LABORATORY PRIMATE NEWSLETTER

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Edited by

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Consulting Editor: Morris L. Povar

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POLICY STATEMENT

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.

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 or the current issue. 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, 3, and 4 for $4.00 per volume, Volumes 5, 6, and 7 for $2.50 per volume, and back issues for the current year for $0.50 each. (Please make checks payable to Brown University.)

The publication lag is typically no longer than the 3 months between issues and can be as short as a few weeks. The deadline for inclusion of a note or article in any given issue of the *Newsletter* has in practice been somewhat flexible, but is technically the fifteenth of December, March, June, or September, depending on which issue is scheduled to appear next. As a rule, authors of longer articles will receive five extra copies of the issue in which the article appears; reprints will not be supplied under any circumstances.

PREPARATION OF ARTICLES FOR THE *NEWSLETTER*.--Articles and notes should be submitted in duplicate and all copy should be double spaced. Articles in the reference section should be referred to in the text by author(s) and date of publications, as for example: Smith (1960) or (Smith & Jones, 1962). Names of journals should be spelled out completely in the 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), beginning with the April, 1969 issue, the scientific names used will be those of Napier and Napier [*A Handbook of Living Primates*. New York: Academic Press, 1967].

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ACKNOWLEDGMENT

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Managing Editor: Kathryn M. Huntington

CONTENTS

DETERMINATION OF BASELINE BLOOD VALUES OF THE SQUIRREL MONKEY (*SAIMIRI SCIUREUS*)

A. Peoples, M. Cranmer, M. Miller

Perrine Primate Research Branch, Division of Pesticides

Food and Drug Administration, Department of Health, Education, and Welfare

Perrine, Florida

We have determined baseline values for several biochemical and hematological parameters, in connection with studies of the biochemical and physiological effects of pesticides in squirrel monkeys. These baseline values are reported below.

The squirrel monkeys (*Saimiri sciureus*) utilized in the acquisition of data had been imported from Iquitos, Peru, and were purchased as acclimated. The group contained 18 female and 12 male adult monkeys weighing between 500 and 1000 grams. The animals were isolated at the Perrine Primate Research Branch for 60 days in individual (metabolism) cages prior to baseline evaluation. The room was maintained between 72 and 74° F with a lighting period from 8 a.m. to 4:30 p.m. The monkeys were fed Purina monkey chow (25% protein). Water was provided by gravity flow water bottles. Each animal received 1/4 apple per day.

Hematology.--Baseline blood values were determined over a period of three months. Blood from each monkey was collected once each week. Manipulations of room temperature, lighting period, caging and feeding routine during the baseline determination were identical with conditions during the isolation period. Blood samples were collected in the mornings by lancing the saphenous vein. The blood was allowed to flow freely and the samples were pipetted and diluted immediately for each test without the use of an anticoagulant except for hematocrit determinations for which heparinized tubes were used. Erythrocytes and white cells were respectively diluted with Hayem's solution and 2% acetic acid and counted with a hemacytometer. Blood smears were prepared with Wright's stain. A microcentrifuge was used to prepare samples for the determination of hematocrit. Hemoglobin values were determined spectrophotometrically, using cyanmethemoglobin reagent. Total protein was determined on plasma from a hematocrit tube with a Goldberg hand refractometer. The results are presented in Table I.

Serum enzymes.--Serum enzymes were determined by the methods outlined by the Sigma Chemical Company in Sigma Technical Bulletin No. 700 for amylase; in Sigma Technical Bulletin No. 505 for glutamic pyruvic transaminase; in Sigma Technical Bulletin No. 175 for isocitric dehydrogenase; and in Sigma Technical Bulletin No. 750 for aldolase. Blood was collected with vacutainers from the saphenous vein in the morning following feeding. The results are shown in Table II.

Table I

Hematological Evaluation of Squirrel Monkeys (*Saimiri sciureus*)

Constituent	Mean	Std. Dev.	Range
Erythrocytes ($10^6/mm^3$)	9.1	0.9	7.4-11.3
Hemoglobin (gm %)	15.0	1.4	12.0-18.0
Hematocrit (%)	49.0	1.3	42.0-57.0
White blood cells ($10^3/mm^3$)	9.9	2.6	5.0-16.0
Neutrophils (per 100 WBC)	41.0	15.0	19.0-77.0
Band cells (per 100 WBC)	1.1	1.2	0.0- 7.0
Lymphocytes (per 100 WBC)	49.0	15.0	9.0-74.0
Eosinophils (per 100 WBC)	3.7	4.0	0.0-15.0
Basophils (per 100 WBC)	0.5	0.7	0.0- 2.0
Monocytes (per 100 WBC)	4.8	3.3	1.0-13.0
Plasma protein (gm %)	8.4	0.7	6.8- 9.7

Table II

Serum Enzymes of Squirrel Monkey (*Saimiri sciureus*)

		Mean		Std. Dev.		Range	
Enzyme	Units	Female	Male	Female	Male	Female	Male
Aldolase	Sibley-Lehninger	21	33	14	28	2-57	4-127
Amylase	Somogyi	247	330	95	109	95-360	133-600
Glutamic pyruvic transaminase (SGPT)	Sigma-Frankel	86	87	52	45	12-332	18-256
Isocitric dehydrogenase (ICD)	Sigma	631	668	196	269	300-900	335-1410

The extreme range and variability of results obtained for hematology and serum enzymes prompted an examination of the variability for separate animals over extended periods of time. Measurements were made weekly on six of the 30 monkeys in the colony over a seven-month period after the initial colony base line was established. No significant alterations with time were found for the hematological parameters of the individual monkeys. The individual variability was small but the variability of the group remained large. On the other hand, the serum enzyme values showed large individual variability (see Table III).

Table III

Serum Enzymes of Six Squirrel Monkeys
Over the Period of Seven Months[1]

Monkey[2]	Measure	SGTP	ICD	Amylase	Aldolase
No. 2 (F)	Mean	51.8	599	390	16
	Std. Dev.	19.8	113	79	12
	Range	24-90	450-780	300-600	2-50
No. 10 (F)	Mean	106.8	716	436	21
	Std. Dev.	35.3	120	71	10
	Range	54-132	600-960	300-555	7-33
No. 11 (M)	Mean	62.3	795	366	24
	Std. Dev.	8.9	146	37	11
	Range	50-78	660-1050	327-450	9-37
No. 18 (F)	Mean	66.3	498	378	15
	Std. Dev.	31.9	144	62	13
	Range	22-124	300-840	88-515	0-46
No. 20 (M)	Mean	219	720	335	15
	Std. Dev.	97.3	186	23	8
	Range	110-360	510-1020	300-360	5-28
No. 22 (F)	Mean	246.7	1005	263	34
	Std. Dev.	60.3	435	16	3
	Range	204-332	570-1440	240-278	30-37

[1]The units for these enzyme activities are as shown in Table II.

[2]Sex of each animal is shown in parentheses.

Discussion.--The range and variability of hematological values reported by New (1968) are not significantly different from those reported herein. New also reported values for serum glutamic pyruvic transaminase with a colony mean of 117.2, standard deviation of 74.9 and range of 38.0-470.0. These values, when compared with those in Table II, are not considered significantly different in view of the large ranges and standard deviations of the two colonies.

The large variability of results obtained from the colony and individual monkeys complicates the use of serum enzymes as indicators of organ and metabolic disorders and negates their usefulness in measuring subtle biochemical effects. The question of whether or not this large variability is a characteristic of the resting state or induced through the stress related to restraint during sampling is now under investigation.

REFERENCE

New, A. E. Base-line blood determinations of the squirrel monkey (*Saimiri sciureus*). In L. A. Rosenblum and R. W. Cooper (Eds.) *The squirrel monkey*. New York: Academic Press, 1968. Pp. 417-419.

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JAPANESE MACAQUE TROOP TO MOVE TO UNITED STATES

Plans are progressing for accepting the generous offer of Japanese primatologists to send a complete troop of *Macaca fuscata* (Arashiyama B) to the United States for release and study under essentially free-ranging conditions. This troop, once established intact under conditions simulating those of the site of origin and with a very full record of genealogy and behavioral history, will provide a unique situation for certain types of behavioral research. Ethologists and primatologists who visualize special research opportunities with this troop that could not be carried out with the more usual type of primate facility are invited to communicate with Dr. John Emlen, Department of Zoology, University of Wisconsin, Madison, Wisconsin 53706.

* * *

RHESUS MONKEYS FOR SALE

Laboratory-raised *Macaca mulatta* born between 1962 and 1968 are for sale. Some of the monkeys have had infants of their own, and mother-infant pairs are available. Wild-born male and female rhesus with good breeding records are also for sale. Most of the animals have been used in a number of behavioral experiments, but some have not. Health, breeding, and experimental histories are available.-- Fred Stollnitz, Psychology Department, Morrill Hall, Cornell University, Ithaca, N. Y. 14850 (Telephone: 607-256-2343).

PRIMATE PYGMALION

Clyde A. Hill

San Diego Zoological Garden

San Diego, California 92112

In the delightful musical comedy "My Fair Lady" Professor Henry Higgins transformed Eliza Doolittle by the "How now brown cow?" school of speech improvement. Should an American speak in the manner of Professor Higgins? The most erudite scholars of speech say "no." Should all Americans pronounce English the same way? Again, the answer is no.

The marked differences between British and American speech are well known; for example, in the pronunciation of the words *schedule* and *laboratory*. Such variances produce a flavor to our language which many believe should not be eliminated. Certainly, few find it objectionable. Thus, when the British primatologist says *Patas* as pə'tɔs or as 'petəs and the American as 'pætəs or whether it is pronounced sə'lebiz macaque in Djakarta or as 'sələbiz in Cleveland, Ohio, all pronunciations are acceptable. In the United States there are three principal speech regions that are usually designated as Eastern American, Southern American and General American. Some of the conspicuous regional differences among educated speakers center around the way the *r* sound is handled and upon the pronunciation of the *a* vowels. Most American scholars of speech believe that standard, clearly articulated Eastern American, Southern American, or General American speech is good anywhere and there is no need to apologize for any of them. Although Riopelle and Fraga (1969) summed up their article "The Pronunciation of Primate Names" in the April, 1969, issue of this *Newsletter* with, "We see little virtue in listing the diverse 'accepted' variants: on the contrary, virtue is found in consistency" (p. 2), they are not complying with what is referred to by the students of speech as the law of common usage (Henderson, Henderson, & Kenneth, 1960).

It perhaps would be appropriate to single out the pronunciation of scientific names since they seem to have troubled so many for such a long time. The scientific names used in biology are based on the dead languages of Greek and Latin. Goodwin (1899), the famous scholar of the Greek language, wrote, "It is safe to say that no one could now pronounce a sentence of Greek so that it would have been intelligible to Demosthenes or Plato" (p. vii) and an equally famous scholar of Latin, Chandler (1889) admitted that no one knows definitely how the Romans pronounced Latin. Nevertheless, various rules for the pronunciation of these two dead languages have evolved. None have priority, all have advocates. It has been argued for almost a century that classical terms should be pronounced as English. Non-English-speaking scholars, accustomed to pronouncing Latin according to either the Roman

Church or Continental method, accuse the English method of being provincial, which of course it is, but so is theirs. The difficulties in pronouncing Greek and Latin terms are simple compared to the complexities involved with scientific names as they are combinations of Greek, Latin and a host of barbaric languages. It is even possible to compound a scientific name from nonsense syllables. In reality there is no such thing as correct pronunciation for scientific names.

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Henderson, I. F., Henderson, W. D., and Kenneth, J. H. *A dictionary of scientific terms* (7th ed.) New York: D. Van Nostrand Co., 1960.

Riopelle, A. J., & Fraga, A. M. The pronunciation of primate names. *Laboratory Primate Newsletter*, 1969, *8* [2], 1-16.

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REQUEST FOR INFORMATION ON NEED FOR COMMERCIALLY-BRED SQUIRREL MONKEYS

Since 1966, we have maintained a breeding colony of approximately 20 squirrel monkeys and have been moderately successful in obtaining live offspring. We are considering expanding our facilities to make available captive-born *Saimiri* if there is any demand, and we would appreciate hearing from anyone who has or anticipates having a need for such animals.--Kenneth Tompkins, Simian Research Center, 6824 North 38 Drive, Phoenix, Arizona 85019.

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BABOONS REARED IN CAPTIVITY FOR SALE

Male and female baboons, born and raised in captivity, ranging in age from 4 months to 51 months, are for sale. Nine of these animals are from an inbred *Papio papio* colony.--Dr. Robt. L. Hummer, Southwest Foundation for Research & Education, P. O. Box 28147, San Antonio, Texas 78228.

ON THE PRONUNCIATION OF PRIMATE NAMES

Celia M. Millward

Department of English

Boston University

As someone who is both a professional linguist and a professional teacher of "correct" English, I find myself in the somewhat uncomfortable role of devil's advocate to both Riopelle and Fraga (1969) and Hill (1969). Riopelle and Fraga seem to feel that there is one and only one "correct" English and that all deviations from this one standard are reprehensible. Hill, on the other hand, recognizes the great diversity in the use of English, but seemingly finds all variations acceptable in all situations.

Much of their apparent disagreement would, I think, evaporate, if they would consider the fact that, not only are there great variations in English speech, but there are different kinds of variation. That is, all native speakers of English operate with a number of different types of dialects. Perhaps the most obvious kind of dialect is geographical--our speech is heavily conditioned by the speech of the community in which we grow up. Hill finds such geographical differences attractive, and, indeed, most Americans are happily quite tolerant of geographically-conditioned speech differences. Neither Hill nor Riopelle and Fraga seem to be aware that a list of suggested pronunciations such as that prepared by Riopelle and Fraga will not, no matter how assiduously one tries to follow it, eliminate geographical dialectal features. For example, the native Bostonian will see *marmoset*: *mär'mo̅s̆et* on the list, but he will still omit the [r] before the [m]. What is more, "r-ful" speakers will understand him, automatically recoding his speech to fit their own patterns. Further, the use of a Key to Pronunciation actually insures the continuation of geographical differences: Our Bostonian will see *hu̅mĕra̅li̅f'er*, look at the Key, see *makĕr* (which in his own speech, has no [r]), and then produce an r-less *humeralifer*.

A second type of dialect which all speakers have, willy-nilly, is an educational dialect. This dialect marks, not the area of our birth and upbringing, but rather the number of years of our schooling. Differences here involve not so much the pronunciation of individual sounds as the enunciation of these sounds, inflectional patterns, complexity of sentence structure, and size of vocabulary. Pronunciation of this vocabulary will play only a very minor role. I think that we can safely assume that the prospective users--or nonusers--of Riopelle and Fraga's list will form a fairly homogeneous population in this respect; I don't have to worry about how the mailman pronounces *Ptilocercinae* because he isn't going to use the word anyway.

A third type of dialect, or set of dialects, with which speakers

of English operate can be described as social dialects or social styles. We all speak differently in different social situations, using one style with our spouses, offspring, and intimate friends, another style with a small group of casual acquaintances, another style in a classroom lecture, and still another style when we read a paper before a scientific convention. Differences among these styles again involve pronunciation, sentence length and structure, use or nonuse of slang, and even presence or absence of gestures accompanying our speech. For example, many a person who does not hesitate to say "Oops" when he steps on his wife's foot will just as unhestitatingly say "I hope you will forgive me" when apologizing to an important colleague for forgetting his name. Both responses are good English in their respective social contexts and bad English out of these contexts.

A fourth type of dialect, not completely independent of educational and social dialects, is the occupational dialect. (If you are a member of the occupation, you call it technical terminology; if you are not, you call it jargon or gobbledygook or worse.) The chief characteristic of occupational dialects is their highly specialized and extensive vocabularies, vocabularies often unique to the profession and totally alien to outsiders. "The Pronunciation of Primate Names" is an attempt to codify the pronunciation of part of an occupational dialect. (There are also other kinds of dialects, such as those involving sex and age--What adult male can tell his hostess that he is having a "lovely" time or what person over 40 can describe something unpleasant as being "yuhky"? But these kinds of dialects have no direct bearing on the question here.)

In summary, I would disagree with Riopelle and Fraga in their assertion that there is *one* "good English"--there are many varieties of good English. It has been said that good English is English that does not attract attention to itself; fortunately most of us know how to select the English appropriate for the situation. For almost the same reason, I would disagree with Hill; I cannot say that English is English, but rather that English is a magnificent conglomeration of many Englishes, and that the mark of an effective user of the language is his ability to select the right variety at the right time.

Two other, more specific, comments about this question are in order. First, from a linguist's point of view, the pronunciation symbols used in the list are a horror. Note that, in the Key to Pronunciation, the underscored portions of silent, connect, circus, account, and sofa are represented as e͡, o͡, u͡, a͡, a͡, respectively. Yet all of these symbols stand for the same sound: [ə]. This is, of course, not Riopelle and Fraga's fault, but rather that of the dictionary from which they took these symbols. Still, such vagueness and redundancy make the Key confusing and difficult to use.

In reply to Hill's distress at the prescriptive function of the list, I should like to point out that many people *want* a guide to pronunciation. The most self-confident user of English occasionally has

recourse to a dictionary for assistance with an exotic word. While there may be no logic behind the existence of prestigious vs. sub-standard labels for pronunciation, like it or not, we all know that "incorrect" speech is a very real occupational and social handicap. Further, there are levels or degrees of "correct" pronunciation. Although r-dropping as a general geographically-based speech pattern may be quite acceptable, the idiosyncratic misplacement of stress on an individual item is not. It is, I assume, for the latter type of problem that such lists are devised. What is more, there is no denying the existence of accepted pronunciations (allowing for a certain number of variants) for most words. Communication would obviously fail if we all became too whimsical in our deviations from the accepted standards--indeed, what does "usage" mean but some sort of a consensus, a standard? Certainly English pronunciation should not be treated as a moral problem, but it is nevertheless a practical problem.

REFERENCES

Hill, C. A. Primate pygmalion. *Laboratory Primate Newsletter*, 1969, *8* [4], 5-6.

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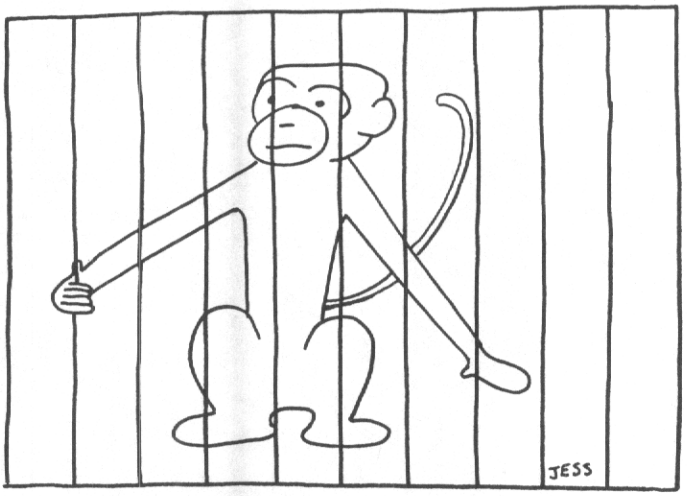

"FURTHERMORE, I WANT A LAWYER WHO UNDERSTANDS THE AMERICAN SIGN LANGUAGE FOR THE DEAF!"

REPORT ON ANOTHER CASE OF MELIOIDOSIS IN A MONKEY[1]

Melioidosis was recently diagnosed in a male rhesus monkey (*Macaca mulatta*) being used in psychological research at the National Institutes of Health (NIH)[2]. The monkey was received at NIH on October 1, 1968, in a shipment of 50 from India. His only overt illness occurred on October 7, when he had soft stools for which he received tetracycline, nitrofurazone, and a commercially-made oral feeding mixture. On December 2 he was issued to a psychology laboratory, where on December 18 he underwent a craniotomy with excision of parts of the cortical sensory areas. Sensory testing was started on January 15, 1969, but the monkey proved difficult to test and train.

In late April round scabs were noted at the surgical scar; by mid-May they appeared raised and were thought to be underlain by abcesses. On May 19 the lesions were distinctly suppurative, and at this time similar processes were noticed on the skin of the chest and leg. The superficial head and chest lesions were cultured. The former site yielded a mixed flora of *Staphylococcus aureus*, *Enterobacteriaceae*, and *Proteus sp.* with a few colonies that were later shown to be *Pseudomonas pseudomallei* (the organism causing Melioidosis), and the chest culture yielded predominantly *P. pseudomallei*.

The animal was sacrificed on May 28. Blood values at that time were hematocrit 32 percent, hemoglobin 9.1 g/ 100 ml, RBC 4,490,000, and WBC 24,850 with 84.5 percent neutrophils, 15 percent lymphocytes, and 0.5 percent monocytes. At necropsy a 2 cm raised, fluctuant, subcutaneous abscess was observed on the left dorsal aspect of the head, directly over the site of the previous frontoparietal craniotomy. The abscess contained thick pale yellow pus. A similar subcutaneous abscess was located on the left chest, approximately 1 cm lateral to the nipple, and was connected by a fistulous tract to a larger 3 by 4 cm abscess in the left axilla, apparently involving the axillary lymph nodes. Internally, multiple 0.5 to 1 cm abscesses were observed in the liver, spleen, pancreaticosplenic lymph nodes, and in the superior gastric nodes. One of the liver abscesses was contiguous with the wall of the gallbladder. Two 1 cm subpleural abscesses occurred in the dorsal aspect of the right apical lung lobe and lesions were found also in several mediastinal lymph nodes. The pus in the internal lesions was thin, dull white, and in some lesions appeared tinted pale green. Cultures taken from the head, chest, liver, and spleen yielded pure growth of *P. pseudomallei*, while culture of heart blood was negative. Identification of the organism was confirmed at the Walter Reed Army Institute of Research and at NCDC.

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[1]From *Morbidity and Mortality Weekly Report (MMWR)*, 1969, *18*, [32], 278-279.

[2]Melioidosis is a serious disease in humans.--Ed.

MMWR's Editorial Comment.--This report represents the fourth culture positive case of melioidosis in imported nonhuman primates reported this year. Melioidosis was previously diagnosed in two stump-tailed macaques (*MMWR*, 1969, *18* [19]; see also *Laboratory Primate Newsletter*, 1969, *8* [3], 21-22) and a chimpanzee. The first reported case had a history of a chronically discharging lesion present at the time of importation. The next two cases first showed signs of disease at the site of implanted foreign objects. The current case first showed signs of disease at the site of an old surgical wound. A serological survey currently in progress indicates that a significant number of monkeys from Southeast Asia have titers to *P. pseudomallei*.

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REPORT ON WORKSHOP: TECHNIQUES IN NONHUMAN PRIMATE REPRODUCTIVE PHYSIOLOGY

On Wednesday, September 10, 1969, at the Annual Meeting of the Society for the Study of Reproduction, a workshop on techniques in nonhuman primate reproductive physiology was held in Davis, California. This workshop was attended by approximately 60 primatologists and reproductionists interested in this particular area. The session was chaired by Dr. Lloyd Neurauter of the National Center for Primate Biology. There were four speakers. The first, Dr. Vicki Giles, Primate Center veterinarian at Davis, spoke on the breeding management of primates in captivity and discussed the various techniques that are used at the Primate Center. Following this, Dr. Ben Brackett of the University of Pennsylvania spoke on techniques employed in the induction of ovulation and in egg recovery from the rhesus monkey. He presented a short movie illustrating the techniques currently in use at the University of Pennsylvania. Dr. John Bennett of the Syntex Corporation then presented data relating to techniques used to recover sperm from the epididymis of nonhuman primates and by various electro-ejaculation techniques. He discussed the problems associated with the liquification of the seminal plug. Finally, Dr. Jimmy Niell of Emory University reported on unusual aspects of primate endocrinology particularly as it relates to radioimmunoassay and problems of cross reactions between human and nonhuman primate compounds. At the conclusion of each individual presentation discussion was obtained from the audience with regard to their own experiences in each of the given areas and a comparison of data. Future workshops in this area are being planned.--Dr. W. Richard Dukelow, Michigan State University.

BREEDING NOTES: TWIN *GALAGO DEMIDOVII* BORN IN CAPTIVITY*

Very few accounts exist of successful breeding of Demidoff's galago in captivity. Cansdale (*Journal of the Society for the Preservation of the Fauna of the Empire*, 1944, n.s. *50*, 7-12) was successful in Ghana, and recently Blackwell (*International Zoo Yearbook*, 1969, *9*, 74-76) reported on two pregnancies in England. On August 12, 1969, non-identical twins were born to one of two females we have been keeping in our home.

One of the three adult galagos we now have was collected by the authors in Nigeria in January 1967 and hand-raised from infancy. The others were purchased from dealers. The animals are kept in a wire mesh cage 105 cm square by 180 cm high which is furnished with several perches and branches, usually including several live branches. A nest box of wood with inside dimensions 12 cm by 15 cm by 5 cm high is located on a shelf high in the cage. A wide variety of foods is furnished daily. About half the solid food is cooked meat, cut into small pieces. Fruits, bread, and vegetables are also given, and milk or juice on alternate nights. Water is always available. Mealworms are a favored food and are given irregularly by hand.

The male has never shown any interest in the hand-raised female, but actively chased and examined the genitals of the other female beginning six months before a successful mating. Based on the 108 to 110 day gestation reported by Blackwell (1969), this must have occurred in late April. At this time we had had the male for eight months and the future mother for fifteen. In late May the pregnant female began building a nest of cloth and paper scraps in an empty nest box. Pregnancy was first evident in early July. Two days before the birth, it was noticed that the mother's genital region, normally hidden in fur, was visible and flushed.

When the male and the mother were first allowed together the evening after the birth, he seemed especially excited. He and the mother mutually groomed for 30 minutes while both were hanging from a perch, head down. This activity was more intense than any such seen previously, but no sign of a post-partum oestrous was observed. This activity has been repeated every night since the birth. Initially it seemed to interrupt maternal behavior, so the time the parents were allowed together was limited to two hours daily for the first week and the male was caged separately during cage hours (0100 to 1900) for the first fifteen days. On the 25th day after the birth one of these grooming bouts was seen to terminate in copulation.

The infants were first weighed about 40 hours after birth, at which time their weights were 11.3 and 12.0 grams. The mother at this

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*Supported in part by U.S. Public Health Service Grant GM 000 666.

time weighed 79 grams, compared to 102 grams eight hours before the birth. The infants have gained weight steadily, and weighed 17.1 and 18.2 grams at an age of one week. At 27 days, each weighed 34 grams.

The young galagos first left their nest box at age 13 days; by 27 days they were occasionally venturing outside the cage and were too active to be weighed easily on a triple-beam balance.--Albert S. Woodhull, Physiology-Psychology Program, Dept. of Psychology, and Ann M. Woodhull, Dept. of Physiology and Biophysics, University of Washington, Seattle, Washington 98115.

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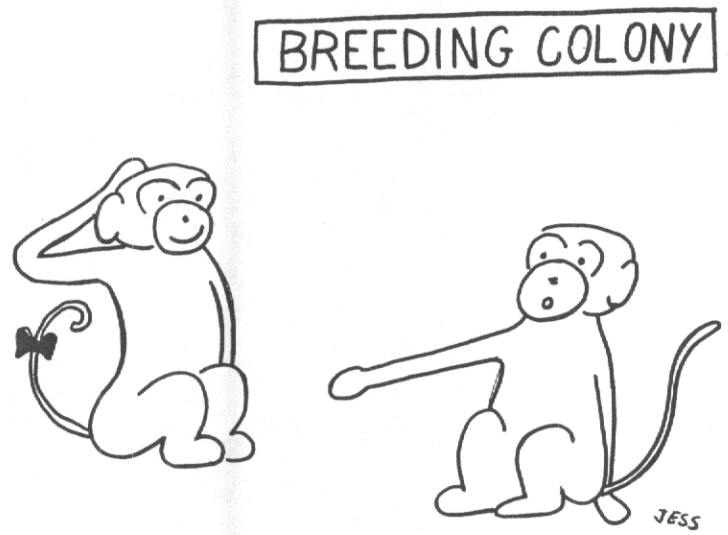

"WHAT'S A NICE GIRL LIKE YOU DOING IN A PLACE LIKE THIS?"

REQUEST FOR PRIMATE MATERIAL: SERUM FROM TUBERCULOUS NONHUMAN PRIMATES

Frozen serum from tuberculous nonhuman primates is requested for a fluorescent antibody study. If available, quantities up to 5 ml. from each animal would be greatly appreciated. All samples will be acknowledged and shipping costs will be refunded upon request.--Dr. John E. Martin, Department of Comparative Medicine, The Milton S. Hershey Medical Center, 500 University Drive, Hershey, Pennsylvania 17033.

CONTENTS OF VOLUMES 1-6 (1962-1967)

STATEMENT ON NEED TO PRESERVE PRIMATE SPECIES

The following statement was adopted by the participants at the Second Conference on Experimental Medicine and Surgery in Primates:

All species of nonhuman primates are potentially endangered, being threatened with depletion and extinction in the wild due to the activities of man. The disappearance of any such species is a loss to man, particularly since nonhuman primates are growing increasingly valuable for biomedical research.

Although the biomedical use of primates accounts for only a minority of the animals taken, we must use those animals with the greatest care and must participate in efforts to preserve the natural populations.

The participants in the Second Conference on Experimental Medicine and Surgery in Primates recommend that:

1. Programs for the breeding of primate animals in "user countries" are urgently needed and should be expanded immediately. Decisions regarding species to be bred should include consideration of (a) animals presently used in the greatest numbers, (b) animals which already face extinction, and (c) informed opinions about projected needs for the next 25 years.

2. More effective action must be taken to strengthen present efforts to conserve species in their natural habitats. International cooperation is essential since these animals are used extensively outside their countries of origin. The international biomedical research community offers its advice and cooperation and desires to be consulted by the various interested international agencies (International Union for Conservation of Nature, International Primatological Society, and two agencies of the United Nations, i.e., the Food and Agricultural Organization and the World Health Organization). In support of the conservation effort more factual information must be obtained about the ecology and distribution of primates in their natural habitats.

3. In order to reduce the loss of primates during trapping, holding, exportation, and importation the establishment of standards should be encouraged to safeguard the health of primate animals and to minimize transmission of disease. Progress toward licensure and inspection would be desirable. Research should be conducted to determine the patterns of utilization, the causes of losses and means for reducing wastage.

4. The rarity and expense of nonhuman primates makes it incumbent on all investigators to take special care in the judicious choice of species and maximum utilization of individual animals.

POSSIBLE AVAILABILITY OF PRIMATES FOR BREEDING

The National Cancer Institute may reduce production of newborn primates and thus may have no further use for some or all of the primates listed below. These primates, including many excellent breeders, may be donated to educational institutions or other government grantees or contractors if it can be shown that it is in the best interest of the government to do so. The minimum requirement is that the animals would be kept as breeders and the progeny used in a project or projects of interest to the National Cancer Institute or to the National Institutes of Health.

	Male	*Female*
Galago crassicaudatus panganiensis (Taveta, Kenya)		
Wild-caught (November 1962)	10	12
Captive-reared (August 1963-May 1969)	15	19
Callithrix jacchus (Recife, Brazil)		
Wild-caught (June 1964-May 1965)	2	
Captive-reared (January 1965)	1	
Saquinus mystax (Leticia, Colombia)		
Wild-caught (October-November 1968)	6	6
Saimiri sciureus (Leticia, Colombia)		
Wild-caught (March 1963-January 1967)	4	32
Captive-reared (October 1963-October 1968)	12	9
Saimiri sciureus (Georgetown, Guyana)		
Wild-caught (June-November 1967)	2	13
Saimiri sciureus (Iquitos, Peru)		
Wild-caught (February 1966)		1
Captive-reared (January-March 1964)	2	1
Cercopithecus pygerythrus callidus (Kitale, Kenya)		
Wild-caught (September 1962)	6	11
Captive-reared (January 1964-July 1969)	8	10
Cercopithecus (Miopithecus) talapoin talapoin (Bata, Rio Muni)		
Wild-caught (January-April 1968)	11	30
Captive-reared (December 1968-July 1969)	2	1

The above animals were all collected near the geographic localities indicated or were produced in captivity by parents so collected. Complete reproductive records have been maintained on all specimens and certain measures of growth and development recorded for all captive-reared specimens. Certain individuals of the *Saimiri sciureus* (Leticia, Colombia) group may be of particular interest due to a high incidence of fetal malformations observed and also to late gestational reproductive failure seemingly related to kidney pathology.

Application to receive any of these animals may be sent to Dr. Robert Cooper, Director, Primate Research Colony, Institute for Comparative Biology, Zoological Society of San Diego, P. O. Box 551, San Diego, California 92112. Please include a statement of the intended use and previous work in the same area.--Roy Kinard, National Cancer Institute, Bethesda, Maryland 20014.

* * *

INFORMATION RESOURCE ON ANIMAL MODELS AND GENETIC STOCKS

In response to requests from the Genetics Society of America and the National Advisory Research Resources Council, the Institute for Laboratory Animal Resources has established a Committee on Animal Models and Genetic Stocks. The group, which recently held its organizational meeting, will concentrate on providing information to interested parties. Anyone who has a question concerning an animal model of disease, or a genetic stock of animals, can write or call the Institute for Laboratory Animal Resources, 2101 Constitution Avenue, Washington, D. C. 20418, Area code (202) 961-1692. A staff officer has been appointed to handle inquiries promptly; he will provide information on the characteristics of the animal or animals involved, sources of supply, and pertinent literature citations. In the event that the information is not on hand, committee members will either supply it themselves or contact the appropriate people who are knowledgeable about the specific problem.

Another activity of the committee will be to publish selected references to animal models of disease and genetic stocks in the ILAR News, a quarterly publication of wide circulation. The first issue to contain this information will appear in January, 1970.

Scientists are invited to use the services of the Institute of Laboratory Animal Resources in support of their animal experimental activities; the committee is anxious to be of service and to enlarge the body of knowledge concerning its charge. Any suggestions on how the service can be of use will be welcomed.

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RHESUS BREEDING STOCK FOR SALE

Hazleton Laboratories, Inc., has available for sale a large number of *M. mulatta* breeders of various sizes, ages, and reproduction histories. Menstrual calendars and other pertinent breeding information are available. --Please contact: Dr. Dan Dalgard or Mr. Tom Johnson, Hazleton Laboratories, Inc., P. O. Box 30, Falls Church, Virginia 22046 (703-893-5400).

THE JAPAN MONKEY CENTRE ZOO

Most primatologists, when thinking of the famous Monkey Centre at Inuyama City, Japan, have the vision of a large colony of Japanese macaques and perhaps a modern laboratory. While there is indeed a large and brand new building which houses the scientific staff, and there is a good sized free-living colony of macaques, Japan Monkey Centre is best known within Japan as a zoological garden. The Monkey Centre itself has been open since October 1956, and the exhibit cages and outdoor runs for the animals seen here reflect this recent construction. There is a very large visitor orientation center, which explains to the public the world of primates, using modern visual aid techniques, combined with mounted specimens (many of which formerly lived in the Centre) and recorded calls of troops of various primates. In addition there is a lecture hall and library. Above the orientation center, on a series of terraces, are large exhibit cages offering both indoor viewing (through glass windows) and outdoor runs. There are, in addition, a series of large outdoor pens, with simple metal fencing, topped with electrified wire for gibbons, langurs and red monkeys. These have natural planting, and shelter for inclement weather. Besides the primates, the zoo exhibits flamingoes, pelicans, sika deer, red kangaroos, California sea lions, native waterfowl and pheasants, and other exotic species. In 1968 the visitor count to the zoo was 1,217,512, which indicates the zoo is popular with tourists to the area since Inuyama City has a population of only 40,000. Admission of 80 Yen for adults and 40 Yen for children is charged. There is no formal guide book, but postcard views of the various animals are on sale as well as the scientific publications of the Centre. There is also a small cafe on the grounds, which offers a good view of the city and the neighboring suburb of Gifu, as the zoo is located on one of several hills above the city. A monorail provides the means of transport from the city center, although a small road also can be used by those with automobiles.--Sfc Marvin L. Jones, AFEES-Oakland, 1515 Clay Street, Oakland, California 94612.

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REQUEST FOR PRIMATE MATERIAL: SKULLS OF YOUNG CHIMPANZEES

Ten dry, frozen, or otherwise preserved (complete or incomplete) skulls of young chimpanzees having deciduous or mixed dentitions, are requested for a comparative study of postnatal craniofacial bone growth and remodeling.--Dr. Herman S. Duterloo, Department of Orthodontics, Faculty of Medicine, University of Nymegen, Nymegen, The Netherlands.

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

BOOKS

Circadian rhythms in nonhuman primates. F. H. Rohles, Jr. (Ed.) Basel: Karger, 1969. (*Bibliotheca primatologica*, No. 9) ($7.90)

Chimpanzee: Central nervous system and behavior--A review. H. H. Reynolds (Ed.) Basel: Karger, 1969. (*Primates in medicine*. Vol. 4) ($9.35)

Experimental medicine and surgery in primates. E. I. Goldsmith and J. Moor-Jankowski (Consulting Eds.) *Annals of the New York Academy of Sciences*, 1969, *162* [Art. 1], 1-704. ($32.50)
Proceedings of the First Conference on Experimental Medicine and Surgery in Primates held September 27-30, 1967.

BOOKLETS, PAMPHLETS, CATALOGUES

The accreditation and recognition schemes for suppliers of laboratory animals. Carshalton, Surrey, England: Medical Research Council Laboratory Animals Centre, July 1969.

BIBLIOGRAPHIES

Bibliography of the studies on non-human primates in Japan: 1967. *Primates*, 1968, *9*, 419-422.
This bibliography is organized into the following sections: Ecology and Sociology, Morphology, and Laboratory Animal Medicine.

A bibliography of the Taiwan monkey (*Macaca cyclopis* Swinhoe, 1862). Pryor, W. H., Jr., & Raulston, G. L. (Vet. Med. Dept., US Nav. Med. Res. Unit No. 2, 7-1 Kung Yuan Lu, Taipei, Taiwan) *Primates*, 1969, *10*, 81-89.
This bibliography is organized into the following sections: Anatomy, Disease, Physiology, Miscellaneous.

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*In many cases, the original source of references in the following section has been the Current Primate References prepared by The Primate Information Center, Regional Primate Research Center, University of Washington. Because of this excellent source of references, the present section is devoted primarily to presentation of abstracts of articles of practical or of general interest. In most cases, abstracts are those of the authors.

DISEASE

Epidemiologic studies of latent virus infections in captive monkeys and baboons. I. Overall plans and virus isolations with special reference to SV40 and foamy viruses. Hsiung, G. D., Atoynatan, T., & Lee, C. W. (Dept. Epidemiol. & Public Hlth, Yale U. Sch. Med., New Haven, Conn. 06510) *American Journal of Epidemiology*, 1969, *89*, 464- .

Host parasite relationships of chimpanzee viruses. Coulston, F., & Soike, K. F. (Albany Medical College, Albany, N.Y.) Technical Report No. ARL-TR-69-9, 6571st Aeromed. Res. Lab., Holloman Air Force Base, New Mexico, 1969.

Throat and fecal specimens collected in four samplings from chimpanzees maintained in the colony of the 6571st Aeromedical Research Laboratory resulted in recovery of 79 viruses from 53 of 187 chimpanzees. Fecal specimens collected from chimpanzees recently imported from Africa resulted in recovery of one or more viruses from 30 to 39 chimpanzees. The viruses recovered from both groups of chimpanzees have been characterized to virus group. Homologous antibody response to the enteroviruses recovered in this study was observed to be poor or non-existent in the majority of chimpanzees. Six human laboratory personnel were found to possess low to moderate antibody levels against six of the chimpanzee enterovirus isolates. A higher incidence of viral infection of the colony maintained chimpanzee was observed in late summer based on results obtained in this study and in prior studies of this series. Oral administration of two chimpanzee enteroviruses to rhesus monkeys was followed by fecal excretion of the viruses for 8 to 10 days without evidence of clinical illness or immunologic response.

Hypervitaminosis D in New World monkeys. Hunt, R. D., Garcia, F. G., & Hegsted, D. M. (Comparative Pathology, New England Reg. Primate Res. Cen., Southboro, Mass. 01772) *The American Journal of Clinical Nutrition*, 1969, *22*, 358-366.

Hypervitaminosis D was produced in squirrel monkeys *(Saimiri sciureus)* and cebus monkeys *(Cebus albifrons)* by daily oral administration of 50,000-100,000 IU vitamin D_3/day. Similar doses of vitamin D_2 did not induce detectable toxicity. The syndrome in the squirrel monkey was characterized by hypercalcemia, hyperphosphatemia, uremia, and death in the absence of significant metastatic calcification or microscopic renal lesions. The cebus monkeys developed widespread metastatic calcification similar to that reported in other species. Lesions of bone were not seen in either species. These data further support the difference in activities between vitamins D_2 and D_3 in New World primates and also suggest

that the lesions of vitamin D toxicity may vary with dose and duration of illness. The data also indicate that renal failure in this syndrome need not be related to nephrocalcinosis but may represent a direct effect of vitamin D on renal function.

Pathogenesis and immunity in hookworm infection. Miller, T. A. (Wellcome Labs. Exp. Parasit., University Glasgow Veterinary Hosp., Bearsden, Scotland) *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 1968, *62*, 473-489.

This review paper also includes a considerable amount of new experimental data generated during the development of an X-irradiated vaccine for canine hookworm disease. The results which are particularly germaine to the study of laboratory primates relate to some preliminary experiments designed to apply the concept of vaccination to a primate-human hookworm system. Of various African species of laboratory primate, only chimpanzees (*Pan* sp.) were satisfactory hosts for the hookworms of man *(Ancylostoma duodenale)*. Infection with third-stage larvae was highly successful and induced severe acute anemia which was fatal to 3 of 4 infant chimpanzees in 38-39 days. The circulating erythrocytes of 2 of the chimpanzees were labelled with radioactive sodium ^{51}chromate and clearances of isotope in their feces were calculated as ml of blood lost. These measurements confirmed the hemorrhagic origin of the anemia. In addition, blood and narrow smears indicated that an apparent failure of erythropoietic response, associated with severe iron deficiency, had contributed to the severity of the anemia and to the precipitous course of the disease.

Salivary gland inclusion disease in the tarsier. Smith, A. A., & McNulty, W. P., Jr. (Dept. Cutaneous Biol., Oregon Reg. Primate Res. Cen., Beaverton, Oregon 97005) *Laboratory Animal Care*, 1969, *19*, 479-481.

Cells showing the morphological and histochemical properties of infection by salivary gland inclusion disease were found in the salivary glands of tarsiers dying in captivity. The authors suggest that this was not the cause of death since no evidence of disseminated visceral infection was found.

Thrush in a rhesus monkey: report of a case. Kaufmann, A. F., & Quist, K. D. (Epidemiology, Nat. Communicable Dis. Cen., Atlanta, Ga. 30333) *Laboratory Animal Care*, 1969, *19*, 526-527.

A case of thrush was observed in a 3-pound (1.4 kg) male rhesus monkey *(Macaca mulatta)*. The illness was characterized by progressive inanition, anorexia and diarrhea over a 2-month period. At necropsy, a rough, yellow adherent pseudomembrane which was histologically consistent with thrush lined the entire esophagus. *Candida albicans* was present in both mycelial (pseudomycelial) and yeast phases.

PHYSIOLOGY AND BEHAVIOR

Hematology of the night monkey, *Aotus trivirgatus*. Porter, J. A. Jr. (Veterans Administration, Edward Hines, Jr. Hosp., RILAMSAT, Bldg. 189a, Hines, Ill. 60141) *Laboratory Animal Care*, 1969, *19*, 470-472.

Hematological determinations for night monkeys, *Aotus trivirgatus*, are reported distributed by sex and by time of collection of blood samples. Collection times are distributed into 3 different groups; time of arrival at laboratory (shortly after capture); maintenance in the laboratory in 1967, primarily on a non-commercial diet; maintenance in the laboratory in 1968 on a commercial diet supplemented by fruits. Both females and males show significant increases ($p < 0.01$) in leukocytes for 1967 and 1968, respectively, in comparison to those for arrival at the laboratory. The respective values for females are 14.8 and 15.3 $\times 10^3$ per cmm, in comparison to 8.6 $\times 10^3$ per cmm; and for males 13.9 and 15.6 $\times 10^3$ per cmm, in comparison to 9.4 $\times 10^3$ per cmm.

Some observations on the prosimian *Perodicticus potto*. Cowgill, Ursula M. (Dept. Biology, U. Pittsburgh, Pittsburgh, Pa. 15213) *Folia Primatologica*, 1969, *11*, 144-150.

Living conditions of three *P. potto* are described. It appears that the one adult female arrived as a juvenile and apparently exhibited some pseudo-oestral behavior prior to what is believed to be her first conception. The behavior of the two males and one female toward two live births is discussed. It appears that the behavior of these pottos toward each other as well as their young is much more social than the literature would lead one to believe. It is suggested that the gestation period is 6-1/2 mo. or less. A hypothesis is put forward that the major use of the cervical spines is to smooth down the rough edges of the inside of tree trunks where they live in this laboratory as well as in the wild.

FACILITIES, CARE, AND BREEDING

Building design in relation to function of a laboratory primate unit. Coid, C. R. (Clinical Res. Cen. Labs, Nat. Inst. Med. Res., Mill Hill, London, N.W.7, England) *Laboratory Animal Symposium*, 1968, *1*, 113-118.

A brief review of some of the principles of design of facilities for laboratory primates.

An occurrence of monozygotic twinning and anencephaly in *Macaca arctoides*. Christie, R. J. (Lab. Exp. Behav., U. Mississippi Med. Cen., Jackson, Miss. 39216) *Laboratory Animal Care*, 1969, *19*, 531-532.

This report describes the birth of monozygotic twins with one anencephalic infant, occurring among 22 births observed in *Macaca arctoides* from July, 1967 to February, 1969.

INSTRUMENTS AND TECHNIQUES

A monkey chair for temporary restraint with minimal human contact. Sledjeski, M. (Dept. Psychol., U. California, Berkeley, Calif. 94721) *Physiology and Behavior*, 1969, *4*, 273-276.

The apparatus combines the general features of earlier chair designs with the advantage of not requiring direct handling of the monkey. The restraining procedure is rapid and subjects suffer little stress or discomfort.

TAXONOMY

Evolutionary systematics of the chimpanzee: immunodiffusion computer approach. Goodman, M., et al. (Wayne State Univ. Sch. Med., Detroit, Mich.) Technical Report No. ARL-TR-69-10, 6571st Aeromed. Res. Lab., Holloman Air Force Base, New Mexico, 1969.

An immunodiffusion computer approach to systematics, based on a set theoretical interpretation of species comparisons in modified Ouchterlony plates, was used to process the data of over 4300 such comparisons obtained with 148 antisera to proteins of various hominoid species. The resultant species placement tables demonstrate that the chimpanzee *(Pan troglodytes)* barely diverges from the pigmy chimpanzee *(Pan panicus)*, slightly diverges from man and gorilla, and shows increasingly more marked divergence from orangutan, gibbons, cercopithecoids, and ceboids. The method for constructing phylogenetic trees from these species placement tables was described and applied to the data. In the Hominoidea the most distant common ancestor separates the gibbon branch from the remaining hominoids, while the next most distant common ancestor separates the orangutan from man, chimpanzee, and gorilla. Chimpanzee and man may have the most recent common ancestor, but it is just as probable that gorilla and chimpanzee or that man and gorilla have the most recent common ancestor. On assuming proportionality between antigenic divergence and time of ancestral branching and on arbitrarily taking the cercopithecoid-hominoid separation as 30 million years, the chimpanzee-man-gorilla separations were dated at about 6 million years, the orangutan at 14 million years, and the gibbon at about 19 million years.

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