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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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HOW LABORATORIES CAN CONTRIBUTE TO STUDIES OF NATURAL POPULATIONS: WITH SPECIAL REFERENCE TO CALLITRICHIDS

P. F. Neyman

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The possible relevance of field studies to laboratory investigations has been suggested by various workers (Rothe, 1975; Epple, 1974; Dienhardt, 1970). That profitable application could also occur in the reverse direction has been less often discussed (Corbin & Vande Populierre, 1976). This contention forms the focus of the present paper. Some types of data or specimens that may seem useless in the laboratory context, and therefore be ignored despite the ease in collecting them, can be invaluable to the field or museum worker. Even animals that are to be "sacrificed" for experimental purposes can provide data such as is outlined below.

When the objective of field study is to characterize a population with regard to age structure and reproductive pattern, two major questions immediately arise: What is this animal's reproductive state? and How do I estimate its age? The typical field study affords neither sufficient time nor adequate sample size to establish satisfactory age and reproductive-state criteria. This could by contrast be relatively easily accomplished in the laboratory. Recent publications on palpation of embryos *in utero* (Phillips & Grist, 1975; Hearn, in press) and on tooth eruption sequences in callitrichids (Chase & Cooper, 1969; Tappen & Severson, 1971; Johnston, Dreizen, & Levy, 1970) are examples of valuable laboratory-derived tools which could not have been efficiently developed in the field.

These comments are particularly applicable to certain callitrichids which are maintained in some numbers in captivity. Field studies of this little-known family are certain to increase in the future. They are amenable to capture methods used for other small mammals and to "in the hand" aging techniques. It is here that laboratory data could be particularly useful. For example, data relevant to estimating the age of juveniles is badly needed. Not only age *per se* is of interest but, ultimately, date of birth. Since births are rarely observed in the field, it is almost always necessary to estimate birth date. If observations on a group are being made daily, the possibility for error is negligible; but since only one group can be observed at a time, the sample so obtained is only a minor part of the total sample. This is particularly true if the investigator can be present at the study site for only part of the year, but still wishes to characterize reproductive patterns over a number

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of years. Types of data useful in aging can be divided into two types: Those applicable to captured animals, and those useful for individuals seen only at a distance. Obviously the latter will have less precision, but, providing its error can be estimated, such a measure is preferable to none at all.

I will outline some types of data I would have found useful during my study of wild *Saguinus oedipus* (Neyman, 1977). Perhaps future workers who undertake field studies of callitrichids can benefit from having available at the initiation of their work baseline data such as these. In addition I will point out some behavioral indices and some anatomical parts easily obtainable in the laboratory, which may be applicable to studies of natural populations.

Indices Relevant to Age Estimation

Weight Measurements of Growth

Needed especially during the early ages where the weight-gain curve shows the least variability and the steepest slope (Chase & Cooper, 1969). This measure has two disadvantages: Possible negative change with age and high variability which increases with age. On the other hand, it is very easy to measure and potentially useful for a longer period of life than length measures, since it levels off later (Chase & Cooper, 1969). Its usefulness in constructing age-estimation curves depends on large samples. Individuals used should be from different litters, as littermate weight tends to be highly correlated (Neyman, personal observations). A weight drop in old animals might be looked for. Data collected by the writer on wild *S. oedipus* suggested this, where age was judged by tooth condition.

Length Measurements of Growth

Body length. Crown-rump length was used by Chase and Cooper (1969) for *Saguinus nigricollis*. For live animals this is probably the most easily taken overall length measure. Its disadvantage is that it differs from the standard method for measuring mammalian body length (DeBlase & Martin, 1974). The latter is calculated by subtracting tail length (tip of first moveable vertebra to fleshy tip, measured dorsally) from total length (nose to fleshy tip of tail, measured dorsally).[1] The method used should be stated.

Knee-heel length. Hearn (1977) found this the most easily taken, most repeatable, and least variable of several length measures attempted on *Callithrix jacchus*, perhaps because it involves basically only one bone.

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[1]The American system (described here) differs somewhat from the European (see DeBlase & Martin, 1974).

Dental Development

The dental complement of a captured animal is a potential check and supplement to an age estimate based on weight or length measures. At present the only species for which tooth eruption sequences are available are *Saguinus nigricollis* (Chase & Cooper, 1969; Tappen & Severson, 1971) and *Callithrix jacchus* (Johnston, Dreizen, & Levy, 1970). Any laboratory regularly examining infants can easily collect these data. A distinction between just erupting, partly grown, and fully grown-in teeth might be made.

Tooth Wear

Canine or molar wear have been used with varying success for age estimation in field studies of many mammalian species (Morris, 1972). A standardized laboratory diet would allow assessment of individual variation and would constitute a valuable contrast and control for wild animal observations. Quantification of the aging process of teeth could be potentially useful.

External Appearance

Details of appearance with age in marmosets are practically undescribed in the literature (and unillustrated). Yet, the collective knowledge from laboratory colonies is potentially considerable. Easily visible characters that are only present during certain stages of development need to be described, and individual variability in their timing assessed.

Characteristics of newborn infants. A medial stripe or patch is present in newborns at the front center of the head in at least several species of callitrichids. This is a potential character by which very young infants could be differentiated from older ones with certainty at a distance, since it apparently disappears at an early age. It would be useful to know in what species it occurs, whether it is consistently present and visible at a distance, and how variable the age of disappearance is. Other distinctive patterns may occur in other species.

Facial and head hair patterns of juveniles. In many callitrichids facial and head hair patterns are markedly different in the infant and juvenile compared to the adult. For example, in *Saguinus oedipus* areas of the cheeks, temples and forehead lateral to the topknot, which are bare in the adult, are in the juvenile covered with black and white hairs that disappear in a predictable sequence (Hampton & Hampton, 1967). The individual variation in age of disappearance, and the duration of the period it subsumes have not been documented. Series of photographs (front and side) of individuals at standard ages could be used by field workers to test or increase their accuracy of age-determination based on appearance. Such a series could even be carried in the field for reference.

Indices of Reproductive State

Nipple Development and Changes

Nipple length, width, and color are standard characters used in mammalian population studies, and will probably prove useful for marmoset studies in differentiating parous from non-parous individuals. Nipples enlarge and elongate in nursing females (R. W. Cooper, personal communication, 1976). The degree of variability of this phenomenon, its post-lactation persistence, and whether it occurs in case of abortion or miscarriage has not been investigated. Such data will have obvious applicability to investigations of social organization, if there is any relationship between dominance and parity in the wild such as that demonstrated in captivity.

Cycle of Mammary Gland Changes During Pregnancy and Lactation

There are practically no data available on lactation, its duration, or the morphological changes that accompany it. The relationship between differential development of the two sides (R. W. Cooper, personal communication, 1976) and litter number or use of them is likewise unknown. Also lacking are data on the duration of lactation and the variables influencing it.

Indicators of Puberty and Reproductive Maturity

Externally visible characters indicating puberty need to be correlated with physiological changes. The onset of pigmentation in the suprapubic gland has been suggested as a criterion for puberty in *Saguinus geoffroyi* of both sexes (Dawson, 1976). Dawson found that presence of pigmentation correlated very well with weight in wild *S. geoffroyi*: Only 3 of 38 individuals in his sample with unpigmented suprapubic glands exceeded 425 gm; no individuals with pigmented glands weighed less than this. Additional criteria for differentiating reproductive from non-reproductive adults would be very useful in field investigations of population and social structure.

Behavioral Indices

In laboratories where behavioral observations are accompanied by routine physical examinations, a look might be taken at correlations between grossly observable skin gland parameters (length, width, discoloration of surrounding hair)[2] and marking frequency. Individual variation in degree of yellowing in the chest, abdominal, and anal areas

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[2]Reliable judgements about color are exceedingly difficult to make. Comparisons may be facilitated through the preservation of hair samples, which can be stored in glasine envelopes. They should be kept in a closed container with paradichlorobenzene to prevent insect damage.

is striking in wild *S. oedipus*. With the data available, it is impossible to judge how much variation is ascribable to age, reproductive state, or individual behavior. If this were known, it might be possible to make limited inferences regarding social structure in wild groups based on skin gland condition. Also, age-specific changes in vocalizations and behaviors of infants could be observed. Of interest here are variability between individuals, effects of litter number, arrival of new litters, etc.

Data Collection

Reasonable sample size and regularity of notation is essential to assessment of the degree of reliability with which data described above can be used for age estimation. Thus the preferable way to collect them is routinely, on standardized forms, and at specific ages. This need involve only a small amount of time. Since only a few births can be expected to occur in a colony on any one day, by scheduling individuals for examination at weekly or 28-day ("standard month") intervals from the date of birth, it would be possible to weigh and examine only a few individuals daily and still obtain standardized data. For characters that cannot be measured, categorization of even a crude nature is always far preferable to *ad lib* verbal descriptions. Until reliable categories can be established, early data might be supplemented with photographs which can later be reclassified if necessary. Lastly, to be most flexible for later users, all published data should include not only mean and range (of character expression or age of occurrence), but, most importantly, a specified measure of dispersion from which error estimates could be made.

Anatomical Material

Bodies of sacrificed animals, especially the less common species, may provide useful material for taxonomic and anatomical studies. Skulls and skeletons, as well as skins, could constitute useful comparative material for the study of wild populations. It cannot replace wild-caught specimens of known origin, but may aid in assessing species variation, particularly since the number of wild-caught specimens available in museums is limited in the majority of marmoset species. In order to document variation, the aim should be to preserve a series of skins, skulls, and skeletons, rather than representative types.

Under the direction of Dr. Richard Thorington, the Smithsonian Institute Division of Mammals recently established a whole-body preservation program for primates, intended chiefly as a source of anatomical material for comparative studies. Uncommon species are particularly needed for this collection. The Smithsonian also maintains a collection of preserved internal organs of mammals.

All specimens should be provided with permanent labels, written in indelible India ink, containing standard data used in mammalian

studies. These are: Origin, date, sex, and certain measurements taken on the unpreserved body--nose-tail length, tail length (as described above), hind foot length, ear length, and weight (for details see DeBlase & Martin, 1974). The inclusion of age, reproductive state, and history would greatly enhance the specimen's value. It is preferable to label the specimen itself, as well as the container in which it is placed, with the data described.

Conclusion

The application of some of the types of data described to natural populations must of course be made with great care. There is already some indication, for example, that rate of growth may differ between captive and wild callitrichids (Epple, 1970). Laboratory-derived data on parameters varying with age would have to be checked with data from known-aged wild animals. Also laboratory animals may be exposed to as much or more variability as are natural populations, albeit from different sources, and to stresses and physiological demands not present in wild environments. Nevertheless the captive situation offers the possibility of controllability, reduction of variability, large sample sizes, and repeated measures on the same individuals. A detailed knowledge of the diet, social exposure, and environmental changes that an individual has experienced is possible. Thus, even where not directly utilizable by field workers in their investigations, laboratory-derived data could potentially increase our understanding through a greater knowledge of species baselines and limits (see, for example, Baldwin & Baldwin, 1976).

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ENFORCED ADOPTION AND SUCCESSFUL RAISING OF A NEONATE SQUIRREL MONKEY *SAIMIRI SCIUREUS* (BRAZILIAN)

David M. Taub, Noel D. M. Lehner, and Michael R. Adams

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For many years, rhesus monkeys *(Macaca mulatta)* have been successfully raised on artificial or surrogate mother "models" from as early as the first day of life, and these techniques are standard procedure in many laboratories. Laboratory housed rhesus females have been observed to spontaneously steal and adopt infants other than their own, and on rare occasions some rhesus females in our laboratory have "kidnapped" an infant from the biological mother and have raised it simultaneously with their own offspring. In many large breeding colonies, it is the preferred procedure to attempt to induce a female whose infant has recently died to adopt a neonate should its own mother die, rather than hand raise the infant (Bernstein, personal communication, 1977).

Squirrel monkeys *(Saimiri sciureus)* have also been successfully raised by artificial techniques (King & King, 1969; Kaplan & Russell, 1973; Kaplan, 1974, 1976). However, squirrel monkeys do not appear to accept infants other than their own as readily as do macaques (c.f., Hopf, 1970; W. Redican, personal comjunication, 1977). For example, commenting on adoption in squirrel monkeys, Kaplan (1976) states, "...this is a rare occurrence and depends more on the individual female than on any other factor." Recently, however, successful adoption of a newborn in this species has been reported (Eveleigh & Hudson, 1973). This brief communication reports on a similar successful enforced adoption in a breeding colony of squirrel monkeys, *Saimiri sciureus* (Brazilian). Details of housing, group structure and reproductive history of the Bowman Gray School of Medicine's squirrel monkey colony have been reported elsewhere (Taub *et al.*, in press).

Female #442 was a feral born female, approximately 14 years old, who had resided in the breeding colony for over 12 years; she was a gravida 9 and a multiparous female. On August 12, 1976, female #442 gave birth to a male infant (#3109) and the following day female #442 died. Female #1418 was a colony-born and raised female approximately 8 years of age; she was a gravida 4 and a multiparous female. On August 13, 1976, female #1418 had a still born, full-term male infant that weighed 130 g.

Several hours after female #442's death, her infant was presented

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to female #1418. Female #1418 immediately accepted the infant and carried it in the dorsal position characteristic of this species. In subsequent weeks, female #1418 exhibited normal maternal behavior toward this "adopted" infant, and her behavior toward this infant did not differ from that of other colony females toward their biological offspring. Over the course of its development, infant #3109 did not respond any differently to its foster mother than other infants did to their biological mothers. As of this writing, infant #3109 is almost 10 months old. All behavioral indicators suggest that he has developed normally and is a socially integrated member of its social group. The adoptive mother was obviously able to provide adequate nutritional support for the infant and apparently also able to provide "psychological" developmental support as well.

The conditions under which our enforced adoption was successful are not equivalent to those reported by Eveleigh and Hudson (1973). We presented the adoptive infant to the prospective female one day after the loss of her own infant; Eveleigh and Hudson report that their female successfully adopted the infant after a lapse of 21 days, although it was necessary for them to stimulate her milk production by exogenous administration of prolactin. It seems likely that the probability of a successful adoption by squirrel monkeys can be maximized by minimizing the time between a female's losing her infant and the presentation of another for adoption. Yet it appears equally true that a delay of up to almost a month does not preclude a successful adoption.

Adoption by a "foster" mother is preferable to hand-raising infant nonhuman primates for several reasons. In contrast to the hand-raising approach, this procedure does not require elaborate or specialized equipment nor does it require any investment of technician time. Furthermore, and of more fundamental importance, offspring raised by an adoptive mother do not manifest any of the social and sexual abnormalities that are the hallmark of surrogate raised primates. As a result, one can expect infants raised on "foster" mothers to develop normal behavior patterns and become reproductively viable members of the social unit.

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OPPORTUNITIES FOR STUDY OF THE CAYO SANTIAGO COLONY

The Cayo Santiago colony of the Caribbean Primate Research Center is available to qualified scientists for observational studies of free-ranging rhesus monkeys *(M. mulatta)* and other terrestrial and marine organisms. Potential investigators should submit written proposals to: Director, Caribbean Primate Research Center, Box 297, Sabana Seca, Puerto Rico 00749.

Proposals will be judged according to compatibility with other ongoing research at the colony, feasibility given the available facilities and characteristics of the population, and scientific merit. Proposals will be evaluated by the Director of the Caribbean Primate Research Center, the Scientist-in-Charge and Resident Scientist of Cayo Santiago, and an Advisory Board.

Prior visits to the research site and discussion with the staff are recommended. Visiting scientists will be provided genealogical and census records from the current population as required by their research. Additional records are available by prior agreement. Contact--R. G. Rawlins, Resident Scientist, Cayo Santiago, Box 106, Punta Santiago, Puerto Rico 00741 (Phone: 809-852-0690).

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REPRINTS AVAILABLE

The Yerkes Primate Center has available a number of copies of reprints of papers by Yerkes, Lashley, Nissen and Schiller. These are available for a small charge. A list of the reprints available will be sent free of charge on request. Contact: Director, Yerkes Regional Primate Research Center, Emory University, Atlanta, GA 30322.

THE NOTORIOUS OR EVEN FAMOUS "TOP TEN" (1976)

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As one playful exercise to determine present and perhaps future trends in primate behavioral research, we have searched the 1976 *Science Citation Index* to see which behavioral primatologists were cited most frequently last year. We felt that it was not how much one publishes, but how much others like or dislike what one publishes that was critical to being in the "Top Ten".

Actually, we included only the first three quarters of last year (1976) and we used only the *Science Citation Index*, not the *Social Sciences Citation Index*. We included, in our original list, those "behavioral primatologists" who were members of the International Primatological Society in 1971, or who were cited in non-edited general primate behavior "textbooks" (Jolly, 1972; Bramblett, 1976; Rowell, 1972), or who were members of the American Society of Primatology in January of 1977. Thus, our starting point and our definition of "behavioral primatologists" were somewhat arbitrary. A different Top Ten would have undoubtedly resulted had we used different qualifications for those to be included in the search. Nevertheless, we felt that, using these criteria, we included most behavioral primatologists. In any event, here is our list of behavioral primatologists most often cited between January and September of 1976.

	Name	Number of Citations
1.	Robert A. Hinde	176
2.	Peter Marler	120
3.	Harry F. Harlow	88
3.	Richard P. Michael	88
5.	Desmond Morris	82
6.	David Premack	71
7.	Hans Kummer	66
8.	J. H. Crook	58
9.	Jane Van Lawick-Goodall	55
10.	Y. Sugiyama	47

To determine the extent to which some of the individuals were cited, we used citations of *A Handbook of Living Primates* (Napier & Napier, 1967) as an anchor point. The *Handbook* is certainly a volume often cited by many of us, yet it was cited only 55 times in the first three quarters of 1976. The first two individuals in our Top Ten (Hinde and Marler) were each cited over twice as often as the *Handbook*!

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The list is certainly an eclectic one. Some individuals probably appear as a reflection of the volume of work they have produced, others because of only one or two extremely well received scientific contributions, and still others for their appeal to the laity. Some, like Harlow for example, would probably appear in the "Top Ten" for any year from at least 1950 onwards, while others would almost surely not have made the list had a different year been selected. Peter Marler's appearance on the list may be due to the impact of his work on development of singing in birds as much as it is to his work on primates. William A. Mason (46 citations), Irwin S. Bernstein (44), Stuart A. Altmann (44) and Sherwood L. Washburn (44) deserve an honorable mention. Had different criteria been used they might have "made" our list.

We leave to the readership of the *Newsletter* the interpretation of the appearance of the names in our Top Ten. Personally, we at first felt that the absence of Coburn, Mitchell, and Wilson in the top 300 could well make the entire list suspect.[1] However, we felt better when we reminded ourselves that the individuals on the list might be notorious as well as or instead of famous.

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[1]We didn't even know there were as many as 300 behavioral primatologists.

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REQUEST FOR COMMENTS ON A PROPOSED NEW INTERNATIONAL JOURNAL OF PRIMATOLOGY

A proposal for a new international journal of primatology has been made to Plenum Press and the purpose of this notice is to solicit support and views on a number of aspects of the proposal.

The major motivation behind this proposal is a clearly felt need not only for an international journal of high standard but also for one with a novel tripartite approach which would include articles of three kinds:

1. Articles of conventional length which would take their place in the queue and for which there would be a reasonable publication lag;

2. Short articles [of three pages at the most] which are judged of sufficient importance would be guaranteed publication in the next issue;

3. Solicited review articles to give well-known research workers the opportunity to review their areas of research and which would be aimed at the research worker as well as the student community. Such review articles could be prescribed for courses and sold as separata. Periodically, every one or two years, review articles could be made available in book form after suitable editing.

It was suggested that there be a Managing Editor, assisted by a group of Joint Editors, and, equally importantly, a large Editorial Board, both of which would be composed entirely of well-established research workers who show every sign of continuing to be engaged in research for many more years. No "elder statesmen" would be included simply for the purpose of decorating the inside cover. The functions of the Managing Editor would be, as the title implies, to manage, organize and edit the journal. The Joint Editors, of which there could be as many as six, would assist in the editing, reviewing and, in addition, would be responsible for soliciting the help of other suitable referees many of which would be on the Editorial Board which could be as large as 30. The success of the journal would depend largely on their providing quality control of the highest order. Articles returned to contributors as unsuitable would be accompanied either by recommendations for revision or fully documented reasons for rejection.

Plenum Press have suggested that I be Managing Editor. I have written to 23 people to ask if they would be prepared to serve on the Editorial Board. Of these, 16 have replied positively although 3 of these have indicated that, because of heavy commitments, they will only be able to help with refereeing an occasional article. Six have not yet replied and only one has declined on grounds of pressure of work.

The 16 people who have thus far agreed to serve on the Editorial Board are:

Stuart Altmann
Matt Cartmill
David Chivers
Tim Clutton-Brock
John Crook
Steve Gartlan
Cliff Jolly
Pat Luckett
Bob Martin
Bill Mason
Thelma Rowell
Duane Rumbaugh
Allan M. Schrier
Jeff Schwartz
Bob Sussman
Ian Tattersall

Some of these may agree to being Joint Editors.

Although it is a bit early to spell out precise editorial policy, the consensus amongst those with whom I had an opportunity of discussing the proposal is that, in broad terms, the journal would accept articles of a high standard devoted to basic or fundamental primatology but would not necessarily exclude all articles in applied primatology.

Plenum Press are enthusiastic about this possible venture and have suggested that initially, at least, it could be published quarterly at approximately 100 pages per number and could probably sell at U.S. $35.00 per volume. But, if a sufficient number of people indicate their willingness to subscribe to this journal the subscription rate could be reduced by 50%, i.e., $17.50. Given today's financial climate they are unlikely to launch a new journal without a guaranteed subscription base. One way of accomplishing this goal would be by means of some sort of official arrangement with an organization such as the International Primatological Society whereby the journal would become the official journal of the Society either by inclusion of the subscription fee in dues or by some elective subscription arrangement. This matter is currently being discussed by the Executive Committee of the International Primatological Society. However, at this time a strong expression of support from the primate research community would probably be sufficient to begin the process of initiating the journal.

It would be appreciated if anyone willing to support the proposed journal by subscribing to it would indicate so by writing to Dr. G. A. Doyle, Director, Primate Behaviour Research Group, University of the Witwatersrand, Johannesburg, South Africa.

* * *

ERRATA: PRIOR ARTICLES ON ENDANGERED SPECIES

We have been advised by Mr. Jacques Berney, Executive Secretary for the Endangered Species Convention, IUCN Secretariat, Morges, Switzerland, of several small errors in two of the articles in the April, 1977 issue of the *Laboratory Primate Newsletter* that dealt with endangered species.

Regarding page 9, paragraph 1, of the article entitled "Convention on International Trade in Endangered Species: Appendices Now Include All Primates": Reservations may be entered with regard to species included in all Appendices I, II or III and not only with regard to Appendix III. If a State enters a reservation it is considered as a State not a Party as far as the species for which a reservation has been entered is concerned. That means that similar documents will be requested by other Parties (See the second article, page 12 (bottom), and 13 (top)). Regarding page 9, paragraph 2: For Appendix I species, as for Appendix II species, a re-export certificate must be issued if the specimen is coming from a country other than the country of origin.

Regarding page 12, paragraph 3, of the article entitled "Convention on International Trade in Endangered Species: Appendices Now Include All Primates": The golden langur *(Presbytis geei)* was on Appendix I since 1973. On the other hand, the long-tailed langur *(Presbytis potenziani)* was added at the first meeting of the Conference of the Parties (Berne, 1976). Regarding page 13, paragraph 2: The special technical meeting in question is called the "special working session" of the Conference of the Parties to the Convention. It will be held in Geneva (Switzerland) from 17 to 28 October 1977.

* * *

TRENDS IN PRIMATE IMPORTS INTO THE UNITED STATES

An article by Dr. Nancy Muckenhirn in the *ILAR News* (1977, *20* [3], 5) indicates that "primate imports into the United States continued their declining trend in 1976." The estimate of a total of 33,539 primates imported in 1976, represents less than half the number imported in the early 1970s. "The overall decline from 1975 was 18 percent, with the greatest decline occurring in imports from Latin American countries." Of the total number indicated above, 20,610 came from Asia, 7,753 from Latin America, 4,712 from Africa, and 464 from secondary source countries.

* * *

RHESUS MONKEYS AVAILABLE

We have approximately 200 rhesus monkeys that have been free of T.B., parasites, and nutritional deficiencies for over five years, and are currently in excellent health. These animals are now available for use in our facility or are for sale. Most have been born in our facility, have not been used for testing, and have exact birth dates and medical histories. Ages of both sexes range from newborn to adult proven breeders. Contact: Dr. G. N. Rao, Endocrine Laboratories, P. O. Box 7546, 3301 Kinsman Blvd., Madison, WI 53704 (Phone: 608-241-4108).

* * *

NEW PRODUCTS AND SERVICES

Capture crossbows are available from Martins' Crossbows. This syringe-bolt system has been used extensively in capturing and recovering primates ranging in weight from 450 g to 60 kg. Maximum weight potential is regulated only by drug choice. Address: Martins' Crossbows, 110 Robinhood Road, King's Forest, Covington, LA 70433 (Phone: 504-892-3143).

* * *

VARIETY OF PRIMATES AVAILABLE

For Sale: *Ateles geoffroyii* (2/1), *A. paniscus* (0/1), *Macaca silenus* (2/0), *M. assamensis* (1/0), *Cebus* spp. (0/2), *Theropithecus gelada* (8/7), *Pan troglodytes* (5/0).

For Indefinite Loan: *Macaca mauris* (1/0), *M. tonkeanna* (2/0), *Celebes--Tonkeanna* hybrids (2/0), *Sykes*--vervet hybrid (0/1), *Mandrillus leukophaeus* (1/0), As a group--11 Mandrill-drill hybrids.

Contact: Brent Swenson, D.V.M., Yerkes Regional Primate Research Center, Atlanta, GA 30327.

* * *

REQUEST FOR INFORMATION

A doctoral research project is currently being undertaken on the effects of voluntary alcohol consumption on the individual behavioral patterns of stumptail macaques *(Macaca speciosa)* and their social interactions in different group situations. Information concerning any studies either currently underway, or that have been completed and are as yet unpublished, that are relevant would be gratefully received and properly acknowledged. All reports should be sent to Mark A. Waruch, Laboratory of Vertebrate Ethology, SUNY College at New Paltz, New Paltz, NY 12561.

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

Books

Language Learning by a Chimpanzee: The Lana Project. Duane M. Rumbaugh (Ed.). New York: Academic Press, 1977. 304 pp. [Price: $17.50]
This book reports the findings of the Lana Project, whose aim was to develop a computer-based language-training system in an effort to investigate the ability of chimpanzees to acquire language. Beginning with a review of language theory and communication, the report discusses the probable relation between cross-modal perception and language. The strategies and tactics of the language project along with the details of the Yerkish language and computerization and programming are presented, followed by a description and analysis of the methods used in training the chimpanzee and her ultimate acquisition of various linguistic skills (e.g., learning names and attributes); the chimpanzee's conversations, both spontaneous and manipulated, are detailed. Implications for the language training of the mentally retarded are discussed. Finally, using the data obtained from their experimentation, the authors consider the possible relationship between communication in general and language in particular from an evolutionary perspective. Contents: LANGUAGE THEORY AND FOUNDATIONS. Language origin theories, by G. W. Hewes; Linguistic communication: Theory and definition, by E. von Glaserfeld; Cross-modal perception: A basis for language?, by R. K. Davenport. DESIGN OF THE LANA PROJECT. The Lana project: Origin and tactics, by D. M. Rumbaugh, H. Warner, & E. von Glaserfeld; The Yerkish language and its automatic parser, by E. von Glaserfeld; Computer programs, by P. P. Pisani; The system: Design and operation, by H. Warner, & C. L. Bell; Training strategy and tactics, by T. V. Gill, & D. M. Rumbaugh. LANA'S MASTERY OF LANGUAGE-TYPE SKILLS. Lana's acquisition of language skills, by D. M. Rumbaugh, & T. V. Gill; Language relevant object- and color-naming tasks, by S. M. Essock, T. V. Gill, & D. M. Rumbaugh; Color perception and color classification, by S. M. Essock; Conversations with Lana, by T. V. Gill; Acquisition and use of mathematical skills by a linguistic chimpanzee, by G. B. Dooley, & T. V. Gill. PROJECTS FOR THE FUTURE. The conversation board, by H. Warner, C. L. Bell, & J. V. Brown;

In many cases, the original source of references in this section has been the Current Primate References prepared by The Primate Information Center, Regional Primate Research Center SJ-50, University of Washington, Seattle, WA 98195. Because of this excellent source of references, the present section is devoted primarily to presentation of abstracts of articles of practical or of general interest. In most cases, abstracts are those of the authors. Any author wishing to have a published paper abstracted in this section may do so by sending the Editor a copy of the reprint with a summary or abstract and indicating his desire on the reprint.

Implications of the Yerkes technology for mentally retarded human subjects, by D. A. Parkel, R. A. White, & H. Warner. LANGUAGE AND COMMUNICATION: A PERSPECTIVE. Communication, language, and Lana; A perspective, by E. S. Savage, & D. M. Rumbaugh.

Intelligence in Man and Ape. David Premack. Hillsdale, NJ: Lawrence Erlbaum Associates, 1976. 370 pp. (Distributed by Halsted Press Division of Wiley.) [Price: $16.50]

This volume describes the author's research concerned with the questions "What is language and what is the nature of the intelligence that can acquire it?" The author describes his program of research which involved decomposing language into atomic constituents, designing and applying training programs for teaching these to chimpanzees, and for teaching chimps major human ontological categories, as well as for interrogative, declarative, and imperative sentence forms. The volume details the progress from teaching apes simple predicates such as same-different, to more complex predicates such as if-then. On the basis of the outcomes of the research the author attempts to answer the following questions directly related to intelligence: What made the training program effective? What is the cognitive equipment of the species which enables it to learn language? What does this tell us about human intelligence? Contents: 1. Introduction. 2. Subjects and general procedure. 3. The physical basis of language. 4. Early failures. 5. Later success: Mapping a social transaction. 6. Transfer. 7. Early concepts: Same-different, no, and the interrogative. 8. "Name of" and metalinguistics. 9. Properties and property classes. 10. Productivity: Use of concepts to generate new instances of themselves. 11. Class membership. 12. Toward logical connectives and the concept of causality. 13. Quantifiers and this/that. 14. Synonymy. 15. Words and memory. 16. Syntax. 17. Mechanisms of intelligence: Preconditions for language.

Primates of South Asia: Ecology, Sociobiology, and Behavior. M. L. Roonwal, & S. M. Mohnot. Cambridge, MA: Harvard University Press, 1977. 421 pp. [Price: $22.50]

The purpose of this book is to serve as a guide to the primates of South Asia. Twenty-five species in all inhabit this region from its northern crown of mountains to the coastal plains, from Afghanistan to Burma. The authors describe the daily life and social structure of each species about which such information is available. Ecological background is provided. Findings from both field and laboratory studies are described. Chapters on each of the 25 species are organized into sections on Tupaiidae (Tree Shrews), Lorisidae (Lorises and Galagos), Cercopithecidae (Macaques, Langurs or Leaf Monkeys, and Baboons), and Hylobatidae (Gibbons and Siamangs).

Use of Non-Human Primates in Biomedical Research. M. R. N. Prasad, & T. C. Anand Kumar (Eds.). New Delhi: Indian National Science Academy, 1977. 400 pp. [Price: $40.00. Order from: The Executive Secretary,

Indian National Science Academy, 1 Bahadur Shah Zafar Marg, New Delhi-110002, India. Orders must be accompanied by an Overseas Bank Draft in $ or DM]

This book contains papers presented at an international symposium, organized by the Indian National Science Academy, which was held in New Delhi, November 3-8, 1975. Contents: NON-HUMAN PRIMATES IN THE WILD AND THEIR CONSERVATION. Utilization, availability and conservation of non-human primates for biomedical programmes, by C. H. Southwick; Population trends and dynamics of rhesus monkeys in Aligarh district, by M. F. Siddiqi, & C. H. Southwick; Ecology and sociology of *Presbytis entellus*, by C. Vegal; Ecology and ethology of the hanuman langur, *Presbytis entellus* and the bonnet monkey, *Macaca radiata*, by M. D. Parthasarathy; Ecological observations on the golden langur, *Presbytis geei*, with remarks on its conservation, by H. Khajuria; Distribution, habitat and conservation of the rain forest primates of Western Ghats, India, by G. K. Kurup; Forest structure and its relation to activity of the capuchin monkey *(Cebus)*, by J. R. Oppenheimer; The ecology of Gibbons: Some preliminary considerations based on observations in the Malay Peninsula, by D. J. Chivers; Need for conservation of primates, by A. B. Chiarelli. REPRODUCTIVE BIOLOGY OF NON-HUMAN PRIMATES AND THEIR USE IN CONTRACEPTIVE TECHNOLOGY. Reproductive biology of the langur monkey, *Presybtis entellus*, by L. S. Ramaswami; Use of the rhesus monkey in studies on reproductive biology of the male: Hormonal regulation of epididymal function, by M. R. N. Prasad, R. Arora-Dinakar, & N. Dinakar; Current status of research on the primate ovary, by T. G. Baker; Induction of abnormal intra-uterine development with triamcinolone, vitamin A and X-irradiation in non-human primates, by A. G. Hendrickx, T. G. Terrel, A. C. Andersen, B. I. Osburn, R. H. Sawyer, & T. Steffek; Use of sub-human primates in studies of placental function, by I. Joelsson, R. Myers, & K. Adamsons; Social influences on reproduction in rhesus monkeys, by J. G. Vandenbergh; Hormonal regulation of reproductive behaviour in the female primate, by E. B. Keverne; Gonadotropin antisera as early abortifacients in humans; Testing the feasibility of the approach using bonnet monkeys, by N. R. Moudgal, S. Prahlada, & M. Venkataramiah; Utility and limitations of rhesus monkey in active immunization with a tetanus toxoid conjugated vaccine eliciting anti-HCG response, by G. P. Talwar, C. Das, S. K. Dubey, M. Salahuddin, & N. C. Sharma; Reproduction of the marmoset monkey in captivity: Its use in studies of contraceptive immunology, by J. P. Hearne; The use of rhesus monkey for pharmocokinetic studies and development of contraceptive methods, by K. R. Laumas; Circulating steroid levels in male and female baboons *(Papio hamadryas)*, by S. Z. Cekan, N. P. Goncharov, & E. Diczfalusy; Steroid pool development in general blood circulation of baboons and its change in stress conditions, by N. P. Goncharov, B. A. Lapin, G. V. Katzija, A. V. Antonichev, T. Aso, S. Z. Cekan, & E. Diczfalusy; Studies on neuroendocrine aspects of reproduction in the rhesus monkey leading to the development of hormonal nasal sprays as a new fertility-regulating method, by G. F. X. David, K. Kumar,

V. Puri, B. Umberkoman, & T. C. Anand Kumar. USE OF NON-HUMAN PRIMATES IN NUTRITION, NEUROBIOLOGY, PSYCHOPHARMACOLOGY, SURGERY, IMMUNOLOGY AND TOXICOLOGY. Similarities between induced nutritional disease in non-human primates and human diseases, by B. Belavady; Non-human primate Kwashiorkor, by M. G. Deo, & V. Ramalingaswami; Mechanisms of cerebral functions and principles of organization of primate brain, by T. Desiraju; Neural correlates of sexual responses in non-human primates, by S. Dua-Sharma; Use of baboons in neurophysiological studies as an experimental model for epilepsy and states of vigilance, by E. Balzamo, R. Naquet, and J. Bert; Experimental brain oedema in non-human primates, by S. Sriramachari, S. N. Pathak, & D. K. Balani; Use of non-human primates in psychopharmacology, by C. Milhaud, & M. J. Klein; Some contributions of non-human primates to human health problems through surgical research, by E. I. Goldsmith; Use of primates in immunological studies and tissue transplantation, by W. van Vreeswijk, & H. Balner; The use of primates in pharmacology and toxicology, by H. Weber, & M. Madoerin; Use of rhesus monkeys in quality control of oral polio vaccines, by S. C. Arya; Blood group of Apes and Old World monkeys: Sub-human type and simian type and their importance for reproduction and perinatal studies and for breeding in captivity, by A. S. Wiener, & J. Moor-Jankowski. ORGANIZATION OF PRIMATE RESEARCH FACILITIES. Organization of primate research facilities in France, by G. Mahouy; Cost accounting of organization of research facilities for multi-disciplinary research in health services, by D. A. Valerio.

The Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing. Washington, D. C.: National Academy of Sciences, 1977. Soft cover. 341 pp. [Price: $9.25. Order from: National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D. C. 20418]

This is the proceedings of a symposium held under the auspices of the Institute of Laboratory Animal Resources of the National Academy of Sciences on October 22 and 23, 1975. It addresses itself to the ethical, ecological, and legal implications of the use of animals in research, as well as to the scientific aspects. Contents: Introduction, by G. T. Harrell; Historical perspectives of biomedical experimentation, by F. C. Davison; Humane perspectives, by C. Stevens; The era of humane awareness, by R. L. Hummer; Biological variability: Precision in biomedical research, by G. J. Race; Experimental systems: Advantages and disadvantages, by K. Benirschke; Ethological contributions to the medical and behavioral sciences, by S. Kramer; Animal behavior: Relation to illness and disease, by E. G. Pattishall, Jr.; Animal models, by L. K. Bustad, G. A. Hegreberg, & G. A. Padgett; Biostatistical and biomathematical methods in efficient animal experimentation, by C. M. Newton; Summation of day one, by W. Gay; A legislator's view on animal legislation affecting biomedical research, by T. S. Foley; Cells in culture in biology, medicine, and public health, by T. C. Hsu; *In vitro* systems in basic biomedical research, by M. Dawson; *In vitro* systems in medical research, by S. Fedoroff; Application of *in vitro* systems to public health, J. C. Petricciani, H. E. Hopps, B. L. Elisberg, & E. M. Earley;

A review of the validity of presently accepted scientific standards, by T. A. Loomis; The ethics of biomedical experimentation, by H. C. Rowsell; Ecological considerations in the use of wild animals for biomedical research, by L. M. Talbot; Root and branch: Legal aspects of biomedical studies in man and other animals, by I. Ladimer; Summary, by H. A. Schneider.

Primate Functional Morphology and Evolution. Russell H. Tuttle (Ed.). The Hague: Mouton, 1975. (Distributed in the United States and Canada by Aldine, Chicago.) 583 pp. [Price: $34.50]

This volume contains papers that were prepared for discussion in a session at the IXth International Congress of Anthropological and Ethnological Sciences, September 2, 1973, in Chicago. Contents: SECTION ONE. NEW PERSPECTIVES ON THE ORIGIN AND DEVELOPMENT OF CATARRHINE PRIMATES. Haplorhine phylogeny and the status of the Anthropoidea, by F. S. Szalay; The beginnings of the catarrhini, by S. Cachel; Paleoecology and zoogeography of the Old World Monkeys, by E. Delson; Discussion. SECTION TWO. BIOMOLECULAR PERSPECTIVES ON PRIMATE EVOLUTION. Molecular evidence as to man's place in nature, by M. Goodman, & G. W. Lasker; The study of primate chromosomes, by B. Chiarelli; Discussion. SECTION THREE. ANATOMICAL CORRELATES OF FEEDING BEHAVIOR IN MONKEYS, APES, AND MAN. An assessment of masticatory efficiency in a series of anthropoid primates with special reference to the Colobinae and Cercopithecinae, by P. Walker, & P. Murray; The role of cheek pouches in cercopithecine monkeys adaptive strategy, by P. Murray; Discussion. SECTION FOUR. KNUCKLE-WALKING AND HOMINOID EVOLUTION. Knuckle-walking and knuckle-walkers: A commentary on some recent perspectives on hominoid evolution, by R. H. Tuttle; Knuckle-walking and the functional anatomy of the wrists in living apes, by F. A. Jenkins, Jr., & J. G. Fleagle; Discussion. SECTION FIVE. MECHANISMS AND EVOLUTION OF BIPEDALISM IN THE HOMINOIDEA. Functions and evolution of hominid hip and thigh musculature, by B. A. Sigmon; Electromyography of the gluteus maximus muscle in gorilla and the evolution of hominid bipedalism, by R. H. Tuttle, J. V. Basmajian, & H. Ishida; Functions of the gluteals in man, by R. K. Greenlaw, & J. V. Basmajian; Functional adaptation to posture in the pelvis of man and other primates, by B. K. F. Kummer; Biomechanical perspectives on the lower limb of early hominids, by C. O. Lovejoy; Comparative osteometry of the foot of man and facultatively bipedal primates, by J. Lessertisseur, & F. K. Jouffroy; Discussion. SECTION SIX. BRAIN EVOLUTION IN THE HOMINOIDEA AND THE EVOLUTION OF HUMAN LANGUAGE. Brain evolution in the hominoidea, by P. V. Tobias; Early hominid endocasts: Volumes, morphology, and significance for hominid evolution; by R. L. Halloway; Maturation and longevity in relation to cranial capacity in hominid evolution, by G. A. Sacher; Estimation of the cranial capacity of fossil hominids, by G. Olivier, & J. M. Dricot; Correlations between major cranial diameters of man and Pongidae, by G. Olivier, & H. Tissier; A comparison of the neurocranium and the splanchnocranium in recent and fossil primates, by F. M. Rosinski, & A. Szwedzińska; The brain of primitive man, by

H. Hamlin; On the evolution of language: A unified view, by P. Lieberman; Discussion.

The Embryology of the Common Marmoset (Callithrix jacchus). I. R. Phillips. (*Advances in Anatomy, Embryology and Cell Biology*. Vol. 52. Part V.) Berlin/Heidelberg/New York: Springer-Verlag, 1976. Soft cover. 45 pp. [Price: $10.70]

The purpose of this volume is to provide a detailed account of development of the marmoset during the embryonic period. In this study, 36 embryos of the common marmoset, representing the major part of the embryonic period, were examined in detail and assigned to horizons on the basis of Streeter's classification. With few exceptions the morphogenesis of the marmoset embryo closely resembled that of other primate species, but there appeared to be a considerable delay in the timing of early embryogenesis. This anomaly together with the unusual placental anatomy of the marmoset is contrasted with development in other mammalian species. Contents: Introduction. Materials and methods: Animals, breeding techniques and the estimation of embryonic age. Collection and processing of embryos. Hysterotomy technique. Limitations to surgical procedures. Dissection and processing. Records. Observations: Description of Stage VII-XXI. Discussion.

Reports

REP: Annual report 1976. Rijswijk, The Netherlands: Organization for Health Research TNO, 1977.

This is the annual report of the REP, which stands for the Radiobiological Institute TNO, Institute for Experimental Gerontology TNO, and Primate Center TNO, Rijswijk Z. H., The Netherlands. Of the many short notes describing the accomplishments of the organization, the following are concerned with primates: TUMOUR INDUCTION AND TUMOUR BIOLOGY. Large DNA transcripts synthesized *in vitro* by primate RNA tumour viruses, by K. J. van den Berg, P. S. Sarin, & R. C. Gallo; Malignant glomus tumours in whole body irradiated rhesus monkeys, by C. F. Hollander, J. D. Burek, & J. J. Broerse. TRANSPLANTATION AND IMMUNOGENETICS. Further studies on the lá-like or B-cell alloantigens of rhesus monkeys, by H. Balner, W. van Vreeswijk, & J. D'Amaro; Current knowledge of the D-locus of rhesus monkeys, by A. A. van Es, B. Tank, G. C. van Kranen-Peltenburg, W. van Vreeswijk, & H. Balner; Inhibition of rhesus monkey mixed lymphocyte culture reactivity with alloantisera, by M. B. Widmer, W. van Vreeswijk, & H. Balner; Isolation and partial characterization of the serologically defined (SD) antigens controlled by the RhLA complex of rhesus monkeys, by B. Tank, M. Giphart, J. W. Bruning, W. van Vreeswijk, & H. Balner; The influence of matching for A and B locus antigens of RhLA and of mixed lymphocyte reactivity on allograft survival in unrelated rhesus monkeys, by A. A. van Es, R. L. Marquet, W. van Vreeswijk, B. Tank, & H. Balner; Blood transfusions induce prolonged kidney allograft survival in rhesus monkeys, by

A. A. van Es, R. L. Marquet, & H. Balner; Attempts to induce immunological enhancement of kidney allografts in rhesus monkeys: The effect of various alloantisera, by R. L. Marquet, G. A. Heystek, R. H. van Leersum, W. van Vreeswijk, A. A. van Es, & H. Balner; Current knowledge of the serologically defined antigens controlled by the major histocompatibility complex of chimpanzees, by H. Balner, W. van Vreeswijk, M. C. Noort, & J. D'Amaro. ETHOLOGY. Analysis of behavioural characteristics of single individuals: Relationships between autoaggression and autogrooming, by C. Goosen, & J. A. J. Metz; Allogrooming conflicts in a pair of adult, stumptailed macaques, by C. Goosen, & L. G. Ribbens; Aims and levels of resolution in the measurement of mother-infant relationships in rhesus monkeys, by H. Dienske; Components of mother-infant body contact in rhesus monkeys, by P. J. C. M. van Luxemburg, H. Dienske, & L. G. Ribbens; Changes with age in the contributions of mother and infant to their mutual body contact in the rhesus monkey, by H. Dienske, G. de Jonge, P. J. C. M. van Luxemburg, & L. G. Ribbens; Regulation of sleeping periods in rhesus monkeys, by G. de Jonge, P. J. C. M. van Luxemburg, H. Dienske, & L. G. Ribbens; The influence of peer interactions on mother-infant interactions in rhesus monkeys, by G. de Jonge. MICROBIOLOGY AND GNOTOBIOLOGY. Gastrointestinal decontamination in monkeys, by W. D. H. Hendriks, C. P. J. Timmermans, J. de Vast, & D. van der Waaij; Herpes antibody in laboratory macaques, by M. C. van den Ende, & M. J. du Chatinier-Bogaerts; Weight related to size as a check on the general condition of adult female rhesus monkeys *(Macaca mulatta)*, by C. Goosen, & E. J. Beyersbergen.

Bibliographies

Bibliography on histochemistry of fetal and infant nonhuman primates. B. Caminiti. Seattle, Primate Information Center, 1977. (Avail. from: Primate Information Ctr., Reg. Primate Res. Ctr. SJ-50, Univ. of Washington, Seattle, WA 98195) [Price: $1.50]

Stress and aversive behavior in non-human primates: A retrospective bibliography (1914-1974) indexed by type of primate, aversive event, and topical area. Stoffer, G. R., & Stoffer, J. E. (Dept. of Psychology, Pacific Lutheran Univ., Tacoma, WA 98447) *Primates*, 1976, *17*, 547-578.

Disease

Intestinal polyposis associated with oxyurid parasites in a chimpanzee *(Pan troglodytes)*. Toft, J. D., II, Schmidt, R. E., & DePaoli, A. (Vet. Sci. Div., USAF Sch. of Aerospace Med., Brooks AFB, TX 78235) *Journal of Medical Primatology*, 1976, *5*, 360-364.

A 40-year-old male chimpanzee had multiple intestinal polyps associated with immature male oxyruid parasites. The gross and histologic characteristics of these lesions were identical to those produced by *Nochita nochiti* in the stomach and esophagus of Old World primates. It was theorized that the lesions resulted from hypersensitivity to

oxyurid infection in an aberrant host.

Mesocestoides in the baboon and its development in laboratory animals. Reid, W. A., & Reardon, M. J. (Dept. of Med. Zoology, Div. of Com. Dis. & Immunology, Walter Reed Army Inst. of Res., Washington, DC 20012) *Journal of Medical Primatology*, 1976, *5*, 345-352.

Tetrathyridia of *Mesocestoides* sp. were recovered from three wild-captured African baboons. Active larvae were administered orally to laboratory-reared dogs, cats, rats and mice. Development in canine hosts was rapid and a high percentage of mature intact worms was recovered as early as 14 days post-exposure. The few worms recovered from the feline hosts were stunted and fragmented. No adult worm development occurred in the rats or mice. No significant clinical or pathological manifestations were exhibited in the primate or experimental laboratory hosts.

Spontaneous malformations in squirrel monkey *(Saimiri sciureus)* fetuses with emphasis on cleft lip and palate. Baker, C. A., Hendrickx, A. G., & Cooper, R. W. (Calif. Reg. Pri. Res. Ctr., Univ. of Calif., Davis, CA 95616) *Journal of Medical Primatology*, 1977, *6*, 13-22.

Gross examination of a group of surviving and non-surviving squirrel monkeys has revealed a high incidence of cleft lip and cleft primary palate defects with an associated anophthalmia. These defects, as well as single incidences of diaphragmatic aplasia, scoliosis, internal hydrocephalus, and funnel chest, are noted or described and discussed with reference to sex and parentage.

Physiology

Composition of lemur milk. Buss, D. H., Cooper, R. W., & Wallen, K. (Food Standards & Sci. Div., Min. of Agric., Fisheries & Food., London SW1, England) *Folia primatologica*, 1976, *26*, 301-305.

The average composition of 8 samples of milk from *Lemur catta, L. fulvus, L. macaco* and a hybrid lemur was (in g/100 ml): lipids, 2.3; protein, 2.7; lactose, 6.4; and ash, 0.35. The fatty acids and major minerals were also quantified. The results did not support classification of *L. fulvus* and *L. macaco* within the same species.

Behavior

Moving laboratory rhesus monkeys *(Macaca mulatta)* to unfamiliar home cages. Mitchell, G., & Gomber, J. (Dept. of Psychol., U. of Calif., Davis, CA 95616) *Primates*, 1976, *17*, 543-547.

Removing a three-year-old rhesus monkey from its home cage and placing it into a second but unfamiliar cage of similar size produces increases in vocalizations and stereotyped behaviors, and decreases in cage shaking and manual and oral exploration of the cage. Males and females respond differently to a cage change, particularly in regard to visual exploration and locomotor activity.

The social behavior of a group of baboons *(Papio anubis)* under artificial crowding. Elton, R. H., & Anderson, B. V. (Dept. of Psychol., Eastern Washington State College, Chesney, WA 99004) *Primates*, 1977, *18*, 225-234.

A harem troop of baboons was crowded by periodically moving one wall of their cage until available space had been reduced to 50%. Social disintegration, as well as individual pathology, was the end result. The behavioral pathology began first with infants and juveniles, and then with the females lowest in dominance.

Facilities and Care

Establishment, maintenance, and behavior of free-ranging chimpanzees on Ossabaw Island, Georgia, U.S.A. Wilson, M. L., & Elicker, J. G. (Yerkes Reg. Pri. Res. Ctr., Emory Univ., Atlanta, GA 30322) *Primates*, 1976, *17*, 451-473.

A small number of adult chimpanzees were released on Ossabaw Island, Georgia, in order to evaluate the feasibility of establishing a free-ranging reproductive colony of chimpanzees in a semitropical North American climate. First, three females and one male were released in June, 1972. Following the unexpected deaths of two of these females, four more females were added. Except for one newborn that was removed from the colony, the chimpanzee colony remained intact, and was still in existence as of February, 1975. Preparation for and maintenance of the chimpanzees is described. Behavioral adaptation to the environment, and some aspects of chimpanzee social behavior are reported. The potential importance of colonies such as this, for reducing over-exploitation of naturally occurring primate populations is discussed.

Influence of noise on animals. Fletcher, J. L. (Dept. of Otolaryng. & Maxillofacial Surg., Univ. of Tennessee Ctr. for Hlth. Sci., Memphis, TN 38163) In T. McSheehy (Ed.), *Laboratory Animal Handbooks*. Buckdew, Huntingdon, Combs., United Kingdom: Laboratory Animals Ltd., 1977. (38 Mill Rd., Buckdew, Huntingdon, Combs., PE 18 (SS))

Little is known about the effects of noise on domestic and wild animals. It is particularly important to know whether noise effects might limit the use or change the results of experiments on laboratory animals. Sources of noise in animal labs were found primarily to ensue from feeding and cleaning operations, animal vocalizations, and animal generated noises such as rattling cages, banging on walls, etc. Another source of noise was from heating, cooling, and ventilation equipment. Noise levels in labs are given and auditory and non-auditory effects on animals are discussed. Auditory effects presented are loss of hearing, non-auditory effects discussion included metabolic, reproductive, biochemical, behavioral and anatomical. It is pointed out that, in general, the sound pressure levels used as stimuli in most of the studies were higher than those normally experienced by animals, while the exposure durations were generally short rather than chronic. Implications of data in this area for

animal care facilities are discussed. A glossary of terms is provided, as well as references to relevant literature.

The Stanford Outdoor Primate Facility: A laboratory for biobehavioral research in chimpanzees. McGinnis, P. R., & Kraemer, H. C. (Dept. of Psychiatry, Stanford Univ. Med. Ctr., Stanford, CA 94305) *Technical Report No. 114*, Laboratory of Stress & Conflict, Department of Psychiatry and Behavioral Sciences, Stanford University, Stanford, California, 1977.

The Stanford Outdoor Primate Facility is a new laboratory for biobehavioral research on chimpanzees. Each of two large outdoor enclosures contains nine animals in an environment that permits a variety of social interaction. The animals' behaviors are monitored regularly by observers using standardized checksheet recording systems. Blood and urine are acquired from subjects for hormone analyses. Behavioral and hormonal data are examined for developmental changes or in relation to experimental variables. Within the operational framework of the facility, the research potentials are many and varied.

Breeding

Factors influencing nursing in *Macaca fascicularis*. Chance, M. R. S., Jones, E., & Shostak, S. (Uffculme Clinic, Univ. of Birmingham Med. Sch., Brimingham 13, England) *Folia primatologica*, 1977, *27*, 28-40.

Nursing by two mother-infant pairs in a caged colony of *Macaca fascicularis* was monitored at 1-min intervals for 8 h beginning 8:30 a.m. BST, once a week for 3 months in the summer of 1973. Nursing occupied about 210 min in 8 daylight hours for the infants at 10 weeks of age, and the time spent nursing decreased at the average rate of 9.4 min per week until the infants were about 6 months old. The time spent nursing by the infants studied here resembled closely the times spent nursing by some other macaques and by baboons. In the course of a day the amount of time spent nursing varies significantly with a diurnal peak. The expected times for the pairs nursing together based on a hypothesis of independent events were significantly less than the observed times the pairs nursed together. Nursing, therefore, involves a positive influence of imitation of one nursing pair by the other. Nursing sessions involving both mother-infant pairs were longer on the average than sessions involving only one pair.

Antenatal sex determination using amniotic fluid of the baboon *(Papio* sp.) Baker, C. A., & Hendrickx, A. G. (Calif. Pri. Res. Ctr., Univ. of Calif., Davis, CA 95616) *Journal of Medical Primatology*, 1976, *5*, 312-316.

Antenatal determination of sex in the baboon was performed by evaluating the percentage of sex chromatin bodies present in the epithelial cells of amniotic fluid obtained during or immediately following Cesarean section. Female sex chromatin patterns revealed a mean of 39.2% positive sex chromatin; the mean in males was less than 5%. This procedure is accurate and simple

to perform.

Use of an ultrasonic blood flow monitor for determining fetal viability in the rhesus monkey *(Macaca mulatta)*: A preliminary study. Mahoney, C. J., & Eisele, S. (Wis. Reg. Pri. Res. Ctr., U of Wisconsin, Madison, WI 53706) *Journal of Medical Primatology*, 1976, *5*, 284-295.

Ultrasonic stethoscopy proved to be a reliable and convenient technique for determining fetal viability in *Macaca mulatta*. Examinations, begun at day 150 of gestation in 33 monkeys and between days 32 and 58 in four other animals, were repeated at intervals of one to seven days. The earliest time of detecting blood flow in the fetal placenta was 42 days of gestation, fetal heart sounds being discerned later. Three types of fetal cardiac rhythms were recognized: (1) a constant rate during most of pregnancy, (2) fluctuations associated with uterine contractions during labor, and (3) sudden transient bradycardia during violent rotations of the cephalically presented fetus.

Reproductive characteristics of free-ranging Panamanian tamarins *(Saguinus oedipus geoffroyi)*. Dawson, G. A., & Dukelow, W. R. (The Museum and the Dept. of Fisheries & Wildlife, Michigan State Univ., East Lansing, MI 48823) *Journal of Medical Primatology*, 1976, *5*, 266-275.

Field observations on reproductive activity in the Panamanian tamarin *(Saguinus oedipus geoffroyi)* were made in conjunction with the examination of 131 reproductive tracts collected at regular intervals over one year. Reproductive tract characteristics were compared over seasons. Embryonic and fetal development were also assessed. A distinct birth peak was observed from April to early June. Pregnancies in April and May point to a potential, but unrealized, birth peak in August and September. Despite the tendency toward birth peaks, reproductive activity occurred throughout the year. Reproduction was limited to a single female per social group. The average number of infants born per female was two. Groups inhabiting lowland areas appeared to be more successful in raising young than groups inhabiting upland areas.

Semi-free breeding of tropical celebes macaques *(Macaca tonkeana)* in a continental European climate. Herrenschmidt, N. (Laboratoire de Psychophysiologie, Strasbourg, France) *Journal of Medical Primatology*, 1977, *6*, 58-65.

Celebes macaques have been successfully bred for four years in a free-ranging colony in the French pre-Alps where they are exposed to continental European climate and temperature variation of 65° Centigrade.

Ovulatory cycle characteristics in *Macaca fascicularis*. Dukelow, W. R. (Endocrine Research Unit, Michigan State Univ., East Lansing, MI 48823) *Journal of Medical Primatology*, 1977, *6*, 33-42.

A total of 595 menstrual cycles were studied in 28 adult *M. fascicularis* over a period of five years. Ovulations, observed laparoscopi-

cally in 138 cycles, occurred on the left ovary 62.6% of the time. No significant effect was noted on cycle length relative to the ovulatory status of the previous cycle or the occurrence of ovulation on the same ovary in consecutive cycles. Laparoscopy had no effect on the parameters studied.

Laboratory and feral hybridization of *Ateles geoffroyi panamensis* Kellogg and Goldman 1944 and *A. fusciceps robustus* Allen 1914 in Panama. Rossan, R. N., & Baerg, D. C. (Gorgas Memorial Laboratory, PO Box 2016, Balboa Hts., Canal Zone) *Primates*, 1977, *18*, 235-237.

A viable, male progeny resulted from a two-year captive pairing of a male red spider monkey (*A. g. panamensis*) and a female black spider monkey (*A. f. robustus*). While the pelage colorations of the parental species are distinctive, the offspring was intermediate in appearance during maturation. Such hybridization apparently occurs naturally in Panama; two feral spider monkeys, captured from an area of sympatry in the Province of Panama east of the Canal Zone, were characteristic of the laboratory cross.

Hibridismo de ♂ *Callithrix geoffroyi* (Humboldt, 1812) X ♀ *C. jacchus* (Linnaeus, 1758), e. criação artificial de filhote híbrido (Callithrichidae, Primates). Coimbra-Filho, A., & Maia, A. De A. (Dept. de Conservação Ambiental, Estrada da Vista Chinesa, 741 - Alto da Boa Vista, C.P. 23011, 20.000 Rio de Janeiro-RJ, Brasil) *Rev. Brasil. Biol.*, 1976, *36*, 665-673.

The authors describe a new case of experimental hybridization between two species of marmoset, *Callithrix geoffroyi* (Humboldt, 1812) and *C. jacchus* (Linnaeus, 1758). Hybrid descendants from the mating of a *C. jacchus* male and a *C. geoffroyi* female had already been obtained (Coimbra-Filho, 1970). The present report is concerned with hybridization of the same species, the male, however, belonging to *C. geoffroyi* and the female to *C. jacchus*. A description of the hybrid offspring is given, as well as the methodology adopted for the artificial nuturing of one of the progeny and a brief comment on the "recuperatory" process of the female *C. jacchus*, who, having abandoned the young of the first pregnancy, demonstrated a behavior change by raising the young of the second birth normally. Assistance from a wild male *C. penicillata jordani* was indispensable in the recuperation of the *C. jacchus* female.

Gestação quádrupla de triplo-híbridos em *Callithrix* duplo-híbrida (Callitrichidae, Primates). Coimbra-Filho, A. F., Rocha, N. Da Cruz, & Pissinatti, A. (Address same as in previous reference) *Rev. Brasil. Biol.*, 1976, *36*, 675-681.

The potential represented by the prolific nature of marmosets is demonstrated by observations of quadruple gestation of triple hybrid offspring in a double hybrid parent of *Callithrix* in which one of the infants was born normally and the other three were removed by Cesarian section. The only survivor required artificial feeding and lived for 48 hours. Furthermore, some deficiency in the grasping

reflex was noted. Each placenta was found to have two umbilical cords which linked it to the respective fetuses. One of the fetuses removed by Cesarian was enveloped by its own cord, which possibly reduced the maternal-fetal flow of blood. As an additional factor, the ectopic implantation was alongside the one born naturally. Insufficient nutritional flow most likely impeded complete development, causing this fetus to remain in a rudimentary state and to block the exit for the other two stillborn infants, later removed during the laparotomy. The two placentae anastomosed by means of three veins, thus promoting fetal cross circulation.

As fases do processo reprodutivo de *Macaca mulatta* Zimmermann, 1780, na Ilha do Pinheiro, Rio de Janeiro, Brasil (Cercopithecidae, Primates) Coimbra-Filho, A. F., & Maia, A. De A. (Address same as in previous reference) *Rev. Brasil. Biol.*, 1977, *37*, 71-78.

Over a two year period concise data were collected on timing of the reproductive process phases of the *Macaca mulatta* Zimmerman, 1780 colony at Ilha do Pinheiro, Rio de Janeiro, Brazil. The authors believe this to be the only population of rhesus in the Southern Hemisphere kept under a free regime, thus making possible a comparison of their mating and birth periods with those of colonies maintained in the Northern Hemisphere. There is evidence of a certain synchronization of biological rhythms with the seasons of the year, usually demonstrating a coincidence of the reproductive phases with the time of year most favorable for each event. At Ilha do Pinheiro, all data indicate that mating begins with the reduction of daylight hours following the summer rains, that is from April to September. In the Southern Hemisphere the birth period of rhesus has become adapted to the regional climate, occurring in the season when abundant food is available which corresponds to the months of October to March. Time of birth in the Southern Hemisphere corresponds approximately to that of mating in the Northern Hemisphere, demonstrating an inversion of the reproductive phases.

The chimpanzee: A unique model for human reproduction. Graham, C. E. (Yerkes Reg. Pri. Res. Ctr., Emory Univ., Atlanta, GA 30322) In *The laboratory animal in the study of reproduction*, T. Antikatzides, S. Erichsen, & A. Spiegel, (Eds.), Stuttgart/New York: Gustav Fischer Verlag, 1976. Pp. 29-38.

We have validated the hypothesis that the close taxonomic affinity between chimpanzee and man is reflected in close physiological similarities. We found that the pattern and amounts of menstrual cycle ovarian hormones and their urinary metabolites more closely resemble man's than do the simian species so far studied. Particular points of interest are the existence of a mid-luteal estrogen peak, development of predecidual tissue in the absence of implantation, and excretion of estriol and pregnanediol as estrogen and progesterone metabolites. Other workers have demonstrated close endocrinological similarities between chimpanzee and human pregnancy which are not shared by simians. Chimpanzees also possess useful

physical characteristics, such as perineal sexual swelling which develops during estrogen stimulation and regresses shortly after ovulation. Large size is an advantage where quantities of body fluids or tissues are required, or where bulky implantable instrumentation must be accommodated.

Large scale production of a small laboratory primate--*Callithrix jacchus*. Hiddleston, W. A. (Pharmaceuticals Div., Imperial Chem. Ind. Ltd., Alderley Park, Macclesfield, Cheshire, England) In T. Antikatzides, S. Erichsen, & A. Spiegel (Eds.), *The laboratory animal in the study of reproduction*. Stuttgart/New York: Gustav Fischer Verlag, 1976.

Between 1968 and 1972 some 1,900 common marmosets *(Callithrix jacchus)* were quarrantined and conditioned in a facility established for the purpose of evaluating their usefulness for pharmacological studies. Hematological and biochemical parameters of this species under conditions of the facility are presented. Varying systems of breeding the marmoset were tried (pairs, trios, and colonies in gang cages). The only satisfactory method of breeding was found to be monogamous pairs housed in individual cages. When sufficient evidence had been gathered that the marmoset was suitable for the experimental requirements, a breeding unit was designed to meet an estimated annual requirement of 1,000 animals at approximately 12 months of age. Calculations showed that to produce 1,000 animals for issue and also the replacement of breeding stock, a colony of 360 breeding pairs would be required. Because of epidemics which had occurred during quarrantine, it was decided to divide the unit into 3 separate colonies, each of which would be staffed and serviced separately. Aspects of the facility and conditions of husbandry are described. In the first 3 1/2 years, the colony has been in operation, 662 litters and 1,074 weaned animals have been produced. The number of breeding pairs has increased from an initial 100 pairs of imported animals to 295 pairs, 195 pairs of which were home-bred. At the time the article was written, the home-bred animals were coming into production and it was estimated that the unit would be in full production by late 1976.

Absence of seasonal variation in the length of the menstrual cycle and the fertility of the crab-eating macaque *(Macaca fascicularis)* raised under natural daylight. Dang, D. C. (Lab. d'Anatomie, UER Biomedicale, 45 rue des Saints-Peres, 75006 Paris, France) *Ann. Biol. anim. Bioch. Biophys.*, 1977, *17* (1), 1-7.

Fifty-five *Macaca fascicularis* females were raised in the laboratory at relatively constant humidity and temperature but under natural daylight ratio in Paris. Their 275 menstrual cycles studied over 3 years showed no variation in mean length during the year. Dividing the year into four different daylight ratio lengths (short, 8-9 hours; increasing from 9 to 15 hours; long, 15-16 hours; decreasing from 16 to 8 hours), no difference in the conception rate was found. The rate was 35/100. Contrary to lemurs, the daylight ratio seems to play no role in the reproduction of macaque females. The length of the menstrual cycle of *Macaca fascicularis* is 34.5 ±

1.3 days; the median is 32 days and the mode 29 days.

Vaginal cytology: Induced ovulation and gestation in squirrel monkey *(Saimiri sciureus)*. Jarosz, S. J., Kuehl, T. J., & Dukelow, W. R. (Endocrine Res. Unit, Michigan St. Univ., E. Lansing, MI 48824) *Biology of Reproduction*, 1977, *16*, 97-103.

From July through September, in the Northern United States, *Saimiri sciureus* experience a period of anovulation and low sexual activity. This report summarizes the results of studies during this anovulatory period and the effects of exogenous gonadotropins on vaginal cytology, ovulation, sexual behavior and pregnancy. By increasing the level of FSH, ovulation occurred and pregnancies resulted. Evidence is presented in support of the theory of a decreased responsiveness of the squirrel monkey to FSH during this summer season.

Ecology and Field Studies

Geographic distribution and habitat diversity of the Barbary macaque *Macaca sylvanus L.* Taub, D. M. (Dept. of Anthro., U. of CA, Davis, CA 95616) *Folia primatologica*, 1977, *27*, 108-133.

During a 15-month behavioral study in Morocco and a 3-month survey in Morocco and Algeria, the present distribution of the Barbary macaque was determined. In Algeria these monkeys are found in seven constricted and disjunct localities in the Grande and Petite Kabylie mountain ranges. These localities are severely restricted in space and are located in remote or inaccessible areas which support only small populations. In only two regions (Guerrouch and Agfadou) can populations of reasonable size be found; even there they do not approach the abundance found in the Central Middle Atlas zone of Morocco. Algeria contains approximately 23% (5,500 maximum) of the total number of surviving Barbary macaques in North Africa. About 77% of the total number of Barbary macaques occur in Morocco. These monkeys are found in high numbers [65% (14,000 maximum)] and in relatively wide stretches of distribution in the Middle Atlas. As in Algeria, distribution in Morocco was wider earlier this century, and several areas have recently become unoccupied.

Taxonomy

Notes on status of *Lemur macaco* and *Lemur fulvus* (Primates, Lemuriformes). Tattersall, I. (Dept. of Anthro., American Museum of Natural History, New York, NY 10024) *Anthropological Papers of the American Museum of Natural History*, 1976, *53* (Part 2), 257-261.

The synonymy of *Lemur macaco* and *L. fulvus* proposed by Schwarz (1936) has been accepted by many workers. The evidence for "intermediate" forms upon which this opinion was based is shown to be inadequate, and a case of sympatry of the two species in northern Madagascar is reported. Consequently it is clear that these forms can no longer be regarded as distinct only at the subspecific

level. The name *L. fulvus "flavifrons,"* still used by some authors, is based on inadequate material and cannot be identified with any known lemur populations.

The family group name of the leaf-eating monkeys (Mammalia, Primates): A proposal to give Colobidae Blyth, 1875, precedence over Semnopithecidae Owen, 1843, and Presbytinae Gray, 1925, Z. N. (S.) 2094. Delson, E. (Dept. of Anthro., City U. of NY, Bronx, NY 10468) *Bulletin of Zoological Nomenclature*, 1976, *33* (Part 2), 85-89.

The Old World monkeys, family Ceropithecidae, are usually divided into two groups. One is the subfamily Ceropithecinae Gray, 1821, which consists of the cheek-pouched monkeys, including guenons *(Cercopithecus)*, baboons *(Papio)*, and macaques *(Macaca)*. The other group is the subfamily Colobinae, which consists of the leaf-eating monkeys, including the African *Colobus* species and the Asian *Presbytis*. Some authors consider these groups of family rank within a superfamily Cercopithecoidea. Although the name Colobinae (or Colobidae) has generally been used for the leaf-eating monkeys a problem arises because this usage is antedated by two older family-group names for these monkeys. The author explains the reasons for his proposal to formalize the use of Colobinae as the name for the leaf-eating monkeys.

Request for the determination of the generic names of the baboon and the mandrill (Mammalia, Primates, Cercopithecidae). Z. N. (S.) 2093. Delson, E. (Address same as in above reference.) *Bulletin of Zoological Nomenclature*, 1976, *33* (Part 1), 46-60.

The author points out that for nearly thirty years, the names of the common or "savannah" baboons and of the mandrill and drill (or "forest" baboons) have been in doubt. In the thirty years immediately prior to 1947, *Papio* Erxleben, 1777 was in general use for the savannah baboons and *Mandrillus* Ritgen, 1824 for the drill and mandrill, while during the preceding 20 years or so the two genera were usually united under the earlier name, *Papio*. Then in 1947 attention was drawn to the generic name *Papio* Müller, 1776, used in combination with the specific name *sphinx* Linnaeus, 1758, usually considered a mandrill. From that time onwards it has been clear that the next available generic name for the savannah baboon (considered as a genus apart from the drill and mandrill) is *Chaeropithecus* Gervais, 1839. Nevertheless many authors have been loath to use the prior names valid under the International Code of Zoological Nomenclature, i.e. *Papio* for the drill and mandrill, and *Chaeropithecus* for the savannah baboons. They have continued to use invalid names in the interests of stability, on the grounds that they were more familiar both to primatologists and to general zoologists. It is to solve this problem--to weigh the claims of priority and usage--that two alternative proposals are being submitted by the author to the International Commission on Zoological Nomenclature with a request for a ruling.

Pulpotomy as an alternative to canine tooth extraction in monkeys *(Macaca mulatta)*. Henderson, J. D., Jr., Rauth, T. J., & Grussing, D. M. (Riker Laboratories, Inc., St. Paul, MN) *Journal of Medical Primatology*, 1977, *6*, 50-53.

An effective method for sealing pulp canals after partial removal of canine tooth crowns from adult rhesus monkeys is described.

The "pill popper": A device for drug capsule self-administration by primates. Grabowski, J., & Sunkin, J. (Univ. of So. Calif., Sch. of Med., Los Angeles, CA 90033) *Behavior Research Methods and Instrumentation*, 1976, *8*, 495-497.

An apparatus for establishing self-administration of drugs in capsule preparation form by nonhuman primates is described. The system includes a capsule loading unit combined with a pressurized liquid dispenser and mouth-operated drinking tube lever. Operation of the mouth lever results in forced ingestion of a capsule or other solid substance and a measured quantity of liquid. The components of the system are separately programmable and adjustable to permit shaping of pressurized liquid and capsule ingestion through successive approximations. Examination of absorption factors and temporal variables associated with delay of drug reinforcement onset, as well as precision in oral dosage, are thus possible in a model which approximates the most common method and features of drug self-administration in humans.

Capturing and marking howler monkeys for field behavioral studies. Scott, N. J., Jr., Scott, A. F., & Malmgren, L. A. (Nat. Fish & Wildlife Lab., Museum of Southwestern Biol., Univ. of NM, Albuquerque, NM 87106) *Primates*, 1976, *17*, 527-533.

Methods for capturing and marking howler monkeys for ecological studies are discussed. Systems for capturing and handling animals are compared. A dart with liquid Sernylan for capture and Sernylan or Ketamine as a holding drug was preferred to darts using powdered succinylcholine chloride (SCC) and ether. The effectiveness of both Sernylan and SCC is compared and dosages are given for Sernylan in howler monkeys and SCC for howlers and capuchins. The advantages of Ketamine over ether as a holding drug are discussed. Animals can be marked with leg-band, collars, and freeze-branding.

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COPIES OF RAVEN'S *ANATOMY OF THE GORILLA* AVAILABLE

The Department of Mammalogy has some unbound, but otherwise complete, copies of Raven's *Anatomy of the Gorilla*, which are available for $5.00 to cover handling and shipping costs. Contact: Sydney Anderson, The American Museum of Natural History, Central Park West at 79th St., New York, NY 10024.

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