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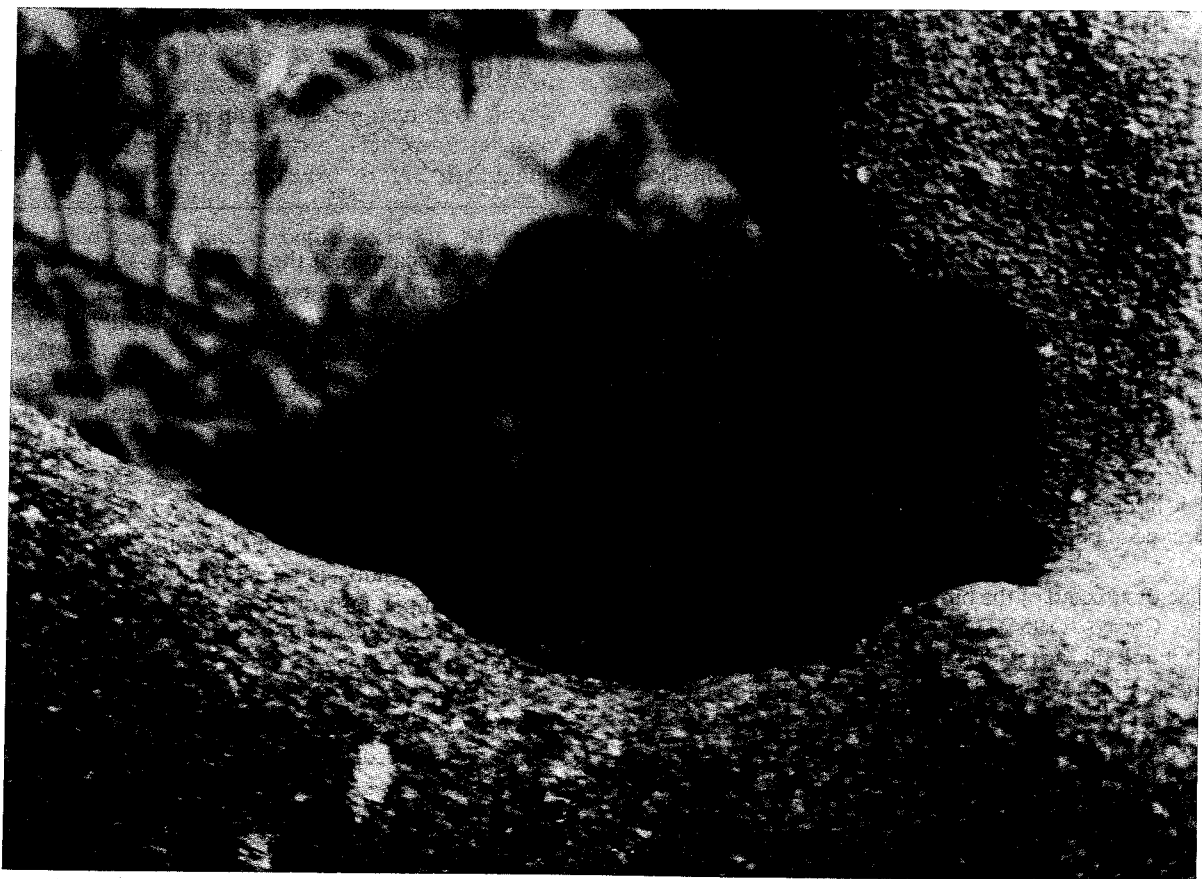
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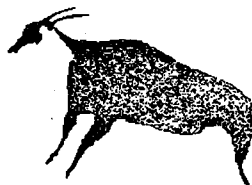
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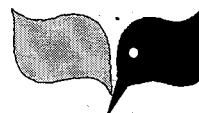
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## Articles

### CONSERVATION AND POPULATION STATUS OF THE BROWN HOWLING MONKEY (*ALOUATTA FUSCA CLAMITANS*) IN ARGENTINA

#### The Present

Due to widespread habitat destruction, the original distribution of the brown howling monkey, *Alouatta fusca*, has been dramatically reduced (Mittermeier, 1986; Mittermeier and Cheney 1987). Its present distribution is limited to small populations scattered throughout its original range, surviving mainly in small nature reserves in south-east Brazil and the Misiones province in Argentina. Little is known about the size and conservation status of the remnant populations, and the records of their occurrence are imprecise (Mendes, 1989). This report is an update of the occurrence and status of the brown howling monkey in Argentina.

Originally, *Alouatta fusca* ranged throughout the Atlantic and Paranaense forests of Brazil from the States of Bahia and Espírito Santo in the north to Rio Grande do Sul and the Argentine Province of Misiones in the south (Cordeiro da Silva, 1981; Kinzey, 1982). Two subspecies of brown howlers are commonly recognized: *A. f. fusca*, from the northern part of the species range, is on the verge of extinction (Mittermeier, 1986) and the 1994 IUCN Red List of Threatened Animals gave the status of this taxon as endangered (Groombridge, 1993). The southern subspecies, *A. f. clamitans*, is considered vulnerable by IUCN due to extreme fragmentation and the evident decline of populations in many parts of its range.

The first record of the brown howler in Argentina was by Crespo (1954), who reported an individual captured in an *Araucaria* (*Araucaria angustifolia*) forest (Fig. 1). In 1974, the same author reported another three individuals which had died in the 1965-66 regional yellow fever epidemic (Crespo, 1974). Recently, Massoia *et al.* (1992) reported two further individuals captured in Misiones in 1976 and 1978 respectively. In January 1991, we recorded the vocalizations of brown howlers (at least two groups were howling simultaneously) at Cruce Caballero Provincial Park, a 435 ha reserve of unspoiled *Araucaria* subtropical forest. In November 1993, at the same site, we encountered a group of brown howlers composed of one adult male, one subadult male, three adult females and one dependent offspring. According to local people, several other groups were living in the

proximity of the Cruce Caballero Provincial Park at this time, in areas of high human pressure. Cruce Caballero Provincial Park is currently the only location in Argentina with a confirmed population of brown howling monkeys.



Figure 1. Locations of the records of *Alouatta fusca* in Argentina. Also shown are the largest protected areas in Misiones province. 1. Crespo (1954). 2. Crespo (1974), 3. & 4. Massoia *et al.* (1992). 5. Living groups at Cruce Caballero Provincial Park. 6. Iguazú Na National Park, 7. Uruguái Provincial Park, 8. Yabotí Reserve.

#### The Problems

Although the knowledge on the status of the brown howler in Argentina is an ongoing challenge, there are some important points to take into account to understand the conservation problems of this species in this part of its range.

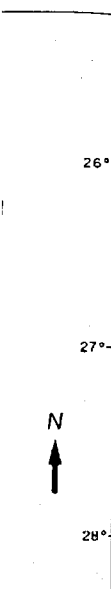
*Unsuited protected areas and habitat fragmentation.* There are no records of brown howlers in the most important reserves in the region: the Iguazú National Park, the Uruguái Provincial Park, and the Yabotí Reserve (Fig. 1). *A. fusca* has apparently some kind of association with *Araucaria* forest in Argentina, and there is a serious lack of protection for this type of forest in Misiones. The Cruce Caballero Provincial Park and the San Antonio Strict Natural Reserve are the only reserves protecting tiny fractions of *Araucaria* forest, and both are suffering the deleterious effects of fragmentation and small size (see for example, Soulé, 1986).

*Land use and habitat degradation.* The degradation of *Araucaria* forest by human pressure is transforming those lands into highly impacted areas for farming. The land tenure order to ensure remnants.

*Rarity of the species.* Both species of the brown howler (*caraya*) have been noted by the Cruce Caballero Provincial Park were well success. We live within the density may effects of the decimated population in Misiones province and (Bejarano, 1981) has been known howling monkey (1952; Timm, 1986) surrounding Park also has domestic animals levels this howling monkey and Placido increased in fragmentation around Cruce disastrous in brown howling understanding particularly to limit the via (Lande, 1988)

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**Land use and development.** Outside the protected areas the native forest is in an advanced state of degradation and fragmentation due to increasing human pressure. Big timber companies are transforming huge portions of native forest into *Pinus*, *Araucaria* and *Eucalyptus* monospecific plantations. Those lands not converted into plantations are being highly impacted by squatters (poor families from Brazil and Argentina) seeking land for subsistence farming. The high degree of poverty, the problem of land tenure and the misuse of natural resources near Cruce Caballero are important problems to resolve in order to ensure the conservation of the forest remnants.

**Rarity of the species and susceptibility to diseases.** Both species of howling monkeys living in Misiones, the brown howler (*A. fusca*) and the black howler (*A. caraya*) have extremely low population densities as noted by the extreme difficulty in encountering them (Crespo 1982). In April 1994, a field trip to Cruce Caballero Provincial Park was made in which over 70 km were walked searching for brown howlers without success. We estimate that no more than three groups live within the Park boundaries. This low population density may best be attributed to the devastating effects of the 1965-66 yellow fever epidemic which decimated populations of both species in Misiones province and areas nearby in Brazil and Paraguay (Bejarano, 1974; Crespo, 1974, 1982). Yellow fever has been known to have harmful effects on other howling monkey populations (Collias and Southwick, 1952; Timm, 1994; K. Stoner, pers. comm.). The surrounding areas of the Cruce Caballero Provincial Park also have a high incidence of *Dermatobia* sp. in domestic animals and humans (pers. obs.). At high levels this parasite has been known to increase howling monkey mortality rates (Milton, 1982; Arditi and Placci 1990; Brown and Zunino, 1994). The increased incidence of epidemics due to habitat fragmentation and the ever growing human presence around Cruce Caballero Provincial Park may have a disastrous impact on the surviving population of brown howling monkeys. There is growing understanding that nongenetic factors, and particularly catastrophic events, may be more likely to limit the viability of populations than genetic factors (Lande, 1988 in Young, 1994).

**Competition with the black howler.** The sympatry of the black and brown howlers in Argentina is still open to controversy. While some authors have reported sympatry (Cordeiro da Silva, 1981; Crespo, 1982; Crockett and Eisenberg, 1987; Redford and Eisenberg, 1992), the scarce information available gives the impression of an area of intermingled populations of *Alouatta caraya* and brown howlers and the

replacement of one species by the other. Whichever is the case, the coexistence of black howling monkeys in the same area is an important point to take into account. The black howler lives in very fragmented and disturbed forests and has a large capacity to disperse and colonize patches and remnants of forest in the Bolivian-Chaco region. Higher densities of black howlers are maintained on the Paraná river islands with a secondary growth vegetation and a lower concentration of secondary compounds (Rumiz, 1990). On the other hand, the brown howler seems to prefer moister forest than *A. caraya* and is found in Brazilian Atlantic forest, the southern Araucaria forest of Brazil and Misiones, Argentina (Redford and Eisenberg 1992), all of which were continuous in the past. The recovery of *A. fusca* populations could be prevented because of the extreme fragmentation of the Paranaense forest and its transformation into secondary patches. However, *A. caraya* populations may be relatively unaffected by these changes and consequently replace brown howlers in this part of their range.

### The Future

Any conservation project must have as its first objective the study and protection of the environment, considering the conservation of forests and monkeys as a whole. The development of an action plan with the aim of improving the conservation of Argentine forests requires not only interdisciplinarity but also a compromise between conservation and development, to include the rural people that live and use these areas (Brown, 1990). Conservation and development programs for alternative and sustainable agricultural and forestry practices are highly desirable in the region. It is necessary to consider people's needs and social promotion by including local people in the discussion and execution of conservation programs.

To preserve the Paranaense forest of Misiones it will be crucial to develop an integrated plan to manage the reserved areas of the northern part of the province and the Iguacú National Park in Brazil. It is important to promote the formation of state and private reserves (including Araucaria forests) that constitute a continuous corridor connecting the former area to the Yabotí Reserve and the Turbo National Park in Brazil. It will also be important to increase the area of the Cruce Caballero Provincial Park while it is still possible, and link it to other protected areas (Rode and Di Bitetti, 1994).

The development of a plan for the conservation of the brown howling monkey and its environment in Argentina will require considerable research and investigation. Misiones still has some 1,200,000 ha of natural forest, approximately 400,000 ha of which are

under protected status. This area, together with the Brazilian part of Iguazú and the Turbo National Park, is the largest area of continuous subtropical Paranaense forest remaining (Laclau, 1994). This provides an outstanding opportunity to develop conservation programs in this important natural area in the neotropics. Not only the brown howling monkey but also other endangered species, such as the harpy eagle, the giant river otter and the jaguar, probably have their last opportunity to continue inhabiting the Paranaense forest only if efforts are concentrated in developing a coherent conservation plan for this region.

**Acknowledgments.** We acknowledge Sr. Arce, keeper of the Cruce Caballero Provincial Park for his hospitality. Andrés Johnson and the Fundación Vida Silvestre Argentina for their logistic and technical field support. The Subsecretary of Natural Resources of Misiones provided permission to do field work in Cruce Caballero. We are also grateful to Miguel Castelino, Sandra Chediack, James Stanford, Héctor Grau, Martín Kovalewski, Susana Bravo, Mariana Diuk, and Marcela Amaya Santi for their company and help during the field surveys. Miguel Castelino also helped by tape recording howler vocalizations. Juan Manuel Morales, James Stanford, María Eugenia Morales and Charles Janson helped with the translation of the manuscript.

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**INJURY AND DISEASE OF THE MANTLED HOWLER MONKEY IN FRAGMENTED HABITATS**

Vulnerability to extinction of a population may be a consequence of insults visiting the bodies of individuals, thereby depressing competitive abilities, reproduction, or predator defense (see Scott, 1988). This note presents data on injury and disease in the mantled howler monkey (*Alouatta palliata* Gray) in three fragmented habitats at Hacienda La Pacifica, Cañas, Guanacaste, Costa Rica. The history of the ranch, its habitats, and a detailed map may be found in Clarke and Zucker (1994), and methods of capture and release are outlined in Scott *et al.* (1976). The study's main purpose was an exhaustive census and morphometric analysis of all howler monkey age-sex classes on the ranch, and was conducted in the early to mid 1970's by Dr Norman J.Scott Jr (U.S.Fish and Wildlife Service, Albuquerque, New Mexico) and his assistants, including this author.

*Ad libitum* notes of bodily insults were recorded while morphometrics were collected on individual animals. Subjects were classified according to site of capture:



riparian habitat (RIP), deciduous habitat (DEC), and irrigation fields (IRR) (habitats of tropical dry forest environment), and analyzed by sex. Only adults were counted, and individuals could be included in more than one category (for example, "injury" or "disease"). Injuries included dislocated and broken bones, missing teeth, blinded eyes, torn tissue, and scars, while disease included lymphadenopathy, ectoparasites (for example, botfly larvae), fungi, and herpes-like lesions. Table 1 gives these results.

Within habitats, events occur equally between the sexes, similar to the findings of Stuart *et al.* (1990). Between habitats (Total columns), injury occurs equally in RIP, DEC, and IRR ( $\chi^2 = 2.69$ , n.s.) while disease occurs much more frequently in the RIP habitat ( $p < .02$ ,  $\chi^2 = 8.9$ ,  $df = 2$ ). These results cannot be explained by differences in the representation across habitats of males and females in Scott's census (Table 1, parentheses). Thus, disease appears to be more frequent in RIP habitat as Stuart *et al.* (1990) found for one specific pathogen of the La Pacifica howlers. These authors identified no ectoparasites (for example, botfly larvae) in their sample. This suggests possible seasonal differences, since the present study was conducted mainly during the dry season months, while that of Stuart *et al.* was carried out primarily during wet season months.

Frankie *et al.* (1974) showed that RIP sites of tropical dry forest environment in Costa Rica are more similar in "tempo and mode" to wet forest sites than to DEC

Table 1. Frequencies of "injury" and "disease" in a fragmented population of howler monkeys at Hacienda La Pacifica, Guanacaste, Costa Rica. Numbers in parentheses = total number of adults by sex and habitat in Scott's census.

HABITAT	INJURY			DISEASE		
	Males	Females	Total	Males	Females	Total
RIP	8	7	15	8 (11)	11 (42)	19
DEC	3	5	8	5 (11)	3 (37)	8
IRR	4	5	9	2 (15)	4 (39)	6

forests. The higher rate of infection in RIP habitat may be explained by a higher rate of disease in a forest more favorable to its spread, possibly related to higher humidity (Stuart *et al.*, 1990). Further, the RIP habitat is, in essence, a corridor of forest extending about 30 m in width along riverbanks, as mandated by law (W.Hagnauer, pers.comm.). Recent wildlife corridor theory predicts a higher incidence of disease in corridors, bringing into question their utility in the design of areas to preserve biodiversity and in the management of the effects of habitat fragmentation (McEuen, 1993; Simberloff and Cox, 1987). Attributing higher incidence of disease in RIP habitat to higher population density (Stuart *et al.*, 1990; Gilbert, 1994) is problematic since in the present study population density was highest in the most fragmented habitat: IRR with 130 individuals/km<sup>2</sup>, compared to 70 individuals/km<sup>2</sup> for RIP, and 25 individuals/km<sup>2</sup> for DEC (estimated from a map of La Pacifica provided by W.Hagnauer). Finally, if the RIP forest is a "better" habitat than DEC or IRR, then coefficients of competition may be higher there, leading to higher interaction rates and greater opportunities for the spread of disease.

Milton (1982) suggested that botfly infestations in howlers may contribute to howler mortality on Barro Colorado Island, Panama. The present results and the report by Stuart *et al.* (1990) do not support such a conclusion. No differences were detected between mean body weights for males and females by habitat for disease (including botflies) or injuries compared with body weights by habitat and sex in Scott's complete census. It is not possible, however, to rule out costs to survivorship and fecundity not affecting body weight.

Injuries are expected to show no habitat differences if they occur primarily as a result of non-interactive or random causes (for example, falls from trees). On the other hand, injuries may arise from competitive interactions common to all habitats, possibly because of the species-typical dominance hierarchy in which younger adults fight their way to high rank and do not secure group membership unless they obtain an age-related position in the hierarchy (see Milton, 1982). Social structure, then, may correlate with likelihoods of injury as well as disease. Higher occurrences of injury might also be expected to occur with higher population densities, but there was no evidence for this in this study.

In conclusion, adults in RIP habitat appear to be significantly more susceptible to disease than adults in other habitats. Several explanations are considered. The drier and more heterogeneous habitats, DEC and IRR, appear to provide some protection from

pathogens (see Stuart *et al.* 1990). Indeed IRR habitat may "behave" more like DEC than RIP habitat. If this is so, then microclimate (for example, temperature and humidity) and microhabitat factors (for example, tree architecture, floristic composition, and tree density and dispersion) rather than population density *per se* may account for most of the variance in susceptibility to disease in addition to individual effects such as dominance rank and age. Injuries occur equally in all habitats, possibly due to accidents and social organization. Further quantitative studies are required to determine the role of injury and disease in howler monkeys and other primate populations.

I thank N. J. Scott Jr, J. K. Palmer, and the W. Hagnauer family for assistance in many ways.

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## INFANTICIDE MONKEY,

Fatal aggression (infanticide) in Neotropical *Alouatta seniculus* (*A. palliata*) (S. Zunino *et al.*) was first time in the a long-term study Reserve, Canaima a 250 ha fragment for its high density recorded through Galetti, 1994 research there Galetti *et al.*

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We are grateful on the man de Oliveira Genebra, a Pesquisa de Higher Edu Brazil Science support.

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## INFANTICIDE IN THE BROWN HOWLER MONKEY, *ALOUATTA FUSCA*

Fatal aggression by adult males toward infants (infanticide) has been reported in several of the Neotropical howler monkey species, including *Alouatta seniculus* (see Crockett and Sekulic, 1984), *A. palliata* (see Clarke, 1983), and *A. caraya* (see Zunino *et al.*, 1985). We observed infanticide for the first time in the brown howler, *Alouatta fusca*, during a long-term study of the species at the Santa Genebra Reserve, Campinas, state of São Paulo. The Reserve is a 250 ha fragment of Atlantic coastal forest, known for its high density of howlers, the highest yet recorded throughout its distribution (Chiarello and Galetti, 1994). For information on the Reserve and the research there see Chiarello (1993a, 1993b, 1994) and Galetti *et al.* (1994).

The study group was composed of one adult male, one female + infant, and one young juvenile male. On 23 November 1989, we observed the group's adult male fighting and chasing a solitary male we had seen occasionally near to the group. The fighting was preceded by howling sessions by both males. One week later, we found a dead infant in the area, which had bites on the head and shoulder, and was missing a leg (Fig. 1). The infant, weighing 170 g, was deposited in the Natural History Museum at the State University of Campinas (UNICAMP, ZUEC 1315). We discarded the possibility of predation because Santa Genebra is too small to support large predators such as eagles or wild cats, and the pattern of injuries was similar to that reported for *A. seniculus* in Venezuela by Crockett and Pope (1988). The possibility of infanticide was strengthened when we found the group to have a new male, and lacking the infant. The young juvenile remained in the group for another two weeks, but subsequently disappeared. We had no evidence that the new male had expelled him. Although infanticide was reported only once for our study site, we expect that the increase in the already large population there might result in more cases being observed in the near future.

We are grateful to Paulo S. Oliveira for comments on the manuscript, to the *Fundação José Pedro de Oliveira* for permission to work at Santa Genebra, and to the *Fundação de Amparo a Pesquisa de São Paulo* (FAPESP), the Brazilian Higher Education Authority (CAPES), and to the Brazil Science Council (CNPq) for financial support.

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Figure 1. Infant *A. fusca*, presumed to be victim of infanticide.

Infanticídio e desaparición de infantes asociados al reemplazo de machos en grupos de *Alouatta caraya*. In: *A Primatologia no Brasil - 2*, M.T.de Mello (ed.), pp.185-190. Sociedade Brasileira de Primatologia, Brasília.

**CAPTURE AND RADIO-TELEMETRY OF MASKED TITI MONKEYS, *CALLICEBUS PERSONATUS MELANOCHIR***

*Introduction:* Masked titi monkeys, *Callicebus personatus*, are extremely shy, quick, and quiet, making behavioral-ecological studies in the wild a difficult task. Their reaction to observers is to flee into the canopy, which in the tall rain forests where they occur can be between 20 and 25 m high. In addition, they are quite small (between 1.5 and 2 kg) and highly cryptic. During a one-year pilot study of the masked titi, *C.p.melanochir*, in southern Bahia, we found that habituation just by following the animals was unsuccessful. Using "play back" of recordings of their calls was helpful only in locating the monkeys, but was equally inefficient for habituating them. The problem was solved only through capturing them and fitting them with radio transmitters.

*Study Site:* The study site was a forest fragment of about 100 ha in the Lemos Maia Experimental Station, of the Cocoa Research Center (CEPEC) of the *Comissão Executiva do Plano da Lavoura Cacaueira* (CEPLAC), the Regional Cocoa Growing Authority, located in Una, southern Bahia, Brazil. A description of the area was given by Rylands (1982).

*Capture Techniques:* The first attempts to capture the titi monkeys used five traps placed in trees frequented by them at a height of about 15 m. The traps were baited with a variety of fruits and observed daily over three months. This method was unsuccessful. We then resorted to chemical immobilization using a carbon dioxide powered dart gun (Telinject, Römerberg, Germany: Type Vario IV.3 1 NP) and reusable syringe darts with a 20 mm needle. The darts were loaded with a mixture of 0.6-0.9 ml (30-45 mg) Ketavet (Ketamine hydrochloride±50 mg/ml) and 0.3-0.45 ml (6-9 mg) Rompun (Xylacine, 20 mg/ml). If it was

necessary to prolong anaesthesia, 0.3 ml (15 mg) of Ketavet was injected subsequently. For revival, we injected a mixture of 0.3 ml Yohimbin (5% solution) and 0.3 ml Effortil (Boehringer, Germany). To prevent bacterial infection, we gave 0.4 ml Tardomyocel (Bayer, Germany). All injections were given intramuscularly into the hind leg. Darting attempts were limited to individuals within 8 m and with the thigh or rump prominent in order to prevent injury. Because of the extended period of recovery and because the group requires several hours to find a sleeping tree, no monkey was darted after 12 a.m.

*Results:* Five successful dartings were carried out between July 1992 and November 1993. See Table 1 for the details of each. The first animal (No.1), a subadult male, was darted by fixing the gun in a sleeping tree of the study group. Early in the morning the dart gun was fired using a long distance switch. The animal was easily caught as it fell. A radio transmitter Type I (weight 42 g; K.Wagener, Köln, Germany) (Fig.1) was strapped to the monkey's neck. The batteries have a lifetime of about nine months. The titi monkeys were measured and marked and the mixture of antibiotic and reviver were injected. They were kept in a burlap bag in the shade until they recovered. The animal's reintegration to the group and its well-being were monitored using a radio-receiver and H-antenna (K.Wagener). Normally the group stayed nearby after one of its members were darted. They emitted long distance calls and quieter "intra-group" calls. After six weeks, the collared animal was found to be in poor condition. There were skin abrasions and infection of the mandible close to the transmitter.



Figure 1. Radio-collar Type I (left), weight 42 g, and Type II (right), weight 22 g.

Table 1. D

No.	Date
1	09.VII.92
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\* 2nd dose.

In the second follow, and in a fruit to the hip. problems v recaptured transmitter neck, which captured lacerations region. As the hip ag observation (No.5).

*Conclusion:* neck of a resulted in tight radio mandible i lower jaw i and the sp is insuffi radio-colla in the case hip attachr designing for exampl

*Acknowledg* (Centro c CPRJ/FEE assistant C project was Austaschd provided b Göttingen.

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Table 1. Details of the capture, treatment, and release of *Callicebus personatus melanochir*.

No.	Date	Dosage (ml)		Locality of hit	Introduction period of anesthesia (min.)	Antidote (min.)	Reappearance of palpebral reflex (min.)	Time of first movement (min.)	Released after (min.)	Behavior after release	Reintegration in the group
		Ketavet	Rompun								
1	09.VII.92	0.9	0.45	paravertebral muscles	<1	63	104	120	220	fled on the ground vocalization	group nearby integrated after 45 min.
2	26.VIII.92	0.6	0.3	femoral muscle	<1	25	44	65	310	fled on the ground vocalization	group nearby integrated after 30 min.
3	01.V.93	0.6 0.72 *	0.3 0.36 *	upper abdomen	30 35	40	80	95	133	uncoordinated climbed up tree	group remained integration immediate
4	20.VI.93	0.9	0.45	left part of abdomen	4	19	66	92	120	uncoordinated climbed up tree	group nearby integrated after 40 min.
5	06.XI.93	0.6 0.3 *	0.3	right lower leg muscle	10 15	55	62	69	120	uncoordinated climbed up tree	group found by vocalization, integrated after 162 min.

\* 2nd dose.

In the second darting (No.2), the group was easier to follow, and a male was darted directly while feeding in a fruit tree. The radio-transmitter Type I was fitted to the hip. During the first two weeks it showed some problems when jumping but was not injured. It was recaptured (No.3) nine months later, and a smaller transmitter (Type II, weight 22 g) was fitted to its neck, which, however, failed after six weeks. It was captured again (No.4), and we found minor lacerations of the skin on both sides of the mandibular region. As a result we refitted a transmitter (Type I) to the hip again (No.4). Two biologists continued the observations and the transmitter was replaced again (No.5).

**Conclusion:** The attachment of a radio-collar to the neck of a titi monkey is evidently dangerous. It resulted in infections through wounds caused by the tight radio-collar. The angular region of the titi's mandible is very large. The caudoventral part of the lower jaw is extended to provide for a resonance cavity and the space required for the radio-collar on the neck is insufficient. On the other hand, attachment of a radio-collar to the hip of a female would be dangerous in the case of pregnancy. The best solution is to use a hip attachment only on males. For females, we will be designing and testing a backpack-style harness (see, for example, Savage *et al.*, 1993).

**Acknowledgements:** We thank Dr Alcides Pissinatti (Centro de Primatologia do Rio de Janeiro - CPRJ/FEEMA) for his helpful advice, and our assistant Clea Serra Silva for help in the field. The project was supported by the Deutscher Akademischer Austauschdienst (DAAD), and the equipment was provided by the Deutsches Primatenzentrum (DPZ), Göttingen.

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**J. Schildger**, Zoological Garden of Frankfurt, Alfred-Brehm Platz 3, D-60316 Frankfurt, Germany.

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### THE NISIA FLORESTA COMMON MARMOSET RESEARCH STATION



**Introduction:** The psychobiology group at the Federal University of Rio Grande do Norte (UFRN), Natal, Brazil, began using the common marmoset (*Callithrix jacchus*), native to north-east Brazil, as a research model in the early 1970's. The "Núcleo de Primatologia" was established in 1985: a breeding colony to support the increasing research demand. It was not long, however, before the need was felt to establish a field site to carry out studies on the ecology and behaviour of wild groups in order to complement or gain a better understanding of the behavioral and physiological research being carried out on the captive population.

Our search for an adequate field site resulted in the choice of the Experimental Forestry Station (EFLEX) of the Brazilian Institute for the Environment and Renewable Natural Resources (Ibama), 2 km from the town of Nisia Floresta and 45 km from Natal. Following due permission obtained from the Brazil

Science Council (CNPq), the first study of the marmoset population there began in January 1991. Due to collaboration between Ibama and UFRN, the research has prospered. Here we briefly describe the site, the research underway and the site's potential for the future.

*The Study Site:* The EFLEX/Ibama study site (6°5' S, 35°12' W) is located 2 km from Nisia Floresta, and about 45 km from Natal, the capital of the state of Rio Grande do Norte. The Research Station has an area of 180 ha, including 80 ha of



secondary Atlantic coastal forest and 40 ha of experimental plantations. The plantations are of pine, eucalyptus, coconut, and various commercial fruit and timber species. Trees in the plantation reach up to 30 m in height, and the understorey is kept clear. The secondary forest can reach 20 m in height, with some trees having trunks as large as 50 cm in diameter at breast height. Vines, bromeliads, orchids and grasses are abundant. The soils are sandy, and the humus layer is generally about 20 cm in depth. All the areas occupied by marmoset study groups, both in and away from the forest, are divided into 50 x 50 m quadrants and the intersections are marked with flagging tape. The quadrant trail system currently covers 28 ha of forest and 15 ha of the plantation area. Although the north-east of Brazil is mostly dry, the coastal regions have distinct seasonality in rainfall. The dry season peaks in December, and the rainy season in May. However, rain rarely interferes seriously with observation schedules. Temperatures are highest during the dry season, reaching 33°C, and lowest during the rainy season, dropping to as low as 20°C. Ibama has allocated a small two-bedroom house to the research group, providing accommodation and laboratory space.

*The Marmoset Groups:* Three groups have been observed continuously since 1991: Belém (Group B), Chui (Group C), and Plantação (Group P). Groups B and C live in the forest area, while Group P inhabits the plantations. Six more groups were included in January 1993: Argentinos (Group Δ), Atlântico (Group A, which recently split up), Meio (Group M, new arrivals), Nisia (Group N, which split from Group Δ), and Oeste (Group O), all in the forested area, and lastly Quatro (Group Q, neighbors to Group P) in the plantation area. Figure 1 indicates the location of the groups in the study area. All individuals in the groups which are followed have been captured, measured, tattooed and fitted with

colored beads on metal chains. The beads, in combinations of two or three, identify the group and the individual. A permanent file is kept recording information on each of the marked individuals.

*Routine Activities - Captures:* The study groups or individuals are routinely captured for collar fitting or replacement, dye marking and biometry. Compartmented traps are baited for several consecutive days and manually operated for the selective capture of individuals. Before new groups are captured they are followed for several days for the identification of areas of exclusive use. Automatic traps are used on occasion. The traps are made of small gauge wire mesh over a wooden frame, with either five or seven compartments, each measuring

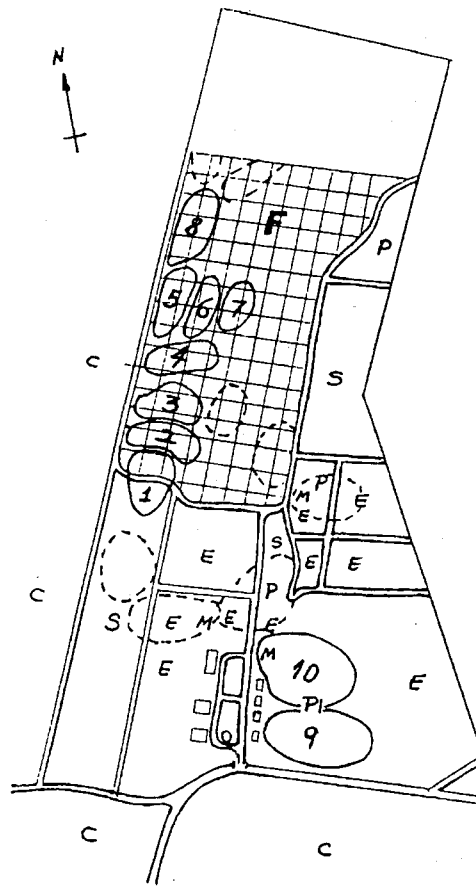


Figure 1. Schematic representation of the study area ( $\pm 1:15,000$ ). Numbered circles indicate marked and followed groups, traced circles indicate known but unmarked groups. Letters indicate the predominant vegetation types of the different areas. Groups: 1 = Argentinos, 2 = Nisia, 3 = Oeste, 4 = Meio, 5 = Chui, 6 = Atlântico II, 7 = Atlântico I, 8 = Belém, 9 = Plantação, 10 = Quatro. Vegetation: C = coconut plantation, E = eucalyptus plantation, F = forest, M = mahogany plantation, P = pine plantation, S = scrub.

roughly 50 high platform. The marmoset is hinged, very flexible. The op... usually hidden. Initial trapping of the animals followed an... to observation.

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roughly 50 x 10 x 20 cm. They are placed on a 1 m high platform at the base of heavily used gum trees. The marmosets are trapped by manual closure of a hinged, vertically-closing door, using nylon fishing line. The operator, a few meters away from the trap, is usually hidden in a blind of coconut palm leaves. Initial trapping and handling does cause some stress to the animals, but groups re-habituate quickly to being followed and the procedure appears to do no damage to observations in the long run.

*Routine Activities - Monitoring:* In addition to the collection of data for specific research projects, each researcher is assigned a group for long-term monitoring. This involves weekly checking of the composition and apparent health and reproductive condition of the individuals, along with records of the use of space and any observable changes in the habitat. This gives us a picture of the long-term history of the groups, and has been routine since the beginning of the study.

*Routine Activities - Meetings:* Administrative and scientific meetings are held regularly by the Nisia Research Group. Aspects of the administration of the research and the study site, the results of the routine monitoring and research projects are discussed at these meetings. Attendance is obligatory for all the participants in the program.

*Research Projects - Dissertations:* The three groups B, C, and P were studied by Leslie J. Digby (University of California, Davis) from January 1991 to June 1992, as part of her doctoral research which examined particularly reproductive strategies and social organization. Dr Steven Ferrari (Federal University of Pará, Belém) also participated in this study. Fabíola Albuquerque, a Master's student in the Psychobiology Course at UFRN, studied the distribution of parental care in Groups B and P from August 1992 to December 1993. Carla Soraia de Castro, also a Master's student in the Psychobiology Course at UFRN, studied rhythmicity in grooming and locomotion during the same period (Groups C and P). From January 1993 to January 1994, Cláudio Barreto (UFRN), who acted as field assistant to Leslie Digby, studied differences in scent-marking behavior between two reproductive females of Groups C and P. The data are currently being analyzed. Arrilton Araújo, a doctoral student from the Université de Paris - Nord, has been observing the Nisia marmosets since March 1993, studying behavioral, kinship and ecological influences on individual migration (Groups B and P), and Catherine Chojnacki, also a doctoral student from the same university, has begun observation on scent-marking and olfactory recognition. Maria Carla

Nascimento and Beatriz Stumpf have begun studies on the vocal repertoire and the contextual use of vocalizations, both for UFRN Master's degrees.

*Research Projects - Long-Term Project:* An integrated project "Ecology, Communication, and Social Development in Wild Groups of *Callithrix jacchus*" is currently being developed by Dr Maria de Fátima Arruda (social development and parental care), Dr Dwain Santee (communication, vocal signatures), and Maria Socorro Borges Freire (ecology, botany), with partial support from the Brazil Science Council (CNPq). This project is assisted by the graduate students listed above, visiting students from the University of São Paulo (Rogério Zanaga de Camargo Neves Jr., Marcos Roberto Pinheiro, and Ruth Teixeira Nunes), and an undergraduate student Rozinelly Queiroz de Miranda.

*Funding:* Activities at the field station are maintained by small grants from ANAP (*Associação Norte-Riograndense de Amparo a Pesquisa*) for the purchase of utilities and equipment. Some equipment has also been purchased with a grant from FINEP (*Financiadora de Estudos e Pesquisas*, Rio de Janeiro). The Department of Physiology at UFRN provides daily stipends for their staff, and also contributes to the daily running of the house. The integrated project mentioned above also counts on a grant from the Brazil Science Council (CNPq) for contracting unskilled labor and the purchase of field materials. The funds available are evidently insufficient, however, for the development of the site and the equipping of the laboratory. The maintenance of the field site is guaranteed in large part by the researchers themselves. Visiting researchers support their own projects and contribute a small daily fee.

*Potential:* There are a number of advantages offered by this field station. In terms of the logistics, geography and climate: the terrain is flat and relatively sparse understoreys mean that it is easy to walk through the forest, rainfall is minimal (only a few weeks of the year) as are temperature variations, the area is protected by Ibama, is only 2 km from the town of Nisia Floresta and 45 km from Natal, can be reached by bus, and being near the Equator has a photoperiod of 12L:12D±15 min. The numerous groups allow for diverse types of socio-ecological studies: new group formation, migrations, and group splitting are not uncommon; groups can be found living in contrasting habitats, from secondary forest to bushes and pine/eucalyptus plantations; and the high density means that intergroup encounters are frequent (sometimes seen several times a day, and involving more than two groups).

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The research at the Nisia Floresta study site follows the regulations imposed by Ibama and CNPq. Researchers linked to academic institutions interested in conducting field research at the site should contact Dr. Maria de Fátima Arruda (Research Coordinator) or Dr. Dwain Santee.

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## News

### A BLACK HOWLING MONKEY STUDY IN BELIZE

January 1993 marked the onset of a year-long study of the black howling monkey (*Alouatta pigra*) in northern Belize. Observations were made on three troops of marked monkeys (colored ankle tags), living in a semi-deciduous riverine habitat at the Bermudian Landing Sanctuary, in the Community Baboon Sanctuary, Belize. These troops of marked monkeys were selected for study based on their accessibility, size, and cohesiveness. The majority of troops consisted of one adult male, several adult females, and juvenile offspring: 5-6 individuals in total. An average troop range size was 3 ha, and in two of the observed troops ranges were overlapping.

Each troop was observed from sunrise to sunset for several consecutive days each month (four days for two troops and two days for the third). Data were collected using scan sampling, recording the activity of each troop member in sight. Six main categories were recorded: feeding, resting, moving, travelling, howling, and playing. When feeding, the plant part and name were noted, and a sample of the food item



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was collected when possible. Howling by troops other than the study troop was also noted during each five minute period.

The study was completed on 2 December 1993. Over 1,500 hours were spent in the field in direct observation, data collection, and the mapping and censusing of other marked troops. The data will yield a series of diurnal behavioral profiles, as well as monthly and seasonal patterns. Preliminary analysis suggests there are some behavioral differences between *A.pigra* and its neighbor, the mantled howling monkey (*Alouatta palliata*). For example, mantled howler alpha males commonly initiate travel (Milton, 1980), whereas in this study this role belonged to the adult females - predominant in instigating troop travel to feeding sites. Likewise, it was not unusual to observe one of the study troops travelling 2-10 m along the ground to reach feeding trees in a field.

The project was carried out with field assistance from my husband, Franklin Pavón, and with supervision from Dr Robert Horwich, Community Conservation Consultants, Gays Mills, Wisconsin. It was supported by a grant from the Lincoln Park Zoo Scott Neotropic Fund, Chicago.

Deborah Goin Pavón, Route 1, Box 141, Prospect, Virginia 23960, USA.

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**PACIFIC PRIMATE SANCTUARY**



The Pacific Primate Sanctuary is a nonprofit organization dedicated to the protection, preservation, and propagation of threatened, endangered or distressed primates. Since 1984, the Sanctuary has maintained a captive breeding program in Hawaii for several species of New World monkeys, including *Callithrix jacchus*, *Callithrix melanura*, *Cebuella pygmaea*, *Saguinus geoffroyi*, and *Cebus capucinus* (Fig.1). The work at the Sanctuary includes rehabilitation: providing the necessary nutritional, psychological, and emotional support to facilitate the recovery of the primates who have been victims of trauma and abuse, and restoring them to health. The Sanctuary is creating habitats for primate family groups to live in safety and in relatively natural surroundings, with an abundant variety of organically grown food, and dedicated care. The tropical climate allows the primates to be in outdoor enclosures year round.

Sanctuary personnel have grown organically-farmed fruits and vegetables for the primates for the last ten



Figure 1. Lucy Wormser, Director of the Pacific Primate Sanctuary, with a rehabilitated adult male *Cebus capucinus*. Photograph: Brian Davis.

years. The Zoological Horticulture project began over four years ago in order to provide more "natural" food and forage. Over 100 trees have been planted from seed for later introduction into the "jungle environments" for each colony of marmosets and tamarins. Special emphasis is placed on growing plant species related to South American sources of gums (for example, *Acacia farnesiana* and *Samanea saman*, "monkey pod"), to accommodate the specific dietary specialization of gumivores. Primate nutritionists are interested in analyzing gum samples with the aim of producing gum supplements which may improve the nutrition and health of captive callitrichid colonies everywhere.

The Pacific Primate Sanctuary offers innovative environmental education to volunteers, students, educators, members of other conservation organizations, and local communities. They are given the opportunity to consider the pressing need and their role in protecting threatened animals on a local, national, and global level. Representatives from the facility have appeared as guest lecturers on the subjects of rain forest preservation and the changing global environment. Schools have "adopted" the Sanctuary as their yearly Community Service Project. The Pacific Primate Sanctuary has recently initiated a program to facilitate these vital environmental partnerships between nonprofit organizations and Maui's school system. The objective is to assist the children in becoming environmental stewards, problem solvers, educators, and powerful forces for change through direct experience with their environment and the groups working to preserve it.

The immediate goal of the organization is to expand the space available for more species of callitrichids through the creation of a large rain forest preserve on Maui with naturalistic habitats. The Sanctuary has recently obtained enough property in Haiku to ensure safe boundaries, with sufficient acreage to grow more organic produce and plants. Volunteers, research assistants, and funds are needed to construct habitats, assist with zoological horticulture, and care for the growing number of threatened and endangered primates in need of protection. Plans are also underway to set up a reintroduction program for the *Cebus capucinus* maintained at the Sanctuary. They will be reintroduced in Costa Rica. Any assistance in facilitating the success of this effort and the captive breeding project for marmosets and tamarins would be greatly appreciated. Please contact Lucy L. Wormser at the address below.

**Lucy L. Wormser**, Executive Director, Pacific Primate Sanctuary Inc., 130 Haloa Road, Haiku,

Maui, Hawaii 96708, Tel: 808 572-8089, Fax: 808 572-1485.

## FEEDING ECOLOGY OF GOLDEN-FACED SAKIS

Eleonore Setz, Assistant Professor at the Zoology Department, State University of Campinas (UNICAMP), São Paulo, completed her doctoral thesis for the Ecology Course at UNICAMP, on the feeding ecology of golden-faced saki monkeys, *Pithecia pithecia chrysocephala*, in a forest fragment in the Central Amazon, in December 1993. It was financed by the World Wildlife Fund (WWF-US), the Smithsonian Institution, and the Brazilian Science Council (CNPq) and Higher Education Authority (CAPES). The research was associated with the Biological Dynamics of Forests Fragments Project of the Smithsonian Institution, Washington D.C., and the National Institute for Amazon Research (INPA), Manaus. The following summarizes the thesis.

The feeding ecology of a group of golden faced sakis (*P.p.chrysocephala*) in a 10 ha fragment of terra firme forest, 80 km north of Manaus, was studied with the aim of determining the influence of seasonal variation in food abundance on diet and other behaviors. After the group was habituated, the first detailed observations were made in July 1986 (133 observation hours; dry season, fruit scarcity) and in March 1987 (135 observation hours; rainy season; fruiting peak). Approximately 1000 hours of observation provided additional data between February 1985 and January 1991. During this time, the single polygynic family group occupying the 10 ha fragment reproduced regularly and showed a low mortality. Time budgets for all group individuals were quantified through scan sampling. The floristic composition and structure of the forest fragment was compared to continuous forest where sakis were also seen, using the point-centered quarter method to sample plants in three size classes, at 45 points in each area. The phenology of 1080 plants was followed from June 1989 to May 1991, evaluating new leaves, flower buds, flowers, immature and mature fruits. The number of plant species, floristic diversity, plant density and the number of species for 50% IVI did not differ between the forest fragment and the continuous forest, although larger trees were significantly less tall and tree mortality was significantly higher in the former. The Morisita Similarity Index revealed significant differences between the fragment and continuous forest only for the species composition of medium-sized plants, and the difference was not great. New leaf production was higher in the fragment. The fruiting peak for

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**Eleonore**  
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individuals and species was from November through March. Fruiting intensity was correlated with monthly rainfall. The activity period of the sakis did not differ between seasons (7 h 52 min. in the dry season v. 8 h 3 min in the wet season) and is very short when compared to other monkeys. Saki time budgets did not differ between dry and wet seasons (e.g., feeding 30% in the dry season v. 28% in the wet season; moving 52% in the dry season v. 49% in the wet season). They did, however, cover longer distances in the rainy season (1115 m per day v. 720 m per day in the dry season). Fruits comprised 91% and leaves 4% of the wet season diet (based on time spent feeding). In the dry season fruits comprised 61.5%, leaves 18% and flowers 16% of the diet. Immature fruits and seeds contributed between 26% and 31% of their diet. Diet diversity was significantly higher in the rainy season ( $H'_{10} 1.41$  v. 1.21) when fruit was more abundant and varied. Sakis like other frugivores change from a strategy of low cost (moving less), low return (more leaves, less nutritious items, expanding their diet) in the dry season when high quality food (fruit) is scarce, to a strategy of high cost (moving more and faster), high return (eating abundant fruits) in the rainy season. The high number of plant species eaten (190) is comparable to that reported for other sakis.

**Eleonore Setz**, Departamento de Zoologia, Instituto de Biologia, Universidade Estadual de Campinas, 13083-970 Campinas, São Paulo, Brazil.

#### Reference

Setz, E.Z.F. 1993. Ecologia alimentar de um grupo de parauacus (*Pithecia pithecia chrysocephala*) em um fragmento florestal na Amazônia Central. Unpublished doctoral thesis, Institute of Biology, State University of Campinas, Campinas. 237pp.

#### A COMPARATIVE STUDY OF PARENTAL CARE AND INFANT DEVELOPMENT IN CALLITRICHIDS

Cristina Valéria Santos completed her Master's thesis in Experimental Psychology at the University of São Paulo in early 1994 entitled "A Comparative Study of Parental Care and Infant Development in Callitrichids (*Callithrix* and *Leontopithecus*) According to Group Size". The study was supervised by Dr Emma Otta of the Institute of Psychology, and financed by the University of São Paulo, the Brazil Science Council

(CNPq), and the *Fundação de Amparo a Pesquisa do Estado de São Paulo* (FAPESP). The following is the abstract of the thesis.

"Cooperative breeding is a feature of the social behavior among species of tamarins and marmosets. As most births result in twins, the contribution of the father and older siblings (alloparents) is essential for decreasing the mother's effort to rear the infants and guarantee offspring survival. Cooperative breeding is characterized mainly by carrying and food sharing. In order to verify differences between group/infant relations, observations were made on 21 infants of *Callithrix* (*C.kuhli* and *C.geoffroyi*) and 29 of *Leontopithecus* (*L.rosalia*, *L.chrysomelas*, and *L.chrysopygus*) at the Rio de Janeiro Primate Center. They were born into two types of groups: small (with 0-2 alloparents) or large (with 3-6 alloparents). The results showed that on the whole the effort related to caring was bigger in *Leontopithecus* than in *Callithrix*. *Leontopithecus* infants were rejected less by the father, spent smaller amounts of time independent on the branch, and displayed more frequent suckling bouts than *Callithrix* infants. The results were interpreted based on concepts such as reproductive costs, maturation patterns, and ecological differences between the two genera".

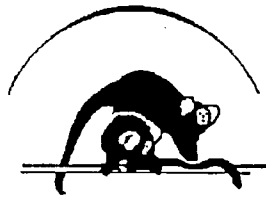
Cristina Santos is currently carrying out Doctoral research on parental care and reproductive behavior of captive groups of *Callithrix kuhli*. The hormonal bases underlying both behavioral processes, such as changes in testosterone and estrogen levels after birth and possible suppression by the dominant female on the other females, will be studied through urine sampling. The research will be carried out at the Rio de Janeiro Primate Center (CPRJ/FEEMA), and supervised by Dr Emma Otta, University of São Paulo, and Dr Jeffrey French, University of Nebraska at Omaha (hormonal assays).

**Cristina V. Santos**, c/o Dr Emma Otta, Instituto de Psicologia, Universidade de São Paulo, Avenida Professor Mello Moraes 1721, 05508-900 São Paulo, São Paulo, Brazil.

#### Reference

Santos, C.V. 1994. Estudo comparativo do cuidado parental e desenvolvimento de filhotes de calitriquídeos (*Callithrix* e *Leontopithecus*) em função do tamanho do grupo. Master's thesis, Institute of Psychology, University of São Paulo, São Paulo. 62pp.

## EUROPEAN MARMOSET RESEARCH GROUP (EMRG) - 1ST GENERAL ASSEMBLY



Since its foundation in the Spring of 1993 the EMRG has been steadily gaining momentum in terms of the number of its registered participants and the number of countries (even some non-European!) and scientific disciplines which they represent. So it was that 60 people involved directly with callitrichids and callitrichid research met in Paris in November for a three-day EMRG workshop entitled "Fundamental and Applied Aspects of Marmoset Science". The philosophy of the workshop (as is that of the EMRG itself) was to stimulate communication about marmosets and tamarins between individuals from various professions and working across the very broadest spectrum of disciplines and interests. This thinking was reflected in the title of the workshop. The quality of the output of biological research, biomedicine, and R & D, is always going to depend directly on fundamental scientific understanding; this is true for science based on callitrichids just as much as it is for that based on any other animal group. Ideally, we hoped to create an informal workshop atmosphere in which people from the following disciplines could openly discuss their theoretical knowledge and practical experience with marmosets and tamarins: animal welfare scientists, ethologists, laboratory-animal technicians, pharmacologists, physiologists, psychologists, toxicologists, veterinary scientists, and wildlife and zoo biologists. As idealistic as this concept might have seemed to us prior to the workshop, and might seem to many people who were not present and are reading this now, the formula worked and it worked *very well indeed*.

Workshop discussion was based around the 22 invited spoken presentations which were divided into four theme sessions: housing and husbandry, nutrition and health, physiology and behaviour, applications. The scene was set by Anthony Rylands' (Federal University of Minas Gerais, Brazil) special guest lecture entitled "The Callitrichidae: a biological overview". Anthony provided the non-fieldworkers among the audience - that is to say the vast majority of us - with an extremely vivid and lively account of the ecological, biological, and behavioural adaptations of the four genera and some 25 species of callitrichid, followed by an informed and heart-felt account of the conservation status of this primate group in its natural habitats. The relevance of the lecture and of Anthony's attendance at the workshop were appreciated by all. Most of those present were familiar with only a few of the species to

which Anthony referred: usually the common marmoset and one or two others. Even more to the point, for most, it is all too easy to slip into the frame of mind that perceives callitrichids as "good laboratory primates", and to stop thinking about the animals in our research colonies in terms of the ecosystems of which they are an integral part and in which they are morphologically and behaviourally adapted to live.

Robert Hubrecht (Universities Federation for Animal Welfare, UK) began the session on housing and husbandry with a presentation of the results of a United Kingdom survey of current laboratory practice in breeding and experimental colonies of common marmosets. The survey was based on the questionnaire returns of 24 laboratories belonging to government agencies, pharmaceutical companies, animal suppliers, and university departments. This survey analysis provided the first evidence of what constitutes 'average marmoset husbandry' in the UK at present. There had been an outstanding response to the questionnaire. Christopher Pryce (Anthropology Institute, Zürich) and Nicole Milkowski (SmithKline Beecham Pharmaceuticals, UK) presented a joint paper in which they described and compared current practice in their own laboratories, and emphasized the advantages of the integration of husbandry, management, and research methods for successful callitrichid research. The above two papers stimulated some very constructive and frank discussion about laboratory practice. Some of us were made aware of certain short-comings of our own current practice compared to other laboratories. It became clear that simply because a husbandry, management or research method works in a particular laboratory, this does not mean that it is necessarily the optimal approach, and, furthermore, that only through workshops such as this will information exchange be achieved and the various options addressed. Three talks that focussed on specific aspects of housing and husbandry completed the session, all concerned with the common marmoset. Andrea Dettling (Anthropology Institute, Zürich) gave an account of a research project in which she had investigated the effects of providing branches at various orientations and of various diameters on marmoset behaviour and activity budgets. Augusto Vitale (Istituto Superiore di Sanità, Italy) described an elegant experiment demonstrating that the familiarity (and perhaps quality) of the home environment is vital to the positive, stimulatory effects that novel environmental features can exert on behaviour (for example, play). Martin Heath (Glaxo Research and Development Ltd., UK) gave a compelling summary of his efforts and successes as a chief technician in the pharmaceutical industry, in simultaneously looking after welfare and experimental requirements. His take-home message was the intimate interdependence of

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the quality of marmoset husbandry and of the scientific data which marmosets yield.

While the session on housing and husbandry was very *Callithrix jacchus* orientated, that on nutrition and health had a definite comparative flavour. Bryan Carroll (Jersey Wildlife Preservation Trust, Jersey) gave a detailed account of the attention paid to callitrichid morphological, physiological, and behavioral adaptations in the formulation of diets for the some 12 callitrichid species which are maintained and exhibited at the Trust. Nadia Robert (Zoological Park, Bern, Switzerland) complemented this neatly in her presentation of comparative pathological-clinical work with the Trust's callitrichids. Although there was only a small number of cases, she described the relationship of pathological findings to clinical symptoms and considered this in the light of husbandry and nutrition practices. Under the provocative title (suggested by us) of "Experimental development of the complete marmoset diet", Allan Thornhill (Special Diet Services Ltd., UK) described the 25-year history of development of captive marmoset diets. He provided examples of how specific nutritional requirements of this specialized primate group come to be recognised and incorporated in commercial diets. The contribution that supplementary foods can make to environmental stimulation was also discussed.

The physiology and behaviour of callitrichids was the opening theme of the workshop's second day. Hilary Box (University of Reading, UK) discussed natural patterns of social organisation and behaviour (for example, group size, dispersal of individuals, and gender differences) that are important to consider in captive management. The importance of integrating knowledge across various fields was emphasized, including the observation that the validity, reliability, standardisation and generalisation of research protocols are dependant on the effects, to a large extent unknown, of interaction between captive management and biobehavioural propensities. Christopher Pryce then talked about the importance of evolutionary and comparative biology to understanding the relationship between human biology and that of other species and, therefore, to assessing the absolute and relative worth of biomedical models, namely callitrichids versus rodents and Old World primates. He argued for the need to apply these two biological disciplines in biomedicine much more widely than is the present case, and took examples from reproduction and the central nervous system to support his argument. Hans Erkert (Universität Tübingen, Germany) gave a fascinating and thorough account of the significance of biological rhythmicity for fundamental and applied research, and

presented various physiological and behavioural examples of diurnal and circadian rhythms from his own work with common marmosets. The need for circadian standardisation of captive conditions as well as phase-constant timing of experimental procedures was emphasised. Bidida Jones (Royal Society for Prevention of Cruelty to Animals, UK) then alerted our attention to the importance of marmoset vocal communication, a long neglected subject in captive research and management. She described the acoustic structure of some species-characteristic marmoset calls, including inter-individual differences. The effects on these calls of changes in social conditions were described; these elegant experiments were indicative of the important function of vocalisation in the mediation of callitrichid lifestyle, not only in the wild but also under captive conditions. Hannah Buchanan-Smith (University of Stirling, UK), another participant with scientific experience of callitrichids both in their natural habitats as well as in captivity, talked about ways of attempting to identify sufficient and optimal captive environmental features which enable primates to deploy decision-making, choice between alternatives, and environmental control. On the topic of endocrinology, Caroline Nievergelt (Anthropology Institute, Zürich) described methods for routine monitoring of reproductive state and for reproduction control in captive colonies of common marmosets. Metabolites of reproductive hormones were measured in urine samples to time ovulation, detect pregnancy, and assess the efficiency of early pregnancy termination. Talking about the brain of the common marmoset, Jean-Pierre Hornung (Université de Lausanne, Switzerland) described, firstly, its proven value in comparative neuroanatomy, and secondly some of his own work on the study of neurochemical organisation during development and in adulthood.

In the final session our attention was turned specifically to aspects of marmoset science *per se*: of course, applied biomedicine had been included in some of the presentations and in all the discussions throughout the 'fundamental' sessions. Leah Scott (Biology Division, CBDE, UK) provided an overview of the techniques which have been developed for behavioural conditioning in marmosets. She then went on to provide examples of how these techniques have been deployed in many different areas of research, both applied (for example, psychopharmacology) and fundamental (for example, behavioural enrichment). Christian Schnell (CIBA GEIGY AG, Switzerland) took up the theme of the continuum between fundamental and applied research in his presentation on the marmoset as a pharmacological model for understanding cardiovascular function, including the telemetric monitoring of responses to stress events.

The application of telemetry in physiological and behavioural monitoring appears to be limited only by human ingenuity at present. The relative merits of the marmoset in toxicological testing were succinctly summarised and elegantly presented by Peter McAnulty (PHARMACO LSR, UK), who gave many of those present a first glimpse into what toxicology actually involves and how those people involved in it pay great attention to the husbandry and welfare of callitrichids in the course of their product screening. Antonia Fehrenbach (Deutsches Primatenzentrum, Göttingen) provided the first of two papers on the common marmoset in reproductive biomedicine, describing a microdialysis technique for studying both paracrine and autocrine events in the ovary of the common marmoset. Stephen Lunn (MRC Reproductive Biology Unit, Edinburgh) then presented an overview of why there is a pressing need for reproductive research and the advantages and disadvantages of the common marmoset relative to other mammals, in this context. Paul Watkins (University of Bristol, UK) completed this session and the programme with an inimitable account of the merits of the cotton-top in the study of inflammatory bowel disease. Although the main impetus behind his work is to achieve a better understanding of intestinal diseases in humans, it will also make an important contribution to the captive breeding programmes that have been or are being established for the many endangered species of callitrichids, a point emphasized by Anthony Rylands during discussion. Indeed, Paul Watkins typified the ethos and attitude that characterised this workshop; he travelled through the night from England to France in order to present and discuss his paper, and then had to leave immediately afterwards to be back in England for a meeting that evening. With such motivated and determined participants, the EMRG will undoubtedly succeed in its objectives. The inaugural general assembly was a success, certainly according to *everybody* who attended. For those that did not, the proceedings of the workshop will be published.

The EMRG coordinating committee is Christopher Pryce, Zürich, Switzerland, Leah Scott, Salisbury, U.K., and Christian Schnell, Basel, Switzerland.

**Christopher R. Pryce**, Anthropologisches Institut, Universität Zürich, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland.

## PARQUE ESTADUAL DO RIO DOCE: UM CONVITE À PESQUISA

O Parque Estadual do Rio Doce, localizado na região leste de Minas Gerais, abrange parte dos municípios

de Marliéria, Dionísio e Timóteo, e dista 248 km de Belo Horizonte. Foi criado através do Decreto-Lei No.1119 de 14 de julho de 1944, estando sob a administração do Instituto Estadual de Florestas (IEF) do Estado de Minas Gerais desde 1962. Possui 35,974 ha, constituindo uma das maiores áreas contínuas de remanescente da Mata Atlântica, protegida em Minas Gerais. As altitudes variam entre 230 e 515 m.

Os principais limites naturais do Parque são: o Rio Doce a leste e o Rio Piracicaba ao norte. Plantações de eucalipto e siderurgias instaladas na região caracterizam o restante da paisagem em seu entorno. O seu sistema lagunar é formado por aproximadamente 40 lagoas e brejos, contornados pela cobertura florestal. O interior do Parque é cortado por dois córregos afluentes da margem esquerda do Rio Doce.

O Parque apresenta infraestrutura adequada para realização de projetos de pesquisas e ensino, possuindo um centro de treinamento constituído por 16 apartamentos com banheiro, frigobar, e quarto com cinco camas em média, sala de aula, auditório com recursos áudio-visuais e restaurante. Oferece também dois laboratórios com 650 m<sup>2</sup>, com duas câmaras frias, um herbário de referências, área de secagem e processamento de sementes, bancadas e pias, estufas, microscópios, estereoscópios, destiladores e instalações elétricas. Os pesquisadores interessados em desenvolver programas de pesquisa a longo prazo, como por exemplo, teses de mestrado e de doutorado, podem contar com três residências. Além disso, possui também um centro de informações, camping turístico, administração, campo de pouso, telefone, facsímile, e um sistema de rádio-comunicação interno. O centro urbano maior e mais próximo, é a cidade de Ipatinga que está localizada a 60 minutos do Parque e que conta com ótimos serviços médico-hospitalares. Passando pelo portaria do Parque existe linha regular de ônibus.

### Primatas do Parque do Rio Doce

- . *Callithrix aurita*<sup>2</sup>
- . *Callithrix geoffroyi*
- . *Callithrix penicillata*<sup>1</sup>
- . *Callicebus personatus nigrifrons*
- . *Alouatta fusca*<sup>2</sup>
- . *Brachyteles arachnoides hypoxanthus*<sup>2</sup>

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Os pesquisadores interessados em desenvolver projetos no Parque não terão dificuldades com relação a problemas burocráticos. Deverão mandar cópia do seu projeto de pesquisa para avaliação, assim como a programação de viagens de campo. É importante que o pesquisador programe com devida antecedência seus trabalhos de campo, para que possa contar com o apoio logístico que a administração do Parque deseja e pode oferecer.

O Parque do Rio Doce faz parte da Reserva da Biosfera da Mata Atlântica, em vias de implantação, constituindo-se num importante instrumento de conservação das florestas tropicais úmidas. Continuar a mantê-lo, como centro de pesquisas de campo, de formação profissional e de educação ambiental, é uma das prioridades do IEF.

Para maiores esclarecimentos, deverão entrar em contato com a: Coordenadoria de Proteção da Vida Silvestre, Instituto Estadual de Florestas (IEF), Rua Paracatu 304, Barro Preto, 30180-090 Belo Horizonte, Minas Gerais, Brazil. Tel: (031) 295-1655 ramal 20, Fax: (031) 295-2803.

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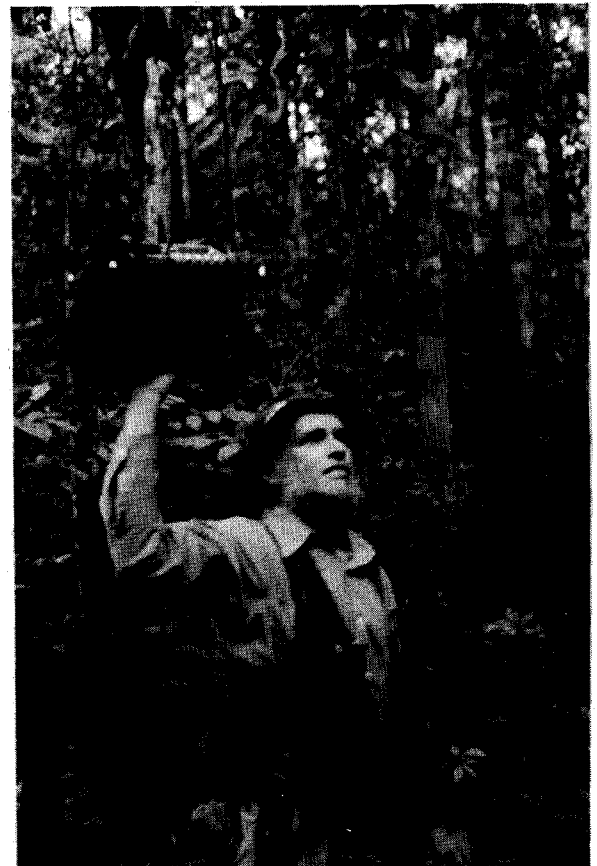
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**WARREN G. KINZEY - A FOUNDING FATHER OF PLATYRRHINOLOGY**

Warren Kinzey died peacefully on October 1, 1994, at his home in Tarrytown, New York. Although he had been suffering from a crippling neurological

illness, ALS (Lou Gehrig's disease), he worked almost until his final days on the subject he dearly loved, the neotropical primates. His last project, an edited book entitled "New World Primates: Ecology, Behavior and Evolution" was delivered to the publisher while Warren lay in hospital with the bout of pneumonia that claimed him.



Warren G. Kinzey (1935-1994)

Warren is remembered not only for his pioneering research on New World monkeys but also for his genius as a mentor. He loved teaching and his inspiration was felt internationally, among young people across the United States where he taught and developed a large professional presence in primatology and anthropology, and also in several Latin American countries, where he carried out fieldwork for 20 years. Warren's capacity to influence so many derived from his warm, engaging personality and also from his scientific background. He held degrees and taught in the fields of anthropology, zoology, biostatistics, and anatomy. He published original research in such areas as endocrinology, paleoanthropology, primatology, human biology, allometry, zoogeography, conservation and functional morphology. His platyrrhine research began in the early 1970's, as a study of form-and-function and

also social behavior. Warren hoped to use the neotropical primates as analogues for early hominid evolution. He began with *Callicebus*, initiating a field project in Amazonian Peru in 1974-1975, and gradually expanded his focus to include pitheciins, trying to understand the adaptations and feeding strategies of this unusual group of frugivores.

Primatology knew what it would lose with the passing of Warren Kinzey, a founder and tireless advocate of platyrrhine studies. And so, in February 1994 some sixty of us gathered at the Smithsonian Institution's National Zoological Park in Washington, D.C., to honor and thank Warren with a two-day conference on New World monkeys. He was too modest at first to be placed on a pedestal, but we prevailed. Although he arrived weak and almost immobile, there was delight and pride in his eye, and warm satisfaction in his voice. We were his family, his friends, his students, his colleagues, his admirers, and the bearers of his legacy. In private, Warren mused about the significance of this gathering, for meetings about platyrrhines are rare in the United States. He realized where we had started 20 years ago, when primatology here was hardly developed and the research was almost totally devoted to catarrhines - and how far we had travelled. Always looking forward, Warren asked if we could make this event an annual occurrence, without a sliver of regret that he would not be with us again. For Warren, there was always another project to do and more people to encourage. What mattered to him most was not the discoveries he made but the understanding he gave.

**Alfred L. Rosenberger**, Department of Zoological Research, National Zoological Park, Washington, D.C. 20008, USA.

#### A Personal Remembrance by Marilyn Norconk

On a November evening three years ago, Warren and I sat across from each other at his dinner table while we chatted about how research was progressing at our field site in Venezuela. I had returned for a short visit and, as had become customary, my first stop was his home in Tarrytown, New York. After dinner that night, he told me that he was having difficulty lifting his arms above his head to erase the chalkboard during his anatomy lectures. I tried to determine how concerned he was about this development, this man who I had known for 10 years, as a field colleague for six years, and who had always seemed to be in the peak of health. Even though he attributed the weakness to bursitis that evening, he was plainly

worried. After all, he was an anatomist, and knew that he was losing muscle mass in his upper arms.

Our first meeting was in Peru in 1982 at his field site near Iquitos. I was looking for a location to study *Saguinus fuscicollis* and spent two weeks at Mishana. We had communicated only by letter before that time, but the youthful middle-aged man I met at Don Giovanni's restaurant in Iquitos, with pens and index cards stuffed in the breast pocket of his short-sleeved shirt was clearly the same person who had thoroughly (and without detectable anguish or sarcasm) answered a steady stream of my naive, question-packed letters. After stocking up with cans of tuna and tucos, oatmeal, pasta, peanuts, and pisco we departed the next morning for the relatively short trip to Mishana. My clearest memories of that brief trip were his patience and clarity of purpose in conducting his research, his interest in my budding career even though I was not his student, and his energy, particularly at 4:30 in the morning as he cheerfully prepared our daily breakfast of oatmeal and raisins. He was the first one up in the morning and the last one to bed at night.

The next time we met, Warren was preparing to do a long-term field study in Surinam: feeding ecology of spider monkeys and bearded sakis. I had just completed my degree and the idea of studying "big" monkeys was appealing. I took a late flight from the west coast and joined him in New York for the flight to Trinidad and on to Paramaribo. I soon learned how he conserved his energy. He was asleep within seconds after the plane took off, and, as I got to know him better, I discovered that he could be fully refreshed after even the shortest of "cat-naps". He loved being in the field. He loved the novelty of each day, the challenge of dealing with day-to-day problems of being in a remote camp, fixing the primus stove, deciding where new trails ought to be cut, adjusting to the rapid pace set by bearded sakis as they moved from feeding tree to feeding tree. He was an astute observer, a problem-solver who had impressive observational skills and a comfortable knowledge of and appreciation for quantitative methods. His calculator and binoculars were never far away. One day when army ants had taken over the camp, I found him down at the stream counting them by the hundreds and trying to determine travel speed as they crossed the only log that provided a safe passage over the water.

We continued to work together, moving our study a year later to Venezuela. He was not able to get away from his university duties as often as he liked, but he was unquestionably field director, even from New York. He took great joy in his energetic, whirlwind visits, and I was always amazed at his even

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temperament, his attention to detail, his social skills with everyone he encountered, his generosity in making sure that the project was well-supplied, and his ability to make things happen. We were building a camp on an island in Guri Lake during the summer of 1988 and it soon became apparent that we had to have a boat and outboard motor if we were to work there. Having gone into town to make arrangements for his flight the next day, he reappeared driving our new boat, grinning from ear to ear. Clearly, I thought, this man knows how to have fun.

His generosity extended far beyond the project itself. We established the custom of taking both graduate and undergraduate students with us, particularly during the summer. He firmly believed that field experience was essential for students. I remember vividly the occasions when we had reached our predetermined limit of students and he would call, "I just talked to so-and-so and they sound great. Couldn't we find room for them this year?" We advertised in *Physical Anthropology Newsletter* the first year but never had to do it again.

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I was in the field when the diagnosis of Lou Gehrig's disease was made. It progressed in an unusual manner and was difficult to diagnose, even after muscle biopsies. He was losing the ability to lift his arms, but his legs were still strong and he insisted on coming to the field in May, 1992. I had not seen him for six months and when we met at the airport it was clear that about 80% of his energy came from his determination. He tired easily, but we went through our usual monthly observations. Always creative and virtually undeterred by his disabilities, he figured out that if he lay on his back on the ground he could still use his binoculars and follow the monkey's feeding activities in the trees above. Unfortunately, we soon realized that his poor balance made every trip away from camp a perilous adventure and he was able to stay only two short weeks.

True to his nature, he turned his illness into a learning experience. But he continued to work only with the intensive care and love of his wife, Julie Kelly, and his students. That must have been the hardest transition for him to make and I often heard the frustration in his voice - an active mind confined in a body that would not work any more. Still, I wonder. If he had not started out with such an intense joy of living, the course of dying would have been much, much worse.

**Marilyn A. Norconk**, Department of Anthropology, Kent State University, P.O.Box 5190, Kent, Ohio 44242-0001, USA.

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## ROBIN KINGSTON

It is with great sadness that we report on the death of Robin Kingston, on the 9th September 1994. William Robin Kingston received the American Society of Primatologists' Senior Biology and Conservation Award in 1993 for his lifelong dedication to the conservation and breeding of primates, notably callitrichids. He was a pioneer in setting up and running primate breeding facilities, first in Europe, and in the 1970's he was the PAHO/WHO consultant for the establishment of the national primate breeding centers in Iquitos, Peru, and Belém, Brazil. Hilary Box, President of the Primate Society of Great Britain, wrote the following at the time of the presentation of his ASP award: "It is not possible to list here all the achievements of someone who has been active in biology for more than thirty years. Suffice it to say that very many of us welcomed the opportunity to applaud his achievements publicly, and to thank the man who had 'set us up' in primate research. We have always appreciated his skills, his enthusiasm, his drive, his charm, and irrepressible sense of humour".

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## TRAFFIC - SUDAMERICA

Las dos mayores amenazas que tiene la naturaleza son: la destrucción de los ambientes naturales y el comercio de fauna y flora y sus derivados. Conscientes de esta situación, el Fondo Mundial para la Naturaleza (WWF), y la Unión Mundial para la Naturaleza (IUCN), han establecido las oficinas TRAFFIC, sigla derivada de "Trade Records Analysis of Flora and Fauna in Commerce". Estas oficinas, distribuidas en todo el mundo, son coordinadas por TRAFFIC Internacional y trabajan en estrecha relación con la Secretaría de la Convención sobre el Comercio Internacional de Especies Amenazadas de Fauna y Flora Silvestres (CITES), en el monitoreo del comercio internacional de plantas y animales silvestres.

En 1985, se estableció la primer oficina regional de la Red en la ciudad de Montevideo, la cual ha recibido el reconocimiento del Gobierno de Uruguay como organismo internacional sin fin lucrativo. TRAFFIC Sudamérica no se ha limitado a un trabajo meramente estadístico, sino que en estos nueve años de vida ha colaborado con los países de la región tratando de lograr una adecuada aplicación de CITES, y así mismo ha participado en acciones directas como por ejemplo el rescate de animales vivos en poder de traficantes.

Para el cumplimiento de su labor de fiscalización y monitoreo del comercio regional, resulta de fundamental importancia la colaboración de todas aquellas personas preocupadas por la conservación de la naturaleza, por lo cual será de gran utilidad toda información relativa al comercio de fauna que se nos haga llegar a la oficina de Montevideo.

**Juan S. Villalba-Macías**, Director, TRAFFIC (Sudamérica), Carlos Roxlo 1496/301, 11200 Montevideo, Uruguay. Tel/Fax: (598-2) 49 33 84.

## BREEDING AND CONSERVATION OF ENDANGERED SPECIES - JWPT SUMMER SCHOOL

The Jersey Wildlife Preservation Trust will be holding its annual summer school "Breeding and Conservation of Endangered Species" from 31 July to 19 August



1995. The course will be based at the Trust's headquarters in Jersey, Channel Islands, GB, and will consist of morning and afternoon lectures, discussion sessions, and individually supervised research exercises. It is suitable for students, zoo and veterinary staff and others with an interest in conservation and/or captive animals. The course and its associated project work are flexible to suit most abilities and backgrounds. Participation is limited to approximately 24 students - selection based on merit and suitability. Early application is essential. Fee per person £880 (includes 1996 free membership to the Trust). Full accommodation provided from 29 July to 19 August 1995. The Course Directors are the Trust Training Officer, Dr John E. Fa, and two internationally recognised scientists. The Course tutor is Dr Anna T.C. Feistner, Trust Research Officer, and the Co-ordinator is Mr Chris Clark, Assistant Training Officer at the Trust. Closing date for applications: 31 January 1995. Applications to: The Summer School, Co-ordinator, Jersey Wildlife Preservation Trust, Trinity, Jersey JE3 5BP, Channel Islands, British Isles. Tel: +44 1534 864666, Fax: +44 1534 865161.



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CONSERVATION BIOLOGY  
FUND**

**RHODE ISLAND ZOOLOGICAL SOCIETY** The Sophie Danforth Conservation Biology Fund was established by the Roger Williams Park Zoo and the Rhode Island Zoological Society to help protect the World's threatened wildlife. Each year grants of up to US\$1,000 are awarded to individuals or institutions working in conservation biology. Projects and programs that enhance biodiversity and maintain ecosystems receive the highest funding priority. Field studies, environmental education programs, development of techniques that can be used in a natural environment, and captive propagation programs that stress an integrative and or multidisciplinary approach to conservation are also appropriate. Proposals for single species preservation, initial surveys, or seed money for technique development are not appropriate. Recipients are required to acknowledge the Roger Williams Park Zoo and the Rhode Island Zoological Society in any publications that result from the project. Recipients must also submit a progress report which includes an update on the status of the project. This report is due one year after funding. Limit your application to the form (available from the address below), and a two-page curriculum vitae. All proposals must be submitted by 1 May, 1995. Applications will be reviewed by a committee of zoo, zoo society, and outside advisors. Grants will be awarded in July 1995. For further information contact: Dr Anne Savage,

Director of Research, Roger Williams Park Zoo, Elmwood Avenue, Providence, RI 02905, USA. Tel: (401) 785-3510, Fax: (401) 941-3988.

**THE BP CONSERVATION EXPEDITION  
AWARDS - STUDENT EXPEDITIONS**

Birdlife International and the Fauna and Flora Preservation Society, with support from British Petroleum, hold an annual competition for conservation exploration projects "The BP Conservation Expedition Awards". Projects entering the competition are judged especially on the level of host country involvement and the global importance of the conservation issues on which the project is focused. The project must fall within one of the following categories: Tropical rain forest, wetlands, oceanic islands and marine, globally threatened species. The expedition should consist of young people, preferably undergraduate students, although it is recommended that at least one postgraduate in life sciences should be included. Proposals for 1995 Expeditions must be entered by no later than 31st December 1994. Entrants will be informed of the results by the end of February. For further information contact: Michael K. Poulson, Birdlife International, Wellbrook Court, Girton Road, Cambridge CB3 0NA, UK, Tel: +44 223 277318, Fax: +44 223 277200.

**DUKE UNIVERSITY - VISITING ASSISTANT  
PROFESSORS**

The Department of Biological Anthropology and Anatomy of Duke University, Durham, North Carolina, anticipates filling 1-3 year teaching/research posts in the following areas: Primate behavior and socioecology; Primate morphology; Primate or human evolution; and Medical gross anatomy. Ph.D. or anticipated award of Ph.D. within two months of appointment is required. Salary competitive and commensurate with qualifications. Starting date: September 1995. Application deadline: 15 February 1995. Send letter of application, current CV and at least three letters of reference to Prof. Richard F. Kay, Department of Biological Anthropology and Anatomy, Box 3170, Duke University Medical Center, Durham, NC 27710, USA.

**FIELD ASSISTANTS - CAYO SANTIAGO**

Field assistants are needed to collect behavioral data and conduct playback trials on free-ranging rhesus macaques in Cayo Santiago, Puerto Rico, January-August 1995. Field experience preferred but not required. Applicants must be serious, dedicated students, willing to work long hours under difficult

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**Primate**

**CREACION  
PRIMATOLOGIA**

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conditions. In exchange, extensive training in observational and experimental data collection techniques will be offered. No funding provided. Send cover letter, résumé, and two letters of recommendation to: Katherine Hardy, 10126 Shady River, Houston, TX 77042, USA. Please include mailing address, phone number, and e-mail address if you have one. Applications will be considered on a rolling basis.

### ESTAGIÁRIO - PROJETO DINÂMICA BIOLÓGICA DE FRAGMENTOS FLORESTAIS

Kellen Gilbert (Southeastern Louisiana University) e Silvia Egler (Instituto Nacional de Pesquisas da Amazônia) iniciarão em 1995 um projeto sobre a diversidade e densidade de primatas em fragmentos florestais e floresta contínua na Amazônia central, como parte das atividades do projeto multidisciplinar "Dinâmica Biológica de Fragmentos Florestais (PDBFF)" do Instituto Nacional de Pesquisas de Amazônia (INPA), Manaus, em convênio com o Smithsonian Institution, Washington, D.C. Estudantes brasileiros interessados em realizar um estágio (uma vaga) junto com este projeto têm uma excelente oportunidade para ganhar experiência de campo e também obter dados iniciais para elaborar projeto individual como uma tese de mestrado. Os interessados devem mandar currículo e pelo menos duas cartas de referência para Kellen Gilbert com cópias para Silvia Egler. Endereços: Kellen Gilbert, Department of Sociology, Social Work and Criminal Justice, Southeastern Louisiana University, Hammond, Louisiana 70403, USA. Tel: 504 543 0068, e-mail: fsoc2750@selu.edu. Silvia Egler, Departamento de Ecologia - V8, Instituto Nacional de Pesquisas da Amazônia (INPA), Caixa Postal 478, Manaus 69011, Amazonas, Brasil.

## Primate Societies

### CREACION DE LA ASOCIACION PRIMATOLOGICA ESPAÑOLA

En 1993, los primatólogos españoles fundaron la Asociación Primatológica Española (APE). Sus objetivos son: fomentar la investigación científica de los primates, respetando las normas éticas sobre el manejo de los animales; impulsar la divulgación de los conocimientos de todas las áreas de la primatología; promover la conservación de todas las especies de primates; facilitar la cooperación entre

todos los científicos que trabajan con primates, dentro y fuera del territorio nacional; y establecer vínculos con asociaciones nacionales e internacionales que persigan fines similares. La APE edita un boletín dos veces al año, y está afiliada oficialmente a la European Federation for Primatology (EFP). El Presidente de la APE es miembro del Consejo de la EFP.

Los miembros de la Junta Directiva de la APE son: Dr. Fernando Colmenares (Universidad Complutense de Madrid), Presidente; Dr. Joaquín Veá (Universidad Central de Barcelona), Vice-Presidente; Dr. Fernando Peláez (Universidad Autónoma de Madrid, Secretario; Dr. Carlos Gil Burman (Universidad Autónoma de Madrid), Tesorero; Dr. Juan Carlos Gómez (Universidad Autónoma de Madrid) y Dra. Maribel Baldellou (Universidad Central de Barcelona), Vocales de Investigación; Adolfo Aguirre (Universidad Complutense de Barcelona) y Mateo Escobar (Universidad Central de Barcelona), Vocales de Educación; Carme Maté y Francisco Gómez (Universidad Central de Barcelona), Comité de Conservación.

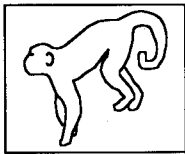
Para mayor información, ponerse en contacto con: Dr Fernando Colmenares, Departamento de Psicobiología, Universidad Complutense de Madrid, Campus de Somosaguas, 28223 Madrid, España. Tel: 34 (9)1 3943073, Fax: (34) (9)1 3943189, e-mail: ppsoc06@sis.ucm.es; o Dr Fernando Peláez, Departamento de Psicología Biológica y de la Salud, Facultad de Psicología, Universidad Autónoma de Madrid, España. Tel: 34 (9)1 3974658, Fax: 34 (9)1 3975215, e-mail: fpelaez@ccuam3.sdi.uam.es.

### V SIMPOSIO DE LA ASOCIACION MEXICANA DE PRIMATOLOGIA Y III REUNION DE LA SOCIEDAD LATINOMERICANA DE PRIMATOLOGIA

Del 23 al 26 de mayo de 1995, se llevará a cabo el *V Simposio de la Asociación Mexicana de Primatología*, en la ciudad de Puebla, Mexico. Durante el pasado XV Congreso de la Sociedad Internacional de Primatología (IPS), celebrado en Bali, Indonesia, convenimos realizar la *III Reunión de la Sociedad Latinoamericana de Primatología* en conjunción con el Simposio antes mencionado. Estamos muy interesados en que al menos una persona de cada Sociedad de Latinoamérica y/o una persona de cada país donde existan poblaciones silvestres de primates, acuda este evento. Asimismo, en el marco de esta reunión se deberá elegir la nueva mesa directiva de la SLAP, que como un acuerdo de la reunión pasada, deberá ser la mesa directiva de alguna

de las Sociedades nacionales de primatología, a fin de evitar los problemas que se presentan cuando se trabaja a larga distancia. Para mayor información contactar con Ernesto Rodríguez Luna, Presidente de la SLAP a: Apartado Postal 566, C.P.91000, Xalapa, Veracruz, México. Tel./Fax: (28) 12-57-48.

## VII CONGRESSO DA SOCIEDADE BRASILEIRA DE PRIMATOLOGIA



Será realizado no período de 23 a 28 de julho de 1995, na Universidade Federal do Rio Grande do Norte, o VII Congresso Brasileiro de Primatologia. A programação do

Congresso incluirá sessões de comunicações coordenadas, mini-cursos, painéis, conferências e mesas-redondas. O prazo para envio dos resumos será 15 de março de 1995, e os formulários já estão sendo encaminhadas aos sócios por meio de carta-circular. Maiores informações: Carmen Alonso, Depto. de Sistemática e Ecologia - CCEN, Universidade Federal da Paraíba, Campus Universitário, 58059-900 João Pessoa, Paraíba, Brasil. Fax: (083) 224 3688.

## VII CURSO DE ESPECIALIZAÇÃO EM PRIMATOLOGIA: ECOLOGIA E COMPORTAMENTO DE PRIMATAS NEOTROPICAIS

O Departamento de Fisiologia da Universidade Federal do Rio Grande do Norte em conjunto com a Sociedade Brasileira de Primatologia, vai realizar o VII Curso de Especialização em Primatologia. O tema do curso será "Ecologia e Comportamento de Primatas Neotropicais". Serão abordados métodos de estudo de primatas em campo e cativo. O curso terá a duração de 480 horas e deverá acontecer de 1º de agosto a 30 de outubro de 1995, em Natal, João Pessoa e Recife. As inscrições para as 15 vagas estarão abertas de 15 de abril a 15 de maio de 1995, para graduados em Ciências Biológicas, Medicina Veterinária, Zootecnia, Psicologia e áreas afins. A seleção será feita através de *Curriculum vitae* do candidato e uma carta de indicação de professor, orientador, empregador ou equivalente. Apenas um candidato de cada instituição será aceito, a não ser que haja vagas ociosas. Maiores informações e inscrições: Dra. Maria Emília Yamamoto ou Dr. Dwain Phillip Santee, Caixa Postal 1511, 59072-970 Natal, Rio Grande do Norte, Brasil. Tel: (084) 206 1147 ou 231 1266 x 359, Fax: (084) 231 9587.



## AMERICAN SOCIETY OF PRIMATOLOGISTS AWARDS 1994

The Awards and Recognition Committee of the American Society of Primatologists made three awards at their annual meeting in Seattle in July 1994. The Distinguished Primatologist Award was presented to *Charles H. Southwick*, Professor Emeritus, University of Colorado at Boulder, for his exceptional career achievements in primate ecology, field research, teaching, international consulting and service on numerous government and primatology advisory committees. Professor Southwick will present the Distinguished Primatologist's Lecture at the 1995 meeting in Arizona. A Distinguished Service Award was given to *Dr Leo A. Whitehair*, Director of the Comparative Medicine Program, National Center for Research Resources, National Institutes of Health, for his outstanding support of primate research during a lengthy career at the Animal Resources Branch and Comparative Medicine Program. ASP also presented a Distinguished Service Award to *Dr Richard Harrison* for his dedicated work and service to the Society as ASP Historian during the past decade. Journal Subscription Awards were continued for 13 past recipients, and two new awards were made to *Dr Maria de Fátima Arruda*, Federal University of Rio Grande do Norte, Brazil, and to *Dr Gilbert Isabirye-Basuta*, Makerere University Biological Field Station at Kibale Forest, Uganda. Small conservation grants were made *Dr A.U. Choudbury*, Gauhati University, India, to *A. K. Gupta*, Forest Training Division, Sepahijala, India, to *Dawn Hawkins*, University College, London, and to *Madhu Rao*, Duke University, North Carolina. The Senior Biology and Conservation Award went to *Hilali Matama*, Gombe Stream Research Centre. From *ASP Bulletin*, 18(3), September 1994.

## Recent Publications

### AMERICAN JOURNAL OF PRIMATOLOGY - SPECIAL ISSUE ON NEW WORLD PRIMATES

Volume 34(2) of the *American Journal of Primatology* was given over to the publication of the proceedings of a symposium "Social Organization in Neotropical Primates: Relation to Ecology, Body Size and Patterns of Infant Care", organized by Suzette Tardif (University of Tennessee, Knoxville), Paul Garber (University of

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Illinois, Urbana), and Anne Savage (Roger Williams Park Zoo, Rhode Island), held during the 1992 Congress of the International Primatological Society, Strasbourg, France, 16-21 August 1992.

The papers in the symposium were centered on three issues: 1) the relation between body size, ecology, and reproduction (Dietz *et al.*, Tardif *et al.*, and Williams *et al.*; 2) ranging and dispersal patterns as determinants of social structure (Boinski and Mitchell, Norconk and Kinzey, Kinzey and Cunningham); and 3) phylogenetic and comparative analyses of behavioral and anatomical traits (Ford and Garber). Within these areas the papers provide new information and new syntheses of existing information on platyrrhine socioecology. In addition, many detail innovative methodological approaches which could fruitfully be applied to other primates.

Boinski, S. and Mitchell, C.L. 1994. Male residence and association patterns in Costa Rican squirrel monkeys (*Saimiri oerstedii*). *Am. J. Primatol.*, 34(2): 157-170.

Dietz, J.M., Baker, A.J. and Miglioretti, D. 1994. Seasonal variation in reproduction, juvenile growth, and adult body mass in golden lion tamarins (*Leontopithecus rosalia*). *Am. J. Primatol.*, 34(2): 115-132.

Ford, S.M. 1994. Evolution of sexual dimorphism in body weight in platyrrhines. *Am. J. Primatol.*, 34(2): 221-244.

Garber, P.A. 1994. Phylogenetic approach to the study of tamarin and marmoset social systems. *Am. J. Primatol.*, 34(2): 199-219.

Kinzey, W.G. and Cunningham, E.P. 1994. Variability in platyrrhine social organization. *Am. J. Primatol.*, 34(2): 185-198.

Norconk, M.A. and Kinzey, W.G. 1994. Challenge of neotropical frugivory: travel patterns of spider monkeys and bearded sakis. *Am. J. Primatol.*, 34(2): 171-183.

Tardif, S.D. 1994. Relative energetic cost of infant care in small-bodied Neotropical primates and its relation to infant-care patterns. *Am. J. Primatol.*, 34(2): 133-143.

Tardif, S.D. and Garber, P.A. 1994. Social and reproductive patterns in Neotropical primates: relation to ecology, body size, and infant care. *Am. J. Primatol.*, 34(2): 111-114.

Williams, L., Gibson, S., McDaniel, M., Bazzel, J., Barnes, S. and Abec, C. 1994. Allomaternal interactions in the Bolivian squirrel monkey (*Saimiri boliviensis boliviensis*). *Am. J. Primatol.*, 34(2): 145-156.

## MASTOZOLOGIA NEOTROPICAL - JOURNAL OF THE SOCIEDAD ARGENTINA PARA EL ESTUDIO DE MAMÍFEROS

The Argentinian Society for the Study of Mammals (SAREM), Rubén M. Bárquez (UNT, Tucumán) President, has edited the second number of the first volume of its journal *Mastozoologia Neotropical*. The editor is Ricardo A. Ojeda (IADIZA, Mendoza). Besides an editorial on Neotropical biodiversity and the role of the region's mammalogists, it includes five articles, three short notes and a book review. Neotropical mammalogists are encouraged to join SAREM (receiving the journal free of charge). Annual dues are US\$40 (US\$25 for students) plus US\$5 for handling and shipping. Contact: Dr Janet Braun, International Secretary, SAREM, 1335 Asp Avenue, Oklahoma Museum of Natural History, Norman, OK 73019, USA, or Mónica Diaz, Tesoreria SAREM, Facultad de Ciencias Naturales Miguel Lillo 205, (4000) Tucumán, Argentina.

## BOOKS

*Introduction to Primate Behavior*, by Nancy E. Collinge, Kendall/Hunt Publishing Company, Dubuque, Iowa, 1993. Price: US\$25.95 (soft cover). In five parts: Part I. Introduction to the World of Primates; Part II. Introduction to the Life-Way Patterns of Non-Human Primate Species; Part III. Primatological Concepts; Part IV. Primate Intelligence; Part V. Applied Primatology. Available from: Kendall/Hunt Publishing Company, 2460 Kerper Boulevard, Dubuque, Iowa 52004-0539, USA.

*The Marmoset: Role in Pharmaceutical Development*, compiled by John S.L. Fowler, Pharmaco LSR, UK, 1994, 88pp. Proceedings of an Advanced Seminar, Brome Grange Hotel, Suffolk, England, 6-7 June 1994. ISBN 0 9514367 1 6. Includes 11 papers: Marmosets as models for man (L. Scott); Marmoset care and reproduction (P. A. McNulty); Spontaneous and background pathology in marmosets (P. F. Wadsworth); ADME and kinetic studies in marmosets (J. S. L. Fowler); Marmosets: their use in safety pharmacology and animal models of CNS disorders (S. Close); The marmoset facilities of Pharmaco LSR (J.S. Stewart); The use of *Callithrix jacchus* in toxicity studies: study direction and clinical monitoring (A. Woolley); Hepatic effects of ciprofibrate in the marmoset (T. J. B. Gray, F. W. Bonner & S. Winthrop); Pathological changes in the marmoset elicited by novel chemicals (J. E. Watson); Pharmaceutical development: first-into-man studies (J. S. L. Fowler); Use of marmoset in pharmacology and toxicology: the regulatory position (B. Rieh); and an

appendix on background data relating to marmosets at Pharmaco LSR. Available from: Pharmaco LSR, Eye, Suffolk IP23 7PX, UK.

*Restoration of Endangered Species: Conceptual Issues, Planning and Implementation*, edited by Marlin L. Bowles and Christopher Whelan, Cambridge University Press, Cambridge, 1994, 420pp. Price Hdbk £35.00. As the human impact on earth leads to ever increasing environmental degradation, the restoration of dwindling populations of numerous plant and animal species is becoming ever more important. In this volume the political, biological, and experimental procedures affecting the restoration of populations of both plants and animals are examined using case studies to illustrate basic points. Available from: Customer Services Department, Cambridge University Press, The Edinburgh Building, Cambridge CB2 1BR, UK.

*The Rainforest Edge: Plant and Soil Ecology of Maracá Island, Brazil*, edited by John Hemming, Manchester University Press, Manchester, UK, 1994. Price £45.00. Available from: Manchester University Press, Oxford Road, Manchester M13 9PL, England, or Manchester University Press, St. Martins Press, Inc., 175 Fifth Avenue, New York, New York 10010, USA.

*Anais do Workshop sobre Pesquisas Prioritárias para o Parque Estadual do Rio Doce*, compiled by Anthony B. Rylands and Ivana R. Lamas, Instituto Estadual de Florestas - IEF/MG, and Engevix Engenharia S.A., Belo Horizonte, Minas Gerais, 1994, 89pp. Proceedings of a Workshop on Research Priorities for the Rio Doce State Park, Minas Gerais, Brasil, 7-10 March 1994. Also *Pesquisas Prioritárias para o Parque Estadual do Rio Doce, Brasil*, a summary in Portuguese and English, 35pp. Available from: Coordenadoria de Proteção a Vida Silvestre, Diretoria de Proteção da Biodiversidade, Instituto Estadual de Florestas (IEF), Rua Paracatu 304/1001, Barro Preto, 30180-090 Belo Horizonte, Minas Gerais, Brazil. Fax: +55 31 295-2803.

*Coletânea Bibliográfica sobre o Parque Estadual do Rio Doce*, organized by Maria Teresa Coimbra Prates *et al.*, Instituto Estadual de Florestas - IEF/MG, Belo Horizonte, Minas Gerais, 1994, 61pp. A listing of bibliographical references pertinent to the Rio Doce State Park in Minas Gerais, Brazil; the largest remaining block of Atlantic forest in the state (35,793 ha). Available from: Coordenadoria de Proteção a Vida Silvestre, Diretoria de Proteção da

Biodiversidade, Instituto Estadual de Florestas (IEF), Rua Paracatu 304/1001, Barro Preto, 30180-090 Belo Horizonte, Minas Gerais, Brazil. Fax: +55 31 295-2803.

*Stress and Animal Welfare*, by D.M. Broom and K.G. Johnson, Chapman and Hall, London, 1993, 211 pp. Available from: Chapman and Hall, 2-6 Boundary Row, London SE1 8HN, England, UK, or Chapman and Hall, Inc., One Penn Plaza, 41st Floor, New York, New York 10119, USA.

*Primate Humor, Volume 1*, published by the American Society of Primatologists Conservation Committee, 1994. Price: US\$10.00 (+US\$1.00 shipping). A collection of primate humors. Send a check or money order payable to "ASP Conservation Fund". Contact: Dr Janette Wallis, Department of Ob-Gyn 4SP700, University of Oklahoma HSC, Box 26901, Oklahoma City, Oklahoma 73190, USA.

#### ARTICLES

Agoramoorthy, G. and Rudran, R. 1994. Field application of Telazol (Tiletamine hydrochloride and Zolazepam hydrochloride) to immobilize wild red howler monkeys (*Alouatta seniculus*) in Venezuela. *J. Wildl. Dis.*, 30(3): 417-420.

Anonymous. 1994. Colombia makes substantive reforms to conserve biological diversity. *Biodiversity Conservation Strategy UPDATE*, 6(3): 7.

Anonymous. 1994. Why do capuchins have big brains? *Inside Yerkes*, (Fall): 2-5.

Anonymous. 1994. New population of 65 howlers in Cockscomb. *Community Conservation Consultants Baboon Update*, (Spring/Summer): 1.

Bös, A., Probst, B. and Erkert, H.G. 1993. Urinary estradiol-17 $\beta$  excretion in common marmosets, *Callithrix jacchus*: diurnal pattern and relationship between creatinine-related values and excreted amount. *Comp. Biochem. Physiol.*, 105A(2): 287-292.

Boinski, S., Moraes, E., Kleiman, D.G., Dietz, J.M. and Baker, A.J. 1994. Intra-group vocal behaviour in wild golden lion tamarins, *Leontopithecus rosalia*: honest communication of individual activity. *Behaviour*, 130(1-2): 53-75.

Christie, M.I. 1994. Estado del conocimiento sobre mamíferos argentinos: especies, ejemplares y documentación. *Mastozoología Neotropical*, 1(2): 157-169.

Deffer, T.R. 1994. La conservación de primates en Colombia. *Trianea (Act. Cien. Tecn. INDERENA)*, 5: 255-287.

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- Durant, S. M. and Mace, G. M. 1994. Species differences and population structure in population viability analysis. In: *Creative Conservation: Interactive Management of Wild and Captive Animals*, P. J. S. Olney, G. M. Mace and A. T. C. Feistner (eds.), pp.67-91. Chapman and Hall, London.
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## Meetings

### 1995

**MOLECULAR ANTHROPOLOGY: TOWARD A NEW EVOLUTIONARY PARADIGM.** 13-14 March 1995. Department of Anatomy and Cell Biology, Wayne State University School of Medicine, 540 E. Canfield Avenue, Detroit, MI 48201, USA. The conference will deal with advances in the study of molecular evolution that relate to the human species. Four working sessions: Process of Evolution in Complex Genomes; Molecular Evolution in Relation to Phylogeny; DNA Evidence on the Evolutionary History of Primates and Other Mammals; Molecular Evolution in the Human Species. Professionals and qualified students will be accepted for attendance at these sessions. There will also be a public lecture "Population Genetics and Human Evolution" by Dr Francisco Ayala on 14 March, 4:00 pm. Contact: Drs Morris Goodman (313-577-1138), G.W.Lasker (313-577-1061), or Mark Weiss (313-577-2935). E-mail: mweiss@cms.cc.wayne.edu. Fax: (313) 577-3125.

**SYMPOSIUM ON NEOTROPICAL PRIMATE PHYLOGENY.** 28 March-1 April 1995. Oakland, California. In conjunction with the American

Association of Physical Anthropology. Focus: New World primate relationships and evolutionary history. Abstract deadline: 30 June 1994. Contact: Jeff Meldrum, Departments of Biological Sciences and Anthropology, Campus Box 8007, Idaho State University, Pocatello, Idaho 93209-8007, USA. Tel: (208) 236-4379. Fax: (208) 236-4570. e-mail: meldjd@fs.isu.edu.

**PRIMATE SOCIETY OF GREAT BRITAIN - SPRING MEETING.** 5-6 April 1995. Institute of Cell, Animal and Population Biology, Edinburgh University. The first day will consist of papers dealing with current field studies of primates. The second day will be held at Edinburgh Zoo, with primate staff talking of their work. Contact: Elizabeth Rogers, ICAPB, Ashworth Building, University of Edinburgh, West Mains Road, Edinburgh EH9 3JT, Scotland. Tel: +44 31 650-5510. Fax: +44 31 650-6564.

**2ND INTERNATIONAL CONFERENCE ON WILDLIFE MANAGEMENT IN AMAZONIA.** 7-11 May, 1995, Iquitos, Peru. Organized by the Tropical Conservation and Development Program, Center for Latin American Studies, University of Florida, Gainesville, and Facultad de Ciencias Biológicas, Universidad Nacional de la Amazonía Peruana. The conference will address wildlife and fisheries management in Amazonia by focussing on the importance of local community participation and the development of economic alternatives to conserve habitats and prevent extinctions. For more information, contact: Conference, TCD Program, P.O.Box 115531, Gainesville, FL 32611-5531, USA, Tel: (904) 392-6548. Fax: (904) 392-6548, or Coordinador Nacional de Congreso, Facultad de Ciencias Biológicas, Universidad Nacional de la Amazonía Peruana, Pl. Serafín Filomeno s/n, Iquitos, Peru. Tel: (51-94) 23-6121. Fax: (51-94) 23-4723.

**V SIMPOSIO DE LA ASOCIACIÓN MEXICANA DE PRIMATOLOGIA Y III REUNIÓN DE LA SOCIEDAD LATINOMERICANA DE PRIMATOLOGIA.** 23 al 26 de mayo de 1995, Puebla, México. Para mayor información contactar con Ernesto Rodríguez Luna a: Apartado Postal 566, C.P.91000, Xalapa, Veracruz, México. Tel./Fax: (28)12-57-48, e-mail: primates@bugs.invest.uv.mx. (See "Primate Societies")

**18TH MEETING OF THE AMERICAN SOCIETY OF PRIMATOLOGISTS.** 21-24 June 1995, Safari Resort, Scottsdale, Arizona. Hosted by the Primate Foundation of Arizona and Arizona State University. Abstract deadline: 13 January 1995. Contact for registration with abstract: Evan Zucker, ASP Program Chair, Department of Psychology, Box 194, Loyola University, 6363 St. Charles Avenue, New Orleans,

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LA 70118, USA. Tel: (504) 865-3255. Contact for registration (no abstract): Jo Fritz, Primate Foundation of Arizona, P.O.Box 20027, Mesa, AZ 85277-0027, USA.

**VII CONGRESSO BRASILEIRO DE PRIMATOLOGIA**, 23-28 de julho de 1995, Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte. A programação do Congresso incluirá sessões de comunicações coordenadas, mini-curso, painéis, conferências e mesas-redondas. Prazo para envio dos resumos: 15 de março de 1995. Contato: Carmen Alonso, Depto. de Sistemática e Ecologia - CCEN, Universidade Federal da Paraíba, Campus Universitário, 58059-900 João Pessoa, Paraíba, Brasil. Fax: (083) 224 3688. (See "Primate Societies").

**24TH INTERNATIONAL ETHIOLOGICAL CONGRESS**, 10-17 August 1995, Honolulu, Hawaii. Sponsored by the University of Hawaii. Contact: Conference Secretariat, 800 N.W. Loop #10, Suite 150-S, San Antonio, TX 78216-5674, USA. Tel: (210) 341-8131, Fax: (210) 341-5252, e-mail: [icc@zoogate.zoo.hawaii.edu](mailto:icc@zoogate.zoo.hawaii.edu).

**4TH CONGRESS OF THE GESELLSCHAFT FÜR PRIMATOLOGIE (GFP)**, 20-24 September 1995, Kassel, Germany. The main topic of the Congress will be the interaction between primatological field and laboratory research, for example, the application of laboratory-based physiological, endocrinological and genetic methods in primate field research. Papers and posters on any other primatological topics are welcome. For more information contact: Prof. Dr Christian Welker, Zoologie und Vergl. Anatomie, Primatenethologie, Universität Kassel, D-34109 Kassel, Germany. Fax: + 49 561 804 4604.

**III CONGRESO LATINOAMERICANO DE ECOLOGIA**, 22-28 Octubre 1995, Universidad de Los Andes, Merida, Venezuela. Los resúmenes de los trabajos a ser presentados deben ser enviados antes del 30 de Julio de 1995 (Ponencia oral o de Cartel). Los idiomas oficiales: Español y Portugués. Se aceptarán ponencias en Inglés y Francés, esperándose contar con sistemas de traducción simultánea. Inscripciones: Hasta 30/12/94 - Profesionales US\$70.00, Estudiantes de postgrado US\$40.00, Estudiantes de pregrado US\$30.00; Hasta 30/05/95 - Profesionales US\$85.00, Estudiantes de postgrado US\$55.00, Estudiantes de pregrado US\$45.00; Al Congreso - Profesionales US\$100.00, Estudiantes de postgrado US\$70.00, Estudiantes de pregrado US\$60.00. Informaciones: Dr Jaime E. Péfaur, Secretario Ejecutivo, III Congreso Latinoamericano de Ecología, Facultad de Ciencias, Universidad de Los Andes, Merida, Venezuela 5101.

Tel: (58)(74) 401305. Fax: (58)(74) 401286, e-mail: [clac@ula.ve](mailto:clac@ula.ve).

## Contributions

We would be most grateful if you could send us information on projects, research groups, events (congresses, symposia, and workshops), recent publications, activities of primatological societies and NGOs, news items or opinions of recent events and suchlike, either in the form of manuscripts (double-spaced) or in diskettes for PC compatible text-editors (MS-Word, Wordperfect, Wordstar). Articles, not exceeding six pages, can include small black-and-white photographs, figures, maps, tables and references, but please keep them to a minimum.

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