

LABORATORY PRIMATE NEWSLETTER

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Edited by

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with the assistance of

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POLICY STATEMENT
(Revised January, 1964)

The primary purpose of the Newsletter is to provide information on maintenance and procurement of nonhuman primates for laboratory studies. A secondary purpose is dissemination of general information about the world of primate research. Examples of the kind of practical information that would be useful are as follows: new drugs; novel aspects of cage design; new products; evaluations of various products; references to or short summaries of articles of general interest; experiences in connection with the procurement of monkeys. The Newsletter will also publish offers to exchange monkeys (for example, older monkeys for young or infant monkeys) and requests for monkeys with special characteristics (for example, good breeders or pregnant females). If someone has a special problem, he might want to request help through the Newsletter.

As a rule, only research articles or summaries which have some practical implications or which provide general information likely to be of interest to investigators in a variety of areas of primate research will be accepted for inclusion in the Newsletter. Descriptions of current research projects will also be welcome. It should be kept in mind that the Newsletter is not a formal publication and it is not likely to be obtainable in libraries. Therefore, citation of Newsletter notes or articles in publications is not recommended.

Information for the Newsletter will be welcome from anyone in any research area who is using monkeys or apes. The Newsletter will appear quarterly and will continue so long as people are interested enough to contribute items of information. The mailing list is open to anyone expressing an interest. There is no subscription charge. However, only new issues and back issues for the current year will be mailed to new subscribers free of charge. Volume 1 of the Newsletter may be purchased for \$2.00 and Volume 2 for \$1.00. (Please make checks payable to Brown University.)

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Acknowledgments

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EDITOR'S NOTES

Our comments on nomenclature in this section of the previous issue of the Newsletter stimulated a number of interesting letters from some of our readers. Also, additional information relevant to our comments was recently published. This information and readers' comments appear in this issue starting on page 4.

We have returned to our original policy of including in our Recent Articles and Books section only articles that are concerned with practical questions of care and maintenance of monkeys and apes, or which seem to be of general interest. We have neither the time nor the facilities necessary for accumulating and publishing extensive bibliographies. A bibliography covering some of the current primate research literature is published in each issue of Folia Primatologica.

This issue of the Newsletter contains a note by Herbert H. Reynolds which points out inaccuracies in newspaper reports of behavioral research being conducted at Holloman Air Force Base. One of these newspaper articles was quoted in the Newspaper Clippings section of the previous issue. It goes without saying (but we will say it anyway, just to be sure) that anything appearing in that section of the Newsletter is hardly to be taken seriously. We have had some traumatic experiences with newspaper reports of our research, too. Not too long ago a newspaper reported an interview we gave under the headline, "Lab finds monkeys like wine, smokes." The article was no better than the headline. We thanked our lucky stars that we kept the sex life of monkeys out of the discussion. At their best, newspaper descriptions can provide only a very rough idea of research results. We quote such reports at times partly for this reason, but mostly to show our readers what the general public is exposed to.

Acknowledgment

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LABORATORY MAINTENANCE OF TREE SHREWS
(Tupaia longipes, T. chinensis*, T. gracilis, T. minor, and Tana tana)

M. W. Sorenson and C. H. Conaway
Department of Zoology, University of Missouri

We have maintained a colony of reproductively active tree shrews (five species) at the University of Missouri for 22 months. The animals were caged in pairs, in specific groups, and in mixed species groups without any deaths due to agonistic behavior. However, several deaths did result from abdominal, thoracic, and subcutaneous hemorrhages following surface bruising. Therefore, three prothrombin times were determined for T. longipes. These times averaged 32 sec. and appeared abnormal when compared with the guinea pig and man (average 12-15 sec.). A clotting time as long as this may indicate a vitamin K deficiency. Death from hemorrhage should be studied further.

With regard to caging, we recommend: (1) One to three animals, three square feet per animal; (2) four or more animals, six square feet per animal; (3) cage height, seven feet; (4) a sex ratio of one male to three or four females per cage. Cages should be arranged to simulate a natural habitat, i.e., contain vertical and horizontal tree branches, hollow logs, elevated rest boards, wall nest boxes, and a suitable floor covering such as soil or wood chips. One-quarter-in. hardware screen may be used for cage construction. One-way mirrors or vertical baffles should be installed to insure minimal animal disturbance during observation periods.

Abundant food and water must be supplied daily. Since tree shrews are omnivorous, the following general diet is recommended: Diced apples, oranges, carrots, and bananas; lettuce, sweet grapes, and melons; Purina dog chow (soaked in water), Hills' canned gravy and horse meat, and soft white bread. Additionally, live crickets and grasshoppers are readily consumed. Freshly killed mice and water-soluble vitamins should be fed periodically as a dietary supplement.

Following parturition, females frequently eat or abandon their young. In the latter case infants may be reared by hand. We have successfully hand-reared 19 T. longipes and recommend the following formula: One-half raw egg yolk, one teaspoon white Karo syrup, 1/3 evaporated milk, 2/3 whole cows' milk, making a one-pint total. Observations of captive tree shrews have shown that they nurse twice daily, once in the early morning and again toward evening. We suggest that hand-reared young also be fed at about 12-hour intervals. The formula should be thoroughly mixed and given at body temperature. The young may be fed with an eye dropper, four to five grams per feeding. If diarrhea occurs, the oral administration of Terramycin (1 mg/30 gm) is effective within one to three

* According to Fiedler in Primatologia (Vol. 1), T. glis includes T. chinensis--Ed.

days. Semisolid foods, such as baby bananas, vegetables, and meats, may be offered when the young reach approximately 50 gm body weight (four to five weeks of age).

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PROTECTIVE MEASURES IN PRIMATE LABORATORY

Because of the note in the Laboratory Primate Newsletter (January, 1964) on hepatitis being associated with nonhuman primates and the reluctance it might generate in some investigators to work with these species, let me pass on some information which may ease their thoughts. The following is quoted from "Guidelines for Laboratory Technicians Working With the Chimpanzee," by Vernon Pegram and Victor Bogo (Special report, Comparative Psychology Branch, 6571st Aeromedical Research Laboratory, Aerospace Medical Division, Holloman Air Force Base, New Mexico).

"Of paramount importance is the finding that a number of personnel associated with the chimpanzees have contracted infectious hepatitis. To prevent contracting hepatitis we adhere strictly to the following rules:

(1) Each individual, whether he works directly with the animals or not, is inoculated with 10 cc of gamma globulin every 6 months (recommended dosage is .06 cc/lb. body weight every six months).

(2) Special clothing (white medical cotton type) is worn by all individuals working directly with the animals. Each individual is issued 8 sets of these uniforms and normally changes uniforms every other day.

(3) Hands will be washed with surgical soap immediately after handling the animals.

With these rules constantly being brought to the attention of the laboratory technician and an insistence that they be rigorously followed, there have been no cases of infectious hepatitis in the Comparative Psychology Branch."

Frederick H. Rohles, Jr.
Institute for Environmental Research
Kansas State University

A MATTER OF TASTE

Dennis D. Devine
Department of Experimental Psychology
Walter Reed Army Institute of Research

Most of the monkeys used in this laboratory are fed a nutritionally complete monkey diet of 0.7-gm food pellets. These pellets facilitate using food as a reinforcer, as they are easily dispensed by electrically operated pellet hoppers.

Although the pellets obtained from Dietrich and Gambrill, Inc. (D&G) provide a complete diet and maintain the animals in excellent nutritional condition for years of experimental use, the taste of the pellets seem to leave something to be desired. It is often difficult to start a monkey on a diet restricted to pellets when it has a recent history of other, more preferred food. When offered only the pellets the animals often go on a "hunger strike" for a time, though they eventually eat the pellets.

In an effort to determine whether a flavored pellet might be more attractive to monkeys than the unflavored ones, this experimenter mixed equal amounts of the D&G pellets and flavored pellets developed by CIBA in the monkeys' pellet hoppers. The pellets developed by CIBA were basically similar to those from D&G, but weighed 1 gm and contained banana flavoring.

The animals tested were six male rhesus monkeys, well trained in an operant-conditioning procedure using the D&G pellets as reinforcers. Each monkey received 70 pellets per session. The mixture of flavored and unflavored pellets was used for three sessions. After each session, all pellets rejected by the monkey and dropped into the sawdust at the bottom of the experimental chamber were removed and examined.

The typical behavior of each monkey on the operant conditioning procedure was maintained, even though as many as 30 pellets were dropped. One monkey consistently dropped the flavored pellets; one monkey consistently dropped the unflavored pellets; one monkey ate all pellets during the first two sessions but dropped a few flavored pellets during the last session; one monkey dropped a few unflavored pellets during the first session and afterward ate both. Two monkeys always ate both and rejected none.

Out of the six monkeys, then, one monkey preferred the flavored, one monkey preferred the unflavored, and the other four monkeys showed no decided preference.

ON THE IDENTIFICATION AND NAMING OF 'CYNOMOLGUS' AND OTHER MONKEYS:

EDITOR'S COMMENTS AND LETTERS TO THE EDITOR

In the Editor's Notes in the January, 1964, issue of the Newsletter, we called attention to the need for clear identification of nonhuman primates used in research. We chose the so-called "cynomolgus" or "crab-eating" macaques as a prime example of nomenclatural confusion, and indicated that, unless informed otherwise, we would use "Macaca irus" to designate the species and "Macaca irus philippinensis" to designate those animals of the species which come from the Philippines. We were informed otherwise at about the same time the January issue of the Newsletter was mailed. The source of the information was a report in Science (1964, 143, 363) by Jack Fooden, entitled, "Rhesus and crab-eating macaques: intergradation in Thailand." Fooden reported that "specimens collected in Thailand...in an area geographically intermediate between the ranges of these two macaques, show that they intergrade morphologically and, therefore, are races of a single species" (p. 363). Fooden concluded that the proper scientific name for the rhesus monkey is Macaca mulatta mulatta, and that that for the crab-eating macaques, assuming they are all conspecific, is Macaca mulatta fascicularis. Fooden explains why the subspecies name should be fascicularis, rather than irus, in a note (No. 2) at the end of his report.

We were more surprised by the fascicularis information than by that on the conspecificity, and we also found it somewhat disturbing. It is bound to further confuse an already badly confused nomenclature. Also, we have no idea whether or not the Fooden report represents the last word on the matter. Despite our qualms, we have decided to use the names that Fooden suggests (along with a statement about the locality from which the animals were obtained), since they appear to be in accord with the present international rules of nomenclature. In connection with this, George Gaylord Simpson wrote, "It might be useful to ask the International Commission on Zoological Nomenclature to put the name of these medically and experimentally important animals on the official list of names. That would fix once and for all such questions as irus versus fascicularis. It would not, however, decide such questions as Macaca fascicularis versus Macaca mulatta fascicularis, which involve zoological, not nomenclatural decisions. A detailed bibliographic analysis would have to be submitted to the Commission." He went on to say, "As you state in your newsletter, knowledge of the locality or, at least, region from which a monkey or its wild ancestors came can be more precise and is more significant, at present, than assignment of a technical name. In the nature of things, if only one or a few individuals are at hand, they cannot be surely assigned to a subspecies, or occasionally even to a species, on their observable somatic characters alone."

The following is from a letter from Sydney Anderson of The American Museum of Natural History. "In general it is my judgement that experimental reports need not cite the name of the subspecies, but may do so if it has been determined by careful taxonomic study. In ad-

dition to the scientific name, whether of species only or of subspecies also, every report should include the geographic source of material as accurately as known. And on this point, if users of primates would let suppliers know that this information is important, more attention would be given to providing it." He summarized his views as follows: "Lack of accurate identification may negate the value of experimental research entirely, because verification is not possible and comparison to related studies is not possible. Identification should be made, or at least verified, by a systematic mammalogist, and I don't mean casually over the telephone, as I have been asked to do. In addition, the specimen itself or adequate documentation such as photographs, should be deposited in a permanent museum or other repository, and the place and catalogue number of the specimen should be cited in published reports, so that future verification of the identification is possible."

Sherwood L. Washburn of the University of California, sympathizing with the confusion many experimenters feel when faced with the problem of nomenclature, stated in a letter, "I believe the currently accepted names of primates should be 'frozen' and only changed if there are major intellectual issues involved. The reason for this is that the constantly changing names mean that the terminology becomes absolutely impossible for the nonspecialist. It is most unfortunate that some zoologists still get their pleasure out of changing the names rather than clarifying the taxonomic issues...The classification of the primates offers particular problems which do not affect the classification of any other group of mammals. Most mammalian classification is used only by a restricted group of zoologists. These people normally know three or four synonyms for each animal and it doesn't bother them because that is their specialty. But in the primates, most of the people who use the technical names are not zoologists at all but all manner of M.D.s, psychologists, anthropologists, etc. This means that the normal zoological procedures simply break down when applied to this group."

We also received a letter from Clyde A. Hill of the San Diego Zoological Garden, which we quote in part: "I am happy to see that you made a big point about animal dealers not knowing what they are selling and that often buyers accept the dealer's identification as fact. This is not only a problem with scientists who are not trained with the identification of primates but even in some zoos! Of all the primates used for research in this country the macaques present the most difficult identification problem and justly so for they are rather a confusing group. There are one or two fair keys for identification of macaques but most animal dealers and almost all scientists working with primates are unaware of their existence. I think it would be beneficial to many of your readers for the Newsletter to publish a key of the macaques that can be used by a layman. I would also suggest that this key be oriented toward, or at least include, identification of juvenile forms."

Finally, we received a more detailed note on the question of primate identification which is reproduced below.

COMMENTS ON THE IDENTIFICATION OF MONKEYS

Robert Holdenried
National Cancer Institute, National Institutes of Health

The Editor's Notes in the January, 1964, issue of the Laboratory Primate Newsletter, on the need for the identification of monkeys used in experiments to the specific and even subspecific level is most appropriate. Monkey users will probably readily agree to the need for the proper identification of their experimental subjects, but they become somewhat impatient and dissatisfied with the results of their efforts in taxonomy. The primate taxonomic literature is unsatisfactory and inadequate for reliable application by those unskilled in this field. How, then, does the experimenter using monkeys determine the identity of his specimens?

The Newsletter Editor indicated only the first step. This step is to determine with all possible accuracy the geographic location in which the monkeys were trapped. In addition to this step, each shipment should be examined for obvious odd species which may have become mixed in the group. Measure standard total length (tip of nose to tip of tail), tail length, length of hind foot (back of heel to tip of toe), and ear (notch to top) of adults preferably, but immatures also, or at least selected samples of them. Include with this measurement information on each specimen, its weight and its degree of maturity. With this basic data in hand seek the help of expert taxonomists available in the major vertebrate museums.

The taxonomists may request an opportunity to examine skins and skulls of both sexes, including occasionally the penis. He may suggest packing the carcasses in dry ice for shipment to a museum. Such specimens may be selected from the animals dying in the period of adjustment to the laboratory or they may be specially selected at a later date. Specimens properly prepared and documented are valuable additions to museum collections where they will serve as comparative material available for better future identification service. In addition, if in the future new information or new interpretation of data results in taxonomic revisions, the preserved specimens remain available for identification verification at any time. Museum curators appreciate the value of suitably prepared specimens and are anxious to add them to their collections. They will gladly supply preservation and shipping instructions.

Until the primate taxonomic knowledge is more completely developed, and simple, perhaps illustrated, identification keys are published, the vertebrate museums and their staffs offer the best means for the proper identification of monkeys. Within the limits imposed by the information supplied, the present state of the taxonomic knowledge, and the time available, these experts are available for your assistance.

Primary museums in the United States with primate identification capabilities are: The American Museum of Natural History, New York, New

York, Dr. Richard G. Van Gelder, Curator of Mammals; Chicago Natural History Museum, Chicago, Illinois, Dr. Joseph C. Moore, Curator of Mammals; U. S. National Museum, Washington, D. C., Dr. David H. Johnson, Curator of Mammals.

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FIELD STUDY OF GIBBONS ANNOUNCED

I have received a Public Health Service grant to do an 18-month field study of gibbons in Malaysia. There are three species in the Malay Peninsula: Hylobates lar, H. agilis, and Symphalangus syndactylus. I plan to spend the initial six months surveying a large area of the peninsula in order to (a) get some idea of the variety of habitats, and (b) to find the optimal place to undertake a year-long study of social behavior; i.e., to find a location where there are both gibbons and favorable observation conditions. This optimal location will, in fact, determine which of the three species I decide to concentrate on for social behavior.

The project is scheduled to start March 1, 1964, and will run until September 1, 1965. The data collected will form the basis of my doctoral dissertation.

If there is anything you would like especially to hear from the field, general or specific, please let me know, and I shall try my best to oblige. My address for the first part of the study will be c/o Dr. F. L. Dunn, Medical Zoology, Institute for Medical Research, Kuala Lumpur, Malaysia.

John O. Ellefson
Department of Anthropology
University of California, Berkeley

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RESEARCH MATERIAL SOUGHT

I am currently working on a systematic study of the penis bone in the macaque. I would be very grateful to have the entire penis (preserved in 75% ethyl alcohol) of laboratory macaques that die or are sacrificed. For each specimen I would need to know the species and approximate age; the number and kind of erupted teeth is a satisfactory substitute for chronological age.

Jack Fooden
Chicago Teachers College South
6800 Stewart Avenue
Chicago, Illinois 60621

CENSUS OF LABORATORY PRIMATES

The results of our recent mail census of primates currently being used in research laboratories of Newsletter readers are summarized below. Unfortunately, it was not always clear what kind of monkey was referred to or what the colony size was, so the figures should be regarded as quite rough. When we were in doubt about the species, we frequently tabulated the genus only. Not surprisingly, the rhesus macaque (Macaca mulatta mulatta) turned out to be the most widely used monkey, both in terms of the number of laboratories using them and the number of animals. The next most widely used is the squirrel monkey (Saimiri sciureus). Other animals widely used (10 or more laboratories and 250 or more animals), with the rank order depending on whether we count number of laboratories or number of animals, are the green monkey (Cercopithecus aethiops), the cynomolgus monkey (M. mulatta fascicularis), the pig-tailed macaque (M. nemestrina), the stump-tailed macaque (M. speciosa), the baboon (Papio), the chimpanzee (Pan), and the marmoset (Callithrix).

Name	No. of Labs	No. Animals
Suborder: Prosimii		
<u>Tupaia</u> spp. (Tree shrew).....	6	48
<u>Lemur</u> spp.....	5	61+
<u>Nycticebus coucang</u> (Slow loris).....	4	5+
<u>Perodicticus potto potto</u>	2	?
<u>Galago</u> spp. (Bushbaby).....	4	45+
Suborder: Anthropoidea		
Superfamily: Ceboidea (New World Monkeys)		
Family: Callithricidae or Hapalidae (mostly marmosets and tamarins)		
<u>Callimico goeldii</u>	2	11
<u>Callithrix</u> (<u>Hapale</u> ; <u>Mico</u>) (Marmoset).....	12	310
<u>Leontocebus</u> spp. (Tamarin).....	5	55+
<u>Leontocebus</u> (<u>Oedipomidas</u>) <u>oedipus</u> (Pinché, cotton-headed tamarin). 2	2	102
Family: Cebidae		
<u>Cebus</u> (<u>apella</u> , <u>albifrons</u> , and <u>capucinus</u>).....	24	217
<u>Saimiri sciureus</u> (Squirrel monkey).....	71	2284
<u>Aotes</u> spp.....	1	7
<u>Ateles</u> (Spider monkey).....	13	112+
<u>Lagothrix</u> (Woolly monkey).....	7	50

Superfamily: Cercopithecoidea (Old World Monkeys)

<u>Cercopithecus aethiops</u> (Green, vervet, or grivet monkey).....	20	1210
Other <u>Cercopithecus</u> spp.....	12	32+
<u>Erythrocebus patas</u> (Red monkey).....	6	38
<u>Cercocebus</u> (Mangabey).....	7	26+
<u>Cynopithecus niger</u> (Celebes, or black ape).....	2	43
<u>Macaca</u>		
<u>mulatta mulatta</u> (Rhesus).....	119	9794
<u>mulatta fascicularis</u> (Cynomolgus).....	55	1022+
<u>nemestrina</u> (Pig-tailed).....	30	485
<u>speciosa</u> (Stump-tailed).....	37	299
<u>fuscata fuscata</u> (Japanese macaque).....	3	100+
<u>fuscata yaku</u> (Japanese yaku).....	1	121
<u>radiata</u> (Bonnet macaque).....	4	121
<u>cyclopis</u> (Formosan macaque).....	1	57
<u>Papio</u> (Baboon)		
spp.....	9	397+
<u>doguera</u>	5	55
<u>papio</u>	1	26
<u>cynocephalus</u>	1	15
<u>Presbytis</u> (Langur).....	1	12
<u>Presbytis entellus</u>	1	29

Superfamily: Hominoidea (Apes and Men)

<u>Hylobates</u> (Gibbon).....	9	25
<u>Pongo</u> (Orangutan).....	3	53
<u>Pan</u> (Chimpanzee).....	21	297
<u>Gorilla</u>	2	8

EXAMPLE OF INACCURATE NEWSPAPER REPORTS ON PRIMATE RESEARCH

Herbert H. Reynolds
Comparative Psychology Branch, 6571st Aeromedical Research Laboratory
Holloman Air Force Base, New Mexico

While I am always pleased to have our research receive favorable publicity, it is of concern to me when newspapers present inaccurate information. The following is based on a letter which I recently sent to many of my close acquaintances concerning such articles as the one quoted in the Newspaper Clippings section of the January, 1964, issue of the Laboratory Primate Newsletter.

Several months ago our Information Services Office informed me that interview and visiting privileges had been granted to Mr. Harold Williams, Associate Press writer, Albuquerque, N. M. Mr. Williams arrived at the appointed time with a personal friend, along with Mr. George Meeter of our Base Information staff. After I was introduced to these visitors we sat down and I prefaced my remarks with a statement very like this: "We are quite careful here in giving out information because so many reporters do not fully understand our mission and thus present to the public a distorted view of our efforts. I therefore must insure that I will have the opportunity to review anything you may write about our efforts." Mr. Williams agreed to this requirement, but I have since learned that he told Mr. Meeter after leaving our laboratory that he couldn't afford to let us review his write-ups and indicated his resentment of our requirement.

Although I am sure I have not seen a tenth of the versions of the three articles Mr. Williams wrote, I nevertheless would like to correct the errors he made in the presentations that I have seen.

1. One article indicated Mr. Williams spent a week in our Lab. He spent less than two hours and did not take notes during much of the briefing.

2. The phrase "nerve gas warfare" was used by Mr. Williams in his first article. This was never used by me. We are doing research on classified compounds with the U. S. Army, none in a gaseous state. Since we are psychologists one could infer we are concerned with the nervous system.

3. Mr. Williams proceeded to discuss UDMH, the fuel for the Titan, and said we use chimps for this work. No work has ever been done on UDMH with our chimps, only with monkeys, and we do not "give them a fresh supply of oxygen to overcome the effects" as Mr. Williams stated.

4. "Bobby Joe, a six year old chimp, has been trained to fly a spacecraft back through the earth's atmosphere after a trip through space." Bobby Joe is trained on a continuous tracking task and we suggested that,

under certain circumstances, he could possibly guide a vehicle through a "window" in space after a flight of a given type. I did not suggest at any time how spacecraft controls might be modified to permit such an act. The reporter also said, "Bobby Joe uses two hand levers..." This is not so; he uses a single omnidirectional "joy stick."

5. George, a chimpanzee that can respond differentially to numeric symbols, was said to have "not received a reward after three hours of work, but had continued to push the levers each time the numbers came up. The scientists were elated." Pure fabrication. A nylon cord had gotten caught in the pellet delivery tube and I moved it in Mr. Williams' presence. George had worked 3 or 4 problems (3 or 4 min. maximum) without reward and I was not elated. I suspect that George would work quite a while before extinction would set in, but all of us know this. He did not, however, exhibit extinction behavior on the day Mr. Williams was here for there was no reason to do so.

6. "Dwayne, a lively, friendly 60 pound chimp, was being fitted into his space suit for a simulated trip through space in a compression chamber." Pure fabrication. Duane was being placed in a restraint suit to work in a life cell couch. The couch, during training, is kept in an ambient environment. Unfortunately, we are not involved in any space program at this time and any reference to such preparation is totally out of line. Duane cannot track like Bobby Joe as Mr. Williams stated and has never worked on any of our tracking tasks.

7. "The chimp is not frightened by pain." This is not so. I said that the chimp appears to have a higher pain tolerance (threshold) than man.

8. "Reynolds said a captive birth of a chimpanzee has never been accomplished." Gad! Even a neophyte primatologist knows better than this. I said that "our attempts at breeding in captivity had been generally unsuccessful." We do hope to get a breeding colony here one day.

9. Louie does not play Tic-Tac-Toe with Big Mean. Mr. Williams plucked this name off one of our housing cages in the room where two chimps do play Tic-Tac-Toe. Louie has never played Tic-Tac-Toe.

I have learned one thing from this trying experience. Even when so-called "responsible newsmen" have a clearance, don't talk with them. Although they may tell you that they will permit a review, only their personal ethics compel them to do so. This is the only way I know of to prevent unfortunate circumstances of this sort.

As a matter of information, we are mainly involved these days in the evaluation of unusual environments, e.g., acceleration, increased and decreased atmospheric pressure, and toxic agents. We are not

scheduled to participate in any of the immediate space efforts. We hope for such an opportunity in the future.

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ON CAGING SMALL PRIMATES

I wish to voice a protest against the practice of maintaining primates in small cages. A review of cage dimensions described in advertisements distributed by a number of cage manufacturers suggests that a cage 10 in. wide, 10 in. high and 12 in. deep is sufficient to meet the needs of small primates such as marmosets and squirrel monkeys. The implication appears to be that small primates don't need much space. Clearly, the fact that in the wilds even the small primates traverse several miles a day has been disregarded. Undue restriction of activity in a laboratory setting seems not only unkind, but unwise in terms of maintaining animals in good health for research and study. Our experience with small primates, in particular the squirrel monkey (Saimiri sciureus), suggests that minimum cage size ought to be 18 in. wide, 28 in. high and 28 in. deep [see Lab. primate Newsltr, 1963, 2 (No. 3).]

Duane M. Rumbaugh
Psychology Department
San Diego State College

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REQUEST FOR INFORMATION ON PRESENTATION OF AUDITORY STIMULI

I am interested in the presentation of auditory stimuli to primates with some kind of ear phone arrangement rather than free field presentation. I am familiar with the use of the foam rubber filled helmet for chair-restrained monkeys used by Romba et al. (Technical Memorandum 3-63, February 1963, U.S. Army Human Engineering Laboratories, Aberdeen Proving Ground, Md.) However, I would very much like to hear from anyone else who has faced the problem and made any headway toward a solution.

William C. Stebbins
Kresge Hearing Research Institute
University of Michigan Medical School
Ann Arbor, Michigan

NEW PRODUCTS AND SERVICES

New Supplier of Conditioned Monkeys

"Primate Imports Corporation has been in the supply of research monkeys for several years on a 'drop' shipment basis. Realizing the need for additional acclimating facilities on the East Coast and the need to serve customers interested in only a small number of animals at a time, we decided to engage last year in an operation that will fill this need. Now we have facilities to hold upwards of 600 animals and have 300 currently in stock. Our principles are to quarantine new arrivals from stabilized animals and to preserve the integrity of a newly arrived group throughout its stabilization period until all animals are sold. With this in mind, we have seven separate animals rooms, each capable of accommodating 100 animals in suspended cages with dividers between each cage. We have found this to be the most practical method of inhibiting the spread of disease. As a routine matter, all animals receive antibiotic broad spectrum medication. They are all fed on prepared monkey pellets. Monkeys that need individual attention are treated individually. We operate in consultation with Dr. David Barsky, our Attending Veterinarian, who has set up for us a practical and effective animal care program. Our acclimating program is based on a four week period but we can expand or diminish this at our customers' option."

Primate Imports Corporation
34 Munson Street
Port Washington, Long Island, N. Y.

Cages For Large Primates

"An integral part of our operations is the wholly owned firm of South San Francisco Metal Fabricators. With this close association our development shop has had excellent, first hand experience in the manufacturing of commercial cages for primates. By actually observing cages in use, our people have been able to see the wear and tear problems developing and then make the necessary modifications to effect an improved design. This has been of particular value to the design and construction of the larger primate cages suitable to hold and maintain chimpanzees and large baboons which are in growing demand. To the best of our knowledge no commercial cage manufacturer is presently offering large laboratory animal cages suitable for these big primates. We would like to make it known that we have such cages for sale."

Asiatic Animal Imports, Inc.
Research Primate Division
P. O. Box 8125 International Airport
San Francisco 28, California

RECENT BOOKS AND ARTICLES

Books

Evolutionary and genetic biology of primates. Buettner-Janusch, J. (Ed.) New York: Academic Press, 1963-64. Two vols.

Chapter titles in Vol. I are: An introduction to the primates. A critical reappraisal of tertiary primates. The primate nervous system: Functional and structural aspects in phylogeny. New approaches to the study of the skin of primates. The sweat glands of the Lorisidae. Nerve endings in the skin of primates. The chromosomes of primates. Chapter titles in Vol. II are: Susceptibility of primates to viruses in relation to taxonomic classification. Immunochemical analysis of serum proteins of the primates: A study in molecular evolution. Hemoglobins of primates. Reproductive physiology and behavior of the Lemuroidea. Use of the hand in lower primates. The displays of the primates.

International zoo yearbook. Vol. IV. Jarvis, Caroline, & Morris, D. (Eds.) London: Published for the Zoological Society of London, 1963. (Order from: Publications Dept., The Zoological Society of London, Regent's Park, London NW1, England)

The Yearbook is divided into three main sections. This year, Section 1 deals with aquatic exhibits in zoos and aquaria. Section 2 is concerned with new developments in the zoo world, and includes articles entitled, "Breeding of tupaia," "Breeding of Bornean tupaia," "Notes on primate nutrition," "Blood groups in anthropoid apes." Section 3, the Reference section, provides information about the zoos and aquaria of the world, species of animals bred by zoos and aquaria during the year, the annual census of rare animals in captivity and details of zoo and aquaria staff. In addition, Section 3 contains the results of a survey of animal milk analyses.

Disease

Zoonoses associated with captive monkeys. Prier, J. E., Sauer, R. M., & Fegley, H. C. (School Vet. Med., Univer. Pennsylvania, Philadelphia) Lab. anim. Care, 1964, 14, 48.

"This presentation reviews the important infections of public health significance, including incidence and epizootiology, in large captive colonies and the associated specific problems regarding human health. The discussions are confined to diseases that are present in captive animals and do not include infections that are found in animals in the natural habitat such as yellow fever and Kyasanur Forest disease. Much of this information is based on observations and data obtained in a large monkey colony used for research and routine production of biological products."

General

The marmoset as an experimental animal in biological research: Care and maintenance. Levy, B. M., & Artecona, J. (Univer. Texas Dental Branch, Houston) Lab. anim. Care, 1964, 14, 20.

"The marmoset is a small, well mannered, easily manageable primate which seems ideally suited for work in experimental biology. In specially constructed, inexpensive cages as many as 90 animals can be comfortably housed in a room 10 feet by 20 feet. The animals are readily maintained on a sterile breadlike ration with a vitamin supplement. Most of the diseases to which the animals are susceptible can be treated successfully."

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NEWSPAPER CLIPPINGS

SPRING BRINGS OUT BEAST IN HER

Susie a seasonally-oriented female, went on a spring tear yesterday that boded absolutely no good for assorted fish, fowl and, in effect, humans. Susie is a 2-1/2-year-old stump-tailed macaque, an ape that is the star attraction and featured pet of the Crystal Aquarium at 1659 Third Ave. at 93d St.

Susie normally has the run of the shop by day. At night, she is harnessed and caged. Four times a year, at the advent of each season, something happens to Susie. She gets a destructive urge and goes ape. In a delayed reaction Susie went on her spring rampage yesterday. At 10 A.M., while dozens of delighted spectators watched through the panes, Susie ripped off her harness, pried open the bars of the cage and managed to do about \$100 worth of damage.

She pulled the tail feathers off a startled Malacca cockatoo from Australia and smashed several tanks of rare fish, leaving the occupants wriggling on the damp floor. Though normally Susie subsists on a diet of fruits, nuts and vegetables, she changed her eating habits yesterday by biting off the head of a South American ghost fish worth \$15. Patroling police from the E. 104th St. station put Susie in her place by calling her bosses, Victor and Michael Hritz. At the sight of the Hritz brothers, Susie calmed down and became her usual charming self.

Victor said he bought Susie two years ago from a Lascar seaman on a British merchant ship sailing in from India, her native land. "We could sell her for \$250," he added, "but we're going to keep her." Susie has really found a home--to wreck.

New York Daily News, March 23, 1964

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