

## THE SNOW LEOPARD IN CAPTIVITY

by: Marvin L. Jones<sup>1</sup>

In May of 1970, I was appointed as the official studbook keeper of the American Association of Zoological Parks and Aquariums. Following discussions with then President Ronald T. Reuther, Director of the San Francisco Zoological Gardens, it was decided to initially survey three species with the idea of creating a suitable international studbook for each. All three were then listed in the IUCN's Red Data Book; all were in captivity in North America; captive breeding in two of them had commenced with some regularity; and none was in a good position either in the wild or as regarded establishment in zoological gardens. They were: the golden lion marmoset (*Leontopithecus rosalia*); woolly or mountain tapir (*Tapirus pinchaque*); and the animal to be discussed here, the snow leopard (*Panthera uncia*).

Some might ask what the value of a studbook would be for these species. The answer is not at all complex. Individual identity of zoo animals is often lost as they move from one collection to another, and as we have seen elsewhere in this volume, one of the main points in any study of animals is being able to determine just which animal you are talking about, be it in the wild or in captivity. The use of studbook cards helps to solve this problem for captive animals, and also ensures a better check on captive populations.

On 1 July, 1970, detailed questionnaires were sent to all zoos and private collections known to have had the snow leopard since 1960, with a combined letter to the

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Methodological Section of the Moscow Zoo, which handles card catalogues for all USSR zoos. It is most gratifying to report that more than 25 collections have responded to date, and while no final reply has been received from the Moscow Zoo they have stated they would in time aid in this project. For the past 20 years I have been collecting data on captive mammals and this information was added to the studbook for those zoos not giving a reply.

Zoos that have so far responded include those in Edmonton and Winnipeg, Canada; Amsterdam, Holland; both East and West Berlin, Germany; Krefeld, Germany; Hagenbeck's Zoo, Hamburg, Germany; London, England; and, here in the United States: Chicago Brookfield and Lincoln Park; Buffalo; Cincinnati; Colorado Springs; Dallas; Bronx Zoo - New York; Detroit; Toledo; Milwaukee; Oklahoma City; St. Louis; Omaha; Los Angeles; San Diego; San Francisco and West Orange.

Staffs of these zoos have been very helpful in completing the studbook questionnaire (Appendix 1). It provides many interesting side comments not solicited, and which have been incorporated into this presentation. I wish to take this opportunity to thank them for their efforts.

This brief report will cover areas of interest brought out by the questionnaires, and also present a chronological history of the species in captivity (Table 1) as well as to provide a preliminary studbook for the snow leopard<sup>2</sup>. This listing shows all specimens known to the writer to have been living in zoological collections since 1960. It must be emphasized that this is not a final listing, and the tentative studbook numbers are subject to change, but will show what has been learned to date, and perhaps serve as a spur to those who have not yet replied.

<sup>2</sup> The snow leopard studbook is available upon a written request.

Table 1. Chronological history of the snow leopard in captivity.

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1851	First known specimen exhibited at Antwerp Zoo.
1891	London's Regents Park Zoo receives its first specimen.
1901	Moscow Zoo exhibits the species.
1903	Berlin Zoo and New York Zoo receive their first snow leopards.
1906	Halle, Hannover and Leningrad Zoos exhibit specimens.
1906	2 are born at Hagenbecks Zoo, Hamburg, first captive birth.
1911	Six arrive at the Breslau Zoo, one lives until June 1917.
1912	One born at the Breslau Zoo, placed with dog foster mother, lived 3 months.
1913	Chicago-Lincoln Park, Calcutta and Philadelphia Zoos receive first specimens.
1914	First to arrive in Australia, at Melbourne Zoo.
1919	Female arrives at Washington's National Zoo, remains of three cubs found in litter at bottom of cage, females lives almost 7 years.
1929	Female arrives at St. Louis Zoo 7 March, lives until July 1944 establishing maximum longevity record.
1930	Basel Zoo exhibits seven adult specimens.
1936	Three are born at Dresden Zoo (29 May), and again in 1938, to a pair that arrived in February 1935. Pair arrives at the Chicago Brookfield Zoo, one lives eleven years.
1946	First postwar import to the United States, a male at New York Zoo.
1949	San Diego receives first pair.
1956	First birth reported from Copenhagen Zoo (not included in studbook, as month not known), also reported in 1957.

Studbook begins with a male brought to the Copenhagen Zoo in 1955, and sire of all young born there through 1965.

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According to the latest snow leopard sheet in the Red Data Book (Simon, 1970), the species inhabits a vast area, including but not necessarily limited to: the mountains of Central Asia and Siberia in the USSR; the mountains of Sinkiang and Tibet in China; the entire Himalayan chain from Kashmir and northern India to Sikkim, along Bhutan and into the Northeast Frontier Agency; the Gilgit, Hunza and Nagar of Pakistan; and the Hindu Kush of Afghanistan. Despite this large natural range, almost all wild caught captive specimens have come from a very limited portion of the Kirghizian Tan Shan and the western Altai in USSR. One Techekir Abdrachmanov supposedly caught no less than sixty live snow leopards in steel traps in the Tian Shan from 1927 to 1967, and many zoo specimens have arrived with toes missing which would indicate capture using this method. Hagenbeck's Zoo in Hamburg reports it has a pair caught in Kashmir, and the type specimen of the subspecies *Panthera uncia schneideri* (Zukowsky), was living in 1930 in the same German zoo and came from Sikkim.

In the past much has been made of the keeping of snow leopards in warm climates and of the need to provide cool quarters in the hot summer months, especially in the southern parts of the United States. Yet few of the collections queried reported any unusual stress in this time of year, and several of those that did were actually in more northern latitudes. Most indicate that drinking water is made more available in the summer, dens in shade are made more accessible, and a few zoos such as Krefeld and East Berlin either spray the cage with water or wet the sand of the flooring of the pen. Only one zoo has provided air conditioning in the summer and this zoo did not have an outstanding longevity record for its specimens.

The argument of wood versus concrete or dirt as cage flooring has raged for many years, and it is worth noting here that most zoos use concrete or tile flooring, only a few use natural earth, and none use wood, however, many provide wooden resting boards, which may or may not be used. Lincoln Park Zoo in Chicago, for instance, states that females given the option of either a floor board or tile

floor, always used the latter when giving birth and raising their young. Cage dimensions generally are large in most zoos, ranging from the 100 feet in length, 40 feet in width and 10 feet high pen at Alberta Game Farm, Edmonton, Canada to the 8 x 7 x 10 feet cages at Lincoln Park. Most zoos did report having dens which females could retire to raise young.

Indoors or out? This is one question frequently posed to zoo staffs concerning display of the snow leopard. While it no doubt seems more pleasing esthetically to show the species outside in all seasons of the year, and especially in the cold winter months, it was found that few zoos allow this, even those in the northern latitudes. One collection, Cincinnati, keeps their animals indoors the year-round, at a constant temperature of from 70 to 72 degrees Fahrenheit, and have had no problems to date, and have in fact raised one young successfully. Lincoln Park Zoo brings the females indoors at cubbing time, and the breeding pair at Chicago Brookfield have never been outdoors. Many zoos do have outdoor cages connected to indoor pens, but not always. It would seem from replies to this questionnaire that it is not necessary to have outdoor quarters in order to maintain the snow leopard in captivity.

Commercial diets have come onto the zoo market in the United States in recent years, often replacing the standard zoo fare of horsemeat or beef, supplemented with vitamins, liver, and on occasion rabbits or chickens. At this time it is too early to say which type of diet is best, although the new rations would appear to be more complete from a nutritional point of view. Most zoos that have had successful births, have fed the adults on the standard fare, and of course this is routine in Europe. Nevertheless there have been litters born to females fed on the new diets which also have done well to date. Most of the reported collections feed their cats daily, and few adhere to the old principle of a fast day, once or twice each week.

Only five zoos reported giving lactating females any supplemental rations: Milwaukee adds more milk to the

daily diet; Krefeld additional rabbits and chickens; Lincoln Park Chicago more calcium; extra vitamins at Chicago Brookfield; and, just more of everything at Amsterdam. All have had successful reproduction, except the latter.

The last litter born (1969), in the San Francisco Zoo had one animal with a pronounced "Stargazing" or "wry-neck" condition, in which the head was turned to one side, and the animal appeared to be looking upwards. This disappeared with age and is not seen today. A thorough examination of this animal at the University of California at Davis Veterinary School was inconclusive but suggested a possible ear infection which was not evident by the time of the examination. Oklahoma City also reported this in one of their litters and also found it to go away as the animal developed. The Los Angeles Zoo noted that both young in the litter born in 1970 tended to crook the head sideways, but it has now disappeared. A cub born at the Kaunas Zoo in the USSR and one born at the Los Angeles Zoo developed eye problems, to the point where blindness occurred, however the cubs survived. One cub born at Dallas had but one kidney and its litter mate had other deformities. Both lived only a few months.

While there have been very few accounts of captive animals, two very excellent papers describing mating behavior and development of young at the St. Louis Zoo by Frueh (1968) and at the Kaunas Zoo by Marma and Yunchis (1968) have been published. Other data has come to light as a result of the studbook questionnaires.

Conception usually takes place in the period from January to April, although there have been a few cases of earlier and later matings, not always resulting in the female becoming pregnant. Gestation is from 98 to 104 days, although those born at Los Angeles Zoo always had a gestation of 99 days. Most young are born in captivity in April, May or June, although there have been births in February, June and July and one in September. There would appear to be a five week period before or after mid-May when most litters are born.

Of 45 litters known born in 19 zoos from 1958 to 1970, which consisted of a total of 97 individuals, 46 were hand-raised, either because the mother refused to care for the young or it was the zoo policy to hand rear all captive born young (a practice which is more common to the United States than to Europe). Of the 46 hand-reared cubs only 14 lived until weaning, and 9 are still known to be alive at this time. None have as yet successfully reproduced in captivity, however, the oldest is only five years of age.

Of the 51 reared by the mother, 39 were successfully weaned, and 15 are known to still be alive. The only successful second zoo generation young (in which both parents were zoo born) have been to those born in the Copenhagen Zoo, which started to breed at six years of age.

Litter size varies from a single cub to as many as four. Of the 45 cited litters, 24 consisted of two cubs, often a male and female, 12 were of 3 or 4 young, and in 9 only a single cub. Those born at St. Louis were all hand-reared and weighed, with weight at birth varying from 368 to 708 grams. The eyes open at eight days and the first tooth erupts at about the 22nd day. They will accept solid food at about four weeks of age, and weaning is from 8 to 10 weeks of age.

Some 64 animals are known to have been imported from the wild in the period 1955 to 1970, of these 32 have since died, with an average captive life of 5.2 years, and a maximum of 13 years. Of 32 known to still be living as of 1 March 1971, the average period in captivity has been 6.3 years with a maximum of 15 years. The longevity record is held by a female that died in the St. Louis Zoo in 1944 after living there for 15 years and 4 months.

The species is very susceptible to feline enteritis in captivity, and most have died from this or pneumonia, although there have been other factors as well.

The snow leopard is very much in need of a long range captive research program, as well as studies on its life in the wild.

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## APPENDIX 1

## SNOW LEOPARD STUDBOOK QUESTIONNAIRE

## GENERAL

The following queries pertain to the manner in which you maintain specimens of this species in your collection.

1. Are your animals exhibited primarily indoors/outdoors? If shown in a house are they given regular access to an outdoor cage?
2. What are the dimensions of the cage?
3. What type of flooring is provided?
4. Are dens or boxes provided females at cubbing time?
5. Have you noted any particular distress during periods of high temperatures, and if so, what have you done to alleviate this?
6. What do you feed your animals, and in what approximate quantities? If you use commercial preparations, give name and company.
7. Are pregnant females given any supplementary rations?
8. Have you noted any abnormalities in young born in your zoo, and if so, have these been permanent or temporary?

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