

LABORATORY PRIMATE NEWSLETTER

Volume 15, Number 4

October, 1976



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Published Quarterly by the Primate Behavior Laboratory
Psychology Department, Brown University
Providence, Rhode Island

POLICY STATEMENT

The purpose of the *Laboratory Primate Newsletter* is (1) to provide information on care, breeding, and procurement of nonhuman primates for laboratory research, (2) to disseminate general information about the world of primate research (such as announcements of meetings, research projects, nomenclature changes), (3) to help meet the special research needs of individual investigators by publishing requests for research material or for information related to specific research problems, and (4) to serve 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. New issues are mailed free of charge in the United States. Persons outside of the U. S. A. are requested to pay \$1.50 per year to cover the additional cost of mailing. Back issues may be purchased for \$1.00 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 and notes 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 publications, 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* the scientific names used will be those of Napier and Napier [*A Handbook of Living Primates*. New York: Academic Press, 1967].

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ACKNOWLEDGMENT

The *Newsletter* is supported by U. S. Public Health Service
Grant RR-00419 from the Animal Resources Branch,
Division of Research Resources, N.I.H.

Cover drawing compliments of Janet Miyo Kato

Managing Editor: Helen Janis Shuman

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INFORMATION ON *MACACA FASCICULARIS*
AS A LABORATORY ANIMAL

To assist scientists considering utilization of the crab-eating macaque (*M. fascicularis*) as a research subject, the Primate Information Center has recently issued three special publications.

Hematologic and blood chemical values for Macaca fascicularis tabulated from the literature contains thirteen tables covering erythrocytes and leukocytes, hemoglobin, bilirubin, cholesterol, electrolytes, enzymes, glucose, proteins, urea nitrogen, uric acid, arterial gases, and coagulation. The volume of information available on any of these variables is not sufficient to provide a baseline or control for experimental studies, but does provide a frame of reference for considering the species' suitability.

Macaca fascicularis: A bibliography of research. Part I. 1970-1974 and Part II. 1974-1975 contain 1280 citations from many areas of research, including management in laboratory colonies, plus topical indexes. An Appendix in each Part indicates which articles also deal with the rhesus monkey (*M. mulatta*), so that scientists familiar with this species can assess the comparative experiences of others.

In addition, bibliographies covering earlier (1940-1969) literature on individual topics involving *M. fascicularis* are available through the Information Center's custom, Retrospective Bibliography service. Citations processed after Part II was completed are available through the bi-weekly Recurrent Bibliography service.

The Primate Information Center receives support from the Animal Resources Branch, Division of Research Resources, National Institutes of Health, through the Regional Primate Research Center at the University of Washington, but this subsidy is no longer sufficient to cover all direct costs of services. The supplemental fees for the services described above are: Blood tabulation, \$3; Part I of bibliography, \$10; and Part II of bibliography, \$4. If all three are ordered simultaneously, the price is \$15.50 for the set. A Retrospective Bibliography is \$15 for 1965-1969 or \$30 for 1940-1969. The fee for a Recurrent Bibliography is \$15 a year. Checks should be made payable to the "University of Washington" and sent to: Primate Information Center (SJ-50), University of Washington, Seattle, Washington 98195. Institutional orders should be sent to the latter address.

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LABORATORY PRIMATE NEWSLETTER QUARTERLY SURVEY:
FIRST QUARTER OF 1976

The present report is one of a series summarizing data from the quarterly surveys being conducted by the *Laboratory Primate Newsletter*. The data in Tables 1 and 2 are based on reports from the following facilities: California, Delta, New England, Oregon, Washington (including Field Station), Wisconsin, and Yerkes Regional Primate Research Centers, Laboratory for Experimental Medicine and Surgery in Primates, National Institutes of Health, and the Southwest Foundation for Research and Education. (See the January and April, 1976 issues for previous survey reports.)

TABLE 1. MORTALITY SUMMARY BY SYSTEM. JANUARY 1, 1976-MARCH 31, 1976^a

SPECIES	Generalized	Integumentary	Musculoskeletal	Respiratory	Cardiovascular	Digestive	Urogenital	Nervous	Endocrine	Neoplasia	Trauma	Unspecified
<i>Gorilla gorilla</i>						1						
<i>Pan troglodytes</i>	4			1								
<i>Macaca arctoides</i>	1					3					1	2
<i>M. cyclopis</i>	1			2		3					1	6 ^e
<i>M. fascicularis</i>				4	1	2	2		1		3	29 ^f
<i>M. fuscata</i>				1								
<i>M. mulatta</i>	16	2		38 ^b	1	27 ^c	7 ⁱ	10		1	7	32 ^{d,j}
<i>M. nemestrina</i>	6			10		16	168	1			11	21 ^h
<i>M. niger</i>	2			1		1						
<i>M. radiata</i>						2						6
<i>Erythrocebus patas</i>	1											
<i>Cercopithecus aethiops</i>				2		2						
<i>Papio</i> Sp.		1		2	2	1	1	1			2	4 ^e
<i>P. cynocephalus</i>				1		1						6 ^e
<i>Saimiri sciureus</i>	8			3		2	3				2	14 ^k
<i>Ateles geoffroyi</i>	1			2								2
<i>Cebus</i> Sp.											1	6 ^e
<i>Aotus trivirgatus</i>	6			1			2				1	8
<i>Callicebus moloch</i>				1								
<i>Saguinus oedipus</i>	1											
<i>S. nigricollis</i>	2											4
<i>Galago crassicaudatus</i>	1											
<i>G. argentatus</i>	1											
<i>Lemur fulvus</i>						1						
Totals	51	3		69	4	62	31	12	1	1	32	140

^aIncludes one report for 1/28/76 through 4/27/76

^bIncludes 14 cases with tubercular lesions (all positive reactors)

^cIncludes 3 cases of esophagostomum infestation

^dIncludes 1 hematology case, 2 nutritional cases, 2 iatrogenic cases, and 1 study related

^eAll study related

^fIncludes 21 study related

^gIncludes 4 abortions, 7 stillbirths, 2 Cesaereans

^hIncludes 18 study related

ⁱIncludes 3 abortions

^jIncludes 13 study related

^kIncludes 2 study related

TABLE 2. CENSUS, NUMBER OF BIRTHS, AND MORBIDITY SUMMARY BY SYSTEM:
JANUARY 1, 1976-MARCH 31, 1976^a

SPECIES	Census	Births	Generalized	Integumentary	Musculoskeletal	Respiratory	Cardiovascular	Digestive	Urogenital	Nervous	Endocrine	Neoplasia	Trauma	Unspecified
<i>Gorilla gorilla</i>		3		1	1			2						
<i>Pan troglodytes</i>	369	10	3	1		13	1	165	1	1			4	4
<i>Pongo pygmaeus</i>	37	1	1		1	2		24					1	
<i>Hylobates</i> spp.													2	
<i>Macaca arctoides</i>	299	13		6	2	7	1	34	6				7	10
<i>M. cyclops</i>	84	3												
<i>M. fascicularis</i>	638	69		1		1		4	2				4	4
<i>M. fuscata</i>	200	1						2						
<i>M. mulatta</i>	5682	92	6	190	86	125 ^b	25	518 ^c	103 ^d	7	1		98	116
<i>M. nemestrina</i>	967	48	1	5	15			73	10			1	58	3
<i>M. niger</i>	83	5		2	1	1		11						1
<i>M. radiata</i>	295	6		9	2	10		36	6	6				6
<i>M. hybrids</i>	27	1												
<i>Erythrocebus patas</i>	43	1			1			2	1					1
<i>Cercocebus atys</i>	42													
<i>Cercopithecus aethiops</i>	53		32	4				5					11	1
<i>C. talapoin</i>													1	
<i>Papio</i> sp.	1120	25	15	9			8	15		6			60	22
<i>Papio anubis</i>	41													
<i>P. cynocephalus</i>	111													
<i>P. papio</i>	74	1		4	2	2		14	1					5
<i>Mandrillus sphinx</i>		1												
<i>Saimiri sciureus</i>	822		2		1	1		10	1				10	1
<i>Ateles geoffroyi</i>					1	1								
<i>Cebus</i> sp.	167													
<i>Aotus trivirgatus</i>	159	3							2					
<i>Calliebus moloch</i>		1												
<i>Saguinus oedipus</i>	63	2												
<i>S. nigricollis</i>	49	3		2			1	7	1					6
<i>S. spp.</i>	81	1												
<i>Lemur fulvus</i>	76	1			1			2	4					
<i>L. oatta</i>	63			4	2	1								
<i>L. macaca</i>		1			4									
<i>L. mongoz</i>				4										
<i>Galago crassicaudatus</i>	1118	1						1					1	
<i>G. argentatus</i>	32	2												
Totals	12,795	295	60	242	120	164	36	925	138	14	7	1	257	180

^aThe morbidity data include the Field Station of the Washington Center, but not the Seattle Colony.

^bIncludes 14 positive TB reactors.

^cIncludes 23 cases positive for shigella, 5 salmonella, and 2 rectal prolapses.

^dIncludes 17 abortions in newly imported animals.

NEW DIRECTOR OF NEW ENGLAND REGIONAL PRIMATE RESEARCH CENTER

Dr. Ronald D. Hunt has been appointed director of the New England Regional Primate Research Center, it was announced by Director Dr. Thomas G. Bowery of the Division of Research Resources, National Institutes of Health. His appointment was effective July 1, 1976. Dr. Hunt succeeds the retiring Dr. Bernard F. Trum, the original director of the Center.

Dr. Hunt has been associated with the Center since its inception. A veterinarian and Diplomate of the American College of Veterinary Pathologists, Dr. Hunt received his doctorate at the University of California, Davis, and holds a joint faculty position as associate professor of pathology at Harvard University. His research has been directed toward herpes virus infections and metabolic bone diseases in primates.

The author or co-author of over 100 papers, Dr. Hunt has been the recipient of the American Association for Laboratory Science Research Award for the most outstanding paper published in *Laboratory Animal Care* in 1967, 1969, and 1973.

In collaboration with his colleagues at the New England Primate Research Center, he reported in his 1967 award-winning paper that the injection of a virus originating in squirrel monkeys into other species, such as marmosets and owl monkeys, would produce cancer. The malignancy was described by Dr. Hunt as being characterized by invasion and replacement of most organs and tissues in the body by neoplastic (abnormal) cells, and in many animals the occurrence of leukemia.

Dr. Hunt and his co-workers received the Award for work on oncogenic viruses in 1969, and on filariasis in 1973.

Dr. Hunt started his career in 1959 as a veterinarian in the U.S. Army Veterinary Corps at the Armed Forces Institute of Pathology. He was later commissioned as captain and re-assigned as assistant chief of the Pathology Division in the U.S. Army Research and Nutrition Laboratory in Denver, Colo. He became associated with the New England Primate Research Center as a research fellow in pathology upon the establishment of the Center in 1963. He is currently the chairman of the Comparative Pathology Department at the Center, and also associate director of the Animal Research Center of the Harvard Medical School.

He has been associate editor of *Laboratory Animal Care*, a lecturer in nutritional pathology for the Massachusetts Institute of Technology, and an affiliate pathologist at the Angell Memorial Animal Hospital.

Currently a member of the subcommittee on laboratory animal nutrient requirements for the National Research Council, National Academy of Sciences, he is also the co-author of *Veterinary Pathology*, a well-known reference book on training now in its fourth printing.

NEW EXECUTIVE SECRETARY OF NIH PRIMATE RESEARCH
CENTERS ADVISORY COMMITTEE

Dr. Dennis O. Johnsen recently joined the National Institutes of Health's (NIH) Division of Research Resources Animal Resources Program as executive secretary of the Primate Research Centers Advisory Committee and the Animal Resources Advisory Committee. As executive secretary, Dr. Johnsen arranges for these two groups of non-governmental consultants to review grant applications and project proposals.

The Division's Animal Resources Program provides, on a nationwide basis, animal resources for medical research and training of health scientists. An important facet of the program is to ensure humane conditions for research animals.

The Primate Centers Advisory Committee is responsible for scientific review of the core grants that support the seven regional primate research centers, as well as for review of other NIH grants involving primates. The Animal Resources Advisory Committee performs the initial scientific review of grants involving the institutional laboratory animal program, the development of laboratory animal models, laboratory animal diagnostic projects, and research and training in laboratory animal medicine.

Dr. Johnsen comes to NIH from the U.S. Army's Medical Research and Development Command, which incorporates the Army's research animal program. He was chief of veterinary medicine and animal resources at installations in Natick, Massachusetts, San Francisco, California, and Bangkok, Thailand. At these installations, Dr. Johnsen concentrated on providing laboratory animal resources and support for an array of projects.

Born in Santa Monica, California, Dr. Johnsen received both his B.S. degree in Veterinary Science and D.V.M. degree at the University of California, Davis. He later attended Ohio State University, Columbus, for his M.S. Degree in Veterinary Medicine.

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DEATH OF PROFESSOR ADOLPH H. SCHULTZ ANNOUNCED

Zürich, May 28, 1976.--The University of Zürich announced that Professor Emeritus Dr. Adolph H. Schultz died on May 26, 1976 at the age of 86. Professor Schultz was a lecturer at The Johns Hopkins University from 1925-1951. In 1951, he became Ordinarius for Anthropology and Director of the Anthropological Institute at the University of Zürich. Even after age compelled his retirement in 1962, Professor Schultz remained very active in research. The University will remember with gratitude this distinguished scholar and outstanding personality.

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DATE OF MARMOSET CONFERENCE SET

The conference on "Marmosets in Experimental Medicine", described in the July, 1976 issue of this *Newsletter* (page 9), will be held at Oak Ridge Associated Universities, Oak Ridge, Tennessee on March 16, 17, and 18, 1977. Those interested in participating should contact Dr. N. Genzozian, Medical and Health Sciences Division, Oak Ridge Associated Universities, Oak Ridge, TN 37830.

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MALE SQUIRREL MONKEYS WANTED FOR BREEDING COLONY

Two or three adult male, Colombian stock ("Letician" type) squirrel monkeys (*Saimiri sciureus*) are urgently needed for our breeding colony. Ideally, we would like to purchase feral-born males, 5-8 years old, weighing not less than 950 grams, and with proven success as breeders. They should have a laboratory history of nonexperimental use. However, less ideally, we are willing to consider nonferal males that have had continuous social group experience from birth, that are at least four years old, and that weigh at least 900 grams.--Dr. R. Charles Boelkins, Department of Nutrition, Harvard University School of Public Health, 665 Huntington Av., Boston, MA 02115 (Phone: 617-734-3300).

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SLOW LORIS WANTED

Three male, adult slow lorises (*Nycticebus coucang*) wanted for research on the endocrine basis of their low metabolic rate.--G. Causey Whittow, Department of Physiology, School of Medicine, University of Hawaii, Honolulu, HI 96822.

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PRIMATE CHAIR FOR SALE

One modified primate restraining chair and experimental stand originally made by BRS Foringer are for sale. Their catalogue numbers and names are PC-001 rhesus chair for physiological research and ESC-003 experimental stand with a stainless steel waste pan to catch excreta. The top plate of the chair has been split and hinged with stainless steel piano hinge to allow better adjustment for the monkey's normal hunched sitting posture. Other minor improvements also included. Photo of chair is available on request. Price \$350 or best offer. New price is approximately \$700.--Michael Punchekunnel, Eye Research Institute, 20 Staniford St., Boston, MA 02114 (Phone: 617-742-3140).

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HAZLETON LABORATORIES CORPORATION ACQUIRES PRIMELABS, INC.

Mr. Donald P. Nielson, President of Hazleton Laboratories Corporation, Vienna, Virginia and Mr. Manmohan S. Rai, President of PrimeLabs, Inc., Farmingdale, New Jersey, have announced the acquisition of PrimeLabs by Hazleton Laboratories Corporation. PrimeLabs, Inc. is a major U.S. importer and distributor of nonhuman primates used for scientific research and testing programs. Hazleton Laboratories America, Inc., a subsidiary of Hazleton Laboratories Corporation, breeds nonhuman primates at facilities in Vienna, Virginia and Alice, Texas.

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PRIMATE PINEAL AND PITUITARY GLANDS WANTED

We are conducting a study of methoxyindoles in pineal glands. We would appreciate about four pineal and pituitary glands from different species of normal primates each collected individually and stored in 0.5-1 ml methanol in the deep freeze.--Ivor Smith, Courtauld Institute of Biochemistry, The Middlesex Hospital, Medical School, London, W1P 5PR, England.

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

Books

First Inter-American Conference on Conservation and Utilization of American Nonhuman Primates in Biomedical Research. Washington, D.C.: Pan American Health Organization/World Health Organization, 1976. (Scientific Publication No. 317). Soft cover, 252 pp. [Price: \$8.00; order from: Pan American Health Organization/World Health Organization, 525 Twenty-Third St., N.W., Washington, D.C. 20037]

This conference was held in Lima, Peru, June 2-4, 1975. The contents include the keynote address, entitled "Importance of American nonhuman primates in human health and biomedical research," by P. C. Zamecnik, a summary of the conference by J. R. Held, and the recommendations of the conference. The remainder of the contents are as follows: TOPIC I: PRIMATOLOGY. Nonhuman primates of the American continent, by F. D. de Ávila-Pires; The systematics of New World monkeys, by R. W. Thorington, Jr.; Census of primates in Peru, by M. K. Neville; Primates and their habitats in northern Colombia with recommendations for future management and research, by N. J. Scott, Jr., T. T. Struhsaker, K. Glander, & H. Chiriví; Primate husbandry and reproduction, by F. G. García; The importance of rearing marmoset monkeys in captivity for conservation of the species and for medical research, by F. Deinhardt, L. Wolfe, & J. Ogden. TOPIC II: IMPORTANCE OF AMERICAN NONHUMAN PRIMATES IN BIOMEDICAL RESEARCH. Natural history of Herpesvirus T and *H. saimiri* in South American monkeys, by L. V. Meléndez; Studies on the viruses of subacute spongiform encephalopathies using primates, their only available indicator, by C. J. Gibbs, Jr. & D. C. Gajdusek; Infectious hepatitis (Hepatitis A) research in nonhuman primates, by M. R. Hilleman, P. J. Provost, V. M. Villarejos, E. B. Buynak, W. J. Miller, O. L. Ittensohn, B. S. Wolanski, & W. J. McAleer; South American primates and cancer research, by D. S. Yohn & J. Hammond; Atherosclerosis in New World monkeys, by T. B. Clarkson; Epidemiology of simian malaria in the American continent, by L. de Mello Deane; Chemotherapy of malaria in South American monkeys, by W. E. Rothe; Synopsis of the pathology of New World monkeys, by N. W. King, Jr.; The use of primates in the testing and control of biologics and drugs, by H. M. Meyer, Jr. TOPIC III: ECOLOGY AND NATURAL RESOURCES. Non-human primates as a natural resource, by M. Moro S.; Guidelines for the

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, University of Washington. 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. Any author wishing to have a published paper abstracted in this section may do so by sending the Editor a copy of the reprint with a summary or abstract and indicating his desire on the reprint.

conservation of primates in Peru, by N. Castro R.; Essential policy guidelines for the conservation and utilization of non-human primates in Colombia, by M. M. Quevedo; International requirements for nonhuman primates in medical research, by R. A. Whitney, Jr.

Neotropical Primates: Field Studies and Conservation. R. W. Thorington, Jr. & P. G. Heltne (Eds.). Washington, D. C.: National Academy of Sciences, 1976. Soft cover, 135 pp. [Price: \$10.25]

The proceedings of a symposium on the "Distribution and Abundance of Neotropical Primates," held in August 1972 in Seattle, Washington. The Symposium was sponsored by the Battelle Seattle Research Center and the Institute of Laboratory Animal Resources, National Research Council. Contents: Introduction, by R. W. Thorington, Jr. & P. G. Heltne; Censusing *Alouatta palliata*, *Ateles geoffroyi*, and *Cebus capucinus* in the Costa Rican dry forest, by C. Freese; Comparison of census data on *Alouatta palliata* from Costa Rica and Panama, by P. G. Heltne, D. C. Turner, & N. J. Scott, Jr.; Primate populations in Chiriqui, Panama, by J. D. Baldwin & J. I. Baldwin; Movements of a wild night monkey (*Aotus trivirgatus*), by R. W. Thorington, Jr., J. A. Muckenhirn, & G. G. Montgomery; The nonhuman primates of Colombia, by J. Hernandez-Camacho & R. W. Cooper; Neotropical primates: Aspects of habitat usage, population density, and regional distribution in La Macarena, Colombia, by L. L. Klein & D. J. Klein; Notes on the ecology and behavior of the pygmy marmoset (*Cebuella pygmaea*) in Amazonian Colombia, by M. Moynihan; The nonhuman primate trade in Colombia, by K. M. Green; Addendum to the nonhuman primate trade in Colombia, by N. A. Muckenhirn; The population and conservation of howler monkeys in Venezuela and Trinidad, by M. Neville; Problems and potentials for primate biology and conservation in the New World, by P. G. Heltne & R. W. Thorington, Jr.

Atherosclerosis in Primates. Jack P. Strong (Ed.). (*Primates in Medicine*. Vol. 9) Basel: Karger, 1976. 388 pp. [Price: \$69.50]

Contents: Atherosclerosis in primates. Introduction and overview, by J. P. Strong; Atherosclerosis in rhesus and cynomolgus monkeys, by M. L. Armstrong; Experimental atherosclerosis in the baboon, by H. C. McGill, Jr., G. E. Mott, & C. A. Bramblett; Atherosclerosis in Old World monkeys, by T. B. Clarkson, T. E. Hamm, B. C. Bullock, & N. D. M. Lehner; Atherosclerosis in New World monkeys, by T. B. Clarkson, N. D. M. Lehner, B. C. Bullock, H. B. Lofland, & W. D. Wagner; Arterial metabolism in primates, by O. W. Portman & D. R. Illingworth; Circulation lipoproteins in nonhuman primates, by L. L. Rudel & H. B. Lofland; Cholesterol metabolism in nonhuman primates, by D. A. Eggen; Reversibility of fatty streaks in rhesus monkeys, by J. P. Strong, D. A. Eggen, & H. C. Stary; Coronary artery fine structure in rhesus monkeys: Nonatherosclerotic intimal thickening, by H. C. Stary & J. P. Strong; Coronary artery fine structure in rhesus monkeys: The early atherosclerotic lesion and its progression, by H. C. Stary.

Nonhuman Primates in Biomedical Research. William Montagna. (*The Wesley W. Spink Lectures on Comparative Medicine*. Vol. 3) Minneapolis: University of Minnesota Press, 1976. 147 pp. [Price: \$9.50]

This introduction to nonhuman primates, their biology and behavior, focuses on the utility and importance of these animals in biomedical research. The author begins with a general discussion of the selection of animals suited for specific experiments, then proceeds to a review of the primates, their evolution, distribution, diversification, and biological properties. There are two accounts of behavior: the first deals with behavioral patterns in general; the second discusses behavioral patterns within a society as exemplified by studies of natural troops of Japanese macaques. The final section gives examples of diseases that are common to monkeys and man: tumors, arterial disorders, cholesterol gallstones, diabetes mellitus, yellow fever, malaria, and tuberculosis. In this connection the author emphasizes the ways in which investigators have used monkeys to better understand the course of the diseases, and to develop therapeutic measures to combat them. There is a foreword by Sherwood L. Washburn.

Taxonomy and Evolution of Liontail and Pigtail Macaques (Primates: Cercopithecidae). Jack Fooden. (*Fieldiana: Zoology*. Vol. 67) Chicago: Field Museum of Natural History, 1975. Soft cover, 169 pp.

A revised taxonomy of pigtail and liontail macaques based on a study of 462 museum specimens and a review of relevant literature, including that dealing with blood proteins, comparative ecology and behavior, hybridization, and fossil records.

Die Gesichtsmuskeln. Rolf Seiler (Ed.). (*Primatologia*. Vol. IV, No. 6) Basel: Karger, 1976. Soft cover, 252 pp. [Price: \$62.25]

This is a treatise on the facial muscles of nonhuman primates, ranging from prosimians to apes. The book deals with the general organization of the facial musculature, nomenclature, the phylogeny and ontogeny of these muscles, and their innervation and function. The specific findings for a large number of species are described.

Primate Research. James Augustine and William J. Goodwin (Eds.) (*Federation of American Societies for Experimental Biology Monographs*. Vol. 6) New York: Plenum, 1976. 122 pp.

All of the material contained in the book originally appeared in *Federation Proceedings*, 1975, 34. The book contains a detailed history and explanation of the seven National Institutes of Health Regional Primate Research Centers by the editors, and eleven papers on non-human primate studies conducted by researchers at the centers. The subjects reported on are melanoma and leukemia associated antigens, cytogenetics of the squirrel monkey, fetal hormone effect on the central nervous system, immunology of borreliosis, effects of certain drugs on pregnant monkeys, marijuana use, ozone exposure, polychlorinated biphenyl exposure, cyclical changes in the sexual skin of the female rhesus monkey, endocrine and metabolic responses to

cold, and immunological and morphologic effects of vasectomy in the rhesus monkey.

Reports and Catalogs

Laboratory Non-Human Primates for Biomedical Research in the United Kingdom: A Report to the Medical Research Council on the Existing Provision and Future Needs. K. R. Hobbs and J. Bleby. Carshalton: Medical Research Council Laboratory Animals Centre, 1976. Soft cover, 59 pp. [Available free of charge from: Medical Research Council Laboratory Animals Centre, Woodmansterne Rd., Carshalton, Surrey SM5 4EF, U. K.]

Breeding primates needed for biomedical research in the United Kingdom, rather than importing them, is recommended in this report which presents the findings of a survey carried out in 1969-71. During the period of the survey approximately 10,000 primates were used annually in the U. K. Of these, 99% came from the wild and 94% were of seven species. The supply of these and other potentially useful species is now limited both by export bans and by the clearing of the animals' habitats for farming and urbanization. The report stresses that trapped wild primates invariably carry parasites and infectious diseases which may vitiate experimental work and be communicable to man. The authors conclude that primates should be bred in the U. K. by specialized commercial breeders, accredited under a voluntary scheme run by the LAC, which monitors their colonies for good husbandry and freedom from disease.

Catalogue of Primates in the British Museum (Natural History). Part I. *Families Callitrichidae and Cebidae.* Prudence Hero Napier. London: British Museum (Natural History), 1976. Soft cover, 121 pp. [Price: £6]

This catalogue lists all the specimens of New World monkeys and marmosets (superfamily Ceboidea) in the collection of the British Museum (Natural History) and is complete up to the end of 1974. (The text, written in 1971, has only been slightly modified since that time.) Fossil specimens of this group are included, but in practice this amounts to only a very few subfossils of extant species. The greater part of the collection is in the form of study skins and skulls, but the catalogue also includes the smaller collections of skeletons and wet-preserved specimens. All the available data on these specimens have been entered into a computer-based retrieval system, and this published catalogue presents a selection of the more important items of information for each specimen.

Disease

Infectivity studies of hepatitis A and B in non-human primates. Maynard, J. E., Krushak, D. H., Bradley, D. W., & Berquist, K. R. (Bur. of Epidemiology, Ctr. for Dis. Cont., Phoenix, AZ 85014) *Developments in Biological Standardization*, 1975, 30, 229-235.

Hepatitis A was induced in marmosets of the subspecies *Saguinus mystax* following primary inoculation with human serum containing the MS-1 strain of hepatitis A virus (HAV) and in 3 further marmoset subpassages using infective marmoset serum from each preceding passage. In each passage acquisition of serum antibody against 27 nm virus-like particles recovered from acute illness stools of human volunteers who developed hepatitis following inoculation with the MS-1 strain of HAV, as well as from acute illness stools of hepatitis A cases from a common source epidemic of hepatitis A in Arizona could be demonstrated by immune electron microscopy (IEM). Particle-containing stool filtrates from the latter epidemic also induced hepatitis in chimpanzees after intravenous inoculation. Inoculation of partially purified particles from a single banding in CsCl₂ has further resulted in the induction of hepatitis in *S. mystax* marmosets. Hepatitis was successfully induced in a series of chimpanzees inoculated with sera containing hepatitis B surface antigen (HB_sAg) of varying subspecificities. Susceptibility appears universal in animals who are initially lacking in serum antibody (anti-HB_s) and antibody induced following experimental infection is homologous in subspecificity to the subspecificities of the antigenic coat components of the HB_sAg in the inoculum. Results of cross challenge experiments indicate that animals developing hepatitis following inoculation of HB_sAg of one subspecificity set in the d/y-w/r system do not again develop hepatitis following inoculation with HB_sAg of the alternate subspecificity set.

Behavior

An ethogram for *Lemur fulvus*. Vick, L. G. & Conley, J. M. (Univ. of North Carolina, Chapel Hill, NC 27514) *Primates*, 1976, 17, 125-144.

As a result of over 2000 hours of observation of two captive *Lemur fulvus* groups, their social behavior are provisionally described and categorized. Characteristic postures, greeting, agonistic, maternal, and play behaviors are described.

An ethogram of the common marmoset (*Callithrix jacchus jacchus*): General behavioural repertoire. Stevenson, M. F. & Poole, T. B. (Dept. of Zoology, Univ. Coll. of Wales, Aberystwyth, SY23 3DA, United Kingdom) *Animal Behaviour*, 1976, 24, 428-451.

The behavioral repertoire of four captive breeding pairs of *Callithrix jacchus jacchus* is described. Social communication took the form of postures, facial expressions, vocalizations and piloerection displays. Detailed analyses were made of piloerection displays, adult play, copulatory, aggressive, and prey-catching behavior. Aggressive behavior was uncommon in adult mated pairs. Play between adults showed a degree of temporal organization. Vocalizations were the main methods of intragroup communication while piloerection displays were directed towards members of other groups and also to unfamiliar objects. The behavioral repertoire of *C. jacchus jacchus* is compared with that of other primates.

Pharmacology and Anesthesia

Tilazol (CL-744): A new agent for chemical restraint and anesthesia in nonhuman primates. Eads, F. E. (Parke Davis & Co., Detroit, MI 48232) *Veterinary Medicine/Small Animal Clinician*, 1976, 71, 648-652.

Tilazol appears to be an extremely promising anesthetic agent when used intramuscularly in nonhuman primates. Its advantages include small-volume dose requirements, ease of administration, rapid induction, dose-related restraint ranging from chemical immobilization to cataleptoid anesthesia, excellent muscular relaxation at higher doses, retention of laryngeal and pharyngeal reflexes, a wide safety margin, and an unremarkable recovery.

Care and Breeding

Infant mortality in *Macaca nemestrina*: Neonatal and post-neonatal mortality at Regional Primate Research Center Field Station, University of Washington, 1967-1974. Dazey, J. & Erwin, J. (Reg. Prim. Res. Ctr. SJ-50, Univ. of Washington, Seattle, WA 98195) *Theriogenology*, 1976, 5, 267-279.

1,174 *Macaca nemestrina* live births that were recorded at the Regional Primate Research Center Field Station, 1967-1974, were used to calculate neonatal and postneonatal infant mortality rates. The neonatal mortality rate (death on or before the thirtieth day of life) was 15.72%, and the post-neonatal mortality rate (death between 31 and 183 days of life) was 15.53%. Virtually all births occurred in harem groups housed indoors at the RPRC Field Station.

Age of menarche in pigtail monkeys (*Macaca nemestrina*): Gross sectional survey of perineal tumescence. Erwin, N. & Erwin, J. (Regional Primate Res. Ctr. SJ-50, Univ. of Washington, Seattle, WA 98195) *Theriogenology*, 1976, 5, 261-266.

A four-month survey of perineal tumescence in 131 young female pigtail monkeys (*Macaca nemestrina*) revealed that most females had begun to swell by the time they were 3 years old. Those that had not begun to swell by that time were generally of lower weight than their peers. Those that tumesced before they were 3 years old tended to be heavier than their peers, but were not necessarily heavier than older, non-swelling females.

Birth and breeding cyclicity in an outdoor living stumptail macaque (*Macaca arctoides*) group. Estrada, A. & Estrada, R. (Inst. de Investigaciones Biomed., Univ. National Autonoma de Mexico, Apartado Postal 70228, Mexico 20, D. F.) *Primates*, 1976, 17, 225-231.

Birth records were examined for a group of 56 stumptail macaques that lived in an half-acre outdoor enclosure from 1971 to 1974. Approximate conception times for 33 offspring were calculated. Although births occurred throughout the year, 48.5% of these took place between June and September with a peak in July and August (39.4%). Two secondary peaks, one between February and April (27.3%) and the other in November (12.1%) were noted. Fertile matings also took place

throughout the year but 56.6% were concentrated between January and June with a peak in January and February (30.3%). A secondary peak were observed for September (12.1%). The data show that no discrete seasonality in matings and births is present for *Macaca arctoides* but that an unusual pattern consisting of three peaks throughout the year, for births, may be typical of the species.

Studbook of *Pan paniscus* (Schwarz, 1929). Gijzen, A. (Nachtegaalstraat 42, Antwerp, Belgium) *Acta Zoologica et Pathologica Antverpiensia*, 1974, 61, 119-164.

On the basis of information provided by various zoos who have, or used to have, *Pan paniscus* in their collections, as well as information in the *International Zoo Yearbook* or in the literature, an approximate outline has been given of our knowledge of this animal since the description given in 1929 by Schwarz. The status of species is preferred to that of subspecies. The question whether the bonobo should be regarded as a true dwarf form is considered. It is, however, emphasized that the majority of researchers--and for different reasons--consider the species to be the primate closest to man.

Monographs, reviews and symposia on reproduction and breeding in nonhuman primates: A bibliography with systematic index, 2nd ed. (Primate Information Center, Reg. Prim. Res. Ctr. SJ-50, Univ. of Washington, Seattle, WA 98195) Seattle, privately published, 1976, 7 pp.

Sex determination of the lesser bushbaby (*Galago senegalensis*). Haines, D. E., Holmes, K. R., & Carmichael, S. W. (Dept. of Anatomy, W. Virginia Univ., Sch. of Med., Morgantown, WV 26506) *Laboratory Animal Science*, 1976, 26, 430-435.

The gross anatomy of the external genitalia of newborn to adult lesser Galago was described. The penis is perpendicular to the body wall at birth and by about 8 weeks of age the testes have descended into the scrotum. In the adult male the testes are permanently descended, the scrotum sessile, the penis is oriented obliquely rostral, and the genitalia are covered by luxuriant pelage. In the young female, the clitoris is also perpendicular to the body wall and the labia and vaginal orifice, although not obvious, are located at its caudal base. In the adult female, the clitoris remains perpendicular, is slender, essentially devoid of fur, and has the urethral opening in its tip. The labia and vaginal orifice are at its caudal base, obscured by fur. Effective and reliable methods for differentiating males from females are outlined.

Diagnosis of pregnancy in marmosets: Hemagglutination inhibition test and radioimmunoassay for urinary chorionic gonadotropin. Hodgen, G. D., Wolfe, L. G., Ogden, J. D., Adams, M. R., Descalzi, C. C., & Hildebrand, D. F. (Section of Endocrinology, Reproduction Res. Br., Auburn-203, National Institute of Child Health and Human Development, Bethesda, MD 20014) *Laboratory Animal Science*, 1976, 26, (Part I), 224-229.

The Subhuman Primate Pregnancy Test kit was used for diagnosis of

pregnancy in 17 marmosets. This hemagglutination inhibition test for urinary chorionic gonadotropin accurately indicated conception by positive responses in 72 of 76 specimens collected between the 4th and 10th week following the estimated time of fertilization. The rate of false positive results did not exceed 1%. A radioimmunoassay system was used to quantify chorionic gonadotropin concentrations in urine. Detectable levels were present by the 2nd week of pregnancy. Peak chorionic gonadotropin levels were found between the 7th to 9th week after conception. Chorionic gonadotropin excretion rates declined to undetectable levels during the final month of gestation.

The management of a squirrel monkey (*Saimiri sciureus*) unit. Delort, P., Chopard, M., & Tachon, J. (Service de Toxicologie-Teratologie and Lab. de Biologie, Ctr. Européen de Recherches Mauvernay, Route de Marsat, 63201 Riom, France) *Laboratory Animal Science*, 1976, 26, (Part II), 301-304.

Biological, particularly reproductive data for the squirrel monkey are reviewed. Information is given on the care, diet, maintenance, health status, and handling of the species. The value of the squirrel monkey in research is discussed. It is concluded that a controlled monkey unit produces a more homogeneous population than one would find in a natural environment and does not deplete the natural populations.

The reproductive potential of the common cotton-eared marmoset (*Callithrix jacchus*) in captivity. Phillips, I. R. (Royal Coll. of Surgeons of England, Res. Establishment, Downe, Orpington, Kent, England) *Journal of Medical Primatology*, 1976, 5, 49-55.

The breeding records of a closed colony of marmosets maintained for five years are described. Three generations have been born and a high incidence of multiparity has been achieved. The reproductive potential of *C. jacchus* is higher than that of virtually any other primate maintained in captivity.

Estimation of fetal age and weight from radiographic skull diameters in the rhesus monkey (*Macaca mulatta*). Ferron, R. R., Miller, R. S., & McNulty, W. P. (Oregon Reg. Prim. Res. Ctr., Beaverton, OR 97005) *Journal of Medical Primatology*, 1976, 5, 41-48.

In utero radiographic measurements of the skull of a rhesus monkey fetus provide estimates of conceptual age and body weight with about a 6% and 15% error of estimate, respectively.

Ecology and Field Study

Field research on colobus, geonon, mangabey, and patas monkeys: An historical, geographical and bibliographical listing. Baldwin, L. A., Teleki, G., & Kavanagh, M. (Dept. of Anthropology, Penn. State Univ., Univ. Park, PA 16802) *Primates*, 1976, 17, 233-252.

Conceived in early 1972, this series on the ethology and ecology of wild nonhuman primates now includes four reports on Old World monkeys and apes (Baldwin & Teleki, 1972, 1973, 1974; Baldwin, Kavanagh, &

Teleki, 1975). This fifth listing includes those projects and publications which focus upon four genera of African colobines and cercopithecines. Although some observational field research (as opposed to corpse collecting) was conducted as early as 1948, primatological field studies on these genera actually began during the early 1960s. Together with the preceding report on the Asian colobines, this one completes the authors' summary of research on the smaller, mainly forest-dwelling monkeys of Asia and Africa. After covering the New World primates in the next listing, they intend to produce one on prosimians, and a final one on macaques.

Instruments and Techniques

Two operative technics applied in perinatal research in the rhesus monkey. Epstein, M. F. & Chez, R. A. (Pregnancy Res. Br., National Institute of Child Health and Human Development, NIH, Bethesda, MD 20014) *Laboratory Animal Science*, 1976, 26, 456-460.

Methods for percutaneous transabdominal amniocentesis and umbilical artery cannulation as modified and applied to the perinatal study of the rhesus monkey are described. These technics proved to be reliable, reproducible, and safe when used with care and attention to sterile technic.

Conservation

Chimpanzees in Uganda. Albrecht, H. (Dept. of Animal Behaviour, Univ. of Amsterdam) *Oryx*, 1976, 13, 357-361.

The author reports the results of chimpanzee population surveys made in the Budongo and Bwindi forests. Data presented include density value for a number of primate species and for treated and untreated forest.

Mountain gorillas and bonobos. MacKinnon, J. (Sub-Department of Vet. Anatomy, Tennis Court Rd., Cambridge CB2 1QS) *Oryx*, 1976, 13, 372-382.

The author spent six weeks in Zaire early in 1975 to get first-hand experience both of mountain gorillas, in the Kahuzi Biega and Virunga National Parks, and of bonobos (pygmy chimpanzees) in forests south of the Zaire river. As a result he believes that, for the mountain gorillas, the enlargement, already planned, of the Kahuzi Biega Park is important to ensure that population's viability, and also that thought should be given to introducing new blood into the Virunga population, which may already be suffering from inbreeding. For the bonobos he suggests that, if investigation confirms the view that the Salonga National Park is not a good area for them, the Lomaki-Bolombo Region should be considered for a bonobo reserve.

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