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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. 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* (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].

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A NEW CHIMPANZEE RESEARCH STATION

Edwin D. Witt, Harriet J. Smith, and James E. King

University of Arizona

Chimpanzees are uniquely valuable laboratory subjects for physiological or behavioral research, and the extant chimpanzee population is clearly a resource upon which many lines of scientific investigation are dependent. To reduce the current demand on wild populations and to insure continued availability of chimpanzees for scientific study, the reproductive rate of captive animals must be maximized. Optimal conditions for successful reproduction in captivity are best attained when large outdoor enclosures are provided, affording the chimpanzees an opportunity for relatively free movement (e.g., Wilson & Wilson, 1968). Furthermore, large outdoor enclosures create possibilities for research not possible with small, laboratory cages (e.g., Menzel, 1972).

Although it is advantageous for breeding purposes to provide a large, outdoor, living area, there are also advantages for providing supplementary indoor caging. Indoor housing is desirable for protection of animals from severe weather, for efficient administration of medication, and for increasing the flexibility of research programs by permitting individual testing of chimpanzees. Individual cages in which animals are fed and which connect with an outdoor communal area would also minimize aggression attributable to food competition. Wilson and Wilson (1968) reported that most fighting among chimpanzees at the Holloman AFB facility occurred during indoor communal feeding.

A research facility incorporating a series of indoor, single occupant cages connected to a large outdoor area would offer maximum possibilities for behavioral research with chimpanzees as well as for their breeding and care. This report describes a new chimpanzee research station incorporating these features. The station is owned and maintained by Dr. Howard H. Purcell, Jr., who conducted an extensive study of chimpanzee holding facilities in several zoos and primate research centers before designing and building the station. Dr. Purcell has generously made the facility available to faculty and graduate students from the Psychology Department of the University of Arizona for behavioral study of chimpanzees.

Description of Facilities

The chimpanzee research station is located at Laveen, Arizona, about 15 miles southwest of Phoenix. The station is surrounded by dairy farms and irrigated fields which provide relative seclusion. Location of the facility amid long established agricultural lands minimized risk

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of infection by coccidiomycosis, a health problem to many mammals, including primates, in scattered areas of southwestern United States.[1]

A map of the research station in shown in Figure 1. It will consist of three "islands." Currently, one island is operational while the other two are in the construction and planning phases respectively. A moat surrounds the operational island and will eventually be expanded to separate the three islands from each other. The operational island contains 2-1/2 acres, and the greatest distance between any point on the island and the observation deck is 119 m. Since the mean annual rainfall in Laveen is only 17.9 cm, a sprinkler system was installed in one corner of the island to stimulate growth of grass and other vegetation. A fountain in the center of the island feeds a small stream which provides drinking water for the chimpanzees during the day. The stream normally flows into the moat but can be diverted to irrigate the northern half of the island.

Several large mesquite and tamarisk trees were set in concrete and their upper reaches connected with nylon rope to provide escape routes if a subordinate animal were chased by a dominant one.[2] Shelters constructed from cable spools are anchored in concrete at several locations on the island and provide shade during summer months when high temperatures average 40.6°C.

The surrounding moat is 4 m wide and the water depth is maintained at about 1 m. The bottom of the moat is mud with a thick algal overgrowth which makes wading difficult. Since the moat is relatively shallow, accidental immersion of a chimpanzee does not result in significant danger of drowning. Relatively inexpensive water is available from the Salt River Project canal system and is used to maintain the water level.

When they are not on the island, chimpanzees are housed in individual cages within the building. There are currently ten cages in two parallel rows separated by a central hallway as shown by the floor plans in Figure 2. Additional cages will eventually be installed in the remaining space on the first floor. Back and side walls of the cages are reinforced concrete while outer walls and tops are steel catwalk grating.

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[1]This disease is caused by a fungus spore which originates in arid, alkaline soil, but does not grow in soil supporting abundant vegetation (Maddy, 1958). This airborne spore is viable no more than a few miles from its source. At the Phoenix Zoo, two gorillas, one gibbon, and two chimpanzees died from the disease recently. The frequency of the problem at the Phoenix Zoo undoubtedly results from the zoo's location in virgin desert land which has soil that supports growth of the fungus.

[2]Such a chase occurred before installation of the ropes. A subordinate chimpanzee was chased up a tree by a female. To escape, he jumped a distance of 7 m to the concrete below, fortunately without serious injury.

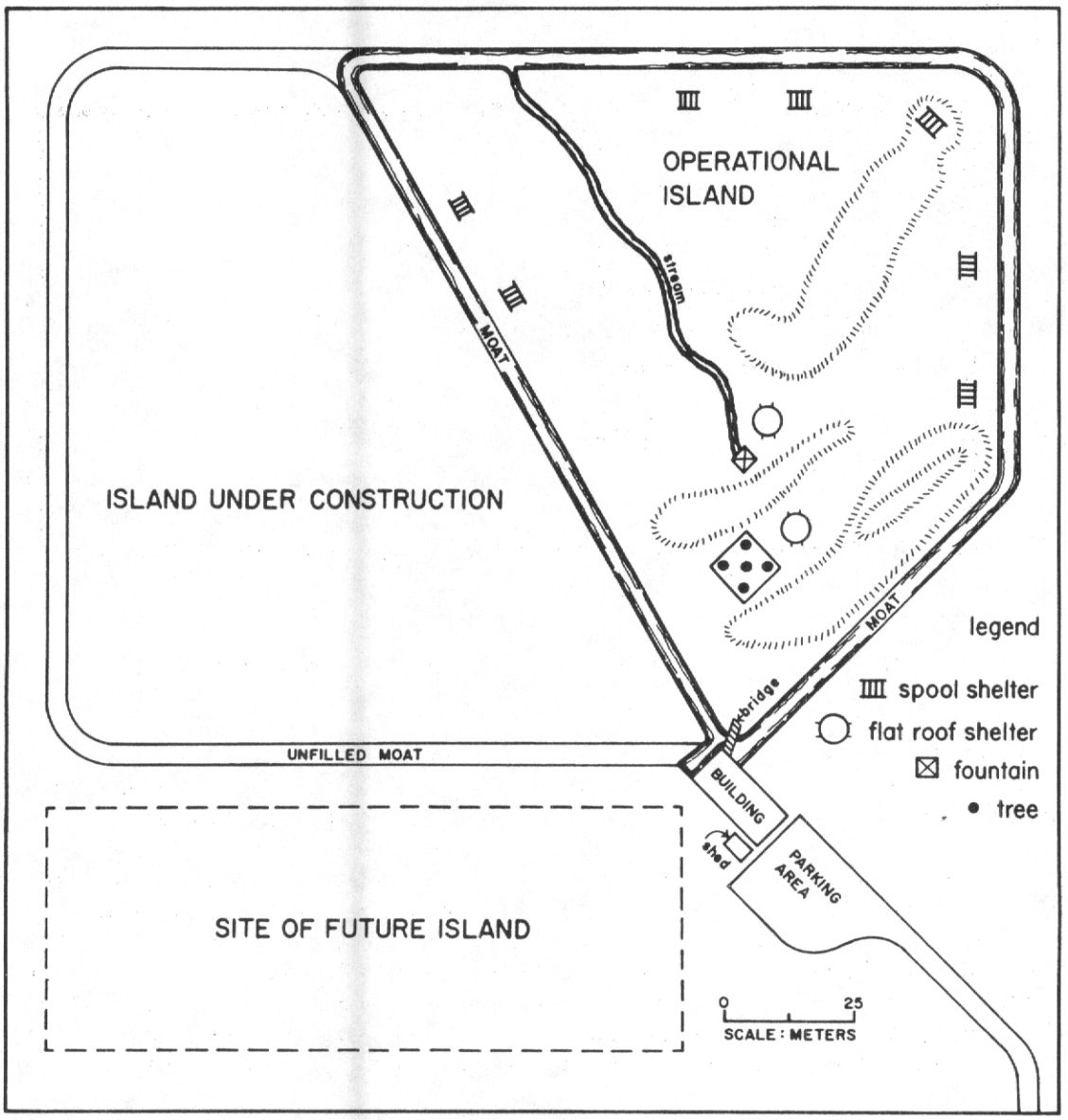

Figure 1. Map of the chimpanzee research station.

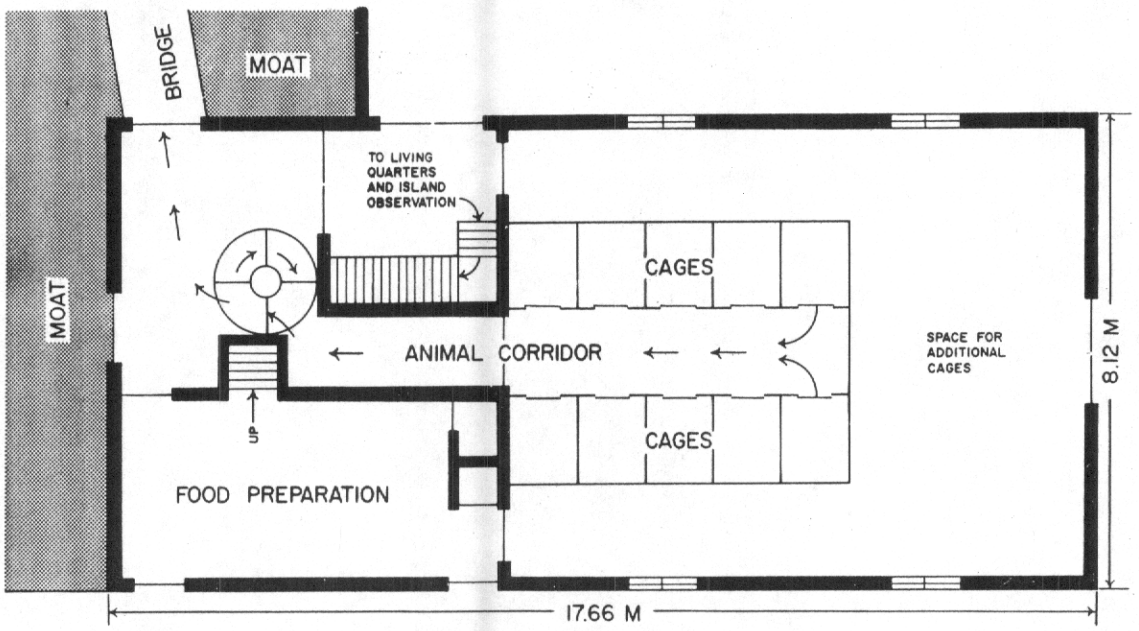

Figure 2. Floor plan for lower level of main building.

Artificial nests were constructed from harrow blades (concave side up) rimmed by tires which had most of the sidewalls cut away. These were hung by chains from the cage tops to serve as sleeping shelves.

The back walls of the cages contain vertically sliding doors which open into the central hallway and are controlled from a catwalk above the hallway. Doors at each end of the central hallway are also controlled from the overhead catwalk, enabling the operator to seal off the central hallway from the rest of the building. Cage cleaning is easily accomplished by allowing an animal to move from its cage to the central hallway, closing the cage door, and then hosing wastes from the cage.

Animals move from cage to island along the central hallway when the door at the end of the hallway is opened. From the central hallway they pass through a revolving door into a vestibule and from there through a vertically sliding exit door onto a bridge connecting the building to the island. When all three islands are completed and operational, each will have a separate bridge connecting it to the vestibule. The revolving door in the vestibule provides a means of separating chimpanzees returning from the island and prevents entrapment of a subordinate animal pursued into the vestibule.

In order to discourage chimpanzees from climbing along the building walls on either side of the bridge, the walls are sprayed by water from nozzles located about 3 m up the side of the building on both sides of

the bridge. An overhang directly over the exit door prevents escape vertically up the wall.

A second floor observation deck offers an excellent view of virtually all points on the islands. The vertically sliding exit door to the bridge is controlled from the observation deck. From this position, a good view of the door and bridge is provided by a parabolic mirror mounted across the moat from the bridge. Exit from and entry to the cages can thus be efficiently monitored and controlled from the second floor of the building. The second floor also contains living facilities for overnight accommodation of research personnel.

Four chimpanzees are currently housed at the station: two mature females, a mature male, and an adolescent male. Additional animals will be obtained within the next few months. The animals were first placed on the completed island in September, 1973, and a male infant weighing 1650 gm was born to one of the females in June, 1974. Infant care by the mother appeared to be normal; however, the infant died when it was 13 days old. An autopsy revealed no evidence of any malformation or injury.[3]

This research station will be highly useful for behavioral studies of the chimpanzee since the same group of animals can be used for field observation in a seminaturalistic environment as well as for laboratory research necessitating individual testing. The research station will function in two important ways. First, it will provide a means for breeding captive chimpanzees, and, second, it will provide unusually varied opportunities for both field and laboratory research.

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[3]Evidence of *Klebsiella pneumoniae* was found in the infant's bloodstream. These bacteria may have entered the bloodstream as a result of the delayed separation of the umbilical cord from the infant four days after birth. This bacteria is normally present in the intestinal tract of the chimpanzee.

THE CARIBBEAN PRIMATE RESEARCH CENTER

William T. Kerber

Although the Caribbean Primate Research Center is only five years old, its roots may be traced back 37 years to 1938. This was the year the late Dr. C. R. Carpenter, then associated with the Columbia University College of Physicians and Surgeons, introduced rhesus monkeys onto the 40-acre island of Cayo Santiago located off the southeastern coast of Puerto Rico. During the early years, the colony was used for work in reproductive physiology, anatomy, and behavior. With the advent of World War II research progress slowed, and for many years thereafter the colony was mainly a source of supply of monkeys. Continuity of funding and direction of the research were lacking.

Stuart Altmann's intensive research on the sociobiology of the colony in the mid-1950's aroused much interest in the scientific world, and in 1956 the federal government assumed control of the colony. The National Institute of Neurological Diseases and Blindness, National Institutes of Health, established their Laboratory of Perinatal Physiology in Puerto Rico in association with the University of Puerto Rico's School of Medicine. The Cayo Santiago rhesus monkeys provided a nearly ideal subject for this laboratory because of the similarity of their gestational physiology to that of man.

In addition to the Cayo Santiago colony, laboratory facilities were developed in San Juan and later, in 1962, a second free-ranging colony of rhesus was established on La Cueva and Guayacan islands located off the southwestern coast of Puerto Rico near the village of La Parguera. For 14 years intensive investigations relating to perinatal physiology, normal and abnormal behavior, and primate ecology were conducted.

In 1970, the Laboratory of Perinatal Physiology was closed and the National Institutes of Health entered into a formal agreement with the University of Puerto Rico that resulted in the establishment of the Caribbean Primate Research Center. (The Center is not a part of the Primate Research Centers Program of the National Institutes of Health which was initiated in 1960.) The contract provided for core funds to initiate a broad range of studies including the behavior, ecology, and reproductive biology of nonhuman primates.

Administratively, the Center was, and continues to be, attached to the Office of the Chancellor of the Medical Sciences Campus of the University. From 1970 thru the fall of 1974 the director of the Center was Dr. Clinton Conaway. The author serves as the present director. Although the federal government's laboratories in San Juan are no longer

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used, the colonies at Cayo Santiago and La Parguera are being fully utilized by the Center. In addition, administrative, laboratory, and housing facilities have been constructed in the San Juan area near the town of Sabana Seca. Since each colony or facility is a distinct subunit of the Center they will be discussed separately.

Cayo Santiago

The free-ranging colony on Cayo Santiago is unique in this hemisphere and perhaps in the world. In 1970, the Scientist-in-Charge, Dr. Donald Sade, established a firm policy that this resource would be utilized solely for the study of normal behavior. Introduction, removal, or manipulation of any monkey is not allowed. The 400 rhesus monkeys on the 40-acre island are organized into five social groups. For the past several years, each group has been observed daily by a sociometric technician who records their behavioral patterns. This work is being supported by the National Science Foundation. In addition, several graduate students or guest investigators are usually in attendance. Approximately 150 skeletons of rhesus monkeys of known age, sex, and maternal genealogy are available at Cayo Santiago for research by qualified investigators.

La Parguera

The research emphasis at La Parguera relates to the production of rhesus monkeys and the study of behavior where the manipulation of the animal is required. The Scientist-in-Charge is Mr. Harry John Herbert. The majority of the 900 rhesus located here are free-ranging on the 100-acre island of La Cueva. Most are utilized in a Food and Drug Administration sponsored breeding colony. Over the next several years the breeding colony will be expanded with an ultimate goal of 1,000 breeding age females.

Other rhesus are housed in one-half or one-fourth acre corrals and are involved in research undertaken by guest investigators or graduate students. Besides the rhesus, a small free-ranging colony of 40 patas monkeys is located on the 80-acre island of Guayacan.

Sabana Seca

The administrative headquarters of the Center, as well as facilities for individual or small group housing of primates is located on a 400-acre plot of ground near the town of Sabana Seca, Puerto Rico. Approximately 150 squirrel, 75 cebus, and 300 rhesus monkeys are located in the Sabana Seca facility. Most of the research here centers around the reproductive physiology of New World primates and the breeding of both Old and New World species. However, other research is encouraged and several guest investigators and graduate students are working at Sabana Seca.

We have recently been awarded a contract to produce squirrel monkeys for the National Institutes of Health. Over the next several months some 300 additional animals will be received at the Center for introduction into the colony.

The Center is quite large when one considers the overall number of primates in residence, in excess of 2000. However, our core staff is small and consists of only four professionals. Much of the productivity of the Center is a result of research by guest investigators and graduate students. In some areas, such as the free-ranging colony at La Parguera, numerous opportunities exist for research that would not interfere with the breeding activities of the colony. Qualified investigators and graduate students interested in pursuing work at any of the locations of the Center should direct their inquiries to the director.

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SYMPOSIUM ON THE USE OF PRIMATES IN BIOMEDICAL RESEARCH TO BE HELD IN INDIA

A symposium, entitled "The Use of Nonhuman Primates in Biomedical Research: the Importance of Their Use in Understanding Problems Related to Human Health", will be held in New Delhi, India, October 27-November 5, 1975. The India National Science Academy is sponsoring this symposium in response to the long-felt need to ensure the proper and rational utilization of nonhuman primates in such a way that they are not depleted by indiscriminate trapping. The following topics will be covered: reproductive biology; nutritional studies; neurosciences; perinatal growth and development; toxicological studies; ecology of nonhuman primates. Participants will visit research institutes in Delhi and take part in field trips to view macaques and langurs.

On behalf of the Organizing Committee, Dr. M. R. N. Prasad and Dr. T. C. Anand Kumar welcome all participants. Those interested in attending should contact: Dr. M. R. N. Prasad, Professor and Head, Department of Zoology, University of Delhi, Delhi-110007 (India).

The organizers are exploring different sources for financial support for participants, which will largely depend upon the volume of responses received. However, they will provide local hospitality during participants' stay in Delhi.

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OPINIONS SOUGHT ON DEFINITION OF "ADEQUATE VETERINARY CARE" IN RESEARCH CONTEXTS

At the annual meeting of the American Veterinary Medical Association this past summer (July 15-18, 1975, Anaheim, CA), a symposium was presented by the American College of Laboratory Animal Medicine. It was part of a larger effort chaired by President Edward C. Melby of the College seeking clarification of the issues in more completely defining "adequate veterinary care" as this key term is used by the various regulatory and accrediting agencies in assuring that institutions have met obligatory laboratory animal care requirements. The issues discussed were as follows.

Veterinarians in the practice of laboratory animal medicine are required to provide "adequate veterinary care" as defined by a complex and interwoven network of external regulatory agencies. The most important of these agencies include the U. S. Department of Agriculture, which administers the Animal Welfare Act (P. L. 91-579), the National Institutes of Health (NIH) through its animal care policy initiatives, and the accreditation agency, the American Association for Accreditation in Laboratory Animal Care (AAALAC).

As it regards the criteria for "adequate veterinary care", both the NIH and AAALAC defer this definition to that appearing in the "Guide for the Care and Use of Laboratory Animals" (DHEW Publ. No. 74-23), published by the Institute for Laboratory Animal Resources (ILAR), National Research Council. The ILAR Guide and also the Animal Welfare Act vest responsibility for determining those research protocols requiring the use of analgesic or anesthetic procedures and other "humane" aspects in the attending veterinarian. This determination appears to involve an operational and now discretionary definition of the permissible level of pain.

Increasingly, veterinarians in this capacity are required to act as responsible institutional officials in providing assurance to external regulatory agencies that the criteria for "adequate veterinary care" have been institutionally met. Considerable professional uncertainty now surrounds these definitions because of their ambiguous brevity in published operational criteria and consequent emphasis on professional judgement.

The purpose of this symposium, therefore, was to assemble a knowledgeable group of disscussants to: a) more adequately define the necessary ethical veterinary purview in the experimental process, b) to more completely define or codify "adequate veterinary care", and c) to define more precisely what is meant by a permissible level of pain above which pain alleviation is required as it applies to various species and research situations.

The open symposium format was chosen so as to broaden the base

of informed opinion contributing to the clarification of this important requirement. Both written and oral depositions were solicited from the floor. Similarly, those readers of the *Laboratory Primate Newsletter* with opinions on the ethical and operational derivative of "adequate veterinary care" are asked to inform the American College of Laboratory Animal Medicine of them. These opinions, along with the symposium proceedings, will be used to draft a consensual position paper under the sponsorship of the College. It will, hopefully, be useful to the larger scientific community and others with constructive interest in the furtherance of appropriate standards of animal care. Correspondence should be addressed to: Steven H. Weisbroth, Division of Laboratory Animal Resources, Health Sciences Center, State University of New York, Stony Brook, NY 11794.

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REQUEST FOR NOTIFICATION OF PLANS TO SACRIFICE ANIMALS

Recent studies demonstrating the presence of endogenous type C virus in nonhuman primates have resulted in a marked need for various tissues from different species. Many of these tissue needs can only be satisfied if obtained from animals that have been sacrificed for one or another reason (excluding infectious disease studies). In order to make such tissues available, especially from the apes and other "exotic" species, and avoid wastage of these species by needless sacrifice, it would be appreciated if the undersigned was notified of future plans to sacrifice such animals. Provisions then will be made to arrange for the handling and shipping of specimens between the concerned parties.--Dr. S. S. Kalter, Director, Microbiology & Infectious Diseases, Southwest Foundation For Research and Education, P. O. Box 28147, San Antonio, TX 78284.

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WOOLLY MONKEYS WANTED

Will trade Old World primate species for woolly monkeys (*Lagothrix lagothricha*) of breeding age, or will directly purchase them. Wanted for production of offspring which will be used in cancer research. Contact: Dr. David P. Martin, Litton Bionetics, Inc., 5516 Nicholson Lane, Kensington, MD 20795 (Phone: 301-881-5600, Ext. 226).

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NEW DIRECTOR OF NIH PRIMATE RESEARCH CENTERS PROGRAM APPOINTED

Dr. Leo A. Whitehair has been appointed Director of the Primate Research Centers Program, it was announced by Dr. Thomas G. Bowery, Director of the Division of Research Resources, National Institutes of Health.

The NIH Primate Research Centers Program was initiated in 1960. It is comprised of seven major centers in the U.S. Now the largest nonhuman primate research center network in the world, the program's main mission is the establishment of primate animal models in which diseases can be duplicated and studied, their causes and effects documented, and effective means of prevention and treatment developed.

Dr. Whitehair succeeds Dr. William J. Goodwin, who officially retired on June 1, 1975. Dr. Whitehair earned a doctorate in veterinary medicine at Kansas State University and a Ph.D. in food science at the University of Wisconsin.

He entered the U. S. Air Force in 1954 as a task engineer, conducting studies on stress and nutritional deprivation. From 1962 to 1967, he was detailed to the U. S. Atomic Energy Commission (AEC), where he was project officer for studies concerning the application of ionizing radiation to agriculture and animal production. He received the USAF Commendation Medal for Meritorious Service for this effort.

Dr. Whitehair served as liaison officer to other Federal agencies and was the AEC representative to the Primate Advisory Committee of the Animal Resources Branch, Division of Research Resources, in 1963-64 and to the Nutrition Study Section, Division of Research Grants, from 1962 to 1967. Upon honorable discharge from the U. S. Air Force in 1967, he was a lieutenant colonel.

After entering the NIH Grants Associates Program in 1967, Dr. Whitehair was subsequently permanently assigned to the Animal Resources Branch, Division of Research Resources, as a health science administrator. His major activities have been in the administration of grants and contracts for laboratory animal model development and special colonies of research animals.

Currently a Captain in the U. S. Public Health Service Commissioned Corps, Dr. Whitehair is serving as secretary-treasurer of the American Board of Veterinary Public Health. He is also a member of the American Veterinary Medical Association, American Society of Animal Science, American Society of Veterinary Nutritionists, Conference of Public Health Veterinarians, Institute of Food Technologists, and Phi Tau Sigma (honorary food science society).

Dr. Goodwin had been in charge of the administration of the seven NIH regional primate centers since 1967, and had also acted as executive secretary of the Primate Research Centers Advisory Committee. He has served as the focal point on matters pertaining to the use of primates in biomedical research for the various Institutes and Divisions of NIH, other Federal agencies, and university scientists.

He acquired his Ph.D. in veterinary and medical entomology at Cornell University after having served with the U. S. Army Tank Corps in World War II. Before entering government service, he was an associate professor of medical entomology at Clemson University.

Dr. Goodwin entered the Commissioned Corps of the Public Health Service in 1957, and was subsequently selected for special assignment by the Agency for International Development as a medical researcher on malaria, typhus, schistosomiasis, and fly-borne diseases in Libya. He ultimately was made U. S. Malaria Advisor to Libya. After four years there, he went on to Haiti in the same capacity, participating in their malaria eradication program.

After joining NIH as a Grant Associate in 1963, Dr. Goodwin was appointed chief of the Environmental Health Sciences Research and Training Grants Branch, which later became the extramural program for the National Institute of Environmental Health Sciences.

Well known in the biomedical research and primatology community, Dr. Goodwin has published numerous papers in the area of entomology, malaria eradication, and primatology.

He plans to move to Portland where he has been invited to join the Medical Research Foundation of Oregon as their Research Coordinator.

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NEW PRODUCTS AND SERVICES

Commercially-Bred Macaques

Domestically bred infant primates of known gestational age will be available for research toward the end of this year from George C. Thorsen, Inc. Present breeding emphasis is on rhesus and the cynomolgus monkeys. Other species small to moderate in size can be accommodated in our environmentally controlled enclosures and facilities. Please direct inquiries to George C. Thorsen, 110 Turnpike Road, Fayville, MA.

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REPORT ISSUED ON PRIMATE USAGE AND AVAILABILITY

The Institute of Laboratory Animal Resources (ILAR) of the National Academy of Sciences has recently issued a report entitled: "Nonhuman Primates: Usage and Availability for Biomedical Programs." The report is based on information gathered by the ILAR Committee on the Conservation of Nonhuman Primates under contract by the Animal Resources Branch of the National Institutes of Health (see January, 1974, issue of this *Newsletter*, p. 22).

The report includes (1) a survey of the numbers and species of primates imported and maintained in the United States for biomedical purposes, (2) a consideration of the types of biomedical programs that use primates, (3) a description of factors that influence the status of wild populations, especially as they relate to the international primate trade and to habitat changes, and (4) recommendations as to methods for supplying primates needed for research, the testing of biologics, and the production of pharmaceuticals.

Some of the recommendations of the Committee are as follows: "Current and anticipated shortages of wild-caught primates for biomedical programs are such as to justify the development of a national plan that will incorporate the following features: 1. An adequate, assured supply of animals derived primarily from the establishment of self-sustaining domestic breeding colonies, but augmented by breeding colonies and production centers in countries of origin and also supported by the application of wildlife management techniques to natural populations. 2. Reduction of wastage in international primate trade by the adoption of sound managerial procedures--e.g., closer supervision of trapping, holding, and shipping operations, and sponsorship of trapping expeditions in which all aspects of collection and transport are monitored. 3. Establishment of a computerized users' service that would encourage and facilitate multiple use of primates by rapidly matching available surplus animals to existing needs, and would permit accurate estimates of national needs based on usage data.

"The overall administration of the proposed national plan should be undertaken by the National Institutes of Health (NIH), with the advice of a committee representative of the national biomedical community. Among the explicit responsibilities of NIH would be: Administration of contracts in support of domestic breeding colonies. Establishment and operation of a computerized users' service. Management of "Certificate of Need" programs. Development and distribution of guidelines for commercial trapping, holding, and shipping of primates, based on best available information. Coordination of methods and locations of trapping expeditions. Support of copperative field studies on population dynamics of wild populations as they relate to the potential for sustained-yield harvesting. Developing of contingency plans to deal promptly with shortages and to allocate resources when shortages develop.

"It is essential that the plan look to meeting the needs of all major biomedical programs and be fully operative within a decade."

Regarding self-sustaining domestic breeding programs, "generally, the primate species now widely used in biomedical research, and doubtless others now relatively unknown, will rapidly become less available from naturally occurring populations. In no cases are wild populations adequate to provide the numbers and the quality of animals needed in the United States and other countries on a sustained basis. Hence, despite the possible application of artificial insemination, sperm banks, fertility drugs, or drugs that regulate reproductive cycles, there are no shortcuts or feasible alternatives to the development of large-scale breeding programs that depend on normal reproductive behavior. Indeed, even if fertility regulating techniques were to become feasible, it is likely that the costs would outweigh the potential benefits--costs of trained staff, nurseries for hand-rearing multiple and premature infants, and technical work.

"If domestic breeding programs are to be successful they must be planned and funded on a long-term basis and must consist of colonies that are sufficiently large to assure adequate genetic diversity. Various political, economic, and ecological forces are such that self-sufficiency for the United States within 15-20 years is essential." Priorities as to species that merit emphasis are then outlined.

Regarding breeding in countries of origin, the indications are "not only that animals for research and testing will become increasingly difficult to obtain in adequate numbers, but that it may be difficult, in certain species, to obtain sufficient breeding stock to establish large-scale domestic production units. Despite the uncertainties, it is essential to support the establishment and operation of breeding colonies and production centers in countries of origin. These enterprises would have the advantage of generally lower costs than in the United States, and would to a degree relieve the pressure on wild populations. At the same time, they would act to stabilize the overall supply."

Regarding harvesting of managed wild populations, "of approximately 201 species of nonhuman primates in 56 genera (Napier & Napier, 1967) a mere dozen species in 8 genera have been sufficiently studied to warrant their production in the United States. If the gene pools of the remaining 94 percent are to be assured for the future, it is necessary to provide encouragement and financial support for conservation and study of the habitats in which they are to be found, whether these habitats be unaltered or under some degree of management. As matters now stand, there are laws in some countries (e.g., Colombia) providing that private lands not now being utilized will be confiscated for agricultural development. In other areas (e.g., Kenya) primates are regularly shot or poisoned as agricultural pests.

"To improve the situation it is proposed that a sustained market for primates harvested from wild populations be developed and support be provided for the management of these populations on a sustained-yield basis. By so doing, it might be possible to make privately owned forest lands economically productive and thereby justify their preservation in essentially their natural state. A further move would be to explore, with appropriate governmental departments, mechanisms whereby trapped animals that would otherwise be destroyed as pests could be purchased for biomedical use. In this way, overall income to the landowner would be increased and the supply of primates somewhat augmented."

Improvement in the primate trade is discussed. "Despite the fact that there have been improvements during the last 10 years, far too many animals are still lost through wasteful capture practices, careless handling prior to export, and destruction as forest and plantation pests. It seems clear that these losses can be appreciably reduced if scientifically sound practices are introduced and if all aspects of collection and transport are monitored by informed officials." Several specific measures are recommended.

Maximum utilization of current animal resources is recommended. "Certain economies in the number of animals used can be realized by the establishment of a computerized users' service that would match availability to need and, overall, provide information for making sound estimates of annual needs. Such an information network would not only provide rapid information on available animals, or, conversely, the need for specific animals, but also facilitate the exchange of biological materials derived from primates....Obviously, an effective information and exchange system must provide for the costs of holding animals for a reasonable time while a suitable arrangement for transport is being worked out. Still further economies could be obtained by critical attention to the validity of choosing primates as laboratory animal models in each instance....If reliable estimates of future needs are to be made, data must be collected more accurately and consistently than is now the case.

"A national program of the kind recommended here would best be administered by NIH under the guidance of an advisory committee representative of the biomedical community. In so doing, it would be necessary for NIH to assume several discrete functions, each related directly to the key recommendations brought out in preceding sections of this report."

Regarding support of breeding programs, "in the overall process of initiating and enlarging self-sustaining breeding colonies, funding mechanisms should be devised that eventually shift the cost burden to the user, although this is not likely to be feasible in certain cases. There should be provision primarily for colonies of outbred animals and also for production of inbred lines selected for specific physiologic

and immunologic characteristics, where it has been demonstrated that primate models are essential." A number of activities and responsibilities that are called for are outlined.

There should be maximal utilization of available resources. "In establishing a computerized users' service, several existing information programs should be evaluated with a view to adapting certain features to facilitate exchange of primate material....In order to administer... [the India Rhesus Monkey Certification Program]...properly, match production capacity to research need, and implement an allocation system in time of shortages, it is essential to know the volume of imports, the output of captive-reared animals, and the level of use in biomedical programs. This information should be compiled either through the users' service noted above or in cooperation with other programs having similar responsibilities.

"A number of steps can be taken by NIH that should improve the situation as regards wild-caught primates used in U. S. biomedical programs. Among these are the following: Coordination of Certificate of Need programs with comparable agencies in other nations and extention of the program to include species other than rhesus macaques....Fostering of international coordination of captive breeding programs and trapping operations through established international scientific channels....Working to minimize duplicative expeditions for trapping primates and assure priority assignment of females to breeding colonies, rather than to direct biomedical use. Development of guidelines for trapping operations that take advantage of good wildlife management techniques....Withholding of funds from investigators shown to knowingly purchase primates that were trapped or exported in violation of the laws of the country of origin. Development of guidelines for improving compounds for holding animals trapped seasonally....Provision of funds for studies of population dynamics that will identify factors affecting the carrying capacity of different habitats and the geographical distribution of primates species, and monitoring of the impact of trapping in areas managed for sustained yield....Provision of support for immediate implementation of improved techniques for capturing primates....

"Despite any precautions that may be taken, it is likely that there will be shortages of primates in the years just ahead. There must be, then, an allocation plan in readiness that will assign priorities for the distribution of imported and captive-bred animals from biomedically supported breeding centers to the most appropriate biomedical uses.... It can be anticipated that export restrictions in countries of origin will be enforced with a measure of irregularity in the next few years, which will lead, in turn, to wide fluctuations in availability and price of wild-caught animals. It would be most unfortunate if these uncertainties were permitted to discourage the development of domestic captive-breeding ventures.

"Much is to be gained by making the specifications for research animals as rational and precise as possible. When this is not the case, females that should be held for breeding will undoubtedly be used in research programs and thereby lost; a shift to specifications that call for more male animals is clearly indicated where otherwise acceptable. In other cases, specifications do not allow for acceptable alternative species or, conversely, unwittingly call for rare or endangered species where they are not in fact essential...."

The report may be obtained from the Institute of Laboratory Animal Resources, National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, DC 20418.

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CIRCULAR ABOUT 6TH CONGRESS OF THE INTERNATIONAL PRIMATOLOGICAL SOCIETY AVAILABLE

The following are now available concerning the Sixth Congress of the International Primatological Society to be held in Cambridge, England, August 23-27, 1976: 1. The "First Circular" outlining symposia in preparation and suggested round-table discussions, registration fees, tours, and other relevant information. 2. Registration forms for tours. 3. Postal cards for potential delegates to use for registration. 4. Information for submitting abstracts for short scientific papers.

This material may be obtained from Dr. David J. Chivers, Sixth Congress of the International Primatological Society, c/o Laundry Farm, Barton Road, Cambridge, England.

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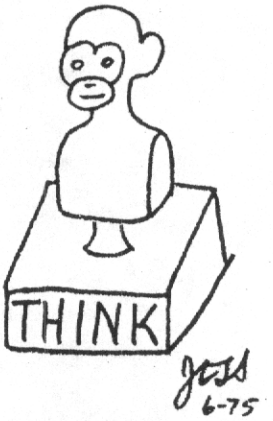

HEW ESTABLISHES PRIMATE STEERING COMMITTEE

Severe constriction of nonhuman primate export quotas by foreign countries has prompted the U. S. Department of Health, Education, and Welfare (HEW) to take immediate action to assure that government-supported biomedical researchers will have an adequate number of laboratory primates to continue their studies.

India, Peru, and Colombia are responsible for nearly 80 percent of the U. S. primate annual imports. In July 1973, the Government of India announced that the number of rhesus monkeys (Old World) permitted to be exported annually would be reduced from 50,000 to 30,000. This means a net of about half the anticipated supply for the United States. India has also warned of future reductions in the years to come, and is expected to reduce the quota to 20,000 annually for 1975-1976. Peru has not exported New World primates since October 1973. Pending the initiation of a proposed conservation program, Colombia has recently stopped issuing primate export permits.

In 1974, the National Institutes of Health (NIH) (through its Animal Resources Program, Division of Research Resources, and the Veterinary Resources Branch, Division of Research Services) instituted a domestic breeding program as part of the NIH National Plan for Rhesus Monkeys (see October, 1974 issue of this *Newsletter*, pp. 12 and 13).

Following this development, the HEW Assistant Secretary for Health in October 1974 approved the formation of a departmental-wide Primate Steering Committee, with the NIH serving as the lead agency. The purpose of this committee is to develop a unified plan to assure primate supplies for biomedical research activities.

This committee consists of Dr. Joe Held (Chairman), Division of Research Services, NIH; Dr. Thomas G. Bowery, Division of Research Resources, NIH; Mr. Kurt Habel, Office of the Director, NIH; Dr. James King, Office of International Health; Mr. George Renaud, Health Services & Mental Health Administration; Dr. Johannes Stuart, Center for Disease Control; and Dr. James Vickers, Food and Drug Administration.

The primary objectives of the Primate Steering Committee are: (a) Development and implementation of a domestic breeding program to assure a supply of medically-important primates. (b) Assist in the development of primatology programs, including breeding, in certain South American countries (New World countries of origin) including Brazil, Colombia, and Peru. (c) Develop plans to implement goal of increasing from 60 to 100 percent the NIH Primate Research Centers' capacity to breed major primate species required for their research programs. (d) Coordinate the use of primates for research in the United States, including the establishment of an allocation system if this becomes necessary.

The mandate of the Committee has been enlarged to cover all national health establishments which use nonhuman primates as a resource. Liaison was also established with other government agencies, the World Health Organization (WHO), Pan American Health Organization (PAHO), and the National Academy of Sciences Institute of Laboratory Animal Resources.

Dr. Benjamin Blood has been appointed as staff officer for this committee. Dr. Blood is a veterinary epidemiologist with long experience in international programs. He has been International Health Attaché with the United States Diplomatic Mission to the United Nations Specialized Agencies, Geneva, Switzerland, since August 1969. In that position, he served in a continuing liaison with WHO and represented health interests of the United States to other international organizations in Europe. While there he worked with the International Union for Conservation of Nature and Natural Resources as well as with the Committee on Animal Welfare of the Council of Europe. Prior to the Geneva assignment, Dr. Blood was Associate Director for International Organizations Affairs, Office of International Health, HEW, Washington, DC. He has represented the United States Government at World Health Assemblies each year since 1966, and has served on the WHO Executive Board as well as on the Governing Bodies of PAHO. Dr. Blood was a staff member of PAHO for 15 years and is best known for his work as founder and first director of the Pan American Zoonoses Center, located in Argentina. Dr. Blood holds the degrees of Doctor of Veterinary Medicine (Colorado State University) and Master of Public Health (Harvard University). He is the author of numerous scientific works. Among the honors that he has received is the Orden de Mayo al merito, in grade of knight commander, from the Argentine Government.

* * *

TRENDS IN PRIMATE IMPORTS INTO THE UNITED STATES*

Export restrictions developed during the past year by the major primate exporting countries have decreased total imports into the United States by 40 percent from 1972 levels (Table 1). The impact has been immediately apparent on the South American trade. During 1974, Peru and Colombia reduced the numbers of primates they exported to 8 percent and 14 percent, respectively, of their 1972 levels.

India has continued to honor the "certificates of need" granted prior to the export quota according to Dr. C. W. McPherson, administrator of the certificate of need program for the Public Health Service. This policy may have cushioned the immediate impact of the worldwide annual export quota of 30,000 primates, imposed recently by India. Indian exports to the United States averaged 22,500 over the past 3 years.

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*Compiled by Dr. Nancy Muckenhirn and reported in *ILAR News*, 1975, *18* [No. 3], 2-3.

Table 1
United States Imports by Region

	1972	1973	1974
Latin America	45,414	30,871	10,869
Asia	25,152	31,955	28,761
Africa	4,760	6,297	6,857
Other (U.K., etc.)	458	425	94
Total	75,784	69,548	46,581

Source: USDC, 1973, 1974, 1975

Other notable changes in the sources of primates entering the United States include increases of several hundredfold in the numbers exported from Malaysia, Indonesia, and the Philippine Republic; a doubling of export volume from Somalia, Ethiopia, and Kenya; and a decline in animals apparently transshipped through countries lacking endemic primates.

The fact that the import volumes compiled by the U. S. Department of Commerce (USDC) have been lower than those of the U. S. Department of Interior (USDI) should be recognized in interpreting these figures. For example, 75,784 primate imports were reported for 1972 by USDC compared to the 90,559 reported by USDI (USDI, 1973).

References

U. S. Department of Commerce, Bureau of the Census. 1973. U. S. imports for consumption. TSUSA [tariff schedule of the U. S., annotated], commodity and country of origin. USDC IM-146, 1972 annual. Washington, DC.

U. S. Department of Commerce, Bureau of the Census. 1974. U. S. imports for consumption. TSUSA [tariff schedule of the U. S., annotated], commodity and country of origin. USDC IM-146, 1973 annual. Washington, DC.

U. S. Department of Commerce, Bureau of the Census. 1975. U. S. imports for consumption. TSUSA [tariff schedule of the U. S., annotated] schedule by TSUSA number by unit control by country of origin. USDC IM-146, 1974 annual. Washington, DC.

U. S. Department of the Interior, Bureau of Sport Fisheries and Wildlife. 1973. Wildlife imported into the United States in 1972. USDI WL-502. Washington, DC.

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REMINDER OF SIMILARITY OF BEHAVIOR OF *MACACA MULATTA* AND *M. FASCICULARIS*

Allan M. Schrier

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By now most readers are aware that rhesus monkeys *(Macaca mulatta)* have become very difficult for animal dealers to supply because of export restrictions by the government of India. This has increased interest in alternative species for research, particularly cynomolgus or crab-eating monkeys *(M. fascicularis;* formerly *M. irus)*, which remain in plentiful supply and are less expensive than rhesus monkeys. A natural concern is whether the former monkeys can be readily substituted for rhesus monkeys. It seems like an opportune time, therefore, to remind readers that the writer has published behavioral studies bearing on the question.

Two of the studies were carried out for the purpose of finding a species to replace the rhesus monkey, whose continued usefulness for purposes of learning and other behavioral research the writer had reason to question (Schrier, 1969a). Rhesus monkeys were compared with cynomolgus and stumptailed *(M. arctoides;* formerly *M. speciosa)* monkeys in these studies.[1] In the first study (Schrier, 1965), it was found that cynomolgus and rhesus monkeys completed a standard behavioral pretraining procedure in about the same number of trials, whereas stumptailed monkeys required significantly fewer trials. This presumably reflects what appears to be a greater similarity in emotional behavior of rhesus and cynomolgus monkeys when compared with stumptailed monkeys. In the second study (Schrier, 1966a), it was found that the asymptotic levels of learning set formation of the three species of monkeys were virtually indistinguishable. (There were indications of differences in rate of learning set formation during the early stages of learning, with the performance of the stumptails being best and that of the cynomolgus worst. Later work on this question has dealt only with stumptailed and rhesus monkeys and has confirmed that the initial learning set performance of the former monkeys is better than that of the latter monkeys.) At the time, the writer rejected cynomolgus monkeys as a replacement for rhesus because of the similarity in their emotional behavior and aggressiveness. Stumptailed monkeys are now relatively expensive and difficult to obtain (the natural populations have been re-

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[1]The cynomolgus monkeys used in these studies came from the Philippine Republic. It should be kept in mind that these monkeys also come from Indonesia and Malasia, among other countries. Experimenters should ask their animal dealer from what country their cynomolgus monkeys were obtained and report this in research papers. There is no indication that there are important behavioral or other differences among cynomolgus monkeys from the different countries, but the possibility must always be considered.

ported to be severely depleted), so they cannot be considered as a substitute for rhesus monkeys.

There have been other, less direct, indications of similarities in the learning and cognitive aspects of the behavior of cynomolgus and rhesus monkeys. One study (Schrier, 1966b) has suggested that the discrimination reversal learning of cynomolgus monkeys is faster than that of stumptailed monkeys. Another study (Schrier, 1969b) has suggested that rhesus monkeys are also faster at this type of learning than are stumptailed monkeys (Schrier, 1969b), so that cynomolgus monkeys are similar to rhesus in this respect, though the reversal performance of the two species has not been directly compared. Finally, the indications are that the three species of macaques under discussion show similar positive transfer between the repeated reversal and learning set tasks (Schrier, 1966b, 1974), suggesting that the mechanism of learning set formation is similar in the three species (Schrier, 1974).

References

Schrier, A. M. Pretraining performance of three species of macaque monkeys. *Psychonomic Science*, 1965, *3* , 517-518.

Schrier, A. M. Learning-set formation by three species of macaque monkeys. *Journal of Comparative and Physiological Psychology*, 1966, *61*, 490-492. (a)

Schrier, A. M. Transfer by macaque monkeys between the learning-set and repeated-reversal tasks. *Perceptual and Motor Skills*, 1966, *23*, 787-792. (b)

Schrier, A. M. A possible change in the behavior of imported rhesus monkeys. *Laboratory Primate Newsletter*, 1969, *8*, [3], 1-5. (a)

Schrier, A. M. Learning set formation without transfer suppression: A replication and extension. *Psychonomic Science*, 1969, *16*, 263-265. (b)

Schrier, A. M. Transfer between the repeated reversal and learning set tasks: A reexamination. *Journal of Comparative and Physiological Psychology*, 1974, *87*, 1004-1010.

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

Books

Reproductive Biology of the Primates. (Contributions to Primatology, Vol. 3) W. P. Luckett (Ed.) Basel: Karger, 1974. 284 pp. [Price: $47.25]

This volume presents selected topics on the reproductive biology of primates for which there are comparative data and of a nature to permit speculation about possible phylogenetic relationships. Contents: Evolutionary trends in primate sex cycles, by H. Butler; Comparative morphology of the primate ovary, by M. J. Koering; Oogenesis in adult prosimian primates, by T. C. Anand Kumar; Biology of primate spermatozoa, by J. M. Bedford; Comparative development and evolution of the placenta in primates, by W. P. Luckett; Comparative aspects of primate chorionic gonadotropins, by W. W. Tullner; Placental biosynthesis and metabolism of steroid hormones in primates, by K. J. Ryan & B. R. Hopper.

Reports

Nonhuman Primates: Usage and Availability for Biomedical Programs. Committee on Conservation of Nonhuman Primates, Institute of Laboratory Animal Resources. Washington, DC: National Academy of Sciences, 1975.

See note on p. 13 of the present issue of this *Newsletter* for further information about this report.

Films

Films on the Behaviour of the Lowland Gorilla Group of the Zoological Gardens in Basle, Switzerland. By Jorg P. Hess with the scientific collaboration of Prof. Dr. Rudolf Schenkel. 1. *On the Sexual Behaviour of Captive Lowland Gorillas* (Gorilla g. gorilla). (16 mm, b & w, sound, 30 min., English titles and commentary, sale price: SFrs. 1'520.-). 2. *Mother-infant Behaviour of Captive Lowland Gorillas* (Gorilla g. gorilla). *Part I.* Goma & Tamtam, the case study of a primiparous mother, who successfully raised her infant. The mother-infant unit, and the infant's developing relationship to his social and material environment

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*In many cases, the original source of references in the following 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 or abstract and indicating his desire on the reprint.

in the first year of life. (16 mm, b & w, sound, 27 min., English titles and commentary, sale price: SFrs. 1'225.-). 3. *Mother-infant Behaviour of Captive Lowland Gorillas* (Gorilla g. gorilla). *Part II.* Kati & Uzima, the case study of a mother, who during her infant's first month of life showed behavioural patterns not adapted to the infant's age. (16 mm, b & w, sound, 23 min., English titles and commentary, sale price: SFrs. 1'125.-). 4. *Prerequisites of Highly Organized Behaviour of Gorillas in Captivity* (Gorilla g. gorilla). (16 mm, b & w, sound, 24 min., English titles and commentary, sale price: SFrs. 1'225.-). Films are available from: Swiss Scientific Film Association, Kapellenstrasse 33 - CH - 4000 - Basle. [Films available for rental only in Europe. Rental fee of SFrs. 50.- plus freight and insurance costs. Films may be previewed in the U. S. A. by writing to Dr. Reto Brun, Cell Biology Dept., Univ. of Calif., Irvine, CA 92664.]

Disease

Pathology of pulmonary acariasis in baboons (*Papio* sp.). Kim, J. C. S. & Kalter, S. S. (Center for Laboratory Animal Resources and Dept. of Pathology, Michigan State U., East Lansing, MI 48823) *Journal of Medical Primatology*, 1975, *4*, 70-82.

Pulmonary acariasis is one of the important and more frequently observed spontaneously occurring diseases in African baboons (*Papio* sp.). It has been found more frequently in baboons in their native habitat than in those in captivity. Prevalence also varies with the sites of captivity. Histopathologic changes occurring in the lungs due to infection with *Pneumonyssus santos diasi* and *P. mossambicensis* are described.

T-strain mycoplasmas and reproductive failure in monkeys. Kundsin, R. B., Rowell, T., Shepart, M. C., Parreno, A., & Lunceford, C. D. (Peter Bent Brigham Hospital, Boston, MA 02115) *Laboratory Animal Science*, 1975, *25*, 221-224.

Of samples submitted, t-strain mycoplasmas were isolated from the genital tracts of 3 species of female monkeys: talapoins (*Cercopithecas talapoin*), patas (*Erythrocebus patas*), and macaque (*Macaca fascicularis*) monkeys. In the colonies from which the samples were drawn, the talapoins have not reproduced successfully for the past 2 years. Fertility in the patas has also been reduced, with a high incidence of stillbirths and spontaneous abortions. The macaques were not permitted to breed.

A spontaneous neuropathy of free-ranging Japanese macaques. Joiner, G. N., Russell, L. H., Bush, D. E., Gleiser, C. A., Johnston, T. D., Fedigan, L., & Fedigan, L. (Dept. of Veterinary Public Health, Texas A & M Univ., College Station, TX 77843) *Laboratory Animal Science*, 1975, *25*, 232-237.

Thirteen cases of a spontaneous neuropathy were observed among 150 free-ranging Japanese snow monkeys (*Macaca fuscata*). Necropsy of 4 individuals revealed lesions in the peripheral and central nervous

systems. Pathologic changes were associated with ingestion of coyotillo berries (*Karwinskia humboldtiana*).

Breeding

Observations on coagulum characteristics of the rhesus monkey electroejaculate. Fordney Settlage, D. S. & Hendrickx, A. G. (Dept. of Obs. & Gyn., Univ. of So. Calif., Los Angeles, CA 90033) *Biology of Reproduction*, 1974, *11*, 619-623.

One hundred and twenty-one ejaculates obtained by penile electrical stimulation of five highly fertile rhesus males are described in appearance, interaction of coagulum and liquid components, and liquid to coagulum ratios. Three types of gross coagulum appearance are identified. The coagulum comprises 55-68% of the ejaculate by volume displacement measurement. A low volume of semen is never trapped in the coagulum and has a much higher sperm density than liquid released by contraction of the coagulum within 15 min after ejaculation. No evidence of coagulum liquefaction was found and both liquid volume and liquid portion sperm count were *reduced* by incorporation into the coagulum if contact was continued. Enzymatic digestion of the coagulum unsatisfactorily causes sperm destruction and loss of motility, limiting its usefulness. Early separation of the coagulum and liquid portions of the ejaculate is recommended for semen assessment studies, and other contemplated utilization of electroejaculates. Surgical removal of the coagulating gland would be ideal if long-term use of electroejaculated semen is contemplated for certain animals.

Changes in facial color associated with pregnancy in Patas monkeys. Loy, J. (Caribbean Primate Research Center, School of Med., Univ. of Puerto Rico, Rio Piedras) *Folia primatologica*, 1974, *22*, 251-257.

During pregnancy, female patas monkeys (*Erythrocebus patas pyrronotus*) exhibit a characteristic set of bodily color changes. These changes, certain of which may be used as 'pregnancy signs', are described and quantified.

Immunologic pregnancy test in the rhesus monkey (*Macaca mulatta*). Gribnau, A. A. M. (Dept. of Anatomy & Embryology, Univ. of Nijmegen, The Netherlands) *Journal of Medical Primatology*, 1975, *4*, 65-69.

In a rhesus monkey population, 90 matings were performed. Chorionic gonadotropin was extracted from the urine using a modified kaoline-acetone procedure. To diagnose pregnancy, a commercial human immunologic pregnancy test was used. The test method seems to give both a false positive and a false negative rate of zero percent.

Taxonomy

Taxonomic notes on the pelage of *Ateles paniscus paniscus, A. p. chamek* (sensu Kellogg and Goldman, 1944) and *A. fusciceps rufiventris (=A. f. robustus,* Kellogg and Goldman, 1944). Heltne, P. G. & Kunkel, L. M. (Dept. of Anatomy & Dept. of Med., The Johns Hopkins Univ. Sch. of Med.,

Baltimore, MD) *Journal of Medical Primatology*, 1975, *4*, 83-102.
Observations on specimens of *Ateles paniscus paniscus*, *A. p. chamek* and *Ateles fusciceps rufiventris (=A. f. robustus)* reveal unreported variations in coat color and lead to expansions of the current taxonomic descriptions of these subspecies. These variants are significant for the correct identification of spider monkeys used in biomedical research and in terms of distribution and speciation within the genus *Ateles*.

Anatomy

An Atlas For The Skeletal Maturation of the Cebus Monkey: The First Year. David A. Thurm, Kenneth W. Samonds, & John G. Fleagle. Boston: Dept. of Nutrition, Harvard School of Public Health, 1975. 35 pp. [Price: $5.00]
Using the scoring system described in the atlas, one can obtain a measure of skeletal maturity or an estimate of chronological age from a single, whole-body x-ray. The technique has been useful in assessing the effects of malnutrition on young cebus, and it might be a useful tool for other researchers. Requests for copies should be sent to: Dr. Kenneth W. Samonds, Dept. of Nutrition, Harvard Sch. of Public Hlth., 665 Huntington Av., Boston, MA 02115. There is a cost of $5 to cover printing, postage, and handling.

Instruments and Techniques

Instrumented primates as cardiovascular models. Vatner, S. F. & Patrick, T. A. (Dept. of Med., Peter Bent Brigham Hosp., Boston, MA 02115) *Advances in Cardiology*, 1974, *13*, 302-314.
We have developed instrumentation and handling techniques to radio telemeter direct and continuous measurements of regional blood flow, arterial pressure, and left ventricular dimensions and pressures from conscious, unrestrained baboons and chimpanzees. These techniques have been applied to provide a description of coronary and regional vasoactivity and left ventricular function at rest and during a variety of spontaneous activities in higher primates. The goal of these studies is directed toward examining physiology of induced disease states, e.g., heart failure, hypertension, anemia, etc., in a primate model, which is phylogenetically closer to man than more commonly used laboratory animals.

An apparatus for the automatic presentation of object discriminations to monkeys. Dean, P., Weiskrantz, L., & Cowey, A. (Dept. of Experimental Psychology, South Parks Rd., Oxford OX 13 PS, England) *Quarterly Journal of Experimental Psychology*, 1974, *26*, 605-609.
Object discriminations have traditionally been presented to monkeys by hand in the Wisconsin General Test Apparatus. This method is time-consuming and prone to various kinds of experimenter error. It has proved possible to administer object discriminations automatically by using a modification of the Gloster Saro VM 51 vending machine.

This machine, which has space for up to 371 objects, moves them on trays by two electric motors, and the control circuits of these are adapted for external operation by relays and modular programming equipment. A series of simple object discriminations or a concurrent (serial) discrimination task can then be given by remote control. The objects are so treated that by touching either of them the animal completes a circuit, enabling the response to be recorded and appropriately reinforced. Learning in the apparatus seems to be about as efficient as in the Wisconsin General Test Apparatus.

Positive contrast peritoneography and herniography in primate animals. James, A. E., Jr., Heller, R. M., Jr., Bush, M., Gray, C. W., & Kook Sang Oh. (National Zoological Park, Wash., DC) *Journal of Medical Primatology*, 1975, *4*, 114-119.

In a number of primate animals contrast medium was injected intraperitoneally to diagnose hernias as well as evaluate the normal anatomical relationships. The technical considerations are discussed. Contrast herniography and peritoneography appear useful under certain clinical circumstances.

* * *

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