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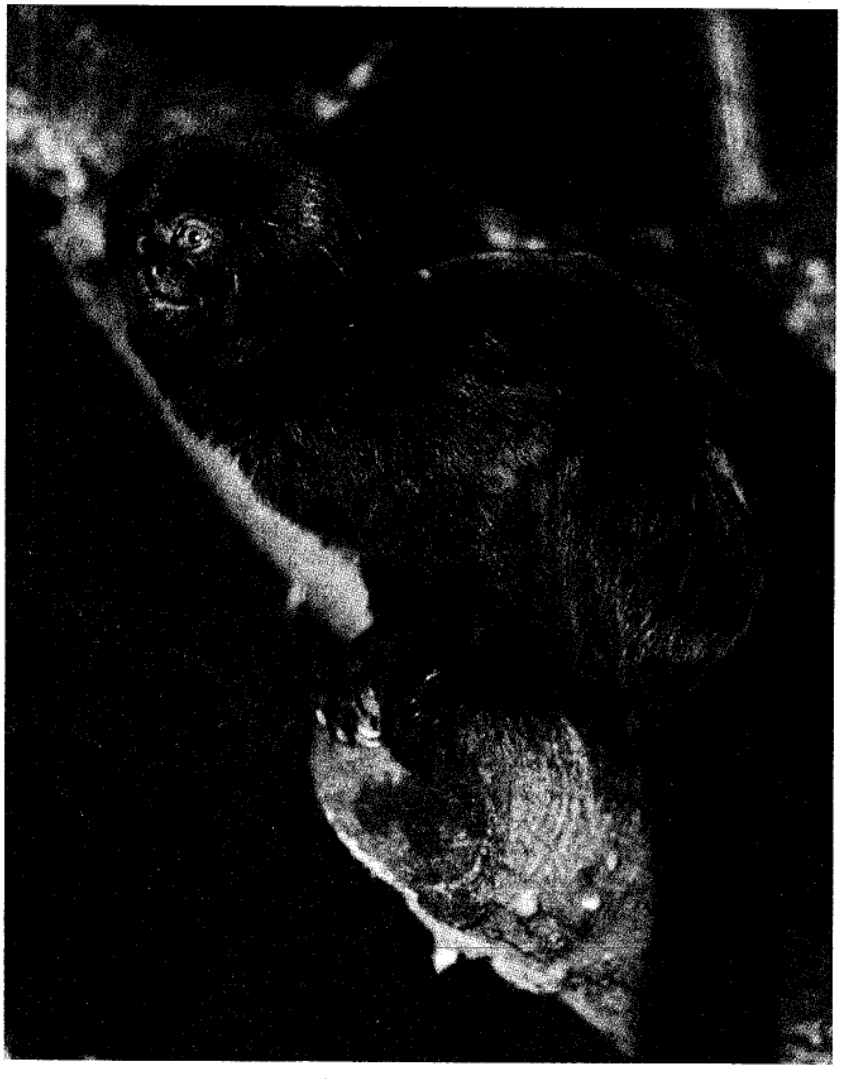

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Articles

CALLITRICHIDS AT BELFAST ZOOLOGICAL GARDENS, NORTHERN IRELAND

Belfast Zoological Gardens has an excellent callitrichid collection that includes representatives from all five genera (see Table 1). Although the zoo has been at the picturesque Cave Hill site since 1934, the development of a new zoo began in 1977. Rather than modifying and upgrading existing enclosures, the new zoo was started from scratch higher up the hill. Careful research ensured that the designs of the new enclosures met the behavioural needs of the animals. Great emphasis has also been placed on allowing optimum viewing for the public. As a result, Belfast has excellent exhibits, and this has been recognised by outside organisations, for instance the gorilla house recently received an award from the Universities Federation for Animal Welfare (UFAW). The purpose of this article is to describe the housing and husbandry of the callitrichid collection at Belfast and to examine their breeding records over the past 10 years.

Enclosure Design

Each group of callitrichids occupies its own indoor and outdoor enclosure. The minimum sizes are 3.8 m^3 and 7.9 m^3 for indoor and outdoor respectively, although most groups live in much larger enclosures, with some outdoor enclosures exceeding 200m^3, and one being over 900m^3. The housing varies between different exhibits in the zoo but most indoor enclosures are off exhibit to the public. They are furnished with branches, shelves, a nest box and a heat lamp. Wood shavings cover the floor. In situations where both indoor and outdoor enclosures can be viewed by the public, there is dense vegetation in both, which allows the monkeys to take cover should they wish to. In all cases, the monkeys have constant access between indoor and outdoor areas except during routine cleaning and husbandry and for observational research. Outdoor areas have a lot of vegetation, with a great variety of diameters, orientations and springiness of branches, providing as such ample environmental complexity. Most enclosures have a large central pole, or other vertical support, allowing the callitrichids opportunities for vertical-clinging, a posture used frequently in the wild and for which their claw-like nails are adapted (Garber, 1991). By virtue of the amount of flowering vegetation in the outside areas, numerous insects are attracted, and the monkeys spend a large proportion of the day foraging for them as they would in the wild. The existence of natural branching is especially important for *Cebuella* and *Callithrix* which have a specialised dentition for gnawing holes to stimulate the flow of gum (Coimbra-Filho, 1972; Coimbra-Filho and Mitttermeier, 1978). Despite several generations of being housed in captivity, this behaviour continues in the absence of any food reward, although artificial gum trees (see McGrew *et al.*, 1986) have been introduced recently to encourage the occurrence of this natural activity. Although good enclosure design is the most important form of "enrichment" for the callitrichids, a number of specific enrichment devices are given. These include novel objects and extractive foraging devices such as boards, pineapple tops and other objects in which mealworms and other "treat" foods are hidden. The *Cebuella pygmaea* enclosure is situated opposite the western lowland gorilla indoor area. The contrast between the largest higher primate and the smallest makes an interesting exhibit, and the gorillas spend a considerable amount of time watching the pygmy marmosets.

Eighteen groups of callitrichids are housed off exhibit to the public. These are mainly of *Saguinus labiatus* and *S. fuscicollis,* a large number of which are kept at Belfast forming as they do part of a research programme examining the costs and benefits of mixed-species groups

Table 1. Callitrichid species currently kept at Belfast Zoo (1st October, 1996).

Species	No. of groups	Sex			Conservation Status*
		Males	Females	Unknown	
Cebuella pygmaea	1	5	1	0	LR
Callithrix argentata	1	1	1	0	LR
Callithrix melanura	1	2	1	1	LR
Callithrix geoffroyi	3	6	3	4	VU
Saguinus oedipus	2	4	5	0	EN
Saguinus imperator subgrisescens	2	2	4	0	LR
Saguinus labiatus labiatus	8	10	10	6	LR
Saguinus fuscicollis weddelli	8	10	10	7	LR
Saguinus bicolor bicolor	2	2	2	0	EN
Leontopithecus rosalia	2	2	3	0	CR
Leontopithecus chrysomelas	2	3	6	0	EN
Callimico goeldii	2	1	4	1	VU

*The IUCN Mace-Lande categories (from Rylands *et al.*, 1995): LR = Lower Risk, VU = Vulnerable, EN = Endangered, CR = Critically endangered.

Cover photograph by Russell A. Mittermeier: Goeldi's monkey, *Callimico goeldii.*

(Buchanan-Smith and Hardie, in press; Hardie, 1995a; Hardie *et al.*, 1993). A number of mixed groups have been established that involve species which naturally form associations in the wild. Currently, there is one tri-specific group of *S. labiatus*, *S. fuscicollis* and *Callimico goeldii* and five mixed groups of the two tamarin species, the largest of which consists of five *S. labiatus* individuals and six *S. fuscicollis*. Details of how the mixed-species groups are established can be found in Hardie (1995a, in press). The key to the success of such housing appears to be the provision of large enclosures (mixed-species groups occupy at least double the area occupied by single-species groups) along with resources such as food, water and sleeping sites being provided at multiple locations to reduce the potential for competition between species.

There are two free ranging groups of callitrichids; one of *Leontopithecus chrysomelas* on exhibit in the zoo and one mixed-species group of *S. fuscicollis* and *S. labiatus* off exhibit. The *L. chrysomelas* group regularly go to the ground to forage and play, and are often seen going down prairie dog burrows!

Diet

Most of the callitrichid groups are fed twice daily. They have a small feed in the early morning consisting of a baby food ("Milupa"), peanuts in their shells, and raisins or primate pellets. Their main feed is given around midday and consists of fruit and vegetables. A high protein food such as marmoset jelly, eggs, chicken, mealworms or crickets is included in each main feed and is varied each day. Vitamin supplements are given regularly. Water is constantly available.

Husbandry

The majority of callitrichid groups consist of an unrelated male/female pair and their offspring. Once offspring are at least 18 months old and have had experience with at least two episodes of infant care-giving, they may be removed to establish new groups or be sent to another collection. There have been two exceptions to this husbandry practice. The first was a *Callimico goeldii* group documented by Hardie (1995b) in which two full sisters were housed with an unrelated male. Both sisters became pregnant and gave birth within 3 days of each other. Due to aggression between the sisters, the infants of the younger sister (who gave birth first) died and due to continued aggression the younger sister had to be removed.

The other case was of a *Callithrix melanura* group. It was sent to Belfast from another zoo on 20 July 1993 and consisted of a father and a son (ages differed by nearly six years) and an unrelated female. The older of the two males was the presumed sire of twin female infants born on 5 August 1993 which were raised successfully. The next birth on 25 May 1994 was of a singleton male, and on the day of birth the older male (aged 9 years 1 month and presumed sire of the infant), was attacked by the younger male. The older male died from the injuries. The newborn infant was unharmed and was reared successfully. The female was impregnated by this younger male and gave birth to triplets on 23 October 1994 (151 days later). They were premature and none survived. This younger male died

Table 2. Data extracted from the breeding records of the callitrichid collection at Belfast Zoo.

Species	No. of births	Triplets: twins: singletons	Sex ratio (male:female: unknown)	Sex ratio surviving to weaning	% surviving	Mean inter-birth interval (days) ± s.e.m.(N)	Median inter-birth interval	Shortest inter-birth interval
Cebuella pygmaea	20	2:10:8	17:13:4	15:10:1	76%	2-47 ± 27 (N = 14)	216	138
Callithrix argentata	3	0:2:1	3:0:2	1:0:0	20%	-	-	-
Callithrix melanura	7	1:5:1	3:3:8	3:2:1	43%	191 ± 34 (N = 4)	160.5	160
Callithrix geoffroyi	15	3:11:1	11:13:8	8:11:4	72%	208 ± 26 (N = 11)	162	149
Saguinus oedipus	16	0:13:3	13:7:9	7:6:3	55%	308 ± 50 (N = 14)	245	160
Saguinus i. subgrisescens	10	0:8:2	3:5:10	1:3:0	22%	351 ± 54 (N = 5)	346	182
Saguinus l. labiatus	15	2:11:2	6:4:20	4:1:7	40%	279 ± 62 (N = 9)	182	176
Saguinus f. weddelli	32	1:20:11	16:20:18	11:16:9	67%	296 ± 45 (N = 19)	220	145
Leontopithecus rosalia	10	3:5:2	15:6:0	10:5:0	71%	243 ± 25 (N = 8)	252	139
Leontopithecus chrysomelas	11	0:8:3	8:8:3	8:8:0	84%	203 ± 26 (N = 9)	162	127
Callimico goeldii	18	0:0:18	7:8:3	2:7:1	56%	295 ± 47 (N = 8)	262	171

on 4 December 1994, and a new male was introduced on 31 January 1995, such that the group then consisted of the new unrelated breeding male, a mother, her twin daughters and her son. The mother gave birth on 9 July 1995 to mixed-sex twins, one of whom (the male) survived. She had another twin birth on 17 December 1995. One of the infants died at 2 months 24 days, but the other male twin survived. One of the twin daughters was removed from the group on 23 December 1995 because she was not well integrated and there were signs of aggression towards her. The unrelated male impregnated both the mother and the remaining daughter in the group. The occurrence of two breeding females in captive callitrichid groups is unusual unless, as is the case here, the breeding male is unrelated to both females. The daughter, aged 2 years and 9 months at the time, was the first to give birth on 19 May 1996, but neither of the twins survived. They were found to be partially eaten. The mother gave birth a week later on 26 May 1996, but both infants were found dead on the second day after birth. They were unmarked at death. Both their mother and the daughter who had given birth a week earlier were seen to carry them on the first day. The daughter was removed on 3 July 1996 to avoid competition for the breeding position. On 27 July 1996, the breeding male (five years old) was found dead as a result of injuries. It appeared he had fought with the oldest son in the group, aged 2 years 2 months at the time, who was also injured but recovered. Despite the increasing number of examples of polygynous and polyandrous matings reported for wild *Callithrix* groups (e.g., Digby and Ferrari, 1994; Ferrari and Lopes Ferrari, 1989), this description of aggression and the inability of two related females or males to live peacefully together in captivity with an unrelated opposite-sexed mate once again suggests that the most compatible grouping in the confines of captivity is that of a monogamous family.

Breeding records

The extent of successful breeding among the callitrichids varies enormously both between species, and between individuals (Table 2). The most successful breeding has been with *L. chrysomelas*, who have raised 84% of 19 infants to weaning (2 months). Belfast also has extremely good breeding records for *C. pygmaea*, *C. geoffroyi* and *L. rosalia*. The records for *S. labiatus* are improving. Belfast has recently acquired several new individuals in its collection, whose rearing histories are unknown. Compared to *S. fuscicollis*, this species has taken a considerable period to settle down, and only recently have several groups started to breed and rear successfully. In *S. labiatus* and those other species where infant survivorship is low, analysis of the records shows that it is generally the case of one pairing continuously failing to rear infants despite regular births. The role of prior infant caregiving is known to be extremely important for all callitrichids (although it may be more important for *Saguinus* sp. than *Callithrix* sp., see Tardif *et al.*, 1984) and the lack of such experience is the most probable cause of failure in these groups. In some pairs, the breeding success has improved over consecutive births, while in others, the husbandry practice of pairing a female who fails to rear with a male who is a proven breeder and caretaker has been more successful.

For marmosets and tamarins, twinning is the norm, and in cases where triplets have been born on no occasion have all three infants survived. There is no clear sex ratio bias at birth for any of the species except for *S. oedipus*, with a ratio of 13 males to 7 females. Interestingly, the males were less likely to survive to weaning resulting in a nearly identical sex ratio at this age (7:6).

It is impossible to determine gestation periods for callitrichids in the Belfast collection, but data on interbirth intervals (with live births) are of interest in this respect (Table 2). The shortest IBI of 138 days for *Cebuella pygmaea* is consistent with gestation periods of 133-140 days given by Christen (1968) and Soini (1988). The shortest IBI for *C. melanura* is 160 days and for *C. geoffroyi* it is 149 days. *C. jacchus* is reported to have a gestation of 148 ± 4.3 days (Hearn and Lunn, 1975). The IBI for *C. geoffroyi* suggests that the gestation may be as short or shorter than *C. jacchus*.

The shortest IBI of 145 days for *Saguinus fuscicollis* is as low as previous estimates of gestation (145-152 days: Wolfe *et al.*, 1975). As with the *Cebuella* and *C. geoffroyi* described above it appears that the females must have become pregnant very shortly after birth. The shortest IBI's for the other *Saguinus* sp. are longer, and may be in line with observations from the wild reported by Soini and Soini (1982), that the smaller bodied *S. fuscicollis* have a shorter gestation, IBI and weaning length than the larger-bodied members of the *S. mystax* group. It is interesting to note that the shortest IBI recorded for *L. chrysomelas* of 127 days is in line with the gestation of *L. rosalia* which is around 125-132 days (Kleiman, 1977) and again this shows that the female became pregnant very shortly after birth assuming gestation is of similar duration in this species. The shortest IBI for *Callimico* was 171 days. Gestation is estimated at 149 days (Ziegler *et al.*, 1989). There are insufficient data to analyse birth seasonality in any of the species as yet, but birth clusters are apparent for *C. geoffroyi*: 47% of the 15 births occurred from September to December. There was also a spring peak for *S. oedipus*, with 44% of the 16 births occurring in April and May.

Zoological collections have the potential to play four

main roles: in conservation, in education, in recreation and in research. Belfast fulfils these four roles. A great many of the animals in the Belfast collection are part of National, European or Global Breeding Programmes. For example 86% of the 59 mammal species kept at Belfast are part of breeding programmes. In terms of education, the combination of excellent signs informing visitors about the animals on exhibit, the activities of the education centre, particularly with school children, and the regular special events concerned with education and conservation issues ensures that Belfast plays a strong role. Recreationally, many local people and visitors to Belfast enjoy a day out at the Zoo. Finally, the commitment of Belfast Zoo to research is exceptional. Not only is there a large enough sample size of monkeys of the same species for experimental studies of behaviour but, in addition, these monkeys are housed off exhibit to the public which minimises disturbance during data collection. Should anyone wish to study callitrichids, or any other animal at Belfast Zoo, they should, in the first instance, contact John Stronge, Director, at the address below.

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Predictability of Plant Food Resources for Mantled Howler Monkeys at Hacienda La Pacifica, Costa Rica: Glander's Dissertation Revisited

Differential use of food resources is one of the principal modes of coexistence among organisms. Groups of mantled howler monkeys (*Alouatta palliata* Gray) at Hacienda La Pacifica, Cañas, Guanacaste, Costa Rica, share an environment, tropical dry forest (see Frankie *et al.*, 1974), that is predictable ("autocorrelated") between seasons (Janzen, 1967; Jones, in press), but the degree of within-season predictability has not been evaluated. Since measures of predictability will reflect the carrying capacity of the environment at any time (see Roughgarden, 1979), howlers might be expected to use environmental cues to "track" temporal fluctuations in resource levels. In a time-varying environment such as that at La Pacifica, however, population parameters will at times "undershoot", at times "overshoot" carrying capacity and, at other times, variations in population parameters may be a function of environmental stochasticity ("discontinuity") rather than predictability.

The purpose of this note is to document variation (temporal heterogeneity) of food resources for mantled howler monkeys at La Pacifica in order to test the idea that where heterogeneity is "fine-grained" relative to generation time (T), animals will "track" the environment with behavioral and/or physiological rather than genetic mechanisms (Slobodkin and Rapoport, 1974; Emlen, 1973). A "fine-grained" environment is defined as one in which environmental variations are shorter than T (i.e., occur several times in an organism's lifetime). Based upon the census of mantled howlers at La Pacifica by Dr. Norman J. Scott, Jr. (U.S. Fish and Wildlife Service) and his assistants, including this author (reported in Malmgren, 1979), I have estimated T to be 6.27 years (Jones, in press).

Tree Abundance and Species Used for Food

The foraging strategy of *A. palliata* at La Pacifica has been described by Glander (e.g., 1975). His studies in riparian habitat showed that the diurnal and wholly herbivorous howlers spent about 24% of their yearly activity "budget" feeding. Six plant families accounted for about 75% of howler feeding time, and three of these (Anacardiaceae, Mimosaceae, and Papilionaceae) accounted for about 61% of total feeding time with about 18% of this total time spent feeding upon flowers (including buds). Glander showed that flowers, in addition to leaf flush and fruit, are a "preferred" food type for howlers who eat, for example, inflorescences of all six species of the Mimosaceae which they use for nutrients and energy. Glander (see also 1978, 1981) likewise demonstrated that five of these species (*Albizzia adinocephala*, *Enterolobium cyclocarpum*, *Inga vera* var. *spuria*, *Pithecolobium longifolium*, and *P. saman*) are among the 25 species used most often for food by howlers and that discriminative feeding may occur in response to phenological patterns within and between seasons, habitats, species, and individual trees that produce qualitative and quantitative differences among plant parts over time and space.

Glander (1975) identified every tree species used as food by one group of mantled howlers in riparian habitat at La Pacifica and classified each species by Family. The Spearman Rank correlation coefficient (r_s) between the number of species per Family used by these howlers and the number of individual trees of that Family present on the group's home range is positive (+0.79) and significant ($p<0.01$), suggesting that animals are primarily sampling from the most common Families of trees *that they use for food.*

Temporal Patterns of Food Available per Month

Glander (1975) reports the food available per month for the top 25 species used most often by his group. Food was categorized by tissue type - new leaves, flowers, and fruit the howlers' preferred diet. From Glander's data it is possible to calculate the number of species out of 25 producing new leaves, flowers or fruit each month. Table 1 presents these data. In absolute terms, there are more species producing new leaves than flowers, and flowers than fruit in each month except June, July, and August (wet season; see Frankie *et al.*, 1974) when more species are producing fruit than flowers. These calculations do not take into consideration variation in tree sizes or fluctuations in phenophases within and between months or hierarchical food preferences which might govern patterns of howler group dispersion over time (see Hubbell, 1979). Nonetheless, these data permit relative assessment of preferred plant tissue availability per month.

Table 1. The number of species producing new leaves, flowers and fruit per month for the top 25 preferred tree species (after Glander, 1975, Table 41).

Month	New Leaves	Flowers	Fruit
January	10	6	5
February	16	13	7
March	17	13	6
April	17	11	7
May	18	8	8
June	11	4	7
July	11	4	5
August	11	2	4
September	13	5	4
October	15	4	4
November	11	5	2
December	12	5	4

On average, 13.5 ± 2.9 (mean ± standard deviation) of the 25 top species are in new leaf phenophase per month, per year; 6.67 ± 3.73 species have flowers; and 5.67 ± 1.3 have fruit. The coefficients of dispersion for these phenophases are 0.62, 2.09, and 0.30, respectively. Absolute diversity of new leaves is greater across months than for flowers and fruit since more species exhibiting new leaf flush are available every month, on average. This pattern of preferred food availability may influence food choice and group dispersion in howlers, although these features of howler socioecology will also be affected by the number of individual trees per species, tree size and architecture, and food quality, as well as other factors (e.g., Schoener, 1971; D. E. Wilson, pers. comm.).

Coefficients of dispersion for new leaves and fruit are repulsed (more observations than expected around a central tendency), whereas flower dispersion is clumped (more observations than expected at tails of distribution). What do these phenomena imply for howlers? Clumping of species in flower shows that more of the 25 preferred species were in flower or not in flower than one would expect if flowering across species were independent. This effect could be explained by flowering synchrony within and between species and suggests that a similar proximate cue triggers flowering at about the same time across species across months. This cue is understood to be the cessation of rainfall in Central American forests (Janzen, 1967; Frankie *et al.*, 1974).

The repulsed distributions of new leaves and fruit are more difficult to interpret than the clumped distribution for flowers, although repulsion does imply that new leaves and fruit are more evenly dispersed across months since about the same number of species exhibit new leaves or fruit over time. Although the clumped distribution of flowers imply that they are a highly predictable food source to howlers *when they are available*, it is not clear whether the relatively even dispersion of new leaves and fruit translates into temporal predictability for howlers. It is likely that one advantage to organisms of foraging on a traditional home range would be an increase in relative stability gained from fine-tuned adjustment to the phenological rhythms of a constant set of trees (see Jones, 1983).

A coefficient of variation (CV) was calculated for the number of months preferred food (new leaves, flowers, and fruit) was available for the 25 favored species. Not every preferred tree species is used for each of the three phenophases. New leaves, flowers, and fruit displayed CV's of 0.30 (8.6 ± 2.6 months), 0.87 (5.3 ± 4.6), and 0.47 (6.3 ± 2.98), respectively. Apparently, the availability of flowers fluctuates more and new leaves and fruit, less, per month than either new leaves or fruit, consistent with the analysis of monthly species diversity as a function of tissue type already reported.

Glander's (1975, Table 41) results on tree phenologies also permit an evaluation of the relative degree of temporal clumping or randomness of new leaves, flowers and fruit for each species. A "runs test" (Siegel, 1956) was performed on the pattern of availability of each preferred phenophase for each of the 25 favored tree species. Sixteen "runs" (8 new leaves, 6 flowers, and 2 fruit) for 14 species could not be evaluated due to insufficient frequency of "runs". Twenty-five "runs" (9 new leaves, 11 flowers, and 5 fruit) of phenophases for 16 tree species exhibited a random pattern of plant tissue availability for one or more of the three preferred phenophases. Ten "runs" (1 new leaves, 5 flowers, and 4 fruit) of 9 of the 25 favored tree species exhibited significant clumping in time ($p<0.05$). That one or more phenophases of the 16 top tree species exhibited a random distribution in time and of 9, a clumped distribution in time, indicates that uncertainty and resource clumping are constant components of the local conditions in which howlers work to survive and reproduce (e.g., Wittenberger, 1980).

Conclusions

A reanalysis of Glander's (1975) data leads to the conclusion that howler populations at La Pacifica are influenced by both predictable and unpredictable factors related to the dispersion of their preferred food, within and between seasons. Emlen (1973) proposes that organisms in a "fine-grained" environment, such as that of the howlers in Guanacaste, will respond to temporal heterogeneity with behavioral and physiological responses and a monomorphic genotype. Malmgren (1979) has shown that howler genotypes are highly monomorphic, implying a "generalist" strategy (Emlen, 1973). Numerous studies document the rich array of behaviors (e.g., Jones, 1995) and physiological responses (e.g., Glander, 1978) displayed by howlers. Studies of the temporal heterogeneity of *A. palliata* and other taxa are important to basic as well as conservation ecology, since an increase in temporal heterogeneity with habitat fragmentation may lead to mortality, negative population growth, and eventual extinction. This observation implies that evolved strategies to the conditions described in this note are eventually limited in their ability to cope with environmental change.

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Notes on a Distributional River Boundary and Southern Range Extension for Two Species of Amazonian Primates

Despite over twenty years of intensive field research in the Neotropics, new species of large mammals, particularly primates, are still being discovered today (e.g., Ferrari and Queiroz, 1994; Lorini and Persson, 1990; Mittermeier *et al.*, 1992). However, from a conservation viewpoint, new distribution records for endangered and threatened species are as important, for example, the significant population of giant otter, *Pteronura brasiliensis*, recently encountered in eastern Bolivia (Taber *et al.*, in prep.). As further regions of the vast Amazonian basin are explored it is vital to recognise the scientific and conservation importance of publishing sightings of rare and endangered species, particularly if localities represent range extensions.

Recent analysis has demonstrated the importance of river boundaries as limiting factors for the distribution of Amazonian primates (Ayres and Clutton-Brock, 1992). Intuitively, the low water width and annual discharge of a given river are important factors to consider when assessing the similarity of primate communities on each bank, since both are likely to affect the river-crossing ability of a given primate species. Ayres and Clutton-Brock (1992) measured the width of a river during the dry season at the midpoint of the river's length, and found that body size and the ability to colonize *várzea* (white-water inundated) or *igapó* (black-water inundated) forest habitats seem to be the most important interspecific differences in how rivers affect different primate species' distributions.

The following observations were made whilst conducting mammalian surveys and ecological research at "Lago Caiman" (13° 35.64' S, 60° 54.74' W) in the Flor de Oro region of the Noel Kempff Mercado National Park, between September 1991 and December 1992, and again from February to December 1995. This protected area is situated on the edge of the Brazilian Shield in north-eastern Santa Cruz Department, Bolivia. The eastern limit of the park is the Guaporé/Iteñez river which is also the border with neighbouring Brazil. At Flor de Oro the dry season river width is between 100-150 m.

In early April 1992, two primates, identified as white-faced bearded saki monkeys (*Chiropotes albinasus*) were observed in *igapó* forest at the river's edge in Brazil (13° 32.63' S, 60° 56.49' W). Both individuals had a striking red colouration around the nasal and genital areas. This species was not encountered again during this field season, probably because it predominantly occurs in *terra firme* forest, with only occasional reports

in flooded forest (Ayres, 1989). In 1995 we observed groups of *Chiropotes albinasus* in *igapó* forest on three occasions between March and April, suggesting a seasonal use of this habitat at the end of the wet season. Previous distributional records suggest these sightings represent a new southern limit for this threatened Brazilian endemic (Ayres, 1989; Emmons, 1990; Ferrari, 1995; Hershkovitz, 1985), extending its known range by about 129 km (see Fig. 1).

Similarly, between April and June 1992, bare-eared squirrel monkeys, *Saimiri ustus*, were encountered on three occasions during research activities, exclusively in a 500 metre stretch of *igapó* forest on the Brazilian side of the river (13°33.75' S, 60°55.47' W). Group size varied from 10 to 40 individuals, although further undetected animals were probably present. Observed individuals foraged along the lower level of the riverside vegetation, once in association with a group of brown capuchin monkeys (*Cebus apella*). In 1995, *Saimiri ustus* was encountered in the same area of *igapó* forest three times between March and April, again suggesting a seasonal use of this habitat. On a fourth occasion *Saimiri ustus* was observed in close association with *Chiropotes albinasus*. Following Hershkovitz (1984), these sightings represent a southern range extension of about 130 km for this taxon (see Fig. 1).

In the Flor de Oro region, primate communities residing on either side of the Guaporé/Iteñez river appear to be considerably different. On the Bolivian side of the river the community includes *Callithrix argentata melanura, Aotus azarai, Cebus apella, Alouatta seniculus, A. caraya,* and *Ateles chamek* (Wallace *et al.*, in prep.). All of these, apart from *Callithrix* and *Aotus*, were recorded on the Brazilian bank along with *Callicebus brunneus, Saimiri ustus, Pithecia irrorata* and *Chiropotes albinasus*. It should be noted that the Brazilian observations were restricted to those primates encountered whilst travelling on the river, whereas the Bolivian information is a product of all sightings during extensive field work. Using analytical techniques adopted by Ayres and Clutton-Brock (1992), and considering only species observed from the river (i.e., *Aotus* and *Callithrix* are not counted for Bolivia), the area has a bank similarity index score of 75%, calculated as: % species on side A common to side B + % on side B common to side A, divided by two. In fact, reliable anecdotal reports suggest that both *Aotus* sp. and *Callithrix* sp. occur on the Brazilian side of the river (L. Garcia, pers. comm.). Following Hershkovitz (1983), the Guaporé represents a boundary for *A. azarai* and the Brazilian *Aotus* is probably *A. nigriceps*, though we have no specimens. Also, according to previous distributional information, the *Callithrix* on the Brazilian side is probably *C. argentata* (Emmons, 1990). Using this rather speculative approach results in a bank similarity score of 66.5%.

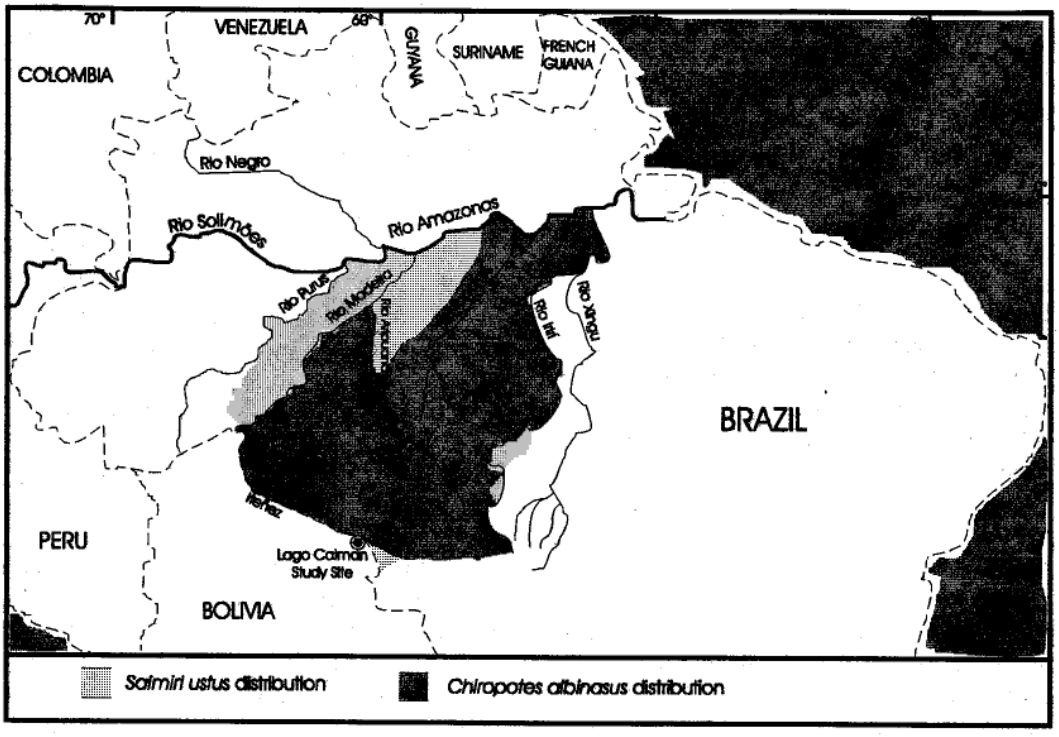

Figure 1. Hypothetical distribution maps for *Chiropotes albinasus* (*v.* Hershkovitz, 1985) and *Saimiri ustus* (*v.* Hershkovitz, 1984), and the location of the Lago Caiman study site. x marks closest previously known site for *Saimiri ustus* and + marks the closest previously known site for *Chiropotes albinasus*.

Both these bank similarity scores are lower than black water rivers of similar width previously considered in Amazonian Brazil (Ayres and Clutton-Brock, 1992). Given the provisos that we have sampled extensively only in one area, and that anecdotal reports suggest *Chiropotes* may occur in Bolivia further east, it appears that the Guaporé/Iteñez represents a natural boundary for several species of primate in this region. Previously published distributional information regarding these species, and the hypothetical range maps drawn up are in agreement with this observation (Ayres, 1989; Emmons, 1990; Hershkovitz, 1984, 1985, 1987). Whether these species' distributions are limited purely by the physical river boundary, which seems dubious given the relatively large size of some of the taxa halted and the narrowness of the river, or if vegetational differences in the two banks also play an important role remains to be investigated.

Reports from local Brazilian inhabitants of a primate species known locally as "macaco barrigudo", suggest that the interior forests of this region of Brazil also include woolly monkeys (*Lagothrix lagotricha*). This suggestion underlines the need for further primate surveys in this region, especially on the Brazilian bank where primate diversity appears to be high and includes several threatened species (*Chiropotes albinasus*, *Ateles Chamek*, and possibly *Lagothrix lagotricha*).

Acknowledgments

The study at Lago Caiman was supported by a grant to A. Taber from the Wildlife Conservation Society (WCS). Considerable logistical support was received whilst at Flor de Oro from Fundación Amigos de la Naturaleza (FAN) and their local employees. We also thank J. Robinson for his comments on an earlier draft of this paper.

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PLATYRRHINES IN PIMENTA BUENO, RONDÔNIA, BRAZIL

The Pimenta Bueno Municipal Park (*Parque Natural Municipal de Pimenta Bueno*) is part of one of the largest and best preserved fragments of native forest habitat in the vicinity of the BR-364 federal highway; pivot of colonisation in southwestern Amazonia, in southern Rondônia (Fig. 1), but an area where the primate fauna is still relatively poorly known (de Vivo, 1985). The park was visited during four days at the beginning of June 1996 as part of a survey of the state's mammalian

fauna. Despite its relatively small size (the park itself covers 532 ha, and adjoining areas of native habitat encompass a further 500 ha), the forest apparently still contains a number of large mammals, including tapirs (*Tapirus terrestris*), peccaries (*Pecari tajacu*) and atelines (*Alouatta seniculus* and *Ateles chamek*), which suggests that hunting pressure is low (see e.g., Peres, 1990).

Ateles chamek is relatively common is Rondônia, but Pimenta Bueno is one of only a handful of sites at which *Alouatta* has been recorded in the state (de Vivo, 1985; Ferrari and Lopes, 1992; Ferrari *et al.*, 1995, 1996). The factors that determine the "patchy" distribution of howler monkeys in southwestern Amazonia (Ferrari *et al.*, 1996) are still unclear, but it is hoped that data currently being collected will throw some light onto this intriguing question.

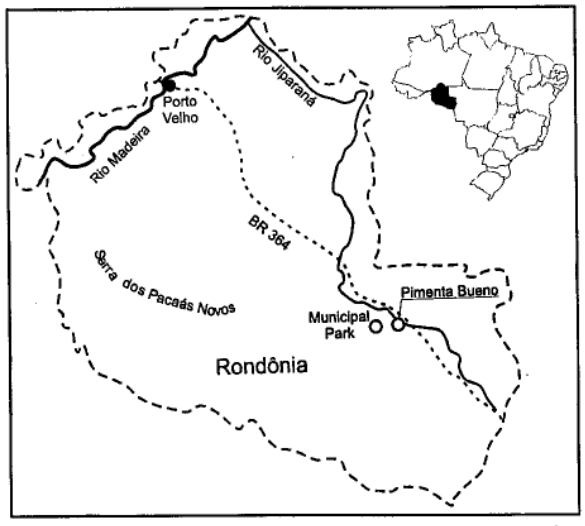

Figure 1. Rondônia, southwestern Brazilian Amazonia, showing Pimenta Bueno and other sites mentioned in the text.

Saguinus fuscicollis weddelli, the most widespread of the numerous subspecies of saddle-black tamarins, was observed at Pimenta Bueno, but no evidence was found of the occurrence of marmosets (*Callithrix* sp.) in either the park or surrounding areas. Their behaviour (especially bark-gouging) and habitat preferences make marmosets relatively conspicuous, and as there were no reports from local residents, it seems reasonable to conclude that these monkeys are absent from this region. While the geographic range of *S. f. weddelli* is thus extended further south and east, that of *Callithrix* is once again reduced. The available evidence now indicates that *S. f. weddelli* occurs throughout Rondônia west of the Rio Jiparaná, and that the range of *Callithrix* is restricted to a much smaller northern portion of this area, a situation exactly opposite to that indicated by the data available prior to 1995 (see Rylands *et al.*, 1993).

Three other platyrrhines were observed in the park, and a fourth (*Pithecia* sp.) was reported by local residents, bringing the total number of diurnal species at the site to seven. Mixed groups of tufted capuchins (*Cebus apella*) and squirrel monkeys, apparently *Saimiri boliviensis*, were encountered on a number of occasions. The occurrence of *S. boliviensis* at this site was unexpected, given that *S. ustus* has been recorded at all others in Rondônia south of the Madeira (Hershkovitz, 1984; Ferrari and Lopes, 1992; Ferrari *et al.*, 1995).

A group of titi monkeys was also observed in the park. The animals were certainly not members of the distinctively brown-coloured *Callicebus brunneus*, the species found at other sites in Rondônia, west of the Jiparaná (Hershkovitz, 1990; Ferrari and Lopes, 1992; Ferrari *et al.*, 1995), but were greyish in colour similar to *Callicebus moloch*, the distribution of which has previously been restricted to the east of the Jiparaná/ Madeira rivers (ibid.).

Overall, these records from Pimenta Bueno would appear to indicate that important differences may exist in the platyrrhine faunas of southern and northern Rondônia (west of the Rio Jiparaná), although the exact nature of these differences is still unclear. If, as suggested above in the case of *Callithrix*, factors such as altituide and related habitat preferences are relevant, then the Serra dos Pacaás Novos, which rises to over 1,000 m above sea level and virtually bisects the state (Fig. 1), may play a fundamental role in these differences.

Clearly, the zoogeography of platyrrhines in southwestern Brazilian Amazonia is more complex than had been assumed previously. Additional data are required not only for the identification of all the region's primate species and the definition of their geographic ranges, but also for a more systematic analysis of the factors determining their distribution. To what extent it will be possible to collect these data remains to be seen, however, given the continuing onslaught of loggers and ranchers in the state of Rondônia and neighbouring areas of Amazonas and Mato Grosso.

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News

IUCN/SSC Primate Specialist Group Triennial Report 1994-1996

The Primate Specialist Group has had a very successful triennium, during which it consolidated the reorganization that began in 1992, started a new publication series, and saw a substantial increase in fundraising success. Some of the highlights of the past three years are briefly summarized here.

First of all, the group now numbers some 250 individuals from more than 30 countries. These are divided into four major geographic regions representing the principal areas in which nonhuman primates live: the Neotropical region, Africa, Asia and Madagascar. Given the large size and many activities of the group, the decision was reached to undertake substantial decentralization during a meeting of the group at the International Primatological Society Congress in Strasbourg, August 1992. This restructuring has been underway for the past four years, and is now almost complete, with Vice-Chairs and regional newsletters in place in each region. Dr. Anthony Rylands from Brazil and Dr. Ernesto Rodríguez-Luna of Mexico are Co-Chairs of the Neotropical Section, Dr. Ardith Eudey chairs the Asian Section, Dr. Thomas Butynski of the Atlanta Zoo (and based in Nairobi) chairs the African Section, each producing newsletters for their respective regions. Dr. Jörg Ganzhorn of the German Primate Center, has taken over the editing of the newsletter for the Madagascar Section, *Lemur News*, and is considering taking over the Vice-Chair position of this section as well. Publication of *Asian Primates* has been underway since 1991, *Neotropical Primates* and *Lemur News* began in 1993, and *African Primates* was inaugurated in 1995.

In addition, after serious consideration of the role of our journal, *Primate Conservation*, which had been backlogged for several years, we decided that there was a continued role for this publication, and it was subsequently brought up to date with the production of three full issues in August, 1996. Editing of the journal has now been turned over to Dr. Anthony Rylands, and the next issue (No.17) is expected by the end of 1996.

The fourth of our PSG Action Plans was also produced during this period, this one being the updated version of the *Action Plan for African Primate Conservation: 1986-90*. The first African Action Plan, published in 1986, was the first of the SSC Action Plans in their modern form. Dr. John Oates wrote the original plan and prepared the updated 1996 version as well. A draft of a second action plan, *Mesoamerican Primates*, has been completed and should be published shortly. It has been prepared by Ernesto Rodríguez-Luna, Liliana Cortés-Ortiz, Russell Mittermeier and Anthony Rylands.

With support from Conservation International, we have also launched a new *Tropical Field Guide Series*, the first few of which will be dedicated to primates. The first volume, *Lemurs of Madagascar*, has already appeared, and other volumes are in preparation for primates of the Guianas, the Atlantic forest of eastern Brazil, Colombia, Peru, and Vietnam, with an additional volume on marmosets and tamarins. The purpose of these books is to summarize available information in a ready-to-use format, with a particular eye towards ecotourism, the idea being to stimulate a tradition of life-listing and primate-watching comparable to that for birds.

The PSG also participated in the analysis of all primate species using the new Red List criteria, published in the

1996 IUCN Red List of Threatened Animals (see *Neotropical Primates*, 3 (suppl.), 1995). The results of this analysis indicated that 95 out of 275 primate species fall into the critical, endangered and vulnerable categories. This is almost certainly an underestimate, given the fact that many animals were in the data deficient category, which, as information, becomes available, are likely to be added to the threatened list. Furthermore, the PSG undertook an analysis of primate status at the most basic taxon level (subspecies), since it rapidly became obvious that the species level was not adequate for fully understanding the conservation situation of the Order Primates. This analysis indicated that of the approximately 620 taxa of primates, fully 35 are in the critical category, 70 in the endangered category, and another 101 in the vulnerable category. Of particular concern are the 35 critically endangered species, which are literally on the verge of extinction. Although the Order Primates is the only large Order of mammals that has not lost a single taxon in this century, a record of which we are particularly proud, we may not be so fortunate in the next century. Indeed, it is possible that one subspecies, Miss Waldron's red colobus (*Procolobus badius waldroni*) from Ghana and Cote d'Ivoire, may already have gone extinct. Clearly these critical primate taxa need very special attention from the primate conservation community.

The PSG also organized a two day symposium at the recent Congress of the International Primatological Society, held in Madison, Wisconsin in August, 1996 (see *Neotropical Primates*, 4(3), 1996, pp.89-90). This was the largest meeting of primatologists in history (1200 participants), and our symposium attracted a large audience. Its principal objectives were to provide a retrospective of what had been accomplished in primate conservation over the past two decades (particularly the activities of the PSG and Conservation Breeding Specialist Group - CBSG), and also a look at the future, focusing on the critically endangered. More than 35 scientists gave presentations in the symposium and there were more than 300 participants in this event, which also included a closing roundtable looking at possibilities for action in the 21st century. One of the conclusions was that we might consider an *Action Plan for the Critically Endangered*, to guide at least one portion of our activities over the next few years. Several areas of particular concern emerged, especially Vietnam, which has a large number of critical and endangered species, most of which are receiving little or no attention. Brazil, Madagascar, Indonesia, China and parts of West Africa emerged as major priorities once again, to no one's surprise. The issue of the bushmeat trade in Central Africa and its impact on primates was also raised and is clearly a major issue in primate conservation with which we will have to deal in the future.

At this meeting, we also announced the appointment of Anthony Rylands as Deputy Chairman of the PSG, replacing William Konstant who had served in that position for almost a decade.

Finally, we are pleased to announce the creation of two new foundations devoted specifically and exclusively to primate conservation. The first of these, the *Margot Marsh Biodiversity Foundation*, will provide several hundred thousand dollars per year for priority primate conservation projects. It is named after the late Margot Marsh, a great supporter and friend of conservation during her lifetime (see *Neotropical Primates* 4(2), 1996, pp.65-66). PSG Chair, Russell Mittermeier, serves as President of this new foundation. The other, entitled *Primate Conservation Inc.*, is headed by PSG member Noel Rowe, and will provide several tens of thousands of dollars for selected primate conservation projects (see *Neotropical Primates*, 3(1), p.23, and 3(3), p.91, 1995).

We look forward to continued growth during the next triennium, and to accompanying and participating in further efforts to maintain the diversity of the Order Primates.

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The Primate Center at the University of Brasília

The Primate Center of the University of Brasília (CPUnB) was established over 20 years ago under the leadership of Prof. Milton Thiago de Mello and has played an important role in the development of primatology in Brazil. During this time, the CPUnB, working together with the Brazilian Primatological Society (SBPr), has promoted six specialization courses in Primatology, and hosted four SBPr congresses and the 1988 Congress of the International Primatological Society (IPS).

The CPUnB is currently in the process of being reorganized, with the construction and refurbishment of

the facilities, improvement of the breeding conditions of the animals, development of new research programs, and expansion of the staff. The main objective of the Center is to provide a captive breeding colony of Brazilian Primates for ethological and biomedical research.

The CPUnB is located in the Fazenda Água Limpa (FAL) about 30 km from the University of Brasília (16° 30' S and 46° 30' W). The FAL, a farm of 4.062 ha, is an experimental station for agronomic, forestry, and ecological research. About one half of the area is an ecological reserve. Surrounding the FAL there are two other reserves, the Brasília Botanical Garden and the Ecological Reserve of the Brazilian Institute for Geography and Statistics (IBGE), together comprising a continuous protected area of 10.000 ha.

The Center is within an area of 30 ha of Cerrado (tropical savanna) vegetation with tropical semideciduous riverine forest. Three primate species occur there naturally: the marmoset (*Callithrix penicillata*), the black howler monkey (*Alouatta caraya*), and the tufted capuchin monkey (*Cebus apella*). The facilities include a laboratory, offices, classroom, kitchen, quarantine facilities, and 36 cages, each with indoor-outdoor sections.

At present the colony has 50 individuals of five primate species: *Callithrix penicillata, Callithrix jacchus, Saguinus midas, Saimiri ustus* and *Cebus apella.* The following research projects are currently undertaken with these animals: learning abilities in capuchin monkeys; color vision in capuchin monkeys and tamarins; temporal and spatial memory in callitrichids; environmental enrichment; spontaneous periodontal disease and diet in squirrel monkeys; and cytoarchitecture of the visual cortex in callitrichids. Research activities are partially supported by Brazilian National Research Council (CNPq) and are in accordance with the regulations imposed by the Brazilian Institute for the Environment and Renewable Natural Resources (Ibama). Furthermore, one of the goals of the Center is the breeding of endangered species along with the development of research on reproductive behavior relevant to their husbandry and management.

The staff is composed by two Senior researchers, four Assistant Professors, two doctoral students, one Master's student, 11 undergraduate students, and two caretakers. The staff has a multidisciplinary background and includes psychologists, physicians, veterinarians, biologists, and dentists.

The CPUnB is maintained by the University of Brasília. The refurbishing of the old and the construction of the new facilities have been supported by FAL and the Centro de Eventos Especiais (CESPE-UnB). The Center is willing to collaborate with researchers and other academic institutions. Further information can obtained from Prof. Maria Clotilde Tavares, Director of the Primate Center.

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Social and Sexual Relations of the Muriquis at the Caratinga Biological Station, Minas Gerais

Promiscuity in primates appears to be a female strategy to increase the possibility of conception. Female muriquis, *Brachyteles arachnoides*, often copulate with more than one male, and there are a number of indications that muriquis have particular preferences for certain sexual partners (Strier, 1986, 1992, in press). From 1 August 1995 to 30 July 1996, a study was carried out at the Caratinga Biological Station, Minas Gerais, Brazil, to clarify the dynamics of female mate choice, observing whether males or females initiate sexual interactions, and determining what the sexes do to attract each other. Methods used included focal animal, scan sampling and opportunistic behavior sampling. Nineteen adult females from the Matão group were observed. The focal animal method was used to record each adult female's activities and her nearest neighbors, scan sampling recorded the degree of group dispersion. All rare events observed were recorded opportunistically.

The study was supervised by Dr Karen B. Strier, Department of Anthropology, University of Wisconsin, Madison, USA. It was supported by grants to her from the U. S. National Science Foundation (Grant BNS 8958298), the Liz Claiborne and Art Ortenberg Foundation, the Chicago Zoological Society, and the Lincoln Park Zoo Scott Neotropic Fund, Chicago.

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Brasileira de Primatologia, Brasília.
Strier, K. B. 1992. *Faces in the Forest: The Endangered Muriqui Monkeys of Brazil*. Oxford University Press, Oxford.
Strier, K. B. In press. Mate preferences of wild muriqui monkeys (*Brachyteles arachnoides*): Reproductive and social correlates. *Folia Primatol.*

The Diet of Muriqui Females, *Brachyteles arachnoides*, in Different Reproductive Conditions

In September, 1996, Cláudio Pereira Nogueira defended his Master's thesis in Biological Sciences, comparing the diets and activity budgets of female muriquis, *Brachyteles arachnoides*, in different reproductive conditions. The degree was awarded by the Faculty of Applied Sciences of the University of Guarulhos, São Paulo, Brazil. The research was supervised by Dr. Mário Sérgio Galvão Bueno in collaboration with Dr. Karen B. Strier of the Department of Anthropology, University of Wisconsin, Madison, and was supported by grants from the Liz Claiborne and Art Ortenberg Foundation, and the Chicago Zoological Society - NSF BNS 8958298 (through Karen B. Strier). The following is a summary of the thesis.

From August 1992 to July 1993, a field study of a group of 17 female muriquis (*Brachyteles arachnoides*) was carried out in the forest of the Biological Station of Caratinga (Fazenda Montes Claros), Minas Gerais, Brazil (see Strier, 1992). Behavioral data was obtained from 1,764 focal samples (of 10 minutes each) of four classes of females: nonreproductive, pregnant, lactating with infant up to 12 months old, and lactating with offspring more than 12 months old. The data indicated that females spend an average of 51.6% of their time resting, 36.0% feeding, 11.2% traveling, 0.5% in social behavior and 0.3% drinking water. Females devoted an average of 60.2% of their feeding time to leaves, 26.9% to fruits, 9.3% to flowers and 3.6% to bamboo, bark and ferns. The increase in time spent feeding compared to other studies may be due to the increase in size of the Matão group and the change in group composition, with a larger number of females with greater energetic requirements. Comparing the females in different reproductive conditions revealed significant differences in their activity budgets. Nonreproductive females devoted an average of 57.6% of their time to resting, 31.4% to feeding, 10.3% to traveling, 0.6% to social behavior, 0.1% to drinking and 64.4% of their feeding time to leaves, 27.1% to fruits, 6.7% to flowers, 1.2% to bamboo, 0.5% to bark and 0.1% to ferns. The pregnant females devoted an average of 54.4% of their time to resting, 31.4% to feeding, 13.2% to traveling, 0.3% to social behavior, 0.1% to drinking and 56.1% of their feeding time to leaves, 27.2% to fruits, 12.5% to flowers, 3.8% to bamboo and 0.4% to ferns. The lactating females with infants up to 12 months old devoted an average of 50.3% of their time to resting, 38.8% to feeding, 9.7% to traveling, 0.5% to social behavior, 0.7% to drinking, and 58.2% of their feeding time to leaves, 30.5% to fruits, 8.2% to flowers, 1.6% to bamboo, 1.0% to barks and 0.5% to ferns. The lactating females with offspring over 12 months of age devoted an average of 47.2% of their time to resting, 39.5% to feeding, 12.5% to traveling, 0.5% to social behavior, 0.3% to drinking water and 60.2% of their feeding time to leaves, 23.9% to fruits, 10.9% to flowers, 1.7% to bamboo, 2.6% to bark and 0.7% to ferns. The results indicated that the females with lower energetic requirements (nonreproductive females) spent less time feeding and adopted an energy-saving strategy, spending less time in traveling and more time in resting, while including a larger proportion of leaves in their diet. The pregnant females spent less time in feeding but consumed more high energy food and avoided feeding competition by varying their diet. The females with the highest energetic requirements (lactating) spent more time in feeding and consumed more high-energy food (fruits and flowers).

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References

Nogueira, C. P. 1996. Comparação entre as dietas de fêmeas de muriqui (*Brachyteles arachnoides*, Primates, Cebidae) em diferentes estágios reprodutivos. Unpubl. Master's thesis, University of Guarulhos, São Paulo. 90pp.
Strier, K. B. 1992. *Faces in the Forest: The Endangered Muriqui Monkeys of Brazil*. Oxford University Press, Oxford.

Cytogenetic and Phylogenetic Studies of *Alouatta* from Brasil and Argentina

Edivaldo Herculano Corrêa de Oliveira completed his Master's thesis on the cytogenetics of howling monkeys, *Alouatta*, at the Federal University of Paraná (UFPR), Curitiba in May 1996. He was supervised by Dr Ives José Sbalqueiro (UFPR), in collaboration with Prof. Margarida M. C. de Lima (Federal University of Pará, Belém). The research was financed by the Brazil National Science Council (CNPq), the Brazilian Higher Education Authority (CAPES), and the Federal

Universities of Paraná and Pará, Brazil.

The study comprised the first intrageneric (G, C and NOR banding) and phylogenetic study of the genus *Alouatta* (Primates, Atelidae), including representatives of all four species found in Brazil and Argentina: *A. fusca, A. seniculus, A. belzebul* and *A. caraya. A. palliata*, was compared from the literature (Ma *et al.*, 1975). The aim was to characterize each species karyologically, as well as to determine the different chromosomal rearrangements involved in inter-and intraspecific variation. The results were converted to numerical data and submitted to cladistic analysis, which was performed using the PAUP program. *Cebus apella* and *Chiropotes satanas* were used as outgroups. The platyrrhine ancestral karyotype proposed in the literature was used in the polarization. The results obtained allowed for the following conclusions.

1) *Alouatta* is very variable in its karyotype, both inter- and intraspecifically.

2) The most important chromosomal rearrangements found in their karyotypic evolution were fusion/fission, inversions, translocations and complex rearrangements.

3) *Alouatta fusca* showed the greatest variation, having diploid numbers of 45, 46, 49 and 52. The odd numbers were due to Y-autosome translocations. The different diploid numbers could be related to different geographic localities.

4) *Aloatta belzebul belzebul*, from our samples, and *A. b. nigerrima*, from the literature, had very different karyotypes: although the both have the same diploid number (2n = 50 in females), the G-banding pattern of *A. b. nigerrima* was more similar to *A. seniculus* than to *A. b. belzebul.*

5) *Alouatta caraya* showed the most conservative karyotype: All the specimens from a number of different localities had 2n = 52.

6) The cladistic analysis clearly separates *Cebus* and *Chiropotes* from *Alouatta.*

7) *Alouatta* could be divided into four different groups: "Palliata" Group (*Alouatta palliata*, 2n = 54, with the least derived karyotype); "Caraya" Group (*Alouatta caraya*, 2n = 52); "Fusca" Group (*Alouatta belzebul belzebul* and *Alouatta fusca*); and "Seniculus" Group (*Alouatta seniculus* and *Alouatta belzebul nigerrima*).

8) On the basis of information obtained from chromosomes, and taking into account the evolutionary theories for platyrrhine monkeys, it was possible to suggest that there is a tendency in *Alouatta* for a reduction in the diplold number in the more derived karyotypes found, probably due to fusions and complex rearrangements such as multiple translocations and tandem fusions.

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Oliveira, E. H. C. 1996. Estudos Citogenéticos e Evolutivos nas Espécies Brasileiras e Argentinas do Gênero *Alouatta* Lacépède, 1799 (Primates, Atelidae). Unpubl. Master's thesis, Universidade Federal do Paraná, Curitiba.

Mesoamerican Biological Corridor Project

The "Regional Mesoamerican System of Protected Areas, Buffer Zones, and Biological Corridors", better known as the Mesoamerican Biological Corridor, is being created in the countries of the region. The project is currently studying opportunities to fund the future operation of a Mesoamerican corridor that will serve to facilitate connections among the Regional System of Protected Areas, and create a migratory route providing some protection for the species that move from one country to another. This is being undertaken by a project developed by the Central American Commission for the Environment and Development (CCAD), which received funding from the Global Environment Facility (GEF), channeled through the local offices of the United Nations' Development Program (UNDP) in each country. The project is coordinated by a regional consultant based in Costa Rica and by national consultants that serve as contacts with the responsible national offices, since it forms part of the framework of regional presidential obligations regarding the environment, such as the Central American Biodiversity Convention, the Central American Forests Agreement, and the Alliance for Sustainable Development.

The Consultants held their first meeting in San Salvador in March 1996, together with personnel from the Wildlife Conservation Society (WCS). A second meting was held in June 1996 at the Santa Rosa National Park, Costa Rica. The Project is strongly supported by the environment and natural resources ministries of the Mesoamerican countries. It is also supported by UNEP,

OAS and GTZ, and participation is being souight from the governments of other countries, including Norway and Austria.

The representatives for each of the Central American countries are: Juan Carlos Godoy (Guatemala), Anselmo Castañeda (Belize), María Luisa Reyna de Aguilar (El Salvador), Jaime Incer (Nicaragua), Leonel Mariñeros (Honduras), Randall Garcia (Costa Rica), and Darío Tovar (Panamá). The project is coordinated by Mario Boza, and advised by a team of experts from WCS: James Barborak, Archie Carr III, Alejandro Grajal, George Powell, and Bruce and Carolyn Miller: as well as members of other institutions, such as Sigifredo Marín (MINAE, Costa Rica), Edgar Piñeda (UNDP Guatemela), and members of the CCAD. For more information, contact Mario Boza, Tel: (506) 224-9215, Fax: (506) 225-7516. From *Mesoamericana*, 1(1): June 1996.

Ecuador's Maquipucuna Reserve Invites Visitors and Researchers

Fundación Maquipucuna, an Ecuadorian non-governmental organization concerned with conservation of biodiversity and sustainable use of natural resources, has recently completed construction of ecotourist and scientific facilities at the Maquipucuna Reserve. The facilities are easily accessed by car, only two hours northwest of Quito on the western slopes of the Andes. Visitors of all types are encouraged to come to learn, study and experience the tropical forest's diversity.

The Maquipucuna Reserve is 4,500 hectares, 80% of which is undisturbed cloud forest, ranging from 1200 meters to 2800 meters in altitude. It is surrounded by an additional 14,000 hectares of "protected forest", which is adjacent to one of the world's top ten biodiversity "hotspots", the Chocó Bioregion. Like many cloud forests, it is extremely rich in epiphytes, many of which have not been identified. The total number of plant species is close to 2000. In addition, the Reserve contains at least 320 species of birds, 45 especies of mammals, and more than 250 species of butterflies. Other groups are yet to be studied in detail. Finally, Maquipucuna offers archaeological resources to those interested. Ceramics, burial sites and buried pathways of Pre-Incaic Indians are scattered throughout the region.

Accommodation and facilities include a tourist lodge by a clean, free-flowing river and housing up to 20 people. In addition, threre is a separate scientific research station for 10 people and an adjoining laboratory. Public space is available for meetings or instruction (the Fundación encourages educational programs and courses). Meals are served to all visitors and are based on local recipes. A network of trails allows tourists and scientists to easily access a variety of natural habitats in different stages of succession. Interpretive materials are being developed for the Reserve, and library resources are available at the Fundación's office in Quito. Information: Abigail Rome, Fundación Maquipucuna, Casilla 17-12-167, Quito, Ecuador. Tel: 593 2 507 200/ 202; Fax: 593 2 507 20; e-mail: abi@maqui.ecx.ec. From *Tropinet* 7(3), 1996, pp.2-3.

WWF and *ORYX* - WWW Sites

The World Wide Fund for Nature (WWF), the world's largest independent conservation organization, has launched its World Wide Web Site, the WWF Global Network. This site provides comprehensive news and information on all aspects of conservation and the environment. Topics include: forests, climate change, marine issues, pollution, species, and sustainable development. The address is: http://www.panda.org.

The journal of Fauna and Flora International, *Oryx*, edited by Dr. Jacqui Morris, also has a home page, mounted on the Blackwell Science Ltd. Internet Server. The address is: http://www.blacksci.co.uk/products/ journals/oryx.htum.

The Primate Information Center - A Premier Information Source

The Primate Information Center (PIC) is the world's most comprehensive bibliographic service for literature on nonhuman primate research. Since its founding in the early 1960's, the PIC has ably served information needs of researchers, educators, and students. The PIC is a division of the Regional Primate Research Center at the University of Washington, Seattle, one of seven such centers established and funded by the National Institutes of Health. The PIC indexes all scientific literature related to nonhuman primates. Coverage encompasses biomedical, behavioral, veterinary, primatological, paleontological, genetic, and zoological studies. Indexed material may focus on nonhuman primate biology and behavior itself, or on the use of nonhuman primates as animal models for human disorders. The PIC's database of citations extends back to 1940. The strength of this database resides both in its comprehensive coverage of the literature and in the thoroughness of the taxonomic indexing. Searches can be narrowed to the exact species, and sometimes even subspecies.

Researchers, both in academia and business, require literature searches when preparing grant applications or

embarking upon new research projects. Colony managers and veterinarians request references on topics ranging from disease symptoms to enrichment practices. Students find our services invaluable for class assignments, and faculty use our bibliographies to help prepare course lectures. Whether you are a pharmaceutical researcher investigating the efficacy of a new drug or a doctoral student about to head off to Amazonia for behavioral research in the field, the PIC can supply the needed bibliographic information.

Current Primate References (CPR): CPR is a monthly bibliographic journal listing all the indexed books, book chapters, dissertations, reports, newsletter items, and journal articles most recently processed. Citations are listed by broad subject categories along with reprint request addresses when appropriate. Each issue contains author and taxonomic indexes. A cumulative author index is found in the December issue. CPR goes worldwide to libraries and individuals on six continents. Subscriptions can be started any time during the year.

Topical Bibliographies: The PIC publishes bibliographies in a wide diversity of areas. When appropriate, bibliographies have taxonomic indexes, and some may contain short subject indexes. They are reasonably priced. The list of available topical bibliographies is very extensive. New topics are announced in *Current Primate References*. The PIC encourages requests from anyone wishing a current list of titles and prices, and we would be happy to add your name to our mailing list for announcements.

Retrospective Bibliographies: The PIC can produce custom retrospective bibliographies to meet your taxonomic and subject specifications. Our computer database contains well over 100,000 citations from 1971 to the present. In addition, we have manually searchable files that cover the 1940-1970 time period. Search requests are best handled by calling the PIC and consulting directly with the Literature Analyst specializing in your area of interest. However, requests are also accepted by mail, fax and e-mail. Subjects must generally be defined narrowly enough that fewer than 200 citations are retrieved. Fees are based on number of years searched.

Monthly Custom Bibliographies: For researchers with a long-term interest in a particular area, the PIC offers a monthly current awareness service. A search strategy is devised in consultation between the requester and Literature Analyst. Each month, this strategy is run against the most current indexing, and the tailored bibliography is mailed to the requester automatically. This service is available only on an annual subscription basis. The service may be started any time during the year.

PRIMATES Database: The PIC leases its bibliographic database files from 1985 to the present to institutions wishing to do on-site searching. This database runs on DOS-based PCs with large hard drives. Access can be through an individual computer or over a network. Monthly updates, with complete indexing, are available by yearly subscription. Contact the PIC manager for details.

Primate Information Center, University of Washington RPRC Westlake Facility, 1101 Westlake Avenue North, Seattle, Washington 98109, USA, Tel: 206 543 4376, Fax: 206 616 1540, e-mail: pic@bart.rprc.washington.edu.

ASKPRIMATE

ASKPRIMATE is an e-mail based international reference service for basic questions dealing with primates, primate organizations, or individuals in primatology. It is a cooperative service managed by the library of the Wisconsin Regional Primate Research Center at the University of Wisconsin - Madison. Queries are relayed to a coalition of libraries including those at the Oregon Regional Primate Research Center, the New England Regional Primate Research Center, Brown University and the Primate Information Center at the Washington Regional Primate Research Center. Other primate information agencies are encouraged to participate. Sample questions: What is the average weight of an adult male chimpanzee? What is the phone number for the Jane Goodall Institute? What is the e-mail address for Dr. Duane Rumbaugh? Are there any videotapes that show sexual behavior in orangutans? Can you recommend any children's books on mountain gorillas? Questions should be as specific as possible. It is recommended that users of this service explore local resources, such as local public, school, or university libraries, before consulting ASKPRIMATE. Primate-related questions which are deemed to be outside the scope of ASKPRIMATE may be forwarded to Primate-Talk, an electronic forum for the exchange of information related to primate research, conservation and education. Requests for extensive bibliographic information will be forwarded to the Primate Information Center,Washington Regional Primate Research Center, which is a fee-based service. Send your questions via e-mail to: askprimate@primate.wisc.edu. Questions are also welcome by phone: (608) 263-3512, fax: (608) 263-4031, or mail to: ASKPRIMATE, Primate Center Library, 1220 Capitol Court, Madison, Wisconsin 53715-1299, USA.

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Measuring Behavior '96 Workshop Proceedings

From 16-18 October, Measuring Behavior '96, the international workshop on methods and techniques in behavioral research, was held in Utrecht, The Netherlands. The proceedings of the meeting are now available on the world wide web. These include the abstracts of all oral papers and posters, as well as short descriptions of the instruments and computer programs demonstrated during the meeting. The address is http://www.diva.nl/noldus/mb96.html.

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Volunteer Research Program - Tambopata, Peru

The Tambopata Reserve Society - Research and Monitoring Studies (TReeS-Ramos), a British non-governmental organization, is presently organizing a two-year study in the southern rainforests of Peru. TReeS-Ramos, which has been working in this area for the last 10 years (particularly in and around the rainforest reserve of Tambopata/Candamo in the Department of Madre de Dios), is undertaking research and funding a number of local conservation and ethnobiological initiatives, as well as lobbying for greater conservation awareness of this area both nationally and internationally.

The rainforest reserve of Tambopata-Candamo extends over 1.4 million ha of subtropical forest incorporating seven distinct forest types. The reserve spans a wide range of altitudes (250 m - 3,500 m) and receives an average of 2,500 mm of rainfall per year. It contains exceptional biodiversity due to the biogeographic characteristics of the area; its position at the foot of the Andes and within the transition zone between evergreeen rainforest and tropical savanna.

Project Tambopata will investigate the impact of tourism on populations of primates, birds, amphibians and reptiles in the reserve. A number of research volunteer positions tenable for three-month periods beginning in January 1997 through December 1998 are available. The project will unite international research volunteers, accepted from the United States and Europe, with Peruvian counterparts. At the project's base camp near the town of Puerto Maldonado, a small frontier town in the heart of the Peruvian Amazon, the principal research crew will begin the process of training volunteers in the zoological monitoring methods used to investigate rainforest fauna. After learning and practicing the necessary skills, volunteers will participate in the collection of zoological data in the field near a number of established rainforest lodges/hotels which cater for national and international tourists. Volunteers will be supervised by members of the principal research crew who are responsible for all field research. These volunteer positions are ideal for those wishing to gain or expand their experience in rainforest field-related research techniques, as well as to learn more about the biology and ecology of Amazonian fauna, and would appeal to undergraduates or postgraduates (natural sciences) as well as amateur biologists who are interested in rainforest resource conservation. For further information on Project Tambopata and the volunteer research program, write to: Chris Kirkby, Project Tambopata, 64 Belsize Park, London NW3 4EH, U.K., e-mail: 106151.1043@compuserve.com. From: *Biological Conservation Newsletter*, Smithsonian Institution, Washington, D. C., N°. 160, October 1966.

Breeding and Conservation of Endangered Species - The JWPT Summer School

The Jersey Wildlife Preservation Trust, established in 1963 by Gerald Durrell, has at its zoo a unique centre for the breeding of endangered animals as a means of ensuring against their extinction.The goal of endangered wildlife conservation is pursued through: Establishing controlled captive breeding programmes; Promoting research on biology and ecology in captivity and in the wild; Conducting reintroduction programmes; and Providing professional training programmes in zoo biology. The Trust maintains captive breeding colonies of a wide variety of reptiles, birds and mammals, and conducts *in situ* conservation field studies. The aim of the three-week course is to provide an introduction to practical aspects of investigation and management and to supply detailed information relevant to conservation and captive breeding direct from those with first-hand experience.

The course will be based at the Trust's headquarters in Jersey and will consist of morning and afternoon lectures, discussion sessions and individually supervised research exercises. The Summer School 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.

What the course offers you. 1. An overview of how the

JWPT and other organisations have integrated captive and wild conservation, and what the future strategy could be. 2. Lectures which are a mixture of fundamentals and provocative appraisals encouraging you to formulate your own views about the conservation role of zoos, based upon understanding of the issues involved. The lectures are given by visiting professionals and specialist staff at JWPT, each dealing with a field within their own expertise. 3. Study projects which provide an opportunity for you to gain first-hand experience of carrying out research and analysing data. Projects are tailored to suit your capabilities, interests and background, and types of investigations possible include: Visitor surveys; Behavioural research on selected animal groups; Analysis of records and studbook data; Preparation of an educational brief or display; Design of layout and management plan; Nutritional analysis of a diet; and Bibliographical reviews. 4. Practical instruction/ workshop sessions with demonstrations of systematic data collection, based on appropriate experimental design, and showing how to analyse the information obtained. These sessions include: Methods of behavioural observation; Analysis of zoo records and studbooks; Statistical and graphical treatment of data; and Quantitative analysis of diets. 5. Other demonstration sessions in which zoo staff and invited experts explain some of the practicalities of captive and field management. These sessions will include: Visits with keepers to individual animal sections; Visits to the laboratory and veterinary centre accompanied by the Trust biologist; Demonstration of the card and computer record systems by the registrar; and Field visit to a local nature area.

Practical involvement in routine zoo work is not part of the course, the primary objectives of which are to provide a good theoretical foundation for future work and insights into practical problems of captive breeding. There will be video presentations and activities outside the course timetable. All participants will be presented with an official certificate at the end of the course. 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. The Course Coordinator is Mr Chris Clark, Assistant Training Officer at the Trust.

Registration and accommodation. The fee per person for the course is £995 (this includes 1990 free membership to the Trust). Hotel accommodation (shared rooms), all meals (breakfast, snack lunch, main evening meal) are provided and the fee covers all the course expenses. Optional field excursions to neighbouring islands and the French coast are available at an extra cost of approximately £25. Accommodation will be provided from Sunday 20th July to Friday 8th August 1997 inclusive. Extra nights will be the responsibility of the participant. The course commences on Monday 21st July and ends on Friday 8th August. Departures will be on Saturday 9th August. Participation in the course is limited to a total of approximately 24 students, with selection based on merit and suitability. Closing date for application: 31 January 1997. Early application is essential. Regrettably, the Trust is not able to offer scholarships to Summer School participants; candidates requiring financial assistance should seek alternative sources at an early stage. For application forms: The Summer School Coordinator, Jersey Wildlife Preservation Trust, Trinity, Jersey JE3 5BP, Channel Islands, British Isles, Tel: +44 1534 864666, Fax: +44 1534 865161.

THE SMITHSONIAN INSTITUTION'S *BIOLOGICAL CONSERVATION NEWSLETTER.*

The *Biological Conservation Newsletter*, produced by the Department of Botany of the National Museum of Natural History, Washington, D. C., editor Jane Villa-Lobos, can now be accessed through the Smithsonian Institution's World Wide Web site at http:// www.nmnh.si.edu, selecting "Botany" and then "Publications". The most recent issue of the newsletter is posted, along with the past 34 issues. The cumulative conservation bibliography files, containing nearly 10,000 references to literature on conservation biology, can be searched or browsed. These references have been obtained from a weekly review of the new journals and books received by the Smithsonian Institution's Botany and Natural History libraries and from suggestions submitted by subscribers to the newsletter.

There are two ways to search the conservation bibliography. The "Search" option will retrieve all the entries that meet the search criteria. Entries are returned as individual documents. A list is presented showing the first line of each entry. One must open each "document" to view the complete text. The "Select" option builds a single document with a maximum of 200 entries from the bibliography. The document can be browsed on the screen, downloaded as a file or printed. The master file has been broken up into smaller files to facilitate retrieval. These files are available for browsing and are named for the issues of the *Biological Conservation Newsletter* where they were first reported.

If any subscriber would rather access the newsletter electronically as an alternative to the printed version, please send a message to the editor at the following address: Jane Villa-Lobos, c/o *Biological Conservation Newsletter*, Department of Botany, NHB 166, Smithsonian Institution, Washington, D. C. 20560, USA,

Tel: (202) 357-2027, Fax: (202) 786-2563, e-mail: mnhbo019@sivm.si.edu.

Duke University - Visiting Assistant Professors

The Department of Biological Anthropology and Anatomy of Duke University, Durham, North Carolina, anticipates filling several 1-3 year teaching/research slots as Visiting Assistant Professors for Fall 1997, 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 is September 1997. Send letter of application, current CV and at least three letters of reference to: Dr Richard F. Kay, Professor and Chairman, Department of Biological Anthropology and Anatomy, Box 3170, Duke University Medical Center, Durham, NC 27710, USA. Deadline 15 February 1997.

Andrew W. Mellon Foundation

The Smithsonian Tropical Research Institute (STR) and the Organization for Tropical Studies (OTS) announce a second round of competition for *Research Enhancement Awards*. Awards, supported by the Andrew W. Mellon Foundation, will support summer salary and travel for up to three years. Applications are invited from estabished investigators in all fields of ecological and evolutionary biology to conduct comparative research between STRI and OTS field sites in Panama and Costa Rica. Successful applicants are expected to apply for (or to have in place) other sources of research support. Long-term scientific interaction across these sites is the expected benefit of this program.

Applications will be accepted until 31 December 96. Proposals are limited to five pages of text. The text should outline the significance of the scientific issue being addressed by the research, briefly describe the proposed methods, emphasize the importance of the cross-site comparison for this issue and address the potential for long-term interaction across the sites. Previous research performed by the PI at any of the sites should also be highlighted. In addition, each proposal should include a brief summary of the project (one paragraph), a budget, a budget justification approved by the home institution of the PI, a timetable, a full CV, a conflict of interest statement and an indication of what other sources of funds are in place or will be sought. Address inquiries to: Education Office, Smithsonian, Apdo. 2072. Balboa, Ancon, Panama or Unit 0948, APO AA 34002-0948, USA.

Mellon Research Exploration Awards in Tropical Biology. Proposals are invited for comparative research between OTS sites in Costa Rica and Smithsonian Tropical Research Institute (STRI) sites in Panama. Awards, supported by the the Andrew W. Mellon Foundation, will support summer salary and travel for up to three years for scientists at any level and range up to $2000 for graduate students and up to $5000 for postdocs and senior scientists. Researchers who have data from one site may apply to study at a comparative site. Travel to and from sites, station fees, and minor equipment can be funded, and proposals are reviewed by an OTS-STRI committee. Application instructions and guidelines for use of fellowship funds can be obtained from the North American Office, attention Dr. Shaun Bennett. Send proposals to Box 90633, Durham, NC 27708-0633 by 31 December 1996. From *Tropinet* 7(3), September 1996, p.3.

Primate Societies

IPS/ASP Conference

Folie à Deux (Madness For Two): Commemorative Poster

The commemorative poster for the Primates in Art and Illustration Exhibit and the XVIth Congress of the International Primatological Society and XIXth Conference of the American Society of Primatologists held in Madison, Wisconsin, in August 1994 was based on a painting by Mary Sims, and titled "Folie à Deux". Copies are still available. It is possible to see what the poster looks like on the Primate Information Network PIN at http://www.primate.wisc.edu/pin/folie.html. The price is US$10 plus US$2.50 for packaging and shipping. The poster is of high quality and many people have had it framed. Orders should be sent to Larry Jacobsen, WRPRC, University of Wisconsin,1220 Capitol Court, Madison, WI 53715-1299, USA, Tel: +1 608 263 3512, e-mail: jacobsen@primate.wisc.edu. We can send and bill if you prefer. Check should be made payable to "IPS/ASP Conference".

IPS/ASP Conference Program and Abstract Booklets

Copies of our IPS/ASP Conference Program and Abstract booklets are still available. To order, please send a check for US$5.00 plus $2.50 for packaging and shipping. Checks should be payable to the "IPS/ASP Congress". Note that there are no plans to publish the Conference Proceedings, but it is anticipated that several

publication will be forthcoming from the symposia and workshops. These publications are being coordinated independently by symposia/workshop organizers. Orders should be sent to Edi Chan, Conference Coordinator,Wisconsin Regional Primate Research Center, 1220 Capitol Court, Madison, WI 53715-1299, USA, e-mail: chan@primate.wisc.edu.

T-Shirts

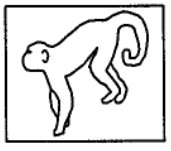
If you would like to purchase a Congress T-shirt, please send a check payable to the "IPS/ASP Congress" for US$12 plus US$3 for packaging and shipping. Please send your complete mailing address. Only the XL size is available. Orders should be sent to Edi Chan, Conference Coordinator,Wisconsin Regional Primate Research Center, 1220 Capitol Court, Madison, WI 53715-1299, USA, e-mail: chan@primate.wisc.edu.

Video Presentations

The plenary lectures given at the Conference were videotaped and will be available on loan from the WRPRC Audiovisual Archive.These lectures were given by Robert Sapolsky (Stress, Stress-related Disease and Personality: Studies of Wild Baboons); Toshisada Nishida (Mahale Chimpanzee Studies: Past, Present and Future); Patricia Goldman-Rakic (The Neurobiology of Cognition: Facts and Concepts from the Study of the Prefrontal Cortex in Non-human Primates); Peter Parham (Major Histocompatibility Complex (MHC) Class I Molecules and the Immune System); and Anthony Rylands (Towards a New Understanding of the Ecology and Phylogeny of the Callitrichidae). Many excellent videotapes were presented at the Congress. We hope that the authors of these tapes will contact the WRPRC so that quality copies can be added to the Audiovisual Archive. For questions about the plenary lectures or contributing video materials to the Archive, please contact Ray Hamel, e-mail: hamel@primate.wisc.edu, Tel: +1-608-263-3512. Six primatologists were interviewed at the meetings for the upcoming Careers in Primatology series. Those interviewed included Anne Savage (Careers in zoo settings); Sue Boinski (field work); Chris Abee (veterinary medicine); Richard Stouffer (biomedical research); Jim Moore (education); Linda Fedigan (edu/fw) and H. Dieter Steklis (conservation). These tapes need editing and formatting before they become available (completion date not set).

Larry Jacobsen, WRPRC Library and Information Service, e-mail: jacobsen@primate.wisc.edu, and **John Hearn**, IPS/ASP Conference Chair, Wisconsin Regional Primate Research Center, Madison, Wisconsin, USA.

SOCIEDADE BRASILEIRA DE PRIMATOLOGIA



VIII Congresso Brasileira de Primatologia: A Sociedade Brasileira de Primatologia (SBPr) realizará o VIII Congresso Brasileira de Primatologia na cidade de João Pessoa, Paraíba , entre os dias 27 de julho e 1 de agosto de 1997. A programação incluirá sessões de comunicações orais, mini-cursos, paineis. conferências e mesas redondas. Os resumos podem ser enviados à Secretaria do Congresso com data de postagem até o dia 30 de abril de 1997. As fichas de inscrição para sócios serão enviados junto com a 2ª circular. Os valores da inscrição para sócios serão: estudantes de graduação R$20,00, estudantes de pós-graduação R$30,00, outros R$50,00, mini-cursos R$10,00. Estes valores serão acrescidos em R$20,00 após 31/04/96. Haverá um espaço reservado para a exposição de fotografias de/ou sobre primatas. Contatos: Secretaria do VIII Congresso Brasileiro de Primatologia, Laboratório Tropical de Primatologia - DSE - CCEN, Universidade Federal da Paraíba, 58059-900 João Pessoa, Paraíba, Brasil. Tel: (083) 216 7471, Fax: (083) 216 7464, e-mail: sagui@vm.npd.ufpb.br.

Curso de Estatística para Primatólogos: A SBPr junto com o Curso de Mestrado em Ciências Biologicas da Universidade Federal da Paraíba realizou entre os dias 21-24 de novembro de 1996 um curso sobre "Tratamento Estatístico de Dados de Comportamento e Autoecologia". O Curso foi ministrado pelo Prof. Paulo de Marco da Universidade Federal de Viçosa, e contou com a presença de estudantes a pesquisadores da Universidade Federal Rural de Pernambuco, Universidade Federal do Rio Grande do Norte e da Universidade Federal da Paraíba. Cerca de 73% dos alunos que assistiram o curso trabalham com primatas da Região Nordeste.

Recadastramento: A SBPr está realizando o recadastramento de todos os membros. Perdemos contato com muitos sócios. Os sócios que não receberam a ficha de recadastramento deveriam entrar em contato com a Secretária da SBPr, Simone Porfírio, Laboratório Tropical de Primatologia - DSE - CCEN, Universidade Federal da Paraíba, 58059-900 João Pessoa, Paraíba, Brasil. Tel: (083) 216 7471, Fax: (083) 216 7464. Precisamos nos comunicar com os seguintes colegas: Alexia C. da Cunha, Diego Miguel Pérez, Elke A. K. Krause, Fernando J. O. de Souza, Gloria Maria B. Cardoso, Juliana C. B. Cunha Lima, Karina L. de Oliveira, Paulo Cesar R. Bastos, Paulo Henrique G. de Castro, Roberta Bodini de Pepe e Vanner Boere Souza.

Anuidade: Pedimos aos sócios que ainda não pagaram as anuidades correspondentes aos anos 1995 e 1996 que

o façam o mais rápido posível. A Sociedade só pode trabalhar com sua colaboração. Lembramos que *Neotropical Primates* é enviado somente aos sócios que estão em dia com a anuidade. O valor desta é R$15,00 para estudantes ou profissionais desempregados e R$30,00 para profissionais com vínculo empregatício. Os sócios que moram no exterior podem mandar um cheque nominal em dólares. O endereço para envio de cheque ou comprovante de depósito bancário na conta No. 3 705 000, Banco Real, Agência 0175, é: Sociedade Brasileira de Primatologia, Departamento de Sistemática e Ecologia - CCEN, Universidade Federal da Paraíba, Campus Universitário, 58.059-900 João Pessoa, Paraíba, Brasil, Tel: (083) 216 7471, Fax: (083) 216 7464, e-mail: sagui@vm.npd.ufpb.br

Primate Society of Great Britain Conservation Grants

The Primate Society of Great Britain (PSGB) often receives requests for grants in support of primate studies through its Conservation Working Party (CWP). Recent awards have included £300 to the Black Lemur Forest Project, Madagascar, to employ a Malagasy education officer for six months, and £300 for the regional Primate Specialist Groups in India to facilitate communication between them. Because the Society has only relatively small amounts available in the Conservation Appeal Fund, we confine grants to specific topics. If you are thinking of applying for funds, the notes given below indicate how to apply and whether you are eligible.

Proposals are invited for grants to assist: 1) Research of benefit to primate conservation; 2) Short surveys to identify locations of value for primate conservation; 3) Projects involving primate conservation education. *Obligations of grantee*: 1) To present a report on the progress of the project within six months of commencement; 2) To present a final report on completion of the project to be used by PSGB at its discretion, in publications, or in any way considered to be of value to primate conservation; 3) Any publication resulting from the project should acknowledge the support received by PSGB. Copies of publications should be sent to PSGB; 4) To produce slides and/or sound recordings where appropriate to the project for non-commercial use by PSGB or others to benefit primate conservation. *Grant basis*: 1) Applications to be received by 1st March or 1st September each year; 2) Individual awards will be for a sum not typically exceeding £250.00; 3) Award applications will be considered by the Conservation Working Party at its next meeting following receipt of applications. If two or more objections are raised by members of the CWP, the Convenor may, if she/he thinks fit, request the applicant to submit an amended application that addresses the committee's reservations; 4) Grants will be awarded to members of PSGB, or to citizens of primate range countries who are sponsored by a PSGB member; 5) Group training projects are not covered by this award scheme.

Application forms are available from: Siân S. Waters, Convenor of the PSGB Conservation Working Party, Bristol Zoo Gardens, Clifton, Bristol BS8 3HA, UK.

Recent Publications

Plant Talk - A Magazine on Plant Conservation Worldwide

Plant Talk is a quarterly magazine, founded in 1995, and published by the Botanical Information Co. Ltd., UK. The Director is Hugh Synge who, with Gren Lucas, set up the Threatened Plants Unit of IUCN. The Editor is Dr John Akeroyd, a freelance writer, botanist and taxonomist. Each issue includes: A round up of news from around the world and an update on threats to plants and their habitats; An inspiring story where conservationists are succeeding; A feature explaining the techniques of plant conservation, for instance how to set up a seed bank, or giving general advice, such as how to write a succesful grant application; An editorial which provides a balanced assessment of a key issue; Notice board of key events and people worldwide; Reviews of Red Data Books; Reports on new Floras, Checklists and Field Guides; Vital plant facts for conservation campaigners; and letters from readers. Subscription rates: Individuals - £15, US$25, Sfr30, DM37 or FF120; Organizations - £35, US$60, Sfr70, DM85 or FF280. Rates include air mail postage. Contact: Plant Talk, PO Box 65226, Tucson, AZ 85728-5226, USA (orders from the Americas), or Plant Talk, P.O.Box 500, Kingston-upon-Thames, Surrey KT2 5XB, UK (rest of the world).

Evolution of Communication

A new journal, entitled *Evolution of Communication* is to be published by John Benjamins Publishers, Amsterdam, under the general editorship of Sherman Wilcox, Department of Linguistics, University of New Mexico.It will be published twice in 1997, to eventually become quarterly, and will contain articles, review articles, book reviews, short notes, and discussions. It is a broadly-conceived journal covering not only the

origins of human language but also the evolutionary continuum of communication in general. The journal therefore accommodates studies on various species as well as comparative, theoretical, and experimental studies. This multidisciplinary approach will integrate research from a variety of disciplines, such as: linguistics, evolutionary biology, artificial life, primatology, ethology, neuroscience, cognitive science, biological and developmental psychology, social and biological anthropology, philosophy, and palaeontology. *Evolution of Communication* will provide a forum in which scholars from these rapidly expanding fields of evolution and communication can share their research within a multidisciplinary, international perspective.

Editorial Board: The editorial board includes two Associate Editors: Barbara J. King (Dept. of Anthropology, College of William and Mary), and Luc Steels (Artificial Intelligence Laboratory, Free University Brussels). Scholars wishing to write book reviews should contact David Armstrong (Book Review Editor), Gallaudet University, Office of Budget & Auditing, 800 Florida Ave. NE, Washington DC 20002. In addition, the editorial board consists of: Bennett G. Galef, Jr. (Department of Psychology, McMaster University); Kathleen Gibson (Department of Basic Sciences, University of Texas, Houston); John Haiman (Linguistics Program, Macalester College); Christine M. Johnson (Department of Cognitive Science, University of California, San Diego); Michael J. Ryan (Department of Zoology, University of Texas, Austin); Chris Sinha (Department of Psychology, University of Aarhus); Eors Szathmary (Collegium Budapest); Michael Tomasello (Department of Psychology, Emory University); Aladdin Yaqub (Department of Philosophy, University of New Mexico); and Anne C. Zeller (Department of Anthropology, University of Waterloo).

Editorial Policy: The journal encourages international and interdisciplinary contributions, is open to a broad variety of theoretical views, and will give preference to work which integrates data with conceptual and methodological concerns. Manuscripts should be submitted in 4 copies to Sherman Wilcox, Department of Linguistics, University of New Mexico, 87131. Tel: 505-277-6353, Fax: 505-277-6355. e-mail: wilcox@unm.edu.

Subscriptions: For information about subscriptions, contact John Benjamins Publishing Company, P.O. Box 75577, 1070 AN Amsterdam, The Netherlands. Tel: +31 20 6762325, Fax: +31.20.6739773, e-mail: Anke.Delooper@benjamins.nl. World Wide Web home page: http://www.unm.edu/~wilcox/EOC.

Books

Contingent Valuation and Endangered Species: Methodological Issues and Applications, by Kristin M. Jakobsson and Andrew K. Dragun, September 1996, 304pp, hardback, ISBN 1 85898 464 5, Price: £49.95. Edward Elgar Publishing Ltd., UK. This book provides a comprehensive and rigorous examination of the contingent valuation method as applied to the profound social problem of biodiversity conservation. The contingent valuation method allows the explicit identification and valuation of the non-use values of species in a way which has not been possible before.This new book offers a rigorous state-of-the-art evaluation of the theoretical and statistical issues central to the contingent valuation method as well as a hands-on account of the design, implementation and analysis of a contingent valuation survey of species conservation benefits. Includes a comprehensive account of efforts for endangered species protection in Australia and New Zealand as well as current developments in the United States. Contents: Foreword (M. Hanemann), Part I: Environmental Values: The Institutional and Biological Setting for Species Conservation. 1. Introduction. 2. The Institutional Setting: The Victorian Flora and Fauna Guarantee Act. 3. Endangered Species in Victoria. Part II: Welfare Economic Principles of Species Conservation. 4. Welfare Economic Principles and Issues. 5. The Economics of Species Conservation. Part III: The Contingent Valuation Method. 6. The Contingent Valuation Method. 7. Estimating Changes in Welfare from Discrete Choice Surveys. Part IV: The Survey Application to Species Conservation. 8. A Contingent Valuation Survey of Endangered species in Victoria. 9. Estimation of Willingness to Pay. Part V: Conclusions. 10. Conservation Value: Estimation and Methodological Inference. 11. From Contingent Valuation to Species Conservation Policy. Available from: Customer Services, Ashgate Distribution, Unit 3, Lower Farnham Road, Aldershot, Hants GU12 4DY, UK, Tel: +44 1252 317707, Fax: +44 1252 317446, http://www.e-elgar.co.uk.

Os Limites Originais do Bioma Mata Atlântica na Região Nordeste do Brasil, por Adelmar F. Coimbra-Filho e Ibsen de Gusmão Câmara, 1996, 86pp. Fundação Brasileira para a Proteção da Natureza (FBCN), Rio de Janeiro. Um livro que documenta cuidadosamente a destruição da Mata Atlântica e outras florestas no Nordeste do Brasil, desde a descoberta do país em 1500. "Este livro constitui uma contribuição ao estudo de causas que, principalmente nos tempos históricos, levaram a Região Nordeste à situação presente de profunda e extensa degradação ambiental, nele interpretada como de origem basicamente antrópica. Os autores, consolidando abundante matéria informativa em

numerosas publicações ou obtida diretamente nas áreas por eles visitadas, pretenderam alertar para as sérias conseqüências do processo ininterrupto de seculares agressões ao meio ambiente que, a continuar sem controle, levará a área hoje designada como Polígono das Secas, a estágios avançada de desertificação, a exigir no futuro medidas onerosíssimas e complexas. O exemplo das plagas nordestinos, resultado de quase meio milênio de continuada desconsideração ao uso sensato do solo e a princípios ecológicos elementares, evidencia-se como grave advertência acerca dos desvarios comparáveis que vêm sendo perpetrados em múltiplas paragens de nossa terra. Ainda que nelas as condições climáticas possam mostrar-se menos severas em relação às prevalecentes no Nordeste, tal fato não impedirá que o desrespeito aos ensinamentos da natureza, em flagrante progressão, repita o dramático quadro de amplo empobrecimento biológico daquelas áreas dotadas outrora de riquíssima biota. Deliberadamente procurou-se no trabalho tornar-lhe o texto ameno restringindo tanto quanto possível o uso de nomenclatura científica e de dados estatísticos, exceto quando exigidos para clareza dos argumentos apresentados. Esperam assim os autores atingir parcela mais abrangente da comunidade, com o propósito de ampliar o campo de discussões sobre um tema por eles considerado de maior relevância para o País." (Apresentação). Este livro é da maior importância para um entendimento das desastrosas conseqüências da destruição da Mata Atlântica, e para uma visão mais realista sobre perda de biodiversidade no Brasil. Altamente recomendado. Disponível para compra na Fundação Brasileira para Conservação da Natureza (FBCN), Rua Miranda Valverde 103, Botafogo, 22281-000 Rio de Janeiro, Rio de Janeiro, Brasil, Tel: (021) 537 7565, Fax: (021) 537 1343.

Mamirauá: Plano de Manejo, compiled by the Sociedade Civil Mamirauá, Tefé and Belém. 1996, 96pp. illustrated. Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brasília, and Instituto de Proteção Ambiental do Estado do Amazonas (IPAAM), Manaus. In Portuguese. Foreword by José Galizia Tundisi, President of CNPq, and Prefaces by Eduardo S. Martins, President of the Brazilian Institute for the Environment (Ibama), and Vicente Nogueira, President of IPAAM. A beautifully presented executive summary of the Management Plan for the Mamirauá Sustainable Development Reserve at the mouth of the Rio Japurá in the Brazilian Amazon, home to the white uacari, *Cacajao c. calvus*, and the black-headed squirrel monkey, *Saimiri vanzolinii*, amongst other primates. It is based on extensive research on all aspects of the white-water inundated forest (*várzea*) and the specific ecological and socioeconomic characteristics of the area. A management plan which can be considered exemplary for the Amazonian protected areas (or for any protected area for that matter). Chapters include: Introduction and Objectives; A Short History of the Creation of the Reserve; Environmental Aspects; Socioceconomic Characteristics; Research on which the Management Plan is Based; Mapping and Use of Resources; Norms and Recommendations for the Sustained Use of Natural Resources; Structure and Functioning of the Second Phase; Fiscalization and Guards; Activities of the Second Phase: Technical Assistance, Research and Monitoring; along with lists of references, financing agents, and the collaborators involved in drawing up the plan. Available from: Sociedade Civil Mamirauá, Projeto Mamirauá, Coordenator José Márcio Ayres, Caixa Postal 038, 69.470-000 Tefé, Amazonas, Brazil.

The Food Web of a Tropical Rain Forest, edited by D. P. Reagan and R. B.Waide, 1996. University of Chicago Press, Chicago. 628pp. illus. Price: Cloth US$110, paperback US$39.95. This volume summarizes studies relevant to describing the food web of the 40 ha of forest surrounding the El Verde Field Station in the Luquillo Experimental Forest, Puerto Rico. The work coalesces 30 years of investigations at El Verde. The food web construct is used to organize information on the species of this tropical forest community and how they relate to one another. There are chapters on plants, microorganisms (primarily fungi), litter and arboreal invertebrates, amphibians, reptiles, birds, mammals, and the stream community. Termites and arboreal arachnids are given special recognition with their own chapters, reflecting their presumed importance as food web links. Each chapter places the subject organisms within the overall food web and then describes abundance and biomass, as well as other important features of the group such as population dynamics, food specialization, consumption rates, and the principal predators. A final chapter analyzes the structure of the El Verde food web and compares it to those from other communities. Available from: University of Chicago Press, Order Department, 11030 South Langley Avenue, Chicago, Illinois 60628, USA, Tel: 1-800-621-2736, Fax: 1-800-621-8476.

World Resources 1996-7: A Guide to the Global Environment, World Resources (WRI) in collaboration with the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), and the World Bank, 1996. 365pp. Large format paperback, ISBN 0 19 521161. Price: US$24.95 + US$3.50 (handling). Database diskette, 3,5", IBM-compatible, ISBN 1 56973 094 6. Price: US$99.95 + US$3.50 (handling). Available from: WRI Publications, P. O. Box 4852, Hampden Stations, Baltimore, MD 21211, USA, Tel: 1 800 822 0504 or 410 516 6963, Fax: 410 516 6998, e-mail: chrisd@wri.org.

Social Learning in Animals: The Roots of Culture, edited by Cecilia M. Heyes and Bennett G. Galef, Jr., 1996, 360pp. ISBN 0 12 273 965 5. Academic Press, London. Price: US$54.95. The increasing realization among behaviorists and psychologists is that many animals learn by observation as members of social systems. Such settings contribute to the formation of culture. The book is divided into two major sections (social learning and imitation). It includes as key features: the integration of the broad range of scientific approaches being used in studies of social learning and imitation, and society and culture; an introduction to the field as well as a starting point for more experienced researchers; succinct reviews of new discoveries and progress in the past decade; statements of varied theoretical perspectives on controversial topics; and authoritative contributions by an international team of leading researchers. Available from: Academic Press, Inc., Order Fulfillment Department, 6277 Sea Harbor Drive, Orlando, FL 32887, USA, or Academic Press, Inc., Order Fulfilment Department, 24-28 Oval Road, London NW1 7DX, UK. US and Canada toll free Tel: 1-800-321-5068, Fax: 1-800-336-7377, e-mail: ap@acad.com. Europe toll free Tel: 0181 300-3322.

Guide for the care and use of laboratory animals, compiled by the Institute of Laboratory Animal Resources, Commission on Life Sciences, National Research Council, National Academy Press, Washington, D.C. 1996. ISBN 0-309-05377-3. Price: US$9.95 plus US$4.00 shipping and handling. A respected resource for decades, the *Guide for the Care and Use of Laboratory Animals* has been revised by a committee of experts, on the basis of input from scientists and the public. The Guide incorporates recent research on commonly used species, including farm animals, and includes extensive references. It treats the following subjects: Insitutional policies and responsibilities; Animal environment, husbandry, and management; Veterinary care; and Physical plant. The book provides a framework for the judgments required in the management of animal facilities. It is a resource of proven value, and has now been updated and expanded. Available from: National Academy Press, 2101 Constitution Avenue, NW, Lockbox 285, Washington, DC 20055, USA, Tel: 1-800-624-6242, Fax: 1-202-334-2451, Internet: http://www.nap.edu.

Informe de la Reunión de la Red Latinoamericana de Cooperación Técnica en Parques Nacionales, otras Areas Protegidas, Flora y Fauna Silvestres, 1996, 51pp. In Spanish. Results of a meeting held at Cancún, México, 13-14 November 1995, organized by the FAO Regional Office for Latin America and the Caribbean as part of the activities of the Project FAO/ PNUMA FP/0312-94-14. Contents: Introducción; Antecedentes de las reuniones previas; Objetivos de le ruenión; Participantes; Inäuguración; Cuenta de las actividades de la Red realizadas durante el periodo 1992-1995; Necessidad de otras actividades para el periodo 1996-1997; Análisis del funcionamento de las redes nacionales; Perfil de proyecto regional sobre criterios e indicadores para el manejo de áreas protegidas; Perfil de proyecto regional (GEF u otras fuentes); Análisis del reglamento de la red de parques; Elección de la Coordinación Regional de la Red para el periodo 1996-1997. Anexos: Lista de participantes; Actividades de la Red (Periodo 1992-1995); Propuestos de los grupos de trabajo relativas al perfil de Proyecto Regional (GEF u outras fuentes); Reglamento de la Red. Published by the FAO Regional Office for Latin America and the Caribbean, Available from: Kyran D. Thelen, Oficial Regional Forestal, Bandera 150, Casilla 10095, Santiago, Chile, Tel: 699-1005, Fax: 696 1121, 696 1124, e-mail: k.d.thelen-fao@cgnet.com.

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Meetings

Southern Connection Congress: Southern Temperate Biota and Ecosystems: Past, Present and Future, 6-11 January 1997, Valdivia, Chile. The II Southern Connection Congress is being organized by the Universidad de Chile and the Universidad Austral de Chile, Congress Presidents: Mary T. Kalin Arroyo and Antonio Lara. Southern Connection has rapidly become the most important venue for interchange and the discussion of biological research in temperate ecosystems in the southern hemisphere. The congress will be organized around special conferences. symposium topics, contributed papers, and special sessions on the science-development-policy interface. These activities will be complemented with workshops, displays, field trips and cultural activities. The main themes to be treated in the congress are: History of the southern continents and their biota - the past, Ecosystem composition, structure and dynamics - the present; and Perspectives for conservation and sustainability - the future. Contributed papers that describe the results of original scientific research in taxonomy, evolution, biogeography, history, ecophysiology, ecosystem dynamics, population, reproductive and community ecology of southern temperate ecosystems and biota will be accepted. While the Congress will concentrate on terrestrial and freshwater ecosystems, papers in marine biology are welcome. The Congress language is English. However to encourage the participation of young Latin American graduate students, posters may be presented in Spanish, with an English abstract. Final date for abstracts is 30 September 1996. Information and registration forms: Dr. Mary T. Kalin Arroyo, President, II Southern Connection Congress, Fax: 56(2) 271-9171; Tel: 56(2) 678-7331, e-mail: southern@abello.dic.uchile.cl.

2nd Annual International Wildlife Law Conference, 8 April, 1997, Washington, D.C. The conference, sponsored by the American Society of International Law's wildlife section, the GreenLife Society - North America, the Georgetown International Environmental Law Review, the Colorado Journal of International Environmental Law & Policy and the Detroit College of Law-Michigan State University, will use the same three panel format as at last year's conference. The panels for the conference are as follows: 1. The precautionary principle and International Wildlife Treaty Regimes; 2. The International Whaling Commission and the Aboriginal Whaling Exception; 3. The Impact of the Convention on Biological Diversity: Present and Future. Contact: GreenLife Society - North America 700 Cragmont Ave. Berkeley, CA 94708 USA, Tel/Fax: (510) 558-0620, e-mail: pcis@igc.apc.org. WWW: site: http://EELINK.umich.edu/greenlife/index.html.

VII Iberoamerican Congress for Biodiversity and Vertebrate Zoology, 22-25 April, 1997, University of Concepción, Concepción, Chile. The objective of the congress is to bring together researchers from Spain, Portugal and Latin America to discuss and exchange information at the highest level on the directions and advances concerning biodiversity, conservation, and zoology of vertebrates. The Congress will cover the following topics: Biology of Development, Biology of Conservation, Decline of Species, Biodiversity, Ecology, Ethology, Evolution, Physiology, Phylogenetics, Genetics, Morphology, Paleontology, Parasitology, Fisheries, Protection and Management of Wildlife, Taxonomy and Zoogeography. The Proceedings will be published in the journals *Gayana* and *Boletin de la Sociedad de Biologia de Concepción*. Fees: Students until 30/09/96 = US$25, until 31/12/96 = US$35, at the Congress = US$50; Professionals until 30/09/96 =

US$70, until 31/12/96 = US$85, at the Congress = US$100. Payment: 1. Electronic transfer; Bank of America 6550-1-28650. 2. Check made out to the Universidad de Concepción. Electronic information available from the homepage: http://buho.dpi.udec.cl/~cibiozve/. Contact: Presidente Comite Organizador: Dr. Juan Carlos Ortiz, VIII Congreso Iberoamericano de Biodiversidad y Zoologia de Vertebrados, Departamento de Zoologia, Universidad de Concepción, Casilla 2407, Concepción, Chile, Tel: (56) 41 234985 x 2157 or 4152; (56) 41 204672, Fax:(56) 41 243379, e-mail: jortiz@halcon.dpi.udec.cl.

Italian Primatological Society Meeting, Spring, 1997. Contact: Augusto Vitale, Section of Comparative Psychology, Laboratorio di Fisiopatologia o.s., Instituto Superiore di Sanita, Viale Regina Elena, 299, 00161 Rome, Italy, Tel.: 39-6-49902107, Fax: 39-6-4957821, e-mail: fos@iss.it.

Primer Congreso Latinoamericano de Parques Nacionales y otras Áreas Protegidas, 21-28 del Mayo de 1997, Santa Marta, Colombia. Entre los objetivos más importantes del Congreso, se encuentra el efectuar un análisis de los progresos alcanzados en la región en los últimos cinco años, desde febrero de 1992, y de las experiencias más exitosas de estos años. Así mismo, el evento se propone elaborar un diagnóstico de la situación actual en parques nacionales y otras áreas protegidas y definir las prioridades así como las estrategias para los próximos cinco años, antes del Congreso Mundial de Parques Nacionales que ha de realizarse en África en 2.002. Ministero del Medio Ambiente, Colombia, Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO) - Oficina Regional para América Latina y el Caribe, Unión Mundial para la Naturaleza (IUCN) - Comisión Parques Nacionales y Otras Áreas Protegidas, Red Latinoamericana de Cooperación Técnica en Parques Nacionales, Otras Áreas Protegidas, Flora y Fauna Silvestres. Información: Secretaría Técnica Internacional de la Red Latinoamericana de Cooperación Técnica en Parques Nacionales, Otras Áreas Protegidas, Flora y Fauna Silvestres, Kyran D. Thelen, Oficial Regional Forestal, Oficina Regional de la FAO para América Latina y el Caribe, Bandera No. 150, 7 a 10 piso, Casilla 10095, Santiago, Chile, Tel: (562) 699 1005, Fax: (562) 696 1121, (562) 696 1124.

XX Meeting of the American Society of Primatologists, 27-30 June 1997, Bahia Hotel, San Diego, California. Hosted by California State Univiersity at San Marcos. Deadline for abstracts: 15 January 1997 postmark. Program and abstracts will be published in the June issue of the *American Journal of Primatology*, 42(2). Questions about the program should be directed to the Chair of the Program Committee, Evan L. Zucker, Department of Psychology, Box 194, Loyola University, New Orlaens, LA 70118, USA, Tel: (504) 865 3255, Fax: (504 834 4085, e-mail: zucker@beta.loyno.edu. For more information, contact: Nancy Caine, Psychology Department, California State University, San Marcos, California 92096, USA. Tel: (619) 752-4145, Fax: (619) 752-4111, e-mail: nancy_caine@csusm.edu.

ASAB Summer Meeting "Biological Aspects of Learning", 2-4 July, 1997, University of St. Andrews, Scotland, UK. Association for the Study of Animal Behaviour (ASAB). Organized by Peter Slater. It is hoped to include talks on a wide variety of animal groups,and ranging from neurobiological aspects of learning to social learning and imitation. Main lectures will be given by Randolf Menzel (Learning and memory in the honey bee), Meredith West (Social development), Peter Tyack (Vocal learning in cetaceans), and Andrew Whitten (Imitation and social learning in primates). Offers of talks or posters, the latter not necessarily restricted to the main subject of the meeting, will be welcomed, and should be sent to: Professor Peter Slater, School of Biological and Medical Sciences, University of St. Andrews, Bute Medical Building, St. Andrews KY16 9TS, Scotland, UK, Tel: +44 (0)1334 463500, Fax: +44 (0) 1334 463600, e-mail: pjbs@st-andrews.ac.uk.

The Royal Society Meeting, "Evolution of Biological Diversity: From Population Differentiation to Speciation", 9-10 July 1997. A discussion meeting at The Royal Society, Carlton House Terrace, London, UK. Organized by Robert May and Anne Magurran. Contact: The Science Promotion Section, The Royal Society, 6 Carlton House Terrace, London SW1Y 5AG, UK, Tel: +44 (0)171 839 5561, Fax: +44 (0)171 930 2170.

Fifth International Congress of Vertebrate Morphology, 12-17 July, 1997, University of Bristol, Bristol, UK. Organized by the International Society for Vertebrate Morphologists. All those interested in vertebrate morphology and related areas are invited to attend. Suitable topics for discussion at the meeting include all aspects of vertebrate morphology, including anatomy, evolution, development, biomechanics and locomotion, vertebrate palaeontology, ecological morphology, morphological aspects of behaviour, cell structure and function, neurobiology and neuroanatomy, and morphometric and other methods. The closing date for submissions is 16 December 1996. Contact: Professor J. M. V. Rayner, School of Biological Sciences, University of Bristol, Woodland Road, Bristol BS8 1UG, UK, Fax: +44 (0)117 925 7374, e-mail: icvm97@bristol.ac.uk, WWW: http://www.bio.bris.ac.uk/icvm.html.

VIII Congresso Brasileiro de Primatologia, 27 July-1 August 1997, João Pessoa, Paraíba, Brazil. Deadline for submission of abstracts: 30 April 1997. Contact: Carmen Alonso, Sociedade Brasileira de Primatologia, Departamento de Sistemática e Ecologia - CCEN, Universidade Federal da Paraíba, 58059-900 João Pessoa, Paraíba, Brazil, Tel: +55 (0)83 216 7471, Fax: +55 (0)83 216 7464, e-mail: sagui@vm.npd.ufpb.br.

XXV International Ethological Conference, 20-27 August, 1997, Vienna, Austria. This meeting will highlight new synthetic approaches to problems in animal behavior, and links between behavior and other disciplines, including neurobiology, sensory physiology, population ecology, conservation biology, and evolution. For additional information about the meeting, contact Dr. Michael Taborsky, Konrad Lorenz Institute fur Vergleichende Verhalternsforshung, A-1160 Wien, Savoyenstrasse 1A, Austria. The U.S. Ethological Conference Committee has applied for a grant from NSF for partial support of travel for younger scientists to attend meeting. If this grant is funded, the US Ethological Conference Committee (USECC) will provide travel funds to younger U.S. scientists defined as those who received their Ph.D. degree between 1992 and 1996, or who will complete their Ph.D. during the 1996/97 academic year. To apply for a travel award, please submit the following items to IEC XXV, c/o Dr. Judy Stamps, Section of Evolution and Ecology, University of California, Davis, California, 95616: (a) 7 copies of a 1-2 page curriculum vitae, (b) 7 copies of the abstract you will submit to the IEC program committee, and (c) 7 copies of two letters of recommendation sent separately by the recommenders. For those who have not completed their doctorate, it is desirable that the major professor include an assurance that the degree will be completed before July 1, 1997. Applications must be received by 15 December, 1996. We hope to notify all applicants of the outcome of their applications by 15 Feb, 1997. Other questions about this competition may be addressed to Dr. Stamps at the address above (e-mail: jastamps@ucdavis.edu).

ASAB Winter Meeting 1997 "Behaviour and Conservation", 4-5 December, 1997,Zoological Society of London, Regent's Park, London, UK. Association for the Study of Animal Behaviour (ASAB). Organized by Morris Gosling and Mark Avery. The organizers aim to use the meeting as the basis for a multi-author book. Current ideas for possible contents include links between mating systems/dispersal and genetic structure of populations; dispersal and other movements in relation to habitat fragmentation and reserve design; individual foraging behaviour and habitat carrying capacity; mate choice, signalling, and manipulation of captive breeding; learning and pre-release training; and practical use of behaviour in conservation (eg., use of songs for censusing). Contacts: Professor Morris Gosling, Institute of Zoology, Zoological Society of London, Regent's Park, London NW1 4RY, UK, Tel: +44 (0)171 449 6600, Fax: +44 (0)171 586 2870, e-mail: suaalmh@ucl.ac.uk, or Dr. Mark Avery, RSPB, The Lodge, Sandy, Beds. SG19 2DL, UK, Tel: +44 (0)1767 680551, Fax: +44 (0)1767 692365, e-mail: bird@rspb.demon.co.uk.

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. Manuscripts should be double-spaced and accompanied by the text in diskette for PC compatible text-editors (MS-Word, Wordperfect, Wordstar). Articles, not exceeding six pages, can include small black-and-white photographs, high quality figures, and high quality maps, tables and references, but please keep them to a minimum.

Please send contributions to: **Anthony Rylands**, c/o Conservation International do Brasil, Avenida Antônio Abrahão Caram 820/302, 31275-000 Belo Horizonte, Minas Gerais, Brazil, Tel/Fax: +55 (31) 441 17 95 or **Ernesto Rodríguez-Luna**, Parque de La Flora y Fauna Silvestre Tropical, Instituto de Neuroetología, Universidad Veracruzana, Apartado Postal 566, Xalapa, Veracruz 91000, México, Fax: 52 (28) 12-5748.

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