Minnesota State Zoological Board. Zoo-Related Organizations Files.

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ISIS

International Species Inventory System

Minnesota Zoological Garden
207 Veterans Service Building
Columbus Circle
Saint Paul, Minnesota 55155
Telephone 612 296-2426

October 25, 1974

TO: Board of Directors and Members of the AAZV

This letter and the attached material are a report to you of the current status of the ISIS program and the development of the physiological norms program. You will note from the status report that 165 organizations are now signed participants in the ISIS program. This means that standardization of zoo records in North America is well underway. It further means that a concerted effort is being made to uniquely identify each and every captive animal in zoo collections. Thus, the necessary mechanism for rational collection of clinical and laboratory data has been established. We are now in a position to complete the development of the physiological norms program and put it on a Minnesota Zoological Garden based computer. The costs for accomplishing this are outlined on the accompanying cost spread sheet. The ISIS program for census and vital statistics has been provided funds by the AAZPA in the form of a $10,000 direct grant and the adoption of a user fee concept. This means that the program has the basis for a continuing operating budget and will not be dependent upon grants after this year. The forms to be used by the ISIS system are going to be adopted as a standard data form by the zoos for their core animal record system. Also, we are beginning development of the birds program and hope to have this inventory begin in 1975. A life history data format is also being explored by the AAZPA.

The physiological norms program also needs to develop a standardized data recording form for laboratory data. There is included with this letter a draft form for your consideration. I would request that you make any suggestions concerning this format in writing and send them to us as soon as possible. We would propose providing the forms in duplicate. The first copy would be lightweight paper to be sent to us for placement of the data into the computer system. The second copy would be on a stiffer paper suitable for permanent placement in your files. This is the approach we have been requested to use for each of the data forms we develop to eliminate duplication of effort. Once the content of this form is agreed upon, we would produce copies and send them to all participating zoo veterinarians. We would request that at that time they begin a systematic process of data reporting. The

design format is simple enough to allow clerical help to complete the form. The development of this form and completion of the systems analysis for computer programing will require about $18,700, as outlined on the enclosed cost spread sheet. We would like to request $5,000 from the AAZV towards these start-up costs for the norms program. Additional funds are being sought through other sources as well.

Two additional areas of data collection need to be considered. The first is the development of forms for common use and central data recording on autopsy and other laboratory data such as parasites and bacteriology. The other area concerns systematic collection of blood data. We have now completed detailed analyses covering three years of data collection on three wild species. Each of these species exhibits seasonal rhythms of many important blood parameters. They also show important sex differences. This means that haphazard, random collection of data from individual species will not readily provide valid norms. It is our recommendation that a deliberate effort to systematically collect blood specimens be made. Specifically, we would suggest that 10-12 species be chosen on the basis of availability, need, and willingness to cooperate of individual veterinarians and zoos. Blood samples from up to 20 animals of each species evenly divided between males and females should be collected on a monthly basis for one year. The blood samples would be sent to us for analysis. Where local laboratories are available, a portion of the sample should be sent to them. This will allow evaluation of interlaboratory variation. This project could begin immediately. We have already begun such a program with lions and plan to begin one shortly with Bactrian camels. If such arrangements can be made, we can provide the necessary blood collecting equipment and shipping containers.

We would like to offer our profound thanks to the many of you who have worked so hard and shared your time and thoughts with us in the effort to make these programs a functioning reality.

U. S. SEAL, Ph.D.

Atts.

jm

ISIS - Physiological Norms

The long term maintenance of animals within zoo populations depends, to a large degree, on competent medical care. This medical care requires physiological norms from each type of animal for reference during the diagnostic procedures. The SEAMAK physiological norms system uncovered two major problems in the collection of these type of data. The first was the proper identification of a specimen within each zoo. The second was the recording of the age of a specimen. These two problems have been solved by the vital statistics portion of ISIS.

The collection of physiological norms by ISIS will be done over the full range of animals displayed in zoos. These data will provide two types of reports for the individual zoo to aid in the maintenance of these animals.

Institution Physiological Records

This report will contain all physiological data records of each animal in a zoo. The report will be arranged in a taxonomic hierarchy, as the ISIS Inventory Report, and will contain vital statistics about the specimen necessary for its maintenance.

Physiological Norms Summary

This report will be produced from all physiological data records collected from all institutions. The report will have the capability of selecting data for summarization on up to four parameters. These are form (species), sex, age, and month of the data collection. Each of these data sets will be summarized by the mean, standard deviation and standard error for each laboratory test being recorded by the system.

The SEAMAK system presently contains approximately 7,500 physiological data records representing more than 200,000 laboratory tests. These data will be converted from their present computerized format to a format which will be compatible with the ISIS - Physiological Norms format, thus contributing significantly to the data base.

PHYSIOLOGICAL NORMS PROGRAM - ISIS
START UP COSTS

Cost Estimates

Edit/Input Subsystem	
Systems Analysis	$1,750
Programming	1,800
Computer Time	350
Subtotal	$4,100
Institution Reports	
Systems Analysis	$ 350
Programming	300
Computer Time	175
Subtotal	$ 825
Physiological Norms Summary	
Systems Analysis	$ 700
Programming	900
Computer Time	200
Subtotal	$1,800
Data Recording Form	
Design	$ 250
Printing	1,000
Subtotal	$1,250
Keypunch	600
Keypuncher	3,000
Cards	125
Subtotal	$3,725
SEAMAK Data Conversion	
Systems Analysis	$ 560
Programming	1,440
Data coding, editing and entry	5,000
Subtotal	$7,000

Total Physiological Norms Development - $18,700

COMMON NAME _____ INSTITUTION _____ DATE _____

SCIENTIFIC NAME _____ RECORDED BY _____

(1) TAXONOMIC CODE	(2) INSTITUTION CODE	(3) SPECIMEN ID	(4) TRANSACTION DATE

HEMATOLOGY

Hemoglobin	_____	g %
RBC	_____	$10^6/mm^3$
Hematocrit	_____	%
MCV	_____	μ^3
MCHC	_____	Vol. %
WBC	_____	$10^3/mm^3$

DIFFERENTIAL

Segments	_____	$10^3/mm^3$
Bands	_____	$10^3/mm^3$
Lymphocytes	_____	$10^3/mm^3$
Monocytes	_____	$/mm^3$
Eosinophils	_____	$/mm^3$
Basophils	_____	$/mm^3$
Reticulocytes	_____	% RBC
Sed. Rate	_____	mm/hr

BLOOD CHEMISTRY

Cholesterol	_____	mg %
Calcium	_____	mg %
Phosphorous	_____	mg %
Total Bilirubin	_____	mg %
Uric Acid	_____	mg %
BUN	_____	mg %
Creatinine	_____	mg %
Glucose	_____	mg %
Sodium	_____	mEq/l
Potassium	_____	mEq/l
Chloride	_____	mEq/l
CO_2	_____	mEq/l
LDH	_____	I.U.
Alk. P'tase	_____	I.U.
SGOT	_____	I.U.
CPK	_____	I.U.
SGOT	_____	I.U.
Thyroxine	_____	µg %
Cortisol	_____	µg %
Testosterone	_____	ng %

Total Protein	_____	g %
Albumin	_____	g %
Fibrinogen	_____	mg %

URINALYSIS

Color	_____	
Specific Gravity	_____	
pH	_____	
Glucose	_____	
Protein	_____	
Ketone Bodies	_____	
Casts	_____	/LPF
RBC	_____	/HPF
WBC	_____	/HPF
Bacteria	_____	/HPF
Epithelial Cells	_____	/HPF

ISIS PHYSIOLOGICAL NORMS

INTERNATIONAL SPECIES INVENTORY SYSTEM

ISIS

CURRENT STATUS SUMMERY

The census, inventory, and vital statistics projects proposed to the American Association of Zoological Parks and Aquariums (AAZPA) at its October 1973 meeting in Houston, Texas was adopted by their board and membership. Initial support of $2,500 was approved. Since then a grant of $10,000 has been made by the Sams Foundation to the project through the AAZPA. An additional $1,000 has been received from the AAZV, two grants totaling $8,500 from the William V. Frankel Foundation, and $10,000 from the Bureau of Sports Fisheries and Wildlife, Office of Endangered Species. This funding combined with facilities available at the Minnesota Zoological Garden and the development effort being made by us (Seal and Makey) plus the strong encouragement offered by the immediate willingness of so many zoos to participate will insure that the initial development of the program is accomplished. The AAZPA membership, at its September - October 1974 convention in Philadelphia voted: (1) to provide $10,000 in support of ISIS for the current year, beginning October 1, 1974, (2) that participant users provide annual operational support at the rate of $1 / mammal / year based on their last December 31st inventory, and (3) the latter will be voluntary for the current year and will be obligatory at the start of each budget year after June 30, 1975. However, it is essential that additional funding be obtained to meet the costs detailed in the budgets if the program is to include birds, reptiles, amphibians, and fish, life histories, and physiological norms data.

The current status of the program development (October 11, 1974) is as follows:

(1) Mrs. Linda Murtfeldt is employed as system manager. She is the person who will be the point of contact with the program for the participating zoos. The telephone is (612) 296-2426 and the address is Minnesota Zoological Garden, Veterans Service Building, Columbus Circle, St. Paul, Minnesota 55155. She will be in contact with each of the participating organizations by letter and phone as the program progresses and data sheets are returned.

(2) Mammal taxonomy codes. These have been completed to the subspecies level for Primates, Artiodactyla, Perissodactyla, Cetacea, Carnivora, and Pinnipedia. The remaining orders are completed to the species level. The information for each taxon includes scientific name, a vernacular name, and approximate distribution. The primary reference source for organization of orders, families, and genera is Anderson and Jones (editors), Recent Mammals of the World, The Ronald Press Co., New York, 1967. The taxonomic literature from 1966 to date has been consulted for the revisions made. This literature plus regional and country check lists have been utilized for the assembly of the species listings. Documentation has been prepared and is included with final compilation of the code.

(3) Geographic codes. Our previous code (SEAMAK) has proven inadequate and has been completely scrapped. Two new systems are being incorporated. The first uses latitude and longitude expressed in degrees and minutes for location of specimens captured at accurately determined localities. The second is a hierarchical code based on the Library of Congress Map Classification System. It proceeds from region to subregion to country to state (province or department, etc.) and then provides 999 slots within this level. These include positions for zoos, aquariums, museums, individuals, dealers, special collections, etc. Code numbers have been assigned to the "state" level for nearly all countries in the world. Code numbers have been assigned to all zoos, exhibitors, and museums known to us in North America and in other parts of the world as well. This has been further checked for completeness by correspondence with zoo and museum people in each of the states in North America and selected countries.

ISIS Current Status Summary (October 11, 1974)

(4) Data sheet. This has been revised in relation to the revisions of the several codes and is now in the process of further revision to improve its usability. It has incorporated the suggestions made by about a dozen knowledgeable professionals who reviewed the material in detail and provided written comments. Special attention has been given to handling births and associated deaths, hybrids, accurate source locality information, individual animal identification, and accuracy of species (and subspecies) identification. A manual of instructions for use of the data sheets has been completed.

(5) Data sheet codes for acquisition and disposal. These have been built upon the codes developed by the Tulsa, Oklahoma zoo under the supervision of Dave Zucconi, and used by them for several years. They have been expanded to include additional birth information and autopsy information where available.

(6) Systems analysis has progressed to the point that we are in the final stages of programming. Programming is being done in relation to the IBM 371-155 computer system which will be used. The schedule for completion of the next phases is such that we will be able to return complete inventories to all participating zoos and aquariums (upon completion of data recording) by early 1975.

(7) Participation. We have received signed agreements to participate from 165 organizations in the United States and Canada and anticipate that nearly complete coverage will be achieved.

(8) Trial run. In order to test the materials for consistency, clarity, usability, and oversights, we sent draft copies and data forms to nine zoos who agreed to assist. Their evaluations and comments have been used in preparing final changes needed prior to printing of the manuals and forms. These data also serve to test the computer programs and they will provide the initial partial inventories for these zoos.

(9) Further developments planned include:

(a) Birds - A first draft species code has been completed but needs careful review and revision. This will need special additional funding.

(b) Reptiles and Amphibians - A species code is about 70% complete.

(c) Fish - A code to the genus level has been prepared in first draft.

(10) Related developments. A careful check has been made to identify any systems available or being developed covering similar or related topics in order to share mutual experience, develop compatibility, and minimize duplication of effort. U.S. Seal attended the Association of Systematics Collections meeting in Lubbock, Texas May 1974 which provided contact with other groups in the country interested in similar problems. The ISIS program is not redundant.

Dr. U.S. Seal will be making presentations on ISIS at the AAZV convention in Atlanta in November and at the Philadelphia Centennial celebration.

In summary, the program has a permanent home, is being actively supported by zoos and exhibitors in this country, and is entering the stage of test runs.

U.S. Seal, Ph.D.
Dale G. Makey
Linda E. Murtfeldt

New Inventory Data

ISIS

Institution _____ Date _____

Scientific Name _____

Common Name _____ Recorded By _____

I. Common Data

CC 1: A 1

CC 4: (1) TAXONOMIC CODE

CC 20: (2) INSTITUTION CODE

CC 29: (3) SPECIMEN ID

CC 35: (4) TRANSACTION DATE

II. Birth Data

CC 41: A A

CC 43: (5) SEX

CC 44: (6) HYB

CC 45: (7) DAM ID

CC 51: (8) SIRE ID

III. Vital Statistics Data

CC 41: A

(9) CODE

CC 43: (5) SEX

CC 44: (6) HYB

CC 45: (10) B

CC 46: (11) LOCATION

CC 57: (12) HT / DEPTH

CC 62: (13) AGE

IV. Transaction Data

CC 41: (9) CODE

CC 43: (14) VENDOR / RECIPIENT CODE

CC 52: (15) V / R SPEC. ID

CC 58: $ (16) PRICE

CC 64: $ (17) DELIVERY

V. Death Data

CC 41: B A

CC 43: (18) CAUSE OF DEATH

CC 44: (19) CARCASS DISPOSITION

CC 45: (20) AUTOPSY

CC 47: (21) CARCASS RECIPIENT

VI. Special Data

CC 41 / CC 43

S	A	STUDBOOK SPECIMEN
S	B	MARINE MAMMAL PERMIT
S	C	POSTENTRY QUARANTINE
S	D	ENDANGERED SPECIES PERMIT
S	E	NOXIOUS ANIMAL PERMIT
S	F	TAG / TATTOO NUMBER

(22) SPECIAL NUMBER

Comment

MAMMALIA/MAMMALS/
CHIROPTERA//
PTEROPODIDAE/FRUIT-EATING BATS/
PTEROPUS/FLYING FOX/
PTEROPUS NEOHIBERNICUS/FLYING FOX/ 05-001-024-030-001

1204 SPECIMEN-ID 05/08/71 OTHER SOURCE AGE: 5YR12MO SEX: MALE HYBRID: NO
WILD BORN LOC: 45
05/08/71 PURCHASED FROM: 310510350 FRANK M THOMPSON & ASS, INC. (EJ)/BRAD
OTHER ID UNKN. ACQ COST: . DELIV COST: .

1205 SPECIMEN-ID 05/08/71 OTHER SOURCE AGE: 5YR12MO SEX: MALE HYBRID: NO
WILD BORN LOC: 45
05/08/71 PURCHASED FROM: 310510350 FRANK M THOMPSON & ASS, INC. (EJ)/BRAD
OTHER ID UNKN. ACQ COST: . DELIV COST: .

1475 SPECIMEN-ID 17/04/73 OTHER SOURCE AGE: 11YR12MO SEX: FEMALE HYBRID: NO
WILD BORN LOC: 45
17/04/73 DONATION FROM: 310509902 FOREIGN ENDANGERED SPECIES (USDI)/WASHI
OTHER ID UNKN. DELIVERY COST: .

1700 SPECIMEN-ID 17/04/73 OTHER SOURCE AGE: 11YR12MO SEX: FEMALE HYBRID: NO
WILD BORN LOC: 45
17/04/73 DONATION FROM: 310509902 FOREIGN ENDANGERED SPECIES (USDI)/WASHI
OTHER ID UNKN. DELIVERY COST: .

SUMMARY: PTEROPUS NEOHIBERNICUS/FLYING FOX/
4 SPECIMEN; 2 FEMALE, 2 MALE, C.FEMALE, C.MALE, ABNL, UNK, STUBK, POST-E Q.
LONGEVITY: 1YR 2YR 3YR 4YR 2 5YR 10YR 2 15YR 20YR GREATER THAN 20Y.

SUMMARY: PTEROPUS/FLYING FOX/
4 SPECIMEN; 2 FEMALE, 2 MALE, C.FEMALE, C.MALE, ABNL, UNK, STUBK, POST-E Q.
LONGEVITY: 1YR 2YR 3YR 4YR 2 5YR 10YR 2 15YR 20YR GREATER THAN 20Y.

SUMMARY: PTEROPODIDAE/FRUIT-EATING BATS/
4 SPECIMEN; 2 FEMALE, 2 MALE, C.FEMALE, C.MALE, ABNL, UNK, STUBK, POST-E Q.
LONGEVITY: 1YR 2YR 3YR 4YR 2 5YR 10YR 2 15YR 20YR GREATER THAN 20Y.

SUMMARY: CHIROPTERA//
4 SPECIMEN; 2 FEMALE, 2 MALE, C.FEMALE, C.MALE, ABNL, UNK, STUBK, POST-E Q.
LONGEVITY: 1YR 2YR 3YR 4YR 2 5YR 10YR 2 15YR 20YR GREATER THAN 20Y.

PRIMATES//
LEMURIDAE/LEMURS-MADAGASCAR/
LEMUR/LEMUR/
LEMUR CATTA(OSSP)/RING-TAILED LEMUR/ 06-001-002-001-001

370 SPECIMEN-ID 30/03/67 CAPTIVE BORN AGE: 7YR 9MO SEX: FEMALE HYBRID: NO
DAM: 209 SIRE: 208

479 SPECIMEN-ID 26/03/68 CAPTIVE BORN AGE: 6YR 9MO SEX: MALE HYBRID: NO
DAM: 253 SIRE: 252

SUMMARY: LEMUR CATTA(OSSP)/RING-TAILED LEMUR/
2 SPECIMEN; 1 FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, UNK, STUBK, POST-E Q.
LONGEVITY: 1YR 2YR 3YR 4YR 5YR 2 10YR 15YR 20YR GREATER THAN 20Y.

MAMMALIA/MAMMALS/

SUMMARY: LONTRA CANADENSIS(7SSP)/NORTH AMERICAN OTTER/
4 SPECIMEN; 2 FEMALE, 2 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E Q.
LONGEVITY: 1YR 3 2YR 3YR 4YR 5YR 1 10YR 15YR 20YR GREATER THAN 20Y.

SUMMARY: LONTRA/AMERICAN OTTER/
4 SPECIMEN; 2 FEMALE, 2 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E Q.
LONGEVITY: 1YR 3 2YR 3YR 4YR 5YR 1 10YR 15YR 20YR GREATER THAN 20Y.

SUMMARY: MUSTELIDAE/WEASELS & OTTERS/
5 SPECIMEN; 2 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E Q.
LONGEVITY: 1YR 3 2YR 1 3YR 4YR 5YR 1 10YR 15YR 20YR GREATER THAN 20Y.

FELIDAE/CATS/
FELIS/CAT/
FELIS (PUMA) CONCOLOR(2SSP)/PUMA/
FELIS (PUMA) CONCOLOR(2SSP)/PUMA/ 12-007-001-009-001
1006 SPECIMEN-ID 30/03/71 OTHER SOURCE AGE: 9YR12MO SEX: FEMALE HYBRID: NO
INSTIT BORN LOC: 310511002
30/03/71 PURCHASED FROM: 310523350 INTERNATIONAL ANIMAL EXCHANGE (MI)/FER
OTHER ID UNKN. ACQ COST: $500. DELIV COST: .
1202 SPECIMEN-ID 28/08/71 CAPTIVE BORN AGE: 3YR 4MO SEX: FEMALE HYBRID: NO
DAM: 1006 SIRE: 687
1987 SPECIMEN-ID 14/06/74 CAPTIVE BORN AGE: YR 7MO SEX: UNKNOWN HYBRID: NO
DAM: UNKN. SIRE: 687
687 SPECIMEN-ID 07/08/69 OTHER SOURCE AGE: 8YR12MO SEX: MALE HYBRID: NO
UNKNOWN LOC: UNKNOWN.
07/08/69 DONATION FROM: UNKNOWN
OTHER ID UNKN. DELIVERY COST: .

SUMMARY: FELIS (PUMA) CONCOLOR(2SSP)/PUMA/
4 SPECIMEN; 2 FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, 1 UNK, STDBK, 1 POST-E Q.
LONGEVITY: 1YR 2YR 1 3YR 4YR 5YR 2 10YR 15YR 20YR GREATER THAN 20Y.

SUMMARY: FELIS (PUMA) CONCOLOR(2SSP)/PUMA/
4 SPECIMEN; 2 FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, 1 UNK, STDBK, 1 POST-E Q.
LONGEVITY: 1YR 2YR 1 3YR 4YR 5YR 2 10YR 15YR 20YR GREATER THAN 20Y.

SUMMARY: FELIS/CAT/
4 SPECIMEN; 2 FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, 1 UNK, STDBK, 1 POST-E Q.
LONGEVITY: 1YR 2YR 1 3YR 4YR 5YR 2 10YR 15YR 20YR GREATER THAN 20Y.

PANTHERA/LION, LEOPARD, JAGUAR, TIGER/
PANTHERA LEO(11SSP)/LION/
PANTHERA LEO(11SSP)/LION/ 12-007-002-001-001
1740 SPECIMEN-ID 17/06/73 CAPTIVE BORN AGE: 1YR 6MO SEX: MALE HYBRID: NO
DAM: 551 SIRE: 743
1741 SPECIMEN-ID 17/06/73 CAPTIVE BORN AGE: 1YR 6MO SEX: MALE HYBRID: NO
DAM: 551 SIRE: 743
1742 SPECIMEN-ID 17/06/73 CAPTIVE BORN AGE: 1YR 6MO SEX: FEMALE HYBRID: NO
DAM: 551 SIRE: 743

MAMMALIA/MAMMALS/

551 SPECIMEN-ID 01/08/68 OTHER SOURCE AGE: 63YR12MO SEX: FEMALE HYBRID: NO
INSTIT BORN LOC: 310537005
01/08/68 DONATION FROM: 310528002 LINCOLN MUNICIPAL ZOO (NA)/LINCOLN/NEBR
OTHER ID UNKN. DELIVERY COST: .
552 SPECIMEN-ID 01/08/68 OTHER SOURCE AGE: 63YR12MO SEX: FEMALE HYBRID: NO
INSTIT BORN LOC: 310537005
01/08/68 DONATION FROM: 310528002 LINCOLN MUNICIPAL ZOO (NA)/LINCOLN/NEBR
OTHER ID UNKN. DELIVERY COST: .
743 SPECIMEN-ID 15/10/69 OTHER SOURCE AGE: 15YR12MO SEX: MALE HYBRID: NO
UNKNOWN LOC: UNKNOWN.
15/10/69 PURCHASED FROM: 310523350 INTERNATIONAL ANIMAL EXCHANGE (MT)/FER
OTHER ID UNKN. ACQ COST: . DELIV COST: .

SUMMARY: PANTHERA LEO(11SSP)/LION/
6 SPECIMEN; 3 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E Q.
LONGEVITY: 3 1YR 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR 2 GREATER THAN 20Y.

SUMMARY: PANTHERA LEO(11SSP)/LION/
6 SPECIMEN; 3 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E Q.
LONGEVITY: 3 1YR 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR 2 GREATER THAN 20Y.

PANTHERA ONCA(8SSP)/JAGUAR/
PANTHERA ONCA(8SSP)/JAGUAR/ 12-007-002-003-001
132 SPECIMEN-ID 17/03/66 OTHER SOURCE AGE: 4YR 3MO SEX: FEMALE HYBRID: NO
INSTIT BORN LOC: 310545002
17/03/66 PURCHASED FROM: 310523350 INTERNATIONAL ANIMAL EXCHANGE (MT)/FER
OTHER ID UNKN. ACQ COST: . DELIV COST: .
1868 SPECIMEN-ID 09/12/73 CAPTIVE BORN AGE: 1YR 1MO SEX: MALE HYBRID: NO
DAM: 132 SIRE: 131
1988 SPECIMEN-ID 15/06/74 CAPTIVE BORN AGE: YR 7MO SEX: UNKNOWN HYBRID: NO
DAM: 132 SIRE: 131
1989 SPECIMEN-ID 15/06/74 CAPTIVE BORN AGE: YR 7MO SEX: FEMALE HYBRID: NO
DAM: 132 SIRE: 131

SUMMARY: PANTHERA ONCA(8SSP)/JAGUAR/
4 SPECIMEN; 2 FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, 1 UNK, STDBK, 2 POST-E Q.
LONGEVITY: 1 1YR 2YR 3YR 1 4YR 5YR 10YR 15YR 20YR GREATER THAN 20Y.

SUMMARY: PANTHERA ONCA(8SSP)/JAGUAR/
4 SPECIMEN; 2 FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, 1 UNK, STDBK, 2 POST-E Q.
LONGEVITY: 1 1YR 2YR 3YR 1 4YR 5YR 10YR 15YR 20YR GREATER THAN 20Y.

PANTHERA PARDUS(15SSP)/LEOPARD/
PANTHERA PARDUS JAPONENSIS/LEOPARD/ 12-007-002-004-006
1255 SPECIMEN-ID 12/11/71 OTHER SOURCE AGE: 53YR20MO SEX: FEMALE HYBRID: NO
INSTIT BORN LOC: 310203005
12/11/71 PURCHASED FROM: 310510350 FRANK M THOMPSON & ASS, INC. (EJ)/BRAD
OTHER ID UNKN. ACQ COST: . DELIV COST: .
1613 SPECIMEN-ID 13/09/72 OTHER SOURCE AGE: 43YR13MO SEX: MALE HYBRID: NO
INSTIT BORN LOC: 310203005

MAMMALIA/MAMMALS/

13/09/72 PURCHASED FROM: 310510350 FRANK M THOMPSON & ASS, INC. (EJ)/BRAD
OTHER ID UNKN. ACQ COST: . DELIV COST: $42.

SUMMARY: PANTHERA PARDUS JAPONENSIS/LEOPARD/
2 SPECIMEN; 1 FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E Q.
LONGEVITY: 1YR 2YR 3YR 4YR 5YR 10YR 15YR 20YR 2 GREATER THAN 20Y.

PANTHERA PARDUS(15SSP)/LEOPARD/
PANTHERA PARDUS ORIENTALIS/AMUR LEOPARD/ 12-007-002-004-011

1729 SPECIMEN-ID 05/06/73 CAPTIVE BORN AGE: 1YR 7MO SEX: FEMALE HYBRID: NO
DAM: 531 SIRE: 52

1730 SPECIMEN-ID 05/06/73 CAPTIVE BORN AGE: 1YR 7MO SEX: FEMALE HYBRID: NO
DAM: 531 SIRE: 52

2028 SPECIMEN-ID 27/06/74 CAPTIVE BORN AGE: YR 6MO SEX: MALE HYBRID: NO
DAM: 531 SIRE: 52

2029 SPECIMEN-ID 28/06/74 CAPTIVE BORN AGE: YR 6MO SEX: FEMALE HYBRID: NO
DAM: 531 SIRE: 52

52 SPECIMEN-ID 08/07/65 OTHER SOURCE AGE: 13YR12MO SEX: MALE HYBRID: NO
INSTIT BORN LOC: 440106001

08/07/65 PURCHASED FROM: 112010350 VAN DEN BRINK, FRANS(6V)/SOEST/UTRECHT
OTHER ID UNKN. ACQ COST: $400. DELIV COST: .

531 SPECIMEN-ID 05/07/68 CAPTIVE BORN AGE: 6YR 6MO SEX: FEMALE HYBRID: NO
DAM: 53 SIRE: 52

SUMMARY: PANTHERA PARDUS ORIENTALIS/AMUR LEOPARD/
6 SPECIMEN; 4 FEMALE, 2 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, 2 POST-E Q.
LONGEVITY: 2 1YR 2YR 3YR 4YR 5YR 1 10YR 1 15YR 20YR GREATER THAN 20Y.

SUMMARY: PANTHERA PARDUS(15SSP)/LEOPARD/
8 SPECIMEN; 5 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, 2 POST-E Q.
LONGEVITY: 2 1YR 2YR 3YR 4YR 5YR 1 10YR 1 15YR 20YR 2 GREATER THAN 20Y.

PANTHERA TIGRIS(7SSP)/TIGER/
PANTHERA TIGRIS SUMATRAE/SUMATRAN TIGER/ 12-007-002-005-007

1122 SPECIMEN-ID 02/05/71 CAPTIVE BORN AGE: 3YR 8MO SEX: MALE HYBRID: NO
DAM: 3 SIRE: 521

1245 SPECIMEN-ID 25/10/71 CAPTIVE BORN AGE: 3YR 2MO SEX: FEMALE HYBRID: NO
DAM: 3 SIRE: 521

1616 SPECIMEN-ID 10/10/72 CAPTIVE BORN AGE: 2YR 3MO SEX: MALE HYBRID: NO
DAM: 3 SIRE: 521

1617 SPECIMEN-ID 10/10/72 CAPTIVE BORN AGE: 2YR 3MO SEX: FEMALE HYBRID: NO
DAM: 3 SIRE: 521

2048 SPECIMEN-ID 17/07/74 CAPTIVE BORN AGE: YR 5MO SEX: FEMALE HYBRID: NO
DAM: 3 SIRE: 521

3 SPECIMEN-ID 01/01/65 OTHER SOURCE AGE: 14YR12MO SEX: FEMALE HYBRID: NO
INSTIT BORN LOC: 310506002

01/01/65 PURCHASED FROM: 310505046 JUNGLELAND, INC.(BX)/THOUSAND OAKS/CAL
OTHER ID UNKN. ACQ COST: . DELIV COST: .

521 SPECIMEN-ID 04/06/68 OTHER SOURCE AGE: 34YR 7MO SEX: MALE HYBRID: NO
INSTIT BORN LOC: 310506002

MAMMALIA/MAMMALS/

04/06/68 DONATION FROM: 310528002 LINCOLN MUNICIPAL ZOO (NA)/LINCOLN/NEBR
OTHER ID UNKN. DELIVERY COST: .

SUMMARY: PANTHERA TIGRIS SUMATRAE/SUMATRAN TIGER/
7 SPECIMEN; 4 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, 1 POST-E Q.
LONGEVITY: 1YR 2 2YR 2 3YR 4YR 5YR 10YR 1 15YR 20YR 1 GREATER THAN 20Y.

SUMMARY: PANTHERA TIGRIS(7SSP)/TIGER/
7 SPECIMEN; 4 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, 1 POST-E Q.
LONGEVITY: 1YR 2 2YR 2 3YR 4YR 5YR 10YR 1 15YR 20YR 1 GREATER THAN 20Y.

PANTHERA UNCIA(OSSP)/SNOW LEOPARD/ 12-007-C02-006-001

1388 SPECIMEN-ID 27/05/72 CAPTIVE BORN AGE: 2YR 7MO SEX: MALE HYBRID: NO
DAM: 7 SIRE: 527

1389 SPECIMEN-ID 27/05/72 CAPTIVE BORN AGE: 2YR 7MO SEX: FEMALE HYBRID: NO
DAM: 7 SIRE: 527

527 SPECIMEN-ID 24/06/68 OTHER SOURCE AGE: 15YR12MO SEX: MALE HYBRID: NO
WILD BORN LOC: 4101
24/06/68 PURCHASED FROM: 112010350 VAN DEN BRINK, FRANS(6V)/SOEST/UTRECHT
OTHER ID UNKN. ACQ COST: $3600. DELIV COST: .

7 SPECIMEN-ID 01/02/65 OTHER SOURCE AGE: 64YR19MO SEX: FEMALE HYBRID: NO
INSTIT BORN LOC: 310201004
01/02/65 PURCHASED FROM: 310201004 ALBERTA GAME FARM (1C)/EDMONTON/ALBERT
OTHER ID UNKN. ACQ COST: $3000. DELIV COST: .

SUMMARY: PANTHERA UNCIA(OSSP)/SNOW LEOPARD/
4 SPECIMEN; 2 FEMALE, 2 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E Q.
LONGEVITY: 1YR 2 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR 1 GREATER THAN 20Y.

SUMMARY: PANTHERA/LION, LEOPARD, JAGUAR, TIGER/
29 SPECIMEN: 16 FEMALE, 12 MALE, C.FEMALE, C.MALE, ABNL, 1 UNK, STDBK, 5 POST-E Q.
LONGEVITY: 6 1YR 4 2YR 2 3YR 1 4YR 5YR 1 10YR 4 15YR 20YR 6 GREATER THAN 20Y.

ACINONYX/CHEETAH/

ACINONYX JUBATUS(6SSP)/CHEETAH/

ACINONYX JUBATUS(6SSP)/CHEETAH/ 12-007-003-001-001

155 SPECIMEN-ID 14/04/66 OTHER SOURCE AGE: 11YR12MO SEX: MALE HYBRID: NO
WILD BORN LOC: 24
14/04/66 PURCHASED FROM: 310533351 F.J.ZEEHANDELAAR INC. (JH)/NEW ROCHELL
OTHER ID UNKN. ACQ COST: . DELIV COST: .

18 SPECIMEN-ID 10/05/65 OTHER SOURCE AGE: 74YR 6MO SEX: MALE HYBRID: NO
WILD BORN LOC: 24
10/05/65 PURCHASED FROM: 310523350 INTERNATIONAL ANIMAL EXCHANGE (MI)/FER
OTHER ID UNKN. ACQ COST: $1200. DELIV COST: .

4 SPECIMEN-ID 03/01/65 OTHER SOURCE AGE: 44YR14MO SEX: FEMALE HYBRID: NO
WILD BORN LOC: 24
03/01/65 PURCHASED FROM: 310523350 INTERNATIONAL ANIMAL EXCHANGE (MI)/FER
OTHER ID UNKN. ACQ COST: $1200. DELIV COST: .

5 SPECIMEN-ID 03/01/65 OTHER SOURCE AGE: 44YR14MO SEX: FEMALE HYBRID: NO
WILD BORN LOC: 24

MAMMALIA/MAMMALS/

03/01/65 PURCHASED FROM: 310523350 INTERNATIONAL ANIMAL EXCHANGE (MT)/FER
CTHER ID UNKN. ACQ COST: $1200. DELIV COST:

589 SPECIMEN-ID 23/10/68 CTHER SCURCE AGE: 43YR20MO SEX: MALE HYBRID: NO
WILD BORN LOC: 24

23/10/68 PURCHASED FROM: 310523350 INTERNATIONAL ANIMAL EXCHANGE (MT)/FER
CTHER ID UNKN. ACQ COST: $1200. DELIV COST:

SUMMARY: ACINONYX JUBATUS(6SSP)/CHEETAH/
5 SPECIMEN; 2 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STOBK, POST-E C.
LONGEVITY: 1YR 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR 4 GREATER THAN 20Y.

SUMMARY: ACINONYX JUBATUS(6SSP)/CHEETAH/
5 SPECIMEN; 2 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STOBK, POST-E C.
LONGEVITY: 1YR 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR 4 GREATER THAN 20Y.

SUMMARY: ACINONYX/CHEETAH/
5 SPECIMEN; 2 FEMALE, 3 MALE, C.FEMALE, C.MALE, ABNL, UNK, STOBK, POST-E C.
LONGEVITY: 1YR 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR 4 GREATER THAN 20Y.

SUMMARY: FELIDAE/CATS/
38 SPECIMEN; 20 FEMALE, 16 MALE, C.FEMALE, C.MALE, ABNL, 2 UNK, STOBK, 6 POST-E C.
LONGEVITY: 6 1YR 4 2YR 3 3YR 1 4YR 5YR 3 10YR 5 15YR 20YR 10 GREATER THAN 20Y.

SUMMARY: CARNIVORA//
59 SPECIMEN; 31 FEMALE, 26 MALE, C.FEMALE, C.MALE, ABNL, 2 UNK, STOBK, 7 POST-E C.
LONGEVITY: 9 1YR 10 2YR 5 3YR 3 4YR 3 5YR 6 10YR 5 15YR 20YR 11 GREATER THAN 20Y.

PINNIPEDIA/SEALS & SEA LIONS/
OTARIIDAE/EARED SEALS/
ZALOPHUS/CALIFORNIA SEA LION/
ZALOPHUS CALIFORNIANUS(3SSP)/CALIFORNIA SEA LION/
ZALOPHUS CALIFORNIANUS CALIFORNIANUS/SEA LION/ 13-001-007-001-002

1601 SPECIMEN-ID 23/03/72 CTHER SCURCE AGE: 6YR12MO SEX: MALE HYBRID: NO
WILD BORN LOC: 310505

23/08/72 PURCHASED FROM: 310505359 SEA LIONS INTERNATIONAL(BC)/SANTA BARB
CTHER ID UNKN. ACQ COST: $200. DELIV COST: $25.

1602 SPECIMEN-ID 23/08/72 CTHER SCURCE AGE: 6YR12MO SEX: MALE HYBRID: NO
WILD BORN LOC: 310505

23/08/72 PURCHASED FROM: 310505359 SEA LIONS INTERNATIONAL(BC)/SANTA BARB
CTHER ID UNKN. ACQ COST: $200. DELIV COST: $25.

1799 SPECIMEN-ID 13/09/73 CTHER SCURCE AGE: 5YR12MO SEX: FEMALE HYBRID: NO
WILD BORN LOC: 310505

13/09/73 PURCHASED FROM: 310505359 SEA LIONS INTERNATIONAL(BC)/SANTA BARB
OTHER ID UNKN. ACQ COST: $600. DELIV COST: $46.

1864 SPECIMEN-ID 28/11/73 CTHER SCURCE AGE: 2YR12MO SEX: FEMALE HYBRID: NO
WILD BORN LOC: 310505

28/11/73 PURCHASED FROM: 310505359 SEA LIONS INTERNATIONAL(BC)/SANTA BARB
OTHER ID UNKN. ACQ COST: $600. DELIV COST: $49.

1880 SPECIMEN-ID 28/01/74 CTHER SCURCE AGE: 5YR12MO SEX: FEMALE HYBRID: NO
WILD BORN LOC: 310505

MAMMALIA/MAMMALS/

SUMMARY: OVIS ORIENTALIS(13SSP)/RED SHEEP, ASIATIC MOUFLON/
1 SPECIMEN; 1 FEMALE, MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E C.
LONGEVITY: 1YR 2YR 1 3YR 4YR 5YR 10YR 15YR 20YR GREATER THAN 20Y.

SUMMARY: OVIS/SHEEP/
1 SPECIMEN; 1 FEMALE, MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E C.
LONGEVITY: 1YR 2YR 1 3YR 4YR 5YR 10YR 15YR 20YR GREATER THAN 20Y.

PSEUDOIS/BHARAL/
PSEUDOIS NAYAUR(3SSP)/BHARAL/
PSEUDOIS NAYAUR(3SSP)/BHARAL/ 19-009-043-001-001
89 SPECIMEN-ID 08/09/65 POST-ENTRY QUARANTINE PERMIT 6561
08/09/65 TAG / TATOO NUMBER 790
08/09/65 OTHER SOURCE AGE: 14YR12MO SEX: MALE HYBRID: NO
INSTIT BORN LOC: 11C972003
08/09/65 PURCHASED FROM: 310533351 F.J.ZEEHANDELAAR INC. (JH)/NEW ROCHELL
OTHER ID UNKN. ACQ COST: $2350. DELIV COST:

SUMMARY: PSEUDOIS NAYAUR(3SSP)/BHARAL/
1 SPECIMEN; FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E C.
LONGEVITY: 1YR 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR GREATER THAN 20Y.

SUMMARY: PSEUDOIS NAYAUR(3SSP)/BHARAL/
1 SPECIMEN; FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E C.
LONGEVITY: 1YR 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR GREATER THAN 20Y.

SUMMARY: PSEUDOIS/BHARAL/
1 SPECIMEN; FEMALE, 1 MALE, C.FEMALE, C.MALE, ABNL, UNK, STDBK, POST-E C.
LONGEVITY: 1YR 2YR 3YR 4YR 5YR 10YR 1 15YR 20YR GREATER THAN 20Y.

SUMMARY: CAPRINAE//
97 SPECIMEN; 56 FEMALE, 38 MALE, 2 C.FEMALE, C.MALE, ABNL, 1 UNK, STDBK, 19 POST-E C.
LONGEVITY: 14 1YR 9 2YR 13 3YR 4 4YR 6 5YR 23 10YR 7 15YR 20YR 2 GREATER THAN 20Y.

SUMMARY: ARTIODACTYLA//
116 SPECIMEN; 68 FEMALE, 45 MALE, 2 C.FEMALE, C.MALE, ABNL, 1 UNK, STDBK, 22 POST-E C.
LONGEVITY: 17 1YR 10 2YR 15 3YR 4 4YR 9 5YR 26 10YR 7 15YR 1 20YR 5 GREATER THAN 20Y.

SUMMARY: MAMMALIA/MAMMALS/
340 SPECIMEN; 190 FEMALE, 138 MALE, 5 C.FEMALE, C.MALE, ABNL, 7 UNK, STDBK, 38 POST-E C.
LONGEVITY: 68 1YR 41 2YR 28 3YR 14 4YR 29 5YR 56 10YR 32 15YR 6 20YR 28 GREATER THAN 20Y.

SUMMARY: HENRY DOORLY ZOOLOGICAL GARDENS (NE)/OMAHA/NEBRASKA/USA
340 SPECIMEN; 190 FEMALE, 138 MALE, 5 C.FEMALE, C.MALE, ABNL, 7 UNK, STDBK, 38 POST-E C.
LONGEVITY: 68 1YR 41 2YR 28 3YR 14 4YR 29 5YR 56 10YR 32 15YR 6 20YR 28 GREATER THAN 20Y.

Don

VETERANS ADMINISTRATION
HOSPITAL
54TH STREET AND 48TH AVENUE SOUTH
MINNEAPOLIS, MINNESOTA 55417

December 11, 1972

YOUR FILE REFERENCE:

IN REPLY REFER TO:

Russell W. Morse, Ph.D.
School of Medicine
Dept. Neurobehavioral Sciences
Medical College of Georgia
Augusta, GA 30902

Dear Doctor Morse:

Thank you for your very carefully thought out memo concerning the objectives of the Physiological Norms Committee of the AAZV. I shall comment item by item following your numerical order of presentation.

I.

a. The interface we have used in most instances has simply been a copy of the data on whatever form was used by the contributing person or institution. Thus, we recognized early that the computer format which is included in the book as an example of how we handle the data was not suitable for general use. We have also provided a simple one-sheet form in clinical language, but found that this too was not desirable since it required copying of the data and this took additional time on the part of someone. We have a coder who is entirely capable of transferring the data from whatever format is used by the contributing institution to our form. This technique is currently in use with all of our major data suppliers.

b. 1) A monthly or periodic report of available data could be generated, but if it is to be distributed to any significant number of people, cost factors will have to be considered. Also, it is essential that some form of interpretation be made with respect to health status of the animal, as to whether the data is suitable as a normal profile.

2) A system for filing reports could be readily devised, and again simply requires the desire to make the investment. The general format used by mammalogists is attractive, but this could be worked out in a committee meeting.

Russell W. Morse, Ph.D.
Medical College of Georgia
Augusta, GA 30902

December 11, 1972

3) The contents of the reports again relate to time effort returned and cost. We have chosen to periodically dump by species since this presents all of the information available to date for this species in a readily readable format. It may be noted that we have considerably improved our software since publication of the mammalian code several years ago. Thus, we have a number of alternate formats for presentation, all of which are more intelligible and useable than our original efforts.

4) Statements concerning definitions of normal definitely would require discussion and agreement amongst users as to useages and methods of reporting.

c. Units of measurements are always a problem, need to be stated explicitely, and where necessary, a table of conversion units might be assembled. This is essential since it is likely that data generated in laboratories used by many of the participants will have their units in use and will not be particularly amenable to changing. This has been the case in our experience, and we have found it necessary to obtain definitions of units from each of the participants for translation.

d. The inclusion of additional information is certainly desirable and easy to accomplish since as many separate software packages can be written as necessary to meet the needs of the participants. Reciprocally, it is only worthwhile doing this to the extent that the participants wish to fill out, prepare, and submit pertinent data. We, for example, have found that it is difficult to get consistent use of scientific nomenclature rather than common names. Also, such matters as unique animal identification are a serious need if this material is to be used clinically in following the history of a particular animal. Our retrieval system is entirely capable of assembling out of the storage data all of the reports on a given animal if he is uniquely identified. This can be done regardless of shifts in institution or other parameters.

II.

A priority schedule is certainly a valuable item to discuss and formulate. We have been essentially attempting to accumulate a very restricted group of data, essentially that covered by routine hematology and clinical chemistry and urinalysis since this is the most frequently acquired data by participants.

Russell W. Morse, Ph.D.
Medical College of Georgia
Augusta, GA 30902

December 11, 1972

III.

I do not entirely understand this comment since I am not clear as to whether the concern with the "present mammalian system" refers to the code or to the physiological data format. These are two entirely distinct items and are not one and the same. The code for mammalian species is an effort to provide a means of agreed upon numerical code identification of a given species. This allows storage of data in any computer system and subsequent retrieval, regardless of search methods used. Thus, our coding system and data format were originally used on magnetic tape. We have since converted to disk which provides a random search system of far greater speed than tape. However, it is essential here to have a code for extracting out the data for a given species. It is entirely analagous to the concept of a social security number or any means of uniquely identifying a particular taxon. This point perhaps might best be resolved by discussion, again at the suggested meeting in case I have missed the point of the comment. I suspect that there may be some misunderstanding of which I am not aware, perhaps based upon the original presentation or the format presented in the manual. In any case, the bird taxonomy code system has been completed. It may be further noted that either system can be revised with regards to taxonomy where this is deemed advisable by suitable authorities.

IV.

I feel that an animal inventory system on a nation-wide basis will eventually be essential in view of restrictions on importation and on a very real need to have a running inventory pedigree system if breeding is to be done on a replacement basis in this country.

V.

There is no question but what costs should be made explicit, including those related to capital investments, personnel time, data handling, report distribution, data analysis and interpretation, literature search, etc.

VI.

A management and systems analysis is highly desirable if for no other reason than to clearly define the ideal requirements for such a system to be functional. There are a number of parallels available in this country from whom we might learn their experience. There has also been an effort to undertake a similar project in Europe which has been a resounding failure. Careful evaluation of the reasons for lack of success of a number of similar systems should be made to avoid any expensive mistakes on our part either in terms of time, effort or money.

Russell W. Morse, Ph.D.
Medical College of Georgia
Augusta, GA 30902

December 11, 1972

I would be pleased to discuss any of these items further in terms of our past experience and in terms of doing whatever is necessary and desirable to meet the needs of maintaining, propagating, and caring for the numerous exotic species currently housed in zoos in this country.

Best regards.

Sincerely,

U. S. SEAL, Ph.D.

cc: Thomas Follis, D.V.M., Ph.D.
Lee Simmons, D.V.M.

VETERANS ADMINISTRATION
HOSPITAL
54TH STREET AND 48TH AVENUE SOUTH
MINNEAPOLIS, MINNESOTA 55417

YOUR FILE REFERENCE:

IN REPLY REFER TO:

Dear Doctor

At the last meeting of the American Association of Zoo Veterinarians, East Lansing, Michigan, November 18 - 20, 1969, a committee on physiological norms was appointed. This committee is composed of the following members with their addresses:

Dr. Fred Soifer
Bellaire Blvd. Animal Clinic
6213 Bellaire Blvd.
Houston, Texas 77036

Dr. Wilber Amand
School of Vet. Medicine
3800 Spruce Street
Philadelphia, Pa. 19104

Dr. Hyram Kitchen
Lab. Animal Resources
Michigan State University
East Lansing, Mich. 48823

Dr. U. S. Seal
Metabolic Research Lab.
V. A. Hospital
Minneapolis, Minn. 55417

The committee was charged with the responsibility of gathering and tabulating information on physiological norms of exotic animals important to zoo practice. After some discussion, the committee has decided to begin its task with the collection of data on hematology and blood chemistry. We are proceeding along three lines.

The available literature is being collected and the data summarized into a convenient form for distribution. The data available to us locally is also being collected and included in separate tabulations. However, it is apparent that only a limited amount of data is available at any one zoo for many species. Thus, we would like to enlist your cooperation in providing us whatever data you may have available. The tests which we are currently tabulating are listed on the accompanying sheets, along with pertinent information on the individual animal. If you could extract this information from your prior records, this obviously would be of great value. We can supply as many of these sheets as you might need.

Alternatively, perhaps it may be convenient for you to reproduce copies of pertinent records and we could perform the necessary transcribing task. We realize that this task of extracting information from old clinical records may be difficult, if not impossible. However, wherever possible, the information

obtained would be of great value. The collection of current information as it becomes available in the course of your work, however, should be a more practical matter. Thus, if copies of the current clinical laboratory data could be forwarded to us, this data could be incorporated into the tabulations very readily. We plan to maintain a running tabulation of all data about the species which would then be available as needed. Summary tabulations could be prepared each year for distribution at the annual meeting of the AAZV, as well.

We are currently preparing computer programs for storage of this material on magnetic tapes. Literature information is also being collected and processed according to a computer program. This will make it possible to extract all available information on a given species on call on the magnetic tape program. It will also be possible for copies of the magnetic tape to be prepared and distributed to those with suitable computer facilities available. Print-outs of the data and statistical treatment where suitable would eventually be prepared in a manual or hand-book form for distribution to members of the Association. To accomplish this task in any usable form and reasonable time, it will be important that we obtain data from as many cooperating zoos as possible. Thus, we would much appreciate your help and positive indication from you that you would be willing to participate in this data collection program. Acknowledgement of all participating members will be made in the final hand-outs of tabulated material. Our use of this material would not compromise independent publication by you of your information.

We would appreciate any suggestions you might have as to other types of data which you consider of great value to you that might be included in the data collection program. Also, for those of you who do not have available testing facilities or laboratory facilities: Would you be interested in the possibility of a central laboratory with arrangements for doing routine hematology and blood chemistries? It is technically practical to do this.

Finally, would you be interested in participating in the collection of normal data from selected species which you consider to be of particular importance in your veterinary practice of zoo medicine? Thus, individual zoos which have several or many specimens of a particular species would be especially suitable for providing a standard set of specimens for obtaining this normal data. Consideration of this possibility is especially important since the great bulk of the available data on zoo medicine is on very ill animals. This, of course, does not provide suitable material for physiological norms or baselines for judgement or evaluation of clinical material. Your thoughts in response to each of these points will be greatly appreciated by all members of the committee.

Best regards.

Sincerely,

U. S. SEAL, Ph.D.
Chairman, Committee of
Physiological Norms
AAZV

Enclosures

AAZV Committee on Physiological Norms
BASIC DATA FORM #1 - June 1970

Zoo _____ Code _____

Animal Name: Genus _____ Species _____ Code _____

Animal Identification Number _____ Sex _____ Age _____

Weight _____ Date Drawn _____

Clinical Impression _____

_____

Hematology:	Value	
Hemoglobin	_____	gm%
Red blood count	_____	$10^6/mm^3$
Hematocrit (PCV)	_____	%
MCV	_____	$\mu 3$
MCHC	_____	vol %
White Blood Count	_____	$10^3/mm^3$
Differential (%)		
Segment	_____	
Bands	_____	
Lymphcytes	_____	
Monocytes	_____	
Eosinophils	_____	
Basophils	_____	
Reticulocytes	_____	
E. Sed. Rate	_____	mm/60 min
Platelets	_____	$10^3/mm^3$

Urinalysis

Color _____
Specific grav. _____
pH _____
Glucose _____
Protein _____
Ketone bodies _____

Microscopic _____
Cast _____
Red cells _____
White cells _____
Bacteria _____

Blood Chemistry (please specify units, if different)		
Total protein	_____	gm%
Albumin	_____	gm%
Sodium	_____	mEq/L
Potassium	_____	mEq/L
Chloride	_____	mEq/L
CO_2	_____	mEq/L
Calcium	_____	mg%
Phosphorous	_____	mg%
Magnesium	_____	mg%
Cholesterol	_____	mg%
Triglycerides	_____	mg%
Glucose	_____	mg%
BUN (Urea)	_____	mg%
Uric acid	_____	mg%
Bilirubin (T)	_____	
Creatinine	_____	mg%
LDH	_____	W.U.
Alkaline phosphatase	_____	KAU
SGOT	_____	KU
CPK	_____	IU
PBI	_____	µg%
Corticosteroids	_____	µg%
Fibrinogen	_____	mg%
Iron	_____	µg%
Transferrin	_____	µg%
Ceruloplasmin	_____	mg%
Temperature	_____	°F
Heart Rate	_____	/min
Respiration	_____	/min

Tentative Disease Category Classification

ANIMAL STATUS REPORT

1. Major category

   A. Normal
   B. Pregnant
   C. Sick
   D. Dead

2. Minor category

   Skin
   Nervous
   Endocrine
   Respiratory
   Reproductive
   Gastrointestinal
   Urogenital
   Muscular
   Skeletal
   Cardiovascular

3. Subcategory

   Tumors
   Genetic
   Nutrition
   Infection
   Traumatic
   Metabolic
   Social
   Toxicity

VETERANS ADMINISTRATION

POSTAGE AND FEES PAID
VETERANS ADMINISTRATION

OFFICIAL BUSINESS

Dr. U. S. Seal
Metabolic Research Lab
Veterans Administration Hospital
54th St. & 48th Ave. So.
Minneapolis, Minn. 55417

FL 22
Oct 1957 (R)

1. Would you like to receive periodic data summaries and literature surveys? Yes_____ No_____

2. Are you interested in participating in data collection program? Yes_____ No_____

3. Will you send copies of current clinical laboratory data? Yes_____ No_____

4. Comments:

Name_____ Zoo_____