

125 YEARS OF CALCUTTA ZOO  
(1875-2000)



*Published by*  
THE MANAGING COMMITTEE  
ZOOLOGICAL GARDEN, ALIPORE, CALCUTTA



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# CALCUTTA—CITY OF ZOOS

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## Abstract

In the early 19th Century—starting from 1801 there were four well documented institutions of some significance which could properly be called menageries or even zoos in Calcutta and a host of hearsay private collections. Even in very recent times, there are 7 zoological institutions in Calcutta which, in the five years after Central Zoo Authority Act was announced, registered with the Central Zoo Authority, the central coordinating department for zoos. Calcutta also had numerous sidewalk zoos until recently as well as a multitude of travelling menageries, parrot and monkey shows and dancing bears. Calcutta is well-known for its animal dealers, both legal and illegal. The city has been an "animal" centre for many decades. This paper is an informal review of some of these institutions from a purely historical fact of their existence, without bias with regard to their utility or quality.

## Introduction and background

Of all the cities in India or—for that matter, South Asia,—why did Calcutta emerge with dubious distinction of being the "captive animal centre of the subcontinent"? It is not such a mystery—there are good reasons in plenty.

For most of the three centuries that India was under British administration, Calcutta was the seat of Government as well as an intellectual and cultural centre. Intellectual and cultured people of the time—both colonials as well as wealthy natives—seemed to have a thirst for knowledge of animal life and a taste for keeping them in captivity. For colonials, the study of natural history provided a stimulating pastime and entertainment on lonely outposts and filled hours looming after work without the variety of social and cultural events common in England. The Indians who really studied animals at that time and before were rare (Jahingir, Raja Sefogee, Raja Mullick) but many other well-off royals kept collections.

The fact that Calcutta was a busy sea port where ships from Europe, Africa and Asia brought luxuries and exotica for the colonial administrators and wealthy and powerful among Indians surely played a role also. It allowed both colonials and natives to ship Indian animals out to friends, colleagues and governments abroad and

also to order strange and wonderful specimens in return. Trade in animals had been going on in India for quite some time, however.

The rich forests of North-east India, Burma and other border countries, and the state of Bengal itself has its own rich forests to supply a very great diversity of animal life. Calcutta also was a gateway or seaport to the rest of southern Asia (even South India and Sri Lanka) and south east Asia which guaranteed a steady flow of animal life into Calcutta.

These factors alone are sufficient to account for the very peculiar phenomenon that four early and most interesting zoos or menageries originated in Calcutta. They were:

1. Barrackpore Menagerie, founded circa 1801 and closed circa 1879
2. Wazir Ali Shah's menagerie founded circa 1830's and wound up circa 1880
3. Marble Palace Zoo, founded 1854 and continuing but in decline
4. Alipore Zoo, founded in 1875 and continuing and rennovating.

Of the seven institutions registered with the Central Zoo Authority in about 1996 two of the above were still functioning, that is the Marble Palace Zoo and the Alipore Zoological Garden. Also there was a proposal or application to Central Zoo Authority for a Deer Park to be located in Barrackpore, beside the police station in the cantonment area just a couple of kilometres where the Barrackpore Menagerie was situated. The other four institutions will be discussed in brief later. Some of these have been denied permission to start or refused recognition to continue. Of the four institutions which were founded in the first part of the 19<sup>th</sup> Century, all were started with a noble purpose, particularly when compared to the motivation for most zoos and menageries of later times and even today.

## Barrackpore Menagerie

Today we speak of the concept of biodiversity as if it was something new on earth! In point of fact the first 'modern' biodiversity project in South Asia (and perhaps much farther afield as well) was initiated in 1801 by then Governor General Lord Arthur Wellesley. Wellesley was



an impetuous, impulsive, arrogant and tactless individual with, nonetheless, a passion for knowledge and some very avant-garde ideas. It was his dream to found a college which would employ the best pundits and scholars from all religions and cultures of India to teach the young English administrators who came over to join civil service. He thought that such a background in Indian culture would uplift the standard of civil government. He was probably right but his superiors were not so prescient and foiled his college plan. However, as the Company managers were always interested in something which would enhance the economic potential of their ward, they permitted Wellesley to initiate a portion of the college proposal, that is the Indian Natural History Project.

The Indian Natural History Project was an ambitious attempt to catalogue the entire faunal wealth of the Subcontinent, which we now refer as South Asia. Wellesley had already made a start on the project even before permission was granted: animals had been collected and kept at Barrackpore, which was the Governor General's summer residence, and 350 pounds spent to house and feed them between 1800 and 1804. This is according to government record.

Wellesley's personal interest in natural history clearly influenced government policy. He had collected in excess of 2660 paintings of flora and fauna, was a hunter and fan of animal fights and kept some wild animals himself, including five cheetas. He deputed his personal physician, Dr. Francis Buchanan to be Director of the Indian Natural History Project and gave him a mandate to begin an "official study" of the Natural History of South and—to some extent—South-east Asia.

It is tragic, therefore, that Wellesley was transferred just as the project was taking off. Buchanan, the Director, also followed him to London and although an assistant to Buchanan continued for some time, due to circumstances, personalities and politics, the descriptions and drawings did not get the attention they deserved and even now they have not been published. A project to annotate and publish the manuscript and drawings is underway by this writer.

Barrackpore itself was a military cantonment with a 300 acre estate attached which served as Summer Residence of Company governors which it remained until the seat of government moved to Delhi. Various governors and their families spent time at Barrackpore and some took great interest in the menagerie. Although the quality of the collection and the care it received varied immensely, there are periodic references in the India and Bengal Despatches in later years to indicate that the menagerie remained a concern of Government for more than 75 years until the Calcutta Zoo was founded and the remaining animals were transferred. During that time the public came from Barrackpore Cantonment and

even Calcutta—both official visitors as well as local people—and it continued as a zoo before the word was born.

### **Barrackpore as a scientific institution**

The significance of this project is yet to be acknowledged in the history of zoos, in the history of natural history and in the history of science. This scientific project to illustrate, describe and classify all the birds and quadrupeds of South Asia was the first systematic study of Indian zoology and well advanced in relation to other scientific activities. The Zoological Club of the Linnean Society of London formed 18 years later. The Zoological Society of London began 22 years after the Indian Natural History project and is likely to have been influenced by it as Stamford Raffles, founder of London Zoo, had visited Barrackpore Menagerie on two occasions before returning to London. The first Indian Journal of Natural History was founded 36 years after INHP. During the short six years it was active, the INHP made an impressive beginning towards creating an inventory of the natural history of India, particularly for those times. Two hundred years later, many of the countries of South Asia still are not up to date with an accurate inventory of the fauna and all are very much lagging behind in knowing the conservation status of most of their biodiversity.

Buchanan described and supervised the illustration of more than 200 birds and quadrupeds. Barrackpore Park Menagerie was begun under the most distinguished of scientific motives—pure research, pure description. In order to assist Buchanan, all the principal civil and military officers at every field station under the presidency were requested to instruct their officers to correspond with him on this subject. Early menageries, although they were started for reasons of scientific investigation were equally experiments in acclimatization and domestication which is more of animal husbandry than wildlife science or natural history. The mandate as Barrackpore was very explicitly scientific. In August 1807, William Gibbons, Dr. Buchanan's assistant sent an inventory to Government stating that he had commissioned 70 original drawings himself since taking charge of the Project and 31 copies for sending to Europe, a total of 107 drawings, which, unfortunately, never saw publication.

### **Barrackpore as a public Zoo**

Barrackpore was located in a beautifully landscaped area, planted with lovely trees, shrubs and flowers which were a mixture of Indian tropical and English garden varieties. It is obvious from the glowing descriptions of visitors that Barrackpore was a refreshing treat after the hot and dusty city of Calcutta. Letters of distinguished visitors to the Governor General's Summer Residence



over the decades trace the history of the collection and its condition.

In 1810 there was a pelican, a sarus crane, flamingos, an ostrich, a cassowary, Java pigeon, two tigers and two bears in the Barrackpore Menagerie. A black leopard had been added by 1814. Between 1817 and 1819 a new aviary was constructed and by 1822 a new menagerie was built with the animals confined in structures which were "partly of Gothic and partly of classical style"—very typical of the times.

In 1820 there is a watercolour of Barrackpore Menagerie by Charles D'Oyly in which a bear, a lion and a pelican can be seen in their cages.

In 1924, Fanny Parks, adventurous wife of a British official and lively writer of Indian life, visited Barrackpore and commented on the "remarkably fine tigers and cheetahs."

On 1828 Bishop Reginald Heber, saw the Gayal, a very noble creature of the ox or buffalo kind, an African wild ass, two lynxes, tigers and leopards, two kinds of bears, a porcupine, a kangaroo, monkeys, mouse-deer, birds and a tame hyena.

In 1929 the French naturalist Jaquemont noted "bears of two species, a caracal, a wild ass, a gibbon, some musk deer, an ostrich, a cassowary and some fine large water birds as well as about ten elephants and a tame one-horned rhinoceros. The latter was attached by a long chain to a tree beside a pond where it stayed the whole time."

Lord Auckland and his two intrepid sisters, however, took a lively interest in it. In letters to home, Auckland's sisters reported "two rhinos, a tiger, two black bears, two cheetahs, a white monkey, three sloths, a baboon, a giraffe, and some birds. Lord Auckland himself started new aviary for some golden pheasants from China.

By 1941 it seems that natural historians of the area were again using Barrackpore to some extent for the purpose it was intended. In July of that year the Calcutta Journal of Natural History record the receipt of animals "for Barrackpore" from Captain Bogle and Lieutenant Phayre who were stationed in the northeast—two consignments of animals; the first consisting of a papio Rhesus and a Hoolook, which died on the way; several specimens of Lemur tardigradus; several Rhizomys, or bamboo rats, and Monitors and the second despatch consisted of a young hoolook, three lenurs, a Martin, two young swine, a Rhizomys, a porcupine, a small Felis, and two spotted deer.

In 1847 a visitor reported seeing the following animals at Barrackpore: tigers, leopards, bears, ostriches, monkeys, rhino, giraffe and water birds, white egrets, flamingos, China pigeons, as well as monal pheasants. In 1848 the Private Letters, Lord Dalhousie reported that Barrackpore has an aviary and a menagerie.

In 1864, a marvellous little story of a child and an ostrich includes the information that Barrackpore had an official Gamekeeper and refers to a "Government Aviary". In the latter part of the same decade, an article in the Calcutta Review advocated the starting of a new zoological garden in Calcutta as the collection in Barrackpore "had deteriorated" and was "not deserving of the name".

There were no more "saviours" for Barrackpore. From 1874 to 1880 practically the last news of the Menagerie is that Lord Lytton handed the remaining animals (and whatever were donated afresh) over to Calcutta Zoo which had been opened at Alipur in 1875.

Barrackpore Park was a transitional institution, having begun before the word "zoo" was in use and continuing long after it was coined, inspired by London Zoo in the 1820's. Although some references claim that Barrackpore was open only to Britishers, this is not the case in fact. Even London Zoo, however, was not "public" in the sense of allowing everyone. Only members could see the collection for many decades.

An interesting watercolour dated 1820 by Charles D'Oyly shows Indians, as well as Europeans, in Barrackpore Menagerie by the cages looking at the animals and in 1924, when Fanny Parks visited Barrackpore, her ayah asked to go with her to see the hyena demonstrating that Indians were "comfortable" going to the menagerie and it was not off limits to them, as such.

Lord Curzon wrote in 1924 that there was "no distinction" between the Parks and the Gardens originally and that the public were increasingly admitted to the Park. In 1862 Lord Elgin complained that there was only one private walk remaining for him and that the whole of the Garden as well as the Park was open to the public.

Finally, an irrefutable indication that Barrackpore was a public zoo is published in a small booklet written in 1931 by Mr. A. C. Pal, a former Superintendent of Barrackpore Park which continued after the zoo was wound up. Pal relates in this booklet that he knew people in the 1930's who could remember visiting Barrackpore when it was a going concern and could relate stories of happy days of childhood looking at animals at Barrackpore Park.

### **Menagerie of Wajid Ali Shah, circa 1830**

The nephew of Wajid Ali Shah has written about his uncle's many interests one of which was animals. He had kept an enormous establishment of fighting animals in Lucknow and again in Calcutta where he was exiled he created another. This was maintained in an enormous estate called Nur Mahal surrounded entirely by an iron fence. Although the public was not admitted as a policy, passers-by could see hundreds of spotted deer, buck



and other animals running free in the large compound along with a water pool in the middle of the estate which was full of partridges, ostriches, turkeys, sarus cranes, geese, herons, demoiselle cranes, ducks, peacocks, flamingoes and hundreds of other birds, and tortoises.

Shah's biographer claims that much attention was given to sanitation and that animal droppings and other artifacts of live animals could not be seen in this park. There were monkey cages with an immense diversity of primate species from around the world. There were also thousands of shining brass bird-cages and scores of large wire-net aviaries where many and various species of birds were kept, including 24 to 25 thousand pigeons and "all possible arrangements were made for their upkeep and breeding." According to Shah's biographer there were over 800 keepers and 300 pigeon fanciers employed by the King with the same number to look after the fish and some 30-40 for the snakes.

It is advised that one must make allowances for exaggeration in such accounts but even so, Ali Khan's menagerie must have been formidable. This information came from one book which was translated from Urdu and also contains a long section on the animals the King maintained for fighting in Lucknow which was even more elaborate than this. Wajid Ali Shah's arrangements for combat and references to this pastime are not infrequent all of which lend credence to the incredible account of his Calcutta Menagerie. Also when the menagerie was finally wound up, many of the animals, albeit in poor condition by that time, were sent to the Calcutta Zoo where R. B. Sanyal had to accommodate them and coax them back into a fit condition.

#### **The Marble Palace Zoo—1854 to the present**

Rajah Rajendro Mullick Bahadur founded the Marble Palace Zoo in Chorebagan, Calcutta in 1854, and it still stands today in the centre of Calcutta city. The Rajah consciously and intentionally founded it as a public service for the education and entertainment of the public. Rajah Rajendro Mullick was a student of natural history and the menagerie in his house contained birds and mammals collected from different parts of the world as well as India and visited by crowds of people daily. His biographer, Dinabandhu Chatterjee, opines that his Zoo must have been an important (animal) collection, even before opening to the public. Mullick gave numerous animals to other institutions such as London Zoo and Antwerp Zoo. He also gave the Calcutta Zoo valuable animals and was honoured by having the first animal house named after him.

Marble Palace Zoo was nurtured by persons who admired and cared deeply about the dramatic and beautiful interesting creatures from around the globe. Much thought went into the keeping and display. It was known, for example, that Hispid hare required privacy,

so they were kept in a very long cage so that the animal could retreat to the back away from the public. In addition they put a bamboo "partition" and provided sand for burrowing. These enclosures can be seen today although most of them are empty. The first cage ever to be constructed in the Marble Palace Zoo still stands, today holding rabbits and guinea pigs. Even the travelling cages of early days are still there but quietly going to rot. The Marble Palace, while its value as a viable animal facility in the present context may not be much, would nevertheless make an excellent medium for explaining the origin and development of zoos and natural history—in Calcutta and India.

#### **Alipore Zoological Garden—1875 to the present**

Although Barrackpore Menagerie continued there were people as early as 1841 who felt that Calcutta should have a proper zoo. The July 1841 issue of the Calcutta Journal of Natural History of July 1841 relates a proposal by Mr. Raleigh for the formation of a Zoological Garden. Although the Jardin de Plantes had been formed only 40 years ago in France and the Zoological Society of London less than 15 years ago in London, these institutions apparently had had such an impact that in a relatively short time it was deemed "necessary" that a city have a zoo! Acquisition of knowledge was the primary motivation according to these discussions and the writer was at pains to point out the necessity of assembling animals in collections to learn about them but NOT like "native courts" which put on animal fights. That these entertainments were much enjoyed by colonials as well as natives was not stressed. Instead "zoological gardens" where the animals were arranged with the "utmost convenience for observing their habits and acquiring a knowledge of their names and peculiarities" were described as the need of the hour.

This is a true description of the modern menagerie—interest in taxonomic differences as opposed to mere curiosities and fighting stock but without regard for habitat or ecological features or conservation. The comment also established the value of a collection for reasons other than domestication or finding new sources of food. Also in referring to "myriad creatures that compose creation" Raleigh comes close to speaking of what we mean by biodiversity today.

For three decades the intelligensia of Calcutta dithered around about the zoo and finally started it in 1876 primarily due to the generosity of Indians, the "native section of the community" for the contribution of Rs. 2,40,000 plus the subscriptions of 1867 which were "at once paid and even increased."

The early history of the Calcutta Zoo is synonymous with R. B. Sanyal who was the first Superintendent of Calcutta Zoo and author of the first true work of zoo



management, the "Handbook of the Management of Wild Animal in Captivity in Lower Bengal." Sanyal was a medical student who had to discontinue his studies on account of his vision and was hired to supervise the labour landscaping the zoo. He worked hard and rose swiftly. In a few months he was promoted and given more supervisory responsibilities including the nutrition and medical care of the growing number of animals. He exhibited such a facility for management and documentation that he was made Acting Superintendent and then Superintendent by default, as no more suitable person could be found.

Practically all that we know about Sanyal today is due to the efforts of his biographer, Dr. Dilip K. Mitra who has written a definitive biography of this eminent zoo man in Bengali language. He is currently working on a translation and expansion of the biography which will include a history of Calcutta Zoo as well.

If we consider Dr. Heini Hedigger the father of zoo biology, then R. B. Sanyal might well be considered great grandfather of the science. Sanyal contributed significantly to the development of a professional identity and was probably the first to practise zoo management as a holistic inter-disciplinary scientific endeavour. He was certainly the first to write about it as such.

Sanyal began his scientific observations into the biology and behaviour of captive wild animals in 1877 recording his experiences in the 'Daily Register' of the Zoological Gardens, Calcutta. It was from the detailed register that he took the material for the Handbook. Sanyal was first to write specifically about zoo enclosure designs, including even dimensions and furniture or props required for animals' general welfare and biological requirements. Regarding nutrition, Sanyal gives details of food, including quantity and also occasional changes in their food habits. He has also pointed out the food habits of some exotic animals under Indian conditions as well, distinguishing between their natural diet and what might be fed in captivity that is readily available in India.

Breeding of animals in general and conditions prevailing in the Gardens for this vital factor in zoo management has been dealt in detail giving therein the reason of failure in breeding. In considering this, it is important to remember that those were the days of Menageries, when most of the people managing captive animal collections were not particularly concerned about breeding. Sanyal was the first to deal with breeding as a serious subject and seemingly an objective of the institution. Sanyal was unquestionably the first truly modern zoo man,—and the last for many decades. The next book to equal his was written in 1960 by Lee Crandall.

The Calcutta Zoo is still a very much going and growing concern today, although it is not without its

problems. What was a quiet tropical suburb in Alipore in the days of its inception is today an intensely crowded part of the metropolis of Calcutta. Visitation is reflected in the growth of the city's population: twenty thousand visitors a day is not unusual for the 45 acre zoo and on special days the count reaches 100,000! This takes an enormous toll on the animals. For a long time there has been a plan to shift the zoo to a large area so that open spacious enclosures could be given for all the animals but, as before, finding an available and appropriate site has delayed the project.

In 1996, Calcutta had no less than seven registered animal collections in or near it—these were school animal collections, deer parks, snake parks and mobile zoos as well as more traditional zoos. In the intervening years a number of these collections have been given notice by Central Zoo Authority to improve or close. Other animal "entertainments" such as sidewalk zoos and performing animals are on the wane. The demise and departure of most of these establishments is welcome for there was no redeeming value or justification at all for keeping animals in the conditions in which they lived.

However, since Calcutta has had such a history of zoological institutions, it is a shame that so little has been done to mark this history or to preserve the valuable documents which are being consumed by insects both in the Calcutta Zoo Library in Alipore, in the National Library next door at Belvedere and at the Marble Palace Zoo.

It is also a great tragedy that an Indian Natural History Project and Barrackpore Park is virtually lost to history. The Government of West Bengal still owns the property on which it sat and undoubtedly there are documents pertaining to it rotting away somewhere. These institutions and the stories connected with them are not just Calcutta treasures or Indian treasures but precious archives of the history of zoos of the world. On the 125<sup>th</sup> anniversary of the Calcutta Zoo, let us hope that awareness might be raised to the extent that funds to preserve and promote these treasures might be found and that it is not too late to find missing information which would fill the gaps in the fascinating zoo history of an entire city.

## References

- Anderson, John, (1883) Guide to the Calcutta Zoological Gardens. Honorary Committee of Management, Calcutta, pp. 181+x.
- Anon., (1864) Proceedings Museum and Asiatic Society of Bengal, Calcutta Review, pp. 451-455.
- Anderson, J., (1878) List of Animals in the Zoological Gardens, Calcutta, Bengal Secretariat Press, pp. 73.
- Anony., (n.d.) Review of a Handbook of the Management of Animals in Captivity in Lower Bengal, by R. B. Sanyal. Appendix to Hours with Nature by R.B.S.



- Archer, M., (1962) Natural History Drawings in the India Office Library, London.
- Bence-Jones, M., (1970) An English Mansion in Bengal: Barrackpore: A Relic of the Raj, Country Life, February, London.
- Brown, E. H., (1899-1900) Report of Honorary Committee for the Management of the Zoological Gardens, Calcutta, Bengal Government Press, Calcutta.
- Brown, E. H. and Berridge, S. C. (1916) Report of Honorary Committee for the Management of the Zoological Garden, Calcutta, Bengal Government Press, Calcutta.
- Brown, Thomas, (1807) "Letter from Thomas Brown dated 25 April, 1807 to William Gibbon given charge to Mr. Bennet as overseer of Hon. Co. Houses and Grounds and directing Gibbon to hand over charge and bills for feeding animals till they could be drawn and disposed," Board collections 4465-4476: 1807-08, Vol. 199 cont., OIOL, London.
- Buchanan, F. and W. L. Gibbons, (circa 1906) Unpublished manuscript, Descriptions of Birds and Quadrupeds in the Barrackpore Menagerie, Calcutta (MSS. Eur. D. 94 and MSS. Eur. D. 541), OIOL, London.
- Buchanan, F., (1804) "A letter from Francis Buchanan dated 20 December, 1804 to Secretary to Government, Mr. Thackeray regarding requests for donations of animals for Barrackpore," Board's Collection, Oriental and India Office Library (OIOL), 3360-3410: 1805-1806, London.
- Buckland, P. A. (1898) Report of the Honorary Committee for the Management of the Zoological Garden, Calcutta. pp. 13.
- Chakraborty, Satya Chhotoder Kaliketa Tinsah (1990) Children's Calcutta Zoo, Mousami Prakashani, Calcutta.
- Chatterjee, Dinabandhu, (1917) A Short Sketch of Rajah Rajendro Mullick Bahadur and His Family, Calcutta.
- Cornwallis, Lt. Gov.? (1806) "Letter dated 28 February 1805 communicating sentiments of Lt. Gov. on subject of Establishment for improvement of natural history, reduction of," Board's Collection OIOL F/4/199 4471, London.
- Crosby, A. W. Ecological Imperialism: The Biological Expansion of Europe 900-1900, Cambridge, London, New York 1986, 178-193.
- Cunningham, D. D. (Secty), (1885-86), Report of the Honorary Committee for the Management of the Zoological Gardens for the Year 1885, pp. 21.
- Curzon, Marquis of Kedleston, British Government in India: The Story of the Viceroys and Government Houses, Volume I and II, Cassell and Company, Ltd., London (date?), (File: Barrackpore)
- Finn, Frank, (1917) "Calcutta Zoo in the Nineties," Hamlyn's Menagerie Magazine, No. 1 Vol. 2, May 1917, p. 8 and part No. 2, Vol. 2, p. 10-11.
- Flower, S. S., (1914) Report on a Zoological Mission to India in 1913, Cairo Government Press, pp. 100.
- Flower, S. S., (1914) Zoological Gardens of the World Reference List, January 1914, Zoological Gardens, Giza, pp. 4.
- Gibbons, W., (1806), "Letter dated 14 August, 1806 from William Gibbons to Secretary to Government reporting he had made 107 drawings of the birds and quadrupeds at Barrackpore Menagerie", Board Collections 4465-4476: 1807-08, Vol. 199 OIOL Records Department (31), London.
- Gibbons, W., (1807), "Letter dated 25 April, 1807 from William Gibbons to Secretary to Government reporting expenses at Barrackpore and need to sack overseer and replace him with one Mr. Bennett," Board Collections 4465-4476: 1807-08, Vol. 199 OIOL Records Department (31), London.
- Heber, Reginald, (circa 1925) D. D., Narrative of a Journey through the Upper Provinces of India from Calcutta to Bombay. 3 volumes, B. R. Publishing Corp., Delhi.
- Kaye, J. W. (1953) Administration of the East India Company in India, London.
- Loiselle, Gustave, (1912) Historie Des Menageries, translated by J. C. Edwards, (unpublished) by courtesy of translator, London, 1993.
- Martin, Montgomery, Ed. (1829) Despatches, Minutes and Correspondence of the Marquis Wellesley, 4 vol., London.
- McClellan, E., Ed., (1841) Proposal to Form a Zoological Garden in Calcutta, Calcutta Journal of Natural History, Vol. II, No. VI, pp. 295-297, July, Calcutta.
- McClellan, Maj.?, Ed., (1841) Collections, Calcutta Journal of Natural History, Vol. II, No. VI, pp. 297-298, July, Calcutta.
- Mitra, D. K., (1993) About the Author, R. B. Sanyal, Unpublished ms, Calcutta.
- Mitra, D. K. (1992), Impact of Environment on Alipur Zoological Gardens, Impact of Development on Environment, Ed. Dr. P. K. Saha, The Geographical Society of India, Calcutta, 1987.
- Mitra, D. K., (1988) First Practical Handbook: More History of R. B. Sanyal, Zoo's Print, Vol II, No. ??, Coimbatore.
- Mitra, D. K., (1992) Role of Ram Bramha Sanyal in Initiating Zoological Researches on the Animals in Captivity, Indian Journal of History of Science, 27 (3), Calcutta.
- Mitra, S. C., (1980) The Pursuit of Natural History among the Natives of India, Calcutta Review, Volume XCI, pp. 159-176, Calcutta.



- Mudford, Peter, (1976) *Birds of a Different Plumage—A Study of British Indian Relations from Akbar to Curzon*, Collins, St. James Place, London.
- Mullan, B. and Marvin, G., (1987) *Zoo Culture*, Weidenfeld and Nicolson, London.
- Parks, F. (1850) *Wanderings of a Pilgrim in Search of the Picturesque, during four and twenty years in the East with Revelations of Life in the Zenana*, Vols. I and II, London.
- Raffles, Stamford, (1925) *Prospectus for forming the Zoological Society of London*, London, 1925.
- Sanyal, R. B. *A Handbook of the Management of Wild Animals in Captivity in Lower Bengal*, Bengal Secretariat Press, 1892.
- Sanyal, letter to Z.S.L. re-interbreeding of monkeys, *Proceedings of the Zool. Soc. of London*, 1893, pp. 615-66.
- Sanyal, R. B. *Notes on Cynogale Bennetti*, Gray, Zoological Society of London, 20 March, 1894.
- Sanyal, R. B. *Hours with Nature*, Calcutta, 1896.
- Scherren, H. (1848) *The Zoological Society of London, A Sketch of its Foundation and Development*, Calcutta Journal of Natural History, Vol. 1, 1840, pp. 1-7, Calcutta.
- Sharar, Abdul Halim, (1994) *Lucknow, The Last Phase of an Oriental Culture*, Oxford University Press, Delhi.
- Symons, N.V.H. (1935) *The Story of Government House*, Calcutta, London.
- Vicziany, Martha, (1989) *Imperialism, Botany and Statistics in Early 19th Century India*, *Surveys of Francis Buchanan, Modern Asian Studies*, Vol. 20, No. 14, 1989. (pp. 625-660).
- Waller, G. D., *The Zoological Gardens, Calcutta: An Illustrated Souvenir*, 25 pp. Waller, Calcutta, 1912.
- Walker, S. (1987) Interview with Purnendro Mullick, *ZOOS' PRINT*, xx August 1989, Coimbatore.
- Walker, S. (1987) *Calcutta Zoo, Circa 1880-1900*, Zoo's Print, November, Coimbatore.
- Wellesley, Arthur, (1805) "Extract from public letter, Minute 297 from Governor General dated 18 June, 1805 requesting principal medical and military officers to communicate information and animals to Francis Buchanan," Board's Collection, Oriental and India Office Library (OIOL), 3360-3410: 1805-1806, London.