

# LABORATORY PRIMATE NEWSLETTER

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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 \$10.00 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 \$100/year. (Please make checks payable to the Brown University Psychology Department.) 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-PDF** 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. Latin names of primates should be indicated at least once in each note and article. In general, to avoid inconsistencies within the *Newsletter*, the Latin 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 photograph of a Bonobo (*Pan paniscus*) family at the Jacksonville, Florida, Zoo, by Marian Brickner

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# The Effects of Increased Space, Complexity, and Choice, Together With Their Loss, on the Behavior of a Family Group of *Callithrix jacchus*: A Case Study

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## Introduction

Understanding the impact of cage size and complexity (which allows the animals more choice) on primate behavior is critical for ensuring their welfare. Although there has been some research on the effects of cage size (e.g., Box & Rohrhuber 1993; Pines et al., 2003) and environmental complexity (e.g. Kitchen & Martin, 1996; Kerl & Rothe, 1996) on the behavior of callitrichids, it is interesting to examine this topic again, and under different environmental conditions. Previous studies on callitrichids have shown a positive impact of a larger, more complex enclosure on behavior (Schoenfeld, 1989; Kitchen & Martin, 1996). However, it has been found that increasing environmental complexity has a greater positive effect than simply increasing space. For example, Kerl and Rothe (1996) found no effect of increasing cage size (from 3.3 m<sup>3</sup> to 10.7 m<sup>3</sup>) on the behavior of pair-housed common marmosets (*Callithrix jacchus*) (but there was a significant increase in heart rate), while they found positive effects of increasing cage complexity on the behavior of the same individuals.

Only one previous study has been done on the effects of crowding (i.e. loss of complexity and choice) on the behavior of captive callitrichids. Schoenfeld (1989) found negative effects (evidenced by decreased levels of play, grooming, locomotion and proximity to each other) on the behavior of a family group of common marmosets after they were moved from a large, outdoor greenhouse (160 m<sup>3</sup>), into a small, barren, indoor cage (1 m<sup>3</sup>). More research has been done on the effects of crowding in other primate species, and results show negative effects of a considerable reduction in available space (e.g. *Pan troglodytes*: Nieuwenhuijsen & de Waal, 1982; *Papio anubis*: Elton & Anderson, 1997).

Kessel and Brent (1995a, 1995b) studied the effects of limited access to an exercise cage on the behavior of baboons (*Papio hamadryas anubis*, *P. h. hamadryas*, and *P. h. papio*). In addition to the positive effects (evidenced by an increase in levels of locomotion and a decrease in levels of inactivity) of these improved housing conditions

on behavior, they found no significant differences in the monkeys' behavior inside their home cage immediately before and after they had access to the exercise cage. This result indicates that there were no negative effects on the behavior of the monkeys upon return to home cage and hence no effects of temporary loss of a larger and more complex space.

Further research is needed on the effects of complexity and choice on callitrichids, to optimize laboratory conditions and to inform guidelines and legislation. Moreover, further research is needed on the effects of loss of complexity and choice on the behavior of captive primates, as their removal to smaller and less complex enclosures could have detrimental effects on welfare.

We studied the behavior of a family group of common marmosets upon removal to a large and complex enclosure and upon return to a smaller and less complex cage.

The following questions were asked:

- 1) How does a larger and more complex environment affect the behavior of a family group of common marmosets?
- 2) How does return to a smaller cage (crowding) affect the behavior of the same individuals?

We hypothesized that a larger and more complex environment would have positive effects on behavior, while crowding would have negative effects.

## Methods

**Study animals and housing:** The study animals were a family group of common marmosets. The group was composed of eight animals: two parents and their offspring of five different births. Only the youngest birth included both a male and a female twin, while for the other births only one offspring remained with the family group.

The monkeys were housed in three different enclosures during the three phases of the study. In Phase I the monkeys were housed in a standard laboratory cage (2.3 m x 1.5 m x 1.1 m). In Phase II the marmosets were housed in an enriched room (5 m x 2.7 m x 2.5 m) with brick walls, ceiling, and floor (covered with wood shavings). The enriched room's furniture was much more complex compared to the standard cage, and contained wooden logs of different types and sizes, bamboo bridges, ropes, natural plants, metal shelves and various feeding enrichment devices (see *Figures 1* and *2*). The metal nest box was the only item that was transferred from the stan-

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We thank staff at the MRC Unit Edinburgh for careful husbandry of the marmosets, and Lois Bassett for helpful comments on a draft of the manuscript. I. B.'s research was funded by the Department of Psychology, University of Stirling.

dard cage to the enriched room. In Phase III the monkeys were housed in two linked standard laboratory cages, which were connected by a short (about 25-cm) tube. In Phases I and III the cages were located in a colony room, which housed other family groups of marmosets. In contrast, in Phase II the family group was isolated from other marmosets; however, they could watch a family group of stump-tail macaques (*Macaca arctoides*) out of a glass window in the room's door.



Figure 1: Standard cage in which the marmosets were housed in Phase I

**Design:** The study period was divided into three phases.

**Phase I:** one week in a standard laboratory cage in which the family group had been housed for more than 18 months.

**Phase II:** four months in the enriched room.

**Phase III:** two separate days in two connected standard laboratory cages.

On the first day of Phase II the marmosets were encouraged to enter their nest box, and then the nest box was transferred into the enriched room and left in it (on a high shelf) to allow the marmosets to explore their novel environment at their own pace. Three times during the period of Phase II the marmosets were transferred (again in their nest box) back into the previous colony room to enable the cleaning of the enriched room. On the first

occasion, the marmosets were housed in a standard laboratory cage and the behavioral reaction of the marmosets to this first transfer was severe. Therefore, on the following occasions the marmosets were given two connected standard laboratory cages.



Figure 2: Enriched room in which the marmosets were housed in Phase II

**Data collection and statistical analysis:** Focal animal sampling was used with five minutes per animal of continuous recording, using OBSERVER software. In Phase I, only six individuals were observed three times (total observation time of 1 hour and 30 minutes). The twin infants were not observed during this phase, as they were very young and were carried by other group members for almost 100% of the time. In the first week of Phase II all eight marmosets were observed five times, and from week 2 to 16 of Phase II, each individual was observed twice a week (total observation time of 15 hours). Although marmosets were transferred back three times into the smaller and less complex cage during the whole study period, they were observed under this condition on only two of these days (total observation time of 1 hour and 20 minutes). Recorded behaviors are described in *Table 1*.

One-way ANOVAs with study phase (within subjects) as a single factor with three levels were carried out twice: 1) data from all eight individuals were used. 2) data from six individuals were used. The reason for the second analysis was that the two youngest infants were not observed during the Phase I of the study, as they were too young. Results of both analyses were very similar; therefore, results are shown for all eight marmosets. Results of the analysis of only six individuals are presented whenever they were different. Although the behavior of every individual in the study was likely to have been influenced by the other study animals, analysis was done at an individual level as the study included only a single family group.

Category	Behavior	Definition
Locomotion and inactivity	<b>Agitated locomotion</b>	Marmoset moving between locations rapidly while its gait is not relaxed
	<b>Calm locomotion</b>	Marmoset travelling between locations by walking, running, climbing, or jumping and its gait is relaxed
	<b>Inactive alert</b>	Marmoset stationary, awake and aware of the surroundings
	<b>Inactive rest</b>	Marmoset is stationary, usually the tail curled around the body or through the legs, not alert with eyes open or closed
Individual behavior	<b>Explore</b>	Marmoset investigating objects in its environment by sniffing, licking, biting, or handling the objects, or attending to them while walking around them
	<b>Scent mark</b>	Marmoset rubbing anogenital area along a substrate
	<b>Solitary play</b>	Marmoset hanging from or moving objects accompanied by rapid movement around the enclosure
Social behavior	<b>Allogroom</b>	Marmoset cleaning another's fur and/or skin with hand or mouth
	<b>Contact</b>	Marmoset is stationary and in physical contact with another individual

Table 1: Behavioral categories and definitions (only behaviors in which significant differences were found are described)

## Results

**Effects of enhanced complexity and choice:** Behaviors were considered to be affected by complexity and choice only when significant differences were found between Phase I and Phase II. When data were analyzed for all eight individuals significant main effects among study phases were found in the amount of time marmosets spent exploring their environment ( $F_{7,21} = 7.8, p < 0.007$ ), allogrooming ( $F_{7,21} = 3.9, p < 0.048$ ), and in contact with other group members ( $F_{7,21} = 8.7, p < 0.005$ ). Further significant differences were in calm ( $F_{7,21} = 25.5, p < 0.001$ ), and agitated locomotion ( $F_{7,21} = 136.4, p < 0.001$ ), and in the time marmosets spent inactive alert ( $F_{7,21} = 30.2, p < 0.001$ ), and inactive rest ( $F_{7,21} = 4.9, p < 0.028$ , Figure 3). Tukey *post hoc* tests showed that the marmosets explored the environment significantly more during Phase II compared to both Phases I and III ( $t = -2.7, p < 0.05$ ;  $t = -3.8, p < 0.006$ , respectively). When data were analyzed for only six animals it was also found that the marmosets spent significantly more time in solitary play during Phase II compared to both Phases I and III ( $t = -3.2, p < 0.025$ ;  $t = -3.2, p < 0.025$ , respectively).

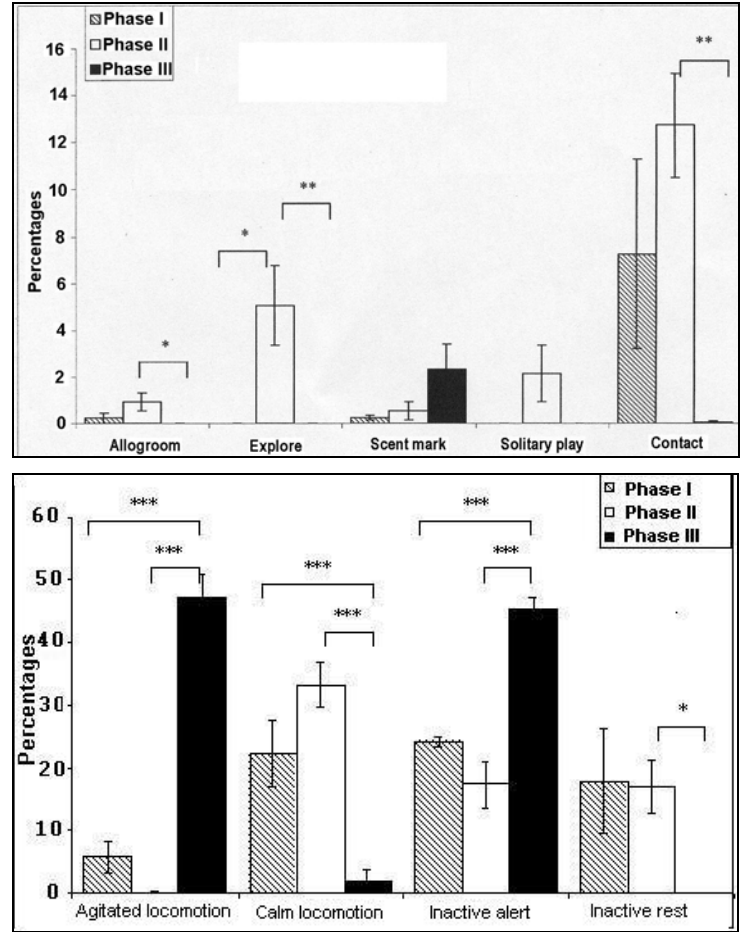


Figure 3: Mean percentage time ( $\pm$  standard error bars) spent in behaviors (a - low rates; b - high rates) for eight individuals in three study phases (Tukey *post-hoc* tests, \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ )

**Effects of loss of complexity and choice:** No formal observations were performed the first time the marmosets were moved back into a standard laboratory cage in the colony room. However, informal observations showed that levels of aggression, towards both family members and laboratory staff, were very high while the marmosets stayed in this cage. Formal observation during the next two transfers showed that the marmosets spent significantly more time in agitated locomotion ( $t = -12.3, p < 0.001$ ;  $t = -15.4, p < 0.001$ , respectively) and inactive alert behaviors ( $t = -5.4, p < 0.001$ ;  $t = -7.4, p < 0.001$ , respectively) and less time in calm locomotion ( $t = 4.5, p < 0.002$ ;  $t = 7.0, p < 0.001$ , respectively) during Phase III compared to Phases I and II. Marmosets also allogroomed less ( $t = 2.7, p < 0.046$ ), spent less time in contact with each other ( $t = 4.2, p < 0.003$ ) and in inactive rest behavior ( $t = 2.8, p < 0.039$ ) during Phase III compared to Phase II. When data were analyzed for six individuals it was also found that the marmosets scent marked more during Phase III compared to Phase II ( $t = -2.8, p < 0.046$ ;  $t = -15.4$ ).



After approximately two and a half years in the enriched room, the group consisted of 17 individuals (a large family group compared to a maximum number of nine individuals in standard cages). Due to laboratory needs they had to be moved back to a colony room. No formal observations were carried out at this time. In the first stage the group was moved to four linked standard laboratory cages (around half of the volume of the enriched room). Within a very short period (a few days) two marmosets had to be removed from the group due to fighting. After about three weeks two more individuals had to be removed, again due to fighting. The group's size was steadily reduced, ultimately to six individuals (including the breeding pair), which were housed in a standard cage, similar to other family groups in the colony rooms.

### Discussion

The results of the study show positive effects of enhanced cage size, combined with increased levels of complexity and choice, on the behavior of a family group of marmosets. Furthermore, the crowding situation and the loss of complexity and choice had major negative effects on the behavior of the marmosets. Surprisingly, only a few significant behavioral differences were found in the behavior of the marmosets in the enriched enclosure (Phase II) compared to their behavior in a standard laboratory cage (Phase I). The marmosets explored the environment significantly more and showed higher levels of solitary play when complexity and choice were increased. Significant differences in levels of exploratory behavior were similar in both analyses. The significant difference in levels of solitary play between the study phases was found only when the infants were excluded from the analysis. This indicates that the behavioral differences resulted from the different housing conditions, and not because the infants were older, more active and independent. Despite the lack of more significant behavioral differences between Phase I and Phase II, a positive influence of enhanced levels of complexity and choice can be concluded as increased levels of both exploratory behavior and solitary play are very desirable for captive marmosets (Chamove & Anderson 1989). One reason why there was not a greater impact on welfare might be that the group became unnaturally large (17 individuals; the mean group size of wild marmosets is 3-15, Hubrecht 1984; Pontes & Da Cruz 1995). This may have increased sociosexual strife.

Although few data were collected on the effects of loss of complexity and choice, the results are discussed because of their importance for the welfare of captive primates. Numerous behavioral indices were significantly adversely affected (including the well known stress-related indicator, scent marking (Cilia & Piper 1997) when the infants, which are known to scent mark less than

adults (Stevenson & Ryland 1988), were excluded from analyses). However, since the marmosets were moved to the impoverished cage for very short periods of time, one may argue that these results are not relevant since it is possible that the marmosets' reaction was an immediate response to the transfer process which involved capture, and that they would settle down again if they were given more time. This seems unlikely as the response of the marmosets to their permanent removal into a colony room, although no formal data were collected and the conditions were different (a much larger group size and slightly different housing conditions), suggesting that this response was a real reaction to loss of complexity and choice, or was associated with crowding and the presence of other conspecifics.

In conclusion, enhanced levels of space, complexity and choice may have a positive influence on the behavior of family-housed marmosets. Moreover, the loss of a larger and more complex enclosure might have detrimental effects on the behavior and the social interactions of family-housed marmosets. Therefore, it is essential to consider these possibly harmful effects of loss of complexity and choice when designing enrichment programs for captive primates.

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## Meeting Announcements

The **Gelada Behavior Discussion Group**, an informal meeting to discuss gelada baboon behavior and sounds, will meet for the first time in Pittsburgh, Pennsylvania, on November 7, 2007, organized by Bruce Richman [412-795-6373; e-mail: [brucerichman22@yahoo.com](mailto:brucerichman22@yahoo.com)]. Contact Bruce for more information.

A Conference, **Animals and Bioengineering – A Consideration of Law, Ethics and Science**, will be held November 9-10, 2007, in Durham, North Carolina, presented by the American Bar Association's (ABA) Tort Trial & Insurance Practice Section, Committees on Animal Law; the ABA Section of Science & Technology Law; and Duke University School of Law. For details, see [www.law.duke.edu/aba-animalconference](http://www.law.duke.edu/aba-animalconference).

The **Scientists Center for Animal Welfare (SCAW) Winter Conference** will be held December 3-4, 2007, in San Antonio, Texas. For more information, see [www.scaw.com/conference.htm](http://www.scaw.com/conference.htm).

The **VI. Goettinger Freilandtage: Primate Behavior and Human Universals** will be held December 11-14, 2007, in Göttingen, Germany. It is sponsored by the Department of Behavioral Ecology and Sociobiology at the German Primate Center (Deutsches Primatenzentrum). For details, see [www.soziobio.uni-goettingen.de/welcome.html](http://www.soziobio.uni-goettingen.de/welcome.html).

The AWEN Group's **5<sup>th</sup> Annual Assessment and Treatment of Pain and Distress in Animals (ATOP V)**

conference will be held Friday, February 8, 2008, at the Massachusetts Medical Society Conference Center in Waltham Woods, Waltham, MA. The title is "Humane Endpoints: Where Good Science and Animal Welfare Intersect". Registration will open soon, and there will be information at [www.theawengroup.com](http://www.theawengroup.com).

The IUCN /SSC Reintroduction Specialist Group and Lincoln Park Zoo will host the **1st International Wildlife Reintroduction Conference** April 15-16, 2008, in Chicago, Illinois. The theme of the conference will be "Reintroduction Programs: Applying Science to Conservation". The conference Website, including information about registration and submitting abstracts, is available at [www.reintroduction.org](http://www.reintroduction.org). Registration is limited to 275 participants.

The 2008 meeting of the **Animal Behavior Society** will be held in Snowbird, Colorado, August 14-19; and the 2009 meeting is scheduled for June 22-26, in Pirenopolis, Brazil. See [abs.animalbehavior.org](http://abs.animalbehavior.org) for information.

**Measuring Behavior 2008**, the 6th International Conference on Methods and Techniques in Behavioral Research, will be held in Maastricht, the Netherlands, from August 26-29, 2008. See [www.noldus.com/mb2008](http://www.noldus.com/mb2008).

The **2009 World Congress of Veterinary Anaesthesiologists** will be held in Glasgow, Scotland, August 31 to September 4, 2009. See [www.wcva2009.com](http://www.wcva2009.com) for details.

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## Announcements from Publications: *Laboratory Animals* Available Online

All issues of *Laboratory Animals* back to Volume 1 (1967) are available online at [www.lal.org.uk/online.html](http://www.lal.org.uk/online.html). Subscribers

[www.lal.org.uk/subscription.html](http://www.lal.org.uk/subscription.html) receive full access, and access is also free to all for articles over three years old.

## News Briefs

### Endangered Grey-Shanked Doucs Found in Vietnam

A team of scientists from the World Wildlife Fund and Conservation International has discovered the world's largest known population of grey-shanked doucs (*Pygathrix cinerea*), increasing chances that the endangered monkey can be saved from extinction. The grey-shanked douc is one of the world's 25 most endangered primates and has only been recorded in the five central Vietnamese provinces of Quang Nam, Kon Tum, Quang Ngai, Binh Dinh, and Gia Lai. Fewer than 1,000 individuals are believed to still exist, and, until now, only one other population with more than 100 animals was known.

Recent surveys in Que Phuoc Commune in Quang Nam Province recorded at least 116 animals (the number of individuals observed), with an estimated population of over 180 individuals. To date, only a small part of the area has been surveyed, meaning significantly more doucs may live in the adjacent forest.

Grey-shanked doucs, first described in 1997, are tree-dwelling colobine monkeys with orange faces and tufts of whiskers. Like many primate species in Vietnam, they face an uncertain future due to hunting and habitat loss. A 2006 IUCN assessment determined that 65 percent of Vietnam's primate taxa are Endangered or Critically Endangered, making the country one of the highest global priorities for primate conservation. – *from a Conservation International press release, July 2*

### Chester Zoo Wins Welfare Excellence Award

Chester Zoo is to receive a prestigious animal welfare award for the work it has done with its mandrills. A team from the Cheshire zoo and Durham University carried out a study on the behavior of the vulnerable monkeys. They found planting a barrier of small shrubs between the mandrills' enclosure and the visitors' viewing area reduced their stress levels by 54%. The study also showed a rise in the social behavior of the seven-individual mandrill group. They are to get the Universities Federation for Animal Welfare (UFAW) Wild Animal Welfare Award.

The zoo's Research Officer, Dr. Sonya Hill, specializes in primate behavior and welfare and supervised the research within the zoo. The work was carried out by Durham students Riccardo Pansini and Jessica Hargreaves. Dr. Hill said: "Good animal welfare is at the forefront of Chester Zoo's mission, and I am delighted that we have won this prestigious award, which recognizes the contributions that our scientific collaboration has made to the lives of the mandrills.

"By assessing animal welfare, we can 'ask' the animals what they want, and this helps us provide conditions that meet their needs for good welfare. Life in the wild is

not always stress-free either, and the more we learn about each species, the more we understand what behavioral strategies they use to cope with things in their environment."

As part of the award, the zoo will receive £1,000, which will go towards further research into animal behavior at Chester Zoo. – *BBC News, July 13*

### One of World's Oldest Chimps Dies at 60

One of the world's oldest chimps, Fifi, has died in Australia, zoo officials said Friday. Fifi was the matriarch of the 18 chimpanzees at Sydney's Taronga Zoo, and celebrated her 60th birthday in May with sugar-free cupcakes and coconuts among four generations of her family. But Fifi, who suffered arthritis and had taken to sipping from a cup of chamomile tea each morning in her later years, stayed in bed Thursday morning, raising suspicions among the keepers that she was unwell, the zoo said in a statement. Keepers provided her with fresh bedding and her favorite foods, while other chimps in the group visited her throughout the day, the zoo said. She died peacefully in the afternoon.

"Keepers have been saddened by the peaceful passing of their oldest and much loved chimpanzee, Fifi," the zoo said.

Cheeta, the star of a dozen "Tarzan" movies in the 1930s and 1940s, is listed by the *Guinness Book of World Records* as the world's oldest chimp. He turned 75 in April. – *Yahoo.com, July 19*

### Cindy Smith Acting Administrator of APHIS

The U.S. Department of Agriculture has announced the appointment of Cindy Smith as the new Acting Administrator for the Animal and Plant Health Inspection Service. As Acting Administrator, Smith will manage one of USDA's most multi-faceted agencies, which includes programs that are critical to the protection of America's livestock, plants and food supply. Smith is acting as a replacement for Dr. Ron DeHaven, who will retire on Aug. 3, after 28 years with APHIS. DeHaven served as Administrator since 2004. – *U.S. Dept. of Agriculture news release, July 30, 2007*

### Orangutan Learns to Take Her Own Medicine

An orangutan at Tama Zoological Park has surprised her minders by willingly taking her medicine after ripping open the packet herself – just like a human would.

"It's rather rare for an animal to take medicine on its own," said Hidetoshi Kurotori, who looks after the orangutan, named Gypsy, at the zoo in Hino, Tokyo. Gypsy, who is thought to be 51 years old, quite elderly for an orangutan, became sick during the rainy season and



was given medicine similar to that used for humans. She had taken the medicine before, after a zoo employee tore open the packet and poured the powdered medicine into her mouth. On June 27, Kurotori accidentally dropped the medicine inside Gypsy's cage. When he collected the packet the next morning, it had been torn open and the contents had disappeared. Kurotori, 55, handed Gypsy another packet and then watched in disbelief as she skillfully ripped it open and tipped the medicine into her mouth. Since then, Gypsy has been quite happy to repeat this feat. The medicine is flavored to suit orangutans' fondness for sweet foods, but Kurotori is unsure if the orangutan knows the powder is a medicine. "Perhaps she just prefers to take it when she wants, not when somebody tries to force her to," he said. Gypsy also wipes her cage with a cloth, and pours water into a plastic bottle before drinking it. — *from the Daily Yomiuri Online and Associated Press, August 9, 2007*

### **Retired Chimps May Help Studies of Aging**

"Seventy-eight chimpanzees once used for medical testing will now give researchers insights into how to improve geriatric care for humans. Since a ban on medical testing on chimpanzees last year, the aging primates have been living out their days at a luxurious ape 'retirement' center run in Kumamoto Prefecture by a pharmaceutical company. A new research wing will open at the center in August to study the aging process in primates. The project, an initiative of Kyoto University and Nagoya-based Sanwa Kagaku Kenkyusho Co. pharmaceutical company, will be funded by drug companies." — *by Naoyuki Uchimura, The Asahi Shimbun, July 25, 2007*

### **Israel Following Europe on Animal Testing Policy**

The *Haaretz* (Israel) reports that during the past month, the Knesset (Israeli parliament) has considered two pieces of legislation regarding animal testing in the cosmetic industry. The Knesset unanimously approved the first bill, which prohibits using animals when developing cosmetics and detergents, about three weeks ago. The other bill, which seeks to forbid the importation and distribution of cosmetics that are tested on animals, was unanimously approved by the Knessets Education Committee. This bill adopts the 2004 European directive forbidding the distribution and sale of nearly all animal-

tested products as of March 2009. — *See NABR Update, Vol. 28, No. 11*

### **Alex the African Grey Parrot Dead at 31**

Alex, the African grey parrot with whom Irene Pepperberg, PhD, has been conducting linguistic and cognitive research for 30 years, died unexpectedly on September 6. At 31 years old, Alex was only about half way through his expected life span. A necropsy did not reveal an obvious cause of death.

"Dr. Pepperberg's pioneering research resulted in Alex learning elements of English speech to identify 50 different objects, 7 colors, 5 shapes, quantities up to and including 6, and a zero-like concept. He used phrases such as 'I want X' and 'Wanna go Y', where X and Y were appropriate object and location labels. He acquired concepts of categories, bigger and smaller, same-different, and absence. Alex combined his labels to identify, request, refuse, and categorize more than 100 different items demonstrating a level and scope of cognitive abilities never expected in an avian species. ... Dr. Pepperberg's research with Alex shattered the generally held notion that parrots are only capable of mindless vocal mimicry. ...

"Over the course of 30 years of research, Dr. Pepperberg and Alex revolutionized the notions of how birds think and communicate. What Alex taught Dr. Pepperberg about cognition and communication has been applied to therapies to help children with learning disabilities. Alex's learning process is based on the rival-model technique in which two humans demonstrate to the bird what is to be learned.

"Alex and Dr. Pepperberg have been affiliated with Purdue University, Northwestern University, the University of Arizona, the MIT Media Lab, the Radcliffe Institute, and most recently, Harvard University and Brandeis University. ... Dr. Pepperberg will continue her research program at Harvard and Brandeis Universities with Griffin and Arthur, two younger African Grey parrots who have been part of the ongoing research program." — *from the Alex Foundation's press release, September 10, 2007. See <www.alexfoundation.org>.*

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## **Travelers' Health Notes: Malaria Rapid Diagnostic Test**

On June 13, 2007, the Food and Drug Administration approved BinaxNOW<sup>®</sup> Malaria (Inverness Medical Professional Diagnostics, Scarborough, Maine), the first malaria rapid diagnostic test (RDT) authorized for use in the United States. Malaria RDTs, which detect circulating malaria-specific antigens, already are available in other countries and often are used in settings where malaria

microscopy is not available. In the United States, use of the RDT can decrease the amount of time required to determine whether a patient is infected with malaria. — *from MMWR, July 13, 2007, 56[27], 686. The entire text can be found at <www.cdc.gov/mmwr/preview/mmwrhtml/mm5627a4.htm>.*

## Workshop Announcements

### First SSP Orangutan Husbandry Workshop

Brookfield Zoo will host the First SSP Orangutan Husbandry Workshop, to be held October 16-18, 2007. This workshop will focus on the care and management of the orangutan in zoological parks and sanctuaries. The workshop will bring together orangutan caregivers and managers, researchers, and field biologists to share and disseminate the most current information on husbandry, conservation, and emergent issues pertaining to captive and wild populations of orangutans.

The Orangutan Husbandry Workshop Planning Committee invites you to present papers, posters, or videos pertaining to environmental enrichment, positive reinforcement training, nutrition, medical management, introductions, birth management, public education, conservation, and general orangutan management. The workshop registration fee (\$85) covers most meals as well as a banquet. An Icebreaker will be generously sponsored by The Orangutan Conservancy. The workshop will be held in conjunction with the Orangutan SSP Masterplan meetings. For information on registration and submission of abstracts contact Carol Sodaro [708-688-8706; e-mail: [casodaro@brookfieldzoo.org](mailto:casodaro@brookfieldzoo.org)].

### Animal Welfare Act Information Requirements

The Animal Welfare Information Center (AWIC) of the U.S. Department of Agriculture, National Agriculture Library (NAL), will give a one-and-a-half-day workshop, Meeting the Information Requirements of the Animal Welfare Act, October 24-25, 2007, at NAL in Beltsville, Maryland. Registration information is available at [awic.nal.usda.gov/nal\\_display/index.php?info\\_center=3&tax\\_level=1&tax\\_subject=188](http://awic.nal.usda.gov/nal_display/index.php?info_center=3&tax_level=1&tax_subject=188).

### Southeast Regional Ape Enrichment Workshop

The Southeast Regional Ape Enrichment Workshop, sponsored by Gorilla Haven (GH), will be held November 1-3, 2007, at GH, in Morganton, Georgia. The workshop fee is \$50. There are limited accommodations at GH; camping areas and inexpensive local hotels are available.

The mission of this workshop is to improve the lives of captive apes through informational and collaborative sessions, in which ideas can be shared and explored. The specific objectives are:

- to bring together animal caregivers from the southeast, in a collaborative effort, in order to bring ideas and methods back to their respective institutions;

- to bring together new caregivers and experienced keepers, where they can learn new methods and styles of enrichment delivery; and
- to educate animal caregivers about fundraising for enrichment materials.

Planned Workshop sessions include:

- Enrichment and safety
- Fund raising methods
- Identifying southeastern edible plants
- Recycled enrichment
- Present your own device, and an enrichment-device-building contest
- Enrichment recipes for the gourmet keeper
- How to create themed enrichment.

Register by October 10, 2007, with Kelly Maneyapanda [e-mail: [kellydm@gorilla-haven.org](mailto:kellydm@gorilla-haven.org)] or Matt Goeben [e-mail: [matthewgoeben@yahoo.com](mailto:matthewgoeben@yahoo.com)]. Thirty applications will be accepted.

### HIV Persistence Workshop

The Third HIV Persistence Workshop will be held December 4-7, 2007, in St Maarten, West Indies. For information, see [hiv-workshop.com/PW2007.htm](http://hiv-workshop.com/PW2007.htm).

### “Teaching Animal Behavior”

The materials for the workshop, “Teaching Animal Behavior,” presented at the Animal Behavior Society’s (ABS) 44th Annual Meetings in Burlington, Vermont, in 2007, are now on-line in the Education section of the ABS Website. Go to [www.animalbehavior.org/ABSEducation](http://www.animalbehavior.org/ABSEducation) and click on “SYMPOSIA”.

### Alternatives and 3Rs at UCLA

The Johns Hopkins Center for Alternatives to Animal Testing and the University of California at Los Angeles (UCLA) will sponsor an “Alternatives and 3Rs” workshop at UCLA on January 24 and 25, 2008. As the name implies, the objective of the workshop is to learn about new scientific innovations and ethical perspectives in research animal alternatives and the “3Rs” (Replacement, Refinement, and Reduction). Additional information on the workshop will be provided over the next few months. Registration begins in October, 2007. Please contact Kathy Wadsworth [e-mail: [arc@opr.ucla.edu](mailto:arc@opr.ucla.edu)], for additional information on the workshop.

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## Information Requested or Available

### Gorilla Haven Update

Jane Dewar writes, "There's a new update at <[www.gorilla-haven.org](http://www.gorilla-haven.org)> dated June 24, 2007, including details of our new mixed-species exhibit with goats and gorillas!"

### Compiling a Dataset of Testes Weights

Geoff MacFarlane is currently compiling a dataset of testes weights and body weights of primate species as a proxy for promiscuity for use in a comparative analysis. He has had difficulty gaining data on a number of species and is hoping some researchers may have data for the following variables from adult male individuals. These variables would include: mean combined testes mass, or testicular volume, or testicular diameter/width measurements for any of the following species: • *Varecia variegata rubra* • *Presbytis johnii* • *Cercopithecus mona* • *Macaca maurus* • *Macaca sylvanus* • *Macaca thibetana*.

Contact Dr. MacFarlane, Biological Sciences, School of Environmental and Life Sciences, Univ. of Newcastle, Callaghan, NSW 2308, Australia [61249217858; fax: 61249216923; e-mail: [geoff.macfarlane@newcastle.edu.au](mailto:geoff.macfarlane@newcastle.edu.au)], if you can help.

### New IPS Website

"The International Primatological Society's Council is pleased to announce that our new Website is now online! Please take a moment to check out our new look: <[www.internationalprimatologicalsociety.org](http://www.internationalprimatologicalsociety.org)>.

"Here you will find information on our upcoming congress in Edinburgh, details on IPS grants and awards, links to regional societies, membership information, and IPS news and announcements. In the coming months, we will be working to increase the amount of information that the IPS provides on our Website. Please contact our Vice Presidents with your comments and suggestions for possible upgrades. Enjoy the new site!"

### Gibbon Discussion List

"The Gibbon SSP has arranged for the creation of a Yahoo! listserver to discuss topics relating to gibbon and siamang husbandry. This will be a professional forum limited to people working with or studying primates. "If

you are interested in joining, please send an e-mail to <[beth.a.richards@disney.com](mailto:beth.a.richards@disney.com)>, indicating your name and professional affiliation. We look forward to some lively discussions."

### More Interesting Websites

- 2008 Gorilla Workshop: <[www.2008gorillaworkshop.com](http://www.2008gorillaworkshop.com)>
- A video, by Moshe Bushmitz, showing long-tailed macaques jumping into a swimming pool, diving under water, swimming, and fishing for floating food: <[www.awionline.org/lab\\_animals/video/enrichment\\_videos.htm](http://www.awionline.org/lab_animals/video/enrichment_videos.htm)>
- Health database for lorises (*Loris*, *Nycticebus*) and pot-tos (*Arctocebus*, *Perodicticus*), prosimian primates: <[www.loris-conservation.org/database/disease](http://www.loris-conservation.org/database/disease)>
- Jennifer Green's primate enrichment photos: <[www.awionline.org/lab\\_animals/LAREF/jennifer.html](http://www.awionline.org/lab_animals/LAREF/jennifer.html)>
- John Grehan's collection of photos and drawings of primate external ears: <[www.sciencebuff.org/externalear.php](http://www.sciencebuff.org/externalear.php)>
- Netherlands Centre Alternatives to animal use (NCA): <[www.nca-nl.org](http://www.nca-nl.org)>
- NCA Newsletter: <[www.vet.uu.nl/nca/nca/newsletters/current\\_issue](http://www.vet.uu.nl/nca/nca/newsletters/current_issue)>
- Office of Extramural Research: <[grants.nih.gov/grants/oer.htm](http://grants.nih.gov/grants/oer.htm)>
- Office of Laboratory Animal Welfare (OLAW): <[OLAW.nih.gov](http://OLAW.nih.gov)>
- Pan African Sanctuary Alliance (new Website): <[www.pasaprimates.org](http://www.pasaprimates.org)>
- Photo of a privacy panel for macaques: <[www.awionline.org/lab\\_animals/LAREF/LAREFphotos.html#priv](http://www.awionline.org/lab_animals/LAREF/LAREFphotos.html#priv)>
- Primates for Primates: Human Primates helping Non Human Primates: <[primates4primates.org](http://primates4primates.org)>
- Royalty-free stock photos from Fotosearch Stock Photography: <[www.fotosearch.com/photos-images/primate.html](http://www.fotosearch.com/photos-images/primate.html)>
- Sanaga-Yong Chimpanzee Rescue Center slide show: <[www.ida-africa.org/index.php?page\\_id=12&newsletter\\_id=42](http://www.ida-africa.org/index.php?page_id=12&newsletter_id=42)>

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## Educational Opportunities: Primate Biology, Husbandry, Nutrition, and Handling

The European Primate Network (EUPRIM-Net; see <[www.euprimnet.eu](http://www.euprimnet.eu)>) conducts a series of courses on "General Primate Biology and Primate Husbandry, Nutrition, and Handling" at the German Primate Center, Göttingen, Germany. These are advanced and specialized training courses for scientist, students, animal caretakers,

and other staff involved in primate research. See <[www.euprim-net.eu/network/courses.htm](http://www.euprim-net.eu/network/courses.htm)> for detailed information about the courses in general, the program, and schedules. You will find lecture abstracts and information about the invited speakers as well as support for travel arrangements.

## Resources Wanted and Available

### AMP's Research Advocacy DVD

"Americans for Medical Progress (AMP) believes public outreach is essential to securing biomedical research from activist attack. Citizen support is the sole way research will prevail against campaigns by extreme animal rights leaders. And public understanding and appreciation of the necessary, humane, and beneficial role of animals in research can only be built and sustained with enough people stepping forward as advocates for research.

"That is the concept behind our new DVD, 'Physicians – Speaking for Research', part of our Raising Voices, Saving Lives campaign. It's designed to give medical professionals the tools to speak comfortably on the topic of animal research and the value of scientists' ethical and humane use of laboratory animals. By virtue of their authority and expertise, and the trust placed in them, physicians are in an unparalleled position to foster greater public awareness of the role laboratory animals play in enhancing and lengthening our lives.

"On the DVD, AMP Board of Directors members John Fung, MD, PhD, and John Young, VMD, MS, speak directly to physicians, noting that to speak up for research is to advocate for the best care and outcome for their patients. Information on ordering one or multiple copies of the DVD is available on AMP's Website <[www.amprogress.org](http://www.amprogress.org)>. The DVD and accompanying brochure are offered without charge, and the material is useful for all advocates, but we do ask that if you are not a physician, you do what you can to share the message with the medical community – either by passing it along to your own doctor, a physician acquaintance, or key staff at your facility.

"The American Medical Association Foundation generously provided a grant to help defray the costs involved in the DVD's production."

### New U.K. Strategy for Nonhuman Primate Testing

According to the *Financial Times* (London), the government, along with key biomedical organizations, will establish a new national strategy for performing scientifically essential research using monkeys. This new strategy is a response to anti-vivisectionists' campaign to phase out all experimentation on nonhuman primates and will likely include a list of centers where scientists are permitted to conduct research with nonhuman primates. Sir David King, the government's chief scientist, stated that, although rare, the use of primates in medical research and testing is invaluable as an essential aspect of work which provides the best hope for breakthroughs in important areas such as neuron degenerative disorders and for as-

pects of immune and reproductive functions. In Britain, the term "nonhuman primates" refers to monkeys because the use of apes has been banned since 1988. The consultation summary of this meeting is available at <[www.defra.gov.uk/corporate/consult/awelfare-strategy/index.htm](http://www.defra.gov.uk/corporate/consult/awelfare-strategy/index.htm)>. – NABR Update 13, June 28, 2007

### NIH Chimpanzee Management Program

The NIH Chimpanzee Management Program (ChiMP) supports long-term, cost-effective housing and maintenance at National Center for Research Resources (NCRR)-supported facilities for chimpanzees. NCRR provides programmatic oversight of the facilities and ensures that they comply with the Animal Welfare Act and policies concerning laboratory animal care and use.

In 1995, a breeding moratorium on NCRR-owned and -supported chimpanzees was instituted. Soon after, the Chimpanzee Management Plan Working Group was created to periodically assess the need for chimpanzees in research and to report its findings to the National Advisory Research Resources Council, NCRR's advisory body. The Working Group serves as a fact-finding body that gathers information, analyzes relevant issues and facts, and drafts proposed position papers. The Working Group is comprised of nongovernment members with a wide range of scientific and nonscientific expertise.

The most recent meeting of the Working Group was held in March, 2007, and the Report of the Chimpanzee Management Plan Working Group was provided to the Council on May 22, 2007. At this meeting, the Group announced they are continuing the moratorium. See <[www.ncrr.nih.gov/comparative\\_medicine/chimpanzee\\_management\\_program/ChimP05-22-2007.asp](http://www.ncrr.nih.gov/comparative_medicine/chimpanzee_management_program/ChimP05-22-2007.asp)>.

### Primate Enrichment Photos

The Laboratory Animal Refinement & Enrichment Forum has posted some primate enrichment photos from Jennifer Green. "Especially nice are the pictures of single-caged rhesus macaques making use of mirrors." See <[www.awionline.org/lab\\_animals/LAREF/jennifer.html](http://www.awionline.org/lab_animals/LAREF/jennifer.html)>.

### Screen Savers, Etc.

Dr. Shirley McGreal, Founder of the International Primate Protection League, invites you to visit <[www.ippl.org](http://www.ippl.org)> for a preview of a collection of 22 fascinating primate portraits by award-winning photographer Michael Turco. The high resolution photos can be used as screen savers or desktop wallpaper. Primates in the series include IPPL's beloved blind gibbon Beanie,

who lived there from 1990 until she died in October, 2004.

### **Best Practices for Great Ape Conservation**

The IUCN/SSC Primate Specialist Group (PSG) is developing a series of guidelines to address critical issues in great ape conservation, drawing on the expertise of PSG members to create a consensus of best practices for field conservationists. Each publication in the new series will provide up-to-date guidance for scientists working on a daily basis with great apes, as well as for the many development organizations, donors and government agencies that are involved in great ape conservation.

Each of these publications will be focused on a specific issue affecting the immediate survival of great ape populations, including: • Commercial Logging • Reintroductions • Survey Methods & Population • Monitoring • Disease Monitoring • Human/Great Ape Conflict and • Tourism.

Based on the most current information, each publication is designed to give a clear, comprehensive overview of an issue, and to provide expert recommendations on how to address it. Particular emphasis will be placed on which practices have or have not proven successful in the field.

The first report in the series, on reducing the impact of commercial logging on great apes, has just been published in English and in French, and is available in PDF format <[www.primatesg.org/BP.logging.htm](http://www.primatesg.org/BP.logging.htm)>. Additional reports will be produced regularly, with the eventual goal of providing a comprehensive framework for natural resource managers working in great ape habitats. For more information, please contact Dr. Liz Williamson, Coordinator of the PSG Section on Great Apes [e-mail: [sga\\_coordinator@conservation.org](mailto:sga_coordinator@conservation.org)].

PSG has also published *Regional Action Plan for the Conservation of the Cross River Gorilla* (Gorilla gorilla diehli), which is available at <[www.primatesg.org/PDF/CRG.Action.Plan.pdf](http://www.primatesg.org/PDF/CRG.Action.Plan.pdf)>.

### **Chinese Scientific Books**

China Scientific Book Services [e-mail: [csbs@mx.cei.gov.cn](mailto:csbs@mx.cei.gov.cn)] has a Website, <[www.hceis.com](http://www.hceis.com)>, with links to dozens of lists of scientific books, most in Chinese, some bilingual, and a few in Western languages. Of particular interest would be the list on mammals: <[www.hceis.com/class.asp?aid=31&nid=390](http://www.hceis.com/class.asp?aid=31&nid=390)>, but you may want to check out other links from the home page.

### **The New Simian (and Prosimian and Ape) Census**

The Primate Freedom Project has retrieved data from the Primate Info Net and created a database, listing the number of each species held at each institution, by country. It is available at <[www.primatefreedom.com/simiancensus.shtml](http://www.primatefreedom.com/simiancensus.shtml)>.

### **Chad Hunter's Gelada Video**

A 14-minute video from the 60 Minutes program, about Dr. Chadden Hunter's work with geladas, can be seen at <[ninemsn.video.msn.com/v/en-au/v.htm?f=39&g=719fb136-4ed6-448a-903d-9d36451482c9&%20p=aunews\\_au60minutes&t=m163&mediaid=%20105664](http://ninemsn.video.msn.com/v/en-au/v.htm?f=39&g=719fb136-4ed6-448a-903d-9d36451482c9&%20p=aunews_au60minutes&t=m163&mediaid=%20105664)>.

### **From the Zoo-Biology Discussion Group**

A Tamarin Weekly Enrichment Schedule, prepared by Hilda Tresz and Abigail Smith of the Phoenix Zoo, is available at <[groups.yahoo.com/group/zoo-biology/files/Tamarin%20Weekly%20enrichment.doc](http://groups.yahoo.com/group/zoo-biology/files/Tamarin%20Weekly%20enrichment.doc)>.

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## **Jacobsen WNPRC Conservation Research Award**

The Wisconsin National Primate Research Center (WNPRC) is pleased to announce the establishment of the Lawrence Jacobsen WNPRC Conservation Research Award. Made possible by an endowment from Lawrence "Larry" Jacobsen, the award supports studies in applied conservation biology that protect non-human primate species and their habitats. The WNPRC at the University of Wisconsin-Madison has a long history of supporting work in primate conservation that has significantly affected the survival of many primate species and the protection of forested habitat. The late J. Stephan Gartlan began the WNPRC's pioneering primate conservation studies in Cameroon and today the center continues to

make significant strides in helping to protect the world's most threatened primates and their habitats.

The award is available to students and/or faculty working in the field of primate conservation. Applicants must be affiliated with a university, college, or non-governmental organization. Students and/or researchers from all countries are welcome to apply. Preference will be given to those working directly with a nonhuman primate species that IUCN lists as threatened or endangered. See <[pin.primate.wisc.edu/jacobsen](http://pin.primate.wisc.edu/jacobsen)> for more information.

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## Awards Granted

### Disney Conservation Hero for 2007 – Jonathan Kang

Jonathan Kang, who overcame a lack of formal education growing up in Cameroon to become one of the most respected primate keepers in Africa, has been selected as a Disney Conservation Hero for 2007. Kang has worked at the Limbe Wildlife Centre in Cameroon since arriving there as a 19-year-old in 1995. He is considered an expert in chimpanzee, gorilla and primate care and behavior, and has helped make Limbe a model member of the Pan African Sanctuary Alliance (PASA).

Kang will receive a certificate and a \$500 prize for being named a Disney Conservation Hero, an annual awards program that “recognizes conservation initiatives are only as successful as the community and the local people involved with the project.”

“On behalf of PASA and its member sanctuaries throughout Africa, we congratulate Jonathan on this wonderful honor,” said Doug Cress, executive director of PASA. “He is a wonderful example of the dedication and skill found among the staffs at all PASA sanctuaries, and we believe Jonathan and his co-workers in Cameroon and Congo and Kenya and elsewhere will continue to play pivotal roles in the conservation of chimpanzees, gorillas and other endangered species.”

The Limbe Wildlife Centre is situated on the Atlantic coast in southwestern Cameroon, and is jointly managed by the The Pandrillus Foundation, a nongovernmental organization working to protect wildlife and fragile ecosystems, and the government of Cameroon. Built on the grounds of the colonial-era Limbe Zoo, the Limbe Wildlife Centre currently cares for 48 chimpanzees, 11 gorillas, and several dozen other primate species. For more information, please visit <[www.PASApimates.org](http://www.PASApimates.org)>, or contact <[PASAapes@aol.com](mailto:PASAapes@aol.com)>. – July 9 announcement by PASA

### 24th Annual Animal Behavior Film Festival Awards

The 24th Annual Animal Behavior Film Festival was held July 21-22 at the 2007 Animal Behavior Society meeting in Burlington, Vermont. The 2007 ABS Film Award for Best Commercial Film went to “Seasons of the Otter”, co-produced by Dale Johnson and Bob Landis, with primary photographer Bob Landis. The winner of the 2007 Jack Ward Memorial Film Competition for Non-Commercial Films was “NUTS about Capuchins”, co-produced by Elisabetta Visalberghi and Istituto di Scienze e Tecnologie della Cognizione (NcR), Rome, Italy. Ordering information for these films and others that have been shown at ABS Film Festivals is available in the newest version of the catalog which will be posted on the ABS Film Committee Website, <[www.animalbehavior.org/ABS/Film](http://www.animalbehavior.org/ABS/Film)>.

### IPS Grants and Awards for 2007

The International Primatological Society Council is pleased to announce the winners of the IPS Grants and Awards for 2007. Congratulations!

**IPS Research Grants:** Alison Behie (Canada), “The roles of nutrition, stress and parasites in determining population density in black howlers”; Sarah Carnegie (Canada), “Reproductive strategies and hormonal patterns in wild female white-faced capuchins”; Marietta Dindo (U.K.), “Investigating primate social learning and culture”; Kathelijne Koops (U.K.), “Elementary technology of foraging and shelter in the chimpanzees of Nimba Mountains, Guinea”; Marie Pele (France), “What is the influence of psychological traits in the ability of macaques to delay gratification?”; Fiona Stewart (U.K.), “The evolution of shelter: Modeling human origins through field study of chimpanzee nest building”; and Michael Wasserman (U.S.A.), “The role of phytoestrogens in the feeding ecology of red colobus monkeys”.

**Charles Southwick Conservation Education Commitment Award:** Jerry Akparawa, Centre for Education, Research and Conservation of Primates and Nature (CERCOPAN), Nigeria.

**Lawrence Jacobsen Education Development Awards:** Christos Astaras (University of Göttingen), “Raising awareness about drill conservation status among youth at Korup Region, Southwest Cameroon”; Marina Cords (Columbia University), “Kakamega Environmental education program: Building a conservation education center at Kibiri”; and Damodar Gaire (Institute of Forestry, Nepal), “Creation of community awareness on primate conservation among the school students and indigenous people in the buffer zone of Bardia National Park, Nepal”.

**IPS Captive Care Grants:** Sagan Friant, “An investigation of the gastrointestinal parasites in wild and captive cercopithecine primates of southern Nigeria”; Natalia Ceballos-Mago, “Survey of Margarita capuchin monkey, *Cebus apella margaritae* and other monkey species in captivity on Margarita Island, Venezuela”; and Doug Cress, “Pan African Sanctuary Alliance (PASA) Population Project / Chimfunshi, Zambia”.

**IPS Conservation Grants:** Abby Baird, “RAPID – Development of playback for rapid population assessment of the critically endangered brown-headed spider monkey (*Ateles fusciceps*) in Ecuador”; Catherine Cooke, “An assessment of primate species abundance and habitat use in Sette Cama and south Loango Park, Gabon”; Antje Engelhart, “Reproductive biology of wild Sulawesi-crested black macaques (*Macaca nigra*) in the Tangkoko-Batuangus Nature Reserve”; Nguyen Man Ha, “Primate survey, with special focus on Hatinh langur (*Trachipith-*



*ecus laotum hatinhensis*), red-shanked douc (*Pygathrix nemaeus*) and white-cheeked gibbon (*Nomascus leucogenys*) in Huong Hoa district, Quang Tri province, Vietnam”; Stacy Lindshield, “Bridging conservation and development: Applied primate conservation in the Talamanca region, Costa Rica”; Alexandre Nascimento, “Black-faced lion tamarin (*Leontopithecus caissara*) con-

servation program: Implementing action plan through filling data gaps”; and Felicia Ruperti, “Population density and habitat preferences of the Sahamalaza sportive lemur (*Lepilemur sahamalazensis*)”.

**Martha J. Galante Award:** Martin Kowalewski.

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## Remembering

Gary Linn, of the Nathan S. Kline Institute for Psychiatric Research, wrote to Primate-Science:

“I would like to use a Wisconsin General Test Apparatus (WGTA) that can be connected to group or pair-housing cages to perform simple object retrieval tests with *Cebus* monkeys. However, rather than trying to build it myself, I was wondering if anybody knew of any companies that already manufacture such devices? Or does everyone build his own? I haven’t been able to locate any sources through internet searches. Any suggestions would be greatly appreciated.”

Judith Schrier, Editor of the *LPN*, replied off-list:

“I haven’t worked with a WGTA for more than 30 years. Allan had a couple when he first built his lab, in 1958, and I *think* they were built by the building staff. His first grad student, Fred Stollnitz, and I created most of the objects for the object discrimination tests, using all kinds of trash objects. I visited, for instance, a local toy company, Hasbro, where I was given a large bag and told to take whatever I wanted from the bins of toy parts along the assembly lines. We also “shopped” at the Salvation Army, as well as among our own children’s broken toys, later.

“I’m not being helpful about where to get a WGTA, but it’s fun to remember those days...”

And Gary answered:

“Judith, I enjoyed hearing from you anyway! Although most responders indicated they’d built their own (or modified an old one previously left behind), I did hear from a researcher at UMass that there was a company (Carter 2 Systems) that will build you a stainless steel version of a WGTA. It wasn’t listed on their Website but you can contact them and they will send a picture. I contacted them and their system (which includes a transfer module) cost \$7K+. I think that I will have to build my own!

“Back in the old days (which for me are the 70’s) when I worked with a semi-free-ranging colony of stump-tails on a small island, I used to get my produce for the monkeys through donations of expired or bruised items from the local Piggly-Wiggly grocery store. Every week I would make a run with the boat to meet a truck from the store (that was easier than trying to carry the fruit between my legs on my 50 cc Mobyette). These days our Animal Facility orders produce for the monkeys directly from the monkey chow suppliers. Easier, but not nearly as much fun to remember!”

\* \* \*



**Oh, Lucy, you *really* know how to tell a joke!**

## Grants Available

### Electronic Financial Status Report System

The National Institutes of Health (NIH) requires *all Financial Status Reports (FSRs) (domestic and foreign) due on or after 10/01/2007* to be submitted using the electronic FSR system located in the eRA Commons. This includes all initial FSRs being prepared for submission and any revisions being submitted or re-submitted to NIH. This requirement does not affect other federal agencies and how they may handle FSRs. The eRA Commons Web-based FSR system allows participants to view information on currently due and late FSRs and to submit FSRs electronically to the NIH.

For those institutions not already registered in the Commons, registering in the eRA Commons allows your faculty and staff to take advantage of the electronic submission and retrieval of grant information. Only an individual with signatory authority for the institution or organization in grant-related matters can register an institution. This individual is known as a Signing Official (SO). To register in the eRA Commons, open the [commons.era.nih.gov/commons](http://commons.era.nih.gov/commons) page and click on the Grantee Organization Registration link. Follow the step-by-step instructions. The institution is registered when the information is completed, submitted (by pressing the Submit button), and confirmed by the NIH. An account with the SO role is created along with the institution registration.

Once an institution is registered, the SO can log into eRA Commons, create individual user accounts, and designate the roles associated with each account. Roles provide the authority within eRA Commons to perform specific tasks. The FSR role allows institutional or organizational staff to process FSRs for submission to the NIH electronically. An account for an individual can include multiple roles, including the FSR role; however, an account with only the FSR role assigned can only perform FSR tasks.

Additional resources concerning the FSR system including a User Guide and an on-line demonstration can be found on the eRA Commons Support Page: [era.nih.gov/commons](http://era.nih.gov/commons).

**Reminder:** Unless the Grants Management Officer of the awarding Institute or Center approves an extension, grantees must submit a final FSR, final progress report, and Final Invention Statement and Certification within 90 days of the end of grant period. Failure to submit timely and accurate final reports may affect future funding to the organization or awards under the direction of the same PI.

Questions concerning specific financial matters in the eRA Commons electronic FSR system should be

directed to the Government Accounting Branch [301-451-9210; e-mail: [WhatleyA@od.nih.gov](mailto:WhatleyA@od.nih.gov)].

General questions concerning using the eRA Commons should be directed to the eRA Commons Helpdesk [301-402-7469; 866-504-9552] or see [ithelpdesk.nih.gov/eRA](http://ithelpdesk.nih.gov/eRA).

### Fyssen Foundation Postdoctoral Research Grants

The aim of the Fyssen Foundation is to “encourage all forms of scientific enquiry into cognitive mechanisms, including thought and reasoning, which underlie animal and human behavior; their biological and cultural bases, and phylogenetic and ontogenetic development.” The Foundation supports research in ethology, psychology, neurobiology, anthropology, ethnology, human paleontology, and archeology. Within the context of general activities, the Foundation will award Research Grants to support post-doctoral researchers, under 35 years of age in the biological sciences and under 40 years of age in the human sciences, already holders of posts, who wish to work independently by establishing around them research teams to achieve a collective scientific operation in laboratories in France and who will work in keeping with the Foundation’s goals.

Priority will be given to researchers who will develop their project in a different laboratory from the one at which they received their doctorate and from the laboratory where they are working at present.

The research grant could range from 15,000 to 30,000 Euros, without renewal. The financing of equipment above 7,500 Euros is excluded. One year after the award, the researchers will have to provide a detailed financial report about the use of the grant, and a short scientific report in French.

Application details and forms may be obtained from the Secrétariat de la Fondation Fyssen, 194, rue de Rivoli, 75001 Paris, France [e-mail: [secretariat@fondation-fyssen.org](mailto:secretariat@fondation-fyssen.org)]; or see [www.fondation-fyssen.org](http://www.fondation-fyssen.org). The closing date for proposals is October 31, 2007.

### Postbaccalaureate Research Education Program

This funding opportunity announcement provides updated guidelines for the National Institute of General Medical Sciences (NIGMS) Postbaccalaureate Research Education Program (PREP). The PREP will support the research training and education of recent baccalaureate graduates from groups underrepresented in biomedical and behavioral research areas, who plan to pursue PhD degrees. This research apprenticeship serves as an educational transition for recent baccalaureate graduates who will acquire essential academic credentials and

research skills to make them more competitive for PhD programs at highly selective institutions.

Through this program, it is anticipated that a steady supply of PhD candidates from underrepresented groups will be established. It is also expected and hoped that some of the PREP participants will eventually become the scientists who conduct research in areas that address reducing health disparities.

The total project period for an application submitted in response to this funding opportunity may not exceed four years. Direct costs are limited to \$350,000 annually.

Public/state controlled institutions of higher education and private institutions of higher education are eligible. The applicant institution must be a research-intensive institution that has a significant number of faculty mentors with active and well-funded research programs to support adequate research and academic training of the participants. It must be an institution with strong PhD degree programs in biomedical and/or behavioral sciences that could provide excellent and challenging, but supportive, peer groups for the PREP participants to interact and network with, and who will serve as mentors.

Any individual with the skills, knowledge, and resources necessary to carry out the proposed research education program is invited to work with his or her institution to develop an application for support. Individuals from underrepresented racial and ethnic groups as well as individuals with disabilities are always encouraged to apply for NIH support.

An eligible institution may apply for and hold only one PREP award. These awards are renewable and the duration of each award may be up to four years. PREP grants are not transferable from one institution to another. Applications can be renewed by competing for additional project periods. Up to two resubmissions (formerly "revisions/amendments") of a previously reviewed research education grant application may be submitted. More than one Program Director/Principal Investigator (PD/PI), or multiple PDs/PIs, may be designated on the application.

For more information, see <[grants.nih.gov/grants/guide/pa-files/PAR-07-432.html](http://grants.nih.gov/grants/guide/pa-files/PAR-07-432.html)>. For general information on SF424 (R&R) Application and Electronic Submission, see <[grants.nih.gov/grants/funding/424/index.htm](http://grants.nih.gov/grants/funding/424/index.htm)>. Special submission dates are January 22, 2008, 2009, and 2010.

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## A Letter from the Executive Committee for IPS 2008

"On behalf of the Executive Committee for IPS 2008, I am pleased to announce that on-line registration and abstract submission is now live for IPS 2008, which takes place in Scotland's capital city, Edinburgh, August 3-8, 2008. The Congress will bring together the global community of researchers and others with interests in primates. We encourage participation from those working with primates in all contexts including conservation, behavior, biomedicine, physiology, biomechanics, psychology, veterinary science, animal welfare, taxonomy and systematics. All disciplines are encouraged to attend this major international meeting and present their research.

"Please click on <[www.ips2008.co.uk/Registration.html](http://www.ips2008.co.uk/Registration.html)> to register to attend this exciting congress. For further information and regular updates, please visit <[www.ips2008.co.uk](http://www.ips2008.co.uk)>."

Additional information:

- Paper and poster abstracts are due to the Scientific Committee by November 30, 2007. Proposal and abstract submission instructions can be found at <[www.ips2008.co.uk](http://www.ips2008.co.uk)>. Please note that presenting authors must register for the Congress prior to submission of an abstract. Additionally, the discounted "members" registration fees are only avail-

able to IPS members in good standing for 2007. You can join IPS at the IPS website: <[www.internationalprimatologicalsociety.org](http://www.internationalprimatologicalsociety.org)>.

- Congress participants will only be allowed to submit ONE oral presentation as presenting author. You can be a co-author on additional oral presentations, but you cannot be the presenting author. All presenting authors must be registered for the Congress. You may be able to submit a poster abstract in addition to your oral presentation. See the Abstract Submission page of the IPS 2008 Website for additional clarification.
- Accommodations during the Congress in Edinburgh are relatively expensive and there is likely to be considerable competition for the most reasonably-priced accommodations. It is suggested that you make your housing arrangements at your earliest convenience.
- IPS conducts a student presentation/poster award competition. Awards are given for the best student paper presentation and the best student poster. Check the appropriate box when you are submitting your abstract if you want to be part of the student award competition.

## Recent Books and Articles

(Addresses are those of first authors unless otherwise indicated)

### Books

- *Distribution and Phenotype of Proliferating Cells in the Forebrain of Adult Macaque Monkeys after Transient Global Cerebral Ischemia*. Advances in Anatomy, Embryology and Cell Biology, Volume 191. A. B. Tonchev, T. Yamashima, & G. N. Chaldakov. New York: Springer, 2007. [Price: Paper, \$119]

### Bulletins

- *NIH Extramural Nexus*, July 2007, [grants.nih.gov/grants/partners/0707Nexus.htm](http://grants.nih.gov/grants/partners/0707Nexus.htm).

### Magazines and Newsletters

- *CC Update*, Summer, 2007, 18[2], [www.communityconservation.org/newsletter.htm](http://www.communityconservation.org/newsletter.htm). (Community Conservation, Inc., 50542 One Quiet Lane, Gays Mills, WI 54631 [e-mail: [communityconservation@mwt.net](mailto:communityconservation@mwt.net)])
- *Folia Primatologica*, 2007, 78[4].

Contents: Editorial – CITES proposal highlights rarity of Asian nocturnal primates (Lorisidae: *Nycticebus*), by K. A. I. Nekaris & V. Nijman; The response of adult orangutans to flanged male long calls: Inferences about their function, by T. Mitra Setia & C. P. van Schaik; Vocal responses of captive gibbon groups to a mate change in a pair of white-cheeked gibbons (*Nomascus leucogenys*), by H. Dooley & D. Judge; Etho-archaeology of manual laterality: Well digging by wild chimpanzees, by W. C. McGrew, L. F. Marchant, & K. D. Hunt; Activity budget and ranging patterns of *Colobus vellerosus* in forest fragments in central Ghana, by S. N. P. Wong & P. Sicotte; and The roaring of southern brown howler monkeys (*Alouatta guariba clamitans*) as a mechanism of active defence of borders, by R. G. T. da Cunha & E. Jalles-Filho.

- *IPPL News*, September, 2007, 34[2]. (International Primate Protection League, P.O. Box 766, Summerville, SC 29484; e-mail: [info@ippl.org](mailto:info@ippl.org))

### Manuals

- *Guidelines for the Humane Transportation of Research Animals*. Committee on Guidelines for the Humane Transportation of Laboratory Animals, National Research Council. National Academies Press, 2006. [Price: \$31.46 (paperback); \$27 (PDF download); free (read on-line at [www.nap.edu/catalog/11557.html](http://www.nap.edu/catalog/11557.html))]

### Reports

- *Compendium of Measures to Prevent Disease Associated with Animals in Public Settings*, 2007. National Association

tion of State Public Health Veterinarians, Inc. *Morbidity and Mortality Weekly Report*, 2007, 56[RR-5], [www.cdc.gov/mmwr/preview/mmwrhtml/rr5605a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5605a1.htm).

Includes appendices: Information and instructions for venue operators and staff about animals in public settings; Suggested visitor handout for petting zoo visitors; Hand-washing recommendations to reduce disease transmission from animals in public settings; and Guidelines for animals in school settings. There is also a test on the material; for reading the article and passing the test CDC can grant 1.0 hour of veterinary CE credit. There is no charge.

- *Toxicity Testing in the Twenty-First Century: A Vision and a Strategy*. Committee on Toxicity and Assessment of Environmental Agents, National Research Council; Board on Environmental Studies and Toxicology; Institute for Laboratory Animal Research; & Earth and Life Studies. Washington, D.C.: National Academies Press, 2007. See [www.nap.edu](http://www.nap.edu).

### Special Journal Issues

- Abstracts of the 5th European Congress on Tropical Medicine and International Health; 24-28 May, 2007, Amsterdam, the Netherlands. *Tropical Medicine & International Health*, 2007, 12[suppl. 1].
- A Socioecological Perspective on Primate Cognition, *Animal Cognition*, 2007, 10[3].

Contents: A socioecological perspective on primate cognition, past and present, by E. Cunningham & C. Janson; Copying without rewards: Socially influenced foraging decisions among brown capuchin monkeys, by K. E. Bonnie & F. B. M. de Waal; Integrating information about location and value of resources by white-faced saki monkeys (*Pithecia pithecia*), by E. Cunningham & C. Janson; Spider monkey ranging patterns in Mexican subtropical forest: Do travel routes reflect planning? by A. Valero & R. W. Byrne; Route-based travel and shared routes in sympatric spider and woolly monkeys: Cognitive and evolutionary implications, by A. Di Fiore & S. A. Suarez; Mental maps in chacma baboons (*Papio ursinus*): Using inter-group encounters as a natural experiment, by R. Noser & R. W. Byrne; Experimental evidence for route integration and strategic planning in wild capuchin monkeys, by C. H. Janson; and What wild primates know about resources: Opening up the black box, by C. H. Janson & R. Byrne.

- Special AIDS issue. *Journal of Medical Primatology*, 2007, 36[4-5], [www.blackwell-synergy.com/toc/jmp/36/4-5](http://www.blackwell-synergy.com/toc/jmp/36/4-5).

Introduction, by R. S. Veazey & F. Novembre; Lessons from naked apes and their infections, by R. A. Weiss; Multiprotein genetic vaccine in the SIV-*Macaca* animal model: A promising approach to generate sterilizing im-

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

munity to HIV infection, by M. T. Maggiorella, L. Sernicola, F. Crostarosa, R. Belli, M. R. Pavone-Cossut, I. Macchia, S. Farcomeni, K. Tenner-Racz, P. Racz, B. Ensoli, & F. Titti; Immunogenicity of a DNA prime and recombinant adenovirus boost regime significantly varies between rhesus macaques of Chinese and Indian origins, by C. Stahl-Hennig, Y. S. Suh, K. S. Park, U. Sauermann, K. S. Kim, S. Ahn, M. Franz, R. Schulte, N. Stolte-Leeb, G. Hunsmann, & Y. C. Sung; Anti-CD3/28 mediated expansion of macaque CD4<sup>+</sup> T cells is polyclonal and provides extended survival after adoptive transfer, by N. Onlamoon, N. Plagman, K. A. Rogers, A. E. Mayne, P. Bostik, K. Patanapanyasat, A. A. Ansari, & F. Villinger; Simian immunodeficiency virus infection induces severe loss of intestinal central memory T cells which impairs CD4<sup>+</sup> T-cell restoration during antiretroviral therapy, by D. Verhoeven, S. Sankaran, & S. Dandekar; Rapid modifications of peripheral T-cell subsets that express CD127 in macaques treated with recombinant IL-7, by N. Dereuddre-Bosquet, B. Vaslin, B. Delache, P. Brochard, P. Clayette, C. Aubenque, M. Morre, B. Assouline, & R. Le Grand; Direct stringency comparison of two macaque models (single-high vs. repeat-low) for mucosal HIV transmission using an identical anti-HIV chemoprophylaxis intervention, by S. Subbarao, A. Ramos, C. Kim, D. Adams, M. Monsour, S. Butera, T. Folks, & R. A. Otten; Griffithsin, a potent HIV entry inhibitor, is an excellent candidate for anti-HIV microbicide, by P. Emau, B. Tian, B. R. O'Keefe, T. Mori, J. B. McMahon, K. E. Palmer, Y. Jiang, G. Bekele, & C. C. Tsai; Immunogenicity and protective efficacy of Gag/Pol/Env vaccines derived from temporal isolates of SIV<sub>mac</sub> against cognate virus challenge, by P. Polacino, B. Cleveland, Y. Zhu, J. T. Kimata, J. Overbaugh, D. Anderson, & S.-L. Hu; Depo-Provera abrogates attenuated lentivirus-induced protection in male rhesus macaques challenged intravenously with pathogenic SIV<sub>mac</sub>239, by M. Genesca, J. Li, L. Fritts, P. Chohan, K. Bost, T. Rourke, S. A. Blozis, M. B. McChesney, & C. J. Miller; Macaques co-immunized with SIV<sub>gag/pol-HIVenv</sub> and IL-12 plasmid have increased cellular responses, by T. M. Robinson, M. K. Sidhu, G. N. Pavlakakis, B. K. Felber, P. Silvera, M. G. Lewis, J. Eldridge, D. B. Weiner, & J. D. Boyer; and Abstracts from the 24th Annual Symposium on Nonhuman Primate Models for AIDS.

- Second Congress of Italian Evolutionary Biologists (First Congress of the Italian Society for Evolutionary Biology), Florence, Italy. 4–7 September 2006. *BMC Evolutionary Biology*, 2007, 7[Suppl. 2].

Contents include Phylogenomics of species from four genera of New World monkeys by flow sorting and reciprocal chromosome painting, by F. Dumas, R. Stanyon, L. Sineo, G. Stone, & F. Bigoni.

- Animal Models Used in the Study of Movement Disorders. *ILAR Journal*, 2007, 48[4].

Contents include: Introduction: The use of animal research in developing treatments for human motor disorders: Brain-computer interfaces and the regeneration of damaged brain circuits, by J. H. Kaas; Animal care and use issues in movement disorder research, by J. M. Wallace and P. Sikoski; Stem cells, regenerative medicine, and animal models of disease, by D. A. Steindler; Nonhuman primate models of Parkinson's disease, by M. E. Emborg; Animal models of Huntington's disease, by S. Ramaswamy, J. L. McBride, and J. H. Kordower; Monkey models of recovery of voluntary hand movement after spinal cord and dorsal root injury, by C. Darian-Smith; and Learning-based animal models: Task-specific focal hand dystonia, by N. N. Byl.

- Behavior, Ecology, and Conservation of Colobine Monkeys. *International Journal of Primatology*, 2007, 28[3].

Contents: Introduction, by P. Fashing; Population declines of colobus in western Uganda and conservation value of forest fragments, by C. A. Chapman, L. Naughton-Treves, M. J. Lawes, M. D. Wasserman, & T. R. Gillespie; Activity and ranging patterns of *Colobus angolensis ruwenzorii* in Nyungwe Forest, Rwanda: Possible costs of large group size, by P. J. Fashing, F. Mulindahabi, J.-B. Gakima, M. Masozera, I. Mununura, A. J. Plumtre, & N. Nguyen; Time constraints limit group sizes and distribution in red and black-and-white colobus, by A. H. Korstjens & R. I. M. Dunbar; Population structure and ranging patterns of *Rhinopithecus roxellana* in Zhouzhi National Nature Reserve, Shaanxi, China, by C. L. Tan, S. Guo, & B. Li; Influence of chimpanzee predation on associations between red colobus and red-tailed monkeys at Ngogo, Kibale National Park, Uganda, by S. Teelen; Seasonal food use strategies of *Semnopithecus vetulus nestor*, at Panadura and Piliyandala, Sri Lanka, by J. D. S. Dela; Aspects of male competition in *Colobus vellerosus*: Preliminary data on male and female loud calling, and infant deaths after a takeover, by P. Sicotte, J. A. Teichroeb, & T. L. Saj; Effects of forest fragmentation on the abundance of *Colobus angolensis palliatus* in Kenya's coastal forests, by J. Anderson, G. Cowlshaw, & J. M. Rowcliffe; Seasonal variation in the activity patterns and time budgets of *Trachypithecus francoisi* in the Nonggang Nature Reserve, China, by Q. Zhou, F. Wei, C. Huang, M. Li, B. Ren, & B. Luo; Influence of plant and soil chemistry on food selection, ranging patterns, and biomass of *Colobus guereza* in Kakamega Forest, Kenya, by P. J. Fashing, E. S. Dierenfeld, & C. B. Mowry; and Dental eruption sequences in fossil colobines and the evolution of primate life histories, by K. Harvati & S. R. Frost.

### Anatomy and Physiology

- The primate semicircular canal system and locomotion. Spoor, F., Garland, T., Jr., Krovitz, G., Ryan, T. M., Silcox, M. T., & Walker, A. (A. W., Dept of Anthropology, Pennsylvania State Univ., 409 Carpenter Bldg, University

Park, PA 16802 [e-mail: [axw8@psu.edu](mailto:axw8@psu.edu)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 104, 10808-10812, <[www.pnas.org/cgi/content/full/104/26/10808](http://www.pnas.org/cgi/content/full/104/26/10808)>.

The semicircular canal system of vertebrates helps coordinate body movements, including stabilization of gaze during locomotion. Quantitative phylogenetically informed analysis of the radius of curvature of the three semicircular canals in 91 extant and recently extinct primate species and 119 other mammalian taxa provide support for the hypothesis that canal size varies in relation to the jerkiness of head motion during locomotion. Primate and other mammalian species studied here that are agile and have fast, jerky locomotion have significantly larger canals relative to body mass than those that move more cautiously.

- Overall brain size, and not encephalization quotient, best predicts cognitive ability across non-human primates. Deaner, R. O., Isler, K., Burkart, J., & van Schaik, C. (C. v. S., Anthropol. Inst. & Museum, Univ. Zürich, Winterthurerstr. 190, CH-8057 Zürich, Switzerland [e-mail: [vschaik@aim.unizh.ch](mailto:vschaik@aim.unizh.ch)]). *Brain, Behavior and Evolution*, 2007, 70, 115-124.

“For over a century, various neuroanatomical measures have been employed as assays of cognitive ability in comparative studies. Nevertheless, it is still unclear whether these measures actually correspond to cognitive ability. A recent meta-analysis of cognitive performance of a broad set of primate species has made it possible to provide a quantitative estimate of general cognitive ability across primates. We find that this estimate is not strongly correlated with neuroanatomical measures that statistically control for a possible effect of body size, such as encephalization quotient or brain size residuals. Instead, absolute brain size measures were the best predictors of primate cognitive ability. Moreover, there was no indication that neocortex-based measures were superior to measures based on the whole brain. The results of previous comparative studies on the evolution of intelligence must be reviewed with this conclusion in mind.”

- Anterior regions of monkey parietal cortex process visual 3D shape. Durand, J.-B., Nelissen, K., Joly, O., Wardak, C., Todd, J. T., Norman, J. F., Janssen, P., Vanduffel, W., & Orban, G. A. (G. A. O., Lab Neuro- en Psychofysiologie, K. U. Leuven, Med. School, Campus Gasthuisberg, Herestraat 49, B-3000, Leuven, Belgium [e-mail: [guy.orban@med.kuleuven.be](mailto:guy.orban@med.kuleuven.be)]). *Neuron*, 2007, 55, 493-505.

“The intraparietal cortex is involved in the control of visually guided actions, like reach-to-grasp movements, which require extracting the 3D shape and position of objects from 2D retinal images. Using fMRI in behaving monkeys, we investigated the role of the intraparietal cortex in processing stereoscopic information for recovering the depth structure and the position in depth of objects. We found that while several areas (CIP, LIP, and

AIP on the lateral bank; PIP and MIP on the medial bank) are activated by stereoscopic stimuli, AIP and an adjoining portion of LIP are sensitive only to depth structure. Furthermore, only these two regions are sensitive to both the depth structure and the 2D shape of small objects. These results indicate that extracting 3D spatial information from stereo involves several intraparietal areas, among which AIP and anterior LIP are more specifically engaged in extracting the 3D shape of objects.”

- Corpus callosum morphology in capuchin monkeys is influenced by sex and handedness. Phillips, K. A., Sherwood, C. C., & Lilak, A. L. (Dept of Psychology, Hiram College, Hiram, OH 44234 [e-mail: [phillipsk@hiram.edu](mailto:phillipsk@hiram.edu)]). *PLoS ONE*, 2007, 2(8), e792, <[www.plosone.org/doi/pone.0000792](http://www.plosone.org/doi/pone.0000792)>.

“Sex differences have been reported in both overall corpus callosum area and its regional subdivisions in humans. Some have suggested this reflects a unique adaptation in humans, as similar sex differences in corpus callosum morphology have not been reported in any other species of primate examined to date. Furthermore, an association between various measurements of corpus callosum morphology and handedness has been found in humans and chimpanzees. In the current study, we report measurements of corpus callosum cross-sectional area from midsagittal MR images collected *in vivo* from 14 adult capuchin monkeys, 9 of which were also characterized for hand preference on a coordinated bimanual task. Adult females were found to have a significantly larger corpus callosum: brain volume ratio, rostral body, posterior midbody, isthmus, and splenium than adult males. Left-handed individuals had a larger relative overall corpus callosum area than did right-handed individuals. Additionally, a significant sex and handedness interaction was found for anterior midbody, with right-handed males having a significantly smaller area than right-handed females. These results suggest that sex and handedness influences on corpus callosum morphology are not restricted to *Homo sapiens*.”

- Neuronal population coding of continuous and discrete quantity in the primate posterior parietal cortex. Tudusciuc, O., & Nieder, A. (A. N., Dept of Cognitive Neurology, Univ. of Tübingen, Otfried-Müller-Str. 27, 72076 Tübingen, Germany [e-mail: [andreas.nieder@uni-tuebingen.de](mailto:andreas.nieder@uni-tuebingen.de)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 36, 14513-14518,

<[www.pnas.org/cgi/content/abstract/104/36/14513](http://www.pnas.org/cgi/content/abstract/104/36/14513)>.

“Quantitative knowledge guides vital decisions in the life of animals and humans alike. The posterior parietal cortex in primates has been implicated in representing abstract quantity, both continuous (extent) and discrete (number of items), supporting the idea of a putative generalized magnitude system in this brain area. Whether or not single neurons encode different types of quantity, or how quantitative information is represented in the neuronal responses,



however, is unknown. We show that length and numerosity are encoded by functionally overlapping groups of parietal neurons. Using a statistical classifier, we found that the activity of populations of quantity-selective neurons contained accurate information about continuous and discrete quantity. Unexpectedly, even neurons that were non-selective according to classical spike-count measures conveyed robust categorical information that predicted the monkeys' quantity judgments. Thus, different information-carrying processes of partly intermingled neuronal networks in the parietal lobe seem to encode various forms of abstract quantity."

### Animal Models

- Uteroplacental ischemia results in proteinuric hypertension and elevated sFLT-1. Makris, A., Thornton, C., Thompson, J., Thompson, S., Martin, R., Ogle, R., Waugh, R., McKenzie, P., Kirwan, P., & Hennessy, A. (Vascular Immunology Lab., Univ. of Sydney, 114 Pyrmont Bridge Rd, Camperdown 2050, NSW, Australia [e-mail: [makrisa@hri.org.au](mailto:makrisa@hri.org.au)]). *Kidney International*, 2007, 71, 977-984.

"Preeclampsia is a complication of pregnancy with significant morbidity and mortality for the mother and the fetus. Presumptions are made that placental hypoxia has a causative role in the clinical syndrome. Furthermore, soluble fms-like tyrosine kinase 1 (sFLT-1) has been shown to have a role in the maternal syndrome of preeclampsia. We investigated the relationship between uteroplacental ischemia (UPI), the maternal clinical syndrome of preeclampsia, and sFLT-1 in nonhuman primates. The induction of UPI in a pregnant baboon resulted in the development of a clinical entity analogous to human preeclampsia. This was illustrated by the increase in blood pressure, development of proteinuria, and renal histological changes identical to human preeclampsia. A significant elevation in the placental and peripheral blood mononuclear cell sFLT-1 mRNA expression was noted, translating to a significant elevation in circulating sFLT-1. Thus, this sequence suggests that a pathogenic reduction in placental perfusion results in the development of the maternal syndrome of preeclampsia and an increase in circulating sFLT-1, which is derived both from placental and extra-placental sources."

- Interactive effects of age and estrogen on cognition and pyramidal neurons in monkey prefrontal cortex. Hao, J., Rapp, P. R., Janssen, W. G. M., Lou, W., Lasley, B. L., Hof, P. R., & Morrison, J. H. (J. H. M., (Dept of Neurosci., Box 1065, Mount Sinai School of Med., New York, NY 10029 [e-mail: [john.morrison@mssm.edu](mailto:john.morrison@mssm.edu)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 104, 11465-11470, <[www.pnas.org/cgi/reprint/104/27/11465.pdf](http://www.pnas.org/cgi/reprint/104/27/11465.pdf)>.

"We previously reported that long-term cyclic estrogen (E) treatment reverses age-related impairment of cognitive

function mediated by the dorsolateral prefrontal cortex (dlPFC) in ovariectomized (OVX) female rhesus monkeys, and that E induces a corresponding increase in spine density in layer III dlPFC pyramidal neurons. We have now investigated the effects of the same E treatment in young adult females. In contrast to the results for aged monkeys, E treatment failed to enhance dlPFC-dependent task performance relative to vehicle control values (group young OVX+Veh) but nonetheless led to a robust increase in spine density. This response was accompanied by a decline in dendritic length, however, such that the total number of spines per neuron was equivalent in young OVX+Veh and OVX+E groups. Robust effects of chronological age, independent of ovarian hormone status, were also observed, comprising significant age-related declines in dendritic length and spine density, with a preferential decrease in small spines in the aged groups. Notably, the spine effects were partially reversed by cyclic E administration, although young OVX+Veh monkeys still had a higher complement of small spines than did aged E treated monkeys. In summary, layer III pyramidal neurons in the dlPFC are sensitive to ovarian hormone status in both young and aged monkeys, but these effects are not entirely equivalent across age groups. The results also suggest that the cognitive benefit of E treatment in aged monkeys is mediated by enabling synaptic plasticity through a cyclical increase in small, highly plastic dendritic spines in the primate dlPFC."

- Attenuation and efficacy of human parainfluenza virus type 1 (HPIV1) vaccine candidates containing stabilized mutations in the P/C and L genes. Bartlett, E. J., Castano, A., Surman, S. R., Collins, P. L., Skiadoopoulos, M. H., & Murphy, B. R. (Lab. of Infectious Diseases, NIAID, NIH, Bethesda, MD 20892 [e-mail: [ebartlett@niaid.nih.gov](mailto:ebartlett@niaid.nih.gov)]). *Virology Journal*, 2007, 4[67], <[www.springerlink.com/content/22w44k3563671136](http://www.springerlink.com/content/22w44k3563671136)>.

Two recombinant, live attenuated human parainfluenza virus type 1 (rHPIV1) mutant viruses have been developed, using a reverse genetics system, for evaluation as potential intranasal vaccine candidates. These rHPIV1 vaccine candidates have two non-temperature sensitive (non-ts) attenuating (att) mutations primarily in the P/C gene, namely C-R84G HN-T553A (two point mutations used together as a set) and C-delta170 (a short deletion mutation), and two ts att mutations in the L gene, namely L-Y942A (a point mutation), and L-delta1710-11 (a short deletion), the last of which has not been previously described. The latter three mutations were specifically designed for increased genetic and phenotypic stability. These mutations were evaluated on the HPIV1 backbone, both individually and in combination, for attenuation, immunogenicity, and protective efficacy in African green monkeys (AGMs).

- Reduced reproductive function in wild baboons (*Papio hamadryas anubis*) related to natural consumption of the African black plum (*Vitex doniana*). Higham, J. P., Ross,

C., Warren, Y., Heistermann, M., & MacLarnon, A. M. (Centre for Research in Evolutionary Anthropology, Roehampton Univ., Holybourne Ave, London, SW15 4JD, U.K. [e-mail: [j.ingham@roehampton.ac.uk](mailto:j.ingham@roehampton.ac.uk)]). *Hormones and Behavior*, 2007, 52, 384-390.

“Several authors have suggested that the consumption of plant compounds may have direct effects on wild primate reproductive biology, but no studies have presented physiological evidence of such effects. Here, for two troops of olive baboons (*Papio hamadryas anubis*) at Gashaka-Gumti National Park, Nigeria, we show major seasonal increases in levels of fecal progesterone metabolites in females, and provide evidence that this is linked to the consumption of natural plant compounds. Increases in fecal progesterone excretion occurred seasonally in all females, in all reproductive states, including lactation. Detailed feeding data on the study animals showed that only one food species is consumed by both troops at the time of observed progesterone peaks, and at no other times of the year: the African black plum, *Vitex doniana*. Laboratory tests demonstrated the presence of high concentrations of progesterone-like compounds in *V. doniana*. Together with published findings linking the consumption of a related *Vitex* species (*Vitex agnus castus*) to increased progesterone levels in humans, our data suggest that natural consumption of *V. doniana* was a likely cause of the observed increases in progesterone. Levels of progesterone excretion in the study baboons during periods of *V. doniana* consumption are higher than those found during pregnancy, and prevent the expression of the sexual swelling, which is associated with ovulatory activity. As consortship and copulatory activity in baboons occur almost exclusively in the presence of a sexual swelling, *V. doniana* appears to act on cycling females as both a physiological contraceptive (simulating pregnancy in a similar way to some forms of the human contraceptive pill) and a social contraceptive (preventing sexual swelling, thus reducing association and copulation with males). The negative effects of *V. doniana* on reproduction may be counter-balanced by the wide range of medicinal properties attributed to plants in this genus. This is the first time that physiological evidence has been presented of direct effects of plant consumption on the reproductive biology of wild primates.”

#### Animal Welfare

- Guidelines for the assessment and management of pain in rodents and rabbits. Kohn, D. F., Martin, T. E., Foley, P. L., Morris, T. H., Swindle, M. M., Vogler, G. A., & Wixson, S. K. [e-mail: [dfk.3@columbia.edu](mailto:dfk.3@columbia.edu)]. *Contemporary Topics in Laboratory Animal Science*, 2007, 46, 97-108.

*Editors' note: Although this is specifically about rodents and rabbits, a great deal of the discussion is relevant to the care of other animals, including nonhuman primates.*

- The Animal Welfare Act – What's That? Sullivan, M. *New York State Bar Journal*, July/August, 2007, 17-23,

<[www.nysba.org/Content/NavigationMenu/Publications19/Bar\\_Journal/Bar\\_Journal\\_Archive/2007\\_Archive/SullivanArticle.pdf](http://www.nysba.org/Content/NavigationMenu/Publications19/Bar_Journal/Bar_Journal_Archive/2007_Archive/SullivanArticle.pdf)>.

- Effect of ketamine anesthesia on daily food intake in *Macaca mulatta* and *Cercopithecus aethiops*. Springer, D. A., & Baker, K. C. (National Heart Lung and Blood Inst., NIH, Bethesda, MD [e-mail: [ds628k@nih.gov](mailto:ds628k@nih.gov)]). *American Journal of Primatology*, 2007, 69, 1080-1092.

Ketamine hydrochloride is frequently administered to nonhuman primates as a means of chemical restraint. This procedure can be a frequent source of stress to monkeys at research facilities, affecting animal health, well-being and research quality. This study was designed to measure ketamine's effect on daily food intake, a parameter that reflects and influences animal well-being and directly affects research studies. On five occasions, baseline daily food intake was compared to daily food intake occurring 24, 48, 72, 96, and 120 h after an intramuscular injection of 10 mg/kg ketamine in male African green monkeys (AGMs) (*Cercopithecus aethiops*) and male and female rhesus macaques (*Macaca mulatta*). AGMs and female rhesus macaques had significantly reduced daily food intake during the first 4 days after receiving ketamine. The AGMs continued to display significantly reduced daily food intake on the fifth day after ketamine administration. The male rhesus macaques showed a trend toward reduced daily food intake, greatest during the first 2 days and remaining less than baseline intake through the fifth day following ketamine. The degree of observed food intake reduction was most severe at the 24 h (mean percent intake reduction: AGMs: 57%; rhesus males: 48%; rhesus females: 40%) and 48 h time points (AGMs: 24%; rhesus males: 14%; rhesus females: 13%). A subset of the AGMs that did not receive ketamine, but observed other animals in the room who did, showed reduced food intake at 24 and 48 h after ketamine, though not to the degree associated with ketamine administration. These results indicate that ketamine anesthesia is associated with a prolonged reduction in daily food intake in AGMs and rhesus macaques. Frequent use of ketamine in nonhuman primates may have a significant impact on animal health and well-being, and alternatives to its use warrant consideration.

#### Behavior

- Aggression and conflict management at fusion in spider monkeys. Aureli, F., & Schaffner, C. M. (Research Centre in Evolutionary Anthropology and Palaeoecology, School of Biological & Earth Sciences, Liverpool John Moores University, Liverpool L3 3AF, U.K. [e-mail: [f.aureli@ljmu.ac.uk](mailto:f.aureli@ljmu.ac.uk)]). *Biology Letters*, 2007, 3, 147-149.

“In social systems characterized by a high degree of fission-fusion dynamics, members of a large community are rarely all together, spending most of their time in smaller subgroups with flexible membership. Although fissioning into smaller subgroups is believed to reduce

conflict among community members, fusions may create conflict among individuals in subgroups that are joining. Here, we present evidence for aggressive escalation at fusion and its mitigation by the use of embraces in wild spider monkeys (*Ateles geoffroyi*). Our findings provide the first systematic evidence for conflict management at fusion and may have implications for the function of human greetings.”

- Spontaneous altruism by chimpanzees and young children. Warneken, F., Hare, B., Melis, A. P., Hanus, D., & Tomasello, M. (Dept of Developmental and Comparative Psychology, Max Planck Inst. for Evolutionary Anthropology, Leipzig, Germany [e-mail: warneken@eva.mpg.de]). *PLoS Biology*, 2007, 5[7], e184, <doi:10.1371/journal.pbio.0050184>.

“People often act on behalf of others. They do so without immediate personal gain, at cost to themselves, and even toward unfamiliar individuals. Many researchers have claimed that such altruism emanates from a species-unique psychology not found in humans’ closest living evolutionary relatives, such as the chimpanzee. In favor of this view, the few experimental studies on altruism in chimpanzees have produced mostly negative results. In contrast, we report experimental evidence that chimpanzees perform basic forms of helping in the absence of rewards spontaneously and repeatedly toward humans and conspecifics. In two comparative studies, semi-free-ranging chimpanzees helped an unfamiliar human to the same degree as did human infants, irrespective of being rewarded (experiment 1) or whether the helping was costly (experiment 2). In a third study, chimpanzees helped an unrelated conspecific gain access to food in a novel situation that required subjects to use a newly acquired skill on behalf of another individual. These results indicate that chimpanzees share crucial aspects of altruism with humans, suggesting that the roots of human altruism may go deeper than previous experimental evidence suggested.”

- Raising the level: Orangutans use water as a tool. Mendes, N., Hanus, D., & Call, J. (Max-Planck-Institute for Evolutionary Anthropology, Deutscher Platz 6, 04103 Leipzig, Germany [e-mail: mendes@eva.mpg.de]). *Biology Letters*, 2007, <www.journals.royalsoc.ac.uk/content/71275735167117j>.

“We investigated the use of water as a tool by presenting five orangutans (*Pongo abelii*) with an out-of-reach peanut floating inside a vertical transparent tube. All orangutans collected water from a drinker and spat it inside the tube to get access to the peanut. Subjects required an average of three mouthfuls of water to get the peanut. This solution occurred in the first trial and all subjects continued using this successful strategy in subsequent trials. The latency to retrieve the reward drastically decreased after the first trial. Moreover, the latency between mouthfuls also decreased dramatically from the first mouthful in the first trial to any subsequent ones in the same trial or subse-

quent trials. Additional control conditions suggested that this response was not due to the mere presence of the tube, to the existence of water inside, or frustration at not getting the reward. The sudden acquisition of the behavior, the timing of the actions and the differences with the control conditions make this behavior a likely candidate for insightful problem solving.”

- Orangutans modify their gestural signaling according to their audience’s comprehension. Cartmill, E. A., & Byrne, R. W. (R. W. B., School of Psychology, Univ. of St Andrews, St Andrews, Fife KY16 9JP, Scotland [e-mail: rwb@st-andrews.ac.uk]). *Current Biology*, 2007, 17, 1345-1348.

“When people are not fully understood, they persist with attempts to communicate, elaborating their speech in order to better convey their meaning. We investigated whether captive orangutans (*Pongo pygmaeus* and *Pongo abelii*) would use analogous communicative strategies in signaling to a human experimenter, and whether they could distinguish different degrees of misunderstanding. Orangutans’ behavior varied according to how well they had apparently been understood. When their aims were not met, they persisted in communicative attempts. However, when the interlocutor appeared partially to understand their meaning, orangutans narrowed down their range of signals, focusing on gestures already used and repeating them frequently. In contrast, when completely misunderstood, orangutans elaborated their range of gestures, avoiding repetition of failed signals. It is therefore possible, from communicative signals alone, to determine how well an orangutan’s intended goal has been met. This differentiation might function under natural conditions to allow an orangutan’s intended goals to be understood more efficiently. In the absence of conventional labels, communicating the fact that an intention has been somewhat misunderstood is an important way to establish shared meaning.”

- Intended receivers and functional significance of grunt and girney vocalizations in free-ranging female rhesus macaques. Whitham, J. C., Gerald, M. S., & Maestripieri, D. (D. M., Univ. of Chicago, 5730 S. Woodlawn Ave, Chicago, IL 60637 [e-mail: dario@uchicago.edu]). *Ethology*, 2007, 113, 862-874.

“We investigated the intended receivers and contexts of occurrence of grunt and girney vocalizations in rhesus macaques (*Macaca mulatta*) to assess whether these calls are best interpreted as signals of benign intent or as calls that may function to attract the attention of other individuals or induce arousal. We focally observed 19 free-ranging adult female rhesus macaques. Female calls increased dramatically after infants were born, and most were directed toward mother-infant dyads. When infants were physically separated from their mothers, callers visually oriented toward infants in over 90% of the cases, suggesting that infants were the intended receivers of grunts and girneys. Approaches followed by vocalizations

were more likely to lead to the caller grooming the mother, less likely to elicit a submissive response, and more likely to result in infant handling than approaches without calls. Infant handling, however, was not necessarily benign. Vocalizations were often emitted from a distance >1 m and were rarely followed by approaches or social interactions. Our results suggest that grunts and girneys are unlikely to have evolved as signals that encode information about the caller's intention or subsequent behavior. Whereas girneys may be acoustically designed to attract infants' attention and elicit arousal, grunts may have no adaptive communicative function. Mothers, however, may have learned that other females' grunts and girneys are unlikely to be associated with significant risk and, therefore, are generally tolerant of the caller's proximity and behavior."

- Social monitoring reflects dominance relationships in a small captive group of brown capuchin monkeys (*Cebus apella*). Pannozzo, P. L., Phillips, K. A., Haas, M. E., & Mintz, E. M. (E. M. M., Dept of Biol. Sci., Kent State Univ., Kent, OH 44242-0001 [e-mail: [emintz@kent.edu](mailto:emintz@kent.edu)]). *Ethology*, 2007, 113, 881-888.

"In several studies of social monitoring in primates, subordinate animals directed more visual attention toward dominant animals than vice versa. This behavior is thought to enable subordinate animals to avoid conflict. We sought to clarify whether visual attention behavior functions in this manner in a small captive group of brown capuchin monkeys, *Cebus apella*. We tested the hypothesis that social monitoring is related to dominance status. Dominance status was determined based on the directionality of aggressive behavior, and visual attention was quantified by using focal animal sampling. Subordinate animals directed significantly more visual attention toward others than dominant animals. Subordinate animals also looked more frequently at the animals that attacked them and others the most. The results indicate that social monitoring behavior in this captive group was driven by conflict-avoidance."

- Chimpanzees are vengeful but not spiteful. Jensen, K., Call, J., & Tomasello, M. (Max Planck Inst. for Evol. Anthropol., Deutscher Platz 6, D-04103 Leipzig, Germany [e-mail: [jensen@eva.mpg.de](mailto:jensen@eva.mpg.de)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 104, 13046-13050, <[www.pnas.org/cgi/content/full/104/32/13046](http://www.pnas.org/cgi/content/full/104/32/13046)>.

"People are willing to punish others at a personal cost, and this apparently antisocial tendency can stabilize cooperation. What motivates humans to punish noncooperators is likely a combination of aversion to both unfair outcomes and unfair intentions. Here we report a pair of studies in which captive chimpanzees (*Pan troglodytes*) did not inflict costs on conspecifics by knocking food away if the outcome alone was personally disadvantageous but did retaliate against conspecifics who actually stole the food from them. Like humans, chimpanzees retaliate against

personally harmful actions, but unlike humans, they are indifferent to simply personally disadvantageous outcomes and are therefore not spiteful."

## Conservation

- The role of studying behavior in the conservation of chimpanzees and gorillas. Lonsdorf, E. V. (Lincoln Park Zoo, Chicago, IL 60614 [e-mail: [ELonsdorf@lpzoo.org](mailto:ELonsdorf@lpzoo.org)]). *Conservation Behaviorist*, 2006, 4[1], 13-15, <[www.animalbehavior.org/Committees/Conservation/ConservationBehaviorist](http://www.animalbehavior.org/Committees/Conservation/ConservationBehaviorist)>.

"Populations of chimpanzees and gorillas are in dramatic decline due to hunting for bushmeat, loss of habitat, and the varied risks of small, isolated populations. Recognizing and understanding the complexities of these threats is the first step in conserving the world's wild ape populations. Mitigating these risks takes a deeper understanding of ape behavior. Here I provide examples of how the study of gorilla and chimpanzee behaviors intersects with and should be considered critical to conservation efforts."

## Disease

- A challenge to the ancient origin of SIVagm based on African green monkey mitochondrial genomes. Wertheim, J. O., & Worobey, M. (Dept of Ecology & Evolutionary Biology, Univ. of Arizona, Tucson, AZ 85721 [e-mail: [wertheim@email.arizona.edu](mailto:wertheim@email.arizona.edu)]). *PLoS Pathology*, 2007, 3[7], e95, <[dx.doi.org/10.1371/journal.ppat.0030095](http://dx.doi.org/10.1371/journal.ppat.0030095)>.

"While the circumstances surrounding the origin and spread of HIV are becoming clearer, the particulars of the origin of simian immunodeficiency virus (SIV) are still unknown. Specifically, the age of SIV, whether it is an ancient or recent infection, has not been resolved. Although many instances of cross-species transmission of SIV have been documented, the similarity between the African green monkey (AGM) and SIVagm phylogenies has long been held as suggestive of ancient codivergence between SIVs and their primate hosts. Here, we present well-resolved phylogenies based on full-length AGM mitochondrial genomes and seven previously published SIVagm genomes; these allowed us to perform the first rigorous phylogenetic test to our knowledge of the hypothesis that SIVagm codiverged with the AGMs. Using the Shimodaira-Hasegawa test, we show that the AGM mitochondrial genomes and SIVagm did not evolve along the same topology. Furthermore, we demonstrate that the SIVagm topology can be explained by a pattern of west-to-east transmission of the virus across existing AGM geographic ranges. Using a relaxed molecular clock, we also provide a date for the most recent common ancestor of the AGMs at approximately 3 million years ago. This study substantially weakens the theory of ancient SIV infection followed by codivergence with its primate hosts."

## Evolution, Genetics, and Taxonomy

- Sexual selection and trichromatic color vision in primates: Statistical support for the preexisting-bias hypothesis. Fernandez, A. A., & Morris, M. R. (Dept of Biol. Sci., Ohio Univ., Athens, OH 45701 [e-mail: [af180603@ohio.edu](mailto:af180603@ohio.edu)]). *American Naturalist*, 2007, 170, 10-20.

“The evolution of trichromatic color vision in primates may improve foraging performance as well as intraspecific communication; however, the context in which color vision initially evolved is unknown. We statistically examined the hypothesis that trichromatic color vision in primates represents a preexisting bias for the evolution of red coloration (pelage and/or skin) through sexual selection. Our analyses show that trichromatic color vision evolved before red pelage and red skin, as well as before gregarious mating systems that would promote sexual selection for visual traits and other forms of intraspecific communication via red traits. We also determined that both red pelage and red skin were more likely to evolve in the presence of color vision and mating systems that promote sexual selection. These results provide statistical support for the hypothesis that trichromatic color vision in primates evolved in a context other than intraspecific communication with red traits, most likely foraging performance, but, once evolved, represented a preexisting bias that promoted the evolution of red traits through sexual selection.”

- Chimpanzee locomotor energetics and the origin of human bipedalism. Sockol, M. D., Raichlen, D. A., & Pontzer, H. (H. P., Dept of Anthropology, Washington Univ., 119 McMillan Hall, St. Louis, MO 63130 [e-mail: [hpontzer@artsci.wustl.edu](mailto:hpontzer@artsci.wustl.edu)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 104, 12265-12269, <[www.pnas.org/cgi/reprint/0703267104v1](http://www.pnas.org/cgi/reprint/0703267104v1)>.

“Bipedal walking is evident in the earliest hominins, but why our unique two-legged gait evolved remains unknown. Here, we analyze walking energetics and biomechanics for adult chimpanzees and humans to investigate the long-standing hypothesis that bipedalism reduced the energy cost of walking compared with our ape-like ancestors. Consistent with previous work on juvenile chimpanzees, we find that bipedal and quadrupedal walking costs are not significantly different in our sample of adult chimpanzees. However, more detailed analysis reveals significant differences in bipedal and quadrupedal cost in most individuals, which are masked when subjects are examined as a group. Furthermore, human walking is  $\approx 75\%$  less costly than both quadrupedal and bipedal walking in chimpanzees. Variation in cost between bipedal and quadrupedal walking, as well as between chimpanzees and humans, is well explained by biomechanical differences in anatomy and gait, with the decreased cost of human walking attributable to our more extended hip and a longer hindlimb. Analyses of these features in early fossil hominins, coupled with analyses of bipedal walking in chimpanzees, indicate that bipedalism in early, ape-like

hominins could indeed have been less costly than quadrupedal knucklewalking.”

- Dental evidence on the hominin dispersals during the Pleistocene. Martínón-Torres, M., Bermúdez de Castro, J. M., Gómez-Robles, A., Arsuaga, J. L., Carbonell, E., Lordkipanidze, D., Manzi, G., & Margvelashvili, A. (CENIEH, Ave. de la Paz 28, 09004 Burgos, Spain [e-mail: [maria.martinon.torres@gmail.com](mailto:maria.martinon.torres@gmail.com)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 104, 13279-13282, <[www.pnas.org/cgi/content/full/104/33/13279](http://www.pnas.org/cgi/content/full/104/33/13279)>.

“A common assumption in the evolutionary scenario of the first Eurasian hominin populations is that they all had an African origin. This assumption also seems to apply for the Early and Middle Pleistocene populations, whose presence in Europe has been largely explained by a discontinuous flow of African emigrant waves. Only recently, some voices have speculated about the possibility of Asia being a center of speciation. However, no hard evidence has been presented to support this hypothesis. We present evidence from the most complete and up-to-date analysis of the hominin permanent dentition from Africa and Eurasia. The results show important morphological differences between the hominins found in both continents during the Pleistocene, suggesting that their evolutionary courses were relatively independent. We propose that the genetic impact of Asia in the colonization of Europe during the Early and Middle Pleistocene was stronger than that of Africa.”

- Implications of new early *Homo* fossils from Ileret, east of Lake Turkana, Kenya. Spoor, F., Leakey, M. G., Gathogo, P. N., Brown, F. H., Antón, S. C., McDougall, I., Kiarie, C., Manthi, F. K., & Leakey, L. N. (Dept of Anatomy and Developmental Biology, Univ. College London, Gower St, London WC1E 6BT, U.K. [e-mail: [f.spoon@ucl.ac.uk](mailto:f.spoon@ucl.ac.uk)]). *Nature*, 2007, 448, 688-691.

“Sites in eastern Africa have shed light on the emergence and early evolution of the genus *Homo*. The best known early hominin species, *H. habilis* and *H. erectus*, have often been interpreted as time-successive segments of a single anagenetic evolutionary lineage. The case for this was strengthened by the discovery of small early Pleistocene hominin crania from Dmanisi in Georgia that apparently provide evidence of morphological continuity between the two taxa. Here we describe two new cranial fossils from the Koobi Fora Formation, east of Lake Turkana in Kenya, that have bearing on the relationship between species of early *Homo*. A partial maxilla assigned to *H. habilis* reliably demonstrates that this species survived until later than previously recognized, making an anagenetic relationship with *H. erectus* unlikely. The discovery of a particularly small calvaria of *H. erectus* indicates that this taxon overlapped in size with *H. habilis*, and may have shown marked sexual dimorphism. The new fossils confirm the distinctiveness of *H. habilis* and *H. erectus*, independently of overall cranial size, and

suggest that these two early taxa were living broadly sympatrically in the same lake basin for almost half a million years.”

- Evolution in the hypervariable environment of Madagascar. Dewar, R. E., & Richard, A. F. (McDonald Inst. of Archaeological Res., Univ. of Cambridge, Downing St, Cambridge CB2 3ER, U.K. [e-mail: [red30@cam.ac.uk](mailto:red30@cam.ac.uk)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 104, 13723-13727, <[www.pnas.org/cgi/content/full/104/34/13723](http://www.pnas.org/cgi/content/full/104/34/13723)>.

“We show that the diverse ecoregions of Madagascar share one distinctive climatic feature: unpredictable intra- or interannual precipitation compared with other regions with comparable rainfall. Climatic unpredictability is associated with unpredictable patterns of fruiting and flowering. It is argued that these features have shaped the evolution of distinctive characteristics in the mammalian fauna of the island. Endemic Herpestidae and Tenrecidae and members of five endemic primate families differ from closely related species elsewhere, exhibiting extremes of ‘fastness’ and ‘slowness’ in their life histories. Climatic features may also account for the dearth of frugivorous birds and mammals in Madagascar, and for the evolutionary prevalence of species with large body mass.”

- A new species of great ape from the late Miocene epoch in Ethiopia. Suwa, G., Kono, R. T., Katoh, S., Asfaw, B., & Beyene, Y. (The University Museum, Univ. of Tokyo, Hongo, Bunkyo-ku, Tokyo 113-0033, Japan [e-mail: [suwa@um.u-tokyo.ac.jp](mailto:suwa@um.u-tokyo.ac.jp)]). *Nature*, 2007, 448, 921-924.

“With the discovery of *Ardipithecus*, *Orrorin*, and *Sahelanthropus*, our knowledge of hominid evolution before the emergence of Pliocene species of *Australopithecus* has significantly increased, extending the hominid fossil record back to at least 6 million years (Myr) ago. However, because of the dearth of fossil hominoid remains in sub-Saharan Africa spanning the period 12–7 Myr ago, nothing is known of the actual timing and mode of divergence of the African ape and hominid lineages. Most genomic-based studies suggest a late divergence date – 5–6 Myr ago and 6–8 Myr ago for the human-chimp and human-gorilla splits, respectively – and some palaeontological and molecular analyses hypothesize a Eurasian origin of the African ape and hominid clade. We report here the discovery and recognition of a new species of great ape, *Chororapithecus abyssinicus*, from the 10–10.5-Myr-old deposits of the Chorora Formation at the southern margin of the Afar rift. To the best of our knowledge, these are the first fossils of a large-bodied Miocene ape from the African continent north of Kenya. They exhibit a gorilla-sized dentition that combines distinct shearing crests with thick enamel on its ‘functional’ side cusps. Visualization of the enamel-dentine junction by micro-computed tomography reveals shearing crest features that partly resemble the modern gorilla condition. These features represent genetically based structural modifica-

tions probably associated with an initial adaptation to a comparatively fibrous diet. The relatively flat cuspal enamel-dentine junction and thick enamel, however, suggest a concurrent adaptation to hard and/or abrasive food items. The combined evidence suggests that *Chororapithecus* may be a basal member of the gorilla clade, and that the latter exhibited some amount of adaptive and phyletic diversity at around 10–11 Myr ago.”

- Lista de los Primates de la República Bolivariana de Venezuela. Aguilar, H. A. (CIRES, A. P. 397, Mérida 5101, Edo. Mérida, República Bolivariana de Venezuela [e-mail: [viremias@gmail.com](mailto:viremias@gmail.com)]). *Biodiversidad & Conservación Integral*, 2004, No. 3, Art. 2, 13-20.

“Venezuelan primates are among our least known mammals. We have 17 species, grouped into 11 genera, 6 subfamilies, and 4 families. All of our primates have scientific, economic, aesthetic, and ecological importance, as well as significance for public health. Private collections, zoos, and pet owners keep primates, but not in an organized way. It is necessary to establish conservation programs that include isolated individuals and collections, enabling all primates of a species to be considered a single population for conservation purposes; only in this way can the success of any program of genetic management be guaranteed in the long term. It is also necessary to include, in distribution maps of our wild fauna, those animals inhabiting the Guayana Esequiba region of Venezuela [formerly part of British Guiana, now disputed territory and part of Guyana]; this region is in the process of [political] reclamation, and for this reason we have included its primates in the list of species in our country. For the above reasons, we need to disseminate an up-to-date list of Venezuelan primates and their taxonomic status. Stud books kept by the Venezuelan people and institutions are also important, and the Centro de Investigación y Reproducción de Especies Silvestres (CIRES: Center for Research and Reproduction of Wild Species) has begun the process of documentation with this database of Venezuelan primates.”

- Human and animal cognition: Continuity and discontinuity. Premack, D. (Univ. of Pennsylvania, Philadelphia, PA 19104 [e-mail: [dpremack@aol.com](mailto:dpremack@aol.com)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 104, 13861-13867, <[www.pnas.org/cgi/reprint/0706147104v1](http://www.pnas.org/cgi/reprint/0706147104v1)>.

“Microscopic study of the human brain has revealed neural structures, enhanced wiring, and forms of connectivity among nerve cells not found in any animal, challenging the view that the human brain is simply an enlarged chimpanzee brain. On the other hand, cognitive studies have found animals to have abilities once thought unique to the human. This suggests a disparity between brain and mind. The suggestion is misleading. Cognitive research has not kept pace with neural research. Neural findings are based on microscopic study of the brain and are primarily cellular. Because cognition cannot be studied microscopi-



cally, we need to refine the study of cognition by using a different approach. In examining claims of similarity between animals and humans, one must ask: What are the dissimilarities? This approach prevents confusing similarity with equivalence. We follow this approach in examining eight cognitive cases—teaching, short-term memory, causal reasoning, planning, deception, transitive inference, theory of mind, and language—and find, in all cases, that similarities between animal and human abilities are small, dissimilarities large. There is no disparity between brain and mind.”

- Genetic modulation of cognitive flexibility and socioemotional behavior in rhesus monkeys. Izquierdo, A., Newman, T. K., Higley, J. D., & Murray, E. A. (E. A. M., Lab. of Neuropsych., NIMH, NIH, Bethesda, MD 20892 [e-mail: [murraye@mail.nih.gov](mailto:murraye@mail.nih.gov)]). *Proceedings of the National Academy of Sciences, U.S.A.*, 2007, 104, 14128-14133, <[www.pnas.org/cgi/reprint/0706583104v1](http://www.pnas.org/cgi/reprint/0706583104v1)>.

“In human and nonhuman primates, structural variants of the gene encoding the serotonin transporter [5-hydroxytryptamine transporter (5-HTT)] affect the transcription and functional efficacy of 5-HTT. Prior work has shown that structural variants differentially affect function of the amygdala and ventromedial prefrontal cortex (VMPFC), regions important for the regulation and expression of emotion. However, relatively little is known about the impact of 5-HTT allelic variants on cognition. To address this question, we tested rhesus monkeys carrying orthologous structural variants of 5-HTT on a battery of tasks that assess cognitive flexibility, reward processing, and emotion. Here we show that rhesus monkeys carrying two copies of the short allele (SS) of the rhesus 5-HTT gene-linked polymorphic region (rh5-HTTLPR) show significantly reduced cognitive flexibility as measured by two

tasks in the battery: object discrimination reversal learning and instrumental extinction. Monkeys with the SS genotype also displayed alterations in socioemotional behavior. Genotype variation was not related to visual perceptual abilities, valuation of food rewards, or the ability to express a wide range of defensive responses. Although emotional alterations associated with 5-HTT variation have been described as the primary phenotype, the present study reports differences in at least one type of cognitive flexibility, which has not been described previously. Because behaviors modulated by the 5-HTTLPR are a subset of those dependent on the VMPFC, analysis of structural and functional correlates of gene variation in this region may inform the nature of the genetic modulation of cognition.”

### Instruments and Techniques

- Implications of experimental technique for analysis and interpretation of data from animal experiments: Outliers and increased variability resulting from failure of intraperitoneal injection procedures. Gaines Das, R., & North, D. (Div. of Biostatistics, NIBSC, Blanche Lane, South Mimms, Potters Bar, Hertfordshire EN6 3QG, U.K.). *Laboratory Animals*, 2007, 41, 312-320.

“Intraperitoneal (i.p.) injections are widely used in laboratory animal experiments. This technique has a failure rate that is typically reported to be of the order of 10-20%. It is not apparent that failures of i.p. injection and their consequences for the experimental results are as widely recognized as the use of the technique. We illustrate the consequences of i.p. injection failure for the analysis and interpretation of several bioassays. We suggest approaches to data analysis that should be considered, and emphasize the need to recognize and allow for the possibility of i.p. injection failure in the analysis and interpretation of laboratory animal experiments involving this technique.”

\* \* \*

## Position Available: Veterinarian – Davis, California

The California National Primate Research Center (CNPRC) is seeking a highly motivated, enthusiastic veterinarian to join its primate medicine team. Position responsibilities include daily clinical care, project support, and teaching in a fast-paced biomedical research facility. The CNPRC, at the University of California, Davis (UCD), houses approximately 5000 nonhuman primates of three different species and supports a diverse variety of research programs. Salary and appointment level will be commensurate with experience.

Qualifications include a DVM/VMD from an AVMA-accredited college of veterinary medicine and a current license to practice in the United States. A candidate should have excellent communication skills, a service-

oriented attitude, and a desire to work in a challenging environment.

For more information on the position, contact Dr. Laurie Brignolo [530-752-2514; e-mail: [llbrignolo@primate.ucdavis.edu](mailto:llbrignolo@primate.ucdavis.edu)] or Dr. Kari Christe [530-572-2514; e-mail: [klchriste@primate.ucdavis.edu](mailto:klchriste@primate.ucdavis.edu)]. You may apply to UCD Human Resources Administration Bldg., Orchard Park, Davis, CA 95616, or online at <[www.hr.ucdavis.edu/Emp/Careers/Application\\_Process](http://www.hr.ucdavis.edu/Emp/Careers/Application_Process)>. Required application materials are available at the UCD Human Resources Administration Building, on the Internet at <[www.hr.ucdavis.edu](http://www.hr.ucdavis.edu)>, or at the UCD Medical Center Personnel Office.

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# CONTENTS

## *Articles and Notes*

The Effects of Increased Space, Complexity, and Choice, Together With Their Loss, on the Behavior of a Family Group of <i>Callithrix jacchus</i> : A Case Study, by I. Badihi, K. Morris, and H. M. Buchanan-Smith .....	1
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---

## *News, Information, and Announcements*

Meeting Announcements .....	5
Announcements from Publications: <i>Laboratory Animals</i> Available Online .....	5
News Briefs .....	6
Endangered Grey-Shanked Doucs Found in Vietnam; Chester Zoo Wins Welfare Excellence Award; One of World's Oldest Chimps Dies at 60; Cindy Smith Acting Administrator of APHIS; Orangutan Learns to Take Her Own Medicine; Retired Chimps May Help Studies of Aging; Israel Following Europe on Animal Testing Policy; Alex the African Grey Parrot Dead at 31 .....	
Travelers' Health Notes: Malaria Rapid Diagnostic Test .....	7
Workshop Announcements .....	8
First SSP Orangutan Husbandry Workshop; Animal Welfare Act Information Requirements; Southeast Regional Ape Enrichment Workshop; HIV Persistence Workshop; "Teaching Animal Behavior" and Alternatives and 3Rs at UCLA .....	
Information Requested or Available .....	9
Gorilla Haven Update; Compiling a Dataset of Testes Weights; New IPS Website; Gibbon Discussion List; and More Interesting Websites .....	
Educational Opportunities: Primate Biology, Husbandry, Nutrition, and Handling .....	9
Resources Wanted and Available .....	10
AMP's Research Advocacy DVD; New U.K. Strategy for Nonhuman Primate Testing; NIH Chimpanzee Management Program; Primate Enrichment Photos; Screen Savers, Etc.; Best Practices for Great Ape Conservation; Chinese Scientific Books; The New Simian (and Prosimian and Ape) Census; Chad Hunter's Gelada Video; and From the Zoo-Biology Discussion Group .....	
Jacobsen WNPRC Conservation Research Award .....	11
Awards Granted .....	12
Disney Conservation Hero for 2007 – Limbe Keeper; 24th Annual Animal Behavior Film Festival Awards; and IPS Grants and Awards for 2007 .....	
Remembering .....	13
Photograph, by M. Brickner .....	13
Grants Available .....	14
Electronic Financial Status Report System; Fyssen Foundation Postdoctoral Research Grants; and Postbaccalaureate Research Education Program .....	
A Letter from the Executive Committee for IPS 2008 .....	15

## *Departments*

Recent Books and Articles .....	16
Position Available: Veterinarian – Davis, California .....	25