. Sequenced and predictable movements enable visitors to watch the planned display of the animals' behaviour a number of times and to focus on the behaviour shown and the parts of the body involved in the actions. The exhibit is attractive to visitors because of its animation and predictability. Furthermore, the portrayal of extinct animals – often large dinosaurs – provides "safe monsters" for young children who hitherto were only able to view these extinct reptiles as fossils, reconstructed models in museums or moving images in films.

Lessons for exhibitors

However, the models have to be realistic so that children do question their authenticity. They must be well made, so that the wires controlling them cannot be seen, the mechanical motors cannot be heard, and joins in the body covering cannot be seen. These features were noticeable in some of the zoo models. Robot animal models also need to be set in a context and to tell a story. This was not the case with the zoo models, except for the mammoth group, which was the most successful exhibit in terms of what the visitors said. Text accompanying the model must be short and relate to the interests and experiences of the majority of the audience.

A variety of animal types portrayed by models provides more opportunities for discussion about classification, behaviour and adaptations to habitat. Mammal-like models provide visitors with images which they are more likely to recognise as being

similar to animals they already know. This in turn provides an opportunity for further interpretation by the zoo, which could lead into conservation issues. Robotics do have an important place in exhibitions and education, but the package must be well thought out. Placing models on spare sites does not appear to work. In zoos, there may be less interest in robotics because of the competition from live animals. Perhaps, in the minds of children, zoos are simply places to see live animals and nothing else? The novelty of moving models has worn off, and it is no longer enough to display them as a curiosity for visitors to be look at in passing. It is not just "how you tell it" but "what you tell" which is important in using animatronic animals as exhibits.

References

Tunnicliffe, S. D. (1995), *Talking about animals: studies of young children visiting zoos, a museum and a farm*, Unpublished PhD thesis, King's College, London

Tunnicliffe, S. D. (1995b), Can your exhibits be interpreted by visitors using more than one sense? *Zoo Padogogik Unterricht* (3), Kassel: Gesamthochschul-Bibliothek

Tunnicliffe, S. D. (1996), A comparison of conversations of primary school groups at animated, preserved and live animal specimens, *Journal of Biological Education* 30 (3)

Sue Dale Tunnicliffe is ICASE Pre-Secondary Project Officer and Senior Research Associate, Homerton College, Cambridge.

The virtual zoo: animal exhibits on the web

Susan Teller Marshall

Zoo websites not only attract virtual visitors, they encourage actual visitors too!

Animal exhibits are not only seen in zoos for real, they can also be seen in a "virtual zoo" on the Internet. Such a facility is surely the way forward in the zoo world, giving access to animal exhibits 24 hours a day.

At Lincoln Park Zoo in Chicago, USA, the education department realised the potential of a virtual zoo and in 1995 began to create a site on the World Wide Web. This effort began without resources, but with the awareness that there was a need to approach the global community this way. This case study shows the advantages that become apparent once the product, however minimal, appears on the Internet. These advantages are a compelling argument, relevant to all kinds of institutions, for starting a website.

In addition to the many "virtual visitors" who can enjoy your zoo or museum via cyberspace, many of your "actual visitors" will do the same. A visit to the zoo can inspire awareness and curiosity, but most visitors are not especially interested in pursuing additional information while they're enjoying their day out. A website makes additional information available to consumers at off-site locations. The visitor will often be more satisfied by a factsheet than by conversation with a staff member, and you can expose the consumer to information, as well as membership and retail opportunities, at any time or place.

TODD ROSENBERG

Visiting a zoo can be a virtual as well as a real experience.

Getting started

How do you start putting your animal exhibits on the web when you have no expertise, no funding and no equipment? Look for assistance that won't cost you anything at the outset. The expertise you need can usually be found within the ranks of your volunteers, members or the families of staff.

Lincoln Park Zoo began its cyberspace venture with the help of a zoo volunteer and the husband of a zoo staff member. Survey your volunteers, members and staff and ask if anyone is willing to donate time to help the project get started. Include in your appeal a willingness to acknowledge the helper at every opportunity and the assurance that, once funding is forthcoming, they will be paid.

Lincoln Park Zoo's website began with an overview of the zoo showing animal exhibits as they are in real time, an animal collection list and some factsheets. We added a virtual tour of our newest building which was designed to entice visitors to come and see it. An education sub-site was also added.

Facts and pictures

Most of the initial visitors to Lincoln Park Zoo's website begin by looking at the animal factsheets. Factsheets for many types of collections are already available in copyright-free form, usually accessible on the Internet. Factsheets can also be produced in-house with minimal time investment if the design format is simple and straightforward: a few sentences of basic information about the animal exhibit followed by a few bulleted points highlighting things that you would like the visitor to notice about the exhibit.

Pictures to complement each factsheet are especially important in designing a user-friendly site. Photographs should be your own originals, as these are your property and can be used on your website without difficulty. In some cases this isn't possible; for example, with well-known works of art. But in the case of most collections at most institutions, volunteers already have a plethora of photos they have taken and would probably donate to your cyberspace venture, especially if they are acknowledged.

Funding follows the product

Once the zoo had a product to show potential sponsors, specific agencies could be approached for specific needs. It is much easier to approach a sponsor if you have a proven product. One company provided Lincoln Park Zoo with funding to improve an existing programme designed to train professional teachers to use the Internet.

When this workshop was first offered, all the teachers huddled around one personal computer. Evaluations emphasised that the workshop was meeting teachers' needs, and provided compelling persuasion to the company that provided grant funding. The zoo was able to incorporate website maintenance into the grant proposal by showing how the teacher workshop sessions used the zoo's website as a teaching resource.

A second company provided Lincoln Park Zoo with a robotic camera connected to the website from our Siberian tiger exhibit. Their intention was to advertise their product (the camera) by having people use it to watch the zoo's great cats from their personal computer. Both the zoo and the company benefited from this partnership, but if the website had not already been established, such a partnership would not have been formed.

Another grant from a philanthropic foundation provided funds to launch an on-line curriculum from the education sub-site. This larger and longer-term financial commitment not only allowed further development of the website, it also provided funds for consultants, equipment and website maintenance. Again, the grant proposal for an on-line curriculum could not have been written without the prerequisite of a website for its location.

It's a hit!

After only a few months in operation, the zoo's website was receiving so many "hits" that other zoo departments, not just the education department, began to see the value of this venue and added their sub-sites to it. After a few years of increasing success and website growth, the zoo's management acknowledged the need to have a member of staff maintaining the site and included this in the zoo's operating plan.

Ask your membership or retail department if they would like to advertise on the institution's site. At first, these departments may not want to participate, but once you get a few fact sheets up and start tracking the number of people who access your site,

tell the membership and retail staff each week how many potential customers they missed.

Tell the collections staff how many people accessed the website for their information instead of phoning or writing. When they are shown the advantages of having a website, these departments may be willing to assist the effort.

Cautionary advice

One word of caution. Communicating via personal computer screen is very different from other modes of communication. Most websites are too text-heavy and have too many nested screens. When you begin your website design, consider that the personal computer user is usually interested in easy access to your site, easy manoeuvring within your site and links to more information on particular topics. Pilot your website design with some volunteers to see if they find it user-friendly. As in any educational venture, don't try to do too much. Stick with just a few main ideas and present them well.

Lincoln Park Zoo invites you to visit its website and look at our animal exhibits. Visiting a zoo can be a virtual as well as a real experience.

Susan Teller-Marshall is Manager of Academic Programmes at Lincoln Park Zoological Gardens, Chicago, Illinois, USA. Lincoln Park Zoo's website is at www.lpzoo.com

Thinking locally: natural history in the Potteries

Keith Bloor and Don Steward

The Potteries Museum in Staffordshire has a strong local focus in its Natural History Gallery.

Natural history was a major focus of the collections of the early museums in the Potteries area. The North Staffordshire Field Club, established in 1865, did much to increase awareness of local wildlife and geology. The collections amassed by members of this Club formed the basis of the North Staffordshire Natural History Museum, which opened in 1908 in conjunction with the Hanley Corporation Museum.

At the opening of the Museum it was noted that "The Committee (of the Club) also came to the wise decision that the Museum should mainly comprise exhibits relative to Staffordshire, and that it should be made as representative as possible of the flora, fauna, and geology of the county. As will be seen, this decision has been adhered to, and there is every promise that in course of time the various collections will represent very adequately a county which is rich in natural history treasurers."

This policy of developing the regional focus of the collections has continued, giving the present-day Potteries Museum & Art Gallery the most comprehensive collection of Staffordshire natural history material anywhere in the world.

Animals, plants, rocks and soil

The term "natural history" is often used to refer only to the study of living animals and plants in the wild. But it should also include the study of rocks, soils and climate. Excluding climate, these constitute the sciences of biology - divided into botany and zoology – and geology. This broader definition is the one we use in the Potteries Museum.

The Natural History Gallery covers an area of about 300 square metres. Designed by Colin Milnes Associates, then based in Coventry, it cost £125,000 to construct. Prince Charles officially opened it on 3 June 1981.

In keeping with the regional focus of the collections, the gallery portrays habitat areas in and around Stoke-on-Trent. The dioramas have been left

The freize above the entrance to the Potteries Museum illustrates that rocks form the foundation of all local habitats including the city

partially unglazed so as to allow a better view of the specimens. Most exhibits are arranged at a fairly low level for easy viewing by children and wheelchair-users. Several examples of rocks and animals are on open display to encourage visitors to touch them.

Visitors should, without going to too much trouble, be able to see many of the exhibited specimens in their natural state outside the Museum. We want the displays to encourage visitors to look out for them. So the gallery seeks to set taxidermically-preserved animals in the context in which they occur naturally.

A walk through the landscape

The route through the gallery takes visitors on an imaginary walk from the north to the south of the Potteries area, encountering on the way limestone grassland, moorland, city and town areas, coniferous and deciduous woodland, heathland, fields and hedgerows, and finally freshwater habitats. Underlying this route (literally!) is a progress from the oldest locally exposed rocks of the Carboniferous limestone, through the Millstone Grit, Coal Measures, Triassic pebble beds and mudstones, and finally the Quaternary deposits from the last Ice Age.

The basic storyline for all the habitats is:

- these are the rocks that form the foundations
- this is the soil produced from the rocks
- these are the plants that grow in that particular soil
- these are the animals that feed on the plants

For example, the high ground to the north-east of the Potteries is formed from sandstones of the Millstone Grit series. These rocks produce an acidic soil which carries a moorland type of vegetation dominated by great tracts of heather and other ericaceous plants. The geology is readily apparent, as the field boundaries are marked by gritstone walls – an estimated 24 miles of wall to every square mile of moorland.

It's a wild and rugged landscape with dramatic outcrops of rock. The moorland habitat provides exclusive breeding sites for birds like the red and black grouse, short-eared owl, golden plover and ring ouzel. In addition, introduced red-necked wallabies and red deer frequent the area. All these representatives of this landscape are displayed in the museum.

A similar approach is followed with the other habitats. The limestone grassland has developed on the outcrops of Carboniferous limestone, cities and towns on the economically important Coal Measures, and the poor heathland soils on the pebbly Triassic sandstone. The rivers and lakes are associated with the drainage patterns created by the power of glacial meltwater.

Contrasting woodlands

Some habitats, however, do not conveniently fit into geological boxes. Woodlands tend to develop anywhere. At one time 70% of the British Isles was covered in woodland. Locally the figure is now only about 5%, but woodland, particularly broad-leaved or deciduous woodland, is a most valuable wildlife habitat for vast numbers of plants and animals. Over 400 invertebrate animals are known to be dependent on oak trees alone for all or part of their life cycle.

Plants and animals typical of a deciduous woodland are displayed, and the visitor can contrast this abundance with the relatively sparse wildlife associated with coniferous woodlands. Real trunks of Scots pine trees reach from floor to ceiling in this part of the gallery, and an artificial leaf-canopy links the two types of woodland together. Exhibits include birds such as the long-eared owl, coal tit, crossbill and redpoll, and mammals such as squirrels, fallow deer and muntjac deer.

The similarity between woodlands and hedgerows is emphasised by depicting "mad March hares", a vixen and her cubs, and a badger "digging out" a wasp's nest. These all form part of a display linking the woodlands to the representation of the fields of farmland surrounding the Potteries conurbation.

Making changes

The main structures of the gallery have changed little until quite recently. Cynics may attribute this to cost considerations, but in fact the gallery was well-designed to begin with and has withstood the test of time. The fact that the gallery still feels up-to-date is partly due to its open design, and partly to the holistic storyline, emphasising the interdependence of wildlife and the landscape.

Recent changes include the addition of low-tech interactives such as "Tracks and Trails", which

20 *A recreation of a local freshwater habitat*

BILL KLEMPERER

challenges the visitor to identify the tracks of various animals using templates, and "Garden Friends and Foes", which uses lift-up labels. These relatively inexpensive additions are complemented by two high-tech computerised interactives. "Stoke Safari" introduces the user to the wildlife of the area through pictures, sounds and reference to the real objects on display.

One of the problems in increasing access to the 150,000 objects in the Museum's collections is how to display them all in a gallery designed for approximately 1,000 objects. The "Virtual Store", our most recent computer interactive, attempts to address this problem by enabling the visitor to search, examine and interact with images of objects that they would not normally have the opportunity to see. This information is also accessible on our internet website.

We try to keep a balance between traditional and new computer-based methods of display, so as to aid interpretation of the "real" objects, including the animal exhibits, in the collections and not to exclude any group of users. These developments, together with a policy of continuous improvement in labelling, have significantly improved the accessibility of the gallery.

The gallery is popular with local people as it provides an opportunity to identify things they see for themselves in and around the city. Although most of the Museum's non-local visitors are initially attracted by the ceramics collections, the natural history gallery provides them with a new insight into the Potteries, challenging the area's predominantly industrial image.

Furthermore, this gallery shows that preserved animals can be part of a meaningful exhibition. Live animals are not the only way to help the public understand animals' form, function and habitat.

References

Halfpenny, G. & Steward, D.I. (1982) Natural History Section, City Museum & Art Gallery, *Stoke-on-Trent Museums Journal* 81(4)

Halfpenny, G. & Steward, D.I. (1983) Featured institution: Stoke-on-Trent City Museum & Art Gallery, Natural History Section, *Newsletter of the Biology Curators Group* 3

Nolan, K. (1997) Stoke-on-Trent safari, *Heritage Development* 2

Steward, D.I. (1984) Geology at Stoke-on-Trent Museum & Art Gallery, *Geological Curator 4*

Keith Bloor is Keeper of Natural History and Don Steward is Deputy Keeper of Natural History at the Potteries Museum & Art Gallery, Stoke-on-Trent, Staffordshire

The Museum's website is at www.stoke.gov.uk/museums/pmag