

LABORATORY PRIMATE NEWSLETTER

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Edited by

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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].

All correspondence concerning the *Newsletter* should be addressed to:
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Managing Editor: Kathryn M. Huntington

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NIH GROUP TO SUPPORT RESEARCH RELATED TO
THE SUDDEN INFANT DEATH SYNDROME

Sudden infant death syndrome, also known as "crib death," is a major cause of infant mortality after the first month of life. The incidence of SIDS in the United States is estimated to range from 7,400 to 10,500 deaths per year. The exact cause of the syndrome remains unknown, but data from carefully conducted epidemiologic studies carried out over the past five years have helped to identify the population most at risk and in the process have yielded important observations of possible underlying mechanisms and relationships to its occurrence.

Crib death is the unexpected demise of an infant not known to have had a serious disease, whose death remains unexplained after complete autopsy. In the majority of cases, the baby does not have a cold or other infection and takes his feedings without difficulty. The infant is then placed in his crib for a nap or for the night; several hours later, or in the morning, the baby is found dead. The sudden infant death syndrome occurs more frequently in families of lower socio-economic status, a factor which may explain its higher incidence in non-white infants. It frequently occurs in infants with a history of prematurity, particularly those born between the 34th and 35th weeks of gestation. Male infants appear to be more at risk than females. Victims are mostly between the ages of one and six months; the frequency is highest around the third month of life. The largest number of deaths occur between the months of November and March. These numerous epidemiologic associations with the sudden infant death syndrome may be independent or merely part of a whole set of circumstances commonly associated with low socio-economic class. The etiology of the sudden infant death syndrome is probably rooted in a factor or set of factors found in all socio-economic classes but most prevalent among the poor.

Numerous pathologic mechanisms involving several body systems have been implicated in the etiology of the sudden infant death syndrome. In the past a steady succession of single-factor explanations were offered. More recently several multifactorial etiologic theories have been advanced. For example, one current theory implicates a combination of factors involving infection, instability of the nervous system, and sleep. Realistically, however, it must be admitted that although etiologic theories abound, very few specific hypotheses have been thoroughly refuted.

The National Institute of Child Health and Human Development, one of the National Institutes of Health, is embarking on an expanded research program aimed at solving the problem of the sudden infant death syndrome. The Institute has sponsored a series of planning workshops to define new directions in research into the causes of the syndrome. Seven emphasis areas have been identified for investigation, and research proposals dealing with related phenomena in nonhuman primates would be

welcome. The emphasis areas are as follows:

1. Developmental neurophysiology as it may relate to the sudden infant death syndrome with particular emphasis on abnormal sleep patterns associated with autonomic disturbances which may interfere with vital functions.
2. Respiratory-cardio-vascular responses to stimuli, such as hypercapnia and hypoxia, and unusual vagal effects in relation to susceptibility to the sudden infant death syndrome.
3. Problems related to the developmental aspects of thermodynamics and relevant ambient conditions which may be associated with the sudden infant death syndrome.
4. Abnormal perinatal development of immune response mechanisms with emphasis on the relationship of deficits in immunologic competence as a predisposing factor in the occurrence of the sudden infant death syndrome.
5. Psychological processes experienced by parents, other relatives, and the community in association with the occurrence of a sudden infant death.
6. Epidemiology of the sudden infant death syndrome.
7. Anatomic pathology of the sudden infant death syndrome.

For additional information and research grant application kits, please write to:

Dr. Eileen G. Hasselmeyer
Program Director
Perinatal Biology and Infant Mortality Branch
National Institute of Child Health and Human Development
Bethesda, Maryland 20014

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REQUEST FOR RHESUS MONKEY CARCASSES

We need bodies of rhesus monkeys (*Macaca mulatta*) of known age from which a complete skeleton can be taken; frozen, unembalmed bodies desirable; autopsied bodies satisfactory if all skeletal parts are included; medical history of animal helpful. Most needed are 6-months-to-one-year-olds and 5-to-8-year-olds of both sexes.--Call collect: Dr. Mildred Trotter, Department of Anatomy, Washington University School of Medicine, St. Louis, Missouri 63110. Telephone: (314) 367-6400, station 401.

NEW PRIMATE EXCHANGE SERVICE*

Because a critical situation exists regarding the conservation of primates, the Regional Primate Research Center at the University of Washington is instituting a policy of total conservation effort. All actions of the Center will be tempered by prior consideration of the influence of these actions upon the supply of primates. In addition, we will take positive action wherever possible to aid in the conservation of primates. In this latter regard, we recognize the potential uses of the materials and organization of the Primate Information Center. Three major assets are the accessibility of the existing analyzed literature on primates, the mailing list of the recipients of the *Current Primate References* (which includes the majority of the world's primate users) and the publication of the *Current Primate References* weekly which means that the information content is new. As an initial effort we have published (*Current Primate References*, September 1, 1972) the Appeal for Conservation of Primates adopted by the Fourth International Congress of Primatologists, a statement very similar in content to that adopted at the Institute on Comparative Biology of Primates held at Turin, Italy, in June, 1972.

Our next effort is to initiate a section of the *Current Primate References* devoted to primate exchanges. We will list either groups of living animals available from noncommercial sources or requests for animals. The ground rules for operation of this exchange will be printed each week with the listings.

We are also considering publication of a list of collections of primate material that are available for general use. By knowing the availability and extent of collections, a scientist may avoid unnecessary duplication of these collections.

The Primate Information Center will make an effort to utilize its resources and capabilities in any reasonable fashion to aid and encourage conservation efforts. However, in doing so, we should emphasize that we are not attempting to or interested in usurping the activities of other publications. The *Laboratory Primate Newsletter* in particular serves an essential service to primate users, which the Primate Information Center cannot provide and the slight amount of duplication in listings of primates available between the two publications can only be beneficial to the conservation effort.

Your thoughts and suggestions on the matter of conservation and how we may help are solicited.--Orville A. Smith, Director, Regional Primate Research Center, University of Washington, Seattle, Washington 98105.

*From *Current Primate References*, September 8, 1972.

RECYCLING PRIMATES

The increasing threat of a short supply of primates in the near future calls for alternative approaches of the disposal of "used" primates. In cases where such animals cannot be recycled into another study and funds are not available to maintain them in a general colony, they are usually killed. At least this is true in our case, although we make efforts to give away the animals to other labs that might want them. Usually, the timing is off and we end up destroying the animals.

Clearly, animals that are still intact, or can recover within a short period from their experimental treatment, represent a resource that could be utilized by other investigators. The problem is how to synchronize timing so that the animals can be placed elsewhere, at little or no cost to oneself. I have solved this problem by selling my used squirrel monkeys (subjects in a drug experiment) to a university medical school lab that is engaged in terminal experiments (e.g., organ transplants, or lethal experiments). We have set up an arrangement to synchronize our experiments, which, at least in our case, is convenient. Our buyer is willing to pay our initial animal cost plus the cost of quarantine, license fees, and shipment; the funds are credited to the grant or project from which I originally purchased the animals. Thus, we not only get rid of our animals, but get paid for them. This arrangement is an ideal one. It is good for the buyer since our animals are well acclimated to lab conditions and are healthy and he avoids the usual risks of purchasing animals of unknown history that have only recently been captured from the wild; he also avoids the 30-35 day delay necessitated by quarantine. A guarantee of live delivery and 48-hour survival is given. It is good for me since over the past two years I have returned approximately \$3,000 to the grant budget that originally paid for these animals, and these animals do "double-duty" by serving the need for primates in two different research programs. Therefore, the effort is highly reinforcing in that it makes more grant funds available for research, and these primates, which are becoming increasingly scarce, are recycled at least once. Other investigators may welcome such "sharing" of primates. I suggest that the *Laboratory Primate Newsletter* might serve as a clearing house for investigators to announce the pending availability of X primates, with a short description of their prior use, and the cost (if any). This might go a long way towards helping to conserve our dwindling primate supply. Perhaps readers could indicate degree of interest in such a plan by communicating with the *Laboratory Primate Newsletter*.¹--Dr. Leon S. Otis, Director, Psychobiology & Physiology, Life Sciences Division, Stanford Research Institute, Menlo Park, California 94025. (Telephone: 415-326-6200)

¹We think the author's suggestions are excellent and plan to continue publishing notices of availability of primates and primate material from noncommercial sources. In this connection, we would like to call your attention to the new Primate Exchange Service initiated by the Primate Information Center at the University of Washington Regional Primate Research Center. This service is described on p. 3 of this issue.

MEETING REPORTS: VIIth INTERNATIONAL CONGRESS OF
ANIMAL REPRODUCTION AND ARTIFICIAL INSEMINATION

This Congress was held June 6-9, 1972 in Munich, Germany (see preliminary announcement in the July, 1971, issue of this *Newsletter*), and featured a symposium on the reproductive physiology of nonhuman primates. This was the first time that nonhuman primate papers and this symposium had been included in this series of Congresses and because of the closeness of this meeting to the 3rd Conference on Experimental Medicine and Surgery in Primates in Lyon, France, many primatologists participated in both meetings. Approximately 40 people attended the symposium with an active informal discussion following the presentations. Presentations in the symposium included: "The role of the reproductive physiologist in primatology," by Dr. W. Richard Dukelow, Michigan State University; "Ovulation induction and *in vitro* fertilization in nonhuman primates," by Dr. Duane C. Kraemer, Southwest Foundation for Education and Research, San Antonio, Texas; "Reproduction in an indoor squirrel monkey colony," by Dr. Eugene Hupp, Texas Woman's University, Denton, Texas, and a report on chimpanzee breeding by Dr. Gary Boorman of The Netherlands Primate Center. Comments of the first three speakers will be included in the proceedings of the Congress to be published this year. Comments by Dr. Boorman have been included in a more extensive presentation at the Lyon Conference and will be available in those proceedings. In addition to the symposium, several papers relating to the artificial insemination of macaques and laparoscopy in macaques were presented at the meeting and will be included in the proceedings.

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REQUEST FOR PRIMATE EYES

Eyes of aged primates are needed to study the incidence and variety of retinal degenerative disorders in such animals. A substantial yield is expected, since in humans more than 10% of senescent eyes exhibit retinal degenerations and breaks of importance. Enucleation should be carried out within 12 hours after death to minimize autolysis (24 hours, if the primate cadaver is refrigerated). Following enucleation, the eyes should be preserved in 10% formalin. Please forward prepared eyes in their containers of formalin together with information regarding species, age, sex, and health of the animal prior to death. A complete report of the postmortem eye examination will be returned to the person submitting the specimen.--Contact: Dr. John R. Griffin, Jules Stein Eye Institute, Center for the Health Sciences, University of California, Los Angeles, California 90024.

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GALAGOS FOR SALE

Five male lesser galagos (*G. senegalensis*). Well conditioned to laboratory conditions. Price \$100 each. Contact: Dr. W. Richard Dukelow, Endocrine Research Unit, Michigan State University, East Lansing, Michigan 48823. Telephone: (517) 355-7474.

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

BOOKS

The primate malarias. Coatney, G. R., Collins, W. E., Warren, McW., & Contacos, P. G. Washington, D. C.: U.S. Government Printing Office, 1972. [\$7.00]

This book deals with the malarial parasite as seen in the primate host and in the mosquito, with comments on the way the habits or geographical location of these hosts may contribute to the biology of the plasmodium. The authors are members or former members of the scientific staff of the National Institute of Allergy and Infectious Diseases.

REPORTS

Report on the projected Israeli Laboratory for Production of Conditioned Nonhuman Primates for Science. Goldsmith, E. I., & Moor-Jankowski, J. Jerusalem: National Council for Research and Development, 1972.

The possibility that Israel may serve as a center for the supply of high quality primates for scientific research is under active consideration. The National Council for Research and Development has assumed the responsibility for examining the need, advantages and proposed structure of a laboratory designed to produce high quality primates for local use and export. This Report was prepared, at the request of the Council, by the authors, founders of the Laboratory of Experimental Medicine and Surgery in Primates, who visited Israel, inspected various laboratories, and met with a large number of personnel working in the field.

The main findings and recommendations of the Report: (1) Primates as experimental animals have many advantages over other such animals and often serve as an exclusive model for medical research. (2) The opinion that primates as experimental animals are expensive is not always well founded. In a number of cases it has been proven that the experimental use of primates is no more expensive than that of other animals. (3) The world demand for high quality primates is on the increase and with it the willingness to

*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.

pay higher prices, while the number of primates in natural habitats is diminishing. (4) There are decided advantages to captive-born and conditioned primates over wild primates. (5) Israel has special qualifications for the establishment of a center for the supply of such primates. These are: high scientific level in the country; wide contacts with the international scientific community; suitable geographic location and climate; proximity to supply countries; nationally owned air transport facilities. (6) The establishment of such a center in Israel would make possible the creation of a center for Applied Biological and Medical Research, including Pharmacology, Toxicology and Ecology. (7) The Report recommends the establishment in Israel of a center for the supply of primates which will engage in import, quarantine (and, later on, reproduction), research, and export. (8) The proposed center would be established in a number of stages which are outlined in the report.

The economic aspects of the establishment of such a center are now being examined by a private consulting firm. If the report is positive the findings will be submitted to the appropriate government offices, as well as to the various research, scientific and industrial bodies for joint consultation on the means for developing the proposed center.

BIBLIOGRAPHIES

The chimpanzee, a topical bibliography. (2nd ed.) Rohles, F. H., Jr. (Ed.) Manhattan, Kansas: Institute for Environmental Research, Kansas State University, 1972. [Price: \$10.00]

In 1962, the first edition of this bibliography was published at Holloman Air Force Base, New Mexico, as Aeromedical Research Laboratory Technical Documentary Report 62-9. The first addenda were published a year later and added 158 references to the 2,365 in the original compilation and in 1967 a second volume of addenda containing 477 new references was published. The present compilation consists of the references from the original bibliography and the two addenda together with 1,248 new references for a total of 4,248. The references from the first edition and addenda cover the 228-year period from 1739 (Rf. 504.1) to 1967; the new references were published in the 5-year period from 1967 to 1972. The references are subdivided into 38 sections under Anatomy; 28 sections under Physiology and Pharmacology; 20 sections under Pathology and Experimental Medicine; 25 sections under Psychobiology; and 4 sections under Miscellaneous. Within each section, the references are listed chronologically. An Author Index is included.

Social dynamics and primate behavior. Ossario, N. A. (Dept. Anthropology, Rutgers University), 1972.

This bibliography includes references up to July 1, 1971. There are 51 pages of references under the heading of "Social Dynamics" and another 34 pages of references under the heading "Primate Social Behavior." The bibliography is available from the compiler at the following address: Rutgers University Heights, 794 Bevier Rd., Piscataway, N. J. 08854.

Bibliographic supplement to "Hematologic values for nonhuman primates tabulated from the literature." Morrow, A. C. & Terry, M. W. (Primate Inform. Cen., Reg. Primate Res. Cen. SH-50, U. Washington, Seattle, Wash. 98105) Seattle: Primate Information Center, 1972, 3 pp.

DISEASE

Parasites of marmosets. Porter, J. A., Jr. (Vet. Admin. Hosp., 1201 NW 16th St., Miami, Fla. 33125) *Laboratory Animal Science*, 1972, 22, 503-506.

Marmosets (285) belonging to 9 species were necropsied and the parasitologic findings recorded. Seven of the 9 species were infected with acanthocephalid adults, *Prosthenorchis* sp. Four species were infected with acanthocephalid larvae. Six species were infected with trematodes of 1 or more of the species, *Platynosomum amazonensis*, *Athesmia foxi*, and *Phaneropsolus orbicularis*. Five species were infected with cestode adults, which, in all but 1 marmoset, belonged to the *Paratriotaenia* sp. Five species were infected with tapeworm larvae, *Spirometra* sp. Six species were infected with cecal worms, *Primasubulura jacchi*. Four species were infected with pinworms, *Trypanoxyrus* (H.) sp. Four species were infected with filarioids, *Dipetalonema gracile*. Three species were infected with filarioids, *Dipetalonema marmosetae*. Three species were infected with trichostrongylids, *Molineus vexillarius*; 1 species with trichostrongylids, *Longistriata dubia*. *Spirura guianensis*, a spirurid, was found in 1 species. *Protospirura muricola*, another spirurid, was found in 2 species. *Filaroides* sp., a metastrongylid, was found in 1 species. *Porocephalus clavatus* nymphs, pentastomids, were found in 4 species. Two species were infected with coccidoid oocysts.

PHYSIOLOGY AND BEHAVIOR

Growth of maturing *Macaca mulatta*. Kirk, J. H. (Radiobiol. Div. USAF Sch. Aerospace Med., Aerospace Med. Div., AFSC, Brooks AFB, Texas 78235) *Laboratory Animal Science*, 1972, 22, 573-575.

Body weights and body weight gains are presented for a group of 26 maturing *Macaca mulatta* from 2 through 8 years. The males were found to outweigh the females by

an amount that was statistically significant at ages 4 yr to approximately 8 yr; the latter being the oldest animals in the study. Comparisons of wild-captured and captive-born primates showed a marked similarity in body weights as a function of age.

Weights and measurements of normal squirrel monkeys (*Saimiri sciureus*). Middleton, C. C., & Rosal, J. (Sinclair Comp. Med. Res. Farm, U. Missouri, Columbia, Mo. 65201) *Laboratory Animal Science*, 1972, 22, 583-586.

Body and organ measurements, urine pH, body temperatures, leukocyte counts, heart rates, and blood pressures were collected from squirrel monkeys in Leticia, Colombia, South America. The monkeys were selected for uniformity. Complete autopsies were performed on all animals.

Nutritional requirements of subhuman primates. Kerr, G. R. (Dept. Nutrition, Harvard U. Sch. Pub. Hlth, Boston, Mass. 02115) *Physiological Reviews*, 1972, 52, 415-467.

The contents of this review are as follows: *Introduction: Use of subhuman primates in biological and behavioral research.* Historical and current areas of study. Nutritional considerations in all studies involving subhuman primates. *Taxonomy of primates.* Classification and geographic distribution of subhuman primates. Taxonomic differences related to digestive system. Considerations in selecting a subhuman primate for specific studies. *General nutritional requirements of subhuman primates.* Diets in habitat. Diets in captivity. *Specific nutritional requirements of subhuman primates.* Energy requirements. Water requirements. Fat requirements. Protein requirements. Vitamin requirements. Mineral requirements. *Nutritional requirements during importation, pregnancy, and infancy.* During importation. During pregnancy. During immediate postnatal period. During periods of rapid Growth. *Summary.*

ANATOMY

A stereotaxic atlas of the brainstem for *Macaca mulatta* in the sitting position. Smith, O. A., Kastella, K. G., & Randall, D. C. (Reg. Primate Res. Cen. SH-50, Dept. Physiol. & Biophysics, U. Washington, Seattle, Wash. 98105) *Journal of Comparative Neurology*, 1972, 145, 1-23.

TAXONOMY

Taxonomic status of the macaques *Macaca mulatta* Zimm. and *Macaca irus* Cuvier (= *M. fascicularis* Raffles). Hill, W. C. O. (Oakhurst, Dixwell Rd., Folkestone, Kent, England) *Journal of Human Evolution*, 1972, 1, 49-51.

Evidence adduced of natural intergradation of *Macaca mulatta* and *M. irus* at the area of contact between their respective ranges near the Thai-Burmese frontier, is interpreted as due to casual hybridization and does not warrant reduction of the crab-eating monkey to the status of a subspecies of the rhesus. Data from morphology, physiology and molecular biology militate against the latter conclusion.

Comparative neuroanatomical evidence and the taxonomy of the tree shrews (*Tupaia*). Haines, D. E., & Swindler, D. R. (Med. Coll. Virginia, Health Sci. Div. Virginia, Commonwealth U., Richmond, Va.) *Journal of Human Evolution*, 1972, 1, 407-420.

Recent neuroanatomical literature and its relationship to the taxonomic question of *Tupaia* is reviewed. The origin, course and terminations of corticospinal fibers in the tree shrew is intermediate between that of the opossum and phalanger, representing more basic forms, and the slow loris and greater galago. The terminations of the optic tract in the dorsal lateral geniculate nucleus share some characteristics with the hedgehog and greater galago. The organization of the accessory optic system is distinctly basic in the tree shrew. The cerebral cortex and corticofugal fibers of *Tupaia* are intermediate between that of basal forms and some Prosimii. The so-called phylogenetic increase in brain stem centers and the degree of encephalization of *Tupaia* is intermediate between advanced insectivores and various members of the Lorisidae and Lemuridae. The cerebellum of *Tupaia* has a poorly developed anterior lobe, and a well developed hemisphere of the posterior lobe, interpreted as basic and moderately advanced characteristics respectively. The deep cerebellar nuclei of the tree shrew more closely resemble those of the hedgehog and mole than those of the lesser galago. The vascular pattern of the rhombencephalon is, in general, similar to that of some Prosimii. The diversified results of comparative studies on the tree shrew central nervous system do not suggest a tupaiid-primate or a tupaiid-insectivore affinity, but tend to support the separate order suggestion of Straus.

CONSERVATION

Gorilla census. Harcourt, A. H., & Groom, A. F. G. *Oryx*, 1972, 11, 355-363.

The authors spent three months in the Virunga volcanoes, in Rwanda, making a census of mountain gorilla groups as an aid to Dian Fossey's long-term studies of this highly endangered primate.

ADDRESS CHANGES

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