

Wrogmann N. 1975. Cheetah under the sun - Appendix. In: Cheetah under the sun. p 127-140.

Keywords: *Acinonyx jubatus*/birth/captivity/cheetah/geographical area/litter/measurement/
parasite/subspecies

Abstract: Appendix of "Cheetah under the sun" about the classification, geographical areas within which sub-species of the cheetah occur, weights and measurements, ecto- and endoparasites, chemical immobilization, list of births, number of litters born in captivity.

NAN WROGEMANN

*Cheetah under
the sun*

McGraw-Hill Book Company

JOHANNESBURG

DÜSSELDORF LONDON MEXICO MONTREAL NEW YORK
SAO PAULO SYDNEY SINGAPORE TORONTO

Appendix I: Classification of cheetah

Kingdom: Animalia
Phylum: Chordata
Sub-phylum: Vertebrata
Class: Mammalia
Sub-class: Theria
Infra-class: Eutheria
Cohort: Ferungulata
Super-order: Ferae
Order: Carnivora
Super-family: Feloidea
Family: Felidae
Sub-family: Felinae¹
Genus: *Acinonyx*
Species: *jubatus*

Generic synonymy following Allen (1939):

Acinonyx Brookes, Cat. Anat. and Zool. Mus. of Joshua Brookes, p. 16, 1828. Type species
Acinonyx venator Brookes = *Felis venatica* H. Smith.

Cynailurus Wagler, Natürl. Syst. Amphib., p. 30, 1830. Type species *Felis jubata* Linnaeus.

Guepardus Duvernoy, L'Institut, Paris, 2:145, 5 May 1834. Type species not specified; includes
Guepardus flavus Schreber (pl.105) and *Felis guttata* Hermann.

Guepar Boitard, le Jardin des Plantes, p. 174, 1842. No type specified; included *Guepar jubatus*
(Schreber) and *Felis guttata* Hermann.

Cynofelis Lesson, Nouv. Table Règne Anim., Mamm., p. 48, 1842. Included *Felis jubatus* Schreber
and *F. guttata* Hermann, of which the latter is excluded, leaving the former as type species.

Gueparda Gray, List. Spec. Mamm. Brit. Mus., p. 46, 13 May, 1843. Type species *Felis jubata*
Schreber.

Note: Ellerman, Morrison-Scott & Hayman (1953) delete *Guepardus* and *Cynofelis* from the
synonymy, saying "The former is based on *Felis guttatus* Hermann, which is unidentifiable but
certainly not a cheetah, and the latter is a substitute for the former".

Acinonyx jubatus jubatus (Schreber, 1777).

Felis jubata Schreber, Säugthiere, 3:392, 586, pl. 105, 1776, Cape of Good Hope. Erxleben,
1777. Thunberg, 1811a. A. Smith, 1826. Smuts, 1832. A. Smith, 1834.

Felis fearonii A. Smith, South African Quart. Journ., 2:245, 1834, Northeast of Natal.

Felis fearonis Fitzinger, Sitzb. K. Akad. Wiss., Wien, math.-nat. Cl., 59:sect. 1, pg. 664, 1869,
Cape of Good Hope.

Felis lanea P.L. Sclater, Proc. Zool. Soc. London, p. 532, Oct., 1877, Beaufort West, Cape of
Good Hope. Layard, 1878. P.L. Sclater, 1884.

Acinonyx guttatus obergi Hilzheimer, Sitzb. Ges. Naturf. Freunde, Berlin, p. 289, text-f.2, 1913,
Ketmannshoop,² South West Africa.

(1) Harrison (1968) and Dorst and Dandelot (1970) use the sub-family name of Acinonychinae.

(2) Correct spelling is Keetmanshoop.

Acinonyx rex Pocock, Abstr. Proc. Zool. Soc. London, no. 283, p. 18, 1 Mar. 1927; Proc. Zool. Soc. London, p. 250, pl. 1 (col.), text-f. 6, 8, 6 Apr. 1927, Umvukwe Range, northwest of Salisbury, Rhodesia.³

Distribution: Angola, Zambia, southern Congo (K.), southern Tanzania, Mocambique, Malawi, Rhodesia, Botswana, South West Africa, South Africa.

Acinonyx jubatus raineyi Heller, Smithsonian Misc. Coll., 61: No. 19, pg. 9, 8 Nov. 1913. Ulu Station, Kapiti Plains, Kenya Colony.

Acinonyx jubatus velox Heller, Smithsonian Misc. Coll., 61: No. 19, pg. 7, 8 Nov. 1913. Agate's, Loita Plains, Kenya Colony.

Acinonyx guttatus ngorongorensis Hilzheimer, Sitzb. Ges. Naturf. Freunde, Berlin, p. 290, text-f.3, 1913. Ngorongoro, south of Lake Natron, Tanganyika Territory.

Distribution: Kenya, Uganda and Tanzania.

Note: *A. guttatus ngorongorensis* was described from a zoo specimen and is considered "doubtfully valid" even although differing in colour and pattern (Smithers 1968).

Acinonyx jubatus soemmeringii (Fitzinger, 1855).

Cynailurus soemmeringii Fitzinger, Sitzb. K. Akad. Wiss. Wien. math.-nat. Cl., 17: pt. 2, p. 245, 1855. Steppes of Kababish, south of Bajuda Desert, Kordofan, Anglo-Egyptian Sudan.

Felis megabalyca Heuglin, Leopoldina, Amtliche Organ K. Leop.-Carol. Deutsch. Akad. d. Naturf., 4: No. 3, p. 23, May 1863. West bank of Bahr-el-Abiad, Anglo-Egyptian Sudan.

Acinonyx wagneri Hilzheimer, Sitzb. Ges. Naturf. Freunde, Berlin, p. 285, 1913. Kordofan.

Distribution: Ethiopia, Chad, northern Cameroun, northern Central African Republic, northern Nigeria, southern Niger.

Note: "The zone of transition between this eastern sub-species and *becki* of Senegal does not appear to have been investigated". (Smithers 1968).

Acinonyx jubatus becki Hilzheimer, 1913.

Acinonyx becki Hilzheimer, Sitzb., Ges. Naturf. Freunde, Berlin, p. 288, text-f. 1, 1913. Senegal, West Africa.

Felis jubata senegalensis Blainville, Ostéographie, Felis, atlas, pl. 10, 1843. Senegal.

Distribution: southern Mauritania, Senegal, east to Haute Volta, southern Mali and northern Dahomey.

Note: The name *senegalensis* was used by von Meyer (1826) for *Felis leo senegalensis*. Blainville's *senegalensis* is thus a homonym and invalid. (Meester, pers. comm.).

Acinonyx jubatus venaticus (Griffith, 1821).

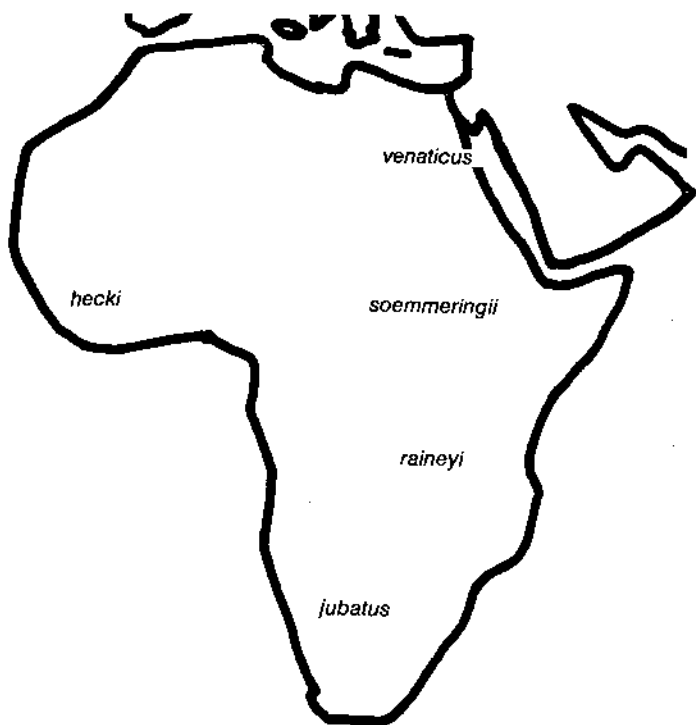
Felis venatica Griffith, Vert. Anim. Carnivora, p. 93, 1821. India.

Acinonyx venator Brookes, Cat. Anat. and Zool. Mus. Joshua Brookes, 16, 33, 1828. India.

Acinonyx raddei Hilzheimer, S.B. Ges. Nat. Fr. Berlin, 291, 1913(?). Merv. Transcaspia.

Distribution: North Africa from Morocco to Egypt, southern Asia and India.

Approximate geographical areas within which sub-species of the cheetah occur.



Appendix II: Table of weights and measurements

LOCALITY	SPECIES/SUB-SPECIES	SEX	MASS (kg)	TOTAL LENGTH (metres)	HEAD & BODY (metres)	TAIL (metres)
East Africa:						
Kenya	—	F	63	2,36	—	—
Kenya	—	M	62	2,24	—	—
Kenya	—	M	58	2,01	—	—
Kenya	—	M	65	2,13	—	—
Kenya	—	M	59	2,11	—	—
Kenya	—	F	—	1,91	—	—
Loita Plains, Kenya	<i>A.j. velox</i>	M	—	—	1,30	0,74
Loita Plains, Kenya	<i>A.j. velox</i>	F	—	—	—	—
Kapiti Plains, Kenya	<i>A.j. raineyi</i>	M	—	—	1,24	0,77
?	<i>A.j. velox</i> and <i>raineyi</i>	M (Min)	—	—	1,12	0,74
		(Max)	—	—	1,13	0,79
?	<i>A.j. velox</i> and <i>raineyi</i>	F (Min)	—	—	1,14	0,72
		(Max)	—	—	1,25	0,80
South Africa:						
Kruger Nat. Park	—	M	59	2,01	—	—
Kruger Nat. Park	—	M	50	2,02	—	—
Kruger Nat. Park	—	M	49	2,01	—	—
Kruger Nat. Park	—	F	58	—	—	—
Eastern Transvaal	—	—	—	2,03-2,31	—	0,84
Kruger Nat. Park	—	M (av)	54	2,06	—	0,72
Kruger Nat. Park	—	F (av)	43	1,90	—	0,66
Transvaal	<i>A.j. jubatus</i>	M (Min)	—	—	—	—
		(Max)	—	—	—	—
Albany Dist.	<i>A.j. jubatus</i>	F	—	—	—	—
Umfolozi River	<i>A.j. jubatus</i>	F	—	—	—	—
Botswana:						
Mababe	—	M	—	1,88	—	0,74
Gomoti River	—	F	39	1,86	—	0,70
Rhodesia:						
Macheke Dist.	<i>A. rex</i>	M	—	—	—	—
S.W. Rhodesia	<i>A. rex</i>	M	—	—	—	—
?	<i>A. rex</i>	—	—	—	1,27	0,76
?	<i>A. rex</i>	—	—	—	1,35	0,76
?	<i>A. rex</i>	—	—	2,06	—	—
?	<i>A. rex</i>	—	—	2,21	—	—
N.W. Rhodesia	—	—	—	2,22	—	—
N.W. Rhodesia	—	—	—	2,20	—	—
Korea ESA						
Korea ESA	—	M	—	1,96	—	—
Korea ESA	—	M	—	1,94	—	—
Korea ESA	—	M	—	1,93	—	—

TAIL (metres)	SHOULDER HEIGHT (metres)	SKULL: TOTAL LENGTH (mm)	REFERENCE
-	0,84	—	Meinertzhagen (1938)
-	0,76	—	Meinertzhagen (1938)
-	0,74	—	Meinertzhagen (1938)
-	0,81	—	Meinertzhagen (1938)
-	0,79	—	Meinertzhagen (1938)
-	—	—	Shortridge (1934)
.74	—	200	Roosevelt & Heller (1914)
-	—	171-178	Roosevelt & Heller (1914)
.77	—	191	Roosevelt & Heller (1914)
.74	—	192	Roberts (1951)
.79	—	193	Roberts (1951)
.72	—	162	Roberts (1951)
.80	—	173	Roberts (1951)
-	0,86	—	Roberts (1951)
-	—	—	Roberts (1951)
-	—	—	Roberts (1951)
-	—	—	Roberts (1951)
.84	—	—	Shortridge (1934)
.72	0,88	—	Labuschagne (PC)
.66	0,85	—	Labuschagne (PC)
-	—	192	Roberts (1951)
-	—	193	Roberts (1951)
-	—	168	Roberts (1951)
-	—	172	Roberts (1951)
.74	—	—	Smithers (1971)
.70	—	—	Smithers (1971)
-	—	203	Roberts (1951)
-	—	203	Roberts (1951)
.76	—	—	Pocock (1927)
.76	—	—	Pocock (1927)
-	—	—	Cooper (1927)
-	—	—	Cooper (1927)
-	—	—	Shortridge (1934)
-	—	—	Shortridge (1934)
-	—	—	Van Ingen & Van Ingen (1948)
-	—	—	Van Ingen & Van Ingen (1948)
-	—	—	Van Ingen & Van Ingen (1948)

Appendix III: Ecto- and endoparasites of cheetah

- (A) Ectoparasites (those found externally);
 (B) Endoparasites (those found internally);
 (C) Protozoal parasites (those occurring in the blood)

PARASITE		*REGION				REFERENCE
SCIENTIFIC NAME	VERNACULAR NAME	K	Z	E	EA	
(A)						
<i>Haemaphysalis leachi leachi</i>	Dog tick		X			Baker & Keep (1970)
<i>Hyalomma truncatum</i>	Bont legged tick		X			Baker & Keep (1970)
<i>Amblyomma hebraeum</i>	Bont tick		X			Baker & Keep (1970)
<i>Rhipicephalus appendiculatus</i>	Brown ear tick		X			Baker & Keep (1970)
<i>R. maculatus</i>	—		X			Baker & Keep (1970)
<i>R. simus</i>	—		X			Baker & Keep (1970)
<i>R. carnivoralis</i>	—		X			Baker & Keep (1970)
<i>Notoedres cati</i>	Mange mite	X			X	Schaller (1972) Young (1972)
(B)						
<i>Taenia acinonyxi</i>	Tape worm					Ebedes (pers.comm.)
<i>T. leonina</i>	Tape worm			X		Ebedes (pers.comm.)
<i>Ancylostoma sp.</i>	Tape worm			X		Ebedes (pers.comm.)
<i>Spirocerca lupi</i>	—				X	Murray <i>et al.</i> (1964)
(C)						
<i>Eperythrozoon felis</i>	—				X	Murray <i>et al.</i> (1964)
<i>Babesia canis</i>	Biliary				X	Adamson (1969)

K = Kruger National Park; Z = Zululand; E = Etosha National Park; EA = East Africa
 *region from which parasite recorded

Appendix IV: *Chemical immobilisation*

Recommended doses of Sernylan and Ketamine (dosage rates in mg/kg)

*†SERNYLAN	†KETAMINE	REFERENCE
0,4-0,8 0,8	6,3	Ebedes (1970; 1973) Seal <i>et al.</i> (1970) Smuts <i>et al.</i> (1973)

*A dosage rate of 0,8 mg/kg body weight should NOT be exceeded as this may cause severe convulsions leading to death (Ebedes 1973)

†There is no specific antidote to these drugs (Harthoorn 1973)

Medication that may be administered to control some side effects (Ebedes 1973; Young *et al.* 1972; Harthoorn 1973; de Vos, pers. comm.)

SIDE EFFECT	CONTROL	RECOMMENDED DOSAGE mg/kg
Muscle spasms and convulsions	Acepromazine maleate	0,05 to 0,10
Muscle spasms and convulsions	Triflupromazine hydrochloride	0,1
Muscle spasms and convulsions	Azaperone	0,4 to 0,6
Muscle spasms and convulsions	Xylazine hydrochloride	0,5 to 0,7
Salivation, only if excessive	Atropine sulphate	0,5 to 1
Hypoventilation	Doxapram hydrochloride	0,5 to 1 (this may be repeated at 5 min. intervals to a total dose of 2)

Dosage rates and reaction times using (a) KETAMINE (Smuts *et al.* 1973; Meltzer pers. comm.) and (b) SERNYLAN (Ebedes 1970; Pienaar *et al.* 1969; Smuts *et al.* 1973)

SEX	APPROX. AGE (years)	APPROX. MASS (kg)	DOXAGE (mg/kg)	TOTAL AMOUNT (in mg)	TRANQUILLISER (in mg)	ATAXIA SETS IN (in mins.)	RECUMLBENT (in mins.)	FULL RECOVERY (in hours)	REMARKS
(a) ♂	5-6	47,30	10,6	500	—	2	6	5	—
♂	5-6	47,30	6,3	300	—	5	8	2	—
♀	3½	45,00	6,7	300	—	5	8	2½	suffered an epileptiform convulsion 29 mins. after dosage
♀	4-5	60,00	7,5	450	—	7	10	—	—
(b) ♂	—	36,40	1,1	40	—	—	28	14	Administered orally
♂	3-4	38,60	0,7	30	+ 10 Siquil	—	30	14	Administered in the hip
♂	4-5	40,90	0,9	40	+ 12 Siquil	—	18	7	Administered in the hip
♀	—	47,30	1,3	60	+ 20 Azaperone	—	—	1 hr. 15 min.	Little evidence of convulsions
♂	—	—	—	60	+ 20 Azaperone	—	—	—	Died in 3 hrs.*

*Death due to anoxia caused by vomited food particles plugging the glottis (de Vos, pers.comm.)

Chemical and trade names of drugs mentioned (from *The capture and care of wild animals* 1973)

ACTIVE INGREDIENT	TRADE NAME	MANUFACTURER
Acepromazine maleate	Acetylptomazine	Boots Pure Drug Co.
Atropine sulphate		
Azaperone	Stresnil	Janssen Pharm.
Doxapram hydrochloride	Dopram	A. H. Robins & Co.
Ketamine hydrochloride	Ketalar, Ketanest, Vetalar	Parke-Davis & Co.
Phencyclidine hydrochloride	Sernyl, Sernylan	Parke-Davis & Co.
Triflupromazine hydrochloride	Siquil	Squibb Labs.
Xylazine hydrochloride	Rompun	Bayer

Notes on post-capture treatment:

1. Hypostasis (fluid on the lung) may be avoided by turning the animal over once an hour.
2. As a measure for the prevention of the possibility of shock, undue noise and activity in the immediate vicinity of the animal should be limited.
3. Under field conditions where there is strong sunlight it is advisable to cover the eyes of the animal with a black blindfold to prevent damage to the retina. To lubricate the cornea and prevent drying an ointment should be instilled - ordinary castor oil is excellent for this.

Appendix V: List of captive births of cheetah (Period 1956 to 1974)

LOCALITY	BIRTH DATE	NUMBER AND SEX RATIO	REMARKS	REFERENCE
U.S.A.				
Philadelphia Zoo	March 1956	2:1	mother became aggressive and killed 1 cub, the other 2 died in 3 days	Ulmer (1957); van de Werken (1968)
Philadelphia Zoo	April 1957	1:1	cubs died at 3 months of distemper	Ulmer (1957); van de Werken (1968)
Oklahoma City Zoo	April 1962	2:1	1 male stillborn, the female lived 24 hours, the other male lived 10 days. Litter premature, autopsy revealed kidneys not fully developed	Camp (pers.comm.)
Oklahoma City Zoo	November 1962	1:1?	1 eaten by adult male, other cub lived 49 hours. Litter premature, autopsy revealed kidneys not fully developed	Camp (pers.comm.)
Toledo Zoo	December 1971	1:3	all survived	Skeldon (1973)
San Diego Wild Animal Park	November 1970	1:2?	2 cubs killed by parents, the male hand-reared	Herdman (1972)
San Diego Wild Animal Park	April 1972	0:3	all survived	Herdman (1972); York (pers.comm.)
San Diego Wild Animal Park	November 1973	0:8	3 died	Thompson & Vestal (1974)
San Diego Wild Animal Park	November 1973	0:3	all survived	Thompson & Vestal (1974)
Lion Country Safari, Georgia	May 1973	2:1	1 cub died at 5 weeks, 1 at 14 weeks, 1 survived	Quinn (pers.comm.); York (pers.comm.)
Lion Country Safari, Georgia	November 1973	4:1	1 cub died at 3 weeks	Quinn (pers.Comm.); York (pers.comm.)
Lion Country Safari, Texas	March 1974	1:3	all survived	Quinn (pers.comm.); York (pers.comm.)
Lion Country Safari, Texas	May 1974	0:4	all survived	Quinn (pers.comm.); York (pers.comm.)
Lion Country Safari, California	January 1973	2:0	delivered by caesarian section but died	York (pers.comm.)
Lion Country Safari, Texas	August 1974	1:1	all survived	Quinn (pers.comm.)
Hogle Zoological Gardens, Salt Lake City	November 1973	1:0	cub died	Thompson & Vestal (1974)
Lion Country Safari, Stockbridge	May 1973	2:1	2 cubs died	Thompson & Vestal (1974)
Lion Country Safari, Stockbridge	November 1973	4:1	2 cubs died	Thompson & Vestal (1974)
World Wildlife Safari	September 1973	0:4	?	Eaton (1974); Thompson & Vestal (1974)
GERMANY				
Krefeld Zoo	April 1960	4?	1 cub eaten by parents, 1 cub killed by female at 2 days, remaining 2 hand-reared and lived 4 years	Encke (1960); van de Werken (1968)
?(W. Scheffel)	February 1969	1:1	all survived	Thompson & Vestal (1974)
ITALY				
Private Zoo, Rome	January 1966	1:0	survived	Florio & Spinelli (1967); van de Werken (1968)
Private Zoo, Rome	December 1966	3:0	all survived	Florio & Spinelli (1967); van de Werken (1968)
ENGLAND				
Whipsnade Park	September 1967	1:2	2 cubs survived, 1 female developed osteodystrophic lesions of limbs and died from apparent epileptiform convulsion at 5 months	Manton (1970)
Whipsnade Park	July 1968	1:2	all survived (one of the litter females produced a litter in Oct. 1972)	Manton (1970)
Whipsnade Park	February 1970	1:1	all survived	Manton (1971)
Whipsnade Park	March 1971	0:3	all survived	Rawlins (1972)
Whipsnade Park	October 1972	1:0	survived	Manton (1974)
Whipsnade Park*	October 1973	2:3	all survived	Manton (pers.comm.)
Whipsnade Park	May 1974	1:0	died after 1 month	Manton (pers.comm.)
Whipsnade Park	September 1974	3?	?	Manton (pers.comm.)
The Lions of Longleat Safari Park	November 1971	1:1	cubs died	Thompson & Vestal (1974)

*The first F2 litter to be born in the world

FRANCE						
Montpellier Park	December 1968	2:1	2 males survived, the female died at 1 year of bronchial pneumonia	Vallat (1971)		
Montpellier Park	June 1970	3:1	all survived	Vallat (pers.comm.)		
Montpellier Park	November 1971	2:2	3 cubs died in 48 hours, the survivor lived for 5 months and cause of death undetermined	Vallat (pers.comm.)		
Montpellier Park	October 1972	2:2	1 male died soon after birth, the other male died from infectious bronchial pneumonia at 4 months, the 2 females survived	Vallat (pers.comm.)		
CZECHOSLOVAKIA						
Prague Zoo	April 1972	2:1	all survived	Thompson & Vestal (1974)		
Prague Zoo	May 1973	3:2	only 1 cub survived	Thompson & Vestal (1974)		
HOLLAND						
Arnhem Zoo	1963	2?	cubs eaten by parents within 2 days	van de Werken (1968)		
Beekse Bergen Safari Park	October 1972	4:1	all survived	Tong (1974 and pers.comm.)		
Beekse Bergen Safari Park	April 1974	1:4	male born dead, had a mouth malformation; all the females survived	Tong (pers.comm.)		
SOUTH AFRICA						
High Noon Game Farm	June 1973	2:0	all survived	Spence (pers.comm.)		
Ski-haven Game Farm	October 1974	2?	?	"The Star" Johannesburg 1974		
Collisheen Estate, Umhlangi, Natal	December 1974	2:3	2 females died at 3 months	Degenaar (pers.comm.)		

Summary:

Total number of male cubs born	59
Total number of female cubs born	66
Unsexed	15
Total number of cubs born	140
Total number of litters born	44
Number of breeding females	29
Survival rate of cubs (survived at least 4 months)	57%

During 1975 at De Wildt Estates, near Pretoria, the following births have taken place:

April 1975	2:1	cubs abandoned by mother, now being hand-reared
April 1975	?2:1	one partially eaten by the mother; one female died at one week due to damage to aorta; one male being hand-reared
April 1975	?1:3	cubs abandoned by mother and three subsequently died; one female being hand-reared
May 1975	4?	being reared by the mother
May 1975	2:3	one cub stillborn; three died from exposure; one female being hand-reared

Numbers of litters born in captivity during period 1956-1974.

