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POLICY STATEMENT

The purpose of the *Newsletter* is to provide a central source of information about nonhuman primates and related matters, which will be of use both to the community of scientists who use these animals in their research and to those persons whose work supports such research. Accordingly, the *Newsletter* (1) provides information on care, breeding, and procurement 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, the only research articles or summaries that will be accepted for the *Newsletter* are those that have some practical implications or that 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 \$2.00 each. (Please make checks payable to Brown University.)

The publication lag is typically no longer than the 3 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 fifteenth of December, March, June, or September, depending on which issue is scheduled to appear next. Reprints will not be supplied under any circumstances.

PREPARATION OF ARTICLES FOR THE *NEWSLETTER*.--Articles, notes, and announcements should be submitted in duplicate and all copy should be double spaced. Articles in the References section should be referred to in the text by author(s) and date of publication, as for example: Smith (1960) or (Smith & Jones, 1962). Names of journals should be spelled out completely in the References section. Technical names of monkeys should be indicated at least once in each note and article. In general, to avoid inconsistencies within the *Newsletter* (see Editor's Notes, July, 1966 issue), the scientific names used will be those of Napier and Napier [*A Handbook of Living Primates*. New York: Academic Press, 1967]. 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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Managing Editor: Helen Janis Shuman

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IPS CONGRESS: TWO REPORTS ON SEXUAL BEHAVIOR IN ORANG-UTANS

Michael Kavanagh

Universiti Pertanian Malaysia

At the VIIIth Congress of the International Primatological Society (Florence, Italy, July 7-12, 1980), complementary reports based on observations of orang-utans in the laboratory and in the field were presented by Dr. Ronald D. Nadler of Emory University's Yerkes Regional Primate Research Center in Atlanta, Georgia, and Mr. Chris Schürmann of the University of Utrecht, the Netherlands.

An adult male orang-utan (*Pongo pygmaeus*) is more than twice as big as his female counterpart and for several years it has been known that when he gets hold of her with amorous intent, there is little that she can do to avoid consummation. On many occasions, both in the wild and in captivity, males have been seen gripping females tightly whilst apparently 'raping' them. The use of the term 'rape' may seem overly dramatic, but it implies force and that is exactly what has been observed. However, the female may have the last laugh in terms of biological advantage. Recent evidence suggests that pregnancies seldom result from orang-utan matings unless the female is the initiator of the interaction.

Dr. Nadler reported that he and his colleagues had been puzzled by the apparent infertility of some of their orang-utans. The Yerkes Center has one of the largest collections of captive orang-utans in the world; and an experimental program of regular matings had been undertaken by the simple method of placing each female in with a male for a few hours per day. Almost invariably, the males would grab the females and 'rape' them. Yet, after doing this for a total of nine sexual cycles with four females, only one pregnancy had resulted.

Dr. Nadler and his colleagues had read that wild orang-utan males seemed most likely to be sexually very aggressive with unfamiliar females, so they decided to allow each of their females the option of getting to know a male at her own pace and to avoid him if she wished. They did this by the simple expedient of joining her cage to his by a door that was big enough for her to pass through, but not for him. What happened was remarkable. Copulations occurred much less frequently than in the one-cage situation, but when they did occur it was the female who took the initiative. Typically, the male lay on his back with only a persistent erection to indicate his interest while the female approached him, manipulated his penis, straddled him and made pelvic thrusts until copulation was complete. Measurements of the

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females' luteinizing hormone levels in the blood indicated that they tended to initiate these matings at mid-cycle when they were likely to be ovulating. And sure enough, using the same subjects as before, the females that behaved in this way became pregnant after only two sexual cycles.

Not surprisingly, the Yerkes researchers wondered whether or not their results had been brought about as an artifact of captive conditions. Did they in any way reflect the natural biology of a wild orang-utan? Field work by Mr. Schürmann indicates that they did indeed. Speaking at the same congress, Mr. Schürmann described some of the observations that he had made in the course of 4,200 hours of contact with orangs at the Gunung Leuser Reserve in Sumatra, Indonesia.

Previous studies had suggested that the orang-utan is a predominantly solitary animal, but Mr. Schürmann found that some of the apes in his study population were extremely gregarious. In particular, one magnificent adult male, known as Jon, was frequently to be found in the company of one or more of three particular females. Schürmann noted that as one of these females, called Yet, passed through adolescence and into adulthood, she attracted the attention of at least four sub-adult males in the area. They approached her, followed her around, touched her genitals and occasionally copulated with her. Sometimes, Yet sexually presented to a sub-adult male and he mounted her, whereas on other occasions she was held and 'raped' as had been seen at Yerkes and elsewhere. These forcible matings typically occurred during short encounters, whereas cooperative copulation typically occurred when the two apes had been moving together for a longer period as a consort pair. Nevertheless, Yet did not show any signs of pregnancy.

During this period, Yet showed a clear preference for bigger males, in particular for Jon. But, Mr. Schürmann reported, it took her five years to build up her relationship with Jon to the point of copulation. As an adolescent, she often followed him about, approached and touched him. Initially, he tended to avoid her, but as time went on he became more tolerant and the two of them would often feed close together. Sometimes, Jon even let Yet take food out of his hand. As the years passed, Yet became more overtly sexual in her approach, even masturbating right in front of Jon, and later manipulating his genitals or licking his penis. It was only when she got to the stage of genital contact that Jon reacted by 'male-presenting': Schürmann's term for a stereotyped pattern of behavior in which the adult male orang practically lies on his back in the trees with his erect penis prominent. Sub-adult males do not appear to adopt this position, although it is very similar to that taken by the captive adult males at Yerkes during the cooperative matings there. Only when Jon did this was the five years of courtship finally consummated, with Yet playing the active role while Jon remained practically motionless.

As at Yerkes, the copulations that now followed were concentrated in

time with most occurring in two periods thirty days apart. Presumably, these were timed to coincide with Yet's ovulatory periods, a conjecture that was supported by her subsequent pregnancy and the birth of an infant nine months later.

Neither Nadler nor Schürmann knew about each other's work until a few months ago, but the parallels between the captive and the field observations are remarkably exact. Now the next question that may be investigated at the Yerkes Center is how it is that a female orang has an increased chance of pregnancy when she, and not the male, is the seducer.

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NEW JOURNAL ANNOUNCED: *AMERICAN JOURNAL OF PRIMATOLOGY*

The *American Journal of Primatology*, edited by J. Erwin, will begin publication in early 1981. The journal will publish original research reports, scholarly reviews, brief reports, and book reviews on all topics relevant to the study of primates, including their anatomy, behavior, development, ecology, evolution, genetics, nutrition, physiology, reproduction, systematics, conservation, husbandry, and use in biomedical research.

The new journal will be published by Alan R. Liss, Inc., 150 Fifth Av., New York, NY 10011. Members of the American Society of Primatologists may subscribe to the journal at the substantially reduced rate of \$25.00 (list price: \$70.00). Manuscripts for consideration should be sent to: J. Erwin, Editor, *American Journal of Primatology*, PO Box 96, Honeydew, CA 95545. Instructions for contributors are available from either Dr. Erwin or Alan R. Liss, Inc. Prompt review and rapid publication are major priorities of the journal.

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NATIONAL ZOO FACILITY AVAILABLE TO ASSESS NATURAL PRIMATE POPULATION HABITAT

Funding from NIH through the Interagency Primate Steering Committee for a three-year period has been awarded to establish an Image Analysis and Graphic Facility for Ecological Studies (IMAGES) in the Department of Zoological Research, National Zoological Park, Smithsonian Institution. Under the direction of Dr. Ken Green, the Project Coordinator, the seed money for this facility has been provided so that primate field workers can utilize remote sensing data from LANDSAT satellites.

The facility will use IMPAC, a new computer hardware and software program package which allows one easily and quickly to derive useful information from digital imagery. Through an interactive approach IMPAC combines the analysis power of digital computers with the scientists' conventional photo-interpretation skills. It is capable of creating and displaying full color multispectral classification maps, provides full statistical analysis capabilities including histogram generation and allows image ratioing and correction. Interactive digital systems such as IMPAC provide the most cost effective way for the user to transform images into information.

While IMPAC is useful for many image oriented applications, it is ideally suited for natural resources exploration. Digital images of the entire earth's surface acquired by NASA's LANDSAT satellites have been available to everyone for several years. However, until now only people at large institutions, with very expensive computer analysis systems, have been able to utilize fully the information in these images.

The vast majority of researchers have been limited to manual photo-interpretation and image enhancement techniques. Analysis of satellite photographs by these limited techniques can only utilize about one-half of the potential image resolution. These manual techniques rely on qualitative or poorly calibrated numeric reflectance information. Reproduction of reliable quantitative data results only when the original digital data is used. The IMPAC system provides full digital capability.

Primate researchers will have access to this digital image processing and associated technology, developed by the Smithsonian's National Zoological Park, Office of Computer Services, and the National Air and Space Museum. Under the guidance of the Project Coordinator, the primate researcher will provide groundtruth and if desired, can gain actual hands-on system experience. The primate researcher will be expected to agree to procedures established by the Smithsonian Institution for the use of the facility. The facility will be available to a limited number of scholars at no charge.

For further information and guidelines for applying to use this facility, please contact: Dr. Ken Green, National Zoological Park, Smithsonian Institution, Washington, DC 20008 (Phone: 202-673-4749).

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FREE-RANGING PATAS MONKEYS AVAILABLE FOR STUDY

The Caribbean Primate Research Center of the University of Puerto Rico, School of Medicine, is accepting research proposals for a multidisciplinary patas monkey program. Areas of investigation presently being considered include husbandry and management, social and locomotive behavior, population dynamics, anthropomorphic development, reproduction, parasitology and hematology. Limited manipulations and sampling will be possible during routine trappings. All monkeys are identified by chest tattoos and color-coded ear tags designating gender and number.

The monkeys reside on the coastal island of La Cueva, adjacent to the town of La Parguera, Puerto Rico, where the habitat approximates that found in the natural environment of the patas monkey. The colony was originally established during the early 1970's, and presently consists of about 10 adult males, 70 adult females, and 50 juveniles. It is the only accessible free-ranging patas monkey colony outside of Africa.

A field office, basic maintenance of the island, census information on the colony, and scheduled port transportation to and from La Cueva are provided by the Center. Investigators interested in studying this truly unique colony should submit their proposal outlines as soon as possible to: Dr. Gilbert Meier, Director, or Dr. Matt Kessler, Veterinarian, Caribbean Primate Research Center, PO Box 1053, Sabana Seca, Puerto Rico, USA 00749 (Phone: 809-784-6619 or 0322).

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NY AREA BRANCHES OF AALAS TO HOLD 13TH ANNUAL JOINT SYMPOSIUM

The Metropolitan New York and Delaware Valley Branches of the American Association for Laboratory Animal Science will hold its 13th Annual Joint Symposium on "Environment and Nutrition - Problem Solving", at the Meadowlands Hilton, Secaucus, New Jersey, on June 10 and 11, 1981. These annual symposia provide in-depth coverage of selected topics designed to present up-to-date information on the latest changes and innovations in the field of laboratory animal science. Papers will be given at both the scientific and technical sessions. At least fifty exhibit areas are available to the allied trades. For further information and advance registration, please contact: Mss. Ellen Kolb or Theresa Kane Musser, American Health Foundation, Hammond House Rd., Valhalla, NY 10595 (Phone: 914-592-2600, E.K. ext. 373; T.K.M. ext. 321).

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TRAINEESHIPS AT THE NATIONAL ZOOLOGICAL PARK: SUMMER 1981

The National Zoological Park, with funding and assistance by the Friends of the National Zoo, is offering a limited number of Research Traineeships for the summer and academic year of 1981-82. The purpose of the traineeship is to allow a student to become familiar with and practice research and clinical methods in one of several program areas of the Zoo. Each student will participate in ongoing projects directed by the National Zoo staff. Each will receive appropriate guidance on methodology and the use of materials. Thereafter, working alone or in small teams the student will be responsible for routine research or preceptorship duties. Weekly progress meetings will be arranged by the staff supervisor. A brief summary report will be required.

The work will be carried out at the National Zoo in Washington, DC and the National Zoo's Department of Conservation in Front Royal, Virginia. There are four general program areas: Program A: Behavioral research and animal husbandry research (Program Coordinator, Daryl Boness, Ph.D.). Participants are Devra Kleiman, Ph.D., Department of Zoological Research; Edwin Gould, Ph.D., Department of Mammalogy; Christen Wemmer, Ph.D., Department of Conservation, Front Royal, Virginia. Program B: 1. Mitchell Bush, DVM, Clinical Zoological Medicine, Department of Animal Health. (Veterinary students only.) 2. Richard J. Montali, DVM, Zoological Pathology, Department of Pathology. (Veterinary students who have completed sophomore year.) Program C: Ms. Judith White, Zoo Education Methodology and Analysis, Department of Education. Program D: Mr. Robert Mulcahy, Zoo Exhibition Design and Methodology, Office of Graphics and Exhibits. (Applicants must submit 20 slides of design project, to be returned.) Selection criteria include: seriousness of interest in a field of work at the National Zoological Park as demonstrated by statement of interest, scholastic achievement, relevant experience, and references.

The duration of the traineeship is twelve weeks. Although usually conducted during the summer, traineeships may be scheduled to coincide with the academic year. The full-term stipend will be \$1,400.00 (on exception, half term--\$700.00). Students are expected to make their own living arrangements in the Washington, DC area. For trainees assigned to the Department of Conservation, Front Royal, Virginia, dormitory space is available for a fee of \$14/week.

To be considered, an applicant must submit a completed application form, postmarked on or before March 15, 1981, transcripts, two letters of reference, and an indication of the preferred time of year. These should be sent to: Mary Sawyer Hollander, Coordinator, Research Traineeship Program, Friends of the National Zoo, c/o The National Zoo, Washington, DC 20008.

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COMPARATIVE PATHOLOGY CONTINUING EDUCATION COURSE

The 8th annual Comparative Pathology Course will be presented 4-6 May 1981, at the Armed Forces Institute of Pathology, Washington, DC. Military and federal service employees in the medical, veterinary and other medical fields are requested to consult respective agency regulations for appropriate application procedures. Civilian physicians, veterinarians and allied scientists are invited to apply and will be considered on a space available basis. This Course is specially designed to bring attention to disease processes in animals for which a similar entity occurs in man. Differences and similarities of pathologic lesions, as well as the biological behavior of specific entities will be compared in animals and man. Application forms to attend this Course may be obtained by contacting: The Director, Armed Forces Institute of Pathology, (AFIP-EDE), Washington, DC 20306. Completed application forms should be returned by 17 April 1981. Non-federal civilians and foreign nationals are required to submit a \$75.00 fee, payable to the Treasurer of the United States.

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ORPRC SYMPOSIUM ON PRIMATE REPRODUCTIVE BIOLOGY

The first Symposium on Primate Reproductive Biology will be held at the Oregon Regional Primate Research Center (ORPRC) in Beaverton, Oregon, May 8-11, 1981. Because of the wealth of material accumulated in recent years, this symposium will examine recent developments in the field of fetal endocrinology, and will focus on studies of fetal development related to sexual differentiation and parturition. Topics to be discussed will range from the regulation of the fetal-placental unit to H-Y antigen and differentiation of the mammalian gonads. Participants will cover the areas of research in which progress has been most significant and in which the knowledge obtained has the greatest potential usefulness in solving problems of pregnant women and their fetuses.

The meeting will take place in the new Montagna Auditorium on the campus of the ORPRC. Initiated by ORPRC Director Dr. William Montagna, the annual symposia will gather together scientists from the seven American primate research centers as well as scholars in the field of primate reproduction from around the world. Proceedings will be published by Academic Press in a new series to be called *ORPRC Symposium on Primate Reproductive Biology* (Vol. 1. *Fetal Endocrinology*).

For more information, contact Marge Shiningier, Symposium Coordinator, Oregon Regional Primate Research Center, 505 N.W. 185th Ave., Beaverton, OR 97006 (Phone: 503-645-1141, ext. 330).

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DEREGULATION MAY AFFECT AIR SHIPMENT OF ANIMALS

Deregulation of domestic airlines may again pose a threat to air transportation of animals, as CAB no longer has jurisdiction of domestic airlines and what items can or cannot be carried. This automatically cancels Administrative Law Judge Argerakis' decision on CAB Tariff No. 96 which allowed the carriage of all animals, if properly packaged, by domestic airlines. Now every airline issues its own regulations as well as revising these regulations. Furthermore, airlines can change their tariffs at will. [Based on a note in the *AAZPA NEWSLETTER*, 1980, 21 [12], 11.]

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FIRST NOTICE: IXTH CONGRESS OF THE IPS, ATLANTA, 1982

The IXth Congress of the International Primatological Society will be hosted by the Yerkes Regional Primate Research Center of Emory University, and will be held in Atlanta, Georgia from August 8 to 13, 1982.

The annual meeting of the American Society of Primatologists will be held jointly with the congress. It is planned that, except for their respective business meetings, the two organizations will hold scientific sessions and social events together.

Arrangements have been made with the Colony Square Hotel, which will serve as headquarters for the meetings, for both sleeping and meeting rooms. In addition, negotiations for university housing for students in economy dormitory rooms are currently underway.

The city of Atlanta, with a metropolitan area population of 2 million, is the hub of the southeastern U.S. and is a major convention center of the nation. It has direct air connections to all major cities in the country as well as non-stop flights to Toronto, Montreal, Vancouver, London, Amsterdam, Brussels, Frankfurt, Nassau (Bahamas), San Juan, and Mexico City. Additional direct access flights are expected to be in service by the time of the congress.

A special international attraction will be the 1982 World's Fair which will be held from May to October in Knoxville, Tennessee, 220 miles north of Atlanta and a 45-minute flight. Among the many nations which will be a part of the fair is the Peoples Republic of China which recently signed a letter of intent to participate. If the Chinese do host a pavilion, it will be the first time in over 40 years that they have taken part in such an event.

Program committees will be established shortly, and future notices of the congress will contain information concerning satellite symposia, scientific sessions, registration and reservations.

Please address all correspondence to Dr. Frederick A. King, Director, Yerkes Regional Primate Research Center, Emory University, Atlanta, GA 30322.

POSTDOCTORAL FELLOWSHIPS

University of Chicago

The University of Chicago is now accepting applications for postdoctoral fellowships in Behavioral Biology for the 1981-82 fiscal year. Application instructions and program information can be obtained from Prof. Stuart Altmann (Program Director), Department of Biology, University of Chicago, 1103 E. 57th St., Chicago, IL 60637

Primate Foundation of Arizona

Funding for a postdoctoral career development program has been awarded by the E. Blois duBois Foundation to the Primate Foundation of Arizona. There will be no specific requirements regarding field of interest placed upon the program or the applicants. Candidates from all fields where the express knowledge of captive chimpanzee behaviors would prove beneficial may apply. The major goal of the program is to develop a person, not only knowledgeable in captive behaviors, but one who is also prepared to find practical solutions to the problems created by captivity. Thus, the Foundation hopes to take another step toward assuring the survival of the chimpanzee while also helping to solve a critical shortage of trained personnel.

Arizona State University has assisted in the program development by creating an Adjunct Assistant Professor position in the Psychology Department for the postdoctoral recipient. This meets the Foundation's requirement that the program include at least one semester of teaching an animal behavior class. A local laboratory has agreed to provide the opportunity for the recipient to spend several weeks in the laboratory, thus viewing first-hand the problems of both human and animal in that setting. The trainee will also be expected to become involved in the community as part of the Foundation's Education Program, as well as conduct a behavioral research project for presentation and publication. The term of each individual's award is yet to be determined. The program will be evaluated at the end of the first year, at which time the most practical and beneficial length of time needed for each recipient will be determined. The program has received three-year funding.

The first recipient of the program has been selected. Ms. Linda Marchant, who received her Ph.D. degree in Anthropology from Rutgers University in December, 1980, started her postdoctoral work at the Foundation in early January, 1981. Ms. Marchant's dissertation was on handedness in chimpanzees and she has had some experience with chimpanzees on an island in Florida.

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NEWS BRIEFS

W. I. Gay Named Director of Animal Resources Program

Dr. William I. Gay, former director of the Extramural Activities Program of the National Institute of Allergy and Infectious Diseases, has been named as director of NIH's Animal Resources Program.

The Animal Resources Program of the Division of Research Resources administers the activities of NIH's Regional Primate Research Centers and the Laboratory Animal Sciences operation which strives to upgrade institutional animal resources, supports facilities engaged in the diagnosis and control of animal disease, develops highly-trained specialists in laboratory animal medicine and science, and supports development of specific colonies of laboratory animal models.

A native of New York State, Dr. Gay is a veterinarian who received his DVM from Cornell University, and is a graduate of the Federal Executive Institute. He has been associated with the National Institutes of Health since 1954.

Prior to coming with NIH, he practiced veterinary medicine at Richmond Hill, New York. In 1952, he was commissioned as a lieutenant in the Veterinary Corps of the U.S. Army and spent two years in charge of the Laboratory Animal Colony at the Walter Reed Army Institute of Research in Washington, DC.

Joining the Division of Research Services as chief of the Animal Hospital Section in 1954, he later served concurrently as assistant chief of the central animal colony. In 1963, he became a senior program official in the Animal Resources Branch of the Division of Research Facilities and Resources. In 1966, he joined the National Institute of General Medical Sciences (NIGMS) as program director for comparative medicine and also program administrator for the radiology and physiology training programs. He became chief of the Research Grants Branch in 1967. Dr. Gay served as acting associate director of NIGMS during most of 1970. In 1971 he joined the National Institute of Allergy and Infectious Diseases.

Dr. Gay has served as president of the DC branch of the American Veterinary Medical Association, and the American Association for Laboratory Animal Science (AALAS). He is a diplomate of the American College of Laboratory Animal Medicine, and has served on the board of directors and as national president of AALAS. He has also been active in committee work with the Institute of Laboratory Animal Resources, the Seeing Eye, Inc., and is a trustee of the Morris Animal Foundation. He is the author of over 20 papers in the field of laboratory animal science and has served on numerous NIH committees. The winner of the 1971 AALAS Griffin award, he is also the recipient of a DHEW Quality Performance Award in 1969 and

a Superior Service Award in 1975. Dr. Gay is a member of the Phi Zeta Veterinary Society.

O. Soave Named Exec. Director of Interagency Primate Steering Committee

Dr. Orland Soave (D.V.M. Wash. 1944) joined the Veterinary Resources Branch of the Division of Research Services, National Institutes of Health, Bethesda, Maryland, on October 6, 1980 as Executive Director of the Interagency Primate Steering Committee. A major mission of the committee is to ensure that sufficient numbers of nonhuman primates are available to the United States for the performance of its human health-related responsibilities.

For the past 15 months Dr. Soave served as an Expert to the National Library of Medicine working on the development of a computerized system containing the biological values of laboratory animals--the Laboratory Animal Data Bank.

Dr. Soave spent 19 years (1969-79) as Director of the Division of Laboratory Animal Medicine at Stanford University in California, specializing in laboratory animal medicine. While at Stanford he served as a consultant in laboratory animal medicine to the Veterans Administration, the National Aeronautics and Space Administration, SRI International and the Linus Pauling Institute for Medical Research. He was president of the American Association for Laboratory Animal Science in 1966 and the American College of Laboratory Animal Medicine in 1969. He served on the Board of Directors of the Institute of Laboratory Animal Resources, 1960-1971 and the Alumni Board of Directors of Washington State University 1964-67.

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INTERNATIONAL JOURNAL OF PRIMATOLOGY POLICY CHANGE

The following change in policy has been made regarding the submission of manuscripts: Prospective authors are encouraged to submit, together with their manuscripts, the names and addresses of between two and four suitable referees. It must be borne in mind, however, that the editors shall not be bound in any way to use all or even any of the referees so nominated.

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PRESERVED PRIMATE MATERIAL AVAILABLE

A large assorted collection of preserved primate material is available for disposal by negotiation. There are part specimens covering genera in the four categories as set out below. Numbers shown against an individual genus indicate complete specimens.

APES: *Pan* (chimpanzee) (4); *Hylobates* (gibbon); *Symphalangus* (siamang); *Pongo* (orangutan); *Pan* (chimpanzee).

OLD WORLD MONKEYS: *Presbytis* (langur) (9); *Papio* (baboon) (4); *Erythrocebus* (patas m.) (2); *Macaca* (22); *Allenopithecus* (pygmy swamp m.) (2); *Theropithecus* (gelada baboon) (1); *Mandrillus* (mandrill) (1); *Cercopithecus* (talapoin) (22); *Cynopithecus* (Celebes ape) (6); *Cercopithecus* (vervet, green m., Diana m., Sykes m., black-cheeked white-nose m.); *Macaca* (rhesus); *Presbytis* (langur, dusky langur, golden langur); *Colobus* (red colobus, colobus); *Papio* (baboon); *Cynopithecus* (Celebes ape); *Erythrocebus* (patas); *Cercocebus* (mangabey, tantalus); *Theropithecus* (gelada baboon); *Mandrillus* (mandrill); *Allenopithecus* (swamp m., pygmy swamp m.).

NEW WORLD MONKEYS: *Saimiri* (squirrel m.) (21); *Cebus* (Capuchin) (7); *Callithrix* (marmoset) (26); *Lagothrix* (woolly m.) (18); *Leontocebus* (tamarin) (1); *Ateles* (spider m.) (3); *Callithrix* (marmoset); *Leontocebus* (tamarin); *Aotus douroucouli* (night m., owl m.); *Lagothrix* (woolly m.); *Pithecia* (saki); *Cacajao* (uakari); *Callicebus* (red titi); *Ateles* (spider m.); *Cebus* (Capuchin); *Saimiri* (squirrel m.); *Alouatta* (black howler).

PROSIMIANS: *Nycticebus* (slow loris) (4); *Loris* (slender loris) (12); *Propithecus* (flying lemur); *Perodicticus* (potto); *Nycticebus* (slow loris); *Loris* (slender loris); *Tupaia* (tree shrew); *Petrodemus* (elephant shrew).

Disposal is by negotiation. Interested parties who require further information should write to: Mr. R. A. Hill, Department of Anatomy, Medical School, University of Birmingham, B15, England.

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RECENT BOOKS AND ARTICLES
(Addresses are those of first authors)

Books

International Association of Biological Standardization. *Developments in Biological Standardization*. Vol. 45. *The Standardization of Animals to Improve Biomedical Research, Production and Control*. Basel: Karger, 1980. Soft cover, 248 pp. [Price: SFr. 65. Approx. \$39.]

The proceedings of a symposium organized by the International Association of Biological Standardization and held in San Antonio, Texas, September 16-20, 1979. The contents of Session I, which dealt with primates, are as follows: Standardized laboratory animals, their need. Why the nonhuman primates? by S. S. Kalter; Hepatitis surveillance standards for hepatitis studies in a chimpanzee colony, by C. Muchmore; Bacteriological findings in a nonhuman primate colony, by L. H. Boncyk & S. S. Kalter; Virus isolations by the NIH and WHO Collaborating Center of Reference and Research in Simian Viruses, by T. L. Lester & S. S. Kalter; Blood groups: Immunogenetic markers in primate animals and their use in breeding and standardization, by J. Moor-Jankowski & W. W. Socha; Growth standards in the skeletal age of rhesus monkey (*M. mulatta*), chimpanzee (*Pan troglodytes*) and man, by M. Michejda; Animal analogues for the study of dental and oral diseases, by B. M. Levy; Detection of primate herpesvirus antibodies including *herpesvirus simiae* by enzyme immunoassay, by J. W. Eichberg, R. L. Heberling, J. E. Guajardo, & S. S. Kalter; Production and standardization of the chimpanzee for research, by L. B. Cummins & S. S. Kalter; A monogamous system of breeding chimpanzees in a controlled environment, by C. J. Mahoney; Baboons--Their care and maintenance in the tropics, by R. A. Whittingham; An open air holding system for chimpanzees in medical experiments, by M. C. van den Ende, B. Brotman, & A. M. Prince; Use of captive-bred monkeys for vaccine production, by G. van Steenis, A. L. van Wezel, I. G. M. de Groot, & B. C. Kruijt; Discussion.

The Comparative Pathology of Zoo Animals. Richard J. Montali & George Migaki (Eds.). Washington, DC: Smithsonian Institution Press, 1980. 684 pp. [Price: Hard cover, \$45. Soft cover, \$25.]

In many cases, the original source of reference in this section has been the Current Primate References prepared by The Primate Information Center, Regional Primate Research Center SJ-50, University of Washington, Seattle, WA 98195. Because of this excellent source of references, the present section is devoted primarily to presentation of abstracts of articles of practical or of general interest. In most cases, abstracts are those of the authors.

The book can be purchased from the Smithsonian Institution Press, PO Box 1579, Washington, DC 20013. The proceedings of a symposium held at the National Zoological Park, Smithsonian Institution, October 2-4, 1978. Of the 88 papers presented, those that deal directly or indirectly with nonhuman primates include the following:

SECTION 1. NUTRITIONAL, METABOLIC, AND TOXIC CONDITIONS. Nutritional, metabolic, and toxic diseases of zoo animals, by F. M. Loew; Osteomalacia and nutritional secondary hyperparathyroidism in a semi-free-ranging troop of Japanese monkeys, by S. S. Snyder, J. L. Omdahl, D. H. Law, & J. W. Froelich; Nutritional secondary hyperparathyroidism in a group of lemurs, by F. N. Tomson, G. L. Keller, & F. B. Kanpke; The comparative pathology of an oral disease resembling noma in six rhesus monkeys, by R. J. Adams & J. L. Bishop; Chronic idiopathic diarrhea with enterocolitis and malabsorption in a captive, lowland gorilla--A case report, by A. Molteni, J. R. Reddy, D. G. Scarpelli, M. Sparberg, & E. R. Maschgan; Lead poisoning in zoo primates: Environmental sources and neuropathologic findings, by B. C. Zook & L. H. Paasch.

SECTION 2. INFECTIOUS DISEASES--VIRAL, BACTERIAL, MYCOTIC, AND IMMUNOPATHOLOGIC ASPECTS. Comparative pathology of viral diseases--An overview, by N. W. King, Jr. & R. D. Hunt; Infectious gibbon leukemia virus, by T. G. Kawakami, L. Sun, T. S. McDowell, & G. V. Kollias; Studies on simian hemorrhagic fever virus infection of patas monkeys I. Serology, by M. Gravell, W. T. London, M. Rodriguez, A. E. Palmer, R. S. Hamilton, & B. L. Curfman; Bacterial diseases of nonhuman primates, by H. M. McClure; Comparative aspects of *Yersinia pseudotuberculosis* infection in animals, by G. B. Baskin; The pathogenesis of Yersiniosis, by M. J. Obwolo; A prokaryotic erythrocytic parasite occurring in a rhesus monkey, by C. Jensen, D. Nawrocki, F. W. Quimby, S. H. Schelling, & C. Ellis; Rheumatoid arthritis in the gorilla: A study of mycoplasma-host interaction in pathogenesis and treatment, by T. McP. Brown, H. W. Clark, & J. S. Bailey; Mycotic diseases in captive animals--A mycopathologic overview, by G. Migaki; Cystic thymic dysplasia in two mountain gorillas with lethal gram-negative septicemia, by G. R. F. Krueger, E. P. Gerhard Newmann, & E. Kullman.

SECTION 3. PARASITISMS--PROTOZOAN AND METAZOAN. Toxoplasmosis in a sifaka, by J. Chang, R. W. Kornegay, J. L. Wagner, E. M. Mikat, & D. B. Hackel; Identification of metazoan parasites in tissue sections, by J. D. Toft II & M. E. Ekstrom; *Echinococcus vogeli* infection in higher primates at the Los Angeles Zoo, by E. B. Howard & A. P. Gendron; Pulmonary acariasis in Old World monkeys: A review, by J. C. S. Kim.

SECTION 4. PATHOLOGY ASSOCIATED WITH CAPTIVITY. Pathophysiology associated with capture of wild animals, by T. R. Spraker; Diseases of moustached marmosets, by J. C. S. Kim & R. H. Wolf; The comparative pathology of the primate colon, by G. B. D. Scott.

SECTION 5. DEVELOPMENTAL, PERINATAL, AND GERONTOLOGICAL DISEASES. Genetic and developmental disorders in zoo animals, by T. C. Jones; Congenital defects of zoo and wild mammals: A review, by H. W. Leipold; Perinatal mortality in zoo animals, by K. Benirschke, F. D.

Adams, K. L. Black, & L. Gluck; Pathophysiology of aging in zoo and captive animals, by C. F. Hollander; Lifespan in mammals, by M. L. Jones. SECTION 6. TUMORS. An overview of tumors in zoo animals, by R. J. Montali; A central repository for cancers of captive wild animals and birds, by H. L. Stewart; Neoplastic diseases in nonhuman primates: Literature review and observations in an autopsy series of 2,176 animals, by H. M. McClure; Cancer of the colon in cotton-topped tamarins, by C. B. Richter, C. C. Lushbaugh, & D. C. Swartzendruber. SECTION 7. CLINICAL PATHOLOGY. Clinical chemistry and hematology as diagnostic aids in zoological medicine, by M. Bush & E. E. Smith; Clinical pathology in zoological medicine with emphasis on interpretation of enzyme assays, by W. Medway. SECTION 8. ZOO PATHOLOGY DATA SYSTEMS. A computerized data management system for zoo pathology, by J. D. Strandberg, L. M. Rizas, & R. J. Montali; Storage and retrieval of necropsy records at the San Diego Zoo, by L. A. Griner; Comparative pathology program of the Penrose Research Laboratory, by R. L. Snyder; and Searching the world literature on animal diseases by computer and microfilm, by E. I. Pilchard.

Comparative Biology and Evolutionary Relationships of Tree Shrews. W. Patrick Luckett (Ed.). New York: Plenum, 1980. 314 pp. [Price: \$39.50]

This volume evaluates the possible evolutionary relationships of tree shrews to primates and other eutherian mammals, and considers the use of tree shrews as models for the study of various primate organ systems. The contributors focus on the question of uniquely derived biological attributes shared solely by tupaiids and primates, and on the phyletic relation of tupaiids to primates, dermopterans, and chiropterans. Data are presented indicating that, despite the lack of corroborating fossil evidence, tree shrews evolved independently since the early Tertiary. The specific topics covered are as follows: I. SYSTEMATICS. 1. The suggested evolutionary relationships and classification of tree shrews. II. CRANIOSKELETAL SYSTEM AND DENTITION. 2. Cranioskeletal features in tupaiids and selected eutheria as phylogenetic evidence; 3. Tupaiid affinities: The evidence of the carotid arteries and cranial skeleton; 4. Evolution and diversification of the archonta in an arboreal milieu; 5. The tupaiid dentition; 6. Siwalik fossil tree shrews. III. NERVOUS SYSTEM. 7. The nervous system of the tupaiidae: Its bearing on phyletic relationships. IV. REPRODUCTIVE SYSTEM. 8. The use of reproductive and developmental features in assessing tupaiid affinities. V. MOLECULAR EVOLUTION. 9. Molecular evidence for the affinities of tupaiidae; 10. Tupaiid and archonta phylogeny: The macromolecular evidence.

The Foraging Strategy of Howler Monkeys: A Study in Primate Economics. Katherine Milton. New York: Columbia University Press, 1980. 165 pp. [Price: \$20.]

Although inhabiting an environment rich in such potential food sources as leaves, bark, flowers, and fruit, primates living in tropical forests find that much of this material is low in food energy, largely indigest-

ible, or even toxic. As a result, they must develop dietary strategies of considerable complexity to survive--balancing the costs and benefits of foraging so that net returns are maximized. With these considerations in mind the author carried out a 14-month field study of the foraging activities of two troops of mantled howler monkeys (*Alouatta palliata*) living in the lowland tropical forest on Barro Colorado Island in Panama. This book is an account of this research. The data are presented and interpreted in terms of evolutionary and foraging strategm theory. Contents: 1. Primates and plant foods: Problems and solutions. 2. The general research plan. 3. Potential food sources. 4. The howler diet. 5. Ranging. 6. Time spent foraging. 7. Assessing the howler foraging strategy.

Handbook: Animal Models of Human Disease (9th Fascicle). C. C. Capen, D. B. Hackel, T. C. Jones, & G. Migaki (Eds.). Washington, DC: Registry of Comparative Pathology, Armed Forces Institute of Pathology, 1980.

Thirty new animal model studies from *The American Journal of Pathology* and the *Comparative Pathology Bulletin* have been reprinted as this fascicle. Together with the 180 animal models already reprinted for inclusion in the Handbook during the past eight years, these new studies make a total of 210 illustrated studies now available. In addition, the Registry has published a Supplement to the Second Fascicle, published in 1973, updating some of the information in several of those earlier studies. The Supplement is provided with the 9th Fascicle. This fascicle, which includes a comprehensive cumulative index to the complete set of 210 models appearing in Fascicles 1-9, can be purchased in a three-ring vinyl binder large enough to contain five fascicles for \$8; unbound, \$5. The first seven fascicles are available in a separate three-ring vinyl binder Library Edition for \$25. Individual copies of Fascicles 1 through 8 are sold unbound for \$4 each. All prices include postage. Orders must be prepaid, with a check or money order made payable to UAREP and sent to Registry of Comparative Pathology, Armed Forces Institute of Pathology, Washington, DC 20306.

Brain, Behavior and Evolution. Vol. 16. *The Perception of Species-Specific Vocalizations: Lessons From Research on Human Speech Perception*. Philip A. Morse (Ed.). Basel: Karger, 1979. Soft cover. 144 pp. [Price: SFr. 45]

The contents of this special issue of the journal are as follows: Introduction, by P. A. Morse; On the perception of speech sounds as biologically significant signals, by D. B. Pisoni; The infancy of infant speech perception: The first decade of research, by P. A. Morse; Models and mechanisms in speech perception. Species comparisons provide further contributions, by P. K. Kuhl; Response of nonhuman animals to speech and to species-specific sounds, by C. T. Snowdon; Monkey vocalizations and human speech: Parallels in perception? by S. Zoloth & S. Green; Perception of conspecific vocalizations by Japanese macaques. Evidence for selective attention and neural lateralization, by M. D.

Beecher, M. R. Petersen, S. R. Zoloth, D. B. Moody, & W. C. Stebbins.

Aggression bei Affen und Menschen. Walter Angst. Berlin: Springer-Verlag, 1980. Soft cover. 190 pp. [Price: DM 32. Approx. \$18.90]

The contents of this book, which is written in German, are as follows:
1. Introduction. 2. Primate systematics. 3. Definition of the concept of aggression. 4. Forms of aggression. 5. Causality of aggression on the behavioral level. 6. Causality of aggression on the physiological level. 7. Functions of aggression. 8. Ontogeny of aggression. 9. General hypotheses of aggression. 10. Control of aggression.

Reports

Laboratory Animal Management: Nonhuman primates. *ILAR News*, 23 [2-3], 1980, 1-44.

This is a report of the Subcommittee on Care and Use, Committee on Nonhuman Primates, Institute of Laboratory Animal Resources, National Academy of Sciences. It is available from the Institute of Laboratory Animal Resources, National Academy of Sciences, 2101 Constitution Avenue, N.W., Washington, DC 20418. This report presents guidelines for improved preventive medicine, quarantine and isolation practices, animal handling methods, husbandry practices, breeding techniques, and facility and equipment design. They are as specific as is practicable and apply to all types of experimental and production colonies, as well as to transient colonies of nonhuman primates. To the extent available, experimental data have been used as a basis for the guidelines; the remainder of the recommendations are based upon extensive experience of subcommittee members and their colleagues.

REP: *ANNUAL REPORT 1979.* Rijswijk. The Netherlands: Organization for Health Research TNO, 1980.

This is the annual report of the REP, which stands for the Radiobiological Institute TNO, Institute for Experimental Gerontology TNO, and Primate Center TNO, Rijswijk Z. H., The Netherlands. Of the many short notes describing the accomplishments of the organization, the following are concerned with primates: RADIOBIOLOGY. Spermatogenesis in adult rhesus monkeys following irradiation with x-rays or fission neutrons, by D. G. De Rooij, P. Sonneveld, & D. W. Van Bekkum; Total lymphoid irradiation in rhesus monkeys, by H. M. Vriesendorp, B. Maat, & B. Hogeweg. TRANSPLANTATION AND IMMUNOGENETICS. Current state of serology and genetics of DR and other Ia antigens in rhesus monkeys, by H. Balner, W. Van Vreeswijk, M. Jonker, & J. H. Roger; Variable "predictive value" of DR matching for MLC non-responsiveness in rhesus monkeys, by J. C. C. Borleffs & H. Balner; Current state of cellular typing for D locus antigens in rhesus monkeys, by M. Jonker, W. Van Vreeswijk, & H. Balner; The use of the PLT test to investigate the "complexity" of

D antigens in rhesus monkeys, by M. Jonker & S. Saltzman; The D locus of chimpanzees, by M. Jonker, A. A. Van Es, & H. Balner; Selection of unrelated donors for bone marrow transplantation studied in rhesus monkeys, by G. Wagemaker & D. W. Van Bekkum. MICROBIOLOGY AND GNOTOBIOLOGY. Testing a hepatitis B vaccine in chimpanzees, by L. Stitz. ETHOLOGY. Adequate mothering by partly isolated rhesus monkeys after observation of maternal care, by H. Dieneske, W. Van Vreeswijk, & H. Koning; On the relationships between mother-infant body contact and social play in rhesus monkeys, by P. J. C. M. Van Luxemburg, G. De Jonge, H. Dieneske, & L. G. Ribbens; Bizarre behaviour in rhesus monkeys and human psychopathology, by C. Goosen.

Directories

Animal Resources, A Research Resources Directory (Revised). (NIH Publication No. 80-1431.) Rockville, MD: Research Resources Information Center, 1980.

This new completely revised 56-page publication is designed as a guide for scientists seeking sources of assistance and collaboration involving animals in biomedical research. The directory identifies animal diagnostic laboratories, animal information projects, animal reference centers, special colony and model study centers, and NIH's major primate research centers currently supported by DRR. The directory identifies the resources provided, research emphasis or application, the principal investigator or director, and address and telephone number. A contact person is indicated for each resource. Included is a geographic index listing the resources by state and within each state. A map shows the locations of the primate research centers and animal diagnostic laboratories throughout the country. A single free copy may be secured by writing to the Research Resources Information Center, 1776 East Jefferson St., Rockville, MD 20852 or by request from the Office of Science & Health Reports, Division of Research Resources, National Institutes of Health, Bethesda, MD 20205.

Bibliographies

Hepatic enzymes of nonhuman primates: A bibliography. Benella Caminiti. Seattle: Primate Information Center, 1980. 237 Citations with Primate Index. [Price: \$6.00. Send orders to: Primate Information Center, Regional Primate Research Center (SJ-50), University of Washington, Seattle, WA 98195]

Biology of the platelets of nonhuman primates: A bibliography 1965-1980. Benella Caminiti. Seattle: Primate Information Center, 1980. 56 Citations with Primate Index. [Price: \$5.00. Ordering information, same as in previous reference.]

Behavioral aspects of circadian rhythms in nonhuman primates: A bibliography. Jean Balch Williams. Seattle: Primate Information Center, 1980. 183 Citations with Primate Index. [Price: \$6.00. Ordering information, same as in previous reference.]

Interferon and inducers of interferon: A bibliography of in vivo and in vitro studies with nonhuman primates. Benella Caminiti. Seattle: Primate Information Center, 1980. 80 Citations with Primate Index. [Price: \$5.00. Ordering information, same as in previous reference.]

Disease

Yersinia pseudotuberculosis infection in a group of *Macaca fascicularis*. Rosenberg, D. P., Lerche, N. W., & Henrickson, R. V. (Public Health Service Ctr. for Disease Control, Bureau of Epidemiology, Field Services Div., Atlanta, GA 30333) *Journal of the American Veterinary Medical Association*, 1980, 177, 818-819.

Diarrheal disease associated with abortions and stillbirths occurred in a group of 42 *Macaca fascicularis*. The group was composed of wild-caught adults and their colony-born offspring housed in a half-acre cage. 13 adult females and 1 infant male were affected. All 14 monkeys had diarrhea and all 9 pregnant females either aborted or had a stillbirth. *Yersinia pseudotuberculosis* was isolated from 7 animals. In addition, *Y enterocolitica* was isolated from 1 monkey and *Shigella flexneri* type IV was isolated from 5 monkeys. 1 adult female had a mixed infection of both *Y pseudotuberculosis* and *S flexneri*. Every pregnant monkey from which *Y pseudotuberculosis* was isolated aborted or had a stillbirth. 5 animals died, and *Y pseudotuberculosis* was the only pathogen isolated from these 5 monkeys.

Fatal *Yersinia pseudotuberculosis* infection in captive bushbabies. Chang, J., Wagner, J. L., & Kornegay, R. W. (Div. of Animal Care, Sch. of Med., Univ. of Miami, Miami, FL 33101) *Journal of the American Veterinary Medical Association*, 1980, 177, 820-821.

Fatal *Yersinia pseudotuberculosis* infection was diagnosed in 3 bushbabies (*Galago crassicaudatus*) in a large prosimian colony. The clinical signs were diarrhea, dyspnea, hyperthermia, dehydration, and lethargy. Histologically, the disease was characterized by lesions of ulcerative enterocolitis, necrotizing hepatitis, splenitis, lymphadenitis, and nonsuppurative pneumonitis.

An epizootic of measles in captive silvered leaf-monkeys (*Presbytis cristatus*) in Malaysia. Montrey, R. D., Huxsoll, D. L., Hildebrandt, P. K., Booth, B. W., & Arimbalam, S. (Commander, US Army Medical Res. Unit, Inst. for Med. Res., Jalan Pahang, Kuala Lumpur 02-14, Malaysia) *Laboratory Animal Science*, 1980, 30, 694-697.

An epizootic of measles occurred in a group of 31 silvered leaf-monkeys (*Presbytis cristatus*) that had been in captivity for 4-12 months. 24 of the monkeys exhibited a maculopapular rash that

persisted for 6-9 days. A serous to mucopurulent nasal discharge and conjunctivitis were seen in some animals. 8 monkeys died during the epizootic; however, their deaths could not be directly attributed to measles. Serum samples from the surviving monkeys collected 1-2 months prior to, and 5 weeks after, the epizootic were examined by the complement-fixation and hemagglutination-inhibition tests for antibodies to measles virus. The preepizootic complement-fixation titers were all less than 1:4 and hemagglutination-inhibition titers, less than 1:10. The postepizootic complement-fixation titers in 21 of 23 surviving monkeys ranged from 1:8 to 1:128, and hemagglutination-inhibition titers in 22 of 23 monkeys ranged from 1:40 to 1:80 or greater.

Susceptibility of tamarins (*Saguinus*) to measles virus. Lorenz, D., & Albrecht, P. (Dept. of HEW, PHS, Food & Drug Admin., Bureau of Biologics, Div. of Blood, and Blood Products, Bethesda, MD 20205) *Laboratory Animal Science*, 1980, 30, 661-665.

Tamarins (*Saguinus mystax* and *S. labiatus*) were experimentally infected with two strains of measles virus. One of the strains (JM) spread readily among the animals with a high fatality rate. The second strain (Edmonston) appeared to be less pathogenic and less transmissible than strain JM. Aerosol was considered the most probable mode of infection.

Haematobium schistosomiasis in the squirrel monkey (*Saimiri sciureus*). Kuntz, R. E., Huang, T. C., & Moore, J. A. (Dept. of Microbiol. & Infect. Dis., Southwest Found. for Res. & Ed., San Antonio, TX 78228) *Tropical and Geographical Medicine*, 1979, 31, 477-483.

The squirrel monkey accommodates *Schistosoma haematobium* moderately well. Adults occur in the major viscera but the extent of tissue egg deposits and associated pathology is variable. Pathologic involvement of the urogenital system occurs in a large proportion of hosts exposed to moderate to heavy infections, and bladder pathology is indicative of conditions associated with bladder carcinoma.

The capuchin monkey (*Cebus apella*) as an experimental host for *Schistosoma intercalatum*. Kuntz, R. E., Huang, T. C., & Moore, J. A. (Microbiol. & Infec. Dis., Southwest Found. for Res. & Ed., San Antonio, TX 78284) *Proceedings of the Helminthological Society*, 1980, 47, 260-262.

The capuchin monkey is a very satisfactory primate for work in experimental schistosomiasis intercalata even though, in contrast with infections in earlier investigations in *Macaca fascicularis*, there was minimal pathologic involvement of the urinary bladder. As other studies on definitive host parasitism for members of the *S. haematobium* complex have shown, there is a marked individuality, i.e., susceptibility, tissue egg deposits and pathology, in the basic parameters for judging the usefulness of a given host for multidisciplinary investigations.

Virus associated papillomas in colobus monkeys (*Colobus guereza*). Rangan, S. R. S., Gutter, A., Baskin, G. B., & Anderson, D. (Dept. of Micro., Delta Reg. Prim. Res. Ctr., Covington, LA 70433) *Laboratory Animal Science*, 1980, 30, 885-889.

Numerous papillomas ranging in size from 1-10 mm were seen in four colobus monkeys (*Colobus guereza*). The lesions were confined to the fingers and toes and to the dorsal-lateral aspects of the hands and feet distal to the carpus and tarsus. The observations, which included results of electron microscopic examinations and the negative stain technique, suggested a viral etiology for the cutaneous papillomas similar to that of other mammalian species.

Natural genital *Herpesvirus hominis* infection in chimpanzees (*Pan troglodytes* and *Pan paniscus*). McClure, H. M., Swenson, R. B., Kalter, S. S., & Lester, T. L. (Yerkes Reg. Prim. Res. Ctr., Emory Univ., Atlanta, GA 30322) *Laboratory Animal Science*, 1980, 30, 895-901.

Type 2 *Herpesvirus hominis* was isolated from pustulovesicular lesions on the external genitalia of two chimpanzees. Histopathologic examinations of biopsy specimens from both animals revealed typical herpetic changes which included necrosis, superficial ulceration, acute inflammatory cell infiltration, multinucleated syncytial giant cells, and intranuclear inclusions. Large numbers of herpes-type viruses were demonstrated by electron microscopy in biopsy specimens from both animals. Serologic studies also demonstrated infection of these animals with *Herpesvirus hominis*.

Blastocystis hominis in a pig-tailed macaque: A potential enteric pathogen for nonhuman primates. McClure, H. M., Strobert, E. A., & Healy, G. R. (Yerkes Reg. Prim. Res. Ctr., Emory Univ., Atlanta, GA 30322) *Laboratory Animal Science*, 1980, 30, 890-894.

Large numbers of *Blastocystis hominis* were found in fecal samples from a pig-tailed macaque (*Macaca nemestrina*) with chronic diarrhea that was refractory to conventional therapy. The animal's condition improved and fecal samples showed minimal numbers of *Blastocystis hominis* following therapy with an antiprotozoal agent. This organism, recently reclassified as a protozoan, appeared to be causally related to the diarrhea. The cytologic and ultrastructural features of the monkey *Blastocystis* were comparable to those reported for similar organisms from man.

Gastrointestinal decontamination in healthy and lethally irradiated monkeys. Hendriks, W. D. H. (Central Bacteriological Lab., Schiedamsedijk 95, 3011 En Rotterdam, The Netherlands) Privately published doctoral thesis, 1980. (A limited number of copies of this 137-page thesis in softcover book format is available from the author.)

Lethally irradiated rhesus monkeys were subjected to reverse isolation prior to irradiation and given nonabsorbable antibiotics by mouth to eliminate their microflora. Sterile cultures were obtained within a few days, although germ-free status was not achieved. No effects of

the treatment were observed on kidney or liver function, electrolyte metabolism or bone marrow function. After total body irradiation, usually followed by a bone marrow graft, a number of colonizations occurred, and these are described in some detail. Physiological changes in the monkeys are also discussed. After stopping the administration of the oral nonabsorbable antibiotics, an anaerobic flora was given in an attempt to restore colonization resistance. A selection of parenterally administered antibiotics was examined for their effects on colonization resistance in a mouse model.

Camphylobacter in monkeys. Tribe, G. W., & Frank, A. (Shamrock Farms (Great Britain) Ltd., Victoria House, Small Dole, Henfield, Sussex, England) *Veterinary Record*, 1980, 106, 365-366.

Camphylobacter is described as a cause of enteritis and abortion in *M. fascicularis*.

Pancreatitis in two New World monkeys. Doepel, F. M., Anver, M. R., & Hofing, G. L. (Unit for Lab. Ani. Med., Univ. of Mich. Med. Sch., Ann Arbor, MI 48109) *Veterinary Pathology*, 1980, 17, 505-508.

Pancreatitis in nonhuman primates can result in prostration and death. Episodes of acute pancreatitis, however, may go undetected clinically. Unlike the dog, in which acute pancreatitis is common, nonhuman primates show no signs of abdominal discomfort. In experimental pancreatitis produced by pancreatic duct and vessel ligation in *Macaca mulatta*, marked elevations in serum amylase have been reported. In chronic pancreatitis, serum lipase and amylase may be normal or subnormal and therefore are not helpful in establishing a clinical diagnosis.

Physiology

Blood groups of apes and monkeys: Current status and practical applications. Socha, W. W. (Prim. Blood Group Ref. Lab. & WHO Collaborating Ctr. for Haematology of Prim. Ani., Lab. for Exp. Med. & Surg. in Primates (LEMSIP) of the New York Univ. Sch. of Med., New York, NY 10016) *Laboratory Animal Science*, 1980, 30, 698-702.

Two categories of blood groups, human-type and simian-type, occur in apes and monkeys and can be routinely tested by methods established for grouping human blood. Abundant data have been obtained on blood groups of chimpanzees, baboons and macaques. Studies of populations of animals, both feral and kept in captivity, resulted in the definition of a number of erythrocyte antigens, some of which fall into separate blood group systems. Two complex chimpanzee blood group systems, V-A-B-D and R-C-E-F systems, proved to be counterparts of the human M-N-S and Rh-Hr blood group systems, respectively. Two graded blood group systems were defined in Old World monkeys: the D^{rh} system of macaques and the B^P system of baboons, both linked by at least one specificity shared by either of the blood group systems.

With established modes of inheritance, blood groups of apes and monkeys become useful chromosomal markers in genetic studies of primates as well as important tools for taxonomists. Serology of some of the blood groups suggests their practical importance in breeding of primates as well as in clinical and experimental problems calling for transfusion of blood or transplantation of organs and tissues.

Comparative blood values of *Macaca mulatta* and *Macaca fascicularis*. Matsumoto, K., et al. (Div. of Toxicol., National Inst. of Hygienic Sci., 1-18-1 Kamiyoga, Setagaya-ku, Tokyo 158, Japan) *Experimental Animals*, 1980, 29, 335-340.

Hematological and clinical biochemistry values of two species of monkeys (*Macaca mulatta* and *M. fascicularis*) were measured by using auto-analyzers. WBC and RBC counts of *M. fascicularis* were high and Hb, MCV, MCH and MCHC values of *M. fascicularis* were low in comparison with those of *M. mulatta*. Albumin and creatinine levels of *M. fascicularis* were lower than those of *M. mulatta*. Total protein and ALP values of female *M. fascicularis* were higher than those of female *M. mulatta*. Differences between the sexes were observed in MCV, inorganic phosphorus, total protein, albumin and creatinine in *M. mulatta*, whereas in *M. fascicularis*, such differences were demonstrated as to creatinine, phospholipids and triglycerides.

Behavior

Behavior and malnutrition in nonhuman primates. D. Strobel. In D. A. Levitsky, Ed., *Malnutrition, Environment, and Behavior: New perspectives*. Ithaca, NY: Cornell University Press, 1979. Pp. 193-218.

The use of animal models has allowed only initial exploration of the complex nutritional variables and environmental factors that may contribute to the behavioral development of the organism. Other specific nutritional deficiencies in the developing monkey, including the effects of prenatal zinc restrictions and iron-deficiency anemia are currently being explored in the author's laboratory. The preliminary results indicate enough parallels between these deficiencies and protein malnutrition to suggest similar mechanisms of behavioral adjustment.

Pharmacology and Anesthesia

Immobilization of baboons (*Papio anubis*) using ketamine and diazepam. Woolfson, M. W., Foran, J. A., Freedman, H. M., Moore, P. A., Shulman, L. B., & Schnitman, P. A. (Harvard Implant-Transplant Res. Unit, Harvard Sch. of Dental Med., 188 Longwood Av., Boston, MA 02115) *Laboratory Animal Science*, 1980, 30, 902-904.

Ketamine (10 mg/kg body weight) was administered intramuscularly in 10 baboons (*Papio anubis*). Subsequently, a combination of ketamine (10 mg/kg body weight) and diazepam (7.5 mg) was administered

intramuscularly. Results indicated that using diazepam concurrently with ketamine suppressed or eliminated the epileptoid movements characteristic of anesthesia with ketamine used alone.

Thermoregulation in Telazol (CI-744)-anesthetized rhesus monkey (*Macaca mulatta*). Holmes, K. R., & Hunter, W. S. (Dept. of Vet. Biosci., Bioengineering Fac., Univ. of IL, Urbana, IL 62901) *American Journal of Physiology*, 1980, 239 (Regulatory Integrative Comparative Physiology, 8), R241-R247.

The results indicate that Telazol-anesthetized monkeys maintain thermal balance at ambient temperatures from 15 to 38°C, and that Telazol induces little or no impairment of thermoregulation in rhesus monkeys.

Facilities and Care

Wellcome Laboratories of Comparative Physiology. Hearn, J. P. *Journal of Zoology*, 1980, 190, 539-552.

The Wellcome Laboratories of Comparative Physiology form part of the Institute of Zoology. During the past two years work has concentrated on development of assay techniques for reproductive hormones and in applying these to study the reproductive physiology of primates and of animals in the Society's collection. In addition, successful breeding programs were initiated in four species of laboratory primate: the common marmoset, the owl monkey, the cotton-top tamarin and the red-mantled tamarin, each of which have unique and important attributes for medical research. Radioimmunoassays now in routine use allow the monitoring of reproductive function in male and female animals and will enable new projects to be initiated on the seasonal control of breeding, the prediction of oestrus and diagnosis of pregnancy, and the developmental and reproductive physiology of primates.

No reprints of this article are available; it is, however, contained in the Zoological Society of London's Scientific Report 1977-1979, which can be purchased from the Publications Department of that institution.

A guide to the maintenance of the cotton-top tamarin (*Saguinus oedipus*). Studd, R. T., & Rawlinson, J. T. (Central Public Hlth. Labs, London NW9 5HT, England) *Journal of the Institute of Animal Technicians*, 1979, 30, 55-62.

It is possible for a reasonably well organized animal establishment, with a few modifications to rooms and cages and some experimenting with diet, to cope with exotic animals like tamarins which require specialized husbandry. It is also important to study the behavior of such animals because some types of animals do better in captivity living in groups and others living singly.

Breeding

Copulation, dominance, and plasma androgen levels in adult rhesus males born and reared in the laboratory. Phoenix, C. H. (Oregon Reg. Prim. Res. Ctr., 505 Northwest 185th Av., Beaverton, OR 97006) *Archives of Sexual Behavior*, 1980, 9, 149-167.

The subjects were adult male rhesus macaques (N=22) that had been born and reared in the laboratory and had failed to ejaculate in standardized tests of sexual behavior in adulthood. As infants they had been given regular but limited social experience, and as juveniles and adults they had been housed in individual cages. The animals were released into an outdoor enclosure with adult females and their sexual behavior observed. In general, sexual performance of the males was found to be low. The results suggest that conditions of even "moderate social deprivation" are inappropriate for the establishment of a self-sustaining breeding program. Long-term housing in individual cages may have contributed to the low level of sexual performance, but comparable housing of wild-born male adults does not appear to have the same long-lasting and profound effect. Even minor social deprivation in the early developmental period and subsequent years of living in an individual cage might produce an interaction or summation effect that would result in the serious disruption of sexual behavior that we observed.

Induction of maternal-infant bonding in rhesus and cynomolgus monkeys after Cesarean delivery. Lindblad, E. G., & Hodgen, G. D. (G.D.H., Bldg. 18 Rm 101, NIH, Bethesda, MD 20205) *Laboratory Animal Science*, 1980, 30, 913.

Following Cesarean section, 5 infants were swabbed with secretions from their dams' vagina. All 5 infants were accepted and nursed by their dams. 11 other infants delivered by Cesarean section were not swabbed with vaginal secretions, and only one of the 11 infants was accepted and nursed by the dam.

Development of sexual behaviour in captive squirrel monkeys (*Saimiri*). Hopf, S. (Max-Planck-Inst. of Psychiatry, Dept. of Prim. Behav., D-8000 Munich 40 (B.R.D.)) *Biologie of Behaviour*, 1979, 4, 373-382.

The development of sexual behavior was studied in 32 captive squirrel monkeys. While 18 of them were born and raised in mixed-age groups comprising individuals of various ages, 14 lived in bisexual age-peer groups from early juvenile age onwards. An early stage of playful mounting, posturing, and thrusting is followed by gradual completion of adult sexual behavior with adult partners. Spermatogenesis and first conception precede full physical and behavioral maturity. In males, the age at first complete mating is about the same in both types of captive groups and in the wild. In the age-peer groups there was no reproductive success, despite mature mating. Fighting was also not observed.

Hand-rearing twin ruffed lemurs (*Lemur variegatus*) at the Duke University Primate Center. Cartmill, M., Brown, K., Eaglen, R., & Anderson, D. E. (Dept. of Anatomy, Duke Univ., Durham, NC 27710) *International Zoo Yearbook*, 1979, 19, 258-261.

Maternal and infant behavior in *L. variegatus* differs from that in other *Lemur* species and resembles the pattern found in cheirogaleines and galagos.

Breech birth of a chimpanzee (*Pan troglodytes*): A case report and literature review. Rushton, E., & McGrew, W. C. (Dept. of Psychol., Univ. of Stirling, Stirling, Scotland) *Journal of Medical Primatology*, 1980, 9, 189-193.

This paper reports the first record of breech birth in a great ape. This birth of a chimpanzee (*Pan troglodytes*), differs from breech births so far described for other nonhuman primates and shows some resemblance to human breech deliveries.

Ecology and Field Studies

Population change of the Hanuman langur (*Presbytis entellus*), 1961-1976, in Dharwar area, India. Sugiyama, Y., & Parthasarathy, M. D. (Primate Res. Inst., Kyoto Univ., Inuyama, Aichi 484, Japan) *The Bombay Natural History Society*, 1978, 75, 860-867.

The population density and the group composition of the Hanuman langurs (*Presbytis entellus*) was studied at Dharwar, South India, in 1976. For the purpose of comparison with a 1961 study of the same population, the present research was carried out in the same season using the same methods as used in 1961. The population decreased to 54.5% during these 15 years. The social characteristics of the species, however, did not change.

Notes on the yellow-tailed woolly monkey (*Lagorhrix flavicauda*) of Peru. Graves, G. R., & O'Neill, J. P. (Museum of Zool., Louisiana St. Univ., Baton Rouge, LA 70893) *Journal of Mammalogy*, 1980, 61, 345-347.

The authors report what they believe are the first observations on this species by naturalists in the last 50 years. Due to the excellent state of the forest and its relative isolation, *L. flavicauda* is probably not uncommon on the cloudy, forested slopes of the cordillera in the departments of Loreto, Amazonas, San Martin, and La Libertad. Yellow-tailed woolly monkeys are increasingly hunted for food as settlers move into the monkey's elevational range, and if not given protection, this species could quickly become rare and endangered.

Comments on the geographical distribution and status of the South Indian black leaf-monkey (*Presbytis johnii*). Oates, J. F. (Dept. of Anthrop., Hunter Coll. of CUNY, New York, NY 10021) *Mammalia*, 1979, 43, 485-493.

A review of available information suggests that the present distribution and abundance of *Presbytis johnii* are imperfectly known. There

have been no recent reports from several hill ranges in the Western Ghats where this leaf-monkey was certainly once present, but a survey of the Shevaroy Hills (Eastern Ghats) confirmed that *P. johnii* has not occurred there within living memory, contrary to some published statements. Although it is abundant in some areas, continuing habitat destruction and poaching make the future of *P. johnii* uncertain.

Instruments and Techniques

An identification system for primates in social groups. Spelman, F. A., Jones, R. J., Bowden, D. M., & Spillane, J. E. (Reg. Prim. Res. Ctr. SJ-50, Univ. of Washington, Seattle, WA 98195) *Physiology and Behavior*, 1980, 25, 147-149.

A system has been devised to identify monkeys in social groups. Identification is achieved by exciting a resonant circuit built into a plastic collar that is worn by the monkey and detecting the electromagnetic energy (260-705 kHz) that is retransmitted from the collar. The resonant circuit is completely passive and can be worn indefinitely. The system is rugged, and its excitation and detection electronics can survive in severe environments.

Noninvasive oscillometric measurement of blood pressure in baboons (*Papio cynocephalus*). Mitchell, D. S., Peel, H. H., Wigodsky, H. S., & Morris, M. D. (Dept. of Bioengineering, Southwest Res. Inst., 6220 Culebra Rd., San Antonio, TX 78284) *Laboratory Animal Science*, 1980, 30, 666-672.

The accuracy and reliability of noninvasive measurement of blood pressure in the forearms of baboons by means of an automated oscillometric method were evaluated. Comparisons of 255 oscillometric determinations of systolic, diastolic and mean arterial pressure in eight anesthetized animals with simultaneously taken direct radial artery pressure measurements revealed average differences and standard deviations of +0.14 (± 9.05), +4.34 (± 6.75), and -1.01 (± 5.84) Torr, respectively. Computation of statistical error bounds indicated that any single oscillometric reading could be expected to fall within 9.6%, 11.0% and 7.4% of directly measured systolic, diastolic, and mean blood pressure with a probability of 0.90. The oscillometric determinations accurately tracked rapid changes in pressure caused by intravenous infusion of pressor and depressor drugs. The method provided fast, reliable readings of arterial pressure without the use of microphones or other transducers that require precise placement and low-noise environments.

Vest and tethering system to accommodate catheters and a temperature monitor for nonhuman primates. Bryant, J. M. (Ani. Res. Div., US Army Med. Res. Inst. of Infec. Dis., Fort Detrick, Frederick, MD 21701) *Laboratory Animal Science*, 1980, 30, 706-708.

A vest and tethering system was constructed for nonhuman primates using leather and flexible metal conduit. The vest and tethering

system allowed monitoring of temperature and access for sampling or injecting venous and arterial blood vessels.

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UPCOMING PRIMATE MEETINGS

Fourth Meeting of the American Society of Primatologists

The fourth meeting of the American Society of Primatologists, hosted by the Southwest Foundation for Research and Education, will be held June 2-5, 1981, in San Antonio, Texas. The paper sessions, symposia, exhibits, and business meeting will take place at the Trinity University Conference Center in uptown San Antonio.

<u>Registration Fees</u>	<u>Before April 30</u>	<u>After April 30</u>
Regular members	\$25	\$35
Student members	\$20	\$25
Non-members	\$30	\$35
Guests	\$20	\$20

The registration fee covers the expenses of the meeting and in addition, includes a reception the first evening (Tuesday) and banquets on Wednesday and Thursday evenings. Individuals accompanying registered participants may obtain tickets for the social functions by registering as guests. The deadline for abstracts is February 15, 1981, and forms may be obtained by writing the local arrangements chairman. Registration fees should accompany abstracts. Checks for registration, made payable to the American Society of Primatologists, should be sent to the local arrangements chairman: Dr. Anthony M. Coelho, Department of Cardiopulmonary Disease, Southwest Foundation for Research and Education, PO Box 28147, San Antonio, TX 78284

IXth Congress of the International Primatological Society

August 8-13, 1982, in Atlanta, GA. See notice in this issue.

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WORKSHOP ON IDENTIFICATION OF ANIMAL MODELS OF INBORN ERRORS OF METABOLISM

A Workshop on "Identification of Animal Models of Inborn Errors of Metabolism" will be held at the National Institutes of Health, Bethesda, MD on October 19 and 20, 1981. It is being sponsored by the Registry of Comparative Pathology of the Armed Forces Institute of Pathology and by the Universities Associated for Research and Education in Pathology, Inc. The purpose of the Workshop is to prescribe precise diagnostic clinical and chemical parameters for the identification of inborn errors of metabolism in animals. Topics to be discussed include: Gene Organization and Expression, Biochemical Variation and Comparative Gene Mapping, From Phenotype to Genotype, Epidemiologic and Family Studies, Biochemical Screening, Therapy of Genetic Diseases, Collagen Diseases, Mucopolysaccharidoses, Immunodeficiency Diseases, MHC (HLA) and Disease, and Endocrine Deficiency. In addition, there will be a poster session, and on the concluding day of the Workshop there will be an opportunity for a limited number of interested participants to present short papers. Anyone desiring to present a paper should submit a 200-word abstract for consideration by May 1, 1981 to Dr. George Migaki, Registry of Comparative Pathology, Armed Forces Institute of Pathology, Washington, DC 20306. The Workshop will be open for at least 100 participants on a "first come" basis. Anyone interested in attending should also contact the above.