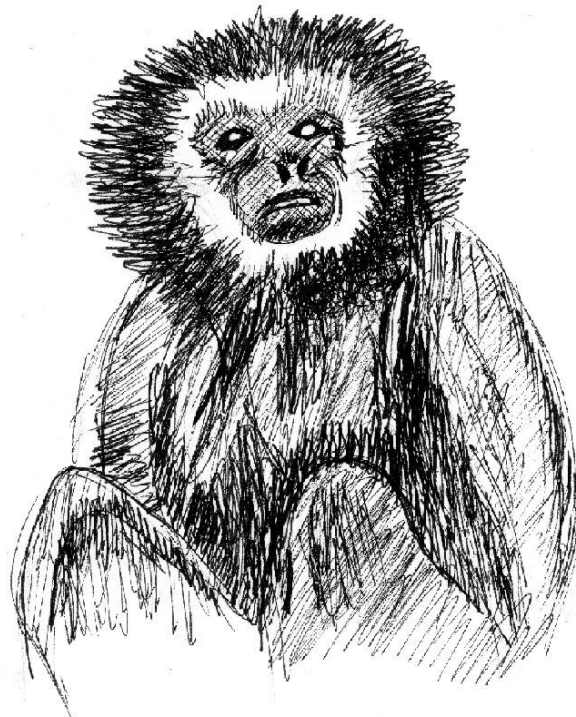


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POLICY STATEMENT

The *Laboratory Primate Newsletter* provides a central source of information about nonhuman primates and related matters to scientists who use these animals in their research and those whose work supports such research. The *Newsletter* (1) provides information on care and breeding of nonhuman primates for laboratory research, (2) disseminates general information and news about the world of primate research (such as announcements of meetings, research projects, sources of information, nomenclature changes), (3) helps meet the special research needs of individual investigators by publishing requests for research material or for information related to specific research problems, and (4) serves the cause of conservation of nonhuman primates by publishing information on that topic. As a rule, research articles or summaries accepted for the *Newsletter* have some practical implications or provide general information likely to be of interest to investigators in a variety of areas of primate research. However, special consideration will be given to articles containing data on primates not conveniently publishable elsewhere. General descriptions of current research projects on primates will also be welcome.

The *Newsletter* appears quarterly and is intended primarily for persons doing research with nonhuman primates. Back issues may be purchased for \$5.00 each. We are no longer printing paper issues, except those we will send to subscribers who have paid in advance. We will not accept future subscriptions, unless subscribers are willing to pay \$60/year within the U.S.; \$80/year outside the U.S. (Please make checks payable to Brown University.) Readers with access to electronic mail may receive the nongraphic contents of each issue by sending the message **subscribe LPN-L your-own-name** to **listserv@listserv.brown.edu** (Send the message **subscribe LPN-PEF** to receive PDF files by e-mail; or the message **subscribe LPN-WARN** to receive a notice when a new issue is put on the Website.) Current and back issues of the *Newsletter* are available on the World Wide Web at <http://www.brown.edu/primate>. Persons who have absolutely no access to the Web, or to the electronic mailing, may ask to have paper copies sent to them.

The publication lag is typically no longer than the three months between issues and can be as short as a few weeks. The deadline for inclusion of a note or article in any given issue of the *Newsletter* has in practice been somewhat flexible, but is technically the tenth of December, March, June, or September, depending on which issue is scheduled to appear next. Reprints will not be supplied under any circumstances, but authors may reproduce their own articles in any quantity.

PREPARATION OF ARTICLES FOR THE NEWSLETTER. – Articles, notes, and announcements may be submitted by mail, e-mail, or computer disk, but a printed copy of manuscripts of any length or complexity should *also* be sent by regular mail. Articles in the References section should be referred to in the text by author(s) and date of publication, e.g., Smith (1960) or (Smith & Jones, 1962). Names of journals should be spelled out completely in the References section. Technical names of monkeys should be indicated at least once in each note and article. In general, to avoid inconsistencies within the *Newsletter*, the scientific names used will be those in *Mammal Species of The World: A Taxonomic and Geographic Reference*, 2nd Ed. D. E. Wilson & D. M. Reeder (Eds.). Washington, DC: Smithsonian Institution Press, 1993. For an introduction to and review of primate nomenclature see the chapter by Maryeva Terry in A. M. Schrier (Ed.), *Behavioral Primatology: Advances in Research and Theory* (Vol. 1). Hillsdale, NJ: Lawrence Erlbaum Associates, 1977.

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Cover illustration of *Hylobates lar* by Anne Richardson,
in memory of Beanie.

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Puzzle-Ball Foraging by Laboratory Monkeys Improves with Experience

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Nonhuman primates in the wild typically spend considerable time foraging for food. The time needed to find, obtain, and process food can take between 30% and 70% of a monkey's day (Boinski, 1988; Sussman & Tattersall, 1981). In captivity, far less time is required owing to the ease of obtaining provisioned food (Boccia & Hijazi, 1998; Crockett et al., 1995). During the idle time that wild monkeys would typically spend foraging, some captive monkeys develop and display abnormal behaviors. Logically, it would seem that providing foraging activities would reduce time spent on abnormal behaviors.

Some studies have found reductions in abnormal behavior of caged monkeys associated with the presence of foraging devices (Bayne et al., 1991; Brent & Long, 1995; Crockett et al., 2001), but not all (Lutz & Farrow, 1996). One found locomotor stereotypies to be reduced shortly after filling a puzzle feeder, but no effect on self-injurious behavior (Novak et al., 1998). Although foraging devices are unlikely to cure severe behavior disorders, they are regarded as a useful part of an environmental enrichment program for captive primates. Foraging opportunities may prevent or reduce the development of abnormal behavior in some animals and stimulate a wider range of normal activities, thus enhancing psychological well-being. "Foraging or task-oriented feeding methods" are specifically mentioned by the USDA as desirable elements in an environmental enhancement plan (U. S. Department of Agriculture, 1991).

When presented with a novel foraging puzzle (stacked PVC tubes provisioned with peanuts), 3 of 9 macaques quickly demonstrated aptitude, whereas others never solved it during seven opportunities (Heath et al., 1992). In a study of a similar device, only 3 of 8 *Macaca fascicularis* were able to remove all the peanuts after 21 days of experience (Murchison, 1991). These devices are relatively expensive and difficult to clean, raising the question of cost vs. benefit when less than half of the monkeys seemed to be able to forage successfully. Seeking a foraging device that would be less expensive, easier to clean, and used by more monkeys, we designed a Puzzle Ball

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Thanks to Vern Davidson for adapting our Puzzle Ball into a commercially available product (see "small foraging ball" at www.steineronline.com). No royalties are received by the inventors or the University of Washington, and the original design is in the public domain (Crockett et al., 2001). Research supported by NIH RR00166.

(Crockett et al., 2001), modified from a design by Murchison (1992). The first batch of Puzzle Balls was installed in 1998, and we have added to the inventory over the years. By December 2004, Puzzle Balls had been installed on nearly every cage at the Washington National Primate Research Center (WaNPRC) in Seattle.



Figure 1: Experienced pigtailed macaque demonstrates Puzzle Ball technique: left index finger in one of three holes, right hand steadying ball. (Photo by Carolyn M. Crockett)

Recently, a foraging ball adapted from our Puzzle Ball design has become available commercially. One customer indicated that the macaques in his facility were having some difficulties removing peanuts from the ball. We speculated that this might be due to the inexperience of the monkeys.

We decided to test this idea by comparing Puzzle Ball use by monkeys that had been at our facility for some time with its use by recent arrivals. We predicted that monkeys recently arrived at WaNPRC would be less proficient at using the Puzzle Ball, perhaps explaining the customer's observations. Effectiveness of using the Puzzle Ball as a foraging device was measured by the percentage of time the monkeys spent manipulating the Puzzle Ball, the number of treats dropped, and the number of treats successfully removed and eaten.

Methods

Data were collected on 22 individually housed non-human primates: 7 *Macaca fascicularis* (longtailed ma-

caques), 8 *M. nemestrina* (pigtailed macaques), and 7 *Papio cynocephalus anubis* (savanna baboons). Eleven monkeys were new arrivals (1 to 3 months prior to data collection) and 11 had been at WaNPRC at least 2 years. Nine subjects were female and 13 were male (sex and recent arrival ratios were similar among the species). The subjects were 2 to 13 years of age.

All subjects were housed at the WaNPRC, in individual cages sized appropriately for their weight as defined by the USDA (U. S. Department of Agriculture, 1991). Subjects were fed monkey chow twice daily at 0900 and 0200 and water was available ad lib through a standard watering system. Cages were equipped with perches and portable toys inside and Puzzle Balls attached permanently to the outside. Prior to the study, the monkeys had been receiving various fruit and vegetable treats and foraging opportunities as part of the Environmental Enhancement Plan <www.wanprc.org/wanprc/psych-wellbeing.htm>, including the filling of Puzzle Balls on their cages 1-2 times per week (often by the observer, CRL).

Each subject was observed once after its Puzzle Ball was filled with 10 whole peanuts, using a "Puzzle Ball Loader" (Crockett et al., 2002). Five-minute focal animal observations were conducted immediately following the provisioning, and the amount of time the subject spent manipulating the puzzle ball was recorded using a stopwatch. The number of peanuts successfully removed (usually eaten), the number dropped, and the number remaining after 5 min were recorded on a data sheet.

Analysis was done using an SPSS statistics program. Two-tailed independent groups T-Tests with alpha level of .05 tested sex differences and differences between experienced monkeys and recent arrivals. A one-way ANOVA with a post hoc Tukey's HSD statistical test was done to test for species differences.

Results

As predicted, there were significant differences in success in using a Puzzle Ball as a foraging device between experienced and recent arrivals at WaNPRC. Experienced monkeys spent a greater percentage of time manipulating the Puzzle Ball ($M=43.1\%$, $SD=20.5$) than recent arrivals ($M=13.7\%$, $SD=20.9$), $t(20)=-3.33$, $p=.003$. Significant differences were also found in the number of treats successfully removed or dropped, with experienced monkeys successfully removing (usually eating) more treats ($M=5.54$, $SD=3.11$) than newcomers ($M=0.27$, $SD=0.90$, $t(20)=-5.399$, $p<.001$), as well as dropping more treats ($M=2.36$, $SD=2.87$) than newcomers ($M=.09$, $SD=.30$), $t=-2.609$, $p=.017$. Experienced monkeys left an average of only 2.09 peanuts in the Ball vs. 9.6 by newcomers. No significant differences were found between sexes or among species in any of the measures.

Discussion

As expected, we found a significant difference between experienced monkeys and recent arrivals at WaNPRC in skill at using the Puzzle Ball as a foraging device. This suggests that as exposure and experience with the Puzzle Ball increase so does effectiveness in using the Puzzle Ball as a foraging device. It might be predicted that monkeys with more experience would spend less time manipulating the Puzzle Ball because they quickly remove more treats. However, we found that on average the experienced monkeys also spent more time manipulating the Puzzle Ball. Seven recent arrivals never touched the Puzzle Ball whereas four manipulated it 14-50% of the time, but unskillfully. This suggests that some recently arrived monkeys regard the Ball as a novel object to be approached with caution.

WaNPRC staff make no effort to "train" monkeys in Puzzle Ball use. Some learn by trial and error, as did the monkeys initially exposed to the Puzzle Ball in 1998. The present study suggests that it takes a while for new monkeys to become proficient. Recent arrivals are put into rooms with longer-term residents after quarantine, and the sample of experienced monkeys suggests that virtually all eventually learn. Of the 11 recent arrivals, 3 (all baboons) had not yet been in rooms with experienced monkeys, but two of them were the most manipulative of the recent arrivals.

The results of this study found no significant differences between sexes or among species in the effectiveness of using the Puzzle Ball as a foraging device. Murchison (1992) found male *M. fascicularis* to be more proficient than female *M. fascicularis* or female *M. nemestrina*. Our two experienced male *M. fascicularis* were the only subjects to successfully retrieve all 10 peanuts during the 5-min observation period. A study with larger sample sizes (both sexes and all species) of experienced animals might reveal some differences. Overall, however, the Puzzle Ball is a useful form of environmental enrichment for laboratory monkeys, and was effectively used by all our experienced monkeys.

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Leo Whitehair

Leo Whitehair, DVM, PhD, and former Director of Comparative Medicine at the National Center for Research Resources, NIH, passed away November 2, 2004. Leo was born on a farm in Kansas, and received his undergraduate and veterinary degrees (in 1953) from Kansas State. After serving in multiple positions with the Air Force since 1954, and receiving a MS degree in animal nutrition and a PhD degree in food science from Wisconsin in 1962, he served as Lieutenant Colonel at the Atomic Energy Commission in Germantown, Maryland, from 1962-1967.

Leo began his NIH career in 1967-1968, when he was selected for the prestigious Grants Associates Program. After the one-year internship, with rotations at various NIH Institutes and Centers, FDA, and NSF, Leo began his service that would eventually span more than three decades with NCRP and its predecessor. He was named Director of Comparative Medicine in 1989, and despite soon thereafter being diagnosed with lymphoma, he ably served in this capacity until early 1999.

Leo has been honored with many awards, including the American Society of Primatology's first Distinguished Service Award in 1994. He was named an honorary member of the American College of Laboratory Medicine in 1996, and an Honorary Diplomat of the American Veterinary Epidemiology Society in 1998. In Leo's case, roots originating on a Kansas farm certainly grew and fed

major lifelong interests and accomplishments in animals and their nutrition.

Leo and his coworkers provided the underlying support and helped produce many publications that still serve as basic references for research using a wide range of animal models, and which benefit many species of animals. These include many NCRP/NIH and NRC/NAS/ILAR publications (including the *Cost Analysis and Rate Setting Manual for Animal Research Facilities*, the NIH/NCRP/Advanced Resource Technologies, Inc., *Survey of Animal Use*, numerous revisions of the "GUIDE" [*The Guide for the Care and Use of Laboratory Animals*], *Chimpanzees in Research*, *Psychological Well Being of Nonhuman Primates*, *Microbial and Phenotypic Definition of Rats and Mice*, and *Nutrient Requirements of Nonhuman Primates*).

Leo seemed to personally know well everyone he needed to know at NIH, no matter which organizational unit, and regardless of whether they had achieved an advanced level or were beginning their careers. He also seemed to know 99% of all the veterinarians in the U.S. who were either researchers themselves or who enabled research. He would often instantly recall where people were born, what their research interests were, and even what joke they had last told him that made him laugh. He will be missed. – *from the Division of Comparative Medicine, NCRP, NIH*

Clinical Experience with NSAIDs in Macaques

Paul Flecknell

Comparative Biology Centre, Medical School, University of Newcastle

There is relatively little information concerning the use of nonsteroidal anti-inflammatory drugs (NSAIDs) in nonhuman primates; the relatively small numbers of animals undergoing surgical procedures at individual research establishments limits the scope of controlled clinical trials. In common with others dealing with this problem, we have developed drug dose regimens by extrapolation from other animal species and from man. We have now completed 24 surgical procedures in rhesus macaques, over a three-year period. The surgical procedures were ocular surgery (implantation of eye coils for detection of eye position), implantation of chambers on the cranium for recording neuronal activity in conscious animals, and surgery to repair injuries resulting from fighting.

The analgesic regimens used in all animals have been carprofen, 3-4mg/kg intravenous or subcutaneous (Rimadyl, Pfizer), administered pre-operatively, followed by meloxicam 0.1-0.2mg/kg orally starting one day post-operatively, once daily for up to 3 days (Metacam palatable meloxicam drops, Boehringer). Some animals also received buprenorphine (0.01mg/kg) immediately following surgery to provide additional analgesia, and to reverse the respiratory depression caused by alfentanil (used as a component of the anesthetic regimen). The efficacy of the NSAIDs was judged solely by clinical criteria, since no validated method of assessing post-operative pain in nonhuman primates has been developed. Slightly more objective assessments of the effects of treatment can be

gained by observation of the degree of wound swelling, which has been substantially reduced after commencing use of NSAIDs. A concern of the investigators was that using NSAIDs might delay bone healing, and compromise integration and anchoring of the cranial implants. This concern has proven unfounded.

The choice of NSAIDs has evolved over a number of years. Initially, a single dose of carprofen was administered pre-operatively, followed by additional doses once daily if required. Metacam palatable drops are honey-flavored, can be injected into banana, grapes, orange segments or other foods, and are readily accepted by our animals. Bioavailability of meloxicam in other species has been reported to be high after oral administration, but we do not know if the dose suggested is optimal. An arbitrary cut-off for treatment of three days was selected, as it seemed unlikely that gastric ulceration would develop during this period, and neither wound swelling nor irritation was noted after discontinuing treatment. Two animals showed signs of wound irritation after discontinuing treatment; these animals received additional treatment (for two days) and showed a rapid clinical improvement. Both of these animals had bite wounds that had been debrided and sutured.

Because of ethical constraints, no blinded control studies have been undertaken, so the safety and efficacy of these regimens remain anecdotal. However, this information may be of value to others and, at the least, provide some reassurance regarding the lack of clinically apparent side-effects and lack of interference with the research procedures. It is to be hoped that pain assessment techniques for these species will be developed, and that controlled clinical trials can then be undertaken to establish optimal analgesic regimens.

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Building Wooden Structures for Habitats: A Letter

A self-described woodworker happened upon the *LPN* Website in September, finding "Wooden Objects for Enrichment: A Discussion" in the July, 2000, issue (Vol. 39, no. 3, 1-4). He writes: "The article discusses the introduction of wooden objects into habitats for primates.

"The nails were said to be a problem as wooden perches are worn down. Well, in the 'old days', before nails and screws, tapered wooden pegs were hammered into place and were quite strong. Some sort of 'dowels' may be your best solution, possibly in concert with a natural tree gum as an extra adhesive measure (non-toxic, of course).

"Please share this with those who are concerned with creating safe places for those animals.

"Thank you for your attention."

[*Editor's note: There is one consideration when using dowels. Depending on the size of the monkeys, the dowels can become foreign objects which can be ingested and/or inhaled and cause serious problems. I would not expect this to be a common problem. But it has caused toys to be withdrawn from sale for children of certain ages. One always has to expect that if nails can be exposed, so can dowels. – Morris Povar*]

Incidence of Wounding Within a Group of Five Signing Chimpanzees (*Pan troglodytes*)

Mary Lee Jensvold, Anne-Ashley Field, Jamie Cranford, Roger S. Fouts, & Deborah H. Fouts

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Introduction

Aggression in chimpanzees arises in a variety of social contexts and can vary in severity from threatening displays to agonistic attacks that result in wounding. Acts of aggression and wounding are evinced in both free-living and captive chimpanzee communities. In free-living communities, social excitement, competition for food or sexual partners, as well as protection of a friend or family member, can all trigger aggression (Goodall, 1986). In captive situations, agonistic encounters occur for reasons similar to those in free-living communities: the introduction of unfamiliar chimpanzees, reunions between chimpanzees after long separations, one chimpanzee's intervention on the behalf of another, or redirected aggression (Alford et al., 1995; Goodall, 1986).

Reducing aggression and wounding in captive chimpanzees is a major concern of primate caregivers (de Waal, 1986). Strategies to reduce wounding rates in captive chimpanzee groups include studying the effects of housing, dominance stability, age, and rearing on wounding rates (Baker et al., 2000). Lambeth et al. (1997) analyzed a database containing wounding reports on the 88 adult chimpanzees housed at the University of Texas to determine effects of the level of human activity on wounding. Results showed a higher incidence of chimpanzee-to-chimpanzee wounds during the weekdays, when levels of human activity were higher. Baker et al. (2000) determined that age, sex, and enclosure type all had significant effects on rates of minor wounds but not on serious wounds in captive-housed chimpanzees.

This report determines the wounding rates at the Chimpanzee and Human Communication Institute (CHCI) and compares it with other published captive chimpanzee wounding rates.

Five socially housed chimpanzees (*Pan troglodytes*), three female and two male, reside at CHCI in Ellensburg, Washington. None of them are genetically related. Washoe, the oldest, was born in 1965 and Loulis, the youngest, was born in 1978. Four of the chimpanzees, Washoe, Moja, Tatu, and Dar, were cross-fostered in a human environment as infants and acquired American Sign Language (ASL) during that time (Gardner & Gardner, 1989). The fifth chimpanzee, Loulis, acquired his

signs from his adopted mother, Washoe, and other signing chimpanzees (Fouts et al., 1989).

The chimpanzees have lived together in a closely bonded and stable social group since 1981 (Sanz et al., 1996; Hayashida et al., 2002). Washoe, a female, is dominant; Loulis and Tatu are high in social status (but below Washoe); Dar is medium; and Moja is low.

As part of regular husbandry practices caregivers observe the chimpanzees daily and record any wounds. The records include the date of observation, location of the wound, and a description of it. These wound reports are stored in a medical log which also contains other medical reports such as illness, fecal analysis, and administration of medicines. For this report wounds recorded between July 1993 and July 2000 were classified as either "minor" or "serious". "Minor wounds" were characterized as scratches, bruises, abrasions, or cuts smaller than one-half inch in length or diameter (Baker et al, 2000). "Serious wounds" were those at least one-half inch in length or diameter, puncture wounds, bites, or wounds deeper than the surface of the skin (Baker et al., 2000).

	Minor	Serious	Total	Average per year
Washoe, female	4	1	5	0.714
Loulis, male	7	4	11	1.57
Tatu, female	3	1	4	0.57
Dar, male	18	8	26	3.71
Moja, female	2	2	4	0.57
Total	34	16	50	
Average per chimp per year	0.971	0.457	1.43	

Table 1: Minor and serious wounds, 1993 through 2000.

Comparisons

A group of 136 chimpanzees at the Yerkes Regional Primate Research Center in Atlanta, Georgia, incurred 965 wounds over a two-year period from August, 1995, to August, 1997 (Baker et al., 2000). The average number of wounds for each chimpanzee per year was 3.55; this rate is 2.5 times higher than at CHCI. Lambeth et al. (1997) reported the wounding rates of a group of 88 chimpanzees (42 female, 46 male) at the University of Texas M. D. Anderson Cancer Center Science Park (UTSP) over approximately a 10-year period. The

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average number of wounds for each chimpanzee per year was 4.5; three times higher than at CHCI. At both facilities, males had higher wounding rates than females. In general, wounding rates at CHCI were lower than those reported by Baker et al. and Lambeth et al. However, Dar, a male, incurred an average of 3.71 wounds per year over the 7-year period. Dar's averages were more congruent with the averages at Yerkes and UTSP. Both males at CHCI, Dar and Loulis, experienced higher wounding rates than the females, which is consistent with the rates at Yerkes and UTSP.

Factors at CHCI that may contribute to the low wounding rates are the chimpanzee-human relationships, group stability, and enclosure size. The social environment of chimpanzees may be the most critical factor affecting their well-being in captivity (Fouts et al., 1994). Berkson et al. (1963) found that social contact is even more important to well-being than enclosure type and size. A larger enclosure that provides no visual contact with other primates can lead to an increase in stereotypic behaviors compared to a smaller enclosure where primates are not visually isolated. In captivity, social environment includes not only the chimpanzees who live together but also the caregivers and humans who are part of the chimpanzees' daily life. Caregivers become a member of the social hierarchy. For many primates who are isolated from other conspecifics, this becomes especially critical.

Since its founding, CHCI has implemented a stringent policy that in order to improve the well-being of the chimpanzees housed in the facility, all personnel must demonstrate an understanding of chimpanzee behavior. In addition, all caregivers must adopt submissive chimpanzee behaviors – such as pronating the wrist – toward the chimpanzees and must treat the chimpanzees with respect. As a result the human caregivers at CHCI are the lowest-ranking individuals in the social hierarchy (Sanz et al, 1996; Hayashida et al, 2002). As members of the chimpanzees' extended social group, the caregivers at CHCI are able to respond as other chimpanzees would in conflict situations. The ability of caregivers to understand the chimpanzees' signals, and to convey their own messages about the stability of the social environment, may help to reassure recent conflict participants. Furthermore, by allowing the chimpanzees to direct their aggression towards humans who are safely outside the enclosures, caregivers are providing a safe outlet for natural chimpanzee aggression and stress. As evidence, Malone et al. (2000) examined post-conflict interactions at CHCI. When the chimpanzees directed aggression at another individual following a conflict, 63% was directed at humans and 37% toward other chimpanzees. This is in contrast to a biomedical facility where 22% of aggression was directed at unfamiliar humans and 78% toward other chimpanzees (Maki et al., 1987).

Another factor that may contribute to the low wounding rates seen at CHCI is the stable social hierarchy (Sanz et al., 1996; Hayashida et al., 2002). Washoe, the oldest female, has maintained her position at the top of the hierarchy since before 1996, while Dar, Loulis, Tatu, and Moja have held middle rankings, and the human caregivers are on the bottom. A stable hierarchy may reduce agonistic interactions due to the absence of attempts to displace the alpha chimpanzee.

A final factor that may contribute to the low CHCI wounding rate is enclosure size. The chimpanzees at CHCI have access to a total of 587 m² (an average of 117 m² each), including tunnels, climbing structures, and a large outdoor enclosure where they can use 30 ft of vertical space. This allows the chimpanzees avenues to escape conflicts. All facilities should be designed with the opportunity for visual and physical escape.

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Update to *Directory of Graduate Programs in Primatology and Primate Studies*

ENGLAND

• Roehampton University, School of Life & Sport Sciences

PROGRAM NAME: Primatology: Master of Research (MRes) degree.

PROGRAM DESCRIPTION: This program provides a unique opportunity to study primate biology in depth. It will combine theoretical investigation with laboratory and field work on a range of topics and provide preparation for advanced research (PhD and consultancy work). Practical investigations will be carried out in zoos, local habitats, museums and laboratories. After the first semester the emphasis will be on independent research, with all students carrying out an in-depth piece of original research. This will be written up as a dissertation and a paper in a form suitable for publication in a peer-reviewed scientific journal.

Key areas of study may include: • Ecology and behavior: methods used in surveying and gathering biological information; methods of recording behavior in the field. • Diet and foraging: observing and investigating behavioral and physical dietary adaptations; field and laboratory techniques for gathering data; analyzing nutritional and foraging data from wild and captive primates. • Life-history evolution: allometry; reproductive life history variables; comparative analysis of life history and brain size evolution. • Reproduction: laboratory techniques for gathering data and analyzing reproductive hormone data in wild and captive primates; the evolution of mating strategies. • Zoos and museums as a resource for the study of primates; the ethics of studying captive primates. • Methods of analyzing physical and behavioral adaptations (e.g. locomotion, sensory systems); phylogenetic reconstructions and interpretations of adaptations.

* * *

FACULTY AND THEIR SPECIALTIES: Professor Ann Maclarnon, Research Professor (primate biology and human evolution, particularly reproductive life history strategies, comparative gestational physiology including endocrinology, comparative morphology [brains and guts], and neurological evolution including vocalization/speech/language evolution); Dr. Caroline Ross, Reader and Programme Convener, MRes (primatology [socioecology of primates, human-animal conflict] and ecology [evolution of life history strategies including the evolution of growth rates and non-maternal investment]); Dr. Stuart Semple, Senior Lecturer (primate communication and cognition; primate welfare; primate conservation biology; evolution of vocal communication; evolution of the primate immune system).

FOR FURTHER INFORMATION: School of Life & Sport Sciences, Roehampton University, West Hill, London SW15 3SN, England [+44 (0)20 8392 3524; e-mail: admissions@roehampton.ac.uk; or see www.roehampton.ac.uk/pg/primatology].

ADDITIONAL INFORMATION: Entry requirements: Candidates should normally hold a minimum of a U.K. lower second-class Honours degree in biological sciences or an equivalent area with sufficient biology (candidates from overseas will be expected to have a good first degree). Applicants without the above first degree qualification will require evidence of practice in primatology and/or may be required to submit a portfolio which demonstrates their academic potential and knowledge of fundamental biological principles. All suitable applicants are interviewed (this may be by telephone for overseas applications). As well as our own laboratories, we also have the advantage of being well placed to use facilities in other London institutions, such as the Zoological Society of London and the Museum of Natural History.

Fentanyl Patches for Macaques: A Summary

Claire E. Lindsell, Senior Clinical Veterinarian at the California Institute of Technology [e-mail: lindsell@caltech.edu], wrote to the COMPMED e-mail list: “Has anyone used fentanyl patches for postoperative analgesia on rhesus macaques? If so, could you please share the details and any tips on how and where to apply them, any problems encountered, and whether jackets are necessary to cover them. Thank you.”

On October 6, she wrote: “Below is a summary of the responses I received to my question about using fentanyl patches for rhesus macaques. Thanks to all who replied.”

- “We use them with great success. We shave an area between the shoulder blades to place them, then cover with a jacket.

“We generally put them on 24 hours pre-op, and change them at 72 hours if more analgesia is needed. Just make sure you insulate them well when they are on a heating blanket – the warmth can increase uptake and overdose the animals. The one time we had that happen was easily addressed with Narcan.”

In response to some further questions from Claire, the same author replied: “You generally need to sedate a monkey to place a jacket, although we have had some very well trained animals where it wasn’t necessary.

“Acclimation per se probably isn’t necessary, but we do a one-week ‘trial’ to make sure the fit is correct and the monkey does not have a big issue with it. Well over 95% of them accept it with no problem. This is stuff we learned over time and many animals, of course, but we’ve jacketed hundreds, maybe thousands, of primates over the past 10 years.

“We generally find that we can accomplish jacketing safely with a ‘light’ dose of ketamine (5 mg/kg), and that the animal is up and normal very quickly. It really hasn’t seemed to be a problem to do this.

“The approach of jacketing at surgery and bridging with buprenorphine is completely acceptable. The minor drawbacks are that it’s hard to know when/how much to pull back the buprenorphine (it can take 12-24 hours for fentanyl blood levels to peak), and if the monkey isn’t already jacketed you might get one of those rare individuals who won’t tolerate it. It’s whatever works better for your team.

“Good luck – we love these because they are effective, steady analgesia, low labor intensity for the staff, and no constant needle stick for the animals in the immediate post-op period. Occasionally we have supplemented with a little buprenorphine or oxymorphone immediately post-op, but rarely does it seem the animals need it. The first time we used a patch I was impressed with how easily the

animal moved and how quickly it returned to eating after a major surgery.”

- “We routinely use the patches on our cynos. We place them on the upper abdomen, just below the rib cage, and we do cover them with jackets. They stick very well, but sometimes we use a little butyl cyanoacrylate tissue adhesive (Vetbond™ 3M) in each corner to tack it down. The only drawback to using the patches is that we have to sedate the monkeys to remove the jackets.”

- “Yes, we use the fentanyl transdermal patches on our macaques and baboons (*M. nemestrina*, *P. anubis*). The patches are placed on the back just below the scapula. We would NOT use the patches unless the animals are jacketed. The patches are glued AND sutured on the corners making sure not to inhibit the reservoir. Dosages are approximately 7.5-10 mcg/kg/hr since the patches only come in 25/50/75/100 mcg sizes. We’ve had excellent results.”

- “We routinely use 50 mcg/hr fentanyl patches on rhesus with very good results. During preparation for surgery, we apply the patch to the inside of the forearm using the following method:

- 1) Shave both forearms and backs of hands to about halfway between wrist and elbow with a #40 clipper blade.
- 2) Make sure the skin is dry, then place the patch on the forearm, ensuring good contact (be sure to note which arm).
- 3) We give them “mitts” by wrapping the shaved area of both arms with Elastikon. Place a piece of 4x4 gauze over the patch, so that it will stay in place if you remove the Elastikon to rewrap.
- 4) Place a couple squares of 4x4 gauze folded into quarters in the palm of each hand & curl the fingers over the gauze.
- 5) I use three continuous layers on Elastikon, making sure that the fingers are all enclosed so they can’t pick away at the bandaging. Also, try not to stretch the Elastikon too much as you’re wrapping so that it doesn’t constrict blood flow.
- 6) After 72 hrs, remove the mitts with bandage scissors. Sometimes they’re so thick that I use a scalpel blade to very carefully scratch through the top layers so I can get to the bottom layers with bandage scissors.

“It takes a bit of trial and error to figure out the best ways to wrap, and it’s easier to do if you have another person positioning the hands and arms. With practice, mitts can be put on and removed pretty quickly. The monkey will look a bit ridiculous, but this keeps him from messing with the surgical site as well. Food must be placed on the floor of the cage for the three days that the mitts are on (change them sooner if they get really soiled).

“If you don’t shave the arms, the monkey can get the mitts off pretty easily with his teeth. I have also tried using Elastoplast, but have found that its adhesive properties are not good enough to stay on a monkey for three days.

“We give one injection of buprenorphine (0.02 mg/kg) during prep to get them by until the fentanyl can kick in.”

- “We’ve used them on big cynos at the base of the tail (dorsal side). Shave, alcohol, patch, and a self-adhesive

* * *

elastic bandage, such as 3M Vetrap[®]. Simple, no jacket required and they’ve left them alone (up to now).”

- “After reading some of these comments I have to disagree with the use of buprenorphine as a “supplement” or “bridging”. Buprenorphine is a partial agonist/antagonist. The insert states: “Narcotic Antagonist Activity: Buprenorphine demonstrates narcotic antagonist activity and has been shown to be equipotent with naloxone as an antagonist of morphine in the mouse tail flick test.”

Grants Available

Center for HIV/AIDS Vaccine Immunology

The National Institute of Allergy and Infectious Diseases (NIAID) seeks to establish a Center for HIV/AIDS Vaccine Immunology (CHAVI) that will support intensive and highly collaborative projects addressing key immunological roadblocks to the discovery and development of a safe and effective HIV vaccine as defined by NIAID and identified by the Global HIV Vaccine Enterprise. Over the 7-year project period the research to be designed and conducted by CHAVI will address: (1) the elucidation of (a) early immunologic and virologic events after HIV-1 infection in humans, and/or (b) immune correlates for protection in animal models; (2) the systematic design and evaluation of immunogens and adjuvants eliciting persistent mucosal and/or systemic immune responses; and (3) the evaluation of vaccine candidates in early-phase clinical trials. First-year funding will support a CHAVI Director and the awardee institution for (1) the further development and initial implementation of a Scientific Agenda and Strategic Plan for all CHAVI activities; (2) the Management and Operations resources to coordinate and manage the entire range of CHAVI activities; (3) research, to be undertaken by the CHAVI Director and investigators in the CHAVI Scientific Leadership Group, focusing on: elucidation of early immunologic and virologic events after HIV infection, and/or elucidation of correlates of immune protection in nonhuman primate models; as well as initiating the systematic evaluation of vaccine candidates and immunization strategies to enhance mucosal immunity, potency, antigen presentation and immunogenicity; and (4) the development of scientific resources and facilities essential to implement the Scientific Agenda. Expanded funding in the second and subsequent years will support additional research and additional investigators to fully implement the CHAVI Scientific Agenda.

Address your scientific and research questions to Stuart Z. Shapiro, Division of AIDS, NIAID, 6700-B Rockledge Drive, Room 5146, MSC 7628, Bethesda, MD 20892-7628 [301-402-0122; fax: 301-402-3684; e-mail: niaidchavi@mail.nih.gov]. Letter of intent receipt date is

January 21, 2005, and the application receipt date is February 23.

2005 AFAR Grant Programs

Since 1981, the American Federation for Aging Research (AFAR) has helped scientists begin and further careers in aging research and geriatric medicine. Their mission is to promote healthier aging through biomedical research. They fulfill this mission by: • supporting biomedical research that promotes healthier aging and furthers our understanding of the aging process and its associated diseases and disorders; • building a cadre of new and young scientists in aging research and geriatric medicine; • offering opportunities for scientists and physicians to exchange new ideas and knowledge about aging; and • promoting an awareness among the general public about the importance of aging research.

Programs include:

- Summer Research Medical Student Geriatric Scholars Program provides short-term research training opportunities for medical students. AFAR has entered a partnership with the National Institute on Aging and several foundations. The program guidelines and application are currently being developed. Anticipated deadline will be in early February, 2005. The guidelines will be available by December 1, the application by December 22.
- The Glenn/AFAR Scholarships for Research in the Biology of Aging (currently under review for renewal) are designed to attract potential scientists and clinicians to aging research and provide PhD and MD students the opportunity to conduct a three-month research project. Students will work in an area of biomedical research in aging under the auspices of a mentor. Each scholarship carries an award of \$6,000. If funded, the deadline for receipt of applications will be February 25, 2005.

For information about these and other programs, contact AFAR, 70 W. 40th St, 11th Floor, New York, NY 10018 [212-703-9977; fax: 212-997-0330; e-mail: grants@afar.org]; or see www.afar.org.

News Briefs

Vietnam Monkey Faces Extinction

The Delacour's langur (*Trachypithecus delacouri*) is one of the most endangered primates in the world. Only about 300 are alive today, and experts fear they could be completely extinct by 2014 if the current rate of decline continues. The monkeys are being pushed to the brink by hunting for the Chinese traditional medicine trade. However, conservationists say swift action now could save the species. Hunting has forced the animal into a few extreme strongholds, where steep limestone cliffs grant a little protection from poachers.

Development is placing additional pressure on the fragile species by isolating already small sub-populations. If the main breeding male dies, the whole sub-population is at risk, because no new males can reach the group.

"We have 19 isolated populations," said Tilo Nadler, Vietnam Country Representative for the Frankfurt Zoological Society. "And 60% of the whole population lives in isolated sub-populations of less than 20 animals."

The Delacour's langur is so rare that it was not described by science until 1932, and it was another 50 years before anyone did any comprehensive research into the distribution and habitat of the species. In the early 1990s, about 600 of them were found in the limestone mountain ranges that cover about 5,000 sq km in northern Vietnam.

"The Delacour's langur is in the top 25 of the critically endangered primate list," said Russell Mittermeier, president of Conservation International. "But the good thing is that people are beginning to pay attention to it, and it does have some protected areas." Conservation efforts are centered on two national reserves in northern Vietnam. In Van Long National Reserve, created three years ago, approximately 70 individuals live in three separate populations. – *Story from BBC News, August 29*

Pacemaker Implanted in Ailing Gorilla

Veterinarians at the Birmingham (Alabama) Zoo, led by Dr. E. Marie Rush, implanted a specialized type of pacemaker in the chest of Babec, a 24-year-old gorilla, according to the zoo. The cardiac resynchronization therapy, or CRT device, is a common human therapy, but it was a first for a great ape, according to the zoo. Babec was diagnosed with heart disease in March, 2003. Since then, he has undergone two procedures to check his heart. After a July echocardiogram, doctors discovered Babec's heart function had fallen to 15 to 20 percent of capacity.

Rush has said Babec has probably less than a year to live. She has been investigating Babec's family tree to see if his father and grandfather, who died young, also had heart disease. Cardiac disease is a progressive, incurable disease in humans and animals. "Babec is presently

recovering and being monitored for response to the implantation of this device," zoo spokesman Ed Noles said. – *Birmingham News, September 28*

Suncoast Primate Sanctuary Has Updated Facilities

There's a cold, hard cage a few feet south of the main entrance of the Suncoast Primate Sanctuary in Palm Harbor, Florida. It's on the uncomfortable side of small, its bars thick and uninviting. It's empty. And it will stay that way. The abandoned cage is a reminder of the facility's past as a decrepit roadside zoo and a silent "thank you" to the donors who made the pen obsolete. A five-year fundraising campaign has helped the nonprofit sanctuary construct nearly all of its planned 19,000-square-foot facility. One section is yet to be completed, but all of the sanctuary's 45 primates now live in spacious enclosures filled with barrels, tires, and toys. Staff members said they hope the sanctuary soon will reopen its doors.

In 1999, the sanctuary, known for years as Noell's Ark Chimp Farm (see *LPN*, 2000, 40[1], 15), was closed to the public because its inhabitants were kept in small rusty cages that did not meet USDA standards. In 2001, the Florida Fish and Wildlife Conservation Commission denied the renewal of the sanctuary's state license for owning exotic animals because of similar problems. But the primates' new homes all meet or exceed federal and state requirements, said Pam Gilbert, great-ape coordinator for the sanctuary.

After appealing the denial of its state license, the sanctuary was granted permission to keep its animals on a probationary basis. The Commission inspected the construction of the new facility in 2003 and granted the sanctuary a full license that runs through September, 2005. The sanctuary has applied for a license with the USDA and asked for an inspection.

The Chimp Farm was founded in 1954 by Bob and Anna Mae Noell, both from families that performed medicine shows along the Atlantic seaboard. The Noells owned chimpanzees that would box and wrestle male volunteers in a traveling show. In 1971, they ended their circuit and settled on their property south of Tarpon Springs. After they retired, they cared for abandoned animals, mostly apes and monkeys. – *from an article by Nick Collins in the St. Petersburg Times, October 11, 2004*

Nobel Peace Prize to Kenyan Ecologist

Kenyan ecologist Wangari Maathai, whose campaign to save Africa's forests began with nine trees in her yard nearly three decades ago, has won the Nobel Peace Prize. She is the first African woman to take the award and it is also the first time since the prize was first awarded in 1901 that an environmental cause has been honored by

the Nobel committee. Maathai, Kenya's assistant minister for the environment since 2003, founded the Green Belt Movement in 1977, the largest tree-planting project in Africa, aimed at promoting biodiversity and at the same time creating jobs and giving women a stronger identity in society.

"Peace on earth depends on our ability to secure our living environment," the Nobel Committee said in announcing the award.

Maathai, 64, is a biologist by training. She was the first woman in eastern Africa to receive a doctorate and become a professor. – *Primate Info Net, October 8, 2004*

Statement from Canadian Public Health Agency: SFV

As part of the Public Health Agency's ongoing efforts to evaluate potential risks for blood transfusion and transplantation, researchers have investigated whether simian foamy virus (SFV) can be transmitted through blood transfusion. Using an animal model, researchers demonstrated that simian foamy virus can be transmitted through blood from one nonhuman primate (NHP) to another. Although this virus is not known to cause disease or health conditions in people or animals, this new research identifies an emerging issue related to the safety and adequacy of Canada's blood supply.

Simian foamy virus is a retrovirus that integrates into the host genome resulting in permanent life-long infections. It is commonly found in NHPs. Several studies show that approximately three percent of people working with NHPs are infected with simian foamy virus. The majority of those infected were either bitten, scratched, or had skin punctures from needle sticks. So far, there is no evidence of illness in the people infected with the virus who have been followed for up to 20 years, and no evidence that they can transmit the virus to others.

The Public Health Agency has advised Health Canada that, although there are no known risks, it would be prudent to take action to ensure that simian foamy virus does not enter the blood system.

As the blood system regulator, Health Canada is considering action to reduce the potential for entry of simian foamy virus in the blood supply. This could include precautionary measures to screen for people who may be at risk of having simian foamy virus. Options include asking those who work closely with NHPs not to give blood, or screening them out in the interview process before a donation. Once the new scientific information has been fully analyzed by the Public Health Agency and by Health Canada, and the impact of potential risk mitigation measures on the safety of the blood supply have been fully evaluated, Health Canada will make a decision on any necessary precautionary measures.

The Public Health Agency of Canada reminds people who work with animals to follow occupational safety precautions to minimize their risk of exposure to simian foamy virus. Occupations that have some risk of infection include people who work in zoos, public or private biomedical research institutions, and animal sanctuaries.

Based on current available information, owners of pet monkeys are not at risk of exposure to simian foamy virus because the New World monkeys usually kept as pets are not known to transmit this virus. However, if pet owners are bitten or scratched, they should follow standard first aid precautions. As with other animals, other infections are possible. Signs of infection, or if the animal is ill, should prompt medical consultation.

No diagnostic test is currently available for human simian foamy virus infection, and since no illness has been associated with infection, there is no need for exposed people to be tested. As noted, the general population is not at risk for simian foamy virus infection.

Company Gets Grant for Monkey Program

Alpha Genesis, which maintains rhesus monkey colonies at three sites, has received a \$1.1 million grant to expand its primate population and research efforts. Alpha Genesis has long used sites in Yemassee, in Early Branch, and on Morgan Island in northern Beaufort County, South Carolina, as holding grounds for the monkeys, which are shipped from overseas and later distributed to government scientists for use in research.

The grant, awarded by the National Institutes of Health, National Institute of Allergy and Infectious Diseases, will allow the company to expand its colony in Yemassee and its ability to characterize the monkeys' genetics for research. Alpha Genesis houses about 5,000 monkeys at its sites and expects that number to grow by about 500 with the new grant. In addition to the grant, the company will receive about \$3 million from the federal government this year.

In June, the South Carolina Department of Natural Resources extended its lease with Alpha Genesis to use Morgan Island, a portion of which is owned by the state. The lease, which was extended by two years, generates about \$800,000 in annual revenue for the state. The state bought the 4,489-acre island in 2002 to protect it from development. – *from the Island Packet, October 17, 2004*

NIH Funds Science Education Partnership Awards

The National Center for Research Resources (NCRR), a component of the National Institutes of Health (NIH), announced that it is providing \$8.1 million to fund seven FY 2004 Science Education Partnership Awards (SEPA). The projects will receive from two to five years of funding. SEPA programs are designed to improve the country's life science literacy by bringing together biomedical

and clinical researchers, educators, community groups, and other interested organizations in partnerships to create and disseminate programs that provide a better understanding of science research. SEPA funds programs that serve K-12 students and teachers, as well as science centers and museums across the country. In addition to targeting students, SEPA partnerships also develop projects that educate the general public about health and disease, with the aim of helping people make better lifestyle choices as new medical advances emerge.

FY 2004 Science Education Partnership Awards went to Boston University School of Medicine; Children's Hospital Oakland Research Institute (California); Colorado State University (Fort Collins); Rice University (Houston, Texas); Science Museum of Minnesota (St. Paul); Teachers College Columbia University (New York City); and University of Texas Health Science Center (Houston). For a full description of projects, see www.ncrr.nih.gov/ncrrprog/clindir/SEPAdirectoryFY2004.asp.

Bastrop Veterinary Campus Re-Named for Keeling

The University of Texas System Board of Regents approved naming The University of Texas M. D. Anderson Cancer Center's Department of Veterinary Sciences facility near Bastrop for its former long-time administrative director and internationally renowned chimpanzee expert. Now known as the Michale E. Keeling Center for Comparative Medicine and Research, the facility's new name honors the memory and contributions of Michale E. Keeling, DVM, who was the only administrative director of the department since it opened in 1975. Keeling was killed in a car accident near his home in Elgin last December at the age of 61.

Located on about 375 acres near Bastrop, the facility houses chimpanzees, rhesus monkeys, sheep, cattle, swine, chickens, and rodents, and has an international reputation for innovation in breeding and managing many species vital to biomedical research.

Under Keeling, the department became one of only a handful of institutions participating in the National Chimpanzee Breeding and Research Program. Acting on an opportunity that arose in 1977, Keeling developed a program at the Bastrop facility for housing, breeding and socializing chimpanzees that had been in federal biotechnology research programs. As part of a \$19-million grant from the National Institutes of Health awarded in 2000, the Bastrop campus recently built innovative new housing for the more than 150 chimpanzees that now reside there.

A veterinarian specializing in the care of primates, Keeling was active in organizations that monitored the use of animals in biomedical research and gave sanctuary to primates no longer involved in research. He published more than 50 papers on the physiology and behavior of

chimpanzees as well as the importance of animals in biomedical research. – *M. D. Anderson Cancer Center Press Release, November 5*

UCLA, HSUS Establish Animal Rights Law Programs

The Bob Barker Endowment Fund for the Study of Animal Rights Law will support teaching, research, seminars and lectures at the University of California–Los Angeles School of Law in the emerging field of animal rights law. “Animals need all the protection we can give them. We intend to introduce a growing number of law students to this area of the law in hopes that they will ultimately lead a national effort to make it illegal to brutalize and exploit these helpless creatures,” said Barker. UCLA animal law professor Taimie Bryant will head this effort and “will focus her scholarship on the theoretical issues of conceptualizing these rights and on legislative and other legal regulation of humane treatment of animals.”

The Humane Society of the United States (HSUS) is joining the growing number of animal activist groups that are developing programs to focus on issues related to “legal rights for animals”. According to Internet postings, the HSUS is seeking “several conscientious law students for Spring and Summer, 2005, Internships (unpaid) within the newly created Animal Protection Litigation Section in our Washington, DC, office.” According to the advertisements, interns “will work closely with the lawyers in the new Animal Protection Litigation Section, and will be integrally involved in the process of researching, preparing, and prosecuting animal protection lawsuits in state and federal courts.”

The Tort Trial & Insurance Practice Section of the American Bar Association has announced the creation of an Animal Law Committee. The Chair of the Committee is Barbara J. Gislason, a Minnesota attorney who is Chair of the Minnesota Bar's Animal Law Committee and a lecturer at the Hamline University School of Law in Saint Paul, Minnesota.

Recognizing the need for the biomedical research community to understand and consider the possible ramifications from this rising trend in animal activism, the National Association for Biomedical Research (NABR) has launched the “NABR Animal Law Section” www.nabranimallaw.org on its Website. This resource is designed to keep the membership, attorneys, and others abreast of developments in the animal rights movement's efforts to increase legal protections for, and grant legal rights to, animals.

Animals Released, Laboratories Vandalized – Iowa

An undetermined number of laboratory mice, rats, and pigeons were released, more than 30 computers were damaged, and hazardous materials were dumped sometime November 12 or 13 in research laboratories and faculty and graduate student offices at the University of Iowa

(UI). The extensive damages were discovered early Sunday morning, November 14, and law enforcement authorities – including local and state police and the FBI – continue to investigate the crime for which no one has claimed responsibility. There were no reports of injuries to faculty, staff or students in connection with the incident. University officials are still assessing the damages, but said they expected the monetary value to be in the tens of thousands of dollars.

NABR has also learned that a nearly completed science building under construction at the University of Minnesota–Duluth was also vandalized sometime over the weekend. – *From an NABR Alert, November 15*

In an e-mail sent to media on November 18, the Animal Liberation Front claimed responsibility for the Iowa break-in. However, investigators in Indiana and Minnesota learned the same day that animal-rights activists were probably *not* responsible for incidents of fire and damage at Purdue University and UM–Duluth science buildings. The FBI had said it was investigating whether there was a link between the Iowa break-in and incidents at Purdue and the UM–Duluth. But teen vandals, not animal-rights activists, are now accused of causing more than \$1 million damage to a \$30-million science center under construction at UM–Duluth. The weekend vandalism included plugging drains and leaving water running, causing extensive damage in one wing of the building.

Purdue officials believe a Sunday-morning fire that destroyed the aquaculture research and training center was caused by an electrical problem. – *From the Des Moines Register, November 19*

Orang Treated for Thyroid Condition

One of Brookfield Zoo’s female orangutans has had her appearance and zeal restored through treatment for a previously undiagnosed thyroid condition. In addition to healthier-looking skin and fur, Maggie has dropped 90 pounds and no longer snores or suffers from the flatulence, runny nose, and constipation that once plagued her.

Before Maggie’s thyroid condition was diagnosed last year, keepers had tried unsuccessfully to get the 43-year-old orang to shed some pounds.

Male orangutans didn’t interest her, but she sought comfort from her keepers. “She had severe headaches, and when she was in the off-viewing areas, she would come and lean her forehead on the front of the cage so that we could massage her temples,” zoo keeper Carol Sodaro said. “Sometimes she fell asleep like that.”

Keepers were stumped about what was wrong with Maggie, who was born in 1961 at the San Diego Zoo and is one of the oldest female orangutans in the country. Then, Sodaro heard about an orangutan at another zoo who suffered from similar problems and was successfully

treated for a thyroid condition. Blood tests were subsequently performed on Maggie by a University of Chicago endocrinologist; they showed she suffered from a hypothyroid, or underactive thyroid, condition, which can hinder metabolism and energy levels. Maggie was prescribed thyroxin to balance her body chemistry and increase her metabolism to help her lose weight. She became more alert after she was put on a high-fiber diet and her keepers put her on an exercise program. – *Associated Press, November 11*

AAALAC Appoints Swearengen Senior Director

The Association for Assessment and Accreditation of Laboratory Animal Care International has appointed James R. Swearengen, DVM, Senior Director. In this position, Dr. Swearengen will direct the expansion of AAALAC’s educational activities into a more formalized program, as well as oversee the ongoing development and future growth of the accreditation program. Dr. Swearengen has been a member of the Council on Accreditation since 2002. He currently serves as Deputy Commander of the United States Army Medical Research Institute of Infectious Diseases at Fort Detrick, Maryland.

Orangutan Dies at Great Ape Trust Learning Center

Indah, a 24-year-old orangutan who was moved in late September from the Smithsonian National Zoological Park in Washington, DC, to the new Great Ape Trust Learning Center in Des Moines, Iowa, was euthanized November 11. A spokesman for the Learning Center said the orangutan had not been eating or acting right so she was taken to Iowa State University’s veterinary medical center.

Indah had a chronic bowel condition since her youth. Her keepers became concerned that she was constipated. After exploratory surgery, it was determined that her intestines were so severely damaged that she could not have survived two more weeks, said Robert Shumaker, the scientist who has worked with the two orangutans since 1995. The ape had so many adhesions and abscesses on her intestines, which also showed signs of leaking, that it was a terminal condition.

Shumaker said orangutans normally live to age 40 and can live to be as old as 60. Indah arrived in Des Moines with her brother Azy, 26, in late September. Shumaker said her bowel condition probably had begun to deteriorate a year earlier. He added that the stress of the move did not exacerbate her condition.

Azy and Indah had been working with Shumaker in the Orangutan Language Project at the National Zoo since 1995. Shumaker has moved to Des Moines to run the project. Three other species of apes, including bonobos that will be brought from Georgia, will occupy the Learning Center. Researchers hope that by studying the primates, and through public education, they can improve

their chances of surviving in the wild. – by Perry Beeman, *Des Moines Register, November 12*

HSUS and FFA to Merge

The Humane Society of the United States (HSUS) is celebrating its 50th anniversary by merging with the Fund for Animals to become the largest and richest animal rights organization in the country, according to Scripps Howard News Service. “This is a historic move that is going to unite the movement,” said Wayne Pacelle, the president of the HSUS. “I’m looking for us to become a

hard-hitting campaign organization,” said Pacelle, who plans to use the organization’s combined budget of \$96 million next year to, among other initiatives, hire five lawyers for a litigation unit. Humorist and commentator Cleveland Amory, who died in 1998, created the Fund for Animals in 1967 after breaking with the Humane Society, and Pacelle previously worked for the Fund. Pacelle said he would like to further unify the animal rights movement in the United States through other mergers, or by creating an umbrella organization that could carry more political clout in Washington. – *NABR, November 24*

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Positions Available

Veterinarian / Division Head – Oregon

The Oregon National Primate Research Center (ONPRC) / Oregon Health and Science University (OHSU) invites candidates to apply for the position of Head of the Division of Animal Resources (DAR). This position provides leadership and management skills for the AAALAC-accredited Primate Center animal care program. The DAR employs eight veterinarians and approximately 80 technical and support staff, and provides care for approximately 3500 nonhuman primates.

Duties of the position include developing and maintaining an organizational structure that assures quality research support, animal health care, and husbandry for a rapidly expanding research program. This position will provide administrative direction in the areas of business/research coordination, clinical medicine, pathobiology, surgery, husbandry and colony operations, and NHP resources. In addition, the responsibilities include the design and development of new animal facilities.

Qualifications required are a DVM and background in primate medicine; ACLAM Board Certification (must be obtained within one year of appointment); three to five years of progressively responsible experience in supervision of multiple functions in a complex organization, preferably in a research, academic, or similar environment (finance and financial planning and accounting; human resource and performance management; change management; public affairs; and space and resource management); and demonstrated managerial, leadership, negotiating, and written and oral communications skills. Preference will be given to candidates with knowledge of research issues and prior experience with administration of animal facilities in a research setting.

Please submit a letter of intent, CV, and names and contact information for at least three references to: ONPRC, DAR Search Committee Chair, 505 NW 185 Ave, Beaverton, OR 97006 [e-mail: vetsrch@ohsu.edu]. OHSU/ONPRC offers competitive salaries, a comprehensive benefits package, and is an Equal Opportunity/Affirmative Action Employer.

Veterinarian – Arizona

The Primate Foundation of Arizona has an opening for an attending veterinarian, who will be responsible for • managing the health care of 73 chimpanzees in an AAALAC-accredited facility; • managing the Animal Care and Use Program; • scheduling and conducting bi-annual preventive health examinations, evaluating all laboratory results, and implementing appropriate therapy; • preparing and maintaining a variety of records concerning chimpanzee physical examinations and diagnostic decisions, ensuring compliance with applicable federal, state, and local regulations; • conferring with and assisting other departments and serving as a member of the IACUC; and • maintaining drug inventory for the chimpanzees’ health, in compliance with regulations.

This person must be knowledgeable with respect to all USDA and PHS/NIH regulations and guidelines, and will have responsibility for the availability, oversight, and training of relief veterinarians. S/he must have a DVM/VMD degree and be licensed to practice in at least one of the United States.

The salary may be lower than one would wish, but we will do our best. The benefits are very good. This is a small, well-known facility. We all work together to achieve the ultimate goal of good health and well-being for the animals.

Send CV and letter of interest to Jo Fritz, Director, PFA, P.O. Box 20027, Mesa, AZ 85277-0027 [480-832-3780; fax: 480-830-7039; e-mail: jopfa@qwest.net].

Lab Animal Clinical Veterinarian – North Carolina

Wake Forest University’s Animal Resources Program is seeking a clinical veterinarian to provide medical care to animals, including primates, rodents, and a variety of other species used in teaching and in a research-intensive setting. The candidate will join a team of veterinary faculty and staff responsible for the provision of animal care that ensures compliance with regulatory and accreditation requirements. Additional responsibilities will include supervision of 3 or 4 animal health technicians, consulta-

tion with research faculty and staff on issues pertaining to animal care and use, training of personnel, and participation in IACUC activities.

Wake Forest University, founded in 1834 and located in Winston-Salem, North Carolina, is a private, co-educational AAALAC-accredited university consisting of six schools, including Wake Forest University School of Medicine (WFUSM). WFUSM has 19 academic departments, 749 full-time faculty, and over 3,700 employees. Areas of research emphasis include cardiovascular disease, neuroscience, cancer biology, substance abuse, women's health, diabetes, infectious diseases, and aging.

Minimum qualifications include a degree in veterinary medicine from an AVMA-accredited school, state licensure to practice veterinary medicine in the United States, and one year of veterinary practice experience, as well as excellent communication skills (written and verbal) and a service-oriented attitude. Also desirable are training and/or experience in laboratory animal medicine, surgical experience, and supervisory skills. Please apply online at www.hrfin.wfubmc.edu:8001/hepro/wfuhsjobs.htm.

Primate Clinical Veterinarian – Alpha Genesis, Inc.

Alpha Genesis, Inc., is an AAALAC-accredited primate breeding and research facility, which maintains three large facilities in South Carolina. A clinical veterinarian is needed for the main facility at Yemassee, South Carolina. Major responsibilities include the provision of hands-on clinical care for Old and New World primates, and participation as needed in medical research that may include neurological, obstetric, or ophthalmic surgical procedures. The clinical veterinarian will perform veterinary exams, surgical diagnostic tests, and maintain the health of the colony. S/he will work alongside other staff veterinarians and veterinary and animal care technicians, and will provide oversight and leadership for veterinary and research personnel. Good written and oral communication skills are needed, as the Clinical Veterinarian may be called on to participate in client services and communications, review and draft standard veterinary operating procedures, and review grant and contract applications.

A DVM or VMD degree from an accredited institution, with current licensure in at least one state, and 3 to 5 years of laboratory primate experience are required. Post-doc or veterinary research experience and ACLAM eligibility/certification are preferred. Computer skills (Access, Word, Excel, e-mail, and Internet) are important. Salary will depend on experience.

For further information contact Dr. Sue Howell, Director of Research and Development [e-mail: suehowell@skycasters.net]. To apply, send materials to Dr. V. J. Richey, Alpha Genesis, Inc., 95 Castle Hall Rd, P.O. Box 557, Yemassee, SC 29945 [843-589-5190; fax: 843-589-5290; e-mail: vjrichey@skycasters.net].

Census Technician – Alpha Genesis, Inc.

Alpha Genesis, Inc. is also seeking a Census Technician, to census 6 to 8 groups (approximately 1000 individuals) of free-ranging rhesus on an island. This person will observe group composition and collect reproductive data. Some computer documentation will be required. You will also assist in processing animals four times a year, cleaning feeders every 6 weeks, and feeding and watering animals occasionally. Ancillary duties may include being the Project Safety Officer, assisting in fuel runs, and moving bags of feed. We will train you in operation of boats and all equipment necessary to carry out required job responsibilities. Qualifications are a four-year college degree (biology or science-related field), or comparable experience. Send application to Dr. Richey at the address above.

Staff Scientist – Alpha Genesis, Inc.

A Staff Scientist is needed for a long-term NIH/NIAAA-funded project focused on the biology and behavior of free-ranging rhesus macaques at Morgan Island, South Carolina. Morgan Island is a tropical island off the coast of South Carolina and is home to more than 5,000 rhesus macaques. The project focuses on the relationship between monoamine metabolites, testosterone, stress hormones, aggression, impulsivity, and maternal and social behavior. The Staff Scientist will work directly with Dr. Sue Howell on all phases of the project from field data collection to manuscript completion.

The candidate must have a background in primatology with specific interest in biology, behavior, and addiction research. Data collection experience in a field environment is strongly recommended. Laboratory or field experience in biological data collection, including blood and CSF sampling, is recommended. Knowledge of monoamine metabolites and cortisol, and a general understanding of related genetic polymorphisms, are requested.

Salary will be \$34,000 to \$38,000 depending on prior work experience and publication record. Working conditions will have minimal conveniences and extensive daily hiking to locate and follow free-ranging focal subjects. Contact Dr. Richey at the address above.

Colony Manager – Chimp Haven, Louisiana

Chimp Haven, Inc., is seeking a Colony Manager to provide care and management for a colony of chimpanzees retired from medical research. Responsibilities include, but are not limited to: hiring, training, and supervising animal care staff; developing SOPs; overseeing work schedules, daily duties, and responsibilities of animal caregivers; preparing for the arrival, care, and socialization of chimpanzees; and working with veterinary and behavioral staff to plan and implement medical and behavioral monitoring programs, including positive reinforcement training and enrichment

forcement training and enrichment procedures. Responsibilities will also include maintaining employee and animal records, managing the ordering of supplies and equipment, and overseeing the maintenance of animal care equipment and the animal facility. A minimum of five years of experience is required, preferably with chimpanzees. A bachelor's degree from an accredited university and experience with positive reinforcement training and safety and biohazard procedures is preferred.

Please send cover letter, resume, and salary requirement to Chimp Haven, Inc., Attn: Human Resources, 710 Spring St, 2nd Fl., Shreveport, LA 71101 [318-425-0002; fax: 318-425-4250; e-mail careers@chimphaven.org]. Employees receive competitive salary and benefits, and work in a team atmosphere. Chimp Haven is an equal opportunity employer.

Clinical Veterinarian – Tulane NPRC

The Tulane National Primate Research Center (TNPRC) has experienced extensive growth to its veterinary resources and research programs and is seeking applications for the position of clinical veterinarian within the Division of Veterinary Medicine to help meet the needs of this expansion.

The TNPRC is an AAALAC International-accredited facility housing approximately 5,000 nonhuman primates (NHP) of 9 different species. The research program is focused on infectious disease research with a concentration on the study of AIDS. Other areas of research in-

volve gene therapy, reproductive biology, biodefense, NHP behavior, and clinical NHP medicine and surgery.

Responsibilities of the position include general medical and surgical care of breeding colony and research animals; provision of research support; and training of investigators, laboratory animal medicine residents, veterinary students, and technicians. The successful candidate will be provided opportunities to participate in the conduct of independent or collaborative clinical research directed toward NHP medicine and surgery.

The candidate must hold a DVM/VMD degree from an AVMA-accredited college of veterinary medicine and be licensed to practice veterinary medicine in one of the 50 states. ACLAM board certification or eligibility is desirable. The candidate should have excellent verbal and written communication skills and the ability to interact positively with others.

This position will remain open until a qualified candidate is selected. Interested persons should submit a letter of interest, CV, and a list of three references to: Rudolf P. Bohm, Jr., Chair, Division of Veterinary Medicine, Tulane NPRC, 18703 Three Rivers Rd, Covington, LA 70433. For more information: [985-871-6266; e-mail: bohmm@tulane.edu].

Tulane University is an Affirmative Action and Equal Opportunity Educator and Employer. Women and individuals from underrepresented minorities are strongly encouraged to apply.

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Meeting Announcements

Biodiversity: Science and Governance: Today's Choice for Tomorrow's Life will be held January 24-28, 2005, in Paris, France, hosted by the Ministry of Research, with additional coordination by the Institut Français de la Biodiversité. The conference is part of the ongoing global effort to curb the loss of biodiversity by 2010 and ensure the long-term conservation and sustainable use of biological diversity. For an overview, see

www.recherche.gouv.fr/biodiv2005paris/en/index.htm.

Zoos & Aquariums: Committing to Conservation, January 26-30, 2005, will be held in Cocoa Beach, Florida, hosted by the Brevard Zoo. Participants will include representatives from zoological institutions, aquaria, and the field. The intent is to facilitate networking among colleagues and to focus on practical applications that support in situ conservation efforts. The registration fee is \$185.00, which includes sessions, some meals, and social activities. Zoos and aquaria are encouraged to sponsor their colleagues from the field. For more information, see www.brevardzoo.org/zacc.cfm.

This is a call for papers on any primate-related topic for the **XXIIIrd Annual Conference of the Austral-**

asian Primate Society to be held at the South Australian Museum in Adelaide, South Australia, on March 12-13, 2005. Twenty-minute sessions will be reserved for each paper, and an abstract should be received before February 1, 2005. For details visit www.primates.on.net/apsconf.htm.

The **Primate Society of Great Britain 2005 Spring Meeting** will be held March 22-23, 2005, at Chester College. For information contact: Paul Honess, PSGB Meeting Officer, Dept of Veterinary Services, Univ, of Oxford, Parks Rd, Oxford OX1 3PT, U.K. [e-mail: meetings@psgb.org]; or see www.psgb.org.

The **Mexican Society of Primatologists' 2005 Meeting** will be held May 4-7, 2005, at the Instituto de Ecología, Xalapa, Veracruz. For information, contact Juan Carlos Serio Silva, Depto de Biodiversidad y Ecología Animal, Inst. de Ecología A.C., km 2.5 antigua carretera a Coatepec, No. 351 congregación El Haya, CP 91070, Apo Postal 63, Xalapa, Veracruz, México [+52 (228) 8 42 18 00, ext. 4109/4110; fax: ext. 4111; e-mail: serioju@ecologia.edu.mx].

The 85th Annual Meeting of the **American Society of Mammalogists** will be held June 15-19, 2005, at Southwest Missouri State University, Springfield, Missouri. In addition to contributed oral and poster presentations covering all aspects of mammalian biology, this year's program will feature "Adaptive Evolution in Mammalian Populations", a symposium convened by Drs. Hopi Hoekstra and Jay Storz; and "Careers in Mammalogy", a workshop led by Drs. Deidre Parish and Greg Wilson. Non-members who are interested in attending the meetings and/or presenting papers should request materials from the Chairman of the Local Program Committee, Dr. Tom Tomasi, Department of Biology, Southwest Missouri State University [e-mail: tomtomasi@smsu.edu]. For more information about the meeting, see <www.asm.smsu.edu>; for information about the ASM, see <www.mammalsociety.org>.

The **19th Annual Meeting of the Society for Conservation Biology** will be held July 15-19, 2005, at the Universidade de Brasília, Brazil, with the central theme of "Conservation Biology: Capacitation and Practice in a Globalized World". Contact SCB 2005 Local Organizing Committee, Depto de Zoologia, IB, Universidade de Brasília, 70910-900 Brasília, DF, Brazil [fax: + 55 61 307-3366; e-mail: 2005@conbio.org]; or see <www.conservationbiology.org/2005>.

The **Association of Tropical Biology and Conservation's Annual Meeting** will be held July 23-29, 2005, in Uberlândia, Brazil. For more information write to Dr. Kleber del-Claro, Lab. de Ecologia Comportamental e Interações, Univ. Fed. de Uberlândia, Caixa Postal 593, Uberlândia 38400-902, Minas Gerais, Brazil [e-mail: delclaro@ufu.br or atbc2005@inbio.ufu.br].

The Wildlife Conservation Society and Columbia University are hosting the **7th International Conference on Environmental Enrichment** in New York City, July 31 to August 6, 2005. The theme of this conference is "Unifying the Art and Science of Animal Enrichment". For information, e-mail <shape@enrichment.org> or see <www.enrichment.org/ICEE7.html>.

The **IXth International Mammalogical Congress** will be held July 31 to August 5, 2005, in Sapporo, Japan. For information, contact MAMMAL2005, c/o Field Science Center, Hokkaido Univ., N11 W10, Sapporo 060-0811, Japan [e-mail: MAMMAL2005@hokkaido-ies.go.jp]; or see: <www.imc9.jp>.

The **1st Congress of the European Federation of Primatology** will be held August 9-12, 2005, in Göttingen, hosted by the German Society for Primatology at the German Primate Center. It will coincide with the 9th Congress of the Society. European students and researchers working on all aspects of primatology are invited to attend. For more information contact Peter M. Kappeler, German Primate Center, Abteilung Verhaltensforschung und Ökologie, Kellnerweg 4, D-37077 Göttingen, Germany [e-mail: pkappeler@gwdg.de]; or see <www.gf-primatologie.de/EF2005/index.htm>.

The **28th Annual Meeting of the American Society of Primatologists** will be held August 17-20, 2005, in Portland, Oregon. The meeting will be hosted by the Oregon NPRC. The deadline for proposals for symposia, roundtables, or workshops is January 17, 2005. Deadline for abstracts for contributed papers, symposia speakers, workshops and roundtable discussions is February 14. For more information, contact Dr. Kristine Coleman, Chair of the local organizing committee, at <coleman@ohsu.edu>.

The **Fifth World Congress on Alternatives and Animal Use in the Life Sciences** will be held August, 21-25, 2005, in Berlin, Germany. For more information, see <www.ctw-congress.de/act2005>.

Measuring Behavior 2005, the 5th International Conference on Methods and Techniques in Behavioral Research, will be held August 30 to September 2, 2005, in Wageningen, The Netherlands, sponsored by Noldus. For information, see <www.noldus.com/mb2005>.

The **2006 International Congress on Zookeeping** will be held in Queensland, Australia, May 7-11. Watch <www.iczoo.org> for information.

The **21st Congress of the International Primatological Society** will be held June 26-30, 2006, at the Imperial Resort Beach Hotel, Entebbe, Uganda. The theme is "Primate Conservation in Action". For preliminary details, contact Dr. William Olupot, Chair, Organizing Committee, IPS 2006 Congress, P.O. Box 21669, Kampala, Uganda [077598134, 077947397, 041501020; e-mail: wolupot@yahoo.com].

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Primates de las Américas...La Página

Estimados lectores, en este número presentamos información del próximo congreso sobre primates en Latinoamérica y las nuevas páginas de Internet colombianas de interés para la comunidad primatológica. También, más conversaciones y un programa de análisis comparativo de interés para nuestros lectores. Cordiales saludos, Tania Urquiza-Haas <turqheza@yahoo.com> y Bernardo Urbani <burbani@uiuc.edu>.

II Congreso Mexicano de Primatología

Otro evento primatológico se celebrará en Latinoamérica este año aparte del ya anunciado Congreso Brasileño de Primatología. Entre el 4 y el 7 de mayo de 2005 se llevará a cabo el II Congreso Mexicano de Primatología. Dicho evento se efectuará en las instalaciones del Instituto de Ecología A. C. en Xalapa, Veracruz, México. Si desea más información puede contactar al Dr. Juan Carlos Serio-Silva <serioju@ecologia.edu.mx>.

La Asociación Mexicana de Primatología Estrena Página de Internet

Esta iniciativa primatológica en la red puede visitarse en la siguiente dirección: <www.amp-ac.com.mx>. En ella encontrará tres secciones: general, miembros y especial. Estas secciones proveen información sobre eventos, anuncios, galería de fotografías, historia de la asociación, biografías de primatólogos, entre otros. De particular interés es la "Biblioteca Virtual Primatológica", en ella podrá bajar artículos en pdf de la comunidad primatológica mexicana.

Nuevas Páginas de Internet sobre la Primatología en Colombia

1) Red Colombiana de Primatología:

<www.geocities.com/primatescolombia/einicio.htm>

El objetivo más importante es la creación de un espacio virtual que puede ser alcanzado por investigadores en toda Colombia y en todo el mundo, en el que comparta información acerca de los primates colombianos, su estatus, programas de conservación, proyectos de investigación, metodologías y publicaciones. Adicionalmente este espacio conectará personas que estén trabajando en las mismas áreas del conocimiento, o con las mismas especies; también informará al público en general e investigadores acerca de las novedades en la primatología colombiana; y finalmente este espacio conectará investigadores u

organizaciones con agencias internacionales, sociedades primatológicas y otros recursos como bases de datos.

2) Asociación Colombiana de Primatología:

<www.geocities.com/primatologica/>

Los objetivos de la Asociación Colombiana de Primatología son:

a) Promover la conservación, el conocimiento y el bienestar de los primates de Colombia a través del estudio, la investigación, la difusión y la aplicación de la primatología en los diversos niveles académicos y educativos, con el propósito de establecer los principios básicos que conduzcan a la conservación de las especies.

b) Promover y apoyar la investigación básica y aplicada en primatología.

c) Promover con las entidades oficiales, semioficiales y privadas el establecimiento de una legislación dinámica a favor del equilibrio ecológico y de la conservación de los ecosistemas.

d) Promover el conocimiento y generar conciencia sobre los primates a nivel nacional.

e) Gestionar recursos a nivel nacional e internacional y orientarlos hacia el desarrollo de los objetivos de la Asociación.

f) Promover el intercambio de conocimiento mediante la organización y participación en congresos, coloquios, conferencias, asesorías y otro tipo de actividades.

g) Velar porque los fines de la Asociación no se aparten de los principios que la estructuran como una entidad sin ánimo de lucro.

Más Conversaciones entre Primatólogos

Si está interesado en discusiones primatológicas en español puede contactar al siguiente correo electrónico: <primatescolombia-subscribe@yahoogroups.com>. Este panel está primordialmente auspiciado por estudiantes de primatología colombianos, bajo la iniciativa de Alba Lucía Morales-Jiménez. Es una buena manera de intercambiar ideas con la comunidad primatológica colombiana y latinoamericana.

Nuevo Programa

Ya es posible bajar totalmente gratuito el programa Mesquite para hacer comparaciones robustas en primatología con el uso de ajustes por filogenia. Se accesa en la siguiente página de Internet:

<www.mesquiteproject.org/mesquite/mesquite.html>.

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Refinement and Environmental Enrichment Bibliography

Viktor Reinhardt announces that the 8th Edition of the *Annotated Bibliography on Refinement and Environmental Enrichment for Primates Kept in Laboratories* will be available in January, 2005. This document includes

only references that have practical relevance. If you wish to receive a free copy, send your mailing address no later than December 31, 2004, to <shasta@mail.siskiyou.net>.

Resources Wanted and Available

Proceedings of 18th IPS Congress Available

A CD-ROM of the XVIIIth International Primatological Society Congress, held in Adelaide, South Australia, in 2001, is now available for \$A35 plus \$A3 postage and handling within Australia. Overseas costs will be \$US25 plus \$US4 for postage and handling. If you would like a copy, contact Graeme Crook, P.O. Box 500. One Tree Hill, SA 5114, Australia [e-mail: aps_editor@msn.com.au].

Publications from PFA

The Primate Foundation of Arizona (PFA) has available copies of the *PFA Captive Chimpanzee Colony Protocol and Wellness Program* and the *PFA Captive Chimpanzee Ethogram* for use by interested parties. Over the past 30 years, PFA programs have applied safe, humane, and innovative captive management strategies to assure the well-being and continuity of the U.S. captive chimpanzee population. The PFA protocols are designed to maintain a physically sound and behaviorally competent chimpanzee population, as well as promote and assure psychological well-being, and are applicable for both large and small facilities. The *PFA Captive Chimpanzee Colony Protocol and Wellness Program* is a detailed program for the daily physical and psychological care of captive chimpanzees on the PFA site. This includes staff training guidelines. The programs are easily adaptable to your own facility. The *PFA Captive Chimpanzee Ethogram* is an exhaustive ethogram for captive chimpanzees containing behaviors, vocalizations, and facial expressions. Both publications are available on one CD-ROM for the cost of \$5.00; of this \$2.00 will be donated to the PFA Chimpanzee Enrichment Fund. Please send check or money order to: Primate Foundation of Arizona, P.O. Box 20027, Mesa, AZ 85277-0027. For more information, contact Elaine Videan or Jo Fritz at the same address [e-mail: evpfa@qwest.net].

LAWTE Information

The Laboratory Animal Welfare Training Exchange (LAWTE) is a group of trainers, training coordinators, veterinarians, managers/directors, consultants, IACUC administrators, and others, dedicated to promoting an information exchange of laboratory animal training programs, systems, materials, and services, to encourage the highest standards of laboratory animal care and use.

LAWTE celebrated its ten-year anniversary with an educational event at Busch Gardens during the AALAS National Meeting in Tampa earlier this year. Currently, plans are underway for our next LAWTE conference to be held in San Diego next August. Please visit the LAWTE Website at www.lawte.org for membership information, conference updates, and training materials. – posted to *CompMed*, November 15

Wanted: Casts of Hands and Feet

The Schmutzer Primate Centre, in Jakarta, is seeking donations of copies of casts of primate hands and feet. “We have looked at commercial suppliers, but as \$1 = 9,024.62 Indonesian Rupiah, it would be very expensive to buy from them and we simply don’t have that money. At the moment we are funded by the Gibbon Foundation. We would like to use casts as part of our education program and are looking for the following: gorillas; orangutans; chimpanzees; gibbons; leaf monkeys/langurs; macaques; slow loris, and tarsiers.

“Please contact Hannah Barlow, Pusat Primata Schmutzer, Taman Margasatwa Ragunan, Jln. Harsono R.M. No. 1 Ragunan, Jakarta 12550, Indonesia [e-mail: hannah@primata.or.id].”

NIA Aged Non-Human Primate Tissue Bank

The National Institute on Aging (NIA) announces a new resource for investigators in the field of aging research. The NIA Aged Non-Human Primate Tissue Bank provides a repository of tissue from aged nonhuman primates (NHP) for use in research. Some tissue from middle-aged and young NHP will also be available soon. The tissues are donated by NIA-supported NHP colonies and other NHP colonies such as the National Primate Research Centers. The goal is to archive tissue that might otherwise be discarded, and provide that tissue to investigators undertaking research on normal aging and age-related diseases. By making NHP tissue readily available, the NIA hopes to encourage investigators using other model organisms such as the rat and mouse to test their research findings in the primate model. In addition, the NIA NHP Tissue Bank will facilitate pilot studies and provide additional resources to investigators already using the primate model.

The primary focus will be on rhesus monkey tissue since this is the NHP model used most often for aging research. Other species will be included as they become available. The tissue available will be of varying ages and the health status of the animals will also vary. Some information on the health status of the donor animals will be available, but the NIA does not guarantee any aspect of the health status. Tissues are available as fresh-frozen specimens, slides containing sections of formalin-fixed tissue, and, to some extent, fresh-frozen specimens embedded with tissue freeze medium. Staining of slides may be requested.

Further information is available at: www.nia.nih.gov/ResearchInformation/ScientificResources/NHPTissueBankHandbook.htm. For information on availability of tissue, contact Tracy Cope [e-mail: copet@nia.nih.gov].

Awards Granted: IPS Student Oral and Poster Presentation Awards

The International Primatological Society's Education Committee has announced the winners from their first student awards, held during the XXth IPS Congress in Turin, Italy. The competition resulted in many outstanding oral and poster presentations by student members. With 48 submissions (36 oral and 12 poster), the process of selecting winners was very difficult!

Best Student Oral Presentation: Katie Slocombe (University of St. Andrews, Scotland), "Agonistic screams: Evidence for referential communication in wild chimpanzees".

Honorable Mention, Oral Presentations: Gabriella Ponce Santizo (University del Valle de Guatemala), "Primate seed dispersal by two species of primates and secondary dispersal by dung beetles of the ramon tree in Tikal National Park, Guatemala"; Rogerio DaCunha (University of St. Andrews), "Function of the moo call of the black howler monkeys"; Marina Scheumann, (University of Hannover, Germany), "Are infant grey mouse lemurs able to produce context specific calls?"

Best Student Poster Presentation: Holger Grlitz (University of Tübingen, Germany), "Prey detection and sensory ecology in free-living mouse lemurs".

Honorable Mention, Poster Presentations: Melanie Dietz (University of Hannover), "Does call structure in a nocturnal primate change with arousal?" Kathelijne Koops (Utrecht University, Netherlands), "Terrestrial nesting in the chimpanzee of the Nimba Mountains, Guinea, West Africa: Environmental or social?" Antonio Moura (Cambridge University, England), "Foraging activity of *Cebus apella* in the Caatinga dry forest: The role of males as food providers".

The Education Committee extends sincere thanks to the judges that participated in the review of each of the oral and poster presentations. They recognize the significant contributions of G. Anzenberger, T. Bettinger, J. Bielitzki, R. Junge, K. Leighty, L. Marsh, C. McCann, C. Padua, I. Portan, J. Roberts, A. Savage, and C. Williams.

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Award Nominations

ASP Grant Application Deadline Set for January 16th

"The American Society of Primatologists' Research and Development and Conservation Committees announce that the application deadline for 2005 grants (both Research and Conservation) is January 16th, 2005. Note that the date is set for much *earlier* than in previous years. This decision was made to better facilitate getting conservation grant money to the winners in time for the "summer" months – when many of these projects get underway. We regret any inconvenience this may cause; we suspect it will help more than hinder most applicants.

"Conservation Grants will be awarded by late March, 2005, and Research & Development Grants will be awarded at the ASP meeting in August.

"Full details of the revised grant application process are available at <www.asp.org>. If you have any questions, please contact the Chairs of the two committees: Research and Development: Karen Bales [e-mail: klbales@ucdavis.edu] or Lynn Fairbanks [e-mail: lfairbanks@mednet.ucla.edu]; Conservation: Janette Wallis [e-mail: janettewallis@sbcglobal.net]."

Charles River Labs' Excellence in Refinement Awards

Nominations are being accepted for the first triennial Charles River Laboratories' Excellence in Refinement Award. Sponsored by Charles River Laboratories, in co-

operation with the Johns Hopkins Center for Alternatives to Animal Testing, the award will honor an individual who has made an outstanding contribution to the development, promotion and/or implementation of refinement alternatives. This award is based on the conviction that the humane care of laboratory animals is both a moral imperative and a scientific necessity. See <caat.jhsph.edu/about-us/craward.htm>.

The award, which includes \$5,000 to further the recipient's scientific endeavors, will be given every three years, to coincide with the World Congress on Alternatives and Animal Use in the Life Sciences. A panel drawn from industry, academia, and government will review the nominations. The first presentation of this award will be at the 5th World Congress, to be held in August, 2005, in Berlin, Germany (see p. 17). The winner must be present to receive the award.

Nominations for the Charles River Laboratories' Excellence in Refinement Award should include a one-page letter outlining why this person should be recognized and a copy of the nominee's CV. Please e-mail nominations to <rbrady@jhsph.edu>. Deadline for receipt of nominations is April 1, 2005.

For information on the Charles River Laboratories' "Humane Care Initiative", see <www.criver.com/humane_care>.

Volunteer Opportunities

Nurturing and Care for Orphaned Baboons

“The Centre for Animal Rehabilitation and Education (C.A.R.E.) is seeking help for the first sanctuary and rehabilitation center for baboons in Southern Africa. Situated within a private game park bordering the Kruger National Park, C.A.R.E. is a specialized wildlife center dedicated to the care of animals, especially baboons. We nurture and hand-rear these orphaned baboons and place them in troops; when they reach the appropriate age we release them into protected conservation areas. You will bottle feed and nurture infant baboons in the baby nursery. You will also play with the juvenile baboons and monitor the progress and health of all the animals. If a release is to take place at the time of your visit, you may be involved in this as well. A large troop of wild baboons have made their home in the area of C.A.R.E., and you will get lots of opportunities to move quite freely among them. Volunteers usually love their time here, become deeply involved in the work, and very often stay longer than originally planned or return later for another visit. Come help us prevent the baboon from becoming another endangered species and experience the great pleasure of being around one of our closest primate cousins.

“Full training will be given. A great love and compassion for animals will take you a long way, and although we cannot guarantee that you have a natural “flair” for baboons, we will make use of your special skills and personal characteristics.

“The volunteer living quarters consist of bedrooms with bathroom facilities, hot water, and electricity. The nearest town is 30 km away, and trips are often made during the week. Internet access is available in town but frequency is not guaranteed. Vehicles are not available for volunteer use, but arrangements can be made for volunteers to get into town if needed. Volunteers take turns preparing food, which is purchased in town by staff. Volunteers must pay for food and lodging, flights and insurance, and must furthermore make a donation to the animal rehabilitation work. Prices are very reasonable. We require a four-week minimum stay. For more information, see <www.primatecare.org.za>.

Contact the Director, Rita Miljo, C.A.R.E., Phalaborwa, P.O. Box 1937, Phalaborwa, Limpopo Province 1390, South Africa [+27 15 769 6251; e-mail: care@lantic.net].”

Great Challenges Under Tropical Skies!

“The Schmutzer Primate Centre occupies a separate area in Jakarta’s Ragunan Zoo (Indonesia). It is a state-of-the-art primate facility with ambitious plans for further development. The Centre offers unique opportunities for a number of differently skilled craftsmen in zoo educa-

tion. We are looking for people who are able to develop and make educational tools and who would like to share these skills with their motivated and enthusiastic Indonesian (English-speaking) colleagues.

“Do you have experience with: • special acoustical effects for indoor exhibits and outdoor applications; • special light effects for indoor exhibitions; • model-making techniques; • ‘anima-tronics’ (electronics for moving animal models); • ape-costume making (level of ‘Planet of the Apes’); or • painting animal portraits on children? Or are you an expert in • organizing events, • setting up themed restaurants (such as a vegetarian restaurant with a jungle menu), • setting up a wildlife ‘Crime Lab’, • developing fund-raising ideas and skills, and so on? Then we would like to hear from you. This is a challenging opportunity to make a change in a country with an amazing biodiversity that is under great pressure.

“We offer board and lodging (up to maximum of six months) in the ‘close-to-paradise’ guesthouse of the Primate Centre. Other conditions and possibilities are negotiable and depend on experience and skills. Contact <priinfo@primata.or.id> or <hannah@primata.or.id>. Please mention *ZooNews Digest*.”

Hope for Homeless Primates

International Primate Rescue, founded in March, 1996, in Polokwane, South Africa, plans to expand its current sanctuary facilities to enable it to accept great apes such as chimpanzees and retired or surplus laboratory primates. The sanctuary currently houses over 50 rescued exotic primates and wherever possible will transport any species of primate from any country to its facilities. The aim is to expand the current sanctuary by purchasing land in Pretoria and building large natural enclosures. When complete, it will house up to 200 primates exotic to South Africa who are damaged beyond release back into the wild. The new enclosures will be designed to provide the primates with a natural, almost free-ranging situation while allowing the care or supervision which some may require. Some of the monkeys currently at the sanctuary had never lived outside or even seen a tree, let alone sat in one. The sanctuary primates are encouraged to engage in natural behavior such as socializing and foraging. Infants received are placed with a foster monkey family as early as possible to ensure that they learn the behavior necessary for normal development. All indigenous primates received (vervets and baboons) are sent on to rehabilitation centers to be returned to the wild. On completion of the building, the current sanctuary primates will be relocated to the new facilities. Being closer to an international airport will give greater accessibility and make transportation of international rescues and volunteer workers easier.

Volunteer workers from the U.K., U.S.A., The Netherlands, Denmark, and New Zealand have visited the sanctuary. Volunteers can carry out observational studies while helping care for and monitor the primates, many of whom arrive with disorders or behavioral problems and need to be socialized and rehabilitated. The sanctuary is not open to the public. Supporters may visit by appointment only and visits are supervised.

For more information contact Sue Gale (U.K.) [01306-640-294 or 078-1779-0573; e-mail: sgipr@aol.com] or Pauline Sher (South Africa) [015-295-7849 or 082-353-1837; e-mail: sgmwf@yebo.co.za]; or see www.internationalprimaterescue.org.

* * *

Information Requested or Available

New Discussion Group, *primate-net*

Hannah Barlow and Colin Angus of the Schmutzer Primate Centre, Jakarta, have established *primate-net*, “a place to exchange information for all those involved with primates professionally. We feel there is a lack of communication between those working with captive primates and those working in the field. We would like this site to act as a forum for this important exchange of information.” To join, send an e-mail to primate-net-subscribe@yahoo.com, or visit groups.yahoo.com/group/primate.net.

New Feature in *PrimateLit*

“The WPRC Library & Information Service, in partnership with the University of Wisconsin–Madison Libraries, is happy to announce the release of the upgraded *PrimateLit* database. The database has been moved to the newest version of the *SiteSearch* software, making it possible for users to download citations to *EndNote*, *Procite*, and other citation management programs.

“When you save your search result, you will have the option of exporting your citations in a variety of formats depending on the target software. Instructions for exporting citations are available through the *Using this Site* page. We hope this latest improvement in functionality will prove to be a valuable feature of the *PrimateLit* database. We welcome your feedback on this new feature. Send your comments, questions or concerns to library@primate.wisc.edu.”

Laboratory Animal Veterinary Information Network

The American College of Laboratory Animal Medicine and the Association for Assessment and Accreditation of Laboratory Animal Care International have announced a new service to facilitate direct contact between laboratory animal veterinarians worldwide – the “Laboratory Animal Veterinary Information Network”. This Web-based service allows colleagues to ask fellow veterinary professionals around the world questions related to laboratory animal veterinary activities. Topics might include animal health standards, certification requirements, transportation issues, local contacts, etc. For details or to ask a question, visit: www.labanimalvet.info.

Noldus Announces “Theme 5.0”

Theme 5.0, a tool for pattern detection in behavioral data, is intended for researchers who study interaction, organization and time structure. More information, references, and examples of Theme use can be found at www.noldus.com/theme.

NIH Information for New Investigators

The Office of Extramural Research (OER), NIH, announces the posting of a new Website that articulates NIH’s continuing commitment to new investigators (see grants.nih.gov/grants/new_investigators). The Website describes current policies, data related to new investigators, resources that new investigators can use to understand and work with the NIH, and hints that might be useful in constructing a first application for NIH support. Visitors who know of additional resources can send suggestions to OEPMailbox@mail.nih.gov.

More Interesting Websites

- *Adaptive Behavior*: adb.sagepub.com/archive
- BioMed Central, open access publisher: www.biomedcentral.com
- HighWire Press, free online full-text articles: highwire.stanford.edu/lists/freeart.dtl
- HINARI – Health InterNetwork Access to Research Initiative: www.healthinternetwork.org/scipub.php
- NABR Animal Law Section: www.nabr.org/AnimalLaw
- Northwest Primate Conservation Society: www.uoregon.edu/~nwpcs
- Primates for Primates: primates4primates.org
- Public Library of Science: www.plos.org
- PubMed Central: www.pubmedcentral.nih.gov
- Scientific Electronic Library Online, covering a selected collection of Brazilian scientific journals: www.scielo.br/scielo.php/lnq_en
- University of Bath Website to reduce animals in medical research: www.bath.ac.uk/mech-eng/ark/index.html
- Veterinary Employment Website: www.vet4vet.com

Announcements from Publications: Electronic *Biologia Centrali-Americana*

The Smithsonian Institution Libraries has launched its digital version of the *Biologia Centrali-Americana* on the Libraries' *Galaxy of Knowledge* Website. Now available at <www.sil.si.edu/DigitalCollections/bca>, it represents more than 25,000 pages. The electronic rendition assumes the duties of the original, out-of-print set of 58 volumes that includes virtually everything known about the animals and plants of Mexico and Central America. This electronic *Biologia Centrali-Americana* is the first product of a major collaborative effort between the Smithsonian National Museum of Natural History and the Natural History Museum in London. This exhaustive but hard-to-find compendium has been in use for more than a century and is now available to all in forms that can be stored on a hard drive or downloaded to a portable hand-held computer.

Published between 1879 and 1915, the *Biologia Centrali-Americana* served as an early database of Central American biodiversity. Scientific surveys and explorations conducted during the latter part of the 19th and early 20th centuries produced the extensive contents of these volumes, and illustrations from the *Biologia Centrali-Americana* are, in many cases, the only images that exist of the biota of the region.

The electronic *Biologia Centrali-Americana* was created in the hope that it will continue to provide significant advances in knowledge of Central American species. In addition, it will serve as a foundation for studying disruptions caused by natural or human factors (i.e., invasive species). Biologists, conservation groups, land planners and independent users will find descriptions of over 50,000 species of animals and plants, and more

than 18,000 images. Users may peruse the information easily by flipping through the pages like a book or opt to browse only the images. Those with more particular purposes may jump between description and image.

This project will be the keystone and model for other major information projects and will speed the pace of scientific investigation into the nature of the rapidly changing natural environment. Eventually, all *Biologia Centrali-Americana* text will be converted into an XML document, using a newly created format standard for taxonomic literature. Use of this format will allow the contents to be searchable by keyword and linked to other works and major bioinformatics databases currently available on the Internet to biologists and conservationists worldwide.

Funding for the project was a priority topic at a conference subsidized by the Andrew W. Mellon Foundation in 2001, "Toward Collaborative Biodiversity Informatics: Mobilizing Collections and Research Data". In 2002, a special award from the Smithsonian Atherton Seidell Endowment provided the financial support.

For further information about the electronic *Biologia Centrali-Americana*, contact Thomas Garnett, assistant director for Digital Library and Information Systems, Smithsonian Institution Libraries [202-633-2240; e-mail: garnettt@si.edu]. For further information about the collaborative project, contact Dr. Anna Weitzman, Informatics Manager, National Museum of Natural History, Smithsonian Inst. [e-mail: weitzman@si.edu]; or Dr. Chris Lyal, Dept of Entomology, Natural History Museum, London, U.K. [e-mail: chcl@nhm.ac.uk].

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Research Opportunities: Duke University Primate Center

Duke University Primate Center (DUPC) houses the largest captive prosimian collection in the world. At present, the Center is home to 240 individuals from 19 species and 6 subspecies. One of the goals of the DUPC is to promote research on prosimian primates and their habitat. Toward that end, we welcome researchers from both within and outside of Duke to pursue conservation and organism-oriented research here at the Center. Current areas of investigation include social organization and behavior, reproductive behavior and physiology, behavioral ecology, cognition, biomechanics, and anatomy.

In addition to these projects, various biological samples are available for purchase. These include banked blood and serum samples from living animals, as well as tissue and organ samples. Samples are preserved and available to researchers. Finally, cadavers, typically employed in a wide variety of anatomical studies, are also available.

For more information, contact Stephanie Combes, DUPC Research Coordinator [919-489-3364, ext 222; e-mail: SLC8@duke.edu].

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Correction

The name of Kendra McCafferty was included in error on page 3 of the last issue of the *LPN*.

Address Changes

Foundation for Biomedical Research, 818 Connecticut Ave, NW, Suite 900, Washington, DC 20006.

Nonhuman Primate Enrichment Questionnaire

The laboratory of James H. Woods, at the University of Michigan, is in the process of designing a system that would utilize touch-screen technology to improve current methods of nonhuman primate environmental enrichment. The system will be comprised of a touch-screen monitor, which can be attached to the monkey's home cage (and can easily be removed), and several computer programs that will deliver food (either monkey chow or supplementary food pellets) for the completion of various tasks designed to maintain behavior over extended periods of time. It is expected that such a system will enrich the environment of these research subjects, and as a result, compete with aberrant behavior that may result from an inadequate type or number of activities. In addition to maintaining behavior over longer times and possibly reducing unwanted (maladaptive) behaviors, this system would permit data collection that would allow researchers, as well as colony managers, to quantify the amount of behavior being allocated to the various programmed tasks. Presumably, such measures would relate to the level of enrichment obtained from a task as well as monkeys' preferences for different tasks. Any changes in behavior relative to baseline could then result in the quick identification of factors affecting motivation, such as ill health.

Please take just a few minutes to answer the questions in this survey to help us gauge your satisfaction with current methods of enrichment and any potential interest you may have in utilizing the proposed system once it is available. Please answer these questions and send them to Tammy Wade-Galuska, Department of Pharmacology, University of Michigan Medical School, Ann Arbor, MI 48108 [or as an attachment to twadegal@umich.edu].

Nonhuman Primate Enrichment Questionnaire

1. Name:
2. Institution:
3. Number of primates housed in your facility:
4. How are your primates housed (singly, group, both)?
5. What type of chow and/or pellets do you feed to the primates in your facility?
6. In as few words as possible, please describe the type of research conducted in your laboratory:
7. Please describe your current method(s) of enrichment:
8. How many hours of the day are these activities available?
(For the following 5 questions, 1 = low, 3 = medium, and 5 = high)
9. What is your level of satisfaction with the method(s) of primate enrichment currently employed in your laboratory? 1 2 3 4 5

10. What do you perceive as the overall level of necessity to improve methods of enrichment in primate housing facilities? 1 2 3 4 5
11. How do you prioritize the importance of enrichment relative to other activities in your laboratory? 1 2 3 4 5
12. The system we are proposing would give researchers the option to collect behavioral data (e.g., response rate), which would be indicative of each program's ability to engage monkeys over extended time periods, as well as other factors such as subjects' health. What is the likelihood that you would opt to collect data such as this if utilizing the method of enrichment we propose? 1 2 3 4 5
Enrichment Questionnaire 2
13. What is your level of preliminary interest in adopting the type of enrichment proposed in the introduction of this questionnaire once it is available? 1 2 3 4 5
14. Please rank order (1 = lowest, 6 = highest) the concerns you would have with implementing the system of enrichment described in the introduction of this questionnaire:
 - _____ Interference with husbandry duties
 - _____ Maintenance of equipment
 - _____ Ease of execution
 - _____ Cost
 - _____ Overall feasibility (e.g., due to large number of monkeys)
 - _____ Other? Please write in:
15. Please rank order (1 = lowest, 6 = highest) the importance of the following features of the proposed method of enrichment:
 - _____ Length of time it would occupy monkeys' behavior each day
 - _____ Rapid identification of ill health (or other factors disturbing baseline performance)
 - _____ Ability to mimic foraging patterns common in natural environment
 - _____ Ability to collect experimental data, if desired
 - _____ Sensory stimulation (colors, sounds, etc. associated with computer programs)
 - _____ Other? Please write in:
16. If possible, please estimate the amount you would be willing to spend on a system such as this (i.e., price per system):
17. Are you are willing to answer further questions or communicate further in any way regarding the development of this system?
18. Additional Comments:

* * *

Recent Books and Articles

(Addresses are those of first authors unless otherwise indicated)

Books

• *What Animals Want: Expertise and Advocacy in Laboratory Animal Welfare Policy*. L. Carbone. New York: Oxford University Press, 2004. [Price: \$29.95]

• *Macaque Societies: A Model for the Study of Social Organization*. B. Thierry, M. Singh, & W. Kaumanns (Eds.). New York: Cambridge University Press, 2004. [Price: \$120.00]

Contents: *Introduction*. Why macaque societies? By B. Thierry, M. Singh, & W. Kaumanns.

Part I. Individual attributes. Personality factors between and within species, by J. P. Capitanio; Social intelligence, by J. Call; The role of emotions in social relationships, by F. Aureli & G. Schino; Power and communication, by S. Preuschoft; Reproductive life history, by F. Bercovitch & N. Harvey; Life-history traits: Ecological adaptations or phylogenetic relics? By M. Singh & A. Sinha.

Part II. Demography and reproductive systems. Demography: A window to social evolution, by W. Dittus; Patterns of group fission, by K. Okamoto; Gene flow, dispersal patterns, and social organization, by H. Gachot-Neveu & N. Mnard; Dominance and paternity, by A. Paul; Mating systems, by J. Soltis; Homosexual behavior, by P. L. Vasey.

Part III. Social relationships and networks. Dominance style, social power, and conflict management: A conceptual framework, by J. C. Flack & F. B. M. de Waal; Social space and degrees of freedom, by M. Butovskaya; How kinship generates dominance structures: A comparative perspective, by B. Chapais; Inter-group relationships, by M. A. Cooper; Intergenerational transmission of behavior, by C. Chauvin & C. M. Berman; Maternal behavior, infant handling, and socialization, by D. Maestriperi.

Part IV. External and internal constraints. Do ecological factors explain variation in social organization? By N. Mnard; Intraspecific variation: Implications for interspecific comparisons, by D. A. Hill; Social epigenesis, by B. Thierry; The role of contingency in evolution, by C. Abegg; The use of artificial-life models for the study of social organization, by C. K. Hemelrijk; Proximate behaviors and natural selection, by W. A. Mason.

Part V. An outside viewpoint. An anthropologist among macaques, by M. Godelier; Do macaque species have a future? By Y. Muroyama & A. A. Eudey; Toward integrating the multiple dimensions of societies, by B. Thierry, M. Singh, & W. Kaumanns.

• *Among Orangutans: Red Apes and the Rise of Human Culture*. C. Van Schaik. Photographs by P. Van Duijnho-

ven. Cambridge, MA: Harvard University Press, 2004. [Price: \$29.95]

• *The Dynamic Dance: Nonvocal Communication in African Great Apes*. B. J. King. Cambridge, MA: Harvard University Press, 2004. [Price: \$29.95]

King's theory challenges the idea that human language is instinctive, with rules and abilities hardwired into our brains. Rather, she suggests, language has its roots in the gestural building up of meaning that was present in the ancestor we shared with the great apes, and that we continue to practice to this day.

• *Language Evolution*. M. H. Christiansen & S. Kirby (Eds.). New York: Oxford University Press, 2004. [Price: \$24.95]

Contents: Language evolution: The hardest problem in science? by M. H. Christiansen & S. Kirby; Language as an adaptation to the cognitive niche, by S. Pinker; The language mosaic and its evolution, by J. R. Hurford; What can the field of linguistics tell us about the origins of language? By F. J. Newmeyer; Symbol and structure: A comprehensive framework for language evolution, by D. Bickerton; On the different origins of symbols and grammar, by M. Tomasello; Universal grammar and semiotic constraints, by T. W. Deacon; The archaeological evidence of language origins: States of art, by I. Davidson; What are the uniquely human components of the language faculty? by M. D. Hauser & W. T. Fitch; The evolving mirror system: A neural basis for language readiness, by M. A. Arbib; From hand to mouth: The gestural origins of language, by M. C. Corballis; The origin and subsequent evolution of language, by R. I. M. Dunbar; Launching language: The gestural origins of discrete infinity, by M. Studdert-Kennedy & L. Goldstein; Motor control, speech, and the evolution of human language, by P. Lieberman; From language learning to language evolution, by S. Kirby & M. H. Christiansen; Grammatical assimilation, by T. Briscoe; and Language, learning and evolution, by N. L. Komarova & M. A. Nowak.

Booklets

• *Science, Medicine, and Animals*. Washington, DC: National Academies Press, 2004. 52 pp. [Price: paperback, \$8.98; PDF, \$6.50 at books.nap.edu/catalog/10733.html], where it can also be read on-line free]

This booklet discusses how animals have been and continue to be an important component of biomedical research. It addresses the history of animal research and what it looks like today, and gives an overview of some of the medical advances that would not have been possible without animal models. Finally, it looks at the regulations and oversight governing animal use, as well as efforts to use animals more humanely and efficiently.

We would like to acknowledge *Primate-Science* as a source for information about new books.

- *MRC Ethics Guide: Best Practice in the Accommodation and Care of Primates Used in Scientific Procedures*. Medical Research Council of the U.K., 2004. <www.mrc.ac.uk/pdf-primate-best-practice.pdf>

Field Guides

- *Primates of Colombia. Conservation International Tropical Field Guide Series*. T. R. Defler. Illustrated by S. Nash, C. Landazbal, & M. Nieto. Chicago: University of Chicago Press, 2004. [Price: \$40]

This field guide illustrates and describes 28 species comprising 43 different taxa, 15 of these taxa being endemic to Colombia. The aim is to help Colombians and other people interested in primates to strengthen their interest with appropriate information and to provide an introduction for those who would like to learn something about these fascinating animals.

Magazines and Newsletters

- *The Conservation Behaviorist*, November 2004, 2[2]. <www.animalbehavior.org/ABS/Conservation/ccConsBeh.html>

Includes: What can captive breeding do for conservation and what can behavior research do for captive breeding? by R. R. Swaisgood.

- *IPPL News*, December, 2004, 31[3]. [International Primate Protection League, P.O. Box 766, Summerville, SC 29484; e-mail: info@ippl.org]

Contents include: A visit to Thailand's Wildlife Friends Rescue Center; Report from the Conference of the Parties to the Convention on International Species (CITES), held in Bangkok, Thailand, in October 2004; Help save the Helsinki Zoo baboons from convenience "euthanasia"; "Taiping Four" gorillas to go on show at South African Zoo; Travel tips: How to observe and report animal abuse; and Singapore pet trade campaign.

- *NCA Newsletter*, October, 2004, no. 17. Netherlands Centre for Alternatives to Animal Use. <www.nca-nl.org/English/Newsletters/Nb17/nl17index.html>

Includes Development and optimisation of an *in vitro* culture and transfection system for the simian malaria parasite *Plasmodium knowlesi*, by C. H. M. Kocken, A. M. van der Wel, & A. W. Thomas.

- *Neotropical Primates: A Journal of the Neotropical Section of the IUCN/SSC Primate Specialist Group*, August, 2003, 11[2]. [Conservation International, 1919 M St, NW, Suite 600, Washington, DC 20036]

Contents: Environmental education: A teaching tool for the conservation of pygmy marmosets (*Cebuella pygmaea*) in the Ecuadorian Amazon, by S. de la Torre & P. Yépez; The discovery of a new population of black lion tamarins (*Leontopithecus chrysopygus*) in the Serra de Paranapiacaba, São Paulo, Brazil, by F. Röhe, A. P. Antunes, & C. F. de Tófoli; On the occurrence of the black lion tamarin

(*Leontopithecus chrysopygus*) in Buri, São Paulo, Brazil, by F. S. Lima, I. C. da Silva, C. S. Martins, & C. Valadares-Pádua; Dieta, área de vida, vocalizações e estimativas populacionais de *Alouatta guariba* em um remanescente florestal no norte do estado do Paraná, by L. de Moraes Aguiar, N. R. dos Reis, G. Ludwig, & V. José; *Callithrix geoffroyi* (Primates: Callitrichidae) and *Alouatta caraya* (Primates: Atelidae) in the Serra do Cipó National Park, Minas Gerais, Brazil, by L. de Carvalho Oliveira, E. M. V. C. Câmara, A. Hirsch, A. M. Oliveira Paschoal, R. M. Alvarenga, & M. G. Belarmino; Distribuição do guigó (*Callicebus coimbrai*) no estado de Sergipe, by M. Cardoso de Sousa; Estimativa de densidade e tamanho populacional de sauá (*Callicebus nigrifrons*) em um fragmento de mata em regeneração, Viçosa, Minas Gerais, Brasil, by R. C. Romanini de Oliveira, A. Sales Coelho, & F. R. de Melo; Primates of Brownsberg Natuurpark, Suriname, with particular attention to the pitheciins, by M. A. Norconk, M. A. Raghanti, S. K. Martin, B. W. Grafton, L. T. Gregory, & B. P. E. De Dijn; Primates in a forest fragment in eastern Amazonia, by O. de Carvalho, Jr.; Some observations on the predation of small mammals by tufted Capuchin monkeys (*Cebus apella*), by B. D. Resende, V. L. G. Greco, E. B. Ottoni, & P. Izar; Insect-eating by spider monkeys, by A. Link; *Lagothrix lagothricha* or *Lagothrix lagothricha*: Which is it? by T. R. Defle; Births of *Alouatta caraya* and *A. belzebul* (Atelidae, Alouattinae) in captivity in Brazil, by D. Fichtner Gomes & J. C. Bicca-Marques; Weight development of hand-reared callitrichids, by M. Schröpel; and Interacciones sociales en un grupo de monos aulladores *Alouatta palliata mexicana* en Cautiverio, by C. Domingo-Balcells, E. Rodríguez-Luna, M. Escobar-Aliaga, & J. Morales-Mávil.

- *Boletín de la Asociación Primatológica Española*, Mayo, 2004, 11[2]. <www.uam.es/ape> [Depto de Psicobiología, Buzón 150, Fac. de Psicología, Univ. Complutense de Madrid, Campus de Somosaguas, 28223 Madrid, Spain]

Contents include: Sarah and Jane: Social cognition on the ape side, by J. Call; and Longevidad, dieta y salud: De genes y de diferencias entre los chimpancés y la especie humana, by F. Colmenares.

Proceedings

- Abstracts of the XX Congress of the International Primatological Society (IPS), August 22-28, 2004, Torino, Italy. *Folia Primatologica*, 2004, 75[suppl 1].
- *Proceedings of the Fourth World Congress on Alternatives and Animal Use in the Life Sciences*, New Orleans, August 11-15, 2002. <www.worldcongress.net/2002/proceedings/proceedings.htm>

Reports

- *Pain & Distress Report*, October, 2004, 4[3]. The Humane Society of the United States. <www.hsus.org/ace/11401>

Special Journal Issues

- Biomechanics. *Folia Primatologica*, 2004, 75[4].

Contents: Introduction, by R. H. Crompton; Thoughts on bone biomechanics, by C. E. Oxnard; The role of the zygomatic arch in the statics of the skull and its adaptive shape, by U. Witzel, H. Preuschoft, & H. Sick; Functional structure of the skull in Hominoidea, by H. Preuschoft & U. Witzel; Stresses exerted in the hindlimb muscles of common chimpanzees (*Pan troglodytes*) during bipedal locomotion, by S. K. S. Thorpe, R. H. Crompton, & W. J. Wang; The relationship between speed, contact time and peak plantar pressure in terrestrial walking of bonobos, by E. Vereecke, K. D'Août, D. De Clercq, L. Van Elsacker, & P. Aerts; and Automatic monitoring of primate locomotor behaviour using accelerometers, by W. I. Sellers & R. H. Crompton.

- On primate evolutionary developmental biology. *Journal of Experimental Zoology. Part B, Molecular and Developmental Evolution*, 2004, 302B[3].

Contents: *Editorial*: Humans and primates: New model organisms for evolutionary developmental biology? By D. Lieberman. *Vignette*: Thomas Henry Huxley (1825-1895) puts us in our place, by K. M. Weiss. *Research Papers*: Craniofacial variability and modularity in macaques and mice, by B. Hallgrímsson, K. Willmore, C. Dorval, & D. M. L. Cooper; Modularity and integration in the hominoid scapula, by N. Young; The anthropoid postcranial axial skeleton: Comments on development, variation, and evolution, by D. Pilbeam; Statistical genetics of molar cusp patterning in pedigreed baboons: Implications for primate dental development and evolution, by L. J. Hlusko, M.-L. Maas, & M. C. Mahaney; Testing hypotheses about tinkering in the fossil record: The case of the human skull, by D. E. Lieberman, G. E. Krovitz, & B. McBratney-Owen; Hominins do not share a common postnatal facial ontogenetic shape trajectory, by S. N. Cobb & P. O'Higgins; and Kinematics of cranial ontogeny: Heterotopy, heterochrony, and geometric morphometric analysis of growth models, by C. P. E. Zollikofer & M. S. Ponce De León.

- Malaria: The long road to a healthy Africa. *Nature Medicine*, 2004, 10[9].

• The intolerable burden of malaria: II. What's new, what's needed. *American Journal of Tropical Medicine and Hygiene*, 2004, 71[2, Suppl].

- *Semnopithecus entellus*, Hanuman langur. *Primate Report*, 2004, no. 69.

Contents: Survey on the use of nonhuman primates in Europe, by J. Hagelin; Evolution in the regulation of space and carrying in the parental rearing of the captive pygmy marmoset (*Cebuella pygmaea*), by A. M. Queralt & J. J. Veá; Observation of isolated/solitary male Hanuman langurs, *Semnopithecus entellus* in semi-arid region, by L. S. Rajpurohit, A. K. Chhangani, R. S. Rajpurohit, & D. S.

Rajpurohit; Crop raid by Hanuman langur *Semnopithecus entellus* in and around Aravallis (India) and its management, by A. K. Chhangani & S. M. Mohnot; and Killing of Hanuman langur (*Semnopithecus entellus*) in road accidents in Kumbhalgarh Wildlife Sanctuary, Rajasthan, India, by A. K. Chhangani.

- Behavioral and genetic diversity in western gorillas. *American Journal of Primatology*, 2004, 64[2].

Contents: Behavioral ecology of western gorillas: New insights from the field, by D. M. Doran-Sheehy & C. Boesch; Social structure and life-history patterns in western gorillas (*Gorilla gorilla gorilla*), by M. M. Robbins, M. Bermejo, C. Cipolletta, F. Magliocca, R. J. Parnell, & E. Stokes; Genetic variation in gorillas, by L. Vigilant & B. J. Bradley; Western gorilla diet: A synthesis from six sites, by M. E. Rogers, K. Abernethy, M. Bermejo, C. Cipolletta, D. Doran, K. McFarland, T. Nishihara, M. Remis, & C. E. G. Tutin; Effects of group dynamics and diet on the ranging patterns of a western gorilla group (*Gorilla gorilla gorilla*) at Bai Hokou, Central African Republic, by C. Cipolletta; Impact of ecological and social factors on ranging in western gorillas, by D. M. Doran-Sheehy, D. Greer, P. Mongo, & D. Schwindt; Home-range use and intergroup encounters in western gorillas (*Gorilla g. gorilla*) at Lossi forest, North Congo, by M. Bermejo; and Within-group social relationships among females and adult males in wild western lowland gorillas (*Gorilla gorilla gorilla*), by E. J. Stokes.

- Evolution of the special senses in primates. *The Anatomical Record*, 2004, 281A[1].

Contents: How humans and their closest kin perceive the world: The special senses of primates, by J. T. Laitman; Evolution of the special senses in primates: Past, present, and future, by N. J. Dominy, C. F. Ross, & T. D. Smith; High-resolution computed tomography study of the cranium of a fossil anthropoid primate, *Parapithecus grangeri*: New insights into the evolutionary history of primate sensory systems, by E. C. Bush, E. L. Simons, & J. M. Allman; Three-dimensional structure and evolution of primate primary visual cortex, by E. C. Bush & J. M. Allman; Comparative morphology of the eye in primates, by E. C. Kirk; On the relationship between orbit orientation and binocular visual field overlap in mammals, by C. P. Heesy; Primate hearing from a mammalian perspective, by R. S. Heffner; Primate auditory diversity and its influence on hearing performance, by M. N. Coleman & C. F. Ross; Meissner corpuscles and somatosensory acuity: The prehensile appendages of primates and elephants, by J. N. Hoffmann, A. G. Montag, & N. J. Dominy; Evolution of somatosensory and motor cortex in primates, by J. H. Kaas; Olfactory fossa of *Tremacebus harringtoni* (platyrrhini, early Miocene, Sacanana, Argentina): Implications for activity pattern, by R. F. Kay, V. M. Campbell, J. B. Rossie, M. W. Colbert, & T. B. Rowe; Distribution of olfactory epithelium in the primate nasal cavity: Are mi-

crossmia and macrosmia valid morphological concepts? by T. D. Smith, K. P. Bhatnagar, P. Tuladhar, & A. M. Burrows; Comparative analysis of the role of olfaction and the neocortex in primate intrasexual competition, by L. J. Alport; Expression of neuron-specific markers by the vomeronasal neuroepithelium in six species of primates, by J. C. Dennis, T. D. Smith, K. P. Bhatnagar, C. J. Bonar, A. M. Burrows, & E. E. Morrison; Facts, fallacies, fears, and frustrations with human pheromones, by C. J. Wysocki & G. Preti; and Convergence of sensory systems in the orbitofrontal cortex in primates and brain design for emotion, by E. T. Rolls.

- Keynote addresses from the XIXth Congress of the International Primatological Society, Beijing, China, August 4-9, 2002. *International Journal of Primatology*, 2004, 25[5].

Contents: Introduction, by F. Wei, R. Pan, & M. Li; Primatology in China, by W. Ji & X. Jiang; Fossil human-kind and other anthropoid primates of China, by X. Wu; The what, why and how of primate taxonomy, by C. Groves; Brain evolution: Mammals, primates, chimpanzees, and humans, by C. E. Oxnard; Effects of sexual selection upon sperm morphology and sexual skin morphology in primates, by A. F. Dixson & M. J. Anderson; and Genetic markers in primate studies: Elucidating behavior and its evolution, by J. R. de Ruiter.

Anatomy and Physiology

- A case of pseudo-pregnancy in captive brown howler monkeys (*Alouatta guariba*). Guedes, D., & Young, R. J. (R. J. Y., Av. Dom José Gaspar 500, Coração Eucarístico, 30535-610 Belo Horizonte, Minas Gerais, Brazil [e-mail: robyoung@pucminas.br]). *Folia Primatologica*, 2004, 75, 335-338.

“Pseudo-pregnancy is a condition characterized by clinical symptoms such as increase in body weight, enlargement of the mammary glands and the production of milk, all in the absence of pregnancy. Hormonally, it is caused by the superproduction of progesterone and the abnormal persistence of the corpus luteum. Spontaneous cases of pseudo-pregnancy are widely reported in a number of mammalian species, including dogs, cats, bears, rodents and humans. It is most common in species with copulation-induced ovulation (e.g. mustelids) and may serve in some species to increase evolutionary fitness, whereby non-reproducing females can feed the offspring of relatives. Spontaneous cases in nonhuman primates are rare. Originally, we were intending to conduct a study on infant development in howler monkeys and commenced observing an apparently pregnant female (visibly enlarged abdomen and mammary glands) before parturition as part of our data collection protocol. However, after two months of behavioral data collection, when we started to doubt whether the female was pregnant, she was examined by veterinarians who found her not to be pregnant.”

Animal Care

- Environmental enrichment techniques in non-human primates: The case of Callitrichids. Vitale, A., & Mancio, A. (Dipto di Biologia Cellulare e Neuroscienze, Ist. Sup. di Sanità, Viale Regina Elena 299, 00161 Rome, Italy [e-mail: vitale@iss.it]). *Annali dell'Istituto Superiore di Sanità*, 2004, 40, 181-186.

“In this paper, we discuss issues concerning the welfare of nonhuman primates used in laboratory research from an eco-ethological standpoint and suggest means of improving welfare. Following a brief review of the use of nonhuman primates in European countries and of the legislation that governs this use, we illustrate how a thorough eco-ethological knowledge of the species being studied can play a vital role in improving both its conditions and the quality of the experimental protocols, arguing that the animal's quality of life is closely linked to the quality of data. As a model for describing environmental enrichment techniques, we have used the common marmoset (*Callithrix jacchus*).”

- Common husbandry-related variables in biomedical research with animals. Reinhardt, V. (6014 Palmer Dr., Weed, CA 95094 [e-mail: viktorawi@siskiyounet.net]). *Laboratory Animals*, 2004, 38, 213-235.

Common, often overlooked, variables in biomedical research with animals are reviewed. The barren primary enclosure is an abnormal living environment for laboratory animals. Species-appropriate enrichment attenuates some of the distress resulting from chronic understimulation. Social deprivation distress of individually-caged social animals is best mitigated by the provision of compatible companionship. Biotelemetry and positive reinforcement training avoid or minimize stress reactions that typically occur when animals are forcibly restrained during procedures. The variables “light” and “position of living quarters” are inherent in the multi-tier caging system. To date there is no satisfactory alternative other than the single-tier cage arrangement that eliminates both variables. Removing test animals from their familiar home environment and from their cage mates for procedures introduces stress as an avoidable influential variable. Music may become an important variable if not all subjects are exposed to it. Disturbance time cannot be controlled as an extraneous variable but it should at least be mentioned to explain possible incongruities of data. A positive relationship between animal care personnel and research subjects is a key requisite to minimize stress as a data-confounding variable.

Animal Models

- Successful retrograde transport of fluorescent latex nanospheres in the cerebral cortex of the macaque monkey. Sato, Y., Koketsu, D., Ageyama, N., Ono, F., Miyamoto, Y., & Hisatsune, T. (T. H., Dept of Integrated Biosci., Grad. School of Frontier Sci., Univ. of Tokyo, 5-1-5 Ka-

shiwano, Bioscience Bldg-402, Kashiwa-shi, Chiba 277-8562, Japan). *Experimental Animals*, 2004, 53, 383-386.

“Retrograde axonal transport of latex nanospheres offers a means of delivering chemical agents to a targeted region of the central nervous system (CNS). In this study we performed microinjections of latex nanospheres into the cerebral cortex of cynomolgus monkeys and observed successful retrograde labeling of neurons in the contralateral region. Our data indicate that the successful use of this delivery system, reported in studies using other animals, may be achievable with primates as well.”

- Comparative study on toxicokinetics of bisphenol A in F344 rats, monkeys (*Macaca fascicularis*), and chimpanzees (*Pan troglodytes*). Negishi, T., Tominaga, T., Ishii, Y., Kyuwa, S., Hayasaka, I., Kuroda, Y., & Yoshikawa, Y. (Dept of Biomed. Sci., Grad. School of Agricultural & Life Sciences, Univ. of Tokyo, 1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-8657, Japan). *Experimental Animals*, 2004, 53, 391-394.

“We compared the toxicokinetics of bisphenol A (BPA) among three animal species: rats, cynomolgus monkeys and chimpanzees. Rats and monkeys were administered BPA orally or subcutaneously at 10 or 100 mg/kg body weight, while chimpanzees were administered only 10 mg/kg of BPA. BPA in serum was measured by ELISA. In oral administration of BPA at 10 mg/kg, both C_{max} and AUC were rats < chimpanzee < monkeys. In oral administration of BPA at 100 mg/kg, both C_{max} and AUC were rats < monkeys. Subcutaneous BPA administrations also revealed similar results, although the values of toxicokinetic parameters in subcutaneous administration were higher than those in oral administration. These results suggest that orally or subcutaneously administered BPA in primates is more easily absorbed than that in rats. We conclude that there are considerable differences in distribution, metabolism, and excretion of BPA between rodents and primates.”

- Prevention of vaginal SHIV transmission in rhesus macaques through inhibition of CCR5. Lederman, M. M., Veazey, R. S., Offord, R., Mosier, D. E., Dufour, J., Melford, M., Piatak, M., Jr., Lifson, J. D., Salkowitz, J. R., Rodriguez, B., Blauvelt, A., & Hartley, O. (Dept of Med., Case Western Reserve Univ., University Hospitals, 2061 Cornell Rd, Cleveland, OH 44106 [e-mail: MXL6@case.edu]). *Science*, 2004, 306, 485-487.

Topical agents, such as microbicides, that can protect against human immunodeficiency virus (HIV) transmission are urgently needed. Using a chimeric simian/human immunodeficiency virus (SHIV SF162), which is tropic for the chemokine receptor CCR5, topical application of high doses of PSC-RANTES, an amino terminus-modified analog of the chemokine RANTES, provided potent protection against vaginal challenge in rhesus macaques. These experimental findings have potentially important implications

for understanding vaginal transmission of HIV and the design of strategies for its prevention.

- The host response to smallpox: Analysis of the gene expression program in peripheral blood cells in a nonhuman primate model. Rubins, K. H., Hensley, L. E., Jahrling, P. B., Whitney, A. R., Geisbert, T. W., Huggins, J. W., Owen, A., LeDuc, J. W., Brown, P. O., & Relman, D. A. (P.O.B., Howard Hughes Medical Institute, Stanford University, Stanford, CA 94305 [e-mail: pbrown@pmsgm2.stanford.edu]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2004, 101, 15190-15195.

“Smallpox has played an unparalleled role in human history and remains a significant potential threat to public health. Despite the historical significance of this disease, we know little about the underlying pathophysiology or the virulence mechanisms of the causative agent, variola virus. To improve our understanding of variola pathogenesis and variola-host interactions, we examined the molecular and cellular features of hemorrhagic smallpox in cynomolgus macaques. We used cDNA microarrays to analyze host gene expression patterns in sequential blood samples from each of 22 infected animals. Variola infection elicited striking and temporally coordinated patterns of gene expression in peripheral blood. Of particular interest were features that appear to represent an IFN response, cell proliferation, immunoglobulin gene expression, viral dose-dependent gene expression patterns, and viral modulation of the host immune response. The virtual absence of a tumor necrosis factor α /NF- κ B-activated transcriptional program in the face of an overwhelming systemic infection suggests that variola gene products may ablate this response. These results provide a detailed picture of the host transcriptional response during smallpox infection, and may help guide the development of diagnostic, therapeutic, and prophylactic strategies.”

Behavior

- A concept of value during experimental exchange in brown capuchin monkeys, *Cebus apella*. Brosnan, S. F., & de Waal, F. B. M. (Living Links Center, Emory Univ., Yerkes PRC, 954 N. Gatewood Dr., Atlanta, GA 30329 [e-mail: sbrosna@emory.edu]). *Folia Primatologica*, 2004, 75, 317-330.

“We evaluated the response of brown capuchin monkeys to two differentially valued tokens in an experimental exchange situation akin to a simple barter. Monkeys were given a series of three tests to evaluate their ability to associate tokens with food; then their responses were examined in a barter situation in which tokens were either limited or unlimited. Capuchins did not perform barter in the typical sense, returning the tokens that were associated with the reward. However, females, but not males, showed a different response, preferring the higher-value token. This may indicate that they learned to prefer one token over the other rather than to associate the tokens with their specific

rewards. This sex difference parallels previous findings of greater reciprocity in female brown capuchins than in males.”

- Chimpanzees are more skillful in competitive than in cooperative cognitive tasks. Hare, B., & Tomasello, M. (Max-Planck-Institute for Evolutionary Anthropology, Inselstrasse 22, D-04103 Leipzig, Germany [e-mail: hare@eva.mpg.de]). *Animal Behaviour*, 2004, 68, 571-581.

“In a series of four experiments, chimpanzees, *Pan troglodytes*, were given two cognitive tasks, an object choice task and a discrimination task (based on location), each in the context of either cooperation or competition. In both tasks chimpanzees performed more skillfully when competing than when cooperating, with some evidence that competition with conspecifics was especially facilitatory in the discrimination location task. This is the first study to demonstrate a facilitative cognitive effect for competition in a single experimental paradigm. We suggest that chimpanzee cognitive evolution is best understood in its socio-ecological context.”

- New insights into chimpanzees, tools, and termites from the Congo Basin. Sanz, C., Morgan, D., & Gulick, S. (Dept of Anthropology, Washington Univ., St. Louis, MO 63130 [e-mail: goulougo@uuplus.com]). *American Naturalist*, 2004, 164, 567-581.

“The tool-using behaviors of wild chimpanzees comprise the most impressive assemblages and flexible repertoires of nonhuman material culture. We expand knowledge of the breadth and complexity of tool use in this species by providing the first descriptions of the form and function of two distinct tool sets used by chimpanzees in preying upon termites within the forests of the Goulougo Triangle, Republic of Congo. Further, we report the first application of remote video monitoring technology to record wild chimpanzee tool-using behavior. Based on tool assemblages recovered at termite nests, we hypothesized that chimpanzees were regularly visiting two forms of termite nests and using specific tools to extract termite prey depending on the structure of the nest. Six months of continuous remote video monitoring at six termite nests confirmed that chimpanzees use a tool set to puncture and fish at subterranean termite nests and another tool set to perforate and fish at epigeal (aboveground) nests. Our findings of strict adherence to tool forms at different nest types, tool material selectivity, repeated visits to nests with reusable wood tool assemblages, and differences in material culture between communities have broad implications for our understanding of the ecological and cultural factors that shape hominoid tool use.”

Conservation

- Hunting vulnerability, ecological characteristics and harvest rates of bushmeat species in afrotropical forests. Fa, J. E., Ryan, S. F., & Bell, D. J. (Durrell Wildlife Conserva-

tion Trust, Les Augrès Manor, Trinity, Jersey JE3 5BP, U.K. [e-mail: jfa@durrell.org]). *Biological Conservation*, 2005, 121, 167-176.

“We reviewed and analyzed patterns and between-site variation in hunter-kill profiles of mammals in tropical moist forests in west and central Africa. Published data from 36 sites in seven countries were used. A total of 71 mammals from 8 orders and 22 families were hunted. Significant variation was found in number of species exploited, but ungulates constituted 73.2% of all hunted animals. Rodents and primates contributed 12.2% and 12.0%, respectively. Large-bodied species (15.0-99.9 kg) represented over half (54.4%) of the total hunted biomass. Most species were snared, and were generally medium-sized, fast, terrestrial, frugivore/herbivores. We showed, using meta-analysis, that species abundance was the main predictor of harvest level. But, the relationship between hunter presence (calculated as average hunter numbers operating per 100 days) and hunter ease (an index of catchability of the hunted fauna) and site harvest levels was shown to be significant only for hunter ease. Site harvest rates were higher in areas with more hunter presence. Overall, an average of 2000 carcasses (16,000 kg in weight) per site was extracted in a year. Per hunter, this amounted to 200 carcasses (1000 kg) extracted. Such amounts fall within reported unsustainable harvest levels of the mammalian fauna in African forests.”

- Determinants of orangutan density in the dryland forests of the Leuser Ecosystem. Wich, S., Buij, R., & van Schaik, C. (Behavioural Biology, Utrecht University, P.O. Box 80086, 3508 Utrecht, The Netherlands [e-mail: sergewich@hetnet.nl]). *Primates*, 2004, 45, 177-182.

Since orangutan densities vary between habitat types within regions and within similar habitat types among regions, it is important to determine areas with high densities for their protection. In this paper it is shown that orangutan density in old-growth dryland forests in the Leuser Ecosystem, Sumatra, is significantly related to the density of large strangling figs and topsoil pH. In addition, large fig density depends on topsoil pH. Provided that orangutans are present and no hunting or logging occur, topsoil pH seems a promising method for rapid assessment of potential orangutan density over large areas.

Disease

- A natural asymptomatic herpes B virus infection in a colony of laboratory brown capuchin monkeys (*Cebus apella*). Coulibaly, C., Hack, R., Seidl, J., Chudy, M., Itter, G., & Plesker, R. (Paul Ehrlich Inst., Paul-Ehrlich-Str. 51-59, D-63225 Langen, Germany [e-mail: couch@pei.de]). *Laboratory Animals*, 2004, 38, 432-438.

“Herpes B virus (BV) infection of macaques persists in the natural host, but is mainly asymptomatic. However, BV can cause fatal disease in humans and in several non-macaque species such as capuchin monkeys. The BV in-

fection described here in a colony of capuchin monkeys was persistent but asymptomatic. Initially the infection was detected serologically in five of seven animals. However, using polymerase chain reaction (PCR) developed specifically for BV, we found the virus in all seven clinically healthy animals. It is probable that the infection was transferred from BV-infected macaques housed in different cages but in the same room for several years. We have no evidence to indicate that similar asymptomatic infections may occur in other New World species but the possibility should not be discounted. We recommend that the housing of capuchin monkeys in close proximity to macaques should be avoided and that greater caution should be used when handling capuchin monkeys and possibly other New World species that have been in contact with macaques. All may act as a source of BV infection in humans, hence routine, repeated testing of all primates is essential.”

- A serological survey of Ebola virus infection in Central African nonhuman primates. Leroy, E. M., Telfer, P., Bumulungui, B., Yaba, P., Rouquet, P., Roques, P., Gonzalez, J.-P., Ksiazek, T. G., Rollin, P. E., & Nerrienet, E. (Inst. de Recherche pour le Dévelop., UR034, Franceville, Gabon). *Journal of Infectious Diseases*, 2004, 190, 1895-1899.

“We used an ELISA to determine the prevalence of IgG antibodies specific for the Zaire subtype of Ebola virus in 790 nonhuman primates, belonging to 20 species, studied between 1985 and 2000 in Cameroon, Gabon, and the Republic of Congo. The seroprevalence rate of Ebola antibody in wild-born chimpanzees was 12.9%, indicating that (1) Ebola virus circulates in the forests of a large region of central Africa, including countries such as Cameroon, where no human cases of Ebola infections have been reported; (2) Ebola virus was present in the area before recent outbreaks in humans; (3) chimpanzees are continuously in contact with the virus; and (4) nonlethal Ebola infection can occur in chimpanzees. These results, together with the unexpected detection of Ebola-specific IgG in other species (5 drills, 1 baboon, 1 mandrill, and 1 *Cercocebus*), may help to narrow the search for the reservoir of Ebola virus. They also suggest that future Ebola outbreaks may occur anywhere in the central African forest region.”

- Simian parvovirus infection: A potential zoonosis. Brown, K. E., Liu, Z., Gallinella, G., Wong, S., Mills, I. P., & O’Sullivan, M. G. (Hematology Branch, NIDDK, NIH, Bethesda, MD 20892 [e-mail: brownk@nih.gov]). *Journal of Infectious Diseases*, 2004, 190, 1900-1907.

“Simian parvovirus (SPV) causes severe anemia in immunocompromised macaques. The closely related erythrovirus, parvovirus B19, causes anemia in susceptible humans and can be grown in human bone marrow mononuclear cells in vitro. We hypothesized that SPV may infect humans and replicate in human bone marrow mononuclear cells. Serum samples from handlers of an SPV-seropositive macaque colony were tested by Western blot

for evidence of antibodies to SPV. SPV capsid protein was expressed in insect cells, and SPV was cultured in human and macaque bone marrow mononuclear cells. Fifty-one percent of exposed handlers (n = 65) were found to be SPV seropositive, compared with 35% of nonexposed individuals (n = 124). In 17% of exposed handlers, compared with 6% of nonexposed individuals, antibodies were directed to SPV but not to B19. SPV capsid proteins, like those of B19, self-assembled to form parvovirus-like particles, and these capsids, like B19 capsids, bound to globoside, suggesting that globoside is also the receptor for SPV. We demonstrated that SPV could replicate in vitro in both human and macaque bone marrow mononuclear cells and that it was cytotoxic to erythroid progenitor cells. Our data suggest that SPV may infect human bone marrow mononuclear cells in vitro and in vivo and should be considered a potential zoonosis.”

Evolution, Genetics, and Taxonomy

- Divergence of T2R chemosensory receptor families in humans, bonobos, and chimpanzees. Parry, C. M., Erkner, A., & le Coutre, J. (J. C., Nestlé Research Center, CH-1000 Lausanne 26, Switzerland [e-mail: johannes.lecoutre@rdls.nestle.com]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2004, 101, 14830-14834.

“T2R (Tas2R) genes encode a family of G protein-coupled gustatory receptors, several involved in bitter taste perception. So far, few ligands for these receptors have been identified, and the specificity of most T2Rs is unclear. Differences between individual T2Rs result in altered taste perception in either specificity or sensitivity. All 33 human T2Rs are characterized by significant sequence homology. However, with a total of eight pseudogenes and >83 coding region single-nucleotide polymorphisms, the family displays broad diversity. The underlying variability of individual T2Rs might be the source for personalized taste perception. To test this hypothesis and also to identify T2Rs that possibly function beyond bitter taste, we compared all human T2R genes with those of the closely related primate species *Pan paniscus* (bonobo) and *Pan troglodytes* (chimpanzee). The differences identified range from large sequence alterations to nonsynonymous and synonymous changes of single base pairs. In contrast to olfactory receptors, no human-specific loss of the amount of functional genes was observed. Taken together, the results indicate ongoing evolutionary diversification of T2R receptors and a role for T2Rs in dietary adaptation and personalized food uptake.”

- Nigerian chimpanzees (*Pan troglodytes vellerosus*) at Gashaka: Two years of habituation efforts. Sommer, V., Adanu, J., Faucher, I., & Fowler, A. (Dept of Anthropology, University College London, Gower St, London WC1E 6BT, U.K. [e-mail v.sommer@ucl.ac.uk]). *Folia Primatologica*, 2004, 75, 295-316.

“Cross-population comparisons of chimpanzees can

shed light on the pathways of hominid evolution. So far, no eco-ethological data exist for the recently recognized subspecies *P. t. vellerosus*. We report on the first two years of a new long-term study from what is perhaps their last remaining stronghold: the Gashaka Gumti National Park, Nigeria. The mosaic habitat (woodland, lowland, and gallery forest) receives 1,826 mm rain/year, with 4–5 months being completely dry. Primates at Gashaka are not hunted, and the chimpanzees are therefore relatively tolerant of human observers. We focused on the Gashaka-Kwano community, investing 3,000 h of patrols. Ninety-five sightings were achieved, lasting an average of 27 min (range 1-190 min). Party size averaged 3.7 animals (range 1-17) but was, like encounter length, susceptible to a wide range of methodological, social, and ecological factors. The Kwano community comprises at least 35 members and occupies a home range of at least 26 km², yielding a density of 1.3/km². The area represents the West African equivalent of a chimpanzee site similar to the forest-woodland habitat in which early humans might have evolved.”

- A new small-bodied hominin from the Late Pleistocene of Flores, Indonesia. Brown, P., Sutikna, T., Morwood, M. J., Soejono, R. P., Jatmiko, Saptomo, E. W., & Due, R. A. (Archaeology & Palaeoanthropology, School of Human & Environmental Studies, University of New England, Armidale, New South Wales 2351, Australia [e-mail: pbrown3@pobox.une.edu.au]). *Nature*, 2004, 431, 1055-1061.

“Currently, it is widely accepted that only one hominin genus, *Homo*, was present in Pleistocene Asia, represented by two species, *Homo erectus* and *Homo sapiens*. Both species are characterized by greater brain size, increased body height and smaller teeth relative to Pliocene *Australopithecus* in Africa. Here we report the discovery, from the Late Pleistocene of Flores, Indonesia, of an adult hominin with stature and endocranial volume approximating 1 m and 380 cm³, respectively – equal to the smallest-known australopithecines. The combination of primitive and derived features assigns this hominin to a new species, *Homo floresiensis*. The most likely explanation for its existence on Flores is long-term isolation, with subsequent endemic dwarfing, of an ancestral *H. erectus* population. Importantly, *H. floresiensis* shows that the genus *Homo* is morphologically more varied and flexible in its adaptive responses than previously thought.”

- Archaeology and age of a new hominin from Flores in eastern Indonesia. Morwood, M. J., Soejono, R. P., Roberts, R. G., Sutikna, T., Turney, C. S. M., Westaway, K. E., Rink, W. J., Zhao, J.-X., van den Bergh, G. D., Due, R. A., Hobbs, D. R., Moore, M. W., Bird, M. I., & Fifield, L. K. (M. J. M., address same as above [e-mail: mmorwood@pobox.une.edu.au]). *Nature*, 2004, 431, 1087-1091.

“Excavations at Liang Bua, a large limestone cave on the island of Flores in eastern Indonesia, have yielded evidence for a population of tiny hominins, sufficiently distinct anatomically to be assigned to a new species, *Homo*

floresiensis. The finds comprise the cranial and some post-cranial remains of one individual, as well as a premolar from another individual in older deposits. Here we describe their context, implications and the remaining archaeological uncertainties. Dating by radiocarbon (14C), luminescence, uranium-series and electron spin resonance (ESR) methods indicates that *H. floresiensis* existed from before 38,000 years ago (kyr) until at least 18 kyr. Associated deposits contain stone artifacts and animal remains, including Komodo dragon and an endemic, dwarfed species of *Stegodon*. *H. floresiensis* originated from an early dispersal of *Homo erectus* (including specimens referred to as *Homo ergaster* and *Homo georgicus*) that reached Flores, and then survived on this island refuge until relatively recently. It overlapped significantly in time with *Homo sapiens* in the region, but we do not know if or how the two species interacted.”

- Determination of genetic status in a closed colony of rhesus monkeys (*Macaca mulatta*). Ribeiro Andrade, M. C., Penedo, M. C. T., Ward, T., Silva, V. F., Bertolini, L. R., Roberts, J. A., Leite, J. P. G., & Cabello, P. H. (FIOCRUZ, Centro de Criação de Animais de Laboratório, Av. Brasil, 4365, Manguinhos, Rio de Janeiro, RJ, 21045-900, Brazil [e-mail: Andrade@fiocruz.br]). *Primates*, 2004, 45, 183-186.

“The long-term management of breeding colonies requires some measure of genetic diversity in the animal population. For the maintenance of breeding colonies of monkeys used for biomedical research, known pedigrees supply precise data to determine the genetic status of colonies. We present data of genetic analyses in an old closed colony of rhesus macaques (*Macaca mulatta*) that was established in 1932 with 100 animals. For more than 40 years, the animals were kept on an isolated island and, in 1980, single-male breeding groups were established. A total of 333 DNA samples of these animals were typed to 20 microsatellite markers using multiplex PCR in order to verify inbreeding coefficient (α) and level of heterozygosity. We found an average heterozygosity of 64% and obtained $\alpha = -0.03293 (\pm 0.00573)$. Our results indicate that the reproductive strategy used was effective because consanguineous breeding was avoided. A continuous genetic program must be carried out in order to obtain better quality primates for biomedical research.”

- *Pierolapithecus catalaunicus*, a new Middle Miocene great ape from Spain. Moyà-Solà, S., Köhler, M., Alba, D. M., Casanovas-Vilar, I., & Galindo, J. (Inst de Paleontologia M. Crusafont, Escola Industrial 23, Sabadell, Barcelona 08201, Spain [e-mail: moyass@diba.es]). *Science*, 2004, 306, 1339-1344.

“We describe a partial skeleton with facial cranium of *Pierolapithecus catalaunicus* gen. et sp. nov., a new Middle Miocene (12.5 to 13 million years ago) ape from Barranc de Can Vila 1 (Barcelona, Spain). It is the first known individual of this age that combines well-preserved cranial,

dental, and postcranial material. The thorax, lumbar region, and wrist provide evidence of modern ape-like orthograde body design, and the facial morphology includes the basic derived great ape features. The new skeleton reveals that early great apes retained primitive monkeylike characters associated with a derived body structure that permits upright postures of the trunk. *Pierolapithecus*, hence, does not fit the theoretical model that predicts that all characters shared by extant great apes were present in their last common ancestor, but instead points to a large amount of homoplasy in ape evolution. The overall pattern suggests that *Pierolapithecus* is probably close to the last common ancestor of great apes and humans.”

Field Studies

- Survey results from Ranomafana National Park: New evidence for the effects of habitat preference and disturbance on the distribution of *Hapalemur*. Arrigo-Nelson, S. J., & Wright, P. C. Dept of Anthropology, Stony Brook Univ., Stony Brook, New York, NY 11794-4364 [e-mail: sarrigon@ic.sunysb.edu]. *Folia Primatologica*, 2004, 75, 331–334.

The greater and golden bamboo lemurs (*Hapalemur simus* and *Hapalemur aureus*) are two of the most endangered and least known lemur species in Madagascar. Both are classified as critically endangered according to IUCN criteria, are extremely limited in their geographical distributions, and are found only in the south-central portion of the eastern humid forests. Today, the only protected populations are found within Ranomafana and Andringitra National Parks. To increase our understanding of these species, a series of lemur density censuses and forest surveys have been conducted within remote areas of Ranomafana National Park. Forest surveys were conducted to (1) locate new *Hapalemur* populations and (2) expand our understanding of their distribution and habitat preferences. Study sites selected had not been sampled previously.

- Capuchin stone tool use in Caatinga dry forest, Moura, A. C. de A., & Lee, P. C. (P. C. L., Darwin College, University of Cambridge, Silver St, Cambridge CB3 9EU, UK [e-mail: acdam2@cam.ac.uk]). *Science*, 2004, 306, 1909.

Wild capuchin monkeys inhabiting dry forest were found to customarily use tools as part of their extractive foraging techniques. Tools consisted of twigs and sticks, often modified, which were used to probe for insects and, most frequently, of stones of a variety of sizes and shapes used for cracking and digging. The use of tools for digging has been thought to be restricted to humans. These monkeys, living in a harsh dry habitat, survive food limitation and foraging time constraints through extensive tool use.

Instruments and Techniques

- Novel restraint system for neuroendocrine studies of socially living common marmoset monkeys. Schultz-Darken, N. J., Pape, R. M., Tannenbaum, P. L., Saltzman, W., & Abbott, D. H. (WiNPRC, 1220 Capitol Ct, Madison,

WI 53715-1299 [e-mail: darken@primate.wisc.edu]). *Laboratory Animals*, 2004, 38, 393–405.

“We describe a novel soft jacket and sling-harness restraint that permits species-typical postures for small-bodied primates, such as the common marmoset (*Callithrix jacchus*), during long-term (> 6 h), continuous restraint. The restraint system is straightforward to use and manipulate, it is easily repaired, and the materials used are readily available. The soft jacket allows for increased versatility and longevity, and the sling-harness provides for greater movement and much longer duration of continuous restraint (up to 3 days) compared to a previously described, more conventional chair restraint for small-bodied primates. The new restraint system prevents the normal diurnal decrease in plasma cortisol levels across the daylight hours; however, it does not disrupt ovulatory cycles. Unlike the previously available techniques, therefore, this new restraint system is applicable to many neurobiological and neuroendocrine studies involving small-bodied, non-human primates and is especially suited to investigations requiring the maintenance of relationships within social groups.”

- Experimental animal urine collection: A review. Kurien, B. T., Everds, N. E., & Scofield, R. H. (Oklahoma Med. Research Fndn, MS # 24, 825 NE 13th St, Oklahoma City, OK 73104 [e-mail: biji-kurien@omrf.ouhsc.edu]). *Laboratory Animals*, 2004, 38, 333–361.

Urine collection is a vital part of veterinary practice for ascertaining animal health and in scientific investigations for assessing the results of experimental manipulations. Untainted animal urine collection is very challenging, especially with small rodents, and is an almost impossible task under conditions of microgravity. The fundamental aspects of urine collection are: (1) ease of collection, (2) quality of sample, (3) prevention of contamination, (4) severity of procedures used, (5) levels of pain caused to the animal, and (6) refinement of methods to reduce stress, pain, or distress. This review addresses the collection of urine for qualitative and quantitative purposes from rodents, rabbits, felines, canines, avian species, equines, porcines, ungulates and certain nonhuman primates, with animal welfare in mind. Special emphasis has been given to rodents, canines and nonhuman primates, since they are the animals of choice for research purposes. Free catch (voluntary voiding), methods with mild intervention, surgical methods, modified restraint, caging, and special requirement methods have been reviewed here. Efforts need to be taken to provide appropriate animal husbandry and to nurture the animals in as natural an environment as possible since experimental results obtained from these research subjects are, to a great extent, dependent upon their well-being. A continuous refinement in the procedures for collecting urine from experimental animals will be the most efficient way of proceeding in obtaining pure urine specimens for obtaining reliable research data.

- Quantitative data on training New World primates to urinate. Smith, T. E., McCallister, J. M., Gordon, S. J., & Whittikar, M. (Biology Department, University College Chester, Park Gate Rd., Chester CB1 4BJ, U.K. [e-mail: tessa.smith@chester.ac.uk]). *American Journal of Primatology*, 2004, 64, 83-93.

This study assessed the effectiveness of operant conditioning in training three species of captive callitrichid primates (*Leontopithecus rosalia*, *Callithrix geoffroyi*, and *Saguinus imperator*) to urinate on demand. Positive reinforcement with a continuous reinforcement schedule was used to capture a natural behavior: urination. Training sessions (30 min each) were conducted thrice weekly during five consecutive phases: habituation, control, training (animals were rewarded for urinating), maintenance (animals had reached a defined training criterion and continued to be rewarded for urinating), and collection (animals were rewarded for urinating, and the trainer entered the cage to collect the sample). The numbers of training sessions required to train the three species (*L. rosalia*, *C. geoffroyi*, and *S. imperator*) were five, six, and eight, respectively. For the three species, the mean number of urinations per animal was significantly greater during the training, maintenance, and collection phases than during the control phase. However, the three species differed significantly in the manner in which the rates of urination changed across the five phases. The entry of the trainer into the cage to collect the urine sample did not appear to alter urination behavior. Thus operant conditioning techniques, which typically incur minimal cost, time investment, and disturbance, can be used to increase the quantity of urine samples collected for physiological analysis, the proportion of animals that urinate, and the speed of sample collection.

- Frameless stereotaxy in the nonhuman primate. Frey, S., Comeau, R., Hynes, B., Mackey, S., & Petrides, M. (Montreal Neurological Inst., 3801 University St, Montreal, QC, H3A 2B4, Canada). *Neuroimage*, 2004, 23, 1226-1234.

With the advent of magnetic resonance imaging (MRI), it is possible to obtain high-resolution anatomical images of the monkey brain. Accuracy, however, is lost in the laboratory or surgical setting when the localization of brain structures depends on nonstereotaxic tracking methods. Here an image-guided stereotaxic system is presented, that is able to localize and access anatomical brain structures using the monkey's MRI. This system, which is also known as frameless stereotaxy, is capable of computing the relation of the physical "real space" of the monkey's head to the corresponding image space, while a position sensor enables the tracking of the animal's head and the localization of brain areas and favorable paths to targets within the brain using real-time display software. Surgical procedures make use of an adjustable upright chair and a surgical head clamp instead of the traditional restrictive head holder with ear bars. This novel system allows for the flexible positioning of the animal and the ability to reach

areas of the brain that were difficult to access in the past. The head clamp also serves as a tool holder, which in the present application guided a cannula of retrograde tracer to the desired location in the frontal lobe. Histological examination of the brain showed that the injection reached the target site, and tests using an MRI-compatible phantom demonstrated that the precision of the system in bringing an injection to target is less than 1.2 mm. This system can be used to inject accurately tracers for anatomical tract-tracing, to make precise lesions, and to position electrodes for electrophysiological studies.

Reproduction

- Reproductive output, maternal age, and survivorship in captive common marmoset females (*Callithrix jacchus*). Smucny, D. A., Abbott, D. H., Mansfield, K. G., Schultz-Darken, N. J., Yamamoto, M. E., Alencar, A. I., & Tardif, S. D. (S. D. T., Southwest NPRC, Southwest Foundation for Biomedical Research, P.O. Box 760549, San Antonio, TX 78245-0549 [e-mail: stardif@icarus.sfbr.org]). *American Journal of Primatology*, 2004, 64, 107-121.

"Common marmosets demonstrate significant variation in reproductive output on both a yearly and lifetime basis in comparison to other anthropoid primates. Studies have found that maternal age, maternal condition, and dam survivorship are related to reproductive output; however, these reports are not in agreement and are far from conclusive. With the use of a large, multicolony, demographic database pooling data across five marmoset colonies, we examined litter information for 1,649 litters, and reproductive summaries for 400 dams, to assess 1) how reproductive output variation (total production, total weaned production) is determined by litter size, interbirth interval (IBI), age at first birth, and dam survival age; 2) the relationship between maternal age and reproductive output variables; and 3) relationship between the reproductive output variables and survival. We used stepwise regression procedures to describe the amount of variation in lifetime reproductive output among dams, and found that mean litter size accounted for 18% of the variance in total production, survival age accounted for 10.6%, age at first birth accounted for 8.8%, and mean IBI accounted for 5%. For total (nonzero) weaned production, survival age accounted for 7.6% of variance, age at first birth accounted for 7.2%, mean IBI accounted for 2%, and mean litter size accounted for 1.6%. We identified significant effects ($P<0.05$) of maternal age on litter size and IBI length, but no effect of dam age on weaned litter size. Cox proportional hazards regression analyses revealed significant effects ($P<0.01$) of number of litters, age at first birth, and site on dam survivorship. Dams that produced more litters showed higher survivorship. Age at first birth showed a positive relationship with dam survivorship, i.e., dams that delayed first reproduction had higher survival. Our findings may have practical applications for the management of marmoset breeding colonies."

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