

Appendix

Volac Farmamate Milk Replacer analysis: Oil 14%, Protein 22%, Ash 7.5%, Lysine 2%, Selenium 0.2 mg/kg, Copper 10 mg/kg, Vitamin A 50,000 IU/kg, Vitamin D₃ 6,000 IU/kg, Vitamin E 100 IU/kg.

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New publication – *Caring for Kangaroos and Wallabies*

Anne and Ray Williams have been involved with the care, study and maintenance of Australian fauna whilst fostering native animals, working in wildlife parks, managing the University of New South Wales's field station near Sydney, and carrying out wildlife surveys. Their book *Caring for Kangaroos and Wallabies* is profusely illustrated with colour photographs, black-and-white line drawings, and colour maps showing the location of the various species. The book is divided into two parts. Part One, 'An Introduction to Kangaroos, Wallabies and Rat-kangaroos', covers such topics as Species of Macropods, Reproduction, Identification of Macropods, Physical Features and the Senses, and The Ecology of Macropods. Part Two gives detailed information on hand-raising and rehabilitating young macropods.

Caring for Kangaroos and Wallabies is available from: Simon & Schuster (Australia) Pty Ltd, 20 Barcoo St (P.O. Box 507), East Roseville, NSW 2069, Australia (Tel.: 61-2-9417-3255; Fax: 61-2-9882-1087), price \$24.95 (postage and handling \$10.00 extra).

I.Z.N. Back Numbers

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FROM COLONIAL MENAGERIES TO QUANTUM LEAP – A HISTORY OF SINGAPORE'S ZOOS

BY SALLY WALKER

Singapore is both a stop and a stop-over for millions of visitors passing into and through Asia. Because of its size and island nature, Singapore caters very heavily for tourism and has made a science of getting and giving the best. There are no less than six facilities in Singapore where visitors can go look at animals. Some are among the most famous in the world, e.g. Singapore Zoo, Jurong Bird Park and Singapore Night Safari. Although everyone knows about Singapore's zoos, few are aware of its very interesting colonial history with regard to captive animal collections.

The city of Singapore is often remembered by natural historians for its founder Stamford Raffles (1781-1826), a dynamic administrator and naturalist, who was also the founder of London Zoo. Raffles pursued his hobby of collecting and naming wild animals and plants wherever he was, and in Singapore at that period he found fertile ground (Hahn, 1948). H.N. Ridley, who served as superintendent of the Botanic Gardens Menagerie in Singapore in the early years of the 20th century, commented on the 'eminent suitability' of having a menagerie in the colony founded by the same Sir Stamford Raffles who founded the famous London Zoo (Ridley, 1906).

Singapore has a very interesting zoo history, if we describe as a 'zoo' any public facility which exhibits captive wild animals, such as the old-style botanic gardens which kept wild animals as well as flowers, trees and shrubs. Such gardens were more common than one would think – we can find several very old examples throughout South and South-East Asia. Many of them encouraged artists to paint the animals in them, and some of those paintings survive as scientific illustrations. There was such an institution in Singapore, where the botanical gardens originally belonged to the Agri-Horticultural Society, which was established as early as 1859. But the Society lacked sufficient funds and public support to maintain the gardens, and in 1874 they turned their property over to the government, who appointed a superintendent. In fact the zoological section was at first separate, making it a very early zoo indeed.

The superintendent, Mr Krohn, published the inevitable, detailed and somewhat stylised bureaucratic reports for which British colonials are well known and from which we today can gain so much historical information about both treasures and trivia. Krohn relates that in 1876 a Chinese resident of Singapore, Mr Cheang Hong Sin, presented a monkey house to the botanic gardens. A list of the animals held at that time includes a rhinoceros, sloth bear, kangaroos, many other mammals, and a number of birds; but in 1878 the government decided to get rid of the larger animals and retain small ones only, such as birds, monkeys and

other small mammals. The large animals were sent to Calcutta Zoo (Ridley, 1906).

From 1888 to 1902 the zoological part of the garden was developed until the collection became 'very representative of the fauna of the Malay peninsula and islands'. This is an interesting precursor of the contemporary concept of a zoo planning its collection around very specific and localised themes, which also ensures that animals appropriate to the biogeographic region are kept. The upkeep of this menagerie was provided for by a fund called the 'Gardens vote', which financed the feeding and housing; the animals were mostly donated by the public (Ridley, 1906). In 1902, an admirer of zoological gardens urged the government to provide a better type of enclosure for the animals. An estimate for improved housing was prepared, but in 1903 the government, instead of approving it, gave an order to abolish the menagerie! (Ridley, 1906)

Mr Ridley's comments about maintaining a zoo in the tropics in those days are appropriate and interesting. He remarks on the suitability of the climate, the low cost of keeping (both because indoor heating is not necessary, and because forage, fruit and fish are practically freely available), and the fact that all manner of interesting animals can be procured 'for a song'. He points out that neighbouring islands and mainlands harbour species which could not be kept easily in temperate collections in Europe or America, but do very well in captivity in Singapore, and even breed. Examples of breeding in Ridley's time were jackal, 'kijang' (Indian muntjac, *Muntiacus muntjak*), 'napu' (greater Malay chevrotain, *Tragulus napu*), and green viper. Probably Ridley was right to say that none of these had previously been bred in captivity anywhere else.

Ridley's values were not the same as ours today, but his comments are perceptive and prescient in the context of the present popularity of Singapore Zoological Garden and Singapore Night Safari. 'To the large number of passengers who visit Singapore on their way eastwards or westwards, a zoological collection is very attractive, and the menagerie in its best days was known all over the world, and was the first thing asked for by the visitor' (Ridley, 1906). This is still true to a great extent today.

Contemporary zoo personnel mixing with the public frequently comment on the very peculiar ideas people have about what will make an animal 'happy'. Ridley describes this ubiquitous phenomenon in 19th-century Singapore, with stories of the visitor who rushed wildly into the garden office to report that the gibbon was in terrible agony because it was howling, and another who wanted to prosecute the staff for continuously torturing the tigress at sundown, as a result of its daily 'aoming' [*sic*] which she took to be cries of pain.

A common theme concerning zoos in general is that captivity is cruelty and avoided as torment by all animals. Ridley exhibits the traditional zoo man's enjoyment of quoting incidents which belie that myth. Once some pelicans which had been donated to the gardens were put out on the lake after spending less than a day in an enclosure. They immediately left the lake and stood on the road, wings and beaks flapping, which frightened the horses; then they returned to their enclosure and waited at the entrance all night until their keeper came and let them in. Another time, some phalangiers who managed to escape were confused as to what they should do next, so they simply sat on the top of their cage all night. 'If an animal

dislikes captivity at all,' Ridley says, 'it is easily seen. It mopes, or is restless, feeds only when no one is by, and is certain to pine away soon.'

Ridley's observations and comments are reminiscent of Gerald Durrell's popular writing. He comments '... some animals and birds [*sic*] much prefer small cages to large ones.' He also discusses the behavioural needs of animals, such as the large civets *Viverra zibethica* and *Pagurus leucomystax* (now *Paguma larvata*) which 'particularly dislike a bright cage. Being nocturnal animals, only coming out after dusk, the light annoys them very much and the *Viverrae* dislike being looked at by a crowd of people and become very nervous. To put these animals in a fine open cage that looks nice from a popular point of view is cruel. The cages should be half dark, when the animals do very well and live for many years.' (Ridley, 1906).

Some zoo keepers would do well to read Ridley now! Having observed many Asian zoos in recent years, I am puzzled why they could not have found such references, read them and learned to exhibit animals in accordance with their behavioural needs.

The Singapore Naturalists' Society and the Singapore Aquarium

In 1921, after the closure of the animal section of the botanic garden, some Singapore citizens founded the Natural History Society to pursue – among other things – the setting up of a proper zoo and aquarium in Singapore. In 1922 the society met to discuss the aquarium and were reminded by the chairman that the idea had come even earlier at the time of the Singapore Centenary itself (1919). At the meeting all the advantages of an aquarium were discussed – as a scientific endeavour, as a public attraction, etc. It was felt that the project was worth doing only if it could be done properly, involving all communities. The Rev. G. Dexter Allen suggested a combination of a zoological garden with the aquarium, and others agreed that a small experimental scheme could be tried so that experience could be gained prior to the larger project (Anon., 1924). A subcommittee was appointed but – these bodies being what they are – it is no surprise that the Singapore Zoo materialised only 50 years later. The Van Kleef Aquarium was not founded until three decades later, in 1955 (Harrison, 1985).

Of passing interest is the news in the same issue of *Singapore Naturalist* that at the same meeting it was announced that a black cobra caught alive during a society excursion to Bukit Timah had arrived safely in England on 21 August 1921 and was presented to the Zoological Society of London by the Singapore Naturalists' Society (Anon., 1924).

The Malaya-Borneo Exhibition Zoo

In those days holding big exhibitions was a fashionable thing to do, and a singular such event was held in Singapore in 1922, called the Malaya-Borneo Exhibition. The Prince of Wales was scheduled to visit, and it was intended that he should see the natural wonders and potential of the Malayan countries and their people and culture. These wonders were presented as 'under British influence', almost as if the colonisation of the area had created them! A high barren area of 70 acres (28 ha) was enclosed for the event which was inaugurated by the Prince. (Anon., 1924).

The Singapore Naturalists' Society organised a zoo for the exhibition on the suggestion of their president, Major J.C. Moulton, who was the organizing secretary of the exhibition. (Anon., 1924). The fact of a zoo being organised solely for an exhibition in 1922 is quite startling, even more so when one reads of the number and variety of the animals of the Peninsular and Bornean region which could be collected there for this purpose.

The society appealed to persons in outlying areas to contribute animals for this temporary zoo. The zoo covered an area of 90 by 141 feet (27 × 43 m) in a large railway 'godown' (warehouse) on the exhibition grounds. To exhibit a large number of animals in such a small area is quite an achievement, but the Singapore Naturalists seem to have done it very creatively, if not quite compassionately. The zoo included a large, rectangular central aviary of 30 × 25 × 30 feet (9 × 7.5 × 9 m), fitted with small bathing pools, rocks and tree branches. Next to the aviary was a small turfed paddock holding mouse deer and other animals. Large deer were accommodated in a large open enclosure. A huge shallow tank banked up with grass was made for the tortoises and turtles. Ten 'large', strong cages measuring 5 × 6 × 4 feet (1.5 × 1.8 × 1.2 m) were made for larger animals, and about 50 small cages for small mammals.

This collection must have been fascinating to both naturalist and layman. There were black panthers, tiger cubs on loan from His Highness the Sultan of Johore, clouded leopards, a Malayan bear cub, tiger-cats, binturongs, civets and monkeys. A modern zoo man would kill for the eight proboscis monkeys of different ages which were on exhibition there at one time, a perfect breeding group which did not, of course, breed. The report of the exhibition said these were 'very gentle and fascinating beasts in captivity and fed readily, seeming quite contented, but one by one they died.' There were also macaques, leaf monkeys and a pair of the uncommon crested 'lotong' (*Trachypithecus [Presbytis] cristatus*) (Anon., 1924).

Game birds and others kept in the central aviary were peafowl, jungle fowl, fireback pheasants, red-crested wood partridges, argus pheasants, peacock pheasants, hornbills, pigeons, finches and parrots. They managed to keep a flock of little egrets as well as a pair of white-necked storks, adjutant storks and even a sarus crane. The rarest birds in the exhibition were some pigeons, stated to have come from the Rhio (Riau) Archipelago and described as *Columba phasma*, but probably silvery pigeons (*C. argentina*).

There were even reptiles and invertebrates. A 27-foot (8.2 m) python later became the largest received at London Zoo when the collection was donated there. There were also black cobras and crocodiles, and even an exhibition of oriental insects which was deemed one of the 'most attractive features'. The zoo was so popular and the crowd so great that at times there was fear of the barriers breaking (Anon., 1924).

After the exhibition the entire collection, but for a few animals (perhaps those owned by the Sultan), was presented to the Prince of Wales for the Zoological Society of London. As mentioned, nearly the whole collection was donated to London Zoo and shipped there on the *Titan* with a keeper sent over from London to accompany them. Amazingly, there were few mortalities but for the argus pheasants and the proboscis monkeys, not one of which reached England alive. The

collection formed one of the most important acquisitions in the history of the zoo (Anon., 1924).

Apparently the members of the Singapore Naturalists' Society themselves were disturbed at the conditions under which the animals had to be confined during the exhibition. A masterpiece of understatement is the comment that some of the members were 'a trifle sad' to see their 'little friends' confined in 'cages rather on the small side'. They comforted themselves, however, with the thought that experience had been gained which could benefit animals in future, although how that might happen was pretty hard to imagine (Anon., 1924).

Van Kleef Aquarium

Bernard Harrison relates that although there were some small private menageries in Singapore during the first part of the century, many of these were owned by animal traders. According to Harrison, the first scientific animal collection was the Van Kleef Aquarium, which was opened in 1955 (Harrison, 1985). This aquarium was located in Central Park, River Valley Road, as late as 1993, operating under the Ministry of National Development (*International Zoo Yearbook* 34, 1995). The aquarium closed shortly thereafter (Bruce McKay, *in litt.*, 1998). In passing, McKay also commented that a 'coralarium' on Sentosa Island had also closed. Currently there is only one aquarium in Singapore, Underwater World Singapore.

Jurong Bird Park

The Jurong Bird Park followed the Van Kleef Aquarium; it is located on Jurong Hill, Jurong Town. The idea for a bird park was conceived in 1968, and in 1971 the park opened, covering 50 acres and constantly evolving as both a visitor attraction and a scientific institution.

Singapore Zoo

Bernard Harrison, Director of Singapore Zoo, points out that although a number of the older zoos and menageries in Asia were established by European influence, they were not model zoos 'either in design or operation.' These were designed during the colonial period by Europeans for Europeans, without taking into consideration the myriad tropical factors, or that local people would be the primary users for years to come. It has been difficult to bring these old zoos up to a modern standard without completely replacing them in both location and design. The Jakarta Zoo, mentioned by Harrison, has been shifted and completely redone. Bombay Zoo and Yangon (Rangoon) Zoo, Burma, mentioned by Harrison in his study, are still in the same place and having many problems modernising. Therefore, a great deal of planning and innovation went into the now famous Singapore Zoo, which was opened to the public in 1973. Harrison points out that Singapore Zoo was set up by interested citizens of the city as a new, non-profit company, and not passed down from an earlier colonial government. The zoo specialised in mammals and reptiles, with birds and fish getting a lesser priority because of the birdpark and aquarium already established in Singapore.

An interesting note is that while all this was going on, there was

apparently some idea in circulation of having an 'animal zoo' next to Jurong Bird Park. In 1970 *International Zoo News* carried a note about the Jurong Bird Park, which was under construction at the time, and envisioned 'an "animal zoo" of about 40 acres adjacent to the bird park to be built in the near future' (Anon., 1970). This project, however, was not destined to become a reality.

Singapore Night Safari

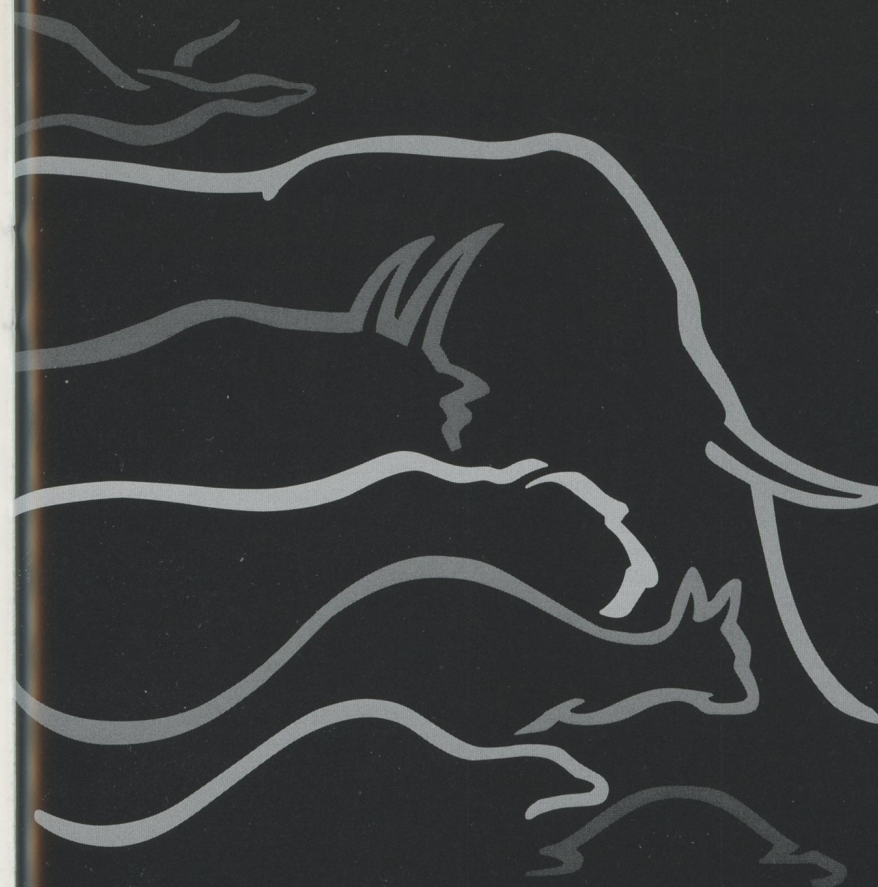
Although Singapore Zoo keeps a great number of tropical Asian animals, it is more of a 'traditional' zoo with animals from many continental areas. However, the Singapore Night Safari, although adjacent to the zoo, is an entirely different facility and a completely new concept in zoo design. The night safari is open only at night, and displays nocturnal or crepuscular animals (which many tropical species are), whose normal cycle is to sleep during the day and carry out their life activities at night. In a daytime zoo, exhibiting these has been less than satisfactory: the visitors go around in darkness and watch active animals in dimly-lit enclosures meant to simulate night-time conditions. The Night Safari consists of several primarily Asian tropical geographical areas – Himalayan foothills, Indian Subcontinent, Indo-Malayan region, Nepalese River Valley, Burmese Hillside Forest and Asian Riverine Forest – as well as micro-habitats on 'trails' for smaller animals, such as Fishing Cat Trail. All of these exhibits are painstakingly furnished with appropriate flora as well as fauna.

So, after 150 years of exhibiting animals in Singapore, the most up-to-date facility could be described with the same words as the first, as 'very representative of the fauna of the Malay peninsula and islands', and with the cages 'half-dark, when the animals do very well and live for many years'! It is a completely satisfactory example of an operation first dictated by straightforward practicality coming full circle to emerge as an ideal for scientific as well as commercial reasons.

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