LABORATORY PRIMATE NEWSLETTER

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POLICY STATEMENT
(Revised January, 1967)

The primary purpose of the Laboratory Primate Newsletter is to provide information on maintenance, breeding, and procurement of nonhuman primates for laboratory studies. A secondary purpose is to disseminate general information about the world of primate research. Requests for information, for special equipment, or for animal tissues or animals with special characteristics will be included in the Newsletter. 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.

It should be kept in mind that the Newsletter is not a formal publication and it is not obtainable in most libraries. Therefore citation of Newsletter notes or articles should be limited to special circumstances. This also means that inclusion of material in the Newsletter does not preclude its publication in a journal. As a rule, authors of longer articles will receive two extra copies of the issue in which the article appears; reprints will not be supplied under any circumstances.

The Newsletter appears quarterly, and the mailing list is open to anyone in the primate field expressing an interest. There is no charge for new issues and back issues for the current year. Back volumes will be furnished free of charge to any library operated by a nonprofit organization with the understanding that they will be kept in the library. Individuals may purchase Volumes 1, 2, and 3 for $4.00 per volume, and Volumes 4 and 5 for $2.00 per volume. (Please make checks payable to Brown University.)

Preparation of articles for the Newsletter.--Articles and notes should be submitted in duplicate and all copy should be double spaced. Articles in the reference section should be referred to in the text by author(s) and date of publication, as for example: Smith (1960) or (Smith & Jones, 1962). Names of journals should be spelled out completely in the reference 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 Fiedler [In H. Hofer, A. H. Schultz, & D. Starck (Eds.), Primatologia. Vol. 1. Basel, Switzerland: Karger, 1956. Pp. 1-266].

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EDITOR'S NOTES

A letter received from Ivor Smith, Senior Lecturer in Biochemistry, Courtauld Institute of Biochemistry (The Middlesex Hospital, Medical School, London, W.1, England) calls attention to the fact that feeding bananas or diets containing banana flakes, such as the banana-flavored Nutrient Pellets (CIBA) previously described in the Newsletter (January, 1966, New Products and Services section), would be contraindicated for primates used in research in experimental phenylketonuria and other aspects of aromatic biochemistry. Bananas contain hydroxytryptamine which is metabolized in various ways by various primates giving rise to indoles in the urine other than those which may be normally present in a particular animal.

We attended the meeting of the International Primatological Society in Frankfurt this past summer. We enjoyed meeting colleagues from other countries and hearing some of the papers. We think the organization itself is a potentially useful one and that an occasional meeting of this sort is desirable. However, we were disappointed with the format of the meeting (though certainly not with our treatment by the hosts) and would highly recommend that it be changed. What we objected to primarily was the almost total emphasis on presentations of short, specific technical papers dealing with topics from a wide range of fields. Although there was some grouping of papers into related areas, the primary unifying principle seemed to be that monkeys or apes were involved. This is a poor unifying principle. The fact that a psychologist, physical anthropologist, and a biochemist are doing research involving monkeys or apes does not automatically make what each is doing either interesting or comprehensible to the others. Of course it is perfectly possible that each has something to learn from the other, but it is rather unlikely that specific technical papers are the best way to accomplish such "cross-fertilization." It would seem more likely that such cross-fertilization would occur when the presentations are of the symposium-type, dealing with general trends and findings in the various fields. In any event, the presentations are more likely to be of interest to people in a variety of fields if they are of the latter type. Furthermore, few people go to a meeting of a society of this type (and here we assume that, as originally stated, the society is still supposed to include all persons doing research involving nonhuman primates, regardless of their discipline) to obtain specific information in their own field--that is what the discipline-oriented professional societies are for. Another change that we would suggest would be that more time be provided for general discussion of topics of broad interest, such as conservation of animals, problems of nomenclature, research facilities and programs in various countries, and the like.

CONTENTS

OBSERVATIONS ON REPRODUCTION OF LABORATORY-MAINTAINED SQUIRREL MONKEYS[1,2]

N. D. M. Lehner, B. C. Bullock, M. A. Feldner, and T. B. Clarkson

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The extensive current interest among biomedical research workers about the reproductive potential of squirrel monkeys in the laboratory has prompted us to present this preliminary report dealing with our observations on reproduction among several groups of squirrel monkeys in our colony.

In establishing the first of our breeding groups, we attempted to take into account the precise origin of the animals. Our own field observations in South America along with published observations of others have suggested that squirrel monkeys in the bush live in rigidly established social troops and that there is probably little exchange of individuals among these different troops. In view of this, it seemed important to establish a breeding colony composed entirely of monkeys from the same social troop. In August of 1964, a member of our staff trapped 18 females and 3 males from a single social troop near the village of Teresina, Brazil. The animals were shipped by air to Winston-Salem and were established as 2 breeding groups at our research farm. Each group was composed of 9 females and either 1 or 2 males and was housed in a cage that was 5 ft. wide, 6 ft. deep, and 7 ft. high. Each cage had an outdoor enclosure of the same size as the indoor, which was available to the monkeys except during very cold weather. The animals were fed a modified Purina Monkey Chow containing 23% protein and vitamin D_3 instead of vitamin D_2. In addition, the animals were given about one ounce of reconstituted frozen orange juice per monkey per day. During 1965, no reproductive activity was noted among these animals. During January and February, 1966, marked swelling of the external genitalia in the females and frequent copulation were noted. The reproductive performance of these animals during 1966 is summarized in Table I.

Of the 18 females in the 2 groups, 17 became pregnant. Of the ensuing births, 16 occurred between June 4 and July 15, 1966, and the other occurred on September 3, 1966. One animal was born dead and the others appeared clinically well at birth. The neonatal period was uneventful with the majority of the animals. Fourteen of the babies developed without complications while one baby died at 2 days of age due to trauma and one at 5 days of age after having been rejected by its mother. Neck chains

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[1] To be published in detail as a separate report.

[2] This work was supported in part by a grant from the National Institutes of Health (FR-00180).

Table I

Reproduction in a Colony of Squirrel Monkeys--1966

DIET	CONCEPTIONS	LIVE BIRTHS	STILL-BIRTHS	NEONATAL SURVIVORS
Modified Purina Monkey Chow (23% protein with vitamin D_3)	17/18 (94%)	16/17 (94%)	1/17 (6%)	14/16 (88%)

were placed on the animals at 6 weeks of age for identification. Accidents with the neck chains resulted in the death of 2 babies, one at 6 weeks of age and another at 8 weeks of age. The remaining 12 babies are growing rapidly and appear quite well.

We have had an opportunity to make some observations on the effect of dietary protein level, among other things, on reproductive performance in squirrel monkeys. This has been in a colony of 53 Brazilian-type female squirrel monkeys, caged with an equal number of males and housed in 8 cages of the same type as described for the colony from Teresina. These animals originated from different social troops and have been maintained at our research farm since December, 1964. Most of the animals appeared immature on arrival at our laboratories and were estimated by us to be 1.5 to 2.5 years old. The average body weight of this group on arrival was 569 gm (the average body weight of 5 Brazilian squirrel monkeys born and reared in our laboratory was 502 gm at one year of age). All of these animals have been fed diets prepared in our own kitchen. One-half of the animals were fed a diet that is generally comparable to that given to the Teresina colony (28% protein), while the other half were fed a diet containing 16% protein. Like the Teresina colony, one ounce of reconstituted frozen orange juice was provided for each monkey per day. No breeding activity was noted in this group of animals during 1965. Beginning in February, 1966, and continuing through April, 1966, swelling of the external genitalia of the females and frequent copulation were noted in these groups. The animals are believed to have been 3 to 4 years old at the time. The reproductive performance of these groups is summarized in Table II.

Thirty-three of the 53 female squirrel monkeys became pregnant, 23 of which delivered live babies and 10 had stillbirths. Twenty-nine births occurred between July 15 and September 14. The remaining births occurred in October. Of the 23 live babies, only 2 have died during the neonatal period, one animal was killed by its mother the day following birth and one baby died at one month of age after its mother became ill.

There were at least two differences between this colony of 53 Brazilian squirrel monkey females and the Teresina colony which might be

Table II

Effects of Diet on Reproduction of Squirrel Monkeys

DIET	CONCEPTIONS	LIVE BIRTHS	STILL-BIRTHS	NEONATAL SURVIVORS
High Protein	12/26 (46%)	9/12 (75%)	3/12 (25%)	8/9 (89%)
Low Protein	21/27 (77%)	14/21 (67%)	7/21 (33%)	13/14 (93%)
Combined Groups	33/53 (62%)	23/33 (70%)	10/33 (30%)	21/23 (91%)

responsible for the differences in reproductive performance: First, the troop of 53 females were younger than the Teresina colony and those that became pregnant were probably primiparous. Second, the troop of 53 female monkeys were housed with an equal number of male monkeys of approximately the same age.

The data accumulated on the reproductive performance of these animals did not provide a basis for assuming that a dietary protein level of 28% is superior to 16%. Among those animals fed either the high protein diet or the low protein diet, some were fed a relatively high fat diet and some a low fat diet. No effect of fat level on reproductive performance could be seen.

In addition to the births described among the animals of these 2 groups, we have had about 15 squirrel monkeys born in animals rooms at the medical school. These births have occurred among animals caged in pairs and in larger groups.

It is our feeling at this time that squirrel monkeys will reproduce successfully in the laboratory providing that they (a) are sexually mature, (b) are allowed 12 to 18 months to acclimate to the laboratory, and (c) are fed a nutritionally adequate diet (particularly vitamin D_3 instead of vitamin D_2).

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POSSIBLE AVAILABILITY OF ANATOMICAL MATERIAL FROM BABOONS

Southwest Foundation for Research and Education, San Antonio, Texas, is planning a special trapping program at its facilities in Kenya, Africa, to acquire 1,000 baboons to meet its requirements for certain organs. Anyone interested in obtaining relatively large amounts of anatomical material from these animals should contact Dr. Robert Hummer at the Foundation by about March 15.

CHIMPANZEE ECOLOGY AND LABORATORY MANAGEMENT

COMMENTS ON THE PAPER BY A. KORTLANDT

J. Moor-Jankowski

Department of Forensic Medicine, New York University School of Medicine

An article on chimpanzee ecology and laboratory management by A. Kortlandt appeared in a recent issue of this Newsletter (1966, 5 [3], 1-11). The article contains a great deal of misinformation and some rash assertions, unsupported by facts.

To begin with, Kortlandt proposes to provide guidelines for the laboratory management of chimpanzees, but there is no evidence published (including especially the article in question), or otherwise, that he is qualified either by experience or knowledge to discuss the laboratory management of primates. In fact, his lack of knowledge of the subject is shown by his confusing the conditions and requirements of zoos, where the animals are maintained for display, with the very different conditions and requirements of biomedical research laboratories.

Kortlandt severely criticizes laboratory animal management practices in the United States. He speaks of his unfavorable "impression," offers criticisms, but fails to cite a single item of evidence for alleged "standards of accommodation, management, and care...below any level that would be accepted in..." (p. 1) European countries. The statement that, "particularly in Central Europe, there is a widespread cultural tradition of keeping and breeding all kinds of animals at home, just because many people love animals..." (p. 2) with the implication that this is not the case in the United States, is entirely gratuitous and reveals a rather prejudiced attitude.

Moreover, the basic tenet of Kortlandt, that research studies should be carried out in the field in order to obtain information which may help to improve the condition of chimpanzees in the laboratories, is in itself debatable. While field studies do advance anthropological and sociological knowledge, the information presently available on laboratory maintenance of chimpanzees goes far beyond what could be gleaned from the best possible (and certainly very expensive) field studies. Besides, it would be rather difficult to decide which of the varied habitats of the free-ranging chimpanzees and which of their varied diets should be considered optimal.

Kortlandt appears to be unaware of achievements and developments which have taken place in the United States in the field of laboratory primate maintenance and experimentation. He seems totally unaware of the efforts of Yerkes who, as long as thirty years ago, surveyed the entire continental area of the United States in an attempt to discover the climatic conditions most appropriate for maintenance of a chimpanzee

colony and most closely resembling those of their native habitat. It was on the basis of this large-scale survey that Orange Park, Florida, was selected by Yerkes as the original site for the Yerkes Laboratories of Primate Biology.

It is true, however, that when selecting sites for research on primates, consideration must be given not only to the optimal natural conditions for their maintenance, but also to the requirements of the experimental work, which demands proximity of specialized laboratories, availability of scientific personnel, etc. After all, that is the reason why the animals were brought from Africa in the first place. But this is no special problem because the climatic conditions can be and often have been improved artificially. Furthermore, in moderate climates such as Georgia's (where the Yerkes laboratories are now located) the animals can also adapt to the prevailing conditions. Kortlandt himself describes the adaptability of chimpanzees to widely different climatic conditions in their natural habitats in Africa.

The criticism by Kortlandt of the low standards of primate animal care in the United States, where he asserts the animals are taken care of by "the least-educated class of workers available" (p. 1), simply does not apply to any of the primate laboratories in this country or to any of the reputable zoos. As a matter of fact, at the Symposium of the International Committee on Laboratory Animals (UNESCO) on the Future of Laboratory Animals (September 18-20, 1966, at Lyon), which the writer attended, the difficulties of obtaining adequately trained animal personnel in France were described by Professor Desbordes, Director of the Microbiological Section of the French National Laboratory of Public Health. The ensuing discussion by participants also from other European countries, and from the World Health Organization disclosed that the career of a certified animal technician simply is non-existent on the European continent and it was recommended to adopt the American system or the very similar English system of training and career development for animal personnel.

Kortlandt's comparison between the zoo keepers in countries like Germany or Switzerland and zoo keepers in America, whom Kortlandt pleases to call "some kind of cowboy," is one of many examples of gratuitous and meaningless remarks made by him. Also, I don't believe many people will agree with his contention that an animal keeper, rather than the veterinarian, should be assigned the responsibility for the animal care.

Another fact contrary to Kortlandt's impressions, is that the American equivalent of a "head keeper of apes at a European zoo" actually receives a salary often much higher than a young university graduate, Ph.D., or M.D. In addition, in the U.S.A., the person responsible for animal care generally has a B.A. or, more often, a D.V.M. degree.

I do not know which chimpanzee living quarters at laboratories in the United States were visited by Kortlandt, which "look as if they have been designed by somebody who was familiar with the needs of pigs" (p. 1)

or to which "so-called primate laboratories" T. Harrisson from Sarawak refers. However, it is a matter of official record that most of the European countries do not require accreditation of their animal facilities by a governmental body such as is now the case in the United States. In addition, in the states where most of the research is being done (e.g., New York, Michigan, Pennsylvania, California), rules and regulations for animal laboratories have been set up and are controlled by the state health authorities.

As far as breeding is concerned, I am an admirer of Lang's results in breeding gorillas in the Basle zoo; however, Kortlandt seems unaware of the large number of chimpanzees that have been bred in captivity in the United States, and of the new concept of laboratory breeding of primates pioneered by various laboratories in this country.

Returning to the basic tenet of Kortlandt's article, it is at least debatable whether the best conditions for maintaining animals in captivity are the same as or approximate wildlife conditions. To support this claim, Kortlandt refers to experience in zoos which he does not document with references. However, his assumption is not supported by the experience gained in primate laboratories. The animals which reach us directly from Africa are usually in a poor state of health, being ridden with parasites, and having 50 per cent of normal hemoglobin concentration and hematocrit and a high white cell count indicative of infection. It is the consensus among people working with laboratory primates that it takes approximately three months for a newly imported animal to arrive at a state of health which one may consider normal for a laboratory primate, i.e., parasite free, with hemoglobin concentration, hematocrit, and white cell counts and blood morphology comparable to that found in a normal human being under civilized conditions.

The housing of chimpanzees in the laboratory has to represent a practicable compromise between the animals' normal living requirements and the requirements of medical experimentation for which the animals are being maintained. This may preclude to a large degree providing an open enclosure, and greater diversity of possibilities for motor exercise and of diet that are among the things that Kortlandt feels they should have. Under special circumstances, as in the Consortium of the Aeromedical Laboratory, Holloman Air Force Base, New Mexico, a compromise solution is obtained by constructing a large enclosure. In the majority of the cases, however, the animal has to be kept in a cage (of adequate size), and single caging offers the advantages of having the animal dependent on the keeper and more easily accessible.

It could be added that the statement on "peaceful co-existence" in Kortlandt's paper has not been quite confirmed by some of the experiences at the Holloman Air Force Base; careful screening and observation of the animals before releasing them into a common enclosure is necessary.[1]

[1] C. H. Kratochvil, personal communication, 1966.

This again is an example of a rash assertion made by Kortlandt, which could give rise to difficulties and loss of animals should workers attempt to follow his advice. Introduction of "escape possibilities" such as "marshy reed bushes, shallow water, sewer pipes to flee into (too narrow for adult males), obstacles, climbing apparatuses..." (p. 5) etc., could make it difficult to capture animals for experimentation. Also, Kortlandt does not mention at all some of the negative aspects of grouping of animals in a common enclosure, such as anorexia in animals ostracized from the group.[2]

Our observations, mentioned above, of the good health of chimpanzees kept in captivity under appropriate conditions does not agree at all with Kortlandt's statement that the "bad condition" of the animals in captivity could be attributed to the monotony of the diet usually provided. On the contrary, our medical experience suggests that it is the inadequate food in the native habitat that is responsible for the poor condition of chimpanzees arriving at our laboratories.

Whatever the sexual behavior of the animals may be in freedom, it can be quite different than that which can be induced in captivity. It is well known that in freedom rhesus monkeys breed only during certain times of the year, while in some laboratories in the United States and France, they have regular menstrual cycles and can become pregnant during every season of the year. A few years ago it was recommended to me by naturalists, at a time when I had had very little experience with the breeding of animals in captivity, that baboons, rhesus monkeys, and other primates should be bred in groups as Kortlandt recommends for chimpanzees. However, a successful technique commonly used in recent years for laboratory breeding of monkeys is to bring the female to the male at the height of her estrus, and for a relatively short period only. This method could prove successful also in chimpanzees.

It is quite interesting to note that in his discussion of the conditions of chimpanzees in Guinea, Kortlandt himself admits that the mortality rate for chimpanzees in the only European institution of which he offers statistics was 30 per cent. This high rate certainly does not compare favorably with the rate in well-run laboratories in the United States.

In closing, I would like to emphasize once more that according to our laboratory experience chimpanzees simply do not "do so much better in the wild" than they do in captivity; the opposite is true. They certainly do much better in American laboratories than they do in the wild in Africa. As far as the situation in Europe is concerned, the few chimpanzees kept in European laboratories for biomedical research do not constitute an adequate sample for comparison with the several hundred animals kept for this purpose in the U.S.A.

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[2] ibid.

CHIMPANZEE ECOLOGY AND LABORATORY MANAGEMENT

COMMENTS ON THE PAPER BY A. KORTLANDT

Geoffrey H. Bourne

Yerkes Regional Primate Research Center, Emory University

Many controversial statements were made by A. Kortlandt in his article on chimpanzees in a recent issue of this Newsletter (1966, 5 [2], 1-11). I do not plan to discuss all of these, but would like to have the opportunity to comment on some of them. It appears to the writer that Kortlandt assumes that all chimpanzees in captivity in the United States are being kept for a study of naturalistic behavior or for observation in zoos, in which case his strictures concerning confinement in cages are quite right. However, only a limited number of chimpanzees in captivity in the United States are being used for this purpose, and certainly at the Yerkes Center this type of study is not pursued with them. In fact, the nature of the psychological and medical studies being carried out on our chimpanzees make the caging in which they are confined mandatory, especially since they necessitate repeated access by the experimenters to the animals. A free-ranging colony would therefore not be practical. In my experience, animal behaviorists interested in the naturalistic type of study are well aware of the limitations of captivity. Even large enclosures with moats or walls introduce factors which affect behavior, and there is little doubt that there is only one place to really study naturalistic behavior and that is in the wild without making any kind of relationship with the animals and intruding as little as possible.

We are well aware that the keeping of our chimpanzees under relatively confined conditions produces animals which are psychologically different from those kept either in the wild or in large enclosures, but there is no evidence that this invalidates any of the experimental studies carried out on them so far. Even if there is a physiological stress factor also involved in moderate confinement, as there probably is, the mammalian body appears capable of adapting to long-term chronic stress, at least as far as adrenocortical excretion is concerned.

Animals that are kept for exhibition at zoos naturally should be housed in a way that is compatible with the health and welfare of the animals and at the same time makes them visible to the observing public in at least a partly naturalistic fashion. There is no doubt that the method of exhibiting the Great Apes at Chester Zoo in England and referred to by Kortlandt is one of the best in the world.

Kortlandt refers to the fact that Nissen reported that chimpanzees are very sensitive to heat. We at Yerkes have been very well aware of this at least since the time of Nissen's Directorship. However, we have not seen either at Orange Park or at our new facility in Atlanta any evidence that the temperature in which the animals were kept was so high

that it affected their comfort or health. In fact, it is our experience that if shade is provided at all times there is no problem. Kortlandt is not correct when he says that "the chimpanzees at the Yerkes Laboratories at Orange Park never had air conditioning, whereas the humans had" (p. 1). When he was at Orange Park, only one room had air conditioning and this was one in which both humans and young chimpanzees worked together. In any case, both in Orange Park and in our new Center the temperature of the "dens" (the indoor part of the run) hardly ever rose beyond 75°F, although the temperature of the outside part of the run could be as high as 95°F, and from Kortlandt's own comments concerning the microclimate of chimpanzees in the wild, this is well within their natural range of temperature. Furthermore, he refers later to the fact that the animals "can survive in the wild under extremely variable conditions of habitat, temperature, and humidity, etc." (p. 11). We find it difficult to understand, therefore, why Kortlandt feels we should air condition our animals' quarters.

Kortlandt also expresses surprise that chimpanzees have not been bred in large numbers. I should point out that we have had only limited problems with chimpanzee breeding. At one time, for 2 years, from a quite limited stock we produced 12 young a year and this was selective breeding. It could have been much higher had we so desired. In any case the colony could have been perpetuated at very much less than that rate. Gang breeding as suggested by Kortlandt is very unsuitable for all the projects in which we have been involved because it is important to have a record of the genealogy of the animal. The total chimpanzee births at Yerkes since 1930 has been 176, an average of 5 a year. This, coupled with the fact that we have carried chimpanzees to the age of 45 and 46 years, suggests that the method of housing, the nutrition and general care are very satisfactory.

I agree with Kortlandt that it is a pity that no collection and nutritive analyses of chimpanzee food from the wild have been made. However, even if the results of such analyses were known, it does not necessarily mean that these animals are eating an optimum diet in the wild. Certainly many human tribes in Africa who were living in the wild on so-called "natural" diets have suffered from gross malnutrition. Generally speaking, one can say that with the present knowledge of human nutrition is is possible to design a diet which would be optimal nutritionally for these animals. Here at Yerkes a variety of foodstuffs together with certain nutritional supplements ensure that the diet the apes receive does not lack anything from amino acids to vitamins and trace elements.

The excellent and varied diet which the Yerkes chimpanzees receive is probably partly responsible for their excellent health record, especially their remarkable freedom from tuberculosis (there are statistics in the human field which show a relation between nutrition and incidence of tuberculosis), although I should not minimize the excellence of our veterinary care and that of our supervisory staff.

May I also say in conclusion that Kortlandt's comments about the educational level and the rate of remuneration of head keepers certainly does not apply to the supervisory staff at the Yerkes Center even though they do not speak foreign languages. In fairness, however, to the point Kortlandt is trying to make, we would agree that animal caretaking is not to be thought of as a job suited only for the ignorant and untrained. It is a highly responsible and highly skilled profession and the salaries should be high enough to attract good people to the job.

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ESTIMATION OF AGE OF SAIMIRI SCIUREUS FROM LENS WEIGHT: REQUEST FOR MATERIAL

The development of a reliable method for estimating the age of wild-born primates would be of considerable value. It has been shown that the dry eye-lens weight bears a close linear relationship to age in the cottontail rabbit (Lord, R. D., Journal of Wildlife Management, 1959, 23, 358-360). The writer plans to study the relationship between lens weight and age in the squirrel monkey (Saimiri sciureus). However, in order to do so, it is necessary to appeal to laboratories having squirrel monkey breeding programs in order to assemble sufficient material of known age for the study.

All gifts of material will be acknowledged, and reprints of any publications arising from this study will be sent without request to all contributors. Cost of postage and packing will be refunded if requested.

Investigators who can supply this material from S. sciureus of known age are requested to use the following procedures: 1. Fix one or preferably both intact eyes from each animal in 10% formalin in an individual container. 2. Place a label on the container clearly identifying the specimen. 3. Supply the following data: (a) dates of birth and death; if precise information is not available, state month and/or year, (b) sex, (c) circumstances of death (e.g., killed/healthy; died/emaciated), (d) weight at death, if known, (e) type and duration of experiment in which the animal was involved. 4. Mail the material within 3 months of fixation. Indicate sender's name and return address.--Charles E. Graham, Yerkes Regional Primate Research Center, Emory University, Atlanta, Georgia 30322.

ORAL ABNORMALITIES IN LABORATORY CHIMPANZEES

Joseph Gary

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This report describes a variety of abnormal conditions discovered during the course of study of the oral cavities of 108 chimpanzees in the vivarium at Holloman Air Force Base, New Mexico. The abnormalities were generally comparable to those found in humans of various ages, ranging from infants to adults, though of a greater frequency than expected.

The primary purpose of this study was to determine the incidence and distribution of physiological pigmentation in the oral cavities of these animals. Accordingly, the occurrence of pigmentations in the following areas of the mouth were noted: hard palate, soft palate, cheek, tongue, floor of the mouth and attached gingiva. The special patterns of pigmentation on the lips were noted. Over 400 photographs were taken during the study in order to provide a permanent record. The basic series of photographs for each animal consisted of one full facial closeup, one of the lips and teeth, and one of the oral cavity, showing the hard and soft palate, tongue, and dental arch. Additional photographs of interesting oral conditions were taken as well as certain comparative facial lateral views. In addition, notes were made of the color of the pelage, skin, nails, ears, hands, and feet. The age and sex of each animal was recorded.

Analysis of the data on pigmentation has not been completed as yet. However preliminary data already indicates that the different subspecies can be distinguished orally. (The subspecies available were Pan troglodytes schweinfurthi, Pan t. t., Pan t. verus, and Koola Kamba, the number studied being, respectively, 30, 20, 56, and 2.)

Some of the abnormalities noted during the gross examination of the oral cavities were the following: (1) Premature loss of deciduous teeth with the resultant drifting and early loss of space. In some instances this was due to fracture or trauma. Where this had happened in one quadrant, the opposing quadrant showed marked signs of dysfunction, particularly in gingival symptoms. (2) Premature abnormal eruptions and rotations. (3) Infection resulting from unattended fractures of the teeth, especially where the pulps were exposed. (4) Abnormalities in form and function of teeth traceable in many instances to ankylosis, over-retention of the deciduous teeth and retained roots. (5) Infectious desquamative gingivitis with marked necrotic lesions. This was seen in a group of young chimpanzees and an older female, with the latter probably being the source of the infection. (6) A severe case of pericoronitis and inflammatory musculature due to cheek biting which probably accounted for the malnutrition and extreme irritability and other behavioral problems seen in the animal. (7) A terminal case of cellulitis

with classic symptomology involving the head, neck, and chest. (8) Two cases of loosening of teeth due to resorption of roots and alveolar bone. These were reactions to the lathyrogenic drug isoniazid. (9) In general, while considerable staining of tooth structure was present as well as instances of marked attrition, erosions were only noted in a few cases and caries were minimal.

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POSSIBLE SENSITIVITY OF SQUIRREL MONKEYS TO COMBIOTIC

Two adult squirrel monkeys, one male and the other female, died within 15 min. of administration of 1 cc/kg I/M of Combiotic (Pfizer). (One cc of Combiotic contains 200,000 units of penicillin G procaine crystalline and 250 mg dihydrostreptomycin as the sulfate and 2% procaine hydrochloride and the following preservatives: butylparaben 0.015%, sodium formaldehyde sulfoxylate 0.37%.) The female had received injections on 3 successive days, while the male had only one injection. Both animals were being treated for bite wounds that were not considered extensive. Necropsy revealed no gross or histopathological changes which could account for the death of either animal. One possible explanation is that these were two cases of anaphylactic shock resulting either from sensitivity to some ingredient of Combiotic or, perhaps, overdosage.

Anyone with information on the matter should notify Bartol Matanic, Associate Veterinarian, Central Animal Service, State University of New York, Downstate Medical Center, 450 Clarkson Avenue, Brooklyn, New York 11203.

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CONFERENCE ANNOUNCEMENTS: EXPERIMENTAL MEDICINE AND SURGERY IN PRIMATES

This conference will be held in New York City September 27 through 30, 1967. It will be sponsored by the New York Academy of Sciences.

Co-chairmen of the conference will be Edward I. Goldsmith, Cornell University Medical College and J. Moor-Jankowski, New York University Medical School.

Sessions will include Taxonomy and Comparative Biology; Experimental Cardiology; Contribution of Nonhuman Primates to the Study of Perinatal Problems, Gynecology and Obstetrics; Supply, Maintenance and Handling of Nonhuman Primates for Medical Research; Experimental Surgery; Virology and Parasitology; and Toxicology.

CONVULSANT LEVEL OF METRAZOL IN THE SQUIRREL MONKEY

Herbert Wells

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The effective convulsant dosage of pentylenetetrazole (Metrazol) for the rhesus monkey (Macaca mulatta) has been reported by Chusid and Kopeloff (1962). They state that an intramuscular dose of 64 mg/kg of body weight was "usually capable of inducing clinical seizures" (p. 546).

As a preliminary to the experimental use of this drug in a study of memory and learning, the convulsant dose was established for another primate species, the squirrel monkey (Saimiri sciureus). The data was quite consistent and strikingly different from those for the rhesus.

Eleven squirrel monkeys, weighing 365 to 925 g, were given intramuscular injections of 10% Metrazol (50 mg/cc) in the upper leg. An initial injection of 20 mg/kg was followed at 4-minute intervals by injections of 2 mg/kg. Pretesting had indicated that any effect would be noticeable within about 2.0 to 3.5 minutes. Additional injections were continued until the first onset of obvious convulsions. Observationally, the course of onset was quite consistent for all animals: first a period of quiescence, with an upward drift of the head; twitching of the upper limbs; jerking of the head, together with rapid jaw movements; and finally a full tonic-clonic response of the whole body.

The minimum dosage necessary to produce convulsions in the 11 animals tested ranged from 20 to 28 mg/kg, with median and mode at 24. There was a tendency for the larger animals to require a higher dosage. The rank order correlation (rho) between weight and convulsant dose was high (+ 0.80) and statistically significant ($t = 4.043$, $df = 9$, $p < .01$). Only 4 animals required more than the median dose. Twenty-four mg/kg can be specified as the dosage sufficient to produce convulsions in over half our sample of squirrel monkeys.

It should be pointed out that giving repeated doses over a period of time may allow some of the initial dose to metabolize before the onset of convulsions. Thus one might get a different estimate of the convulsant dose if a single larger injection were given. It is not known whether metabolic loss within the time involved (4 to 16 minutes for different animals) is enough to be of concern. To the extent that it is a problem, these data would tend to overestimate the convulsant dose.

References

Chusid, J. G., & Kopeloff, Lenore M. Chlordiazepoxide as an anticonvulsant in monkeys. Proceedings of the Society for Experimental Biology and Medicine, 1962, 109, 546-548.

"TIEING" BETWEEN STUMP-TAILED MACAQUES DURING MATING

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A number of us at the University of Oklahoma have been working with a small colony of stump-tailed macaques (Macaca speciosa), one male and 6 females, which were secured as infants. Our investigation is concerned with the development of sexual and social behavior. We have noticed the appearance of what, in a dog, would be called a "tie" between female and male genitalia after the male's ejaculation. At the time of these observations the females available to the male were nulliparous but sexually mature and cycling. On a number of occasions, during copulation, the male has been dragged by a female for over a meter when she was apparently attempting to escape. This does not happen unless the male ejaculates.

Other observations made over a period of 15 months suggest that during ejaculation (without intromission) the glans penis of the male flares out in circular fashion, thus extending the circumference of the glans markedly. On a number of occasions and particularly during the hot weather, immediately after ejaculation, the male behaved as if he were in extreme pain, shrieking and clutching repeatedly at his own loins, legs, and toes while in "tied" position. Median post-ejaculatory intromission time is from 11 to 12 seconds, after which the male withdraws the penis and grooms it with every appearance of solicitude and tenderness. We have descriptive accounts of the mating of this male with 6 females; in every case, in which the male ejaculated after intromission, a "tie" occurred. In one case, a male infant was conceived and subsequently delivered 157 days after a "tie". We have some rather inartistic 8 mm motion picture sequences of what is clearly a "tie", as well as several abortive attempts at copulation. The male clearly has "favorites" among the 6 females available to him. He will mount one favorite and attempt intromission even when she is not at the peak of estrus.

Digital exploration assisted by a nasal speculum suggests the presence of at least one sphincter within the vaginal tract of the female speciosa (bulbo cavernosus, coccygeus?). This may become extremely responsive around the time of ovulation and with the flaring of the glans of the male, may lead to the "tie". It has seemed to us possible that such a "tie" might well presage successful insemination; its utility to the breeder who needs to predict delivery times is thus obvious. I. S. Bernstein, of the Yerkes Regional Primate Research Center, reports that speciosa are somewhat more aggressive during mating than are other macaques, but has never observed a "tie" phenomenon. If anyone using speciosa as an experimental animal has noticed this or a similar phenomenon, please notify us.

Incidentally, these animals have been in our colony for a number of years and can still be handled without gloves. Although they will threaten an unfamiliar observer, people with whom they are familiar can handle them without difficulty. We have not trimmed any of their canines despite the fact that the females have on occasion bloodied one another extensively.

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NEW ENGLAND REGIONAL PRIMATE RESEARCH CENTER DEDICATED

The New England Regional Primate Research Center of Harvard University was dedicated November 14, 1966. The Director of the Center is Dr. Bernard F. Trum. It is located in Southboro, Massachusetts, which is about 20 miles from Boston. The following divisions of the Center are already active: Comparative Pathology, which is responsible for providing diagnostic and histological service; Microbiology; Primatology, members of which are doing research on reproductive behavior, karyology, genetic markers, thermoregulation, and anatomy; Zootechnology, which is responsible for animal care and management. A division of Physiology is currently being organized.

Any institution of higher learning in the New England area may participate in the activities of the Center. During the formative stage, members of the faculty of Boston University, Dartmouth University, Harvard University, Massachusetts Institute of Technology, Tufts University, the Worcester Foundation for Experimental Biology, and several research hospitals of Greater Boston have engaged in the planning in one way or another.

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MEETING ANNOUNCEMENTS: INTERNATIONAL PRIMATOLOGICAL SOCIETY

The next meeting of the International Primatological Society will be held at the Yerkes Regional Primate Research Center, Atlanta, Georgia, U.S.A., from June 30 to July 4, 1968. It will be a memorial for Dr. Robert M. Yerkes.

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

Disease

Parasites of baboons (Papio doguera (Pucheran, 1856)) captured in Kenya and Tanzania, East Africa. Kuntz, R. E., & Myers, Betty J. (Dept. Microbiol., Southwest Found. Res. & Educ., San Antonio, Texas) Primates, 1966, 7, 27-32.

Extended B-virus anti-body determinations in a closed monkey colony. Gralla, E. J., Ciecura, S. J., & Delahunt, C. S. (Med. Res. Labs., Chas. Pfizer Co., Groton, Conn. 06340) Laboratory Animal Care, 1966, 16, 510-514.

A monkey with buccal, lingual, and pharyngeal herpetic lesions suggesting Virus B was discovered in a colony which had originally been titer-free for B Virus antibody. No inclusion bodies were discovered when tissues taken at autopsy were examined histologically. However, a mild encephalitis indicating a possible active Virus B infection was present. A serum antibody titer of 1:128 supported this diagnosis. Blood sampling with antibody determinations of the whole colony immediately and periodically for 20 months disclosed a 6.6% incidence of positive titers for B Virus antibody which increased to 22% within 6 weeks and stabilized at a level of 20-28%. These animals were individually caged and new animals were excluded. It is concluded that active titers will not disappear spontaneously within 20 months. A variation in duration of active titers among monkeys was also observed.

Isoniazid therapy in the chimpanzee. Fineg, J., Hanly, W. C., Prine, J. R., Van Riper, D. C., & Day, P. W. (6571st Aeromed. Res. Lab., Holloman Air Force Base, New Mexico) Laboratory Animal Care, 1966, 16, 436-446.

Three chimpanzees were diagnosed as having tuberculosis (diagnosis based on PPD and chest x-rays). Two of the animals were necropsied and the diagnosis confirmed. The remaining chimp was then housed with 3 chimpanzees which had shown negative reaction to the tuberculin test. All were administered isonicotinic acid hydrazide (INH). The reacting chimp reverted to negative after 6 mo. on INH 10 mg/kg/day orally. When this animal was necropsied several months later virtually no lesions were found. All the chimpanzees studied were fast inactivators

*References in this section without summaries have in many cases been taken directly from the Current Primate References prepared by The Primate Information Center, Regional Primate Research Center, University of Washington.

of isoniazid. An INH dosage schedule within the range of 15-25 mg/kg body weight twice a day should be sufficient to achieve a bacteriostatic level in the Pan species. This dosage is considerably below the toxic level, but 3 to 5 times that recommended for humans.

Pigmentary liver disease in howler monkeys. Maruffo, C. A., Malinow, M. R., Depaoli, J. R., & Katz, S. (Oregon Reg. Primate Res. Center, Beaverton, Ore. 97006) American Journal of Pathology, 1966, 49, 445-452.

Susceptibility of Old World monkeys to Yaba virus. Ambrus, J. L., & Strandstrom, H. V. (Roswell Park Memorial Inst., Buffalo, N. Y.) Nature, 1966, 211, 876.

Physiology and Behavior

Diagnosis of pregnancy in the squirrel monkey. Nathan, T. W., Rosenblum, L. A., Limson, G., & Nelson, J. H., Jr. (State U. of N. Y., Downstate Med. Cen., Brooklyn, N. Y.) The Anatomical Record, 1966, 155, 531-536.

Diagnostic pregnancy assessments have been carried out in 18 squirrel monkey females using Delf's method for chorionic gonadotropin bioassay, palpatory, x-ray, and other auxiliary techniques. Out of the 24 bioassay tests performed, 11 were positive (one of them weakly positive) and 13 negative These results were confirmed by the other parallel measures, except in 2 cases of possible false positive reactions. No false negative results were noted. The implications of the results are discussed in terms of the sensitivity and reliability of the bioassay in the early diagnosis of pregnancy in the squirrel monkey.

The oestrous cycle of the Potto. Ioannou, J. M. (Anat. Dept., Birmingham U., Birmingham, England) Journal of Reproduction and Fertility, 1966, 11, 455-457.

Total darkness as an aversive stimulus condition for the squirrel monkey. Parker, C. E. (Box 483, San Diego State Coll., San Diego, Calif. 92115) Psychonomic Science, 1966, 6, 111-112.

Auditory sensitivity of the monkey. Stebbins, W. C., Green, S., & Miller, F. L. (Kresge Hearing Res. Inst., U. Mich. Med. Sch., Ann Arbor, Mich.) Science, 1966, 153, 1646-1647.

Pregnancy and delivery behavior in the squirrel monkey (Saimiri sciureus) and other primates. Bowden, D., Winter, P., & Ploog, D. (Psychiatrie, Max-Planck-Inst., Kraepelinstrasse 2, 8 Munchen 23, Germany) Folia Primatologica, 1967, 5, 1-42.

Data were compiled on all reported Saimiri sciureus

births; two deliveries--one normal and one breech presentation--are described in detail. Comparisons between the squirrel monkey and other primate species were made of as many aspects of pregnancy, delivery, and early postpartum behavior as possible. The gestation period in the squirrel monkey is 24-26 weeks. During this period the pregnant female's weight increases by 27-57%. There is no reliable sign of impending labor, and labor is very short. In all primate species, birth of the infant normally occurs from a cephalic presentation. Delivery among monkeys and apes, however, differs from that of the human in at least 3 respects, viz., occiput posterior rather than occiput anterior rotation is the rule; face presentations occur in more than 50% of births; and breech presentations occur 3 to 4 times as frequently as in humans. The mortality rate for breech presentations of monkeys in captivity is about 90%. In the multiparous squirrel monkey, the duration of labor (about 1 hr.) and the number of contractions (10-12) are small, even as compared with other nonhuman primates. As with the rhesus and the baboon (but not the chimpanzee), labor in the squirrel monkey usually begins between dusk and dawn. If delivery has not occurred by daybreak, the contractions cease and recommence at sundown. For the squirrel monkey, the infant-maternal weight ratio at birth is 12-19%, a figure quite comparable to that of other monkey species and 2 to 3 times that of the human. Usually, the squirrel monkey mother eats the placenta down to the cord; she may chew the cord itself or leave it to dry and slough. The influence of social factors on the successful completion of different stages of reproduction is discussed. There is strong evidence that a living group with a stable social structure may be a prerequisite for conception and successful completion of pregnancy in Saimiri sciureus. Most squirrel monkey infants which have been born in captivity and failed to live to maturity have died early in the postpartum period. Maternal aggression, maternal rejection, and the aggressive curiosity of other animals have contributed most to the high mortality rate. The adult male shows virtually no interest in the newborn infant. The vocal behavior of the pregnant female and her living group was also studied by means of sound frequency spectrograms.

The preservation of whole monkey blood by the Linde liquid nitrogen technique. Gikas, P. W., Knorpp, C. T., Thompson, N. W., & Merchant, W. R. (Veterans Admin. Hosp., Ann Arbor, Mich.) Proc. Congr. int. Soc. blood Transf., 1966, 10, 714-718.

Control of conception in primates. Mastroianni, L., Jr. (Dept. Obstet., U. Penn., Philadelphia, Pa.) Transactions College of Physicians of Philadelphia, 1966, 34, 1-3.

Caryology and taxonomy of the catarrhine monkeys. Chiarelli, B. (Inst. Antropol., Centro di Primatologia, U. Torino, Torino, Italy) American Journal of Physical Anthropology, 1966, 24, 155-169.

Bacterial flora of the alimentary tract of captive chimpanzees. Gall, Lorrain S., Riely, Phyllis E., & Levenson, R. (Life Sci. & Space Environ. Lab., Republic Aviation Corp., Farmingdale, L. I., N. Y.) Bacteriological Proceedings, 1966, 66, 66.

Behavioral observations of an infant squirrel monkey. Vandenbergh, J. G. (Box 668, Lajas, Puerto Rico) Psychological Reports, 1966, 18, 683-688.

The behavioral development and social relations of one infant squirrel monkey were observed in a small caged group of 5 animals. Description is based on 108 hr. of observation over the first 28 wk. of his life. During his first 12 days, the infant either rode on his mother's back or nursed. On the thirteenth day he began to leave her, becoming more independent during the next 5 wk. After 7 wk. he returned to his mother only to nurse or when frightened. After Week 21 he was free from bodily contact with his mother at least 95% of the time. The infant first ate monkey chow at 7 wk. of age and regularly ate it at 9 wk. Some maternal rejection appeared at 3 wk. and was strong by 16 wk. He still nursed at 28 wk. Incidental interaction among adults was described.

Study of the fecal bacterial population of chimpanzees. Riely, Phyllis E. (Life Sci. & Space Environ. Lab., Republic Aviation Corp., Farmingdale, L. I., N. Y.) Technical Report No. ARL-TR-66-13, 6571st Aeromedical Research Laboratory, Holloman Air Force Base, New Mexico.

Cultures isolated from rectal swabs obtained from 100 chimpanzees, as well as from 2 fecal samples from each of 5 chimpanzee handlers, were studied. The data obtained from the aerobic bacterial studies were summarized in tables grouping the occurrence of the Enterobacteriacea, streptococcus, and miscellaneous aerobes so that comparisons could be made with the results obtained on 2 prior studies. The data of the occurrence of the anaerobic bacterial cultures were summarized in tables as obligate or facultative anaerobes, using the same method of grouping the cultures as in prior studies. Differences in the anaerobic character of chimpanzees and human fecal populations were noted; the percentage of obligate anaerobes exceeding 90% for the human cultures, and ranging between 26% and 71% for the chimpanzee cultures. A literature survey was conducted to aid in the evaluation of the potential pathogenicity of bacterial strains isolated from the chimpanzee. A remarkable similarity exists in the

aerobic flora of primates, although differences in the pathogenicity of particular species of bacteria for various primate hosts have been reported in the literature. Carrier states are prevalent in the chimpanzee.

Study of the viral flora of the alimentary tract of chimpanzees. Coulston, F., & Soike, K. B. (Inst. Exp. Pathol. & Toxicol., Albany Med. Coll., Union U., Albany, N. Y.) Technical Report No. ARL-TR-66-10, 6571st Aeromedical Research Laboratory, Holloman Air Force Base, New Mexico.

Throat and fecal specimens have been taken from approximately 40 chimpanzees on each of 6 occasions over a period of 18 months at 3-month intervals and studied for the presence of viruses. 96 chimpanzees have been examined one or more times in this survey. 69 viral isolates have been recovered from 502 throat and fecal specimens. 40 viruses have been classified as enteroviruses, presumably belonging to the group of enteric cytopathogenic orphan viruses. 9 adenoviruses have been recovered as well as 6 members of the reovirus group. 5 Coxsackie group A viruses were discovered in feces from one collection period. 5 viral isolates classified as parainfluenza Type 2 viruses were identified serologically as being related or identical to SV-5 and the existence of the infection by these viruses of the chimpanzee has been demonstrated by the presence of antibody in the homologous chimpanzee sera. 4 viruses recovered are presently unclassified.

The mycoflora of the intestinal contents of the vervet monkey. Al-Doory, Y. (Dept. Mycology, Southwest Found. Res. & Educ., San Antonio, Texas) Mycologia, 1966, 58, 659-662.

A circadian temperature rhythm in the rhesus monkey. Ternes, J. W., & Farrer, D. N. Technical Report No. ARL-TR-66-21, 6571st Aeromedical Research Laboratory, Holloman Air Force Base, New Mexico.

A rhesus monkey was restrained and kept isolated from normal laboratory distractions for 4 months. Environmental and subcutaneous temperatures were recorded every 15 minutes throughout this time. A circadian rhythm of subcutaneous temperature, whose frequency was synchronized to the 24 hour light-dark cycle, was demonstrated. The effects of constant illumination and of different feeding times were also studied. It was found that the subcutaneous temperature rhythm can be maintained under constant illumination and also that the shape of the daily curve, for this rhythm, can be effectively modified by manipulating feeding time.

The viral flora of the alimentary tract of chimpanzees. Day, P. W., Soike, K., Levenson, R. H., & Van Riper, D. C.

(Inst. Exp. Pathol. & Toxicol., Albany Med. Coll., Albany, N. Y.) Laboratory Animal Care, 1966, 16, 497-504.

During a 12-month period, 5 samplings, at 3-month intervals, were taken in order to determine the normal viral flora of the alimentary tract of the chimpanzee. From 414 throat and fecal specimens collected, 62 viral isolates were obtained. The virus thus far identified fall into the Coxsackie A, parainfluenza (SV-5), adenovirus, reovirus, and enterovirus groups. 34 agents thus far studied appear to belong to a group of enteric orphan virus peculiar to the chimpanzee since they could not be neutralized by antisera to any of the known human enteroviruses.

Facilities, Care, and Breeding

Air transport of monkeys from India. Cullum, L. E. (Animal Resource Cen., Arizona State U., Tempe, Ariz.) Journal of the American Veterinary Medical Association, 1966, 149, 909-911.

Training graduate students in the use and care of animals. Cohen, B. J. (Dept. Physiol., U. Michigan, Ann Arbor, Mich.) Federation Proceedings, 1966, 25, 1473-1476.

An outline is given of 2 courses designed to facilitate training in animal experimentation. Graduate students are introduced to the use, care, and handling of commonly used laboratory species. They are exposed to the complexities of maintaining high standards of animal care. They are introduced to the principles of animal surgery and post-surgical care of animals. The courses emphasize the students' obligation to learn and practice humane methods in the interest of their animals and of their research.

Ecology, Field Studies, and Taxonomy

The relationships of the tree shrews: the evidence of the nervous system. Campbell, C. B. G. (Dept. Neurophysiol., Walter Reed Army Inst. Res., Washington, D. C. 20012) Evolution, 1966, 20, 276-281.

Phyletic position of tree shrews. Goodman, M. (Dept. Microbiol., Wayne State U., Coll. Med., 1401 Rivard, Detroit 7, Mich.) Science, 1966, 153, 1550.

The population characteristics of howler monkeys (Alouatta caraya) in Northern Argentina. Pope, Betty L. (Oregon Reg. Primate Res. Center, Beaverton, Ore. 97006) American Journal of Physical Anthropology, 1966, 24, 361-370.

Comments on the proposal for conservation of Pan Oken, 1816, and Panthera Oken, 1816. Hershkovitz, P. (Chicago Nat. Hist. Museum, Roosevelt Rd. & Lake Shore Dr., Chicago, Ill. 60605) Bulletin of Zoological Nomenclature, 1966, 23, 67-70.

Identification of the stump-tailed monkey, Macaca speciosa I. Geoffroy, 1826. Fooden, J. (Illinois Teachers Coll., Chicago-South, Chicago, Ill. 60621) Folia Primatologica, 1967, 5, 153-164.

The name Macaca speciosa I. Geoffroy, 1826 is based on the "Macaque à face rouge" described and illustrated by F. Cuvier [1824-29]. The animal illustrated is a Japanese macaque, not an Indochinese bear macaque as presupposed in current nomenclatural usage. Erroneous transfer of the name to the Indochinese bear macaque followed Blyth's [1875] influential misidentification of the "Macaque à face rouge". The valid scientific name for the Indochinese bear macaque is M. arctoides I. Geoffroy, 1831. Although the oldest available name for the Japanese macaque is M. speciosa, it is proposed that M. fuscata (Blyth, 1875) be conserved as the name for this species by suppression of the names M. speciosa I. Geoffroy, 1826 and Papio japonicus [Rennie], 1838. The brown-faced stump-tailed macaque of southern China, M. thibetana A. Milne Edwards, 1870 is specifically distinct from M. arctoides and M. fuscata.

Seasonal breeding of the Senegal galago (Galago senegalensis senegalensis) in the Nuba mountains, Republic of the Sudan. Butler, H. (Dept. Anatomy, U. Saskatschewan, Saskatoon, Canada) Folia Primatologica, 1967, 5, 165-175.

In the Nuba mountains, Republic of the Sudan, and in Northern Uganda, the Senegal galago (Galago senegalensis senegalensis) breeds twice a year and usually has only one young at a time. It is probable that, south of the equator, the Moholi galago (Galago senegalensis moholi) breeds only once a year but commonly has twins. Both races usually have 3 pairs of nipples, 1 pectoral and 2 abdominal.

Metric and taxonomic variations in the dentitions of two Asian cercopithecoid species: Macaca mulatta and Macaca speciosa. Biggerstaff, R. H. (Dept. Anthropol., Univer. Museum, U. Pennsylvania, Philadelphia, Pa.) American Journal of Physical Anthropology, 1966, 24, 231-237.

The primary molars and the first permanent molars of 2 Asian cercopithecoid species, Macaca mulatta and Macaca speciosa, were statistically described. Sexual dimorphism was not found related to tooth dimensions nor was there a significant difference between the right and the left sides. Generally, the teeth of Macaca mulatta were found to be larger than those of Macaca speciosa, and that this difference was significant for most tooth measurements. The discriminant function analysis reveals that the 2 species may be distin-

guished by tooth dimensions alone except in the dimensional range where overlapping is expected.

Instruments, Techniques, and Suppliers

A training technique for the daily chairing of monkeys. Barrow, S., Luschei, E., Nathan, M., & Saslow, C. (Reg. Primate Res. Cen., U. Washington, Seattle, Wash. 98105) Journal of the Experimental Analysis of Behavior, 1966, 9, 680.

A catheter-protection system for use with monkeys. Pickens, R., Hauck, R., & Bloom, W. (Psychiatry Res., Box 390 Mayo, U. Minn., Minneapolis, Minn.) Journal of the Experimental Analysis of Behavior, 1966, 9, 701-702.

Complete squirrel monkey diet in tablet form. Riddle, W. C., Rednick, A. B., Catania, A. C., & Tucker, S. J. (Smith Kline & French Labs., 1500 Spring Garden St., Philadelphia, Pa. 19101) Journal of the Experimental Analysis of Behavior, 1966, 9, 670.

Restraining boards for radiography of small primates. Ferron, R. R. (Oregon Reg. Primate Res. Cen., Beaverton, Ore. 97006) Laboratory Animal Care, 1966, 16, 459-464.

Technique for radio telemetry of blood-flow velocity from unrestrained animals. Franklin, D. E. (Biomed. Eng., Scripps Clinic Res. Found., La Jolla, Calif.) American Journal of Medical Electronics, 1966, 5, 24-28.

A collar and chain procedure for handling and seating Macaca mulatta. Hurst, C. M., & Lucero, J. F. Technical Report No. ARL-TR-66-14, 6571st Aeromedical Research Laboratory, Holloman Air Force Base, New Mexico.

A collar and chain procedure for transporting Macaca mulatta from living cages to pillory neck plate type restraint chairs, is described. The relative merits of this procedure are discussed in comparison with standard handling techniques. The application of this procedure was demonstrated with 14 Macaca mulatta (7 males and 7 females) ranging in weight from 3.4 to 6.6 kilograms.

A method for attaching apparatus to the skull. Roth, J. G. (Dept. Neurophysiol., Oregon Reg. Primate Res. Cen., Beaverton, Ore. 97006) Electroencephalography and Clinical Neurophysiology, 1966, 20, 618-619.

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Ikeda, J., Mizono, N., Hayama, S., Inoguchi, S., Iwamoto, M., Kanaseki, T., Matsuda, T., Ogawa, T., Ohmori, A., Saheki, M., & Takeda, H. (Chiba U., Chiba, Japan) Primates, 1966, 7, 117-136.

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AN APPEAL FOR MATERIAL FOR A COMPARATIVE STUDY OF PRIMATE PLACENTAS

Following a study of the lobular architecture and its relation to the openings of maternal vessels in the human placenta (Gruenwald, P., Bulletin of the Johns Hopkins Hospital, 1966, 119, 172-190), a companion study of primate placentas has been started. It has been very difficult to obtain suitable material, probably because the mother eats the placenta if she delivers unattended. I have adequate material from baboons, rhesus, and squirrel monkeys and single specimens of a few other species. Any material from other species would be very welcome. Interesting differences between species have already been found. Serial or step-serial sections (depending on the size of the specimen) are used for graphic reconstruction, similar to those pictured in the study of humans. Any donor of material will receive, if he wishes, a step series from each placenta thus examined for his own collection. From large placentas, pieces should be at least 4 by 6 cm with an intact maternal surface, fixed in any one of the customary solutions. It is desirable to receive information on the length of gestation, weight and sex of the fetus, and corresponding data for the usual full-term pregnancy of the particular species. Placentas fixed in situ attached to the uterine wall are, of course, particularly welcome.--Peter Gruenwald, Sinai Hospital, Baltimore, Maryland 21215.

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