

THE INTERNATIONAL ZOO YEARBOOK

VOLUME I

1959

EDITED BY

Desmond Morris, D.Phil

Caroline Jarvis



THE ZOOLOGICAL SOCIETY OF LONDON

Published in 1960 by The Zoological Society of London, Regent's Park, London N.W.1., Great Britain.

Copyright © by The Zoological Society of London 1960. All rights reserved. No portion of this book may be reproduced without the written permission of the Editors of The International Zoo Yearbook, The Zoological Society of London.

Printed in England by Waterlow & Sons Limited, London and Dunstable.

CONTENTS

	Page
INTRODUCTION Solly Zuckerman	
SECTION I—APES IN CAPTIVITY	
INTRODUCTION TO THE SECTION The Editors	1
THE BIRTH OF A GORILLA AT BASLE ZOO E. M. Lang	3
THE NEW APE HOUSE AT ANTWERP ZOO W. Van den Bergh	7
THE NEW APE HOUSE AT ZURICH ZOO H. Hediger	12
THE NEW APE HOUSE AT WEST BERLIN ZOO Heinz-Georg Klös	14
THE NEW APE HOUSE AT TOKYO ZOO T. Koga	15
KEEPING APES AT ROTTERDAM ZOO A. C. van Bommel	16
EXPERIMENTS WITH A CHIMPANZEE COLONY AT CHESTER ZOO G. S. Mottershead	18
THE NEW CHIMPANZEE DEN AT LONDON ZOO Desmond Morris	20
SECTION II—NEW DEVELOPMENTS IN THE ZOO WORLD	
<i>Publicity</i>	
FILMING AT LONDON ZOO	29
<i>Architecture</i>	
REBUILDING LONDON ZOO	30
THE EXOTARIUM AT FRANKFURT ZOO B. Grzimek	31
NYLON NETTING FOR AVIARIES AT LONDON ZOO J. J. Yealland	34
<i>Public Services</i>	
THE IMPORTANCE OF LABELLING Guenter Voss	34
WATERFOWL REFERENCE SHELTER AT EDINBURGH ZOO	35
TALKING LABELS AT SAN FRANCISCO ZOO	35
BULLETIN BOARDS AT CHICAGO (LINCOLN PARK) ZOO	35
EDUCATIONAL SCHEME AT STATEN ISLAND ZOO	36
LECTURES FOR SCHOOL CHILDREN AT LONDON ZOO	37
YOUNG ZOOLOGISTS' CLUB AT LONDON ZOO	37
PIONEER YOUTH GROUP AT PRAGUE ZOO	37
TRAVELLING NATURAL HISTORY COLLECTION AT THE BRITISH GUIANA MUSEUM AND ZOO	38
SEA LION INSTALLATION AT SAN DIEGO ZOO	38
WATER BUS AT LONDON ZOO	38
ELECTRIC HAND DRYER AT CHICAGO (BROOKFIELD) ZOO	38
<i>Stock</i>	
THE NEW OKAPI HOUSE AT ROTTERDAM ZOO A. C. van Bommel	38
WORLD REGISTER OF PERE DAVID'S DEER E. H. Tong	39
INTERNATIONAL SYMPOSIUM ON THE PRESERVATION OF THE PRZEWALSKI HORSE	41

	Page
AFRICAN MIXED SPECIES EXHIBIT AT ALBUQUERQUE ZOO	42
NATURE AREA AT DETROIT ZOO	42
MOSSY-THROATED BELLBIRD AT THE BRONX ZOO.. .. .	43
BONGO ANTELOPE AT CLEVELAND ZOO	43
GIANT PANDAS IN CAPTIVITY	43
HOODED SEAL AT BREMERHAVEN ZOO	43
LEOPONS AT KOSHIE ZOO	44
ALBINO WAPITI AT LINCOLN PARK ZOO (OKLAHOMA)	44
BANANA DIET FOR AMERICAN MOOSE	44
PELLET FOOD FOR BIRDS AT THE LONDON ZOO	44
HORSEMEAT SUBSTITUTE AT WASHINGTON ZOO	44
CRATE DESIGN FOR AIR TRANSPORT	44
PIGMY HIPPOPOTAMUSES AT WASHINGTON ZOO	45
BREEDING FLAMINGOS AT BASLE ZOO	45
HIPPOPOTAMUS MILK ANALYSIS	46
LIONS BRED AT ARNHEM ZOO	46
USE OF HORMONES AT SOFIA ZOO	46

Animal Welfare and Zoological Research

THE BIOLOGICAL RESEARCH INSTITUTE AT SAN DIEGO ZOO	46
THE NEW ANIMAL HOSPITAL AND QUARANTINE STATION AT THE LONDON ZOO	47
USE OF TRANQUILLISERS AT THE JOHN BALL ZOO	50
DRUG RESEARCH AT ST. PAUL'S COMO ZOO	51
USE OF TRANQUILLISER DRUGS AT LINCOLN PARK ZOO, OKLAHOMA	51
USE OF TRANQUILLISER DRUGS AT WASHINGTON ZOO	51
USE OF TRANQUILLISER DRUGS AT WOODLAND PARK ZOO	51
TREATMENT OF A SKIN DISEASE IN AN ORANG-UTAN AT WOODLAND PARK ZOO	52
DIARRHOEA IN ORANG-UTANS AT STATEN ISLAND ZOO	53
ANTHRAX AT GLASGOW ZOO	53
"MOOSE DISEASE" AT ASSINIBOINE PARK ZOO	53
MORPHOLOGY OF THE PITUITARY GLAND OF SNAKE EMBRYOS	53

SECTION III—REFERENCE SECTION

ZOOS OF THE WORLD	57
SENIOR ZOO STAFF OF THE WORLD	101
UNIVERSITY DEPARTMENTS OF ZOOLOGY	113
INTERNATIONAL LIST OF ANIMAL DEALERS	123
FILMS MADE AT ZOOS DURING 1959	131
ZOO TELEVISION PROGRAMMES DURING 1959	132
ZOO PUBLICATIONS	134
SPECIES OF MAMMALS BRED AT ZOOS DURING 1959	138
SPECIES OF BIRDS BRED AT ZOOS DURING 1959	148
MAMMALIAN GESTATION PERIODS	157

INTRODUCTION

THE need to encourage the conservation of the remaining wild fauna of the world becomes more urgent every day, particularly as technical and economic development gathers its inevitable force in previously undeveloped or under-developed areas of the world. At the same time, new zoos are being born all over the globe, while others which have been places of public education for many years are being renovated and extended. It is in the interests of everyone that the need to conserve wild life and the move to develop zoos should be reconciled. This will be possible only if we can ensure that zoos are designed and maintained in such a way that the wild animals housed in them not only live long in captivity but also live in conditions where they can reproduce themselves. Already there are species which have disappeared from their natural habitats and which today exist only in captivity. For this reason one of the most important and vital functions of the modern zoo is its role as a living museum—as a repository of the world's fauna.

A few years ago I began to seek information for use in planning the major reconstruction of the Zoological Gardens in Regent's Park, London, managed since 1829 by The Zoological Society of London. Information was not easy to find in published records, although in recent years there has been great progress in animal husbandry and management; in the knowledge of the specialised building requirements of animals; and in various methods of animal display. I accordingly circulated Directors of Zoos throughout the world, suggesting that it was essential that every zoo should be able to share in this accumulated knowledge and the relevant details of all new research and development should be readily available. There was clearly a need for an authoritative channel for the international exchange of information about zoos.

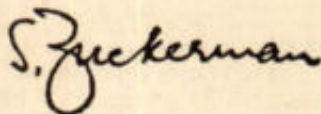
At the same time, I asked Zoo Directors to send us material for publication in a Yearbook on zoos which the Council of The Zoological Society of London agreed to support, granted that we could count on the co-operation that was required. The response was generous and the present volume is the result. It provides ample proof of the gap which this new publication, *The International Zoo Yearbook*, is designed to fill. Nearly 200 zoos have replied to the detailed questionnaire sent out by Dr Desmond Morris and Miss Caroline Jarvis—members of the staff of The Zoological Society of London to whom the work of editing the volume was entrusted. Indeed, the response was so great that the date of publication had to be delayed several months owing to the heavy task of sorting all the information which reached us. •

The Zoological Society of London would like to thank all those who have sent material for inclusion in this first edition of the Yearbook. Since the value of a Yearbook is entirely dependent on the up-to-date nature of the information it provides, we should also like to take this opportunity of asking all Directors to send information about the new developments which have taken place during 1960, for inclusion in the 1960 edition of the Yearbook (to be published in 1961). New

questionnaires will be sent out at the end of 1960; we hope that we will be able to achieve a much earlier publication date next year.

The present volume is divided into three sections. The first deals with a special topic, to which various authorities were invited to contribute. The subject selected was the keeping of apes in captivity. The second section deals with general problems which affect the maintenance and administration of zoos and with new developments that have taken place in various zoos throughout the world during 1959. The third section comprises a reference section and provides information of the type that can be tabulated or listed. This section will be enlarged each year as more and more data becomes available.

The special topic chosen for the 1960 Yearbook is the keeping of elephants, rhinoceroses and hippopotamuses in captivity. The Editors would welcome contributions from those with special knowledge in this field. In future editions of the Yearbook it is intended to include tables dealing with such matters as the life-span of animals in captivity, the timing of breeding seasons and animal diets. A section on the Game Reserves of the World is also planned.

A handwritten signature in dark ink, reading "S. Zuckerman". The signature is fluid and cursive, with the first letter "S" being large and stylized.

Sir Solly Zuckerman
Secretary, The Zoological Society of London

London, 1960.

SECTION I

APES IN CAPTIVITY

NEW DEVELOPMENTS IN THE KEEPING OF GREAT APES IN CAPTIVITY

Introduction

METHODS of exhibiting and caring for great apes in captivity have improved tremendously during the past twenty years. Detailed studies of the needs of these fascinating creatures have been carried out at the Yerkes Laboratories in Florida and elsewhere since the 1930's. In recent years the results obtained from such studies have been illuminated by practical application in a number of major zoos throughout the world. One of the results has been the greatly increased life span of captive gorillas to the point where the breeding of this species in zoos promises to become a regular event in the near future.

1959 witnessed the second successful birth of a captive gorilla and Basle Zoo is to be complimented on this outstanding achievement. As an introduction to Dr Lang's article on this important zoo event, there follows a brief note on the history of zoo gorillas.¹

The gorilla was not officially discovered until 1847, when skulls were examined for the first time. In 1848 a complete skeleton was sent to a Paris museum and another reached America in 1851. In 1852 an American ship's captain offered 6,000 dollars for a live pair, but without result, although it was in this year that the first complete gorilla carcass reached the academic world.

The first live gorilla to be seen in captivity was apparently overlooked until after its death. It is said to have been displayed in an English menagerie as a chimpanzee called "Jenny" in 1855, but the first live gorilla to be shown as such arrived in England in 1860 where it lived for seven months. A second one was shipped to Europe in 1875, but died during the voyage.

During the 1860's and 1870's hunters killed a number of gorillas and most of the major museums in Europe and America obtained skins and skeletons for their collections. But as a live captive animal, the gorilla was still a great rarity. A young male, however, arrived at Hamburg in 1876, was then shipped to London where he was exhibited for eight weeks, and finally returned to Germany where, in Berlin, he died after only five months in captivity.

In the 1880's and 1890's several more gorillas arrived alive in Europe. Berlin received one in 1881, another in 1883 and a third in 1892. France saw her first live gorilla in 1883 and London obtained another in 1887. In 1897 Breslau purchased a four year old gorilla from an animal dealer at Liverpool and this one, unlike its forerunners in captivity, lived for several years.

At the turn of the century a second species, or race, the Mountain Gorilla,

¹ For further details, see articles by E. P. TRATZ and B. GRZIMEK in "Zoologische Garten", 1952 and 1954 respectively.

was discovered by Captain von Beringe and described in 1903 by Matschie. During the first twenty years of the present century, according to Paul Tratz, eighteen gorillas arrived alive in Europe and were seen at London, Berlin, Hamburg, Leipzig, Rotterdam and Dublin.

During the inter-war period at least twenty-six more gorillas were exhibited at zoos in Europe and America. Mountain Gorillas were shown at Philadelphia and London in 1937 and 1938 respectively.

Between 1945 and the present time many more gorillas have been obtained by zoos all over the world. In 1954, Bernhard Grzimek estimated that there were fifty-six gorillas in captivity, thirty-five being males and twenty-one females. Since that date many more are known to have been exported from Africa. Thanks to improved veterinary knowledge, their chances of survival are extremely good. The regular breeding of gorillas in zoos is now the new challenge with this species.

The first successful breeding was in America at Columbus Zoo in 1956. The second, in 1959, at Basle Zoo in Switzerland, has now been achieved and it is with a report on the details of this success that we open this section of the Yearbook dealing with new developments in the keeping of great apes in captivity.

THE BIRTH OF A GORILLA AT BASLE ZOO

By Dr E. M. LANG

Director of Basle Zoological Gardens

GREAT APES have always been particular favourites at the zoo. Crowds of visitors gather in front of their cages, compelled to linger awhile watching their movements and drawing comparisons.

Although attempts to keep anthropoid apes in zoological gardens date back to the 19th Century, the first to meet with any success have occurred within the last thirty years. Nowadays Chimpanzees have been bred in captivity to the third generation; the Rotterdam and Philadelphia Zoos have furnished other gardens with home-bred Orang-utans; yet in the case of the Gorilla, the rarest of the great apes, the first birth in captivity could be recorded only three years ago (in Columbus, Ohio, USA, on 22nd December, 1956).

Modern methods of keeping anthropoids are based on the knowledge that these animals, being extremely susceptible to cold and influenza viruses or even tuberculosis which can lead to dangerous and often fatal illnesses, must, above all, be protected from infections carried by human beings. At the same time they require a complete diet, as perfected by Ratcliffe (Philadelphia), the success of which needs no further commentary than to mention that Philadelphia Zoo possess Chimpanzees, Orang-utans and even Gorillas that have surpassed the venerable age of thirty. Obviously the excellent results achieved by these prophylactic and feeding measures must not be jeopardised by the public who would, unwittingly, offer the animals unsuitable food or spread infection through coughs and colds. A glass screen erected in front of both indoor and outdoor cages effectively excludes these elements of danger. Furthermore, great apes are social animals, and it is important not to keep them isolated; especially when young they should be brought up in the company of their own kind, or a closely related species, bearing in mind that the slow Orangs and Gorillas are favourably influenced by the lively Chimpanzees; otherwise the necessary distraction and stimulation must be provided through regular contact with human beings. Experience has shown that there is no fear of the animals becoming 'humanised'. Anthropoids and human beings resemble each other so closely, both in behaviour and stature, that young apes accept their own kind later on without any trouble and quickly establish a social link.

The first description of the Gorilla—of a scientific nature—appeared only just over a hundred years ago. The following decades brought a steady flow of young Gorillas into Europe and later America as well but, on the whole, it proved impossible to keep these delicate animals longer than a few years. Since then, to be sure, many Gorillas have been exported from Africa and, nowadays, the number of these great apes in all the zoological gardens of Europe and America can probably be estimated at over 130. In October 1959, Australia received its first Gorilla, signifi-

cantly enough not from Africa, the native country of the Gorilla, but from an American zoo. Keeping Gorillas is fashionable in America and the smallest gardens may exhibit half a dozen of these rare animals, even though the price for a freshly imported young Gorilla ranges between 3,000 and 5,000 dollars.

It appears somewhat strange that more Gorillas have not been born in American zoos. The reason lies in the fact that anthropoid apes do not reach maturity until the age of nine and, therefore, only very few zoos own animals capable of reproducing. However, now that a good start has been made in Columbus and Basle, it is to be hoped that more births will follow.

Basle Zoo imported the first Gorilla into Switzerland on 23rd October, 1948. The animal, a young one weighing 8.45 kilograms, was acquired from a large shipment which had arrived in Paris from the Cameroons. It measured 44 centimetres from head to rump, and was registered as a male. Brought up in the company of a Chimpanzee, likewise a male, 'Achilles' developed very promisingly, but no one realised until 2nd January, 1952, that the animal was a female! In June 1953 faint signs of a sexually receptive phase were observed during which Achilla was especially demonstrative towards certain persons. Often she would keep up a song, peculiar to herself, making rhythmic movements with the lower part of her body, while she was wont to embrace a particularly favoured girl keeper. On 16th September, 1954, through Messrs Hermann Ruhe, Hanover, the Zoo succeeded in obtaining a male. This specimen had arrived in Columbus (Ohio, USA) from the Cameroons in January 1951 as a young animal, 8.1 kilograms in weight, and had been living there with a slightly older Gorilla pair who were later destined to become the parents of the first Gorilla baby ever born in a zoo (22nd December, 1956). For a time the three Columbus Gorillas lived together in great harmony. Later, however, the elder couple began suppressing the younger male whereupon the management of the Columbus Zoo decided to sell him. On his arrival in Basle on 16th September, 1954, he weighed 36 kilograms. Christopher, as he was called, was quite tame. He could hardly climb at all since he had hitherto had no opportunity for doing so, but he quickly learned the art and grew rapidly. Unfortunately his growth could not be recorded accurately as he refused to sit on the scales.

Getting the two Gorillas accustomed to each other was not so easy. They spent the first few days in adjoining cages where they could see one another through a narrow grating. The female was extremely jealous when the keeper visited the male, and even attacked him when he ventured to speak to Christopher through the bars from her cage. Four days after the male's arrival the animals established social contact by smelling each other through the grating, and exactly three weeks after their first meeting they could be let together. Achilla, who was bigger at that time, showed off at first but any feelings of awkwardness were soon overcome and the pair began playing with one another. Now and then they had their mild quarrels but, on the whole, the two Gorillas got on very well and lived together peacefully.

On 14th October, 1954, we noticed the first mating attempts. The female was sexually receptive every 30 days on an average, though copulations were not observed during each of these phases. With our Gorilla pair copulation takes place both *more canum* and *more hominum*. Usually the female plays the active part, stimulating the male by embracing him from behind or in front and drawing him to her. The

erected penis is inconspicuous, being roughly only 5 centimetres long, while the female genitals are scarcely visible even during the receptive phase.

After a copulation on 21st August, 1957, no further phase of sexual activity could be observed for some time. A urine specimen submitted for a pregnancy test showed a positive reaction. But during the night of 29th March, 1958, Achilla aborted a mummified foetus, 10.5 centimetres in length, together with a small amount of after-birth, though apart from losing a little blood she showed no sign of what had happened. On 16th May and June, 1958, she was receptive again, and on 31st August another copulation took place. The phases of sexual receptivity now resumed their normal course, appearing at regular monthly intervals. After a final copulation on 8th December, 1958, conditions similar to heat occurred on 13th January and 2nd February, 1959. A urine specimen collected on 2nd March was declared positive. Within the next five months Achilla put on 7.5 kilograms in weight! Her belly rounded visibly, her breasts began to protrude and, on 7th June, 1959, we saw her pressing out milk which she licked from her finger. From 21st August on, the pair were only let together, under supervision, during meals. The female spent the night in a small sleeping-den and was given one or two sacks out of which she fashioned a bed.

The birth took place during the night of 22nd to 23rd September. When the keeper entered the sleeping-den in the morning, he found Achilla with an infant pressed against her breast. The little one had a light-coloured, almost pink face, crowned with a dark mop of hair, and a sparse hairy covering on its back. It was still joined to the placenta by the umbilical cord; at 11 a.m. these organs lay on the floor and could be removed.

The umbilical cord, which was torn off close to the surface of the abdomen, measured 65 centimetres in length and the whole placenta weighed 342 grams, the latter being ovoid in shape with a diameter of 15.5×11.4 centimetres.

Unfortunately, subsequent to the birth, the mother-infant relationship failed to function properly. Achilla held her offspring firmly in her left arm, turned away from her, and as she never relaxed her vice-like grip it was quite impossible for the baby to reach the nipple. On the following day, when the infant expressed its hunger by whimpering and shrieking repeatedly, she held its little mouth shut with her other hand. Head Keeper Stemmler, with whom Achilla is on the best of terms, tried to show the inexperienced mother how to hold her daughter, but in vain. There lay only one way open to us to save the precious little creature—to remove it from its mother as soon as possible. Using a capture pistol we gave Achilla 5.0 grams of a tranquillised i.m. She was taken aback for a moment by the impact of the injection, then calmly drew the needle out of her thigh and placed it beside her. After 15 minutes she made as if to lie down, but the dose received was naturally not sufficient to induce complete relaxation. At the end of half an hour Achilla was very tired and could scarcely keep her eyes open; she allowed herself to be touched but not held. Another 5.0 grams Pentobarbital i.m. were administered 10 minutes later with the capture pistol. 10 minutes more elapsed and at last Achilla lay down on the ground, placing the little Gorilla beside her. We pulled up a sliding door, and the mother, startled by the noise, rose and went through it into the adjoining cell, leaving her infant behind. This was our chance to take the baby away. Shortly afterwards Achilla lay down

and fell asleep. The next day we had the impression she had already forgotten what had happened.

The young Gorilla weighed 1820 grams. Whilst in its mother's care it had twice passed a good deal of meconium but had definitely drunk nothing. From head to rump it measured 28 centimetres. We called the baby Goma which, in Kisuaheli, means Dancing Festival; a town on the Lake of Kivu in the Belgian Congo bears the same name.

The problem confronting us involved nourishing a new-born anthropoid (which had received no colostrum from its mother) in such a way as to ensure normal development. From the beginning the Gorilla infant had never manifested anything like the clinging reflex characteristic of a young Chimpanzee or Orang-utan, and was perfectly happy to be laid in a basket. When asleep, Goma kept both little fists near her head, often holding on to the covering with one hand. She lay now on her belly, now on her back, according to how we had put her down after drinking. Newly born, Goma required to be fed nine times on an average (including night feeds) making her hunger known, in no uncertain terms, by shrieking loudly. From the age of one month, she received her last bottle at 11 p.m. after which she slept continuously until 7 o'clock in the morning. The number of meals was thus gradually reduced to five or six and after two months to four. By three months Goma was given the bottle three times a day. The daily quantities consumed increased fairly rapidly from 235 grams to 600-700 grams but we remained constantly on our guard to avoid overfeeding. After four weeks the daily quantity consumed fell to 550-650 grams and after eight weeks to 490-525 grams—taken on an average. By the sixteenth week the daily quantity rose again to 600-630 grams. In spite of these differences in the amount of food taken, however, the weight-curve showed no fluctuations worth mentioning. With an average daily increase in weight of 17.1 grams, Goma doubled her birth weight (1820 grams) after sixteen weeks and by the end of January 1960 tipped the scales at 4 kilograms.

During the first days of her life Goma was nourished on one of the usual baby-foods. She put on weight steadily but passed very thin stools from which we concluded she was not getting the right kind of nourishment. An analysis of Gorilla's milk has yet to be made and, as far as we know, Chimpanzee's milk has only been examined on one single occasion in Yerkes' 'Laboratory Colony' (Yale University Press, 1948); the analysis showed the milk to contain values very similar to human milk. From the eleventh day on, we fed the Gorilla baby on human milk, kindly placed at our disposal by the Children's Hospital, Basle, to which pulverised carob beans (5% in water) were added. The stools soon became firmer and after a month, we began weaning the baby on to humanised cow's milk thickened with 2% rice gruel. After eighteen days the human milk could be entirely dispensed with.

For hygienic purposes the infant was dressed in a pair of plastic knickers with a cellulose lining which had to be changed six to eight times a day.

At the age of two months exactly Goma cut her first lower middle incisors. Fourteen days later the corresponding upper teeth broke through. By three months a second upper incisor appeared on either side, and on 27th January and 9th February, 1960, the two lower ones broke through, making altogether a total of eight teeth. Shortly afterwards the first upper premolars made their appearance.

Before actually teething, Goma had seized every opportunity of biting her foster-parents' fingers, and once having cut her teeth she gnawed busily away at her toys and any wooden objects she could get hold of.

On the 2nd January Goma graduated during the day-time into a playpen. She immediately learned to draw herself up on the rails and amused herself for minutes on end standing up in this way. Thus she experienced, before learning to walk, a period of standing upright, while at crawling she was already expert. Her attention now turned to higher things and, after she had successfully climbed out of her playpen several times and crawled behind a cupboard, we moved her, on 9th February, into a higher playpen with rails across the top which had specially been made for her.

Once her hunger has been satisfied Goma stays happily in her playpen. She often plays with her teddy-bear, although one of her favourite toys is just a piece of cloth. For hours on end she rests or sleeps on her feather-bed, but with the first pangs of hunger she calls or shrieks until one of her foster-parents picks her up. This contact means a great deal to her, and usually she wants to be played with and caressed for quite a while before taking her bottle, even though she is ravenously hungry. When one of us was obliged to be absent for ten days, Goma had completely forgotten him on his return. It took three days before she would allow him to feed her again after which the old happy relationship was reinstated.

Report ended 30th January, 1960.

THE NEW APE HOUSE AT ANTWERP ZOO

By W. VAN DEN BERGH

Director of the Royal Zoological Society of Antwerp

UNTIL about the beginning of this century it was the custom in zoological gardens to give the buildings housing exotic animals an over-romantic atmosphere conjuring up the animals' geographic origin or legendary attributes. This was pompously called the 'atmosphere' style and the success of some great international exhibitions where these reconstructions were to be found, made the style fashionable. In zoos, however, this style was generally inspired by oriental ideas that were often fantastic and which tried to create a gaudy, picturesque effect rather than cater for the physiological needs of the animals. Even less did they take into account the cultural, scientific and instructional rôle that should belong to any zoological garden worthy of the name. Until the Second World War, the prototype of the 'atmosphere' zoos was the Berlin Zoo with its series of temples, pagodas and mosques.

The Antwerp Zoo which is more than 100 years old still contains certain examples of this romantic, 'atmosphere' style. For instance the Egyptian Temple is a relatively faithful reconstruction of an ancient temple on the Isle of Philae. During the epoch when it was built, zoological gardens were still considered as exhibitions of living

curiosities and as pleasure grounds rather than as centres of culture and nature protection. Fortunately a nobler and more sensible idea of what a zoological garden should be gradually became established: that it should have a useful role in the fields of scientific research, popular education, aesthetic inspiration and the protection of rare species. It is only in the last analysis that an animal is a subject of curiosity.

It is generally known that the Antwerp Zoo has been engaged on much cultural, scientific and architectural work for many years. Numerous successful achievements are evidence of this and to them has been added a particularly eloquent example—the new building for anthropoid apes.

Before building the new Ape House we made a very careful study of all the latest technical developments and the experience gained by other people in this field, in particular the New York (Bronx) Zoo. Our aim was to try and achieve the objectives mentioned above and to breed apes in captivity so as to help safeguard the future of these increasingly rare animals.

The Ape House is no longer really 'new'. It has been finished for more than a year now and it has been in use for some time. However, a construction of this nature is not really completed until it has been used intensively for several months and the faults which use brings to light have been corrected. It is only recently that this stage has been reached at Antwerp.

What is there so special about this compact building with its restrained lines and unpretentious appearance which so many foreign technicians have already visited and admired in terms which can make our architect, Mr M. R. Grosemans, proud?

In the first place, it is much more spacious than it appears from the outside and the interior arrangements much more complicated than a visitor would imagine. It is completely functional and every detail of the building is up to date. The special appearance of the building arises from the fact that all the outside architecture is based on the needs of the planning of the interior and the surrounding landscape.

In our northern climate it is essential that anthropoid apes should be able to benefit from sunlight, and it is therefore very important to ensure that their house faces in the right direction. It is for this reason that we did not hesitate to sacrifice an attractive corner of the garden when it was discovered that this position was the only one that met the requirements of the new building. However, in order to preserve the harmony of the landscape we were determined that the building should be as restrained and compact as possible.

The building has been constructed on a slightly lower level than the surrounding gardens. A rustic style with thatched roof was rejected straight away since it excluded all possibility of trapping the sunlight horizontally. The chosen site has turned out to be particularly favourable: no trees have had to be felled and at the same time it has been possible to arrange the spacious terracing in such a way that it receives the full benefit from the sun on clear days.

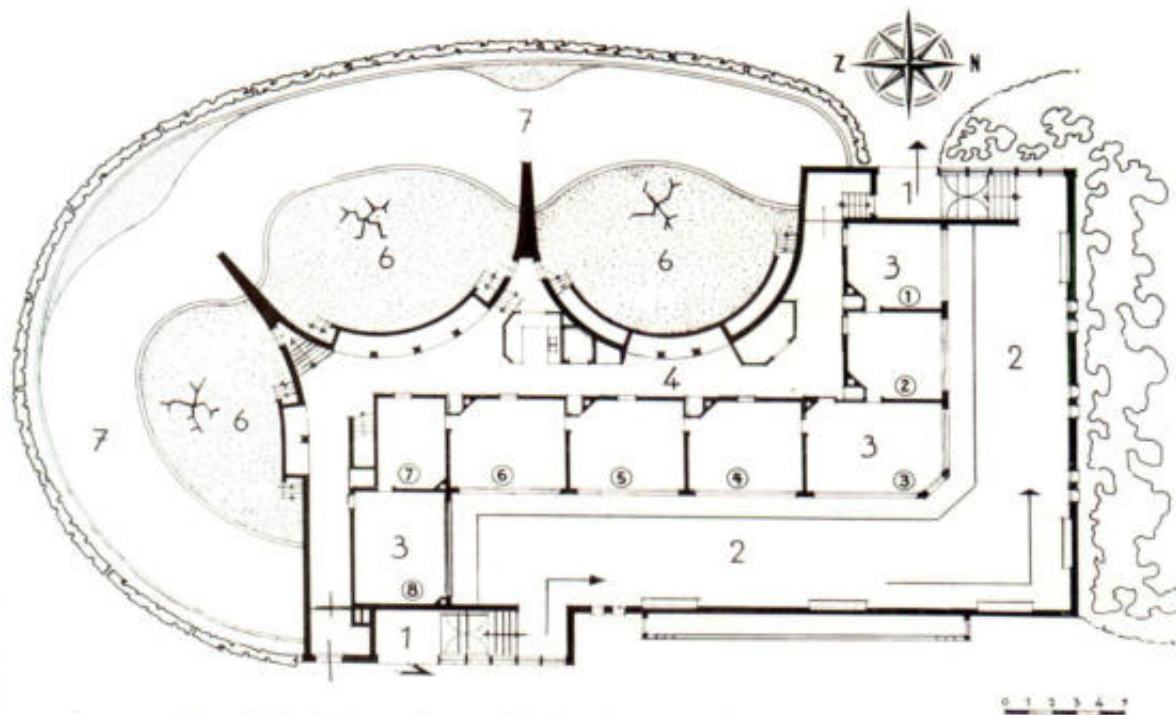
The terraces, of which there are three, are separated from the public and are delimited by a deep ditch four metres wide. We have had to limit ourselves to this width of four metres as there is not enough space to make a wider ditch. It goes without saying that if enough space is available, a greater width would be preferable. An important consideration is that although anthropoid apes may not be able to



Plate 1

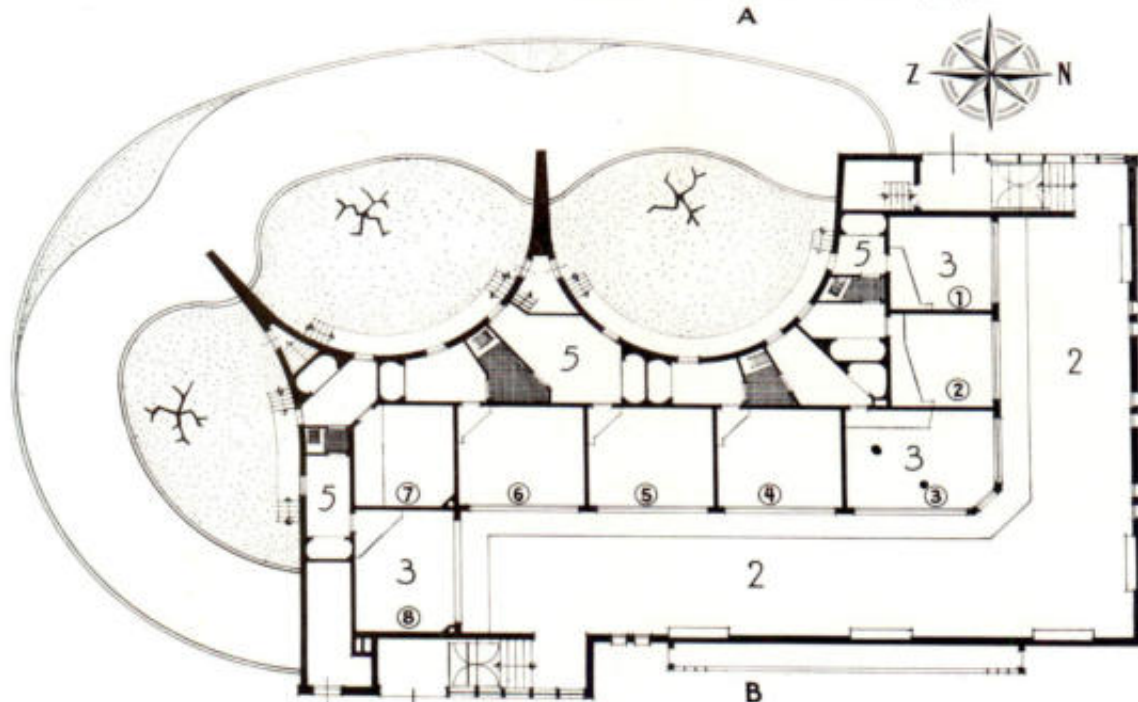
Yves Debraine

"Goma", the young gorilla born at Basle Zoo on the 23rd September, 1959.



Ground plan of the new Antwerp Zoo Ape House, seen from the level of the day cages.

A



B

Legend: 1. The Entrance. 2. The Public Section. 3. Day Cage. 4. Service Corridor. 5. Night Cage. 6. Terrace. 7. Ditch.

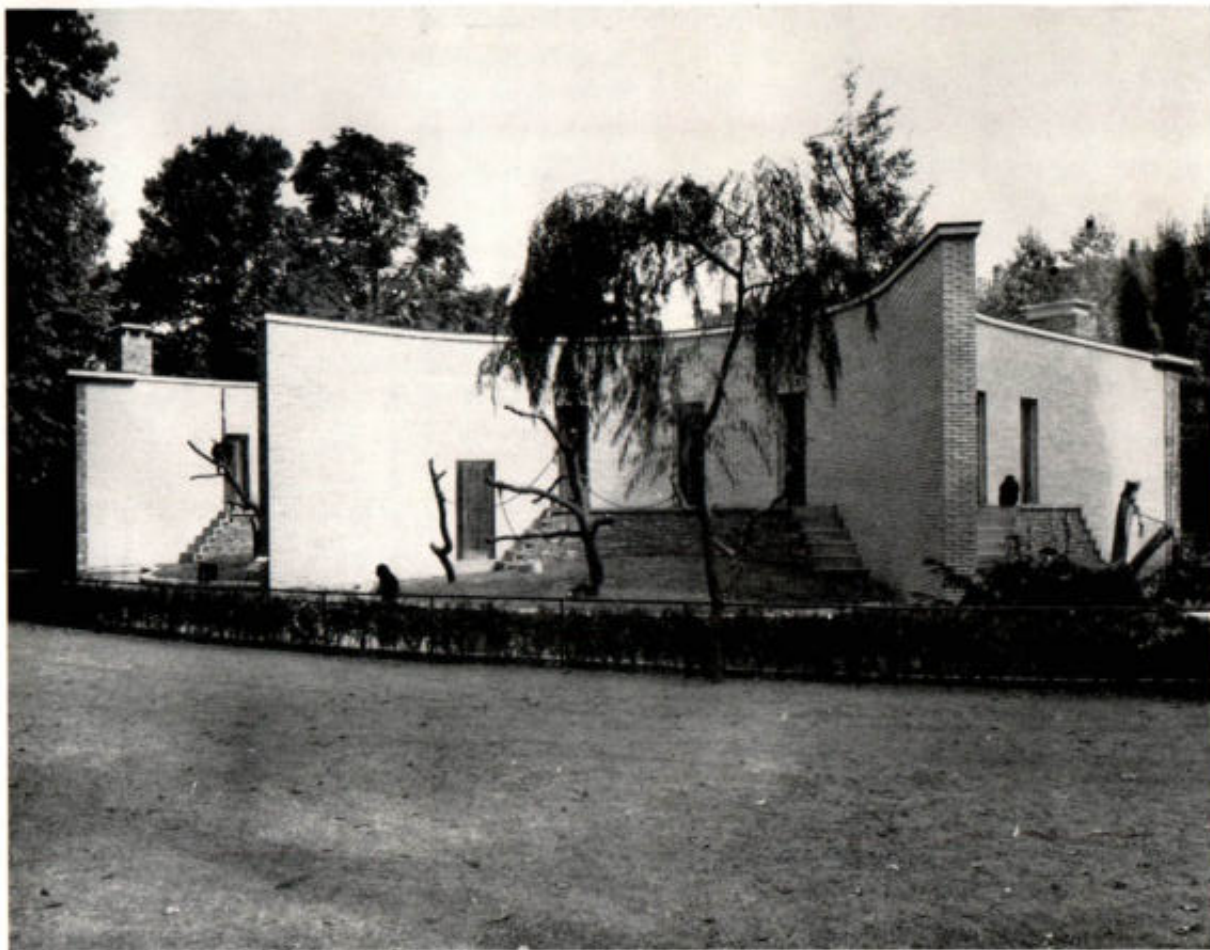
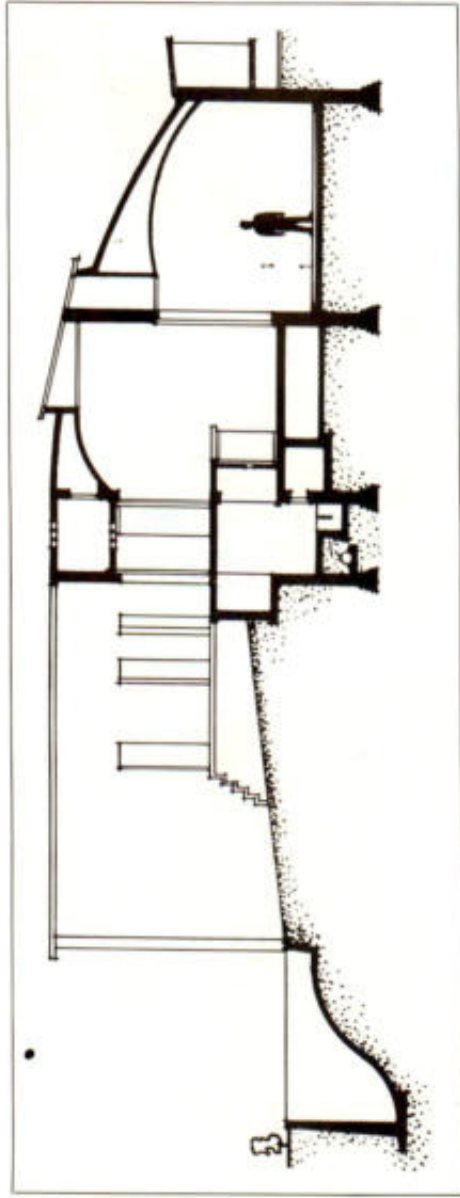


Plate IV

A. Pelegrie

The new Ape House at Antwerp Zoo—the outside terraces, seen from the south-west.
The water-ditch is partly hidden by the hedge.



Cross-section of the new Ape House at Antwerp Zoo.



Plate V

Young Gorilla and Chimpanzees on the climbing equipment in the Antwerp Zoo Ape House.
(See Section I of the *Yearbook*)



Plate VI

Beringer & Pampaluchi

The exterior of the new Ape House at Zürich Zoo. (See Section I of the *Yearbook*)



Plate VII

Beringer & Pampaluchi

General view of the interior of the new Ape House at Zürich Zoo. (See Section I of the *Yearbook*)



Plate VIII

Beringer & Pampaluchi

Interior of the Ape House at Zürich Zoo, showing the climbing equipment provided for the Gibbons. (See Section I of the *Yearbook*)

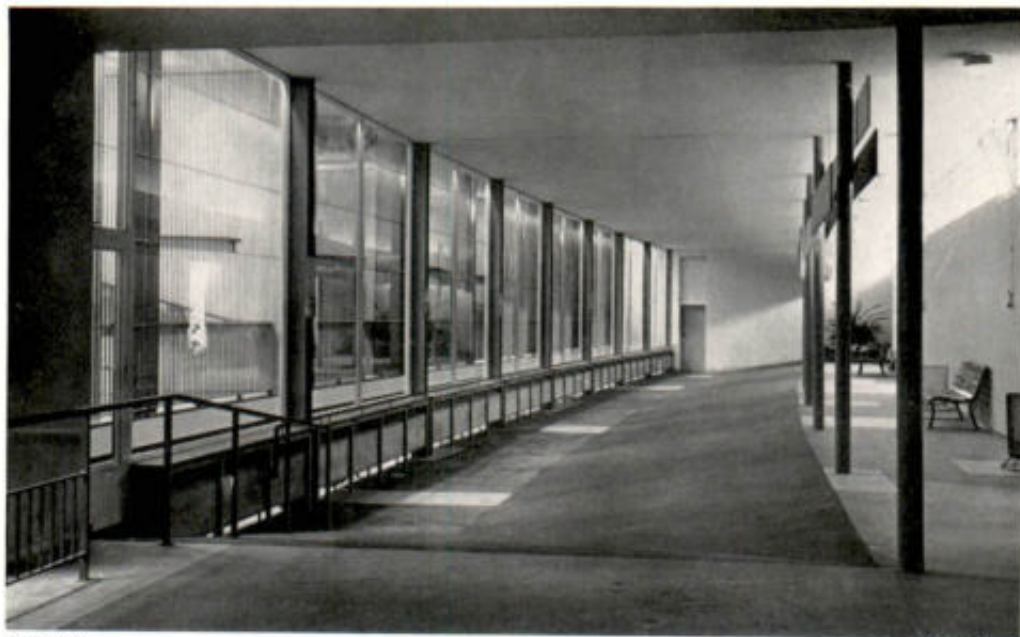


Plate IX

H. Klinge

Interior of the new Ape House at the West Berlin Zoo. Note the slanted floor of the public gallery to facilitate clearer viewing. (See Section I of the *Yearbook*)

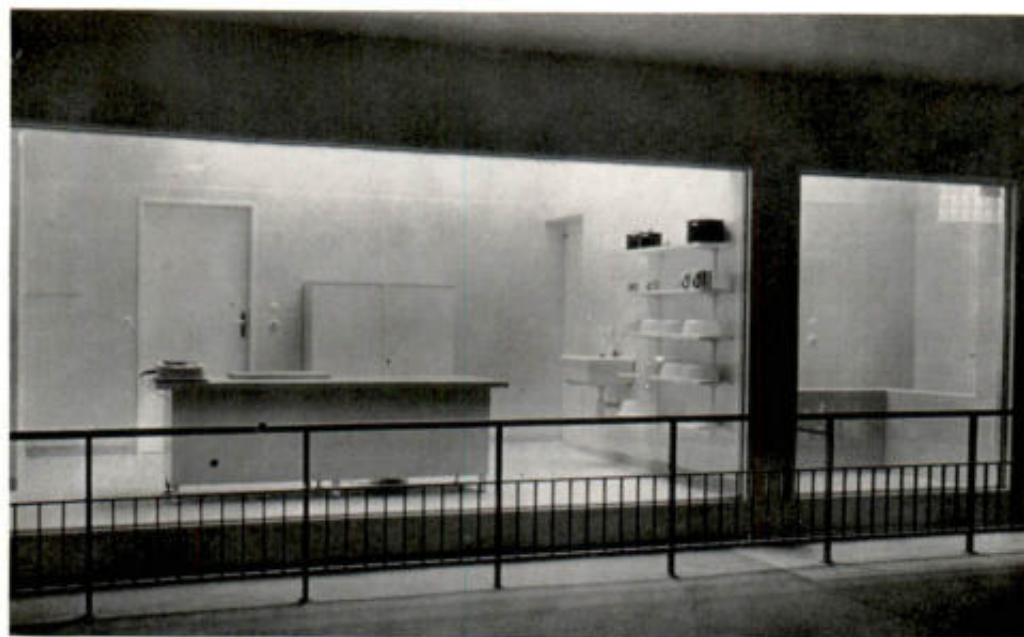


Plate X

H. Klinge

The kitchen and bathroom (right-hand side of the photograph) of the new Ape House at the West Berlin Zoo. (See Section I of the *Yearbook*)



Plate XI

Adult male Orang-utan at the Rotterdam Zoo. The cages are 15 feet high and, as can be seen from the photograph, the Orang-utans make full use of the space available to them



Plate XII

Dr. B. Grzimek

Polar landscape at the Frankfurt Zoo Exotarium (see Section II of the *Yearbook*). The Penguins are kept in an artificially cooled environment (6-8° C. air temperature, 5° C. water temperature)



Plate XIII

The new Okapi Enclosure at the San Diego Zoo

R. Van Nostrand, San Diego Zoo Photo



Plate XIV

W. G. Vanderson, Fox Photos

"Chi-Chi," the Giant Panda at London Zoo, sitting on the weighing machine.
(See Section II of the Yearbook)



Plate XV

The colony of breeding Flamingos at the Basle Zoo. (See Section II of the Yearbook)



Plate XVI

The Field

The Animal Hospital and Quarantine Station at the London Zoo. The photograph shows the ground level exercise yards and the first floor balcony leading off one of the animal wards



Plate XVII

W. G. Vanderson, Fox Photos

The operating theatre at the London Zoo's new Animal Hospital. (See Section II of the *Yearbook*)



Plate XVIII

W. G. Vanderson, Fox Photos

Public demonstration of a Chimpanzee intelligence test at the new Chimpanzee Den at the London Zoo.
(See Section I of the *Yearbook*.)



Plate XIX

A view of the Chimpanzee Island at Chester Zoo.
(See Section I of the *Yearbook*.)

3 swim, they can fall into the ditch accidentally and drown. It is for this reason that the water on the edge of the ditch is shallow so that the animals can easily climb back if they should fall in. However, when the new building was first put into use we lost a Chimpanzee which rolled headlong into the water while playing on the outside terrace and drowned before the keeper could intervene. Since then we have safeguarded ourselves against a similar occurrence by placing a wire mesh barrier between the shallow area of water near the enclosure and the deeper section of the ditch. (See ground plan reproduced on Plate II). Since its installation, the barrier has twice saved two very lively young Gorillas which fell into the water and were able to get out again on their own accord.

Inside, the glass-fronted cages look like empty rooms. Each is a separate unit—ventilation, humidity and heating (radiant heat from the walls and paved floor) can all be regulated separately. Following the example of Brookfield Zoo, Chicago, USA, we used glass for the partitions between the animals and the public; but while at Brookfield electrified glass is used, we chose 'Polyglass'. This is a sheet of glass 2 cm. thick, fixed at the edges to another similar sheet 1 cm. thick; between the two sheets there is 1 cm. of dry air. In this way the cages are insulated against heat and noise and condensation is prevented. The strength of the sheets of Polyglass was laboratory-tested at Ghent University where it was established that they could withstand the weight of a 300 kilo Gorilla charging from some distance above the ground, five metres away. The hermetically sealed glass partitions have the great advantage of protecting the animals from infection and thoughtless visitors are prevented from teasing and feeding the animals.

It is unnecessary to emphasise that the animals can also be observed much better through glass than through bars. Another advantage of the hermetically sealed glass partitions is that the public gallery can be heated and ventilated separately; in the same way the extremely disagreeable smell, up till now one of the inevitable conditions of monkey-houses, is non-existent. The walls of the cages are covered with enamelled concrete; the floor is tiled and a solid iron trellis protects the glass ceiling. Most of the cages are equipped with tubular equipment for exercise and play; and in the cage of the popular Gorilla, 'Gust', we have installed a weighing machine in the shape of a mushroom—each time Gust jumps on to it a needle indicates his weight on a dial placed outside the cage. As well as being a great attraction to the public, the scales enable us to follow the increase in weight of the Lowland Gorillas. (Up till now Gust's weight has increased at the rate of one kilo a month.) This system of weighing is very interesting and if we have the means, we will install similar weighing machines in the other cages. At the back of each of the glass-fronted cages are two doors, one above the other. The lower door leads on to the keepers' service corridor; the upper on to an ante-chamber from which the animals can go into their night quarters, or out on to the terrace. The nocturnal cages, invisible to the public, are situated above the service corridor; each is provided with two or more 'beds' made from a heap of hay placed on a solid shelf, some distance above the ground. The attendants can look after each cage easily from the service corridor—everything has been so designed that it is no longer necessary for the keepers to go into the animals in order to make them change their cages, enter their night quarters or go to the outside enclosure.

Altogether the building contains eight cages, seven of which connect directly with the three outside enclosures. We would have preferred to have each indoor cage leading on to its own outside terrace, but owing to lack of space and funds, this was not possible. For security reasons, certain cages have their wooden doors reinforced by a second door—a solid metal grille. The door and the grille can never be opened simultaneously and there is a double locking system. If necessary, these doors can be manipulated from a distance by a lever which is also provided with a lock. Each lever has a colour and a number which corresponds to the cage it unlocks. In order to save space, and for security and convenience, most of the doors slide shut vertically. The walls at the back of the cages and the doors are fitted with 'judas windows' so that at any moment the animals can be observed. The service corridor can only be reached from the outside of the building. Behind the entrance door there is a second iron grille and each can only be opened with its own key. Thus it is impossible for the animals to escape through the doors to the outside and it is equally impossible for intruders to penetrate where they have no business to be.

From the completely independent service section it is possible to maintain, not only all the cages, but also the loudspeaker system, repairs, forage, water supply, drainage, etc. The walls and floor are covered with tiles and cement throughout. All corners in the building have been rounded to avoid dust traps so that the equipment can be kept scrupulously clean. The effect of all the many double doors, levers, judas windows, ladders and apparatus is to make the service section look like the interior of a submarine!

Unlike the animal section, the service corridors are not air-conditioned. As it turned out, this was a mistake for the corridors were heated only to suit the keepers' needs, not the animals. As the result, whenever the doors communicating with the animal cages were opened, there was a draught. To counteract this, a supplementary heating system has been installed in the corridors.

During the summer four keepers look after the animals. One of them is permanently outside to prevent the public from feeding the animals exhibited on the outside terraces. He also keeps an eye on the animals and is able to intervene in case of need. During the winter there are three keepers. We do not think that a larger number is necessary although the daily cleaning of the cages and the tile-work, all of which are sluiced down with quantities of water, involves a lot of heavy work.

The public gallery is in front of the day cages and is very spacious and well-ventilated. The cages are brightly lit and the public gallery is kept in darkness. As the result the animals are clearly visible and relatively undisturbed. To prevent the cries and various sounds made by the animals from being inaudible to the public on account of the glass partitions, we installed microphones in the cages and linked them up with loudspeakers placed in the public gallery. In this way the visitors have the impression of hearing the animals without interference. As in the Hippopotamus House, there are instructional show cases set into the wall. These contain photographs, anatomical specimens and explanatory charts which give details of certain aspects of the biology of anthropoid apes. They are the work of our associate, Robert Landois.

Of the eight cages that go to make up the building, one has been placed at an angle invisible to the public (cage 7 on the plan) and is intended for a reserve cage or for hospitalisation. However, this cage has not yet been used: if an animal is sick we prefer to transfer it to our quarantine section where it can be under the constant supervision of Professor Dr J. Mortelmans, the Veterinary Surgeon in charge of our Laboratories.

Although the contemporary buildings in modern zoological gardens appear to be infinitely simpler and less imposing than the 'palaces' of the old days, their cost is not lower. Far from it, alas! In the first place, these new functional buildings have to be provided with a great number of special technical devices which are expensive. Secondly, it is not possible to use standard materials suitable for ordinary buildings: they have to be of exceptionally high quality in order to be able to withstand defacement by the public and by the animals. Moreover, it is never possible to copy existing buildings exactly since the methods of exhibiting animals in captivity vary continually and unforeseen problems always occur during construction. In these circumstances it is hardly surprising that the cost of a specifically 'zoological' building is several times higher than the cost of an ordinary construction of the same scope.

THE ANIMALS IN THE NEW APE HOUSE

At the time of writing our new Anthropoid Ape House contains a representative collection of anthropoid apes. It consists of 12 specimens of Chimpanzee (4 *Pan paniscus* and 8 *Pan schweinfurthii*), 3 specimens of Orang-utan (*Pongo pygmaeus*), 3 specimens of the Mountain Gorilla (*Gorilla gorilla berengei*) and 2 specimens of the Lowland Gorilla (*Gorilla gorilla gorilla*). During the warm weather all these species are allowed out on to outdoor terraces. The one exception is Gust, our large Gorilla, who is only familiar with one keeper which would mean that should an emergency arise, the other keepers would not be able to intervene effectively. We had planned to allow the apes out during the winter by leaving the communicating doors open so that the animals would be able to return into the warmth at will. However, we have not met with much success since the Gorillas, for example, allow themselves to get cold and do not have the sense to return indoors to the warmth. At the same time, since we wished to re-grass the terraces and it was important that the grass should be well-rooted by the summer, we renewed the grass and kept the apes indoors. The exercise and play equipment is put to very lively use by the Chimpanzees, the Orang-utans and the Lowland Gorillas. The three Mountain Gorillas seem to prefer to play on the ground, though they climb a lot in the trees in the outside enclosures. It would be premature to say that our anthropoid apes are in better health in the new House, but they are much more easily controlled, better looked after and in every way they are more active.

The new Ape House provides these precious animals with conditions of life that correspond exactly to their biological needs; moreover, they are the object of the constant care of the keepers and the Veterinary Department. Most of the animals are still young; and we shall have to be patient for a little longer before we can record such successful acclimatisation results as we are given every reason to hope for.

THE NEW APE HOUSE AT ZÜRICH ZOO

By Dr H. Hediger

Director of the Zürich Zoological Garden

THE formal opening of the new Ape House at Zürich Zoo, which took place on the 18th of April, 1959, may be regarded as a hopeful sign of the Zoo's awakening from a slumber in which, like the Sleeping Beauty, it has been submerged ever since its foundation in 1929.

The year 1959 was marked by other important events, one of which was the formation of an entirely new Management Committee which will now proceed in earnest with the development of this, the second largest zoo in Switzerland. During 1959 the Zoo had over half a million visitors, which corresponds to roughly 120 per cent of Zürich's population.

The new building is the first one in Switzerland to be specially built for Apes. It has been built at a cost of Swiss Frs. 750.000 by the architect M. E. Haefeli and his colleague Andre Studer, in collaboration with the writer. The necessary funds and land had been granted by the town and canton of Zürich when the Zoo in May, 1956, was voted two million francs and a land increase of two hectares.

The new Ape House has met with the approval of the public and, I think I may be permitted to add, of the Primates themselves, in particular the Chimpanzees whose accommodation had been rather scant.

Today the building houses eight Chimpanzees, two Orang-utans and eight Gibbons. Three of the Chimpanzees were born at the Zoo, in 1955 and 1956 respectively, one—'Fritzli'—was presented to us by Dr Albert Schweitzer in 1958. Orang-utans and Gibbons have been acquired for the new house. Gorillas are still lacking.

One solitary person, an anonymous architect, has—apparently out of deep resentment—strongly attacked the new ape-house in the 'Hauszeitschrift der schweizerischen Architektur' (volume No. 11, 1959). It is evidently quite alien to him. As the Zoo's Director, however, I can only be pleased about this criticism, as he states; 'We are confronted with architecture which, in its quality, is worthy of a church or of some other important building'.

It seems to trouble him that so elaborate a building has been constructed to house animals which, out of the roughly one million species of living creatures known today, are closest to the human being, and this at a moment when we are getting ready to meet Mooncalves and Martians, while on our own planet species after species is being exterminated before having been properly studied.

Our anonymous critic also states: 'The question remains as to how to build human accommodation, buildings for cultural purposes and churches, if all that modern architecture has to offer has been lavished on the monkeys'.

I am convinced that our new Primate House will not be an embarrassment to good Swiss architects when having to build in a style worthy of 'cultural purposes and churches'. They are certainly not so lacking in phantasy and creative powers.

After all, does not the Zoo itself serve cultural, educational and scientific purposes? Our anonymous critic seems unaware that in the second half of our progressive twentieth century 'monkeys' and their monkey business' have ceased

to be purely a popular amusement, and that these animals and their adequate housing might serve scientific purposes. Thus he shows us that—at least in this respect—he is a century behind the times, on the level of the old-fashioned menageries, when animals were at best considered as mobile museum pieces. Somebody who is so little aware of the implications of keeping a modern zoo and has no idea of modern research into animal behaviour, however, in my opinion has no right to judge the merits or demerits of the building in question. It is fortunate that the Zürich authorities, through their recommendations, and the Zürich people, through the extent of their favourable vote, have shown such clear-sightedness in the matter.

Zürich Zoo is situated outside the city proper, on steep, hilly land over 600 metres above sea level, and in winter has to contend with very strong winds, and temperatures down to -20°C . It is a typical mountain zoo. In consequence tropical animals—and most of the primates come under that heading—must be kept in solid, climatically-controlled structures.

Architect Haefeli and his colleagues have made very ingenious use of the steep plot of land available for the Primate House. The House is sub-divided and terraced both inside and out, vertically as well as horizontally, so that a maximum number of visitors may obtain a clear view of the animals. This in itself gives life and purpose to the building, and prevents monotony.

The building is basically divided into three approximately parallel, terraced sections which are sealed off from each other. According to experiences in most of the continental zoos, it is necessary to separate the animals from the visitors, as too many precious primates have become the victims of tuberculosis, influenza, pneumonia and other infectious diseases contracted from the public. We wish to avoid such serious losses by all means in our power. For this reason Chimpanzees and Orang-utans are housed on the West side in one climatically-controlled section and the Gibbons, on the East side, in another separate, climatically-controlled section.

These two sections are divided by the visitors' hall which can be heated and ventilated independently, and is therefore completely free of animal odours. The visitors for their part may smoke as much as they like. Automatic food dispensers offer the visitors the opportunity of an indirect contact with the animals, and at the same time enable the keeper to check both quantity and quality of any food dispensed. A tape recorder plays primitive African and Malayan music in the visitors' hall and this, with the plants which surround the cages, creates a symbolical tropical atmosphere.

While the Gibbons are kept behind glass panes only, the Chimpanzees and Orang-utans are kept behind glass panes and very tough, electrically welded chrome-steel netting with 9 cm. mesh. Visibility is hardly affected by this fine but solid wire-mesh.

In other zoos the existence of glass panes, which are put in purely for hygienic reasons, has often caused light reflections, which can make it difficult for the visitor to detect the animals behind his own mirrored image. Also, the sunlight may be reflected from windows. We tried to avoid these troublesome secondary effects by fitting, instead of windows, very narrow slits, which help to diffuse all outside light.

The cages obtain daylight straight through the roof; alternatively, electric lighting can be used.

The Chimpanzee and Orang-utan cages are not equipped with the more usual climbing branches, but with abstract concrete equipment, horizontal and vertical bars some of which have wooden cuffs, and ropes suspended from the ceiling. There are four such inner and two outer cages, which can be occupied in rotation. Between the inner and outer cages is the keepers' corridor, which ascends at an angle, and the animals' sleeping cages which, in case of need, can also be used as day cages.

Wire tunnels lead from the inner, sleeping cages over the corridor to the outer cages. The tunnels can be locked and used for catching animals, and as operating cages. They can be lowered by means of manual winches on to a small trolley and wheeled, for instance, to the operating theatre.

The two Gibbon cages are equipped with resilient bamboo structures and some thick rope, which give these elegant and acrobatic creatures an excellent opportunity to practice and demonstrate their specific means of locomotion—brachiation. In addition, the Gibbons have a ten metre long cage outside, which is similarly equipped and can be observed from three different levels.

The sleeping cages are situated below the higher-level inner cages, and a small keepers' room adjoins the lower and larger Gibbons' cage. There is sleeping accommodation for a keeper and a toilet on the Chimpanzee side of the house, which is also occasionally used by visiting keepers.

An electric trolley can be wheeled into the ground floor of the building, where the heating and air-conditioning plants, and the public WCs are situated, as are the small laboratory or assistant's room, the air raid shelter (prescribed by law), the kitchen, and the laundry with its automatic washing machine where the monkeys' woollen blankets, towels, keepers' uniforms, etc., are laundered.

South-east from this building a house for rhinoceros and hippopotami will be built in 1960.

THE NEW APE HOUSE AT WEST BERLIN ZOO

By Dr Heinz-Georg Klös

Director of the Zoological Gardens of West Berlin

THE once famous Ape House of the Berlin Zoological Garden was completely destroyed during the war and was only partly restored to accommodate the anthropoid apes and monkey species after almost 15 years. It was one of the most urgent projects in the rebuilding of the zoo to replace this ruin by a modern building designed to incorporate the most recent experience in zoo architecture.

The Ape House was designed by Heinz Diesing, a Berlin architect, who had also built the Elephant House and Hippopotamus House at the West Berlin Zoo.

Specifications of zoological requirements and the number of cages to be installed were supplied by the Zoo Management. The project is to be built in 5 stages, 3 of which have been completed and are inhabited by the animals. The building itself consists of 2 separate structures: one section for the anthropoid apes and one for the lower species. They are only connected by a rain roof for the protection of the public. The building will have an over-all length of 160 metres (about 500 feet) after completion. All outside cages of both sections face south. The anthropoid ape section is about half completed and has four outside and inside cages. There is another cage 36×36 feet with a barless enclosure of 600 sq. feet for baby anthropoid apes. In addition there are kitchen facilities and a bath for the anthropoid apes. Kitchen and bath are on view to the public through huge glass panes. Each cage is 27 feet long, 18 feet deep and 14 feet high and tiled throughout. Tiles are alternate light green and yellow, thus contrasting the black Gorillas against yellow and the red-brown Orang-utans against the light green background. All inside cages have glass panes in front of them, which has proved beneficial to the animals condition. The area for the public is 22 feet wide and slanted to provide better viewing when the house is crowded. The flooring is slip-proof. The public area is darkened, all light coming from dome-shaped, double-paned, overhead windows of plexiglass above each cage.

The anthropoid ape section accommodates 2 Gorillas, 5 Orang-utans and 7 Chimpanzees at present. The section for monkeys which has been completed so far, has 8 inside and outside cages. Here the cages (measuring $14 \times 12 \times 10$ feet) also have glass panes in front of them. The oil-heating system for the whole building is located in the basement of the ape section. Both structures have 2 storeys. The second floor consists of 16 smaller inside and outside cages, each for ill or convalescent animals and a small dispensary for the Veterinarian.

The removal of the old Ape House eliminated the last ruin from the worst hit zoo in Germany and the Berlin Zoological Garden is again on the way to becoming one of the most important in Europe.

THE NEW APE HOUSE AT TOKYO ZOO

By T. Koga

Director of the Ueno Zoological Gardens

•
The old Hippopotamus House has been converted into the new Ape House at Ueno Zoological Gardens, Tokyo. Designed by the Zoo Architect, I. Mitsuhashi, it was opened on July 27, 1957, and it houses Chimpanzees, Orang-utans and Gorillas.

The 6 indoor cages are glass-fronted and the animals are completely separated from the public. The 3 outdoor enclosures are moated, and in front of the ditch there is an area about 1.8 metres wide which is planted with flowers and trees. This

area helps prevent visitors from throwing food to the animals and it stops them from seeing the ditch.

The keepers' passage runs between the indoor and outdoor enclosures and above it there is an animal corridor connecting the indoor and outdoor enclosures.

The new Ape House at Ueno owes much to the kind help and suggestions of Mr Robert Bean, the Director of Brookfield Zoo, Chicago, USA, and Dr Tee Vann and his staff at the Bronx Zoo, New York, USA.

KEEPING APES AT ROTTERDAM ZOO

By Dr A. C. V. van Bemmelen

Assistant Director of the Royal Rotterdam Zoological Gardens

THE Royal Rotterdam Zoological Garden has a special interest in keeping and breeding apes. The collection contains 5 common Chimpanzees (*Pan satyrus*), one Bonobo or Dwarf Chimpanzee (*Pan paniscus*), 8 Orang-utans (*Pongo pygmaeus*) and a pair of Lowland Gorillas (*Gorilla gorilla*). The Ape House was built in 1939. The inner cages of the circular building face the space provided for the public in the centre of the building. Public and animals are separated from each other by bars and glass panels. The cages are roomy and high, the height being more or less 15 feet. They receive their light through a glass roof. Between the outer wall of the building and the inner cages, there are two service passages. The upper one encircles the top of the inner cages, offering through the barred top of these cages a clear view inside. In the outer wall of this passage there are panels, which can be opened and which give the building excellent ventilation without any draught.

The lower passage is connected with the inner cages by doors and steel slides. At the southern side of the building large outside cages have been built on what was originally an open terrace, separated from the public by a deep, concrete trench. The doors of the inner and outer cages can be connected by steel-barred doors which thus form a passage crossing the lower service passage. Originally there was a passage between both serviceways, which was meant for the animals to go from the outer to the inner cages. This, however, proved to be impractical. The animals simply refused to enter it.

Each inner cage is provided with one or two sleeping boxes, with bars in front; a door at the lower service passage; and a slide opening on to the inner cage. The animals can sit on top of these boxes. Part of the inner cages also have a wooden platform.

The heating of the building is provided by central heating pipes between the glass panels surrounding the space for the public and the barred front of the inner cages. Furthermore, there is a heating system under the concrete floors.

The building is kept rather cool, compared with former ideas about temperature in an ape house. The building is hardly ever heated over 62°F. Good ventilation,

fresh air, moderate temperature and painstaking cleanliness keep the atmosphere in the building free from any disagreeable odours.

The circular shape of the building has the disadvantage that outside cages could be placed only on the southern side. Slow moving animals, such as the Orang-utan, cannot be summoned to make the long walk round to the outside cages if housed at the north side interior rooms.

Rotterdam Zoo has a special feeding system for the apes. The principal characteristics of this system are, that no food is ever cooked and no meat is ever given. The bulk of the diet consists of a dough made from wheatflour (50), sugar-molasses (100), rice-flour (50), whole wheatbread (80), eggs (50), sunflower-seed oil (15), honey (50), sea-salt (15) and 'Liga' baby biscuits (45). The largest apes, such as the full grown Gorilla, receive one pound of this dough daily, the others a quantity that varies according to their weight. The diet also includes vegetables and fruit. A fully grown Gorilla receives 4 pounds of lettuce, kale or other green vegetables as available, one pound of carrots, apples, half a lemon and two or three oranges. Occasionally extra vitamins, bananas, an onion, garlic, yeast, fruit juice, etc., are given.

This system has proved rather successful. In ten years time the only losses have been of one old male Orang-utan, and one full-grown female Chimpanzee which died through sepsis after a miscarriage. Other casualties occurred only with newly imported animals which had not yet left quarantine.

During these ten years one Chimpanzee and six Orang-utans, all of them sired in the Zoo, were born and all of them survived. The eldest of these, a male Orang-utan, is now eight years old. Miscarriages have occurred twice, both times to Chimpanzees. The newborn animals have all been accepted and nursed by the mothers.

The female Orang-utan 'Tineke' (imported November 1950) gave birth to young November 1951, October 1956 and July 1959. The first one was sired by the male 'Bonzo' (imported 1949), the other ones by the male 'Adriaan' (imported 1951). The other female Orang-utan 'Julia' (imported 1951) gave birth for the first time October 1953, and again after that January 1957 and February 1960. All these have been sired by Adriaan. The breeding animals all came from North Sumatra.

As she is his favourite, the female Orang-utan Tineke, lives together with the male Adriaan, even if she has a baby. Julia is only brought together with the male if she is on heat.

Birth has always taken place without any trouble. Most of the births could not be observed. Five times we found the mother in the early morning, happily nursing the baby. Julia's last baby was born in the afternoon, hidden in a huge nest of straw. The young have to be separated from the mother at about 1½ to 2 years. If the babies stay longer with the mother, they stop growing. Possibly food-competition between mother and child is the reason for this.

It should be mentioned here, that diet, fresh air and moderate temperature may be of great importance in breeding Orang-utans. But another factor could be the height of the cages. Copulation takes place in a hanging position. If the male is very large and the cage not high enough, copulation can be prevented through lack of space.

Other diets and systems may be just as successful as those used at the Rotterdam Zoo. The animals in Rotterdam are pure vegetarians. Other Zoos have bred apes on a diet with lots of meat. If Rotterdam carries on with the system now adopted, there is no other reason than the old slogan: Never change a winning team!

EXPERIMENTS WITH A CHIMPANZEE COLONY AT CHESTER ZOO

By G. S. Mottershead

Director of the North of England Zoological Society, Chester

FOR many years I have felt that to confine Chimpanzees and Orang-utans in cages is not conducive to their health and happiness. I was sure that if they could be kept within bounds and yet lead an active, out-door life, that they would be less susceptible to the various bronchial ailments which often trouble Chimpanzees in captivity.

With this idea in mind, I decided to experiment with these anthropoid apes, and in 1956 a special enclosure was constructed at Chester Zoo. Naturally the animals had to have indoor sleeping quarters, and it was also essential that they had some sort of a covered 'playground' which could be used in very bad weather, but in the main my idea was to allow them to spend as much time out of doors as possible.

For those of you who have not seen the Chimpanzees at Chester I will explain that the Ape House is really only part of a much larger structure to be known as the Tropical House. The windows in the sleeping dens will eventually open into part of this Tropical House, where there will be a humid atmosphere; at the present time the windows look out on to an area which is undeveloped.

During the day time if the animals are indoors they can be seen from the public passageway in the Ape House, where they are viewed through windows of armour-plated glass. If, however, the Chimpanzees wish to go out of doors on to the islands which surround the building, they use the door from their covered playground, underneath the public passageway.

The Chimpanzees are confined on the islands by means of shallow ditches filled with water, varying in depth from a few inches at the water's edge to about 3 feet in the centre of the waterway. Originally the waterways were about 12 feet in width, but it was later decided to widen them and at the present time they vary from 14 feet to 17 feet across.

Strangely enough, during all the years the Chimpanzees have been kept on islands at Chester Zoo, they have never made a determined effort to jump from one bank to another. Most of them will go only to the edge of the water. One Chimpanzee which had been brought up as a pet with humans and had been used to being bathed every day, took a great delight in wading into the water (so long as the water covered

only his legs) and throwing water at the visitors. Nevertheless he never actually crossed the ditch.

In 1957 one of the female Chimpanzees had a youngster, and on one occasion when the mother and baby were on one of the islands the youngster was playing by the edge of the water while the mother sat perched on a tree, several feet from the ground. The baby accidentally fell into the water and at once 'Meg', the mother, took a flying leap at the baby and grabbed it, but the impetus of her jump carried her right into the water. Unfortunately she scrambled out on the wrong side of the bank, still clutching the baby to her; they were both covered with duckweed and a pathetic sight. No amount of persuasion with planks or ladders would induce Meg to take her youngster back again and eventually a window was removed from the indoor quarters and Meg carried her baby back that way. This was the first occasion that a Chimpanzee had actually crossed the water, and it was a pure accident.

Some months later we received a male Chimpanzee of a very robust nature and one who was obviously psychologically unbalanced in many respects. 'Compo' was boisterous to say the least of it, and very excitable. When he was liberated on one of the islands he discovered a large piece of concrete which had been left in the water between two of the islands; having observed this he took a running jump on to the piece of concrete and then jumped on to the next island where he was attacked by his neighbours. He was separated, and as he was of such a violent disposition, it was decided to keep him indoors for the rest of his life.

It now seemed fairly safe to assume that Chimpanzees could be confined by water ditches, and no further trouble was experienced until last year. One very warm day last summer, 'Joe', the Chimpanzee which liked to stand in the water and splash the visitors, decided that he would join the other Chimpanzees on the next island. At first everything appeared to be going smoothly when suddenly the other males attacked him. After a struggle he managed to break away and crossed the water back to his own island, only to be followed by 'Solomon', one of the largest Chimpanzees at the Zoo. Joe did not stop on his island but crossed the water to the next island; from there he crossed to the island used by the Orang-utans, and from this island out into the Zoo grounds. Fortunately Joe is a very docile Chimpanzee and we were able to put a chain on him and to lead him back to his indoor quarters.

We were rather worried to think that Solomon would cross the water after Joe, and after this incident we wondered what would happen next. We were therefore very cautious and every day looked to see what reactions were taking place. For a while everything appeared to be normal until one day several weeks later Compo succeeded in jumping a wall over 12 feet high in his indoor quarters, and escaped through one of the ventilators. He was spotted at once by the other Chimpanzees on the islands and Solomon crossed the water immediately, and attacked him. After a struggle Compo broke away, made off across the fields, and was eventually shot. Solomon was persuaded to go through the indoor way to his island.

As a result of this escapade, it was felt that it would be wiser to install an electric wire in the centre of the waterway so that if a Chimpanzee attempted to cross, he would receive an unpleasant shock. The wire which was used was the same as that used for electric cattle-fencing.

As soon as the wire was in position, Solomon went to investigate. He touched the wire and received a shock, looked at it and touched it again with the same result. Without further ado he went to each Chimpanzee in turn and apparently conveyed to them that this was something dangerous. 'Elmer', the largest Chimpanzee then obtained a small twig from a willow tree, and whilst the other Chimps watched him, he cautiously touched the wire. Naturally he received a shock, and dropped the twig. Since that day the Chimpanzees have made no attempt to get into the water.

I have now come to the conclusion that it is quite safe to confine Chimpanzees by a barrier of water, providing that the water is at least 15 feet in width and not less than 4 or 5 feet deep. It is of course a great advantage if the surrounding area used by the public is slightly higher than the islands where the Chimpanzees are, but if this is impossible I would suggest widening the water barrier. To my mind, the water bed should slope to the bank, so that if a Chimpanzee falls into the water, it is able to walk out. A waterway constructed of clay, etc., is far more advisable than one constructed of concrete, as in my opinion a concrete pool which is the same depth all round would prove to be rather dangerous. It is possible that a Chimpanzee might accidentally fall into the water and drown since it is very questionable as to whether it would swim.

There is another point I should like to make. At Chester Zoo the Chimpanzees go out to the islands from their indoor quarters by means of a passageway underneath the public gangway; this gangway is approximately 5 feet from the ground. From it the public view the Chimpanzees through windows of armour-plated glass, and the bottoms of the panes are a total height of 8 feet from the ground. The Chimpanzees jump up and hit the glass continually, with great force and to the great delight of the public. If I were constructing another similar house for Chimpanzees, I would make the windows three feet higher than they are in our present Ape House, *i.e.*, 11 feet from the ground—as a further precaution.

THE NEW CHIMPANZEE DEN AT THE LONDON ZOO

By Dr Desmond Morris

Curator of Mammals at the Zoological Society of London

IN the summer of 1959 the London Zoo opened to the public for the first time its new Chimpanzee Den in the remodelled and extended Children's Zoo. In this new ape building four demonstrations of Chimpanzee behaviour are given every day, summer and winter.

For many years the Chimpanzee tea-party on the central lawn has been a popular feature of the summer season at the zoo, but its appeal has always been frankly anthropomorphic and it can have done little to illuminate the true personality of the

Chimpanzee. To do this it is necessary either to present the animals in a natural family group in a large wooded enclosure, or alternatively to provide a more serious demonstration of their most impressive characteristic, namely, their strikingly high degree of intelligence.

For larger zoo-parks, the natural wooded enclosure is an obvious development for the future, both for exhibiting and for breeding great apes in captivity. But for the more restricted city zoos, the space required would be prohibitive. Instead the accent must be on the demonstration in admittedly artificial surroundings of the Chimpanzee's powers of learning, memory and manipulative skill.

It was with this last point in mind that the new Den was designed for the re-built Children's Zoo at Regent's Park. Luckily a great deal of experience had been obtained during the past few years when live weekly television programmes were transmitted from a 'Television Den' in the Zoo. This TV Den was erected inside the Zoo for the weekly Granada TV programme 'Zootime', the star of the show being a Chimpanzee called 'Congo'. Each week Congo appeared and was expected to demonstrate some new facet of his intelligence on each occasion. Since well over a hundred of the TV programmes were transmitted, it is not surprising that every conceivable piece of Chimpanzee intelligence apparatus was brought into action, that every gymnastic or manipulative skill was tested to the full. The series ended just before the Children's Zoo was due to be remodelled and it was felt that the most successful Congo tests should be retained permanently as a public demonstration with other young apes. The tea-party Chimpanzees were therefore transferred from the Monkey House to the Children's Zoo and installed in the new building.

Basically the new Den consists of a stage with large sleeping quarters on either side, tiered seating for the public in front of the building and service rooms behind. At set times in the morning and the afternoon the Chimpanzees emerge from their rest rooms and for half an hour or more go through a series of tests, gymnastics and intelligence problems for the dual benefit both of themselves and the visitors.

The tests that have proved most popular are as follows. Firstly, the aiming test in which a Chimpanzee is presented with an apparatus like a 'coconut shy' scaled down to take grapes instead of coconuts. The animal has to aim with a ball at the row of grapes and if it successfully knocks one off one of the sticks, the grape then rolls down a slope towards the Chimpanzee and it gets the reward. This test has been particularly successful in demonstrating the exact aiming capacities of Chimpanzees and it has shown that, although they are almost as good as man in this respect, they lack his powers of concentration. If the first aim at a particular grape by an ape is compared with that by a man, then the two species are similar in skill. But if the first few shots at it happen to be unsuccessful, the difference between the two contestants quickly emerges. The man at this point begins to concentrate more and more until he is successful, whereas the Chimpanzee rapidly loses patience and his aim deteriorates. If the aiming tests are made too difficult, the ape is even likely to wreck the apparatus. But despite these differences, it is amazing just how far a good Chimpanzee will go towards learning to cope with the problem and this particular demonstration never fails to excite both performers and public.

Secondly, there is the weight-lifting test. Here the Chimpanzee sits at the end of a long thin table. In the table there is a groove along which runs a tray. On this tray

there is the food reward for the test and all the animal has to do is to pull the tray towards himself by means of a long rope attached to its near side. On the far side of the tray there is a second rope that travels up over a wheel and then down to a pan of weights. By increasing the number of weights on the pan it is possible to make it more and more a test of strength for the Chimpanzee to pull the food reward towards itself. In this way it is possible to study the way in which the increase of the weight of the young growing Chimpanzee is related to increases in the animal's strength. If an ape is growing and getting heavier but without the appropriate increase in muscular strength, then obviously, there is something wrong with the animal. Thus it is possible to keep a close check on the animal's growth and physical progress.

Thirdly, there is the manipulative test, in which the Chimpanzee is presented with a tilting board and a stick. In order to obtain the food reward—a grape—it has to push the stick first into a hole on one side of the board and then into one on the other side. Each time it presses the stick into the hole it tilts the board in that direction and the grape rolls down one section of a zig-zag path cut into the surface of the board. Each time the stick is used, the grape passes along another stretch of the path until eventually it arrives at the end and can then be reached by the ape's hand.

There are other manipulative tests, including a 'chimpanomat' slot machine (first developed at the Yerkes Laboratory in America). With this, the apes can be given money instead of food. They can then spend their coins in whichever machine they like according to their food preferences. The machine is similar to a human-operated slot machine, except that it has a side lever to be pulled down to open the reward draw. This draw then shuts automatically. On human-operated machines, the purchaser must shut the drawer himself, but the ape is too inclined to put in another coin while the drawer is still open and thus interfere with the operation of the apparatus. It is striking to watch the manipulative skill with which a Chimpanzee can insert a coin into a small slot and is an interesting comment on the alleged awkwardness of the Chimpanzee hand.

An even more subtle manipulative test involves the obtaining of food from a locked cupboard. The ape is here given a bunch of keys and must operate the lock itself if it is to obtain the reward. Once again, the public are fascinated to watch the detailed skill of this remarkable species.

At the end of a session the apes are allowed a free period of gymnastics, with balancing, swinging and climbing apparatus and in addition to this there are several 'staged' meals a day, one of these being the perennial tea-party out on the central lawn. Far from being over-worked, exhausted Chimpanzees, these demonstration Chimps are the healthiest, most intelligent and most alert that I have ever seen in captivity. They obviously benefit tremendously from their varied and complicated activities and one is immediately struck by the need for introducing some similar kind of occupational therapy for adult Chimpanzees and for other Primates. Since adults cannot be handled safely and bearing in mind their great strength, this problem for the future promises to be a particularly hard one to solve.

In conclusion a few words should be added concerning constructional difficulties with the new Den. For veterinary reasons, it was agreed to separate the public from the apes by glass. The need for isolation of this sort has long been advocated by

veterinary experts and is now practised in most major zoos, although it has recently been pointed out that apes isolated in this way still suffer from coughs and colds and that there is something to be said for permitting the animals to develop a natural resistance to infection. It is argued that, by giving them an isolation that can never be complete, as they work in close contact with their keepers, they are prevented from developing any resistance to respiratory infections, so that when they are, on rare occasions, exposed to a mild infection, they fall prey to it much more readily. At the present stage, much more detailed evidence is needed before this particular argument can be settled.

The present Chimpanzee Den, as already mentioned, followed the current practice and a large armoured glass screen was installed across the front of the stage. In order to prevent reflections, two measures were taken. First, floodlighting was installed in the roof of the den, behind wire to protect it from interference from the Chimpanzees. This helped to tip the light balance slightly more in favour of the interior area, but the public sitting out in the open were still in the more brightly lit area. Secondly, the glass screen was tilted upwards at an angle that reduced reflections to a minimum. Reflection from the bright sky was eliminated by building out a horizontal shield from the front of the roof of the den and painting the underside of this a dull black. This shield also protected the front rows of seats from the rain and the smaller crowds that visited the 'Den' on rainy days were therefore able to watch the performances in comfort.

When the rebuilt Children's Zoo was opened to the public, it was an immediate success and whereas previously only one in ten of the visitors to the main gardens also entered the children's section, this figure now rose to one in six. There was little doubt, moreover, that the real cause of this increase was the new Chimpanzee Den. The crowds there were so dense during the summer that in the winter of 1959, it was agreed to treble the size of the public area and to build fully tiered seating on a much larger scale so that, in the summer of 1960, even larger crowds would be able to watch the various demonstrations of these remarkable creatures.



SECTION II

**NEW DEVELOPMENTS
IN THE ZOO WORLD**

NEW DEVELOPMENTS IN THE ZOO WORLD

PUBLICITY

FILMING AT THE LONDON ZOO, GREAT BRITAIN

During 1959 the Granada/Zoological Society Film Unit completed a series of thirteen films on different aspects of animal behaviour. Each film is black and white 16 mm. sound (English commentary): running time 25 minutes.

1. "*Table Manners*" Shows patterns of feeding behaviour in a number of different species with emphasis on the way in which animals prepare their food. Items include a thrush at its anvil beating snails from their shells, and a comparative study of egg-smashing behaviour in the Coati-mundi, the South American Raccoon, the Marsh Mongoose and the Dwarf Mongoose.
2. "*Safety First*" Illustrates some of the ways in which animals are protected from their enemies; ranging from camouflage in the Mata Mata and Stick Insects to deflection devices in fish and moths and countershading in caterpillars. Various warning displays are also shown, including those of the Skunk, the Cobra and the Rattlesnake. Highlights include a Cuttlefish eluding a Roman Eel by releasing a cloud of ink.
3. "*Armoured Corps*" The Armoured Zonure, the King Crab, the Crested Porcupine, the Dragon Fish, the Hermit Crab and other animals which have protective armour are featured. The efficiency of various kinds of armour is tested. Capuchins are shown trying to hammer open mussels and an Otter catches and eats a Crayfish. Pike and Perch attempt to eat Three-spined Sticklebacks. The Pike succeeds, but the Perch quickly learn to leave the prickly morsel alone.
4. "*Spick and Span*" Illustrates some of the ways in which animals keep clean and comfortable. It includes the cleaning patterns of rodents, social grooming in monkeys and apes, scratching patterns in mammals, fish chaffing and bathing patterns of birds including the Humming Bird, the Java Sparrow, Ducks and Flamingos. Of special interest is a slow motion sequence showing Starlings "anting".
5. "*On the Move*" Shows something of the impressive variety of types of locomotion found in animals which live in the water. The scope of this film takes in the Volvox, Stylonichia, and other microscopic organisms, Echinoderms, Crustaceans and the Octopus. A number of locomotory patterns in fish are shown including those of various Eels, the Gurnard and the Mudskipper. Part of the film is devoted to aquatic insects and reptiles and to aquatic mammals such as the Coypu and Hippopotamus.
6. "*Early Days*" An intimate picture of the lives of very young animals and parental offspring relationships. Many Zoo favourites are included, a Sea Lion pup with its parents, baby Rhesus Monkeys, a baby camel only a few hours old and tiny bear cubs in their winter den. Items of special interest show the parental care of the Giant Blue Centipede and the development of a wallaby from a month-old embryo to the time when it leaves the pouch.
7. "*Playtime*" Shows some of the aspects of behaviour usually described as play in young wild and domestic animals, including amongst other examples, play-hunting in a domestic kitten, a tiger cub and a leopard cub, and the investigatory behaviour of fox cubs. Part of the film analyses certain "playful" activities which occur in adolescent, or adult animals in Zoos, including chimpanzees, elephants, a polar bear and the Giant Panda.

8. *"Nesting Time"* A study of some of the different ways in which birds build their nests and rear their young. The nest-building behaviour of a number of birds including Quaker Parakeets, Cormorants and Swans is shown; and parental behaviour in Thrushes and Gannets. House Martins are featured building their nests of mud pellets and feeding their offspring whose growth is followed through the season.
9. *"At Home"* Shows some of the different kinds of shelters which animals use when they hibernate, rest or breed. Included in the film are sequences showing the community life of Prairie Dogs; the roosting behaviour of Starlings in the country and city and the coastal caves in which British Bats hibernate during the winter.
10. *"No Holds Barred"* Illustrates some of the different techniques used by animals and plants, which prey on other creatures. Many animals, including Sea Anemones, Preying Mantids and a Bushbaby are shown in action and a number of insect-eating plants trapping prey, including the Venus Fly-trap, the Pitcher Plant and the Sundew. There is a dramatic sequence in which an Ant Lion digs its pit and ambushes ants.
11. *"Courtship"* Of particular interest is the courtship and spawning of the Siamese Fighting Fish; the territorial and courtship behaviour of the Three-spined Stickleback; and a comparative study of the dances and songs of two species of Estrildine Finches, the Gouldian Finch and the Cut-throat Finch.
12. *"So Much Like Us"* A study of the behaviour of the Chimpanzee and the Orang-utan. The film deals with their reaction to snakes, investigatory behaviour, intelligence tests, weight-lifting apparatus, and their aiming accuracy. Of special interest is a section dealing with the analysis of drawings and painting produced by a Chimpanzee.
13. *"Family Portrait"* A study of the Great Apes, including items on the Gorilla, the Chimpanzee, the Orang-utan and also the Gibbon, showing their different features, the way they feed, their social grooming and bed-making. Of special interest is the item dealing with their fear of mushrooms!

In addition the Unit has produced three veterinary films, in co-operation with the Zoological Society's Hospital.

- | | |
|--|--|
| 14. <i>"Anaesthesia for Bone Plating in a Leopard"</i> | 16 mm.; colour; no sound
running time—app. 20 mins. |
| 15. <i>"Colostomy Performed on a Python"</i> | 16 mm.; colour; no sound
running time—app. 10 mins. |
| 16. <i>"Removal of a Fibroma from a Tasmanian Devil (Sarcophilus)"</i> | 16 mm.; colour; no sound. |

ARCHITECTURE

REBUILDING THE LONDON ZOO, GREAT BRITAIN

The plans for the new London Zoo have been prepared by the architect, Sir Hugh Casson, in association with Mr. F. A. P. Stengelhofen, the Zoological Society of London's architect.

These plans envisage the gradual replacement of nearly all the present animal buildings by new constructions of modern design and the introduction of a number of new architectural and landscape features. No proposals are made in the present plan as to the architectural appearance

of the new buildings which will be the responsibility of the architects who will be appointed to execute the work. Although the present boundaries of the Zoo remain unchanged, discussion is proceeding with the Ministry of Works and the Crown Estate Commissioners to find out whether the natural features along the southern boundary can be so landscaped as to make the Zoo and Regent's Park (which is a public park completely separate from the Zoo) appear as one. Before describing the proposed plans, a short description of the general layout of the London Zoo is necessary.

The London Zoo is built on land belonging to the Crown. It is divided into three sections, the North, Middle and Main Gardens. Originally the Zoological Gardens consisted of an area of land bounded on three sides by Regent's Park, and on the fourth by a public road, the Outer Circle of Regent's Park. To the Main Gardens was added a further section, the Middle Gardens, divided from the rest of the Zoo by the Outer Circle and separated from the northern part of Regent's Park by the Grand Union Canal. The last important addition to the London Zoo was a strip of land on the north side of the canal, the North Gardens. The North and Middle Gardens are connected by bridges over the canal; the Middle and Main Gardens are connected by two tunnels underneath the public road.

REPLANNING THE NORTH AND MIDDLE GARDENS

The North Entrance is to be moved slightly and a new bridge built across the canal in order to improve the flow of traffic (pedestrian) and prevent congestion. The North Gardens will include a new Children's Zoo and a new Aviary. The Middle Gardens will retain the present Giraffe House, the Gorilla House (at present housing Kodiak Bears) and the Administrative Offices which will be extended to include a new Meeting Room for the Society's scientific and business meetings, and an Education Centre. The new buildings to house small mammals will be erected on the site of the present Elephant House and Paddocks, and the maximum use will be made of the ground on both banks of the canal for paddocks and shelters displaying mammals and birds.

THE MAIN GARDENS

The Mappin Terraces (enclosures for goats and bears featuring large artificial rocks), the Aquarium, the Reptile House and the old Camel House (the oldest building in the Gardens, erected in 1836 and designed by the architect, Decimus Burton) will remain, as will the large Restaurant buildings. The new layout will include a system of elevated walkways, beginning at the Main Gate (which will be moved slightly to give a view down a broad piazza to the Park) and incorporating the present Decimus Burton terrace and steps. These walkways will connect up with the main animal houses at first floor level and will provide a covered route at ground level. A terraced arena is planned for displays, including the Chimpanzees' Tea Party, and the various ponds in the Gardens are to be increased in size and connected with each other.

CARRYING OUT THE PROGRAMME

The first phase of the new plan has already begun. It includes the new Animal Hospital (already built), the Works Department (completed) and the Supplies and Transport Buildings (completed in 1960). The second phase, the demolition of the present Works Department in the Middle Gardens, has also been finished. The reconstruction of the Giraffe House, the terracing of the Canal Banks and the building of a new bridge will begin in 1960. The third phase, to be started in 1961, will see the new Elephant House built on the site of the present Antelope House. Further phases will follow. It is estimated that the whole plan will take not less than ten years to complete.

THE EXOTARIUM AT THE FRANKFURT ZOO, GERMANY

The Frankfurt Zoological Gardens, Germany, have a proud tradition regarding the exhibition of aquaria. And although the Frankfurt Aquarium was not yet completed when the Zoological Gardens were opened in March 1874, by the beginning of the nineteenth century, Freshwater and Marine Sections had been established. In 1907 a tropical marshland for crocodiles was constructed by the Director, Dr Kurt Priemel, together with an arrangement for ornamental fish. For the first time large crocodiles were exhibited in terraria designed as landscapes. Between 1925 and 1928 the old Aquarium was completely modernised and it became, from a technical standpoint, one of the most modern public aquariums on a large scale. Only two years after its inauguration, the Frankfurt Aquarium was taken as the model for the new aquarium at Amsterdam. During the Second World War the Aquarium was destroyed by bombing, as were many valuable animals.

THE EXOTARIUM IS REBUILT

The people of Frankfurt were convinced that an institution that had made the name of Frankfurt so widely known and had become an intrinsic part of the town, must be rebuilt. It was decided to use those parts of the old Aquarium that were still in existence as the nucleus of the new, much larger Aquarium. This resulted in the saving of about a million marks but it has meant that the Aquarium can only be visited if an admission ticket to the Zoological Gardens has already been purchased, so that the charge for admission cannot be properly related to the actual costs and exhibition value of the building. Another disadvantage is that, generally speaking, it is not possible for a visitor to take in and appreciate in a few hours or one day, a large Zoological Garden and a large Exotarium. For this reason the management of the Gardens decided to vary the hours of opening of the Exotarium by not opening its doors until later in the morning and by making it available for visitors in the evening when tickets have stopped being issued for admission to the Zoo. The same problems were encountered in the construction of the new Exotarium as on the first occasion 80 years before. Shortage of money necessitated frequent interruptions which meant that it took four years before it was finally completed.

BASIC PRINCIPLES OF THE EXOTARIUM

The new Exotarium was planned, not as an elaborate aquarium, but as a unit housing representatives of many classes of animals—freshwater and marine fish; crocodiles; lizards; snakes; tortoises; batrachians; lower animals such as crabs, anthozoa, echinoderms, cephalopods, snails and mussels, insects, spiders, millipedes; as well as birds and marine mammals from all parts of the earth. Thus in the new Exotarium, the Aquarium is only one section. In addition there is a Polar Landscape, a section of the water and bank of a tropical river, Reptile Halls, a crocodile-infested jungle, an Insect House and large open modern ponds for different species of seals. These ponds are linked to the machinery and administration of the Exotarium. The huge new Aquarium in New York which is being constructed at the moment (part of which has already been opened) will also use this principle of linking marine animals in an open pond with the Aquarium. The large new Elephant Seal Pond at Frankfurt was opened to the public in March 1957.

THE HALL OF CLIMATIC LANDSCAPES

Inside the entrance to the Exotarium, the first exhibition display is the Polar Landscape, the largest display in the world of penguins in polar surroundings. The large species of South Pole penguins are great favourites with the public, but experience has shown that they live only a short time in European Zoos and have to be replaced constantly as the high summer temperatures and oidium spores do not suit them. In our latitudes these spores are distributed everywhere in the atmosphere. They do not, however, occur in the snowy regions of Antarctica and the animals therefore have no powers of resistance against them and often succumb to thrush. For this reason the penguins in the Exotarium display are kept at an artificially cooled environment (6–8° C. air temperature, 5° C. water temperature). The enclosure is like a refrigerator with thick cork sheets insulating the inside from penetration by external heat. Two cooling units ensure that the air and water are kept cool. A third produces natural ice on which the penguins sometimes sit. The air is kept free of infectious germs by bacteria filters. To prevent the glass from steaming up as the result of the warmth generated by the public, water-tight panes of glass about 4 cm. thick are further insulated by thin glass panes with air in between. For the first time in Germany penguins can be watched swimming and feeding underwater. A display notice near the Polar Landscape shows the species of penguins which inhabit the South Pole, the reverse side showing the battle of two giant saurians, *Megalosaurus* and *Iguanodon*.

THE TROPICAL RIVER BANK

The exhibition landscape opposite the penguins represents a section of the bank of a tropical, primeval river. Fish, reptiles, birds and plants live here in the same biological communities as in the wild. As in the Polar Landscape, the visitor can look under the surface of the water into the huge tank containing 27,000 litres, and above it at the section of forest. Inspection windows in the doors which open on to the back of the exhibition landscapes enable visitors to get an idea of the complicated machinery which maintains the humidity, and water and air temperatures in these widely differing landscapes.

THE AQUARIUM HALL

Near the entrance of the Aquarium Hall are the smaller tanks which contain North Sea animals in specially cooled water. Leading on from the entrance is the main hall containing 14 large exhibition tanks with glass panels 40 mm. thick. There are only a few special glass factories that

can make them and they cost 3,000 to 4,000 DM each. On one side are tanks with some of the larger sea animals including large turtles and seals—Frankfurt is the only place in Germany where it is possible to see seals swimming under water and not just from above the surface. Near these tanks there is a German mountain stream with trout swimming in it. Other features of the Aquarium are posters giving the measurements of the larger sea animals, freshwater tanks and a special tank containing the small exotic Coral Fish from warm seas. The giant cisterns which contain a reserve of 1,250,600 litres of water can be seen through two windows in the floor.

THE ACCLIMATISATION HALL

Here some of the Exotarium equipment can be seen by the visitors through inspection windows.

THE REPTILE HALL

This is designed as a primeval forest. The visitor walks between and beneath vegetation protected from the weather by glass walls and roofs. Beyond the glass is a curtain of indigenous plants. The exhibition cases for the reptiles are scattered between the groups of trees. Each has its own air supply and humidity and temperature control. The containers housing the poisonous snakes are made of specially thick glass and have protective blinds which can be let down so that the keeper can clean the glass without danger. The glass roof of the hall is on runners and can be moved aside from above the cases so that the animals can get the direct light of the sun. Beyond the Reptile Hall is the Crocodile Jungle containing species of crocodiles found in Eastern Asia, Africa and South America, while a section houses the giant tortoises. There is a "waterfall" in the jungle and by turning knobs it is possible to produce a tropical thunderstorm. In this way animals and plants are kept fresh.

OTHER FEATURES OF THE EXOTARIUM

The last section of the Exotarium is the Insectarium and beyond this are outdoor exhibition tanks for seals. An important part of the Exotarium are the inspection windows placed in the various exhibition halls through which visitors can see some of the complicated machinery which maintains the humidity and water and air temperatures of the widely differing landscapes.

TECHNICAL INSTALLATIONS

The most important equipment of the Exotarium consists of 3 refrigerator units, 18 centrifugal pumps, 31 motors, 14 air heaters and ventilators, 60 temperature regulators and engine valves, 17 air-conditioning plants, 15 piping systems with about 800 slide valves, mixing valves and stopcocks, 2 large filter units, 5 pressure filters, 4 large cisterns and 4 overhead containers for fresh and seawater with a capacity of almost 1½ million litres. In addition there is a vast number of coal, gravel, peat and pumice and micro-filters. The fresh water in the large exhibition tanks flows without interruption day and night from the aquaria to the filters where it is gradually purified. From there it is forced by automatic centrifugal pumps to the overhead containers in the tower. From these it flows along two conduits to individual tanks. One of the conduits carries the water in an electrically-controlled counterflow apparatus 2.15 metres long where it is warmed to a temperature of 35°C. By means of mixing valves and mixing tubes, also electrically controlled, the water from the two conduits is then brought to the desired temperature and passes through a hydrometer into the exhibition aquaria. These arrangements make it possible for us to feed the tanks constantly with running water of a given temperature. If the inflow of preheated water should fail, an engine valve immediately cuts off any further flow and a rust-proof heating coil built into the tank automatically comes into operation. All the conduits are made of polyvinyl resin. Pumps, mixing valves, counterflow apparatus, cocks, etc. are lined with this synthetic product or nylon. A similar circulating unit has been installed for the sea water (here, of course, the pumps and pressure filters are made of acid-resistant ceramics). The pipes are made of polyethylene, glass or perspex, and the cocks of nylon. No water can come into contact with metal. Heating is provided by a fully-automatic, oil-fired system with 4 boilers and 3 huge oil tanks which hold 150,000 litres of fuel oil each. This modern heating unit with 12 different heating groups makes it possible to control rapidly, safely and, to some extent, automatically, the temperature of the individual rooms. The building is honey-combed throughout with a network of pipes for the hot water supply with 2 giant boilers, circulating pumps and dechlorination filters. The large quantity of compressed air that is required to aerate the aquaria, drive the filter pumps and vaporise water into fine rain, is provided by the compressed air supply unit.

Dr. B. Grzimek, Zoo Director, Frankfurt Zoo, Germany.

NYLON NETTING FOR AVIARIES AT THE LONDON ZOO, GREAT BRITAIN

Recently the roof of one of the birds of prey aviaries at the London Zoo was covered with nylon netting in place of wire netting. The purpose of this was to prevent the occupant, a nervous bird, from injuring itself against the roof and also to discover how long nylon netting would last out of doors in London. Ordinary wire netting, if unpainted, becomes rusty within a few months and the fixing and painting of wire netting is expensive in labour costs. Nylon, though initially more expensive, is easily and quickly fixed and may prove to be the best roof covering for aviaries containing such birds as are likely to kill or injure themselves by flying against the roof. Certain birds of prey, game birds and waders are particularly likely to do this. If satisfactory in lasting qualities nylon would, by reason of its light weight, make for a considerable modification in aviary construction.

J. J. Yealland, Curator of Birds, The Zoological Society of London, Regent's Park, London N.W.1, Great Britain.

PUBLIC SERVICES

THE IMPORTANCE OF LABELLING

One of the major features of Zoological Gardens is doubtlessly their educational value. Large Zoos can contact the public by lectures, guided tours, publications, television and film programmes. The most direct and most needed fulfilment of a person's desire to learn about the animals in the Zoo is achieved by proper labels at animal enclosures. Here immediate education takes place, and people will accept it quite willingly.

The fact that there is no uniformity in the systems of signs used in different Zoological Gardens seems to indicate that the ideal labelling system has not yet been discovered.

B. Grzimek and D. Backhaus describe new signs at the Frankfurt Zoo in their book "Hundert-jähriger Zoo in Frankfurt am Main" (Frankfurt, 1958). This design is also used at the Basle Zoo, Switzerland. It consists of a square stainless metal frame with a glass front. Beneath the glass there are four signs for every species: one with the German, English, French and scientific names of the animal; one with a photograph of the species (not necessarily the specimen on exhibition); the third with some typewritten explanatory text; and the fourth with a small map of the world in which the range of the particular species is marked in red.

Another system of signs is described by H.-G. Thienemann in "Eine Praktische Zoo-Beschriftung" (Der Zoologische Garten 18, 1-2, Leipzig, 1951). He recommends plastic signs with carved-out letters. The advantage is that these signs can withstand rain and sun for several years. On the same material pictures of the animals can be painted in oil-colours and, covered with lacquer, they will also last quite long. These signs are used at the Duisburg Zoo, Germany. Following the same principle, similar labels are also found at the Zoo-Parks at Krefeld and Wuppertal in Germany, and probably elsewhere as well.

Some experts in the U.S.A. recommend stainless steel labels with carved-out lettering. I feel that Zoos which can afford it are best-served by stainless metal labels, particularly when they also have milling equipment of their own. The majority of Zoological Gardens, however, will neither have the scientific staff needed to keep the labels up to date, nor the financial resources that make it possible to mill steel plates.

When I had to replace the worn-out, incomplete signs at the Assiniboine Park Zoo, I decided to introduce something on the lines of the Duisburg system. The Winnipeg Zoo at Assiniboine Park being fairly spacious (120 acres) and the development plan being designed to make use of the whole area, but to keep the number of species restricted, relatively large signs seemed to be the right answer.

The signs are made from "Lamicoid", a species of plastic material. They are screwed on to varnished wooden boards (one board for one species) with brass screws. Six screws hold a long

sign, four screws a medium or small one. A complete set of signs would consist of five different signs at the most for one species, covering $16'' \times 10''$ altogether. On top a long red sign ($16'' \times 2''$) may catch the special attention of visitors with one of three texts in white letters: "JUST ARRIVED", "BORN HERE", or "PLEASE DO NOT FEED". The central sign ($8'' \times 4''$) gives the English name and the range in white letters on a black ground. Right and left of it are white signs ($4'' \times 4''$), the left one showing a painting of the animal, and right one an acknowledgment of gifts or loans in black letters on a white ground. Short biological or historical explanations are given in white letters on a blue sign at the bottom of the board, again the sign is a long one (either $16'' \times 4''$ or $16'' \times 2''$).

In a few cases, there is nothing on the board but the main sign in black. With the main sign there may be a red (exclamatory), blue (explanatory), or a white (acknowledgment) sign, or any combination of them.

Where the number of a species in an enclosure is increased either by birth or gift, all we need to do is to add a red or white sign in the space provided on the board.

Special wooden blackboards with the permanent text "TEMPORARY SIGN" name newcomers in handwritten letters during the few days before delivery of the proper sign.

Lamicoid signs can be damaged by scratching with stones, knives, etc. In order to protect them they have been placed—wherever possible—inside enclosures or flower-beds; and, for further protection, special screws have been used that cannot be turned with knives or common screw-drivers.

It is planned to sell as souvenirs $4'' \times 4''$ Lamicoid signs with animal paintings on a grey or light brown ground and text "Assiniboine Park Zoo" in white letters.

Dr. Guenter Voss, Zoo Director, Assiniboine Park Zoo, Winnipeg, Canada.

WATERFOWL REFERENCE SHELTER AT EDINBURGH ZOO, SCOTLAND

Clear, informative labelling of animal enclosures is an important feature of the Edinburgh Zoo, as are the coloured animal identification cut-outs which are super-imposed on the labels. With an ever mounting number of ducks, geese and swans, however, the path through the Waterfowl Enclosure was going to be lined with glass-fronted information boards to such an extent that a view of the birds themselves would be interrupted. To overcome this handicap without sacrificing information about the birds an attractive octagonal Reference Shelter in cedar shingles has been built in the centre of the enclosure. A low window extending the full width of each side allows an uninterrupted view over most of the enclosure, while above these windows the walls are lined with columns of glass-fronted printed cards giving information about the different species, each column being headed with a coloured cut-out of the bird referred to below. As the Shelter is roofed with glass there is ample light for reading, and seating round the inner walls makes it a pleasant retreat during showers, especially as one can continue observing the rain-loving water-birds.

The Royal Zoological Society of Scotland Annual Report, 1959, Edinburgh, Scotland.

"TALKING" LABELS AT SAN FRANCISCO ZOO, U.S.A.

40 loudspeaker and tape playback units have been installed in front of interesting exhibits at San Francisco Zoo. Visitors can buy keys which will operate the speakers and in the first few weeks of operation, several thousand were sold. Each unit consists of a taped discussion on an adult level, about the animals next to the loudspeaker. Historical, geographical, geological and zoological aspects are worked into the discussion, and the need for animal conservation emphasised.

Similar labels are also in use at Kansas City Zoo; and the Como Park Zoo, Saint Paul, Minnesota, U.S.A. is planning to install "Talking Storybooks" round the Zoo.

BULLETIN BOARDS AT LINCOLN PARK ZOO, CHICAGO, U.S.A.

At the Lincoln Park Zoological Gardens, Chicago, U.S.A., the main use to which the bulletin board is put is to feature the "Animal of the Month". A photograph and various interesting facts about the animal are displayed on separate pieces of paper to make reading easier. Other uses for the bulletin boards include the explanation of scientific names and the display of interesting

articles on zoo animals, animal preservation and zoology. Zoo news boards are also posted in the keepers' rooms and the information on them is sent round to the various houses in rotation.

The bulletin boards are constructed as glass-fronted cases with tight-fitting, weatherproof doors. Fibre-board makes the most suitable backing as it takes tin-tacks well, is cheap, lasts indefinitely and can be easily replaced. This backing should be covered with some coarse cloth to give a neat appearance. Cases about 6'-12" deep are more useful than narrower ones as they can then take models, bones, etc., as well as papers and pictures.

The general purpose of these boards is to stimulate interest in the educational and recreational aspects of the Zoological Garden, without cluttering up the front of the cages.

R. L. Blakely, *Zoologist, Lincoln Park Zoological Gardens, Chicago, U.S.A. (Parks & Recreation, Jan. 1959.)*

EDUCATIONAL SCHEME AT STATEN ISLAND ZOO, U.S.A.

The Staten Island Zoo, Barrett Park, Staten Island, U.S.A. was designed and built as a unique educational institution. The idea of this new, progressive type of Zoo was conceived by the Staten Island Zoological Society. It is operated under an agreement which provides that the Society shall supply all exhibits, conduct programmes and issue publications, and the City shall appropriate funds to cover maintenance and operation. The Zoo was planned to fit a comprehensive programme of education in the field of zoology and to provide permanent recreational facilities for many and varied types of people. One of its chief functions is to develop and foster zoological hobbies. The design of the building at Barrett Park was carefully planned to provide a balance between its two purposes; educational and exhibitional. For exhibition purposes there are bird, mammal and reptile wings and a tropical fish section. A large part of the building is given over to educational and recreational facilities. These include an auditorium with a seating capacity of about 400, three classrooms or meeting rooms, a library, a biological laboratory with two adjoining study rooms, and a mortuary freezer.

The Staten Island Zoo demonstrates that a Zoo can be successfully adapted to a small community without the necessity of maintaining the larger and more expensive animals. Hitherto zoos have made little attempt to use the magnificent opportunity to illustrate biological principles and to study numerous other problems. The advantages offered by the Zoo in increasing knowledge of animal behaviour, genetics, ecology, pathology and taxonomy are obvious. Almost every child has a natural interest in wild life. It is often manifested in the collecting of frogs, turtles or insects—in the keeping of pet birds or fish—or perhaps only in a desire to visit a zoo frequently for the purpose of seeing in real life the animals portrayed in picture books. If this original interest could be guided properly and if suitable facilities were available, it would often result in the development of a healthy hobby to provide life-long diversion and recreation with practically no physical limitations. Children have a keen sense of realism and a live animal will arouse their interest much quicker and hold it much longer than the best efforts of the taxidermist's art. The life history of a stuffed specimen is rarely more than a matter of passing curiosity, but the same animal in living form stimulates the imagination and the desire to learn something of its behaviour. The Staten Island Zoo and the Society's programme of operation combine the educational features of a museum with the live animal spectacles of a modern zoo.

A typical day in the Zoo will include conducted tours of classes from elementary schools round the exhibits, an afternoon children's lecture in the auditorium, an operation or post mortem in the hospital for high school biology classes, classes in skeleton technique in the laboratory, and in the evening a members' lecture with sound motion pictures in the auditorium, and perhaps a meeting of the Tropical Fish Society, Reptile Study Society or other adult groups in the classrooms.

Another important educational feature at the Staten Island Zoo is the help given to the public in identifying and learning a few interesting characteristics of the specimens, provided by the accurately descriptive illustrated labels on cages in all exhibitional sections. A picture of each specimen, its common name, scientific name, native habitat and main characteristics and habits are on each label. This is obviously particularly necessary where several specimens are displayed in the same cage.

The Zoo's reference library, although not very large, is growing steadily. Books, magazines, and pamphlets on natural history are available for reference to the public as well as to students, members of clubs affiliated to the Zoo and members of the Staten Island Zoological Society.

The Society publishes a News Bulletin containing illustrated reports on the collection, interesting new additions and the story of their acquisition. Articles of a zoological nature are written for the Bulletin by members of the staff and outside contributors.

"The Staten Island Zoo" (a Staten Island Zoological Society publication), Staten Island, U.S.A.

LECTURES FOR SCHOOL CHILDREN AT THE LONDON ZOO, GREAT BRITAIN

During 1959 the Zoological Society of London's Education Scheme completed its second year of operation. Lectures were designed for pupils of three different levels of academic ability—those starting their secondary education (11 to 13 years), and those taking their General Certificate of Education at the Ordinary and Advanced Levels (15 to 16, and 17 to 18 years respectively).

Each visit consists of a lecture given by one of the Society's fully-qualified Education Officers and is illustrated by specimens, slides or films in the specially equipped lecture theatre which seats 100 children. It is followed by a guided tour of the appropriate animal houses in the Gardens. During 1959 a total of 13,906 pupils from 200 schools attended the lectures with their teachers.

In addition to the school lectures, short courses were provided for university and training college students.

YOUNG ZOOLOGISTS' CLUB AT THE LONDON ZOO, GREAT BRITAIN

In January 1959, the Zoological Society of London decided to launch a junior section in order to make available some of the Society's educational facilities to young people. The junior society, which is known as the XYZ (Exceptional Young Zoologists') Club is for children between 11 and 18 years of age interested in the Zoo, in natural history and in animals generally. Although the Club is based on the London Zoo, its membership is not confined to London and out of the 3,000 members, approximately one third live in the country or abroad.

The subscription is 10s. a year (there are reduced rates for schools and groups) and for this each member receives a magazine, a number of free tickets to the London Zoo and Whipsnade Park, meetings in the school holidays, the use of an "information bureau", photographic, painting, general knowledge, essay and field study competitions (all of which are based on animal study) and a distinctive metal badge. The magazine is published three times a year and contains articles by well-known scientists, natural historians and zoo specialists on current scientific discoveries, British natural history, the life of animals in the Zoo and in the wild, and the care of unusual pets. In addition, there are regular crossword puzzles, quiz competitions, book reviews and several pages consisting of a selection of members' queries answered by the Information Bureau.

The first year of the Club which was of an experimental nature has been extremely successful and the Club and its magazine have been very favourably reviewed in a large number of national newspapers and natural history periodicals. Even more encouraging, however, has been the enthusiasm and interest of the members. It would seem that the Club is fulfilling an important need.

PIONEER YOUTH GROUP AT PRAGUE ZOO, CZECHOSLOVAKIA

The Pioneer Youth Group at Prague Zoo is a subsidiary of a much larger organisation, the Czechoslovak Union of Youth, which caters for the out-of-school education of children between 11 and 14 years of age. The Union of Youth provides meeting rooms and instructors for children interested in a great variety of hobbies, of which zoology is one. Membership of the organisation is free and depends only on the interest of the child and the recommendation of the school.

The Zoology Section of the Union of Youth has a meeting room at the Prague Zoo. It contains aquariums, terrariums and cages for small animals such as Golden Hamsters, Guinea Pigs and Mice. The necessary equipment for looking after the animals is also provided. Lecturers visit the Youth Group regularly and give talks on various aspects of zoology.

Each week from Monday to Friday a group of children comes to the Zoo to attend lectures and meetings and to help look after animals under their supervisor and a keeper. The children do not, in fact, make the zoo administration any easier as they cannot work on their own and every afternoon a keeper must devote his whole time to them. However, the trouble involved is greatly outweighed by the enthusiasm of the children and the benefit they receive from the scheme. Experience gained studying and working at the Zoo has proved invaluable to children who have gone on to study zoology and biology at the University.

Dr Jan Landowski, Zoo Director, Prague Zoo, Czechoslovakia.

TRAVELLING NATURAL HISTORY COLLECTION AT THE BRITISH GUIANA MUSEUM & ZOO

Throughout the year a special collection of suitable British Guiana Museum exhibits is circulated among the rural schools of the area. The travelling exhibits, which are installed in portable cases of standard sizes, have been planned and prepared in the Museum as supplements to the science syllabus of rural schools. At the end of 1959, 60 schools were receiving exhibits. To date the collection consists of 73 exhibits and ranges from "Some Cuckoos of British Guiana", to "How, Museum Fish Models are Made", to "Timber", and "Star-fish, Sea-Urchins and Sea-lilies".

SEA LION INSTALLATION AT SAN DIEGO ZOO, U.S.A.

Sea Lion pools have always been a centre of attraction at San Diego and these have now been made the focus of a resting and eating area.

Designed by Charles Faust, the refreshment stand is a many faceted unit facing the different terraces with a 180° frontage. In the centre of the building is a large glass panel through which the cooks can be seen at work. The front of the building is shaded by a 12' plastic over-hang which provides shade, but at the same time allows the light to come through. The chairs used are plastic and steel and have sidearms for holding food and drink. There are seats for 120 guests. The building is, throughout, both colourful and contemporary in design. The entire installation overlooks the pool; terraces are built on different levels; fish can be bought to feed the sea lions with. The surrounding area is planted with trees and shrubs.

Edna Heublin, Editor of Zoonooz at San Diego Zoo, Calif., U.S.A. (Jan. 1959 "Parks & Recreation".)

WATER BUS AT THE LONDON ZOO, GREAT BRITAIN

A Water-bus service between the London Zoo and Paddington Basin on the Grand Union Canal was started in May 1959 by British Waterways in conjunction with the Zoological Society of London. Leaving at half-hourly intervals the converted canal boats (seating 46 passengers each), glide past the picturesque tree-lined avenues of Maida Vale, through the Maida Hill Tunnel, eventually emerging into the greenery of Regent's Park and arriving at the London Zoo landing stage close to the Elephant Paddock after a journey of half an hour. During 1959 the waterbuses were used by 75,000 visitors to and from the Zoo.

ELECTRIC HAND DRYERS AT BROOKFIELD ZOO, U.S.A.

12 electric hand dryers have been installed in the 10 rest-rooms at Brookfield Zoo, Brookfield, Illinois, U.S.A.

The Zoo is visited by over one and a half million people annually; at least half the visitors use the restrooms, using two paper hand towels each; thus the annual total of hand towels used was 1½ million which was costing the Zoo \$2,800 a year (average).

The hand dryers paid for themselves within a year and a half and are saving the Zoo at least \$1,000 a year; at the same time storage space is saved and there is much less litter to deal with. (*"Parks & Recreation."* Feb. 1959.)

STOCK

THE NEW OKAPI HOUSE AT THE ROTTERDAM ZOO, THE NETHERLANDS

In April 1957 a pair of Okapis arrived at the Royal Rotterdam Zoological Garden direct from Epulu in the Belgian Congo. The animals were housed in the Giraffe House where they were given separate boxes. These were partly roofed because the Giraffe House is very high and has

free access to sunlight, as the whole south wall is made entirely of glass. Okapis being forest-dwelling animals, we thought this abundance of light would be disagreeable to them. From the boxes a passageway led to the outer enclosure. The animals could visit each other through a door between the boxes. They were always together during the daytime in the open air enclosure if the weather was more or less favorable. They spent the night in their separate boxes.

The first mating occurred during December 1958. The roofing of the box being only 2.50 metres above the ground, it was thrown off by the male during mating. But as it was made of matting, laid on light wooden poles, no accident occurred. After several months it became clear that the female was pregnant. As both female Giraffes were also pregnant, over-crowding in the Giraffe House became a serious problem. We therefore decided to build a new Okapi House, facing the outside enclosure of the animals. The new building has been built close to the Giraffe House, because this meant that we could use its central heating system.

The new Okapi House is of a very modest design, but it proved to be highly effective. The building is more or less 10 metres long, 4 metres wide and 3.25 metres high. The floor is concrete. On this stands a wooden frame filled in with Heraclite plates. On the outside the walls are covered with wood. The inner side of the walls has been plastered. The roof is flat, insulated on the inner side by Heraclite plates, also plastered. Just under the roof and around the whole building are double window panes, and at regular intervals there are movable windows for ventilation. These window panes are 60 centimetres high. Just under the windows the pipes of the central heating system are attached. The insulation of the building has proved to be excellent. No difficulties have occurred in keeping it at a constant temperature. The building is divided into three boxes, 4×3 metres, and a small service room, 4×1 metres. The service room has a door opening on to the back of the building, and three doors opening on to the boxes. The service room is separated from the boxes by a wooden wall. The boxes are separated from each other by a fence of iron bars and are connected by a door in this fence. These doors have no threshold. All three boxes have a wooden door in the front wall, opening on to the outside enclosure. Each box contains a hay rack and a stone drinking trough. The floor slopes gradually toward the grating of the drains.

If Okapis are to be kept in good health, the most painstaking cleanliness is of the utmost importance and the new stable has proved to be extremely easy to keep clean.

Our young Okapi, named Ituri, was born on February 12th, 1960, to the female Mambuti, the father being our male, Dinota. The weather was very cold and Mambuti and her daughter had to be kept inside until the end of March. During this time the new building proved to be very practical. The male was able to reach the outdoor enclosure through the door of his own box, without disturbing the mother and child and without any draught which could have damaged the young animal. During the cleaning of the boxes, the mother and child walked in to the central box and were able to come into contact with the father through the bars. As the male proved to be very much interested in his daughter and tried to lick her through the bars, we had not the slightest fear in bringing the animals together in the outside enclosure after the weather had improved in the first week in May.

The new building has only one disadvantage—the public cannot enter it! As the birth of an Okapi is still a rare occurrence, this was rather disappointing to the visitors who came to see the newborn baby. In any other respect we think the new building is one of the best and the most practical in the Rotterdam Zoo.

Dr A. C. van Bemmelen, Asst. Director, Royal Rotterdam Zoological Gardens, The Netherlands.

WORLD REGISTER OF PERE DAVID'S DEER 1958-59

The herd of Pere David's Deer in the world today now totals 456 and is distributed over 6 continents. 356 of these are in Great Britain and the remainder in China, Canada, America, South Africa, Australia and on the continent of Europe.

It is interesting to note that there are now 31 Parks and Zoos in the world exhibiting these rare deer as against 18 when this Register was first compiled.

Both the Woburn and Whipsnade herds have recently been slightly reduced in numbers. The Whipsnade herd was fortunately divided into two some years ago and in the spring of 1959 the original stock became infected with "Malignant Catarrh" and several of the animals died. The remainder of that herd were destroyed to prevent the spread of the disease to other ruminants. Fortunately the second herd and all other deer escaped and the number of animals now at Whipsnade is increasing again. In the case of the Woburn Park herd the number was reduced by the culling of old stags and some of the older females.

	Herd 1957	No. Born	Deaths	Transferred to:	Transferred from:	Herd 1959
Adelaide Zoo	-	-	-		1 Taronga Zoological Gardens	1
Antwerp, Royal Zoological Society of	3	-	-	1 Barcelona, Parque Zoologico		2
Barcelona, Parque Zoologico	-	-	-		1 Antwerp, Royal Zoological Society of	1
Basle, Zoological Garden ...	5	4	2			7
Berlin (East) Zoological Garden	5	1	-	2 Ruhe, L. Hanover		4
Berlin (West) Zoological Garden	2	-	1			1
Calgary, Zoological Society	-	-	-		1 Riverdale Zoo, Toronto	1
Chester, North of England Zoological Society	-	-	-		1 Lord Tollemahe 1 Wellingborough Zoo	2
Chicago Zoological Garden	12	-	-			12
Cleveland Zoological Park ...	3	2	-			5
Copenhagen Zoological Park	8	1	1	3 Munich Zoo		5
Edinburgh Zoological Park	5	1	-			6
Edmonton, Alberta Game Farm	-	-	-		1 Riverdale Zoo Toronto	1
Johannesburg Zoological Park	2	1	1			2
Lindemann, Mr. R., New York	1	-	-			1
Melbourne Zoo	-	-	-		1 Taronga Zoological Gardens	1
Milan, Dr Paladini ...	2	2	-			4
Munich Zoo... ..	-	-	-		3 Copenhagen Zoo- logical Park 1 Hannover Ruhe, L.	4
New York Zoological Society	8	1	-	1 Highland Park Zoo, Pittsburgh		8
Paris Zoological Park ...	2	-	-		•	2
Pekin Zoological Garden ...	5	1	1		•	5
Pittsburgh, Highland Park Zoo	-	-	-		1 New York Zoo- logical Society	1
Prague Zoological Garden...	3	-	-			3

	Herd 1957	No. Born	Deaths	Transferred to:	Transferred from:	Herd 1959
Pretoria, National Zoological Gardens	3	1	1			3
Regent's Park (London Zoo)	1	—	—		1 Whipsnade Park	2
Riverdale Zoo, Toronto ...	6	—	1	1 Edmonton, Alberta Game Farm 1 Calgary Zoological Society		3
Rotterdam Zoological Garden	2	1	—			3
Ruhe, L., Hannover ...	—	—	1	1 Munich Zoo	2 Berlin (East), Zoological Garden	—
Taronga Zoological Gardens	14	1	—	1 Adelaide Zoo 1 Melbourne Zoo		13
Tollemache, Baron of, Suffolk	1	—	—	1 Chester Zoo		—
Washington Nat. Zoological Park	2	—	1			1
Wellingborough Zoo ...	—	—	—	1 Chester Zoo		—
Whipsnade Park ...	23	13	18	1 Regent's Park		17
Woburn Park ...	324	194	183			335
Total	442	224	211			456

E. H. Tong, F.L.A.S., Director of Whipsnade Park, Great Britain.

PRESERVATION OF THE PRZEWALSKI HORSE

The First International Symposium on the preservation of the Przewalski Horse was held in Prague on September 7th-8th, 1959. It was agreed that:

1. The State of the wild Przewalski Horse is catastrophic and it is necessary to organise immediate measures to save it. It was requested that the Governments of those countries, on the territory of which the wild horse is still living, should promptly take steps to establish reservations.
2. It is necessary to encourage and increase the breeding of the Przewalski Horse in captivity. The Prague Zoological Gardens are entrusted with keeping the stud-book, founded by Dr Erna Mohr.
3. The International Society for Protection of and Research on the Przewalski Horse should be established. The following were elected to the Preparatory Committee: Chairman—Dr Z. Veselovsky (Prague); Members—Dr F. J. Appelman (Rotterdam), Prof. Dr A. G. Bannikov (Moscow), Prof. D. Cevgmind (Ulan Bator), Prof. Dr H. Dathe (Berlin), Dr H. Heck (Catskill, U.S.A.), Dr h. c. Erna Mohr (Hamburg).
4. It is necessary to obtain reliable information about the Przewalski Horses living in the wild state. The Czechoslovak Academy of Sciences, in co-operation with L'Union pour la Conservation de la Nature et de Ressources will approach the Academies of Sciences in the U.S.S.R., the Mongolian People's Republic and the Chinese People's Republic with regard to the sending of an international expedition to the territories where the horse is living, in order to ascertain the present condition of the wild horses.
5. It would be useful to publish the results of research work on *Perissodactyla* in special publications, beginning with the lectures delivered at the First International Symposium. The editorial offices will be accommodated in the Prague Zoological Gardens.

6. In future it will be possible to envisage the return of Przewalski Horses to the wild state. The Academy of Sciences of the U.S.S.R. will be asked to establish special reservations at such time as a sufficient number of Przewalski Horses shall have been reared in captivity.

In order to carry out the programme of protection and breeding of the Przewalski Horse it is essential to obtain complete and concise records of all Przewalski Horses living in captivity, and with this in mind the First International Symposium on the Preservation of the Przewalski Horse has issued a Pedigree Book (Zoological Garden, Prague, 1960) edited by Jiri Wolf, Dipl. Biol. Many thanks are due to Dr Erna Mohr for compiling the basis of the Przewalski Horse stud-book (Dr ERNA MOHR "Das Urwilpferd", Die Neue Brehm-Bücherei, Heft 249, A. Ziemsen Verlag, Wittenberg Lutherstadt, 1959).

The stud-book is based on a card-index, which has been compiled and is kept by the Prague Zoological Gardens. Cards of size A 5 are prepared in two original copies. One copy (in blue for a stallion, in red for a mare) remains in the card index, while the other (in reversed colours) is kept by the owner of the Przewalski Horse concerned. On the front of the card is a list of particulars about the horse, on the back is a record of off-spring and of forbears to the third generation. When a horse changes hands, the new owner receives the card. On the death of a horse, the card is sent to the "dead card-index" at the Prague Zoo. All supplementary records by the owner are reported to the keeper of the stud-book, Jiri Wolf, and entered on the cards. Additions and corrections are published once a year.

On January 1st, 1960, there were 59 Przewalski Horses (23 stallions and 36 mares), representing a net increase of two during 1959, i.e. 3 per cent. Six foals were born in 1959 (2, 4)—four in Prague (1, 3), one in Munich (0, 1) and one in Rotterdam (0, 1). In 1959 four Przewalski Horses died (2, 2)—two in Prague (2, 0), one in Warsaw (0, 1) and one in Whipsnade (0, 1).

Reprinted from the Pedigree Book of the Przewalski Horse, Prague Zoo, Czechoslovakia.

AFRICAN MIXED SPECIES EXHIBIT AT ALBUQUERQUE ZOO, U.S.A.

During 1959 an exhibit of mixed species of African animals was started at the Rio Grande Park Zoo, Albuquerque, New Mexico, U.S.A. It is similar in principle to the "African Veldt" exhibit at the New York Zoological Gardens and consists of a landscaped paddock containing a "waterhole", boulders and a few shade trees. Up to date, only Zebras and Ostriches have been exhibited together, but later on it is hoped to add Eland and/or Gazelles. Visitors have the choice of viewing the animals either at ground level, or from a ramp six feet above the animals. Other mixed species exhibits at the Rio Grande Park Zoo are the Australian Exhibit (Emus, Wallabies and Wallaroos), the South American Exhibit (Guanacos, Rheas and Patagonian Cavies), and an Indian Exhibit (Blackbuck Antelope and Sarus Cranes).

NATURE AREA AT THE DETROIT ZOO, U.S.A.

At the Detroit Zoological Park, Detroit, Michigan, U.S.A., great importance is attached to the "Nature Area" and the "Nature Cabin", the Zoo's special presentation building. The purpose of the displays is to help the visitor understand the many aspects of animal life. It is, in addition, a trial ground for various exhibition methods. At present, reptiles make up the bulk of the displays, but small mammals, birds, amphibians and invertebrates may also be shown.

Exhibits are of two basic types—the habitat group and the demonstration. Habitat groups follow the general pattern of display in the park in which animals are exhibited in settings emulating their natural surroundings.

There are special displays using living animals which point out many features of their existence—colour, structure, evolution, etc. One, for instance, shows animals that spend all day sleeping.

The emphasis is not on the animal, but on the circumstances which govern its way of life. Using living animals, these principles can be presented vividly with a minimum of words so that the visitor is given some awareness of natural laws without the necessity of prolonged study.

The outside setting for this exhibition is a nature area which represents a successful transplanting of a northern Michigan woodland habitat into a corner of the Zoological Park. This section is about 1400 feet long and varies from 60 to 150 feet in width. Native trees, shrubs, wild flowers and ferns growing on simulated forest floor bordering a small trout stream complete the area. It is a favourite nesting place for many wild birds.

A walk along the stream will reveal that it broadens at various places to form seven different pools in which fish are exhibited. Rainbow and Brown Trout are in the first two pools near the rapids and falls. The remaining five pools contain other native fish.
Detroit Zoo Guide Book, 1959.

MOSSY-THROATED BELLBIRD AT THE BRONX ZOO, U.S.A.

During 1959 the Bronx Zoo, New York, U.S.A. exhibited a Mossy-throated Bellbird, the first ever to be seen in a zoo. The bird was captured on April 6, 1959, in the mountains of northern Trinidad by William G. Conway, Curator of Birds, and was kept in seclusion at the Bronx Zoo for 5 weeks while it became adjusted to captivity.

Appearance: it is slightly larger than a robin, has black wings and a silvery-grey body. Its call is a series of loud kong-kong-kong notes.

It was first described scientifically in 1817 but little was known about it until Dr William Beebe of the Zoological Society of New York's Department of Tropical Research found and described its nest in 1954. There are four species, three of which are on show at the Bronx Zoo—the Bare-throated Bellbird, the Three-wattled Bellbird and the Mossy-throated Bellbird. The fourth species, the One-wattled Bellbird, has been exhibited at the London Zoo.

Diet in Captivity: for a month the Mossy-throated Bellbird would only accept tinned cherries, but gradually it began accepting the zoo's standard diet for such birds—this is composed of cottage cheese, poultry laying mash, horsemeat, brewer's yeast, hard-boiled egg and assorted vitamins; it also became fond of bananas and grapes.
(*"Parks & Recreation"*, Nov. 1959.)

BONGO ANTELOPE AT CLEVELAND ZOO, U.S.A.

During July 1959 the only Bongo Antelope in captivity was put on exhibition at the Cleveland Zoo, U.S.A. It is the second time that one has been exhibited in the U.S.A. and the sixth time that one has been exhibited in captivity in the world. It is a female called "Karen" and she was captured when only a few days old in the Aberdare Mountains of Kenya in May 1958. She was hand-reared by the young wild-life photographer, Alan Root, who lives near Nairobi and who brought her to the Cleveland Zoo.

GIANT PANDAS IN CAPTIVITY

At the time of writing there are five Giant Pandas on exhibition in zoos. Two are at the Peking Zoo, two at the Moscow Zoo and one at the London Zoo. The Moscow and London Giant Pandas all came from the Peking Zoo.

At the end of 1959 the Giant Panda at the London Zoo, "Chi-Chi" was approximately 4 years old, weighing just over 200 lbs. It is fed on a diet which consists mainly of bamboo of various species, but which also includes a mixture consisting of rice, fruit, milk, eggs, cooked chicken, breadcrumbs and vitamins. In addition it receives a loaf of stone-ground, whole-meal bread every day. During the summer it is given large blocks of ice to lie on and its sleeping-quarters are air-conditioned against winter fogs. It is very healthy and tame and spends a large part of the day romping with a young keeper whose job it is to prevent it from becoming bored.

HOODED SEAL AT BREMERHAVEN ZOO, GERMANY

Because the Tiergarten und Nordsee-Aquarium, Bremerhaven, Germany, succeeded in keeping an almost adult Hooded Seal (*Cystophora cristata*) in captivity from the 5th November, 1954, to the 14th January, 1956, it was decided that the Tiergarten should try and acquire another of these animals.

The original Hooded Seal was caught by a steam trawler at 61,5° North and 5° West at a depth of 400 metres. He was five to six years old, 275 cm. long with a chest circumference of 220 cm. and weighed 375 kg. The "hood" was well developed.

A second Hooded Seal was also caught by a steam trawler at a depth of 420 m. at 65,30° North and 32° West. He is 185 cm. long and weighs 260 kg. He was caught at the beginning of 1960. He eats 15 kg. of fresh dead herring daily.

An article on the Hooded Seal by Dr Kurt Ehlers, the Director of the Bremerhaven Zoo and Aquarium, Werner Sierts and Dr Erna Mohr, appeared in "Der Zoologische Garten" 1958; Bd. 24.3/4—pp. 149-210.

LEOPONS BORN AT KOSHIEH ZOO-BOTANICAL GARDENS

At the beginning of December, 1959, two "Leopon" hybrids were born at Koshien Zoo-Botanical Gardens, Japan. The father, a Leopard, was born in the Gardens in January 1955 and the mother, a Lion, in March 1955 and have been kept together ever since.

ALBINO WAPITI AT LINCOLN PARK ZOO, OKLAHOMA, U.S.A.

The Lincoln Park Zoo, Oklahoma City, U.S.A. possesses a herd of Wapiti. Three of the herd are "sports" without pigment except for a small abdominal patch and blue eyes. Two are young bulls, the third, a cow, is unfortunately sterile. However, it is hoped to maintain the White Blood Line by mating the two bulls with seventeen normal-coloured cows and then breeding back later on in the future.

Dr Warren D. Thomas, Director of Lincoln Park Zoo, Oklahoma City, U.S.A.

BANANA DIET FOR AMERICAN MOOSE

On the recommendation Mr. George Spiedel, the Director of the old Washington Park Zoo at Milwaukee, Wisc., U.S.A., the American Moose (*Alces americana*) at the Assiniboine Zoo, Winnipeg, Canada, have been fed bananas as a partial substitute for the aquatic plants that form part of their diet in the wild. The bananas are fed to the Moose with their peel on and they have been a great success. A Mi-lu stag (Pere David's Deer—*Elaphurus davidianus*) has also had bananas added to his diet.

Dr Guenter Voss, Zoo Director, Assiniboine Park Zoo, Winnipeg, Canada.

PELLET FOOD FOR BIRDS AT THE LONDON ZOO

During the past one and a half years some of the gallinaceous birds (pheasants, junglefowl, peafowl and guineafowl) have been fed on one of the high protein pellet foods commonly used for the feeding of domestic turkeys, plus some green foods such as grass growing in the aviaries. Those birds that will incubate their own eggs and rear their young are allowed to do so (making, incidentally, a very interesting exhibit) and excellent young birds have been reared on similar pellet foods. Birds that have been accustomed to other diets naturally need to be conditioned to eating the pellets by having a gradually increasing proportion of such food mixed with a correspondingly decreasing amount of the accustomed diet.

J. J. Yealland, Curator of Birds at the London Zoo, Regent's Park, London, N.W.1, Great Britain.

HORSEMEAT SUBSTITUTE AT THE NATIONAL ZOOLOGICAL PARK, WASHINGTON

A major dietary change instituted at the National Zoological Park, Washington, U.S.A. was the substitution of a slaughter-house byproduct for a portion of the raw ground horsemeat formerly used as the carnivore ration. The product has a much better nutritional analysis than horsemeat and requires no labour to bone and grind, as it is supplied ready for use.

1959 Annual Report, National Zoological Park, Washington.

CRATE DESIGN FOR AIR TRANSPORT

With the bringing into service of jet or turbo-jet engined aircraft, there is a marked change in crating requirements due to the increased speed of travel. This means, that with longer journeys, of short duration, crates can be of a smaller size with a consequent saving in freight charges. Even more important is the fact that sufficient foodstuffs for the journey can often be placed in the crate by the sender before departure, and the shorter duration of the journey means that food will remain fresh.

The cargo services being offered at cheaper rates are increasing so rapidly that it is becoming more economical to send larger animals by air rather than by sea; this in turn involves the use of

lighter but stronger material for crate making. Laminated plywood has proved most suitably in this respect and where necessary, can be metal lined.
C. G. Harwood, Transport Officer, The Zoological Society of London, Regent's Park, London N.W.1, Great Britain.

PIGMY HIPPOPOTAMUSES BRED AT WASHINGTON NATIONAL ZOOLOGICAL PARK, U.S.A.

Because the National Zoological Park had considerable success in raising Pygmy Hippopotamuses, it seems advisable to list the breeding record here. The first Pygmy Hippopotamus to come to the Zoo was a gift from Harvey Firestone, Sr., to President Calvin Coolidge in 1927. It was known as "Billy". In 1929 a mate, "Hannah", was purchased. In 1940 the Smithsonian Institution-Firestone Expedition returned from Liberia with one young male, which died May 3, 1943, and one adult female, known as "Matilda".

Billy and Hannah

August 26, 1931, male, died August 27, 1931, killed by mother.
August 21, 1932, male, died August 22, 1932, killed by mother.
April 29, 1933, male, died April 29, 1933, killed by mother.
May 8, 1938, female, sent to Cole Bros. Circus April 26, 1939.
June 24, 1939, female, prematurely born, died June 25, 1939.
February 25, 1940, female, died October 28, 1942.
May 9, 1941, female, sent to Philadelphia Zoological Gardens, March 16, 1944.
February 1, 1943, female, died February 2, 1943.
February 20, 1945, male, sent to Miller Bros. Circus, January 7, 1950.
December 21, 1945, female, died December 21, 1945.
October 11, 1947, female, died February 11, 1948.
March 12, 1950, female, sent to Catskill Game Farm, June 16, 1953.
June 13, 1951, male, sent to Catskill Game Farm, June 16, 1953.
April 26, 1953, female, died November 8, 1953.
June 8, 1954, female, died June 23, 1955.

Billy and Matilda

December 13, 1943, male, sent to Fort Worth (Tex.) Zoo.
March 5, 1947, female (living in NZP).
July 3, 1948, female (living in NZP).
December 20, 1949, female, sent to Sydney, Australia, October 18, 1954.
April 24, 1952, male, died October 8, 1952.
October 2, 1953, female, died September 16, 1954.
January 30, 1955, female, sent to John Seago, England, September 7, 1956.
March 29, 1956, female, sent to L. Ruhe, New York, May 7, 1957.

Matilda and two of her daughters are still living in the National Zoological Park. Billy died on October 11, 1955, and Hannah on March 6, 1958.
From Annual Report on The National Zoological Park, Washington, 1959.

BREEDING FLAMINGOS AT BASLE ZOO, SWITZERLAND

Since we first bred Flamingos at Basle Zoo, we have always wondered why we could keep these birds for so many years (our oldest specimens were imported in 1932) without their reproducing.

The reason for this appeared when we examined their old diet. This consisted mainly of boiled rice, wheat and dried shrimps—and consequently was low in proteins and very low in vitamins. Although the nutritional content was sufficient for keeping the adult birds alive, it was inadequate for bringing them into breeding condition. In all these years only one egg was laid (in 1940).

In 1956, scientific rations, rich in protein and complete in all the essential nutrients, were introduced throughout the Zoo. Since then the Flamingos have been given a diet which corresponds closely to a mash for laying hens which is commercially available all over the world. In July of that year it became obvious that the birds were trying to nest. The lawn where the birds were

kept was then flooded and a number of birds started to build nests. But when moulting started, this activity gradually ceased.

In 1957, 5 nests were built and 4 eggs laid but these were infertile. From 1958 onwards almost all our birds built nests. In 1960 we had 15 nests and 15 eggs. So far we have raised 3 Chilean and 3 Greater Flamingos. The low fertility rate of the eggs is explained by the pinioning of the birds, the male's ability to copulate being somewhat impaired.

Dr H. Wackernagel, Scientific Assistant, Basle Zoo, Switzerland.

HIPPOPOTAMUS MILK ANALYSIS

To date one of the main difficulties of hand-rearing baby hippos has been the difficulty of finding a suitable substitute milk. For several years Overton Park Zoo have been trying to get a milk sample from a lactating Nile Hippo and during 1959 they were successful.

On February 12, 1959, a female Hippo at Overton Park gave birth to a male baby weighing approximately 65 lbs. At 10 weeks it was accidentally killed by its mother. When weighed it showed a phenomenal increase of 300 lbs. since birth.

As the female was a heavy milker it was decided to milk her with an ordinary breast pump to prevent her udder from becoming congested.

The Analysis: Fat 3.49%; Protein 5.30%; Lactose 4.32%; Ash 0.80%; Total Solids 11.50%; (Solids not fat (i.e. protein, lactose and ash) come to 8.01%.)

Fat content lower than that of most cow's milk, with the exception of that of Holstein.

Raymond F. Gray, Overton Park Zoo, Memphis, Tenn., U.S.A. ("Parks & Recreation." Sept. 1959.)

LIONS BRED AT ARNHEM ZOO, NETHERLANDS

During 1959 22 Lion cubs were born at the Burgers' Natuur Dierenpark, Arnhem, Netherlands. The record for the Zoo is 32 Lion cubs bred during 1937.

USE OF HORMONES AT SOFIA ZOO, BULGARIA

In co-operation with the Bulgarian Academy of Science (Zoological Institute) experiments are being carried out on animals using Testin, Prolan, Testosteron, Yohimbin and Vitamins A, E, B-I.

ANIMAL WELFARE AND ZOOLOGICAL RESEARCH

THE BIOLOGICAL RESEARCH INSTITUTE OF THE ZOOLOGICAL SOCIETY OF SAN DIEGO, U.S.A.

The Biological Research Institute is housed in a two-storey building with well equipped individual laboratories, operating room and offices. Extensive outdoor animal isolation quarters adjoin the building. Members of the Research Council of the Institute meet regularly to discuss special problems involved in research. The Research Council administers the Robert P. Scripps Fellowship which is available to graduate or post-doctoral students for the pursuit of problems in some phase of animal biology at the Biological Research Institute. Research may be in the fields of pathology, bacteriology, parasitology, physiology, comparative anatomy, comparative biochemistry, animal nutrition, veterinary medicine or animal psychology. The stipend is \$3,000 for a ten month period and \$500 for expenses. Typical problems already investigated include: effects of rapid freezing on the bacterial flora of fish and meat; the digestion of carbohydrates in carnivorous animals; ectoparasites of wild and captive rodents; comparative physiology of seals living in fresh and sea water; nutrition and skin-and-feather-pigmentation of exotic birds, etc.

SUMMARY OF ACTIVITIES OF THE RESEARCH COUNCIL
of the
ZOOLOGICAL SOCIETY OF SAN DIEGO
for the year 1959-60

M. T. Clegg, Ph.D.: University of California, School of Veterinary Medicine, Davis, California—"Studies on the Gonadotrophic and Estrogenic Hormones in the Blood and Urine of Different Wild Mammalian Species during Pregnancy". Stipend—\$300 plus \$100 for expenses for one month.

Charles E. Cornelius, D.V.M., Ph.D., University of California, School of Veterinary Medicine, Davis, California—"Studies Concerning the Chemical Composition and Concentration of the Serum Glycoproteins in Zoo Animals". Stipend—\$300 plus \$100 for expenses for one month.

Leslie A. Page, Ph.D.: University of California, School of Veterinary Medicine, Davis, California—"A Study on the Microflora of Penguins in Captivity; also will Study the Normal Oral Microflora of Snakes, with Studies on the Possible Etiology of Neurotic Stomatitis ('Mouthrot') in Snakes". Stipend—\$300 plus \$100 for expenses for one month.

Richard Yamamoto, Ph.D.: University of California, School of Veterinary Medicine, Davis, California—"Studies on Exotic Avian Species for the Presence of PPLO (pleuro-pneumonia-like organisms)". Stipend—\$300 plus \$100 for expenses for one month.

L. Z. McFarland, D.V.M.: University of California, School of Veterinary Medicine, Davis, California—"Comparative Studies on the Nasal (salt) Glands of Marine Birds". Stipend \$300 plus \$100 for expenses for one month.

Ernest L. Biberstein, D.V.M., Ph.D.: University of California School of Veterinary Medicine, Davis, California—"Studies on the Nasal Microflora of Exotic Ruminants with Special Attention to the Presence of *Pasteurella Hemolytica*". Stipend—\$300 plus \$100 for expenses for one month.

Jiro J. Kaneko, D.V.M., Ph.D.: University of California, School of Veterinary Medicine, Davis, California—"A Study of Hemoglobins and the Erythrocyte Survival of Zoo Animals". Stipend—\$300 plus \$100 for expenses for one month.

Lawrence R. Penner, Ph.D.: University of Connecticut—"Studies of Schistosome Dermatitis". Stipend—\$1,400 was awarded for the 3½ month period.

Graham M. Sterritt, Ph.D.: University of Colorado Medical Centre Denver Colorado—"Studies on the Participation of Primary Nutrient Needs and Need Satisfaction in the Development of Basic Components of Behaviour". Stipend—\$300 plus \$100 for expenses for one month.

— + —

THE NEW ANIMAL HOSPITAL AND QUARANTINE STATION AT THE LONDON ZOO

The Zoological Society of London has always had special premises available for the accommodation of sick animals. Until fairly recently, there was a Sanatorium equipped to deal with casualties. However, with the advances in veterinary medicine and surgery, the Society realised that a new Hospital and Quarantine Station would have to be built.

In the early 1950's, therefore, investigations were carried out into the precise requirements of such a building. Many other zoological gardens were contacted and were most helpful in letting us know their experiences in this field. In addition, many research institutes were visited and consulted about such mundane subjects as floor surfaces, wall surfaces, drains, ventilators, etc.

One of the most difficult problems involved in the design of a Hospital and Quarantine Station is the great variety of inmates it has to deal with. Standardisation of dens or cages is essential since it is impossible to cater for individuals when, as is the case with the Zoological Society of London, there may be as many as three thousand animals belonging to about one thousand species on

exhibition in the Zoo. At the same time the accommodation must be varied enough to provide suitable quarters for sick mammals, birds and reptiles.

Thus one of the first tasks was to try and work out statistically what the demands on the accommodation were likely to be. Fortunately the Society possessed figures dating back well over 100 years, and by examining these it was possible to assess the average number of sick animals at any time and the approximate number of new animals arriving from time to time for quarantine. These figures were then re-examined in order to gain some idea of the sizes of the animals coming into the building so that a maximum cage size could be arrived at. In this connection it was agreed that pachyderms and giraffe would not be hospitalised.

DESIGN

After much discussion between the Society's Veterinary Officer and Architect, final plans were approved, building started and the new Hospital and Quarantine Station was opened to receive patients early in 1957. The new building consists of a Pathology Department, a Quarantine Section for newly imported animals that have to be quarantined before they can be put on view to the public, and a Hospital Section. It has been built on the western side of the Zoo and it has direct access from the public road and the Zoo. The outside cages face the Park to the south and the west. The building is steel-framed and faced with cavity brick walls, the service rooms are tiled and the dens are surfaced with polished concrete.

The Basement: this is provided with storage rooms, with a lift and with plant rooms which provide filtered air. Heating for the whole building is provided by a central plant.

The Ground Floor: the large animal dens are on the ground floor and are big enough to accommodate animals up to the size of an adult ape, antelope, zebra or big cat. These dens are situated in a projecting single storey base to the north, west and south sides of the building and they are designed to provide five dens for quarantine purposes, nine dens for hospital requirements and six dens which can be used for hospital or quarantine purposes. A small outside exercise paddock is provided for every two dens. If each den is occupied, alternative exercising times can be arranged to give each animal the benefit of fresh air and sunshine as required. Extra exercising space for a very large animal can be provided by opening a dividing door and combining two exercise paddocks. The small exercise area allowed is sufficient to give the animal "walking space" but it is not so large as to make frequent boxing difficult. All dens are connected by a service corridor from which heating, water, lighting and den door controls are operated so that the attendants need not enter the dens. The service corridor connects directly with the staff rooms, operating theatre, X-ray rooms and dispensary offices. The operating theatre contains all the latest aids to precise surgery such as pressure sterilisation, wet sterilisation, a full range of surgical instruments, modern anaesthetic apparatus, and protective clothing for those working in the theatre.

The First Floor: this is built over the centre section of the building and provides accommodation for medium to small sized mammals, birds and reptiles. There are two cage rooms or wards. The first is so designed that the temperature can be raised to 90° F. if required. Here delicate or newly-sick animals can be hospitalised at a temperature which will aid their recovery. The high-temperature ward also has special accommodation for chimpanzees. The second ward is maintained at a temperature of 60° F. and is for animals which are less seriously ill or are on their way to recovery. Leading off the second ward there is an open-air balcony on to which cages can be wheeled so that animals can be re-acclimatised before returning to the Zoo to be put on exhibition. Also housed on the first floor are offices and laboratories.

Doors: all doors are built on a continuous wire sliding system and are operated from corridors inside the Hospital. Sliding doors for wild animals in captivity are considered an essential security precaution. In addition to solid doors, there are detachable wire mesh doors which can be dropped on to built-in lugs inside the entry doors to the dens. Apart from giving additional security, these mesh doors allow the solid sliding doors to be kept permanently open in the case of sociable animals which enjoy seeing what is going on. On the other hand, the existence of solid doors give an atmosphere of seclusion to an animal that prefers solitude and quiet. Inspection of the animal in these circumstances is facilitated by the inclusion of a "judas-window" or "peep hole" in the corridor door.

WORK UNDERTAKEN BY THE HOSPITAL AND QUARANTINE STATION

1. Disease Prevention

On account of the difficulties associated with the diagnosis and treatment of illness in captive wild animals, it is obviously essential that disease prevention should play a far larger part in

general policy than the treatment of illness. For this reason, as many as possible of all newly-arrived animals should spend a time in the Hospital being examined for fitness. During this period (which anyway may be imposed by law in association with quarantine requirements) it is possible, not only to examine excreted material for parasites or infections, and remove them where necessary, but also to assess the dietary requirements of the individual animal. An animal may not necessarily eat those foods which constitute a balanced diet, but it is important to allow it a free choice during its first few weeks of captivity in order that a feeding pattern can be built up. In the succeeding months there is plenty of time to modify the diet according to precise dietary requirements, but in the meantime the important thing is to help the animal to settle down. While the animal is under observation, its peculiarities of temperament which might indicate the need for special housing can be noted. Once the animal is put out on exhibition, great attention is paid to hygiene. New disinfectants are always being tried out for efficiency and special attention is paid to the residual bacteriostatic effects of certain chemicals within the disinfectant group. Regular faecal samples are taken from many of the animals and examined by the Hospital in order to ensure that the parasite load of any particular animal is not rising above a pathogenic level.

2. *Hospital Service*

(a) *Reporting the Sick Animal.* Reports of animals that are newly-sick are handed in to the Hospital by 9.00 a.m. Each case is assessed on its merits by the Hospital Superintendent and the Veterinary Officer, particular reference being paid to the problem of whether the animal should be moved to the Hospital or allowed to remain in the House where it belongs. Many factors have to be taken into account, including the seriousness of the disease, the urgency or otherwise of medical treatment, the risk involved in moving the animal, the shock that moving might cause, etc.

(b) *Moving the Sick Animal to the Hospital.* If it is decided to transfer the animal to the hospital, it is moved there as soon as possible and if necessary it is transported in a special electrically-propelled vehicle which is very quiet and has special springing to minimise traumatic shock from jolting.

(c) *Treatment of the Sick Animal in the Hospital.* On admission to the Hospital the correct type of accommodation is assessed as are the details of what type of bedding the animal requires, the possible need for infra-red or ultra-violet irradiation, the temperature of the den, the need for oxygen or otherwise, the use of medicaments, the obtaining of laboratory samples and the starting of a case sheet. A short period of convalescence is considered desirable before the animal goes back on exhibition.

(d) *Return of the Animal to the Zoo.* When the animal goes back on exhibition, any special instructions are passed on to the Curator in charge of the animal.

3. *Surgery*

When surgery is required, as in the case of fractures, serious fighting injuries, self-inflicted wounds, abdominal disease, obstetrics, etc., the animal is operated on in the fully-equipped operating theatre. However, it is realised that major surgery is always performed with the risk that the animal may later attempt to damage the wound.

4. *Restraint and Anaesthesia*

No effort is spared to improve the methods of restraint and anaesthesia available for dealing with a sick wild animal. Violent physical battles with an animal are inadvisable from all points of view. Tranquillising and paralytic drugs are very important in this field, but because of species variation and individual variation in tolerance to an accepted dose of such drug, it is not possible to say categorically that they are always successful. These drugs have proved very useful in pre-operative calming of a patient and after the operation they can help remove the desire to inflict injury on a new wound. However, where regular treatment is involved it is often difficult to administer the drugs. The difficulties of administration by mouth are obvious, and possibly repeated injections of a tranquillising drug may annoy the animal to such an extent that the beneficial effects that might be expected from the drug are to some extent cancelled out. Paralytic drugs, whether they act centrally or peripherally, are claimed by some to be of great use in dealing with wild animals. However, experience at the London Zoo has shown that this type of drug has a very critical dosage rate and excesses can easily prove lethal. Often it is difficult to obtain the accurate body weight of an animal when an emergency occurs and since it is also very difficult to know the individual reactions to a paralytic drug, some of us feel that the use of these drugs is still in the experimental stage and that there is much room for improvement of the type and safety of these drugs. A useful addition to the technique of drug administration is the development of a CO₂

fired rifle or pistol which will fire a dart loaded with the drug into the animal. Upon impact, carbon dioxide is generated in the posterior chamber of the dart, and the pressure created forces the plunger down the barrel of the dart, thus injecting the drug. This technique is a brilliant advance in the problem of administering medicaments to a wild animal without restraint, but it is limited by the limitations of the drugs in use. An important part of the function of the Hospital is to investigate new drugs and their administration methods with a view to improving their usefulness.

RECOVERY RATE OF SICK ANIMALS

Some indication of the progress made in recent years in overcoming illness in captive wild animals is given by the following table which illustrates the increasing recovery rate achieved at the London Zoo during the last five years.

<i>Year</i>	<i>Percentage of Animals recovering from sickness</i>
1955	58%
1956	67%
1957	76%
1958	75%
1959	81%

O. Graham-Jones, M.R.C.V.S., Veterinary Officer, The Zoological Society of London, Regent's Park, London, N.W.1. Great Britain.

USE OF TRANQUILLISER DRUGS FOR MOVING BEARS AT JOHN BALL ZOO, U.S.A.

At the John Ball Zoological Park the drugs Sucostrin and Halatal (sodium penorbital), were used to move two Black Bears to temporary quarters. The male was estimated to weigh 125-150 lbs. and the female 100 lbs.

The dosage used of Sucostrin was one cc. (20 mgm. per cc.) for up to 200 lbs. body weight; the female was given slightly less than one cc. The drug was administered by a metal barred syringe with an eighteen gauge needle, 1½" long, fastened by metal clips to a wooden pole about three feet long. The whole dose was injected in one quick thrust against each bear's flank. Each bear became unconscious within two minutes. The female was then moved to the new cage, the drug taking full effect for about four or five minutes.

Halatal was used in addition to Sucostrin on the male. Once the Sucostrin had made him unconscious a dose of one cc. to 5 lbs. body weight was injected by syringe (placed I.P.). The first injection failed completely, possibly because it had entered the stomach and had been absorbed with the food. A second shot of Sucostrin and a reduced dose of Halatal were again administered, this time successfully and the bear remained fitfully asleep for about four hours.

For several days after the injections the bears were nervous but otherwise suffered no ill-effects. Mr. Meyer reaches the conclusion that so long as the bears are given time to recover between each dosage, repeated injections of Sucostrin can be administered without ill-effects. The bear should be injected when on a level area well-padded with straw in case it should fall heavily when the drug starts to take effect. The correct dosage for larger bears is not known and more experience is needed before dosing large bears with Sucostrin is attempted.

Sucostrin and Halatal act independently. Sucostrin acts at the junction between the nerve endings and the muscular cells; Halatal acts on the central nervous system. It is thought that on some animals the intramuscular route of Sucostrin might be dangerous since the action of this drug is very variable.

Fred A. Meyer, Director of John Ball Zoological Park, Grand Rapids, Mich., U.S.A. ("Parks & Recreation." April 1959.)

DRUG RESEARCH AT ST. PAUL'S COMO ZOO, MINNESOTA

"Observations on Effect of Preanesthetic Medication with Meperidine and Promazine on Barbiturate A in an Ocelot and a Leopard".

Summary

The literature on general anaesthesia in large cats is reviewed. Promazine (Sparine) and Meperidine (Demerol) were administered as preanaesthetic medication prior to sodium pentobarbital in an Ocelot. Promazine was administered twice prior to pentobarbital anaesthesia and once prior to combined thiopental-pentobarbital anaesthesia in a leopard.

These preanaesthetic agents reduced struggling, facilitated intraperitoneal injection in the ocelot and intravenous injection by the tail vein in the leopard. The 112-lb. leopard required 500 mg. of promazine and 30 gr. of pentobarbital for euthanasia.

A comprehensive bibliography is included in the paper which is illustrated with a photograph of the administration of the preanaesthetic medication of the ocelot.

Received from Donald H. Clifford, D.V.M., M.Ph. Veterinarian at St. Paul's Como Zoo, St. Paul, Minn., U.S.A. The paper is reprinted from the *Journal of the American Veterinary Medical Association*, vol. 133, No. 9, Nov. 1, 1958, pp. 459-463.

USE OF TRANQUILLISER DRUGS AT LINCOLN PARK ZOO, OKLAHOMA, U.S.A.

The Veterinary Research Department at the Lincoln Park Zoo, Oklahoma, U.S.A. have arranged tests for new drug preparations on the market. One of the drugs tested has been succinylcholine used with the Cap-Chur Gun. To date they have successfully paralysed 93 animals of 17 different species. The death loss has been only six.

USE OF TRANQUILLISER DRUGS AT THE WASHINGTON NATIONAL ZOOLOGICAL PARK

A long-acting ataraxic drug (Trifalon, Schering) has been used with very encouraging results on the following animals, all except the last being given by projectile syringe:

Gaur, young male. This animal was shipped to the Philadelphia Zoological Gardens after receiving two doses of the drug. He was crated, loaded and trucked without creating any disturbance.

Yak, male. This very aggressive bull was given one dose of the drug which lasted for 4 days, during which time it was possible for the men to enter his pen.

American Bison, male. This bull became aggressive when it was necessary to treat one of the old cows. He also began to knock the cow about and keep her down. After the drug had been given he became docile and easily managed.

Brown Fallow Deer, male. The animal was extremely excitable until given this drug for the removal of a leg cast.

Pampas Cat. This excitable individual was given a small dose of the drug to facilitate trapping and moving to new quarters. The move was easily accomplished, and the effect of the drug lasted during the early acclimatisation period in the new cage.

1959. *Annual Report of the National Zoological Park, Washington, U.S.A.*

USE OF TRANQUILLISER ON A RETICULATED GIRAFFE AT WOODLAND PARK ZOO, U.S.A.

On August 24th 1959, an attempt was made to tranquillise and restrain a 1,200 lbs. female Reticulated Giraffe at the Woodland Park Zoological Gardens, Seattle, Washington, U.S.A. Three days before this date the animal had been startled and, as it pivoted while galloping, it fell, causing a simple midshaft fracture of the greater metatarsal. As there were no compounding skin lacerations, it was decided that an attempt would be made to tranquillise the animal with subsequent

casting of the fracture. Palmer Cap-Chur equipment was obtained and used throughout this attempt. The equipment did an excellent job in all respects.

At 5 a.m. 160 mg. Vesprin (Squibb Triflupromazine HCl) was injected intramuscularly in the biceps. There was no apparent reaction to this injection. At 10.20 a.m. the following was tried:

10.20 a.m.	10 mg.	Sucostrin (Succinylcholine HCl) IM.
10.48 a.m.	12 mg.	"
11.15 a.m.	14 mg.	" Eyes blinking; increased salivation.
11.45 a.m.	16 mg.	"

There was no reaction to any of these injections of Succinylcholine HCl. The animal remained alert and highly nervous. After a half hour wait, the following drug was tried:

12.15 p.m.	10 cc.	Trifalon (225 mg.) IM—(perphenazine).
1.35 p.m.	5 cc.	" (125 mg.).
2.25 p.m.	10 cc.	" (225 mg.).
3.40 p.m.	18 cc.	" (450 mg.) Incoordinate.

After the last injection of Trifalon, the animal was drowsy enough to relax to the sitting position. Any attempt to approach the animal was fruitless, however. She would struggle to arise, and eventually the distal portion of the fractured limb was torn free at the break.

The animal was quietened down and destroyed using 9 cc. (180 mg.) Sucostrin and 225 cc. Lethal (Euthanasia type pentobarbital).

This case illustrates the need for more study on the use of tranquillisers, the possible development of a new drug and the physiological ability of an animal under stress and shock to eliminate massive doses of existing drugs.

Kenneth L. Binkley, D.V.M., Zoo Veterinarian, Woodland Park Zoological Gardens, Seattle, Washington, U.S.A.

TREATMENT OF SKIN DISEASE IN AN ORANG-UTAN AT WOODLAND PARK ZOO, U.S.A.

The following is a description of the treatment of a skin condition of unknown etiology in a 50 pound young female Orang-utan at the Woodland Park Zoological Gardens, Seattle, Washington, U.S.A.

The first indication of pathological condition was the report that the animal had multiple skin eruptions. During the period of treatment, these eruptions would form vesicles and then coalesce into large blotchy dry areas, and eventually a large percentage of the animal's skin was involved. Over a period of five months the following medications were used.

Selenium sulfide bath
Nitrofurazone (Furacin)
Long-acting penicillin
Polysulfide (Tropical antifungal solution)
Salicylic acid ointment
Tamed iodine solution
Gentian violet 1:500
Medicated dusting powder
Griseofulvin (Fulvicin oral tablets)

All attempts to diagnose this condition at the Zoo were without success, so we called upon the resources and facilities of the University of Washington Medical School, Microbiology Department. They repeated our efforts at skin scrapings and blood slides, with negative findings. As a final resort, we permitted the ape to be anaesthetised and biopsies taken. These, too, proved negative. According to the Dermatologists at the Medical School, the lesions appeared to resemble Chromoblastomycosis or North American Blastomycosis, but these organisms were not found.

At the present time, the animal appears to be making a slow recovery. We attribute this to the use of Griseofulvin which is the only medication she has had for the last three months. She receives 1,000 mg. per day in divided dosage.

This case shows the great need for extensive combined study of pathology and methods of diagnosis in all medical fields.

Kenneth L. Binkley, D.V.M., Zoo Veterinarian, The Woodland Park Zoological Gardens, Seattle, Washington, U.S.A.

DIARRHOEA IN ORANG-UTANS AT STATEN ISLAND ZOO, U.S.A.

Two Orang-utans at the Staten Island Zoo suffering from sporadic attacks of diarrhoea in spite of the fact that repeated faecal examinations were negative for intestinal parasites have responded well to treatment with *Polymagna*, a combination of Kaopectate and antibiotics. Recovery was prompt.

Patricia O'Connor, D.V.M., Staten Island Zoological Society Annual Report.

ANTHRAX AT GLASGOW ZOO, SCOTLAND

During 1959 a seven year old male Puma died of anthrax at Glasgow Zoo, Scotland. An unusual feature of the death was that no other animal fed from the same delivery of food (horseflesh and wood pigeon) was affected.

"MOOSE DISEASE" AT ASSINIBOINE ZOO, CANADA

On September 4th, 1959, the Assiniboine Park Zoo, Winnipeg received a Moose cow (*Alces americana*) from the southern part of the Whiteshell Forest Reserve, South East Manitoba. There was no particular problem in catching the Moose since it was said to be a young tame specimen. It had no fear of man and was in a rather weak condition. Breathing was laboured, there were hardly any synchronised movements of the legs which after a short while did not carry the rump any more. The neck was stiffly kept in a bent position towards one side. The day after arrival at the Zoo, the animal was dead. It was not a calf but a very old cow, judging from the teeth which were loose and worn and the coat which still contained patches of winter coat in it (in September). All these observations corresponded with what has been described as "Moose Disease" (THOMAS & CAHN, 1932, as cited in R. L. PETERSON: North American Moose, Toronto, 1955). The post-mortem did not reveal any particular sickness of organs nor parasitic infections. However, it seemed to be desirable that in similar cases, microscopic slices of the brain tissue should be made and compared with similar slices from a healthy Moose.

This specimen of American Moose was the first one found with "Moose Disease" in the Province of Manitoba.

Dr Guenter Voss, Director of the Assiniboine Park Zoo, Winnipeg, Canada.

MORPHOLOGY OF THE PITUITARY GLAND OF SNAKE EMBRYOS

Charles Hackenbrock, senior reptile keeper at the Staten Island Zoo, New York, U.S.A., has been studying the morphology of the pituitary gland of snake embryos at Wagner College. The subjects of his research have been the Corn Snake and the Timber Rattlesnake.

Embryos were carefully removed at various stages of development from a newly-laid clutch of Corn Snake eggs and histological sections of the head cut and stained. Study of embryonic development of the Timber Rattlesnake proved more difficult. However, two gravid females were caught near New York and each was subjected to four Caesarian sections and the embryos studied. Both females are alive and thriving. The paper containing the conclusions of Mr. Hackenbrock's research are to be published shortly.

Staten Island Zoological Society Annual Report, 1959.

The journal "Parks and Recreation" mentioned in Section II of the Yearbook is published monthly by The American Institute of Park Executives, Inc. and its affiliated branch, The American Association of Zoological Parks and Aquariums. Membership and subscription details can be obtained from A.A.Z.P.A., Oglebay Park, Wheeling, West Virginia, U.S.A.

SECTION III

REFERENCE SECTION

ZOOS OF THE WORLD

ALGERIA

ALGIERS

Parc Zoologique, Jardin d'Essai, Algiers.

ARGENTINE REPUBLIC

BUENOS AIRES

Jardin Zoologico de la Ciudad de Buenos Aires, Acevedo no. 2900, Buenos Aires, Argentine Republic. Tel: 71-2174 & 71-2678. *Zoo Director*—Dr Enrique J. Saporiti. Founded 26.7.1874 by Don D. F. Sarmiento, opened on present site 1888. Financial support received from the Municipality of Buenos Aires. *Admission Fees*: Adult \$1.00 m/n, Child 6-10 years \$0.50 m/n, Child under 6 free. *Hours*: 8 a.m.-12 noon, 3 p.m.-7 p.m. summer, 9 a.m.-6 p.m. winter. 1959 *Attendance*: 3,000,000. 18 hectares, 183 employees. *Mammals* 111 species, 574 specimens; *Birds* 125 species, 723 specimens; *Reptiles & Amphibians* 16 species, 129 specimens. *Total* 252 species, 1426 specimens. *Library*—10,000 vols.; *Publication*—Illustrated Guide (1950, \$3.60); *Veterinary & Zoological Research Dept.*

LA PLATA

Jardin Zoologico, La Plata, Argentine Republic. *Zoo Director*—Dr Thomas Enrique Grigera.

MENDOZA

Jardin Zoologico, Mendoza, Argentine Republic. *Zoo Director*—Ing. Agr. E. A. de Godoy.

AUSTRALIA

ADELAIDE

Adelaide Zoological Gardens, Frome Road, Adelaide, South Australia, Australia. Tel: M.9371. *Cable*: ZOO, ADELAIDE. *Zoo Staff*: *Zoo Director*—Vincent D. Haggard; *Hon. Vet.*—Dr P. S. Watts, D.Sc., Ph.D., F.R.C.V.S. Society founded 23.7.1878 by the South Australian Acclimatisation Society, Zoo opened 23.5.1883, 1938 became known as the "Royal Zoological Society of South Australia, Inc.". Financial support received

from the State. *Admission Fees*: Adult 3s.; Child 1s. *Hours*: 9.30 a.m.-5 p.m. throughout year (Sun. 10 a.m.-5 p.m.). 1959 *Attendance*: 285,213. 20 acres; 30 employees. *Mammals* 86 species; *Birds* 243 species; *Reptiles & Amphibians* 18 species. *Total* 347 species. *Botanical Section*; *Educational Facilities*—cheap rates for school & student parties; *Library*—for use of Council & Staff; *Publications*: Annual Report, Zoo News (quarterly for Society members); *TV Prog.*—Zoo occasionally featured. Elephant & train rides. 1959 *Building*: Enclosures & Shelters for Kangaroos & Wallabies; 1960 *Building*: Rock Enclosure for Thars, cages for Lemurs, Tree Kangaroos, Badgers, Tasmanian Devils & Native Cats.

MELBOURNE

Zoological Board of Victoria, Zoological Gardens, Royal Park, Parkville, N.2, Melbourne, Victoria, Australia. Tel: FJ.3812, FJ.3218 & FJ.1479. *Zoo Staff*: *Zoo Director*—A. G. Whitlam; *Head Keeper*—W. Van Aperen; *Head Gardener*—H. Emmerik; *Catering Manageress*—Mrs. M. Hulme; *Publicity & Public Relations*—Mrs. J. Seekamp. Founded by the Ornithological Soc. (est. 1857), 1862 moved from the Botanical Gardens to Royal Park, 1910 received royal charter, 1937 control of Gardens transferred from the Zoological & Acclimatisation Soc. of Victoria to the Government of Victoria which gives a small annual grant. *Admission Fees*: Adult 3s.; Child 1s. *Hours*: 9.30 a.m.-5.30 p.m. throughout year. 1959 *Attendance*: 500,000. 55 acres. 60 employees. *Mammals* 92 species; *Birds* 110 species; *Reptiles & Amphibians* 30 species. *Total* 232 species. *Botanical Section*; *Library*—for Staff only; *Publication*—Zoo Guide (6d.); *Radio Prog.*—occasional; *TV Prog.*—regular children's programme & Zoo occasionally featured on other channels; Elephant & train rides, merry-go-round, miniature circus. 1959 *Building*: several new enclosures.

SOUTH PERTH

Zoological Garden South Perth, Labouchere Road, South Perth, Western Australia,

Australia. Tel: 67-1050. Zoo Staff: *Managing Secretary*—H. E. Bancroft; *Superintendent*—W. K. Lyall. Founded 26.10.1898 by the State which gives financial support. *Admission Fees*: Adult 2s.; Child (under 14) 6d. *Hours*: 10 a.m.—5.30 p.m. throughout year, 1959 *Attendance*: 150,000 adults + 100,000 children. 43 acres. Approx. 30 employees. *Mammals* 63 species, 273 specimens; *Birds* 91 species, 858 specimens; *Reptiles & Amphibians* 4 species, 8 specimens; *Fish* 40 species, 498 specimens. *Total* 198 species, 1637 specimens. *Aquarium*; *Botanical Section*; *Vet. Services* provided by the Ministry of Agriculture. Elephant rides, miniature trains & merry-go-round. 1960/61 *Building*: Extensions to Restaurant & to Bear Cage; new Carnivore House, Flamingo Yard, Aviaries, Eagle Cage & Entrance Building.

SYDNEY

Taronga Zoological Park Trust, Zoological Gardens & Aquarium, Mosman, Sydney, New South Wales, Australia. Zoo Staff: *Hon. Director*—Sir Edward Hallstrom; *Vice-President*—Ald. Frank G. Pursell; *Manager*—Mr. Calman; *Administrative Sec.*—Miss Helen Cowell. Zoo opened 1916 on Crown land—initial construction undertaken by Public Works Dept. of the Government, but no state subsidy. *Admission Fees*: Adult 4s.; Child 2s. *Hours*: 9.30 a.m.—sunset throughout year. 1959 *Attendance*: approx. 1,000,000. 70 acres. 60 employees (excluding catering staff). *Aquarium*; *Botanical Section*; *Children's Zoo* (free) & *Children's Circus* (small charge); *Educational Facilities*—free admittance for some schools; *Library*—for Staff; *Publications*—Annual Report (not on sale) & illustrated Guide Book; Zoo regularly featured on *Radio & TV*; *Veterinary work* undertaken by visiting Vet. from Sydney University. Amusement Area—elephant & miniature train rides, merry-go-round. 1959 *Building*: Indian Monkey House, Koala House, large Tree-climbing Kangaroo Enclosures, large pens for Native Cats. 1960 *Building*: Gibbon House.

AUSTRIA

VIENNA

Tiergarten Schönbrunn, Wien XIII, Austria. Tel: 821236. Zoo Staff: *Zoo Director*—J. Glaser, Hofrat Dipl. Ing.; *Zoological Director*—Dr W. Fiedler; *Financial Administrator*—A. Russold; *Inspector*—R. Brandstätter. Zoo founded by Kaiser Franz I. Financial support received from Austrian Republic & the Federal Ministry of Reconstruction & Commerce. *Admission Fees*: Adult 3 schillinge; Child 1 schillinge. *Hours*: 9 a.m.—6.30 p.m. (Sun. 7 p.m.) summer;

9 a.m.—4.30 p.m. winter. 1959 *Attendance*: 970,917. 64,000 sq. metres + 60,000 sq. metres. 59 employees. *Mammals* 102 species, 290 specimens; *Birds* 264 species, 597 specimens; *Reptiles & Amphibians* 53 species, 148 specimens; *Fish* 148 species, 1246 specimens; *Invertebrates* 71 species, 1159 specimens. *Total* 638 species, 3440 specimens. *Aquarium*—large collection of Mediterranean fish & invertebrates; *Library*—for Staff; *Vet. Services* provided by the Veterinary High School. 1959 *Building*: Aquarium & Terrarium. 1960 *Building*: Houses & Enclosures for Mountain Ruminants; House for Cranes & Storks.

BELGIUM

ANTWERP

Société Royale de Zoologie d'Anvers, Place Reine Astrid 26, Anvers, Belgium. Tel: Anvers 32-52-59 & 32-22-80. *Zoo Director*—Walter Karel Van den Bergh. Founded 1841 by the Society; since 1870 société anonyme. Financial support received from Anvers Province (240,000 francs p.a.). *Admission Fees*: Adult F.40; Child F.20; Personal Season Ticket F.700 p.a.; Groups (25+) F.30 each; Family Rate F.1000 p.a. *Hours*: 8.30 a.m.—dusk throughout year. 1959 *Attendance*: 797,672. 24 acres 170 employees (200 in summer). *Mammals* 187 species, 825 specimens; *Birds* 542 species, 1904 specimens; *Reptiles & Amphibians* 98 species, 379 specimens; *Fish* 203 species, 2541 specimens; *Invertebrates* 29 species, 203 specimens. *Total* 1059 species, 5852 specimens. *Aquarium*—sea & freshwater sections, both with hot & cold water tanks; *Botanical Section*; *Children's Zoo*; *Educational Facilities*; *Film Unit*; *Library*; *Pathology Dept.*; *Publications*: "Zoo" (a review, 50F. p.a., free to members), *Bulletins* of the Society at intervals; occasional *Radio Prog.*; *TV Prog.* twice a month; *Veterinary & Zoological Research Dept.*; *Bird Reserve* "De Zegge" at Lichtaart; *Natural History Museum*; *Animal Rides*. 1959/60 *Building*: Auditorium for concerts & lectures (2040 seats), also 2 conference rooms (150 seats) and Lecture Hall (for 100 pupils).

BOLIVIA

COCHABAMBA

Jardín Zoológico, Alcaldía Municipal, Cochabamba, Bolivia.

ORUNO

Jardín Zoológico, Alcaldía Municipal, Oruno, Bolivia.

BRAZIL

RIO DE JANEIRO

Jardim Zoológico, Rio de Janeiro, Brazil. *Zoo Director*—Henrique Lahmeyer de Mille Baretto.

SAO PAULO

Fundação Parque Zoológico de São Paulo, Avenida Água Funda (Caixa Postal 12.954), São Paulo, Brazil. *Zoo Director*—Mario Autuori. Founded 16.3.58 by the Municipality of São Paulo, 12.12.59 became a foundation. State-aided. *Admission Fees*: Adult Cr. \$20.00; Child (over 6) Cr. \$5.00; Child (under 6) & school children free. *Hours*: 9 a.m.–6.30 p.m. summer; 9 a.m.–5.30 p.m. winter. 1959 Attendance: 437,242. 355,204 sq. metres. 106 employees. *Mammals* 54 species, 254 specimens; *Birds* 39 species, 319 specimens; *Reptiles & Amphibians* 2 species, 13 specimens. *Total*: 95 species, 586 specimens. *Library*; *Vet. Dept.* 1959 *Building*: Hippo House, Gibbon Island. 1960 *Building*: Snake House; Small Mammal House, 3rd Bird House. Children's Zoo planned.

BRITISH GUIANA

GEORGETOWN

British Guiana Zoo, Botanical Gardens, Georgetown, British Guiana. *Tel*: 4717. *Zoo Staff*: *Zoo Director*—Vincent Roth, O.B.L., J.P., F.R.G.S.; *Superintendent*—James S. Lel. Founded 1947 by the Royal Agricultural & Commercial Soc. of British Guiana as a branch of the British Guiana Museum which administers the Zoo. State-aided. *Admission Fees*: Adult 10 cents; Child (under 12) 2 cents. *Hours*: 8 a.m.–6.15 p.m. throughout year. 1959 Attendance: 69,051. 2 acres (approx.). 12 employees. *Mammals* 35 species, 153 specimens; *Birds* 98 species, 314 specimens; *Reptiles & Amphibians* 17 species, 128 specimens; *Invertebrates* 1 species, 4 specimens. *Total* 151 species, 599 specimens. *Aquarium*—in the Museum, not in the Zoo; *Children's Zoo*; *Educational Facilities* (at Museum)—27 City schools attend daily lectures, 73 country schools provided with travelling loan collection. *Library*—zool. section at the Museum; *Publications*: Journal of the British Guiana Museum (quarterly, 25 c.); *Vet. Services* provided by the Government Agricultural Dept. 1959 *Building*: steel & concrete Big Cat House. •

BRITISH HONDURAS

TEGUCIGALPA

Jardim Zoológico de Honduras, c/o Palacio del Distrito Central, Tegucigalpa, D.C., Hon-

duras, C.A. *Zoo Director*—Sr. Director del Museo y Jardín Zoológico.

BULGARIA

SOFIA

The Zoological Garden, 15 Tolbuhin Bul., Sofia, Bulgaria. *Zoo Staff*: *Zoo Director*—Yanko Banvernisti; *Zoo Technician*—Raina Velichkova; *Senior Accountant*—Naiden Naidenov; *Vet. Surgeon*—Dr Arseni Ivanov. The Zoo was founded 1890 and is governed by the City Council (Education & Culture Dept.) & an advisory group of scientists from the Bulgarian Academy of Science. *Admission Fees*: Adult 1.20 lv; Child 0.30 lv. *Hours*: 9 a.m.–mid-day, 2 p.m.–6 p.m. throughout year. 1959 Attendance: 800,000. 30 decares; 31 employees (including senior staff). *Mammals* 193 specimens; *Birds* 596 specimens; *Reptiles & Amphibians* 139 specimens; *Fish* 355 specimens. *Total* 1283 specimens. *Aquarium*; *Educational Facilities*—courses for keepers, training facilities for students & school children; *Publications*: scientific papers by Zoo Staff are published in the Zoological Institute of the Bulgarian Academy of Science; *Vet. Dept.*—quarantine section, pathology section & much assistance received from the Veterinary Bacteriological Institute, the Uninfectious Diseases Institute & the Food Research Institute. *Building Plans*: new Zoo with open cages.

BURMA

RANGOON

Rangoon Zoological Gardens (formerly Victoria Memorial Park & Gardens), Kandawgalay Post Office, Rangoon, Burma. *Tel*: 12923. *Zoo Director*—U Kyaw Thein, G.M.V.C. Founded 1908 the Government of the Union of Burma. Financial support received from the Government, the Rangoon Municipal Corporation, the Rangoon Port Trust & the National Housing Board. *Admission Fees*: Adult 30 pyas; Child 10 pyas; Child under 12 free. *Hours*: 6.30 a.m.— $\frac{1}{2}$ hour after sunset throughout year. 1959 Attendance: 737,248 + 7,980 children (free). 42 acres; 90 employees. *Mammals* 66 species, 517 specimens; *Birds* 107 species, 1102 specimens; *Reptiles & Amphibians* 13 species, 134 specimens; *Fish* 23 species, 11600 (approx.) specimens. *Total* 209 species, 13353 specimens. (approx.). *Aquarium*—25 freshwater tanks; *Botanical Section*; *Library*; *Pathology work* by Government Medical College Path. Dept.; *Vet. Services* provided by the Government Vet. Research Institute. Elephant cart, Elephant rides, Camel and Donkey rides.

CANADA

ALBERTA—CALGARY

Calgary Zoological Gardens, St. George's Island, Calgary, Alberta, Canada. Tel: B.R. 35772. *Zoo Director*—Thomas R. Baines. Founded 1929 by the Calgary Zoological Soc. Financial support received from the Province, the City & the Society. Free admission. *Hours*: 8 a.m.—10 p.m. summer; 8 a.m.—5 p.m. winter. 1959 *Attendance*: 750,000 (estimated). 15 acres. 12 employees. *Mammals* 123 species, 338 specimens; *Birds* 216 species, 662 specimens, *Amphibians & Reptiles* 9 species, 22 specimens, *Fish* 22 species, 178 specimens. *Total* 370 species, 1200 specimens. *Children's Zoo*; *Educational Facilities*; *Library*; *Publications*—Guide Book (50 c. annually) & Honker Bulletin (irregular intervals); *Radio & TV Progs.*; part-time *Vet. Dept.* 1959 *Building*: Aquatic Bird House, Children's Zoo Building.

ALBERTA—EDMONTON

Borden Park Zoo, City of Edmonton Parks Dept., Civic Block, Edmonton, Alberta, Canada. *Zoo Director*—A. C. Patterson.

BRITISH COLUMBIA—VANCOUVER

Vancouver Public Aquarium, Stanley Park, Vancouver 8, British Columbia, Canada. *Director*—Murray A. Newman.

MANITOBA—WINNIPEG

Assiniboine Park Zoo, Winnipeg, Manitoba, Canada. Tel: HU.92986. *Zoo Staff*: *Zoo Director*—Dr. Guenter Voss; *Head Keeper*—Rolf W. Henning. Founded 1905 by the City of Winnipeg which gives financial support; endowments are also received from the Zoological Society of Manitoba. Free Admission. *Hours*: day & night, throughout the year. 1959 *Attendance*: 750,000 (estimated). 120 acres (only 40 developed). 9 employees. *Mammals* 40 species, 250 specimens; *Birds* 50 species, 300 specimens; *Reptiles & Amphibians* 2 species, 2 specimens. *Total*: 92 species, 552 specimens (average figures). *Botanical Section*; *Children's Zoo* (Adult 25 c.; Child 6-14, 10 c.); *Educational Facilities*—conducted tours & lectures, films & meetings of the Zoological Society of Manitoba; *Library*—for Staff; *Publications*: Pictorial Guide (annual 25 c.), *Zoolog* (quarterly, free to members of Z.S.M.); regular *Radio Prog.* of Zoo News; occasional *TV Prog.* Pony rides. 1959 *Building*: Children's Zoo (stage I), Washrooms, Moose & Deer shelters. 1960 *Building*: Siberian Tiger Enclosure, Tree Porcupine cages, pond in Wapiti Enclosure, perimeter fence & road extension.

ONTARIO—TORONTO

The Municipality of Toronto Riverdale Zoo, Winchester Street, Toronto, Ontario, Canada. Tel: HU.5-9491. *Zoo Staff*: *Zoo Director*—Dr Norman D. Scollard, D.V.M., V.S. *Foreman*—Mr. George Stewart. Founded by the City of Toronto 1887. The Zoo is operated as a division of the Metropolitan Toronto Parks Depts. and is financed by the Metropolitan Corporation. Free Admission. *Hours*: Buildings 10.30 a.m.—4.30 p.m. (7 p.m. Sun.) throughout year; Grounds 8.30 a.m.—sunset throughout year. 1959 *Attendance*: 400,000 (estimated). 9 acres. 17 employees (+13 in summer). *Mammals* 53 species, 246 specimens; *Birds* 79 species, 455 specimens; *Reptiles & Amphibians* 13 species, 30 specimens; *Fish* 3 species, 50 specimens. *Total*: 148 species, 781 specimens. New Zoo planned for 1963.

QUEBEC—GRANBY

Société Zoologique de Granby Inc., Rue Bourget, Casier Postal 514, Granby, Quebec, Canada. Tel: FR.8-3545. *Zoo Director*—Gilles Charbonneau. Founded 1947-51 by the City, from 1959 administered by the Zoological Society. Subsidised initially by the City, now receives annual subsidies from the State for fauna protection and donations from individual benefactors. *Admission Fees*: Adult 50 c.; Child under 14 free. *Hours*: 9 a.m.—7 p.m. May-Oct.; closed in winter. 1959 *Attendance*: 227,645 (paying visitors). 80 acres. 9 employees (25 in summer). *Mammals* 45 specimens; *Birds* 10 specimens; *Fish* 6 specimens. *Total*: 61 specimens. *Aquarium* (small); *Children's Zoo* (small); *Educational Facilities*; educational progs. on *Radio & TV*; *Vet. Dept.* 1959 *Building*: Zebra & Bactrian Camel House.

QUEBEC—MONTREAL

Montreal Children's Zoo (Jardin de Merveilles), 4000 Avenue Calixa-Lavallée, Lafontaine Park, Montreal 24, Canada. Tel: UNiversity 1-3811, Ex. 2559. *Zoo Director*—Gerald T. Iles. Founded 1957 by the City of Montreal. Initial capital expenditure paid for by City. *Admission Fees*: 15 c. *Hours*: 10 a.m.—sunset May-Oct.; closed Nov.—April. 4 acres approx. 4 permanent employees (30 in summer). 1959 *Attendance*: 392,564. *Mammals* 18 species, 39 specimens; *Birds* 53 species, 133 specimens; *Reptiles & Amphibians* 7 species, 12 specimens; *Fish* 1 species, 49 specimens. *Total*: 79 species, 233 specimens. *Botanical Section*; *Library*—belonging to the Director; *Pathology Work* undertaken by the City of Montreal Public Health Dept. or McGill University; *Publication*: Children's Zoo Souvenir Booklet (15 c.). Regular Sea Lion performances. 1959 *Building*: 2 service buildings, Monkey Theatre, winter quarters.

QUEBEC—ORSAINVILLE

Le Jardin Zoologique de Quebec, Orsainville (via Charlesbourg), R.54, Quebec, Canada. Tel: MA.3-2923. **Zoo Staff:** *Zoo Director*—Dr Ja. Armand Brassard, m.v.; *Asst. Zoo Director*—Dr Richard Bernard, licence en chimie, Ph.D.; *General Supervisor*—Ovila Rhéaume; *Curator of Birds*—Raymond Cayouette. Founded 1931 by the Government of Quebec Province which given financial support. **Admission Fees:** Adult 25 c. (except Tues. & Thur.); Child free. **Hours:** 9 a.m.—sunset, summer; closed in winter. **1959 Attendance:** 350,000 (estimated). 90 acres (half developed). 20 employees (+20 in summer). **Mammals** 73 species, 273 specimens; **Birds** 223 species, 923 specimens. **Total:** 296 species, 1150 specimens. **Children's Zoo; Educational Facilities**—special days for schools, zoological meetings; **Library**—3,000 vols. & 40 periodicals; **Publications:** Les Carnets de Zoologie, Tracts & Zoo Guide; regular **Radio Prog.**; **1959 Building:** Houses for African & Asian animals, Primate House.

CEYLON**DEHIWALA**

The Government Zoological Gardens of Ceylon (The Dehiwala Zoo), Allan Avenue, Dehiwala, Ceylon. Tel: Mt. Lavinia 275. **Cable ZOOLOGY, CEYLON. Zoo Staff:** *Zoo Director*—Maj. Aubrey Neil Weinman, O.B.E., C.M.Z.S.; *Director in Training*—W. L. E. de Alwis, B.Sc.; *Office Asst.*—R. D. Abeygoonewardane; *Senior Animal Overseer*—J. G. L. Ohlmus; *Gardens & Works Supt.*—S. K. Sameem; *Vet.*—P. B. K. Pillai. Founded by the Government of Ceylon which gives financial support. **Admission Fees:** Adult 50 c.; Child 15 c. **Hours:** 8 a.m.—6 p.m. throughout year. **1959 Attendance:** 1,200,000. 42 acres; 110 employees. **Mammals** 140 species, 1018 specimens; **Birds** 180 species, 1648 specimens; **Reptiles & Amphibians** 52 species, 84 specimens; **Fish** 46 species. **Total:** 418 species, 2750+ specimens. **Aquarium**—marine & freshwater; **Botanical Section; Children's Zoo; Educational Facilities**—guided tours; **Government Film Unit; Library; Publications:** Zoo Guide Book (rs.1.00) & free pamphlets; **Vet. Dept.**—also pathology section; **Radio & TV Progs.** Elephant, Pony & Camel rides, performing Elephants & Chimpanzees. **1959 Building:** Hippo & Sea Lion installations.

CHILE**CHILLAN**

Jardin Zoologico de Chillan, c/o Quinta "Santa Cruz", Jardin Zoologico, Chillan Viejo, Chile. Zoo Director—Carlos Junge.

Founded 6.2.59 by Carlos Junge. Financial support received from the "Circle of Friends of the Chillan Zoo". **Admission Fees:** Adult 0.06 Escudos; Child 0.03 Escudos. **Hours:** sunrise to sunset throughout year. **1959 Attendance:** 16,000. 2 employees. **Mammals** 3 species, 18 specimens; **Birds** 27 species, 78 specimens; **Reptiles & Amphibians** 10 species, 35 specimens; **Fish** 1 species, 1 specimen. **Total** 42 species, 132 specimens. **Botanical Section**—collection of cacti; **Educational Facilities**—lectures to schools; **Library**—belonging to the Director.

CONCEPCION

Jardin Zoologico, c/o Senhora Ester de Pablo, Municipalidad de Concepcion, Chile.

SANTIAGO DE CHILE

Jardin Zoologico Nacional, Cerro San Cristobal, Santiago de Chile, Chile. Tel: 397687. **Cable ZOOCHILE. Zoo Director**—Galo Perez Acevedo. Founded 1924 by the Government of Chile which gives financial support (140,000 Escudos p.a.). **Admission Fees:** Adult 0.05 Escudos; Child 0.01 Escudos. **Hours:** 8 a.m.—8 p.m. throughout year. **1959 Attendance:** 2,500,000. 8 hectares. 60 employees. **Mammals** 450 specimens; **Birds** 2700 specimens; **Reptiles & Amphibians** 45 specimens. **Total:** 3195 specimens. **Educational Facilities**—free admittance for children from government schools, documentary film with commentary lasting for 10 mins.; **Library** (small); 2 Vet. Depts. **1959 Building:** Enclosures for Penguins, Waterfowl, Caimans & Pheasants.

VICTORIA

Jardin Zoologico, Escuela Normal, Victoria, Chile.

CHINA**PEKING**

Peking Zoological Garden, Peking, People's Republic of China. Zoo Director—Tsui Chan-p'ing.

COLOMBIA**BOGOTA**

Jardin Zoologico, Ciudad Universitaria, Bogota, Columbia.

CONGO REPUBLIC**LEOPOLDVILLE**

Jardin Zoologique, Leopoldville, Congo.

STANLEYVILLE

Jardin Zoologique, Stanleyville, Congo.

CZECHOSLOVAKIA

BOJNICE

Zoologická záhrada—Bojnice, Bojnice, okr. Prievidza, Czechoslovakia. Tel: 28-60. *Zoo Director*—Ing. Gustav Cmarko. Founded 1.1.55 by the State (Nitra Dept.) which gives financial support. *Admission Fees*: Adult 2 Kcs; Child 1 Kcs. *Hours*: 8 a.m.—6 p.m. summer; 8 a.m.—4 p.m. winter. 1959 *Attendance*: 250,000. 7 hectares (30 hectares planned). 27 employees. *Mammals* 49 species, 163 specimens; *Birds* 131 species, 415 specimens; *Reptiles & Amphibians* 1 species, 6 specimens. *Total*: 181 species, 584 specimens. *Aquarium* (finished 1960); *Children's Zoo* (finished 1960); *Educational Facilities*—detailed lectures for students, 150,000 attended during 1959. *Library*—445 vols.; *Publication*—"Nase Zoo" (Our Zoo, 1 Kcs.); *Vet. Services* provided by Vet. Dept. of Bojnice; *Zool. Research* undertaken by Bojnice Zool. Research Dept. 1959/60 *Building*: Aquarium with 24 tanks, Children's Zoo.

BRATISLAVA

Zoologická záhrada Bratislava, Bratislava, Czechoslovakia. Tel: 261-71. *Zoo Director*—Ján Májek; *Zoologist*—Ján Kaluza. Founded April 1959 by the City of Bratislava; officially opened 17.4.60. Financial support received from the City. *Admission Fees*: Adult 1.00 Kcs; Child 0.50 Kcs. *Hours*: 8 a.m.—6 p.m. summer; 8 a.m.—4 p.m. winter. 10 hectares (90 hectares planned). 20 employees. *Mammals* 25 species; 140 specimens; *Birds* 55 species, 60 specimens. *Total*: 80 species, 200 specimens. *Children's Club* for rearing exotic birds; *TV Prog.* on Zoo animals.

BRNO

Zoologická záhrada města Brna, Bystř u Brna, Czechoslovakia. Tel: Brno 525-92. *Zoo Director*—Jan Bartušek. Founded 1950 by the people & City of Brno which gives financial support. *Admission Fees*: Adult 2 Kcs.; Child 1 Kcs. *Hours*: 9 a.m.—7 p.m. summer; 9 a.m.—4 p.m. winter. 1959 *Attendance*: 300,000. 19 hectares (100 ha. by 1970), approx. 45 employees. *Mammals* 54 species, 159 specimens; *Birds* 96 species, 202 specimens; *Reptiles & Amphibians* 31 species, 156 specimens; *Fish* 58 species, 432 specimens; *Invertebrates* 7 species, 50 specimens. *Total* 246 species, 999 specimens. *Aquarium* forty 200 litre tanks & 20 terrariums; *Botanical Section*—2 hectares; *Educational Facilities*—Young Zoologists' Club; *Library*—500 vols.; *Publication*—Zoo Guide (2 Kcs.); short news prog. on *Radio*; *Vet. Services* provided by the Vet. College at Brno; *Zool. Research* undertaken by the Czech. Academy of Science. 1959

Building: Bear Enclosure (600 sq. m.), 5 out-buildings, 1 Ruminant Enclosure (5 hectares).

DECIN

Zoologická záhrada Děčín, Děčín, Czechoslovakia. *Zoo Director*—Ludvík Grác. Founded 1.5.49 by the City of Děčín which gives financial support. *Admission Fees*: Adult 1.50 Kcs.; Child 0.50 Kcs. *Hours*: daylight throughout the year. 1959 *Attendance*: 71,000. 7 employees. *Mammals* 40 species, 120 specimens; *Birds* 48 species, 160 specimens; *Reptiles & Amphibians* 17 species, 36 specimens; *Fish* 20 species, 28 specimens. *Total*: 125 species, 596 specimens. *Aquarium*—freshwater with 10 tanks. 1959 *Building*: Cage for Malayan Bears; Wolf Enclosure; perimeter fence for whole Gardens.

LESNA u GOTTWALDOV

Zoopark Lešná u Gottwaldova, Zoopark Lešná, pošta Stipá, okr. Gottwaldov, Czechoslovakia. Tel: Frystak 75. *Zoo Director*—Miroslav Novotný. Founded August 1954 by the Ministry of Culture. State-supported. *Admission Fees*: Adult 2.00 Kcs. (adult group rate, 1.50 Kcs. each); Child 1.00 Kc. (child group rate 0.50 Kcs. each). *Hours*: 7 a.m.—8 p.m. summer; 8 a.m.—5 p.m. winter. 1959 *Attendance*: approx. 120,000. 54.4 hectares. 30 employees. *Mammals* 39 species, 168 specimens; *Birds* 67 species, 454 specimens; *Fish* 64 species, 625 specimens. *Total*: 170 species, 1247 specimens. *Aquarium*—tropical & freshwater, own fish-hatchery; *Botanical Section*; *Children's "Young Aquarists' Club"*; occasional *Radio & TV Progs.* *Zoo Speciality*—breeding Ostriches, ornamental Pheasants & Waterfowl, also large game kept in open air park (30 ha.). 1959 *Building*: Ape House & Pheasant Farm. 1960 *Building*: Stage I of open-air Lion Enclosure, also various other enclosures.

LIBEREC

Severočeská zoologická záhrada Liberec, Liberec, Czechoslovakia. Tel: 4838. *Zoo Staff*: *Zoo Director*—Jiri Badalec; *Asst. Director*—Lubos Bulir; *Educational Asst.*—Jiri Mikolas. Founded 1919 by the City of Liberec. *Admission Fees*: Adult 2.00 Kcs.; Child 1.00 Kcs. *Hours*: 7 a.m.—7 p.m. summer; 8 a.m.—5 p.m. winter. 1959 *Attendance*: 311,867. 12 hectares; 31 employees. *Mammals* 83 species, 240 specimens; *Birds* 105 species, 342 specimens; *Reptiles & Amphibians* 16 species, 28 specimens; *Fish* 59 species, 2500 specimens. *Total*: 263 species, 3110 specimens. *Aquarium*; *Children's Club*; *Library*; *Publication*—Zoo Guide (3.00 Kcs.); *Radio Prog.*—Staats und Stadtfunk; *TV Prog.*—Staats television. Pony rides. 1959 *Building*: Antelope House with sections for Antelopes, Zebras, Dromedaries,

Kulan & Deer; Bird House with Aviary for Exotic Birds. 1960 Building: Baboon Rock.

OSTRAVA

Zoologická zahrada Ostrava, Ostrava, Czechoslovakia. Tel: 24541. Zoo Staff: Zoo Director—Bohumil Vitek; Asst. Director—RNDr. Vladimír Zdarský; State Vet.—MVDr. Zdeněk Kolar. Treasurer—Marie Grünbergrová. Founded 1950 by the City of Ostrava. State-aided. Admission Fees: Adult 2.00 Kcs; Child 1.00 Kcs. Hours: 7 a.m.—7 p.m. summer; 8 a.m.—4 p.m. winter. 1959 Attendance: 177,230. 84.16 hectares. 58 employees. Mammals 72 species; Birds 44 species; Reptiles & Amphibians 6 species; Fish 30 species. Total: 152 species. Publication: Zoo Guide (2 Kcs.); Radio & TV Progs.; Vet. Dept. Camel & Pony Rides. 1959 Building: Bear Enclosure; Greenhouses; Administrative Buildings. 1960/61 Building: Central Zoo Building with subsidiary buildings attached for Carnivores, Elephants & Apes. 1961/65 Building: Animal Hospital; Children's Zoo.

PRAGUE

Zoologická zahrada Praha, Praha 7, Czechoslovakia. Tel: 732-96. Cable ZOOPARK PRAHA. Zoo Staff: Zoo Director—Dr Zdeněk Veselovský; Asst. Director—J. Červenka; Head of Technical Dept.—Ing. A. Turek; Curator of Ungulates—L. Dobrořuka; Curator of Small Mammals & Primates—J. Volf; Curator of Birds & Reptiles—J. Felix; Head of Vet. Dept.—MVDr. Z. Jaros. Founded by a Society formed to start a Zoological Garden. Financial support received from the City. Admission Fees: Adult 3.00 Kcs.; Child 1.40 Kcs. Hours: 8 a.m.—7 p.m. summer; 9 a.m.—4 p.m. winter. 1959 Attendance: 860,000. 45 hectares. 124 employees. Mammals 131 species, 576 specimens; Birds 252 species, 974 specimens; Reptiles & Amphibians 68 species, 87 specimens; Fish 12 species, 69 specimens; Invertebrates 8 species, 15 specimens. Total: 471 species, 1721 specimens. Children's Club; Educational Facilities for schools & close co-operation with students from Prague University who do much of their work at the Zoo; Library (scientific); Publication—Annual Guide Book; Radio & TV Progs.; Vet. Dept. co-operates with the Biology Faculty of Prague University; Zoo Speciality—Przewalski Horse Stud Book kept at the Zoo. Pony rides. 1960/65 Building: Pachyderm House; Quarantine Station.

USTI nad LABEM

Zoologická zahrada v Usti nad Labem, Svermova ul. 870/23, Usti nad Labem, Czechoslovakia. Tel: 2664. Zoo Director—MVDr. Dusan Sedlar. Founded 1912 as a Bird Sanctuary by RNDr. H. Lumpe, the City & the State.

Admission Fees: Adult 2.00 Kcs.; Child 1.00 Kcs. Hours: 8 a.m.—8 p.m. summer; 8 a.m.—6 p.m. winter. 1959 Attendance: 85,000. 5 hectares. 16 employees. Mammals 15 species, 53 specimens; Birds 8 species, 100 specimens; Reptiles & Amphibians 5 species, 20 specimens; Fish 7 species, 200 specimens. Total: 35 species, 373 specimens. Botanical Section (in preparation); Children's Zoologists' Club; Library with 400 vols.; 1959 Building: Ape & Lion Houses. 1960 Building: new Aquarium & Terrarium; new Bird Houses.

DENMARK

AALBORG

A/S Aalborg Zoologiske Have, Mølkeparkvej, Aalborg, Denmark. Zoo Director—Kaj Wendelboe. Founded 31.4.34 by the City of Aalborg & a Society; opened 14.4.53. Admission Fees: Adult 1.50 Kr. (annual season ticket 10.00 Kr.); Child 0.50 Kr. (annual season ticket 5.00 Kr.). Hours: 9 a.m.—sunset throughout year. 1959 Attendance: 219,845. 6.86 hectares. 8 employees. Mammals & Birds 150 species, 1000 specimens. Publication—Zoo Guide (1.00 Kr.); Radio & TV Progs. 1959/60 Building: Kangaroo House.

CHARLOTTENLUND

Danmarks Akvarium, Charlottenlund, Denmark. Tel: Helrup 3283. Aquarium Director—Mag.sc. Mogens Jørgaard. Founded by Civil Engineer Knud Højgaard. Admission Fees: Adult 2.00 Kr.; Child 0.50 Kr. (reduced rates for schools and groups). Hours: 10 a.m.—8 p.m. summer; 10 a.m.—4 p.m. winter. 1959 Attendance: 218,975. 50 exhibition tanks from 1-9 cbm. 10-12 employees. Reptiles & Amphibians 17 species, 73 specimens; Fish 158 species, 3000 specimens (approx.); Invertebrates 47 species, 80 specimens (approx.). Total: 222 species, 3153 specimens (approx.). Zoological Research Dept.—Physiological Laboratory which works with Danmarks Fisker—og Havundersøgelser (Danish Institute for Fishery & Marine Research) at Charlottenlund.

COPENHAGEN

Zoologisk Have, Roskildevej 32, Copenhagen F. Denmark. Tel: 30-25-55. Zoo Staff: Zoo Director—Sven Andersen, cand. mag; Curator of Birds—Holger Poulsen, D.phil.; Curator of Reptiles—Aren Schiøtz, cand. mag; Overseer—Martin Kül; Asst. Overseer—Jens B. Rysgaard; Buildings & Grounds Supt.—S. Jensen; Head Gardener—Helge Busch; Cashier—Johanne Nørgaard; Book-keeper—Vera Bornild; Private Secretary—Nina Falck-Nyberg; Consultant Architect—Fritz Schlegel, M.A.A.; Consultant Engineer—H. Leth Hansen; Vet.—Dr N. O. Christensen; Consultant

Parasitologist—J. A. Guildal, cand. mag. Founded 20.9.1859 by Niels Kjaerboelling. Financial support received from the State (6000 dkr.) & from the City (6150 dkr.). *Admission Fees*: Adult 2.50 dkr.; Child 0.75 dkr. *Hours*: 9 a.m.–sunset throughout year. 1959 *Attendance*: 1,153,466. 25 acres. 125 employees. *Mammals* 166 species, 655 specimens; *Birds* 599 species, 1065 specimens; *Reptiles & Amphibians* 71 species, 185 specimens; *Fish* 4 species, 27 specimens; *Invertebrates* 6 species, 46 specimens. *Total*: 846 species, 2518 specimens. *Botanical Section*: *Children's Zoo* (free)—playground with small domesticated animals; *Publication*—Annual Report; *Radio & TV Progs.*; *Vet. Dept.*—in association with the Royal Vet. & Agricultural College; *Zool. Research*—animal psychology & herpetology. 1959 *Building*: Houses for Flamingos, Springbok & Bontebok; winter quarters for the Sumatran Rhino.

DOMINICAN REPUBLIC

CIUDAD TRUJILLO

Jardin Zoologico, Ciudad Trujillo, Dominican Republic.

ETHIOPIA

ADDIS ABABA

Imperial collection of Lions.

MENAGESHA

Zoo being planned.

FINLAND

HELSINKI

Korkeasaaren Eläintarha, Helsingfors, Finland. *Tel*: 5-47-11. *Zoo Director*—Curt af Enehjelm. Founded 1889 by the City of Helsinki which gives financial support. *Admission Fees* (the Zoo is on an island & ferry transport is included in the price): Adult 2 Marks; Child 1 Mark. *Hours*: 10 a.m.–9 p.m. summer; 10 a.m.–4 p.m. winter. 1959 *Attendance*: 400,000. 50 acres. 25 employees (+15 in summer). *Mammals* 60 species, 380 specimens, *Birds* 130 species, 550 specimens. *Total*: 190 species, 930 specimens. 1959 *Building*: Cafeteria; Waterfowl & Flamingo Enclosure. 1960 *Building*: small Parrot House.

FRANCE

CLÈRES

Parc Zoologique de Clères, Clères, S.M., France. *Tel*: Rouen 75-61-08. *Zoo Director*—Frank Edward Fooks. Founded 1919 by Jean Delacour. *Admission Fees*: Adult 2.00 NF.; Child 0.60 NF. 1959 *Attendance*: 168,571; *Hours*: 9 a.m.–noon, 1.30 p.m.–8 p.m. (Sun.

9 a.m.–8 p.m.) summer; 9 a.m.–noon, 1.30 p.m.–sunset, winter. 52 acres; 12 employees (including admin. staff). *Mammals* 16 species, 70 specimens; *Birds* 260 species, 1600 specimens; *Fish* 6 species, 200 specimens. *Total*: 282 species, 1770 specimens. *Botanical Section*; *Publication*—Zoo Guide by Pierre Pellerin (0.40 NF). 1960 *Building*: Tropical Aviary.

MAUBEUGE

Parc Zoologique, Maubeuge, France.

MULHOUSE

Jardin Zoologique de la Ville de Mulhouse, 1 Avenue de la Ge. D.I.C. à Mulhouse, Haut-Rhin, France. *Tel*: 45-30-54. *Zoo Director*—Antoine Willemann. Founded by the Société du Jardin Zoologique de Mulhouse (13.9.1868) & acquired by the City of Mulhouse 28.12.1893. *Admission Fees*: Adult 1 NF; Child (6-14) 0.25 NF; Child (under 6) free. *Hours*: 8 a.m.–8 p.m. summer; 8 a.m.–5 p.m. winter. 1959 *Attendance*: 286,341. 25 hectares. 24 employees. *Mammals* 43 species, 230 specimens; *Birds* 76 species, 592 specimens; *Reptiles & Amphibians* 7 species, 25 specimens. *Total*: 126 species, 847 specimens. *Botanical Section*; *Children's Club*—"Jeune Science"; *Educational Facilities*—free entrance for Mulhouse school children; *Library*; occasional *Radio & TV Progs.*; *Vet. Dept.*; *Zool. Research Dept.* Animal rides on special holidays. 1960/61 *Building*: New Monkey Enclosure with rocks.

NICE

Aquarium Tropical de la Ville de Nice, Promenade des Anglais, Nice, A.M., France. (c/o the *Director*—Georges P. Creuse, 2 Bd. Mantega-Righi, Nice. *Tel*: 832-08.) Under construction. Proposed size: more than 100 tanks of up to 32,000 litres; salt & fresh water, cold & warm; 8,000 sq. metres.

PARIS

Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France. *Tel*: GObelins 89-01. *Zoo Staff*: *Zoo Director*—Dr Prof. J. Nouvel, D.vet.; *Curator of Mammals, Birds & Library*—Mlle. M. A. Pasquier, licenciée en sciences; *Architectural Asst.*—M. P. Bonnet; *Education Officer & Public Relations*—M. Coupe; *General Supt.*—M. R. Sarret; *Vet. & Pathology Officers*—Dr P. Bullier, D.vet. & Dr J. Rinjard, D.vet.; *Mycologist*—Dr M. E. Saez; *Bacteriologist & Photographer*—Dr P. Corson. Founded 1934 by the Ministry of National Education, the City of Paris & the Muséum National d'Histoire Naturelle. State-aided. *Admission Fees*: Adult 1.00 NF; Child (3-7 years) 0.50 NF; Group Rate 0.80 NF each. *Hours*: 9 a.m.–7 p.m. summer; 9 a.m.–sunset winter. 1959 *Attendance*: 550,000. 3½ hectares.

51 employees. *Mammals* 167 species, 453 specimens; *Birds* 200 species, 801 specimens; *Reptiles & Amphibians* 30 species; *Fish* 28 species. *Total*: 425 species, 1254+ specimens. Donkey, Pony & Camel rides. Shares some facilities with the Parc Zoologique, Paris (q.v.).

PARIS

Parc Zoologique, 53 Avenue de St.-Maurice, Paris XIIème, France. *Tel.*: DIDerot 84-95. *Zoo Director*—Dr Prof. J. Nouvel, D.vet.; for other administrative staff, see the Ménagerie du Muséum, above. *Admission Fees*: Adult 1.00 NF; Child (3-7 years) 0.50 NF; Group Rate 0.80 NF each. *Hours*: 9 a.m.-7 p.m. summer; 9 a.m.-sunset winter. *1959 Attendance*: 1,720,550. 17 hectares. 110 employees. *Mammals* 131 species, 528 specimens; *Birds* 200 species, 672 specimens. *Total*: 331 species, 1200 specimens. *Educational Facilities*—available for teaching establishments; *Library*; *Publication*—"Les Amis du Zoo"; *Radio & TV Progs.*; *Vet. Dept.* with pathology section; *Zool. Research Dept.*—research into animal behaviour. Donkey, Camel & Pony rides. *1959 Building*: Food & Supplies Buildings; employees hostel.

SAINT-JEAN-CAP-FERRAT

Jardin Animé du Cap Ferrat, St.-Jean-Cap-Ferrat, A.M., France.

GERMANY

BERLIN (EAST)

Tierpark Berlin, Berlin - Friedrichsfelde, Schloss-strasse 1, Germany. *Tel.*: 550012. *Zoo Staff*: *Zoo Director*—Prof. Dr Heinrich Dathe; *Asst. Director & Curator of Reptiles, Amphibians & Fish*—Dr Hans-Günther Petzold; *Head Asst. & Curator of Birds*—Wolfgang Grümmt, Dipl. Biol.; *Asst. & Curator of Mammals*—Manfred Bürger, Dipl. Biol.; *Technical Asst.*—Anni Gedack; *Chief Vet.*—Dr Klaus-Peter Jaksztien; *Radiographer*—Helga Pitschke; *Zool. Research Committee* (in association with the German Academy of Science); *Director*—Dr Dathe; *Head Asst.*—Dr K. Odening; *Assts.* Manfred Gruner, Dipl. Biol.; Gottfried Mauersberger, Dipl. Biol., Hans Oehme, Dipl. Biol. Zoo founded 1954 by the City of Berlin which gives financial support; income also derived from lotteries. *Admission Fees*: Adult 1.00 DM; Child 0.50 DM. *Hours*: 7 a.m.-dark, summer; 7.30 a.m.-dark, winter. *1959 Attendance*: 1,600,000. 160 hectares. 320 employees. *Mammals* 163 species, 647 specimens; *Birds* 277 species, 1051 specimens; *Reptiles & Amphibians* 122 species, 410 specimens; *Fish* 5 species, 100 specimens;

Invertebrates 4 species, 40 specimens. *Total*: 571 species, 2248 specimens. *Children's Zoo*; *Library*—1500 vols.; *Publications*—"Milu" (1 vol. p.a.), *Zoo Guide* (1 DM), "Der Zoologische Garten", "Beiträge zur Vogelkunde" (Essays in Bird Studies); *Radio*—2 weekly progs.; *TV*—2-3 progs. a month & a children's prog.; *Vet. Dept.* with animal clinic & X-Ray Section; *Zool. Research Dept.* in association with the German Academy of Science; *Zoo Speciality*—snake farm with daily poison extraction in view of the public. Pony rides. *1959/60/61 Building*: Enclosures for Prairie-dogs, Secretary Birds, Porcupines, Lesser Pandas, Owls; central heating system; Houses for Lions, Birds & Giraffes.

BERLIN (West)

Zoologischer Garten Berlin, Berlin West 30, Hardenbergplatz 8, Germany. *Tel.*: 131101. *Zoo Staff*: *Zoo Director*—Dr Heinz-Georg Klös; *Director of the Aquarium*—Werner Schröder; *Vet.*—Heinrich Francke; *Scientific Assts.*—Dr Helmut Reichling & Dr Wolfgang Gewalt. Founded by a society, "Aktien Verein des Zoologischen Gartens zu Berlin". Financial support (not regular) from the City of West Berlin. *Admission Fees*: Adult 1.50 DM; Child 0.75 DM. *Hours*: 7 a.m.-dark, summer; 9 a.m.-dark, winter. *1959 Attendance*: 2,015,000. 34 hectares. 202 employees. *Mammals* 226 species, 1037 specimens; *Birds* 386 species, 1446 specimens; *Reptiles & Amphibians* 273 species, 639 specimens; *Fish* 429 species, 2144 specimens; *Invertebrates* 220 species, 2980 specimens. *Total*: 1534 species, 8246 specimens. *Aquarium*; *Children's Zoo*; *Film Unit*—3 films produced in 1959; *Library*; *Publication*—*Zoo Guide* (annual, 0.75 DM); twice-monthly & weekly *Radio Progs.*; *Pathology, Vet. & Zool. Research Depts.* Pony rides. *1959 Building*: new Ape House, 2 new Buffalo Houses, 3 Antelope Houses, cages for Birds of Prey. *1960 Building*: reconstruction of war-damaged Lion House, new Parrot House & Bird House; new Beaver Run.

BOCHUM

Verein Bochumer Tierparkfreunde e.V., Bochum, Geschäftsstelle, Tierpark im Stadtpark, Germany. *Tel.*: 67612. *Zoo Director*—Engelbert Honne. Founded 1.3.33 by a society. Financial support received from the City. *Admission Fees*: Adult 70 Pfennig; Child 30 Pfennig. *Hours*: 8 a.m.-8 p.m. summer; 9 a.m.-dark, winter. *1959 Attendance*: 185,000. 2½ hectares; 8 employees. *Mammals* 29 species, 184 specimens; *Birds* 158 species, 638 specimens; *Fish* 54 species, 1000 (approx.) specimens. *Total*: 241 species, 1822 specimens (approx.). *Aquarium*. Animal rides.

BREMERHAVEN

Tiergrotten und Nordsee-Aquarium, Bremerhaven, Germany. Tel: 476516. *Zoo Director & Vet.*—Dr Kurt Ehlers. *Aquarium* founded 1.8.1913; *Zoo* 1.8.1928 by F. Teubben. *Admission Fees:* Adult 0.80 DM; Child 0.40 DM. *Hours:* 8 a.m.—8 p.m. summer; 8 a.m.—5 p.m. winter. 1959 *Attendance:* 270,000. 1 hectare. 10 employees. *Mammals, Birds & North Sea Fish* 86 species, 331 specimens. *Aquarium*—Halibut, both species of Catfish; *Library;* *Publications*—*Zoo Guide*, various works on *Cystophora cristata* (Hooded Seal) & articles in *Orion* magazine; occasional *Radio & TV Progs.*; *Vet. Dept.* with pathology section under Dr Ehlers. *Zoo Speciality*—breeding seals (60% success).

BRUNSWICK

Braunschweiger Zoo, Braunschweig, z.Zt. Waggumerweg (Postal address—Münzstrasse 5), Germany. Tel: 2-60-63. *Zoo Director*—Ernst Berger. Founded June 1957 by a society, "Braunschweiger Zoo e.V.". Financial support from members' donations & private donations. *Admission Fees:* Adult 0.60 DM; Child 0.30 DM. *Hours:* 9 a.m.—6.30 p.m. (all out at 7 p.m.) summer; 10 a.m.—5 p.m. winter. 1959 *Attendance:* 80,000+30,000 at group rates. 3,000 sq. metres. 4 employees. *Mammals* 24 species, 49 specimens; *Birds* 59 species, 130 specimens; *Reptiles & Amphibians* 9 species, 38 specimens; *Fish* 10 species, 20 specimens. *Total:* 102 species, 237 specimens. *Children's Club*—Young Helpers' Group; *Exotarium*—5 tanks in a Hot House for Reptiles & Birds; *Zool. Research Dept.*—in association with the Brunswick Natural History Museum. *Building Plans*—plans for new Zoo on new site, in co-operation with Brunswick City.

COLOGNE

Aktiengesellschaft Zoologischer Garten Köln, Köln, Riehlerstr. 173, Zoo Köln, Germany. Tel: 734155. *Zoo Director*—Dr Wilhelm Windecker. Founded 22.7.1860 by the Köln Aktiengesellschaft. Financial support received from the City. *Admission Fees:* Adult 1.50 DM; Child 0.75 DM. *Hours:* 8 a.m.—sunset, throughout year. 1959 *Attendance:* 774,000. 19 hectares. 50 employees. *Mammals* 121 species, 368 specimens; *Birds* 338 species, 1171 specimens; *Reptiles & Amphibians* 51 species, 150 specimens; *Fish* 11 species, 71 specimens; *Invertebrates* 4 species, 11 specimens. *Total:* 525 species, 1771 specimens. *Educational Facilities*—Society of Zoo Friends meets monthly at the Zoo for lectures & films; *Publication:* "Zoo Zeitung Freunde des Kölner Zoo" (Friends of the Cologne Zoo, 4 p.a.) Animal rides on public holidays & Sunday. 1960 *Building:* Penguin runs, Otter

runs, Crocodile Enclosure, 6 stables for Ungulates, riding ground, Pheasantry, lecture room, pond, additional accommodation for guests; second Zoo entrance.

COTTBUS

Tierpark, Cottbus, Germany.

DORTMUND

Tierpark Dortmund, Dortmund - Brünninghausen, Mergelteichstr. 80, Germany. Tel: 71165. *Zoo Director*—Konrad Glocker. Founded 1953 by the City of Dortmund which gives financial support. *Admission Fees:* Adult 0.40 DM; Child 0.20 DM. *Hours:* 8 a.m.—9 p.m. summer; 9 a.m.—5 p.m. winter. 1959 *Attendance:* 463,053. 12 hectares. 32 employees. *Mammals* 34 species, 142 specimens; *Birds* 128 species, 675 specimens; *Reptiles & Amphibians* 11 species, 17 specimens; *Fish* 91 species, 2760 specimens. *Total:* 264 species, 3594 specimens. *Aquarium*, combined with *Botanical Section, Bird House & Terrarium;* *Publication*—"Kinderfest" (Children's Party, summer only, 0.10 DM). Pony rides.

DRESDEN

Zoologischer Garten der Stadt Dresden, Dresden A20, Tiergarten Strasse 1, Germany. Tel: 46170. *Zoo Director*—Dr Wolfgang Ullrich. Founded by a society, "Aktienverein Zoologischer Garten zu Dresden". Financial support received from the City. *Admission Fees:* Adult 1.00 DM; Child 0.25 DM; family of four 2.00 DM. *Hours:* 8 a.m.—8 p.m. summer; 8 a.m.—sunset, winter. 1959 *Attendance:* 879,552. 15 hectares. 90 employees. *Mammals* 95 species, 300 specimens; *Birds* 190 species, 400 specimens; *Reptiles & Amphibians* 35 species, 65 specimens; *Fish* 100 species, 500 specimens; *Invertebrates* 15 species, 250 specimens. *Total:* 435 species, 1515 specimens. *Aquarium;* *Children's Zoo;* *Film Unit*—1 film during 1959; *Library;* *Publications*—6 books (see publications section); *Radio & TV Progs.*; *Zool. Research Dept.*

DUISBURG

Duisburger Tierpark, Duisburg, Mülheimerstrasse 273, Germany. Tel: 33571. *Zoo Staff:* *Zoo Director*—Dr H. G. Thienemann; *President*—Helmut Horten; *Administrative & Commercial Supt.*—O. Sprunck. Founded 1934 by a society, "Duisburger Tierparkverein e.V.". Financial support received from the City. *Admission Fees:* Adult 1.50 DM; Child 0.60 DM. *Hours:* 8.30 a.m.—6.30 p.m. summer; 8.30 a.m.—4.30 p.m. winter. 1959 *Attendance:* 675,000. 14 hectares. 51 employees. *Mammals* 96 species, 299 specimens; *Birds* 309 species, 1061 specimens; *Reptiles & Amphibians* 30 species, 122 specimens; *Fish & Invertebrates*

166 species, 1635 specimens. *Total*: 601 species, 3117 specimens. *Aquarium*; *Children's Zoo* with farmyard; *Children's Riding Club*; *Educational Facilities*—"Zoo School" in the Zoo being planned by the City; *Filming* by Dr Thienemann—1 film in 1959; *Library* for staff; *Publication*—Annual Report (free); occasional *Radio & TV Progs.* by "Westdeutscher Rundfunk & Fernsehen". *Pony & pony cart rides*, riding classes. *1959 Building*: new stables & enclosures for Peccaries, Warthogs, Capybaras & Tapirs; bridges over railway & Autobahn connecting with extension area. *1960 Building*: Baboon Rock & House; open moated enclosure for Siberian Tigers; new large building for Primates.

DUSSELDORF

Löbbecke - Museum — Aquarium, Düsseldorf, Museumsbunker am Zoo, Germany. *Tel*: 623793/660341. *Aquarium Director*—Horst Sieloff. Museum founded 1904 by Theodor Löbbecke in co-operation with the City of Düsseldorf; aquarium built 1948 by Herr Sieloff in co-operation with the City which gives financial support. *Admission Fees*: Adult 0.50 DM; Child 0.25 DM. *Hours*: 10 a.m.—6 p.m. throughout year. *1959 Attendance*: 67,212. 3,000 cubic metres (aquarium). 22 employees. *Reptiles* 71 species, 252 specimens; *Amphibians* 15 species, 120 specimens; *Fish* 151 species, 1347 specimens. *Total*: 237 species, 1719 specimens. *Library* approx. 7000 vols.; *Publications*: Aquarium Guide & 2 books (see publications' section), all 2.00 DM each. Meetings held at the Aquarium of the "Arbeitsgemeinschaft Rhein-Westf. Lepidopterologen" (Society of Rhine-Westfalen Lepidopterists).

ERFURT

Thüringer Zoopark, Erfurt, Roter Berg, Germany. *Tel*: 27037. *Zoo Director*—Dr Harald H. Roth. Founded 1957 by the Erfurt City Council; opened 7.10.59. Financial support received from Thüringer State & the City of Erfurt; Zoo also financed by lotteries. *Admission Fees*: Adult 0.80 DM; Child 0.50 DM. *Hours*: 8 a.m.—sunset, summer; 9 a.m.—sunset, winter. *1959 Attendance*: 170,000. 12 hectares (45 ha. planned). 45 employees. *Mammals* 54 species, 182 specimens; *Birds* 42 species, 138 specimens; *Reptiles & Amphibians* 3 species, 8 specimens. *Total*: 99 species, 328 specimens. *Children's Zoo* planned; *Educational Facilities*—guided tours for school children, popular zoology talks; *Film Unit* (belonging to the City)—1 film in 1959; *Library*; *Publications*—Zoo Guide (0.20 DM), the Building of Thüringer Zoopark (1.50 DM), space reserved for Zoo News in various local publications; regular *Radio Prog.*; occasional

TV Progs. on Fernsehfunk-Aufnahmen TV; own *Vineyard*. *1959 Building*: various cages. *1960 Building*: Asian Tropical House (Vivarium).

FRANKFURT/MAIN

Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz 16, Germany. *Tel*: 20221, App. 3727. *Zoo Staff*: *Zoo Director*—Dr Bernhard Grzimek; *Head Asst.* Dr Richard Faust; *Curator of the Exotarium*—Dr Dieter Backhaus; *Zoo Inspector*—Inspektor Hellmut Neubüser; *Supt. of Staff*—Oberinspektor Heinz Oestreich; *Public Relations Officer*—Robert Stausberg; *Consultant Vet.*—Dr Günther Klöppel; *Vet. & Scientific Asst.*—Dr Jakob Schmitt; *Zoologist & Sc. Asst.*—Dr Rosel Kirchshofer. Founded by a Society in 1858; owned by the City since 1915. *Admission Fees*: Adult 1.50 DM (Exotarium 1.00 DM, Zoo & Exotarium 2.40 DM); Child 0.75 DM (Exotarium 0.50 DM, Zoo & Exotarium 1.10 DM). *Hours*: 8 a.m.—7 p.m. (Exotarium 10 a.m.—10 p.m.) summer; 8 a.m.—5 p.m. (Exotarium 10 a.m.—10 p.m.) winter. *1959 Attendance*: 1,551,523. 18 hectares. 88 employees. *Mammals* 147 species, 554 specimens; *Birds* 271 species, 688 specimens; *Reptiles & Amphibians* 159 species, 370 specimens; *Fish* 308 species, 1896 specimens; *Invertebrates* 56 species, 555 specimens. *Total*: 941 species, 4063 specimens. *Exotarium*; *Film Unit*—Fotorlabor; *Library*—not open to the public; *Publications*—Annual Report; regular talks by the Director & his Asst. on the *Radio*; the Director has a regular *TV Prog.*; *Vet. Dept.*; *Zool. Research Dept.*—research section of the German Research Society, currently working on the blood of wild animals, regular research lecture, scientific breeding experiments. During the summer & on public holidays, Donkey & Pony rides. *1959 Building*: Gibbon & Baboon Enclosure. *1960 Building*: new Monkey House, Bird House, Ostrich House, Antelope Paddock; Anthropoid Ape House to be enlarged.

GELSENKIRCHEN

Ruhr-Zoo, Gelsenkirchen, Germany.

GÖPPINGEN

Verein "Aquarium" E.V. Göppingen—Tierpark, (14a), Göppingen, Germany. *Tel*: 6183 & 6870. *Zoo Director*—Dr Eugen Pfeffer. Founded 1952 by the Society. Financial support received from the City. *Admission Fees*: Adult DM 0.50; Child DM 0.30. *Hours*: 9 a.m.—sunset throughout year. *1959 Attendance*: 11,500. 3,200 sq. metres: 1 employee. *Mammals* 8 species, 17 specimens; *Birds* 6 species, 28 specimens; *Reptiles & Amphibians* 1 species, 8 specimens; *Fish* 20 species, approx. 100 specimens. *Total*: 35

species approx. 153 specimen. *Aquarium* with 8 tanks; 1 film produced during 1959; *Library*. 1959 *Building*: 2 stables, 1 warehouse. 1960 *Building*: extensions to aquarium.

HALLE

Zoologischer Garten, Fasanenstrasse 5a, Halle (Saale), Germany. *Zoo Director*—Dr Hans Petzsch.

HAMBURG

Karl Hagenbeck Zoopark, Hamburg-Stellingen, Hamburg, Germany.

HAMM

Tiergarten Hamm, Hamm, Germany.

HANOVER

Zoologischer Garten, Hannover, Hindenburgstrasse 53, Germany.

HEIDELBERG

Tiergarten Heidelberg, Heidelberg, Germany.

KARLSRUHE

Zoo Karlsruhe, Karlsruhe, Ettlingerstr. 6, Germany. *Tel*: 20121/2686. *Zoo Director*—Dr Karl Birkman. Founded 1866 by the City of Karlsruhe which gives financial support. *Admission Fees*: Adult 0.50 DM; Child 0.20 DM. *Hours*: 7 a.m.—8 p.m. summer; 8 a.m.—4.30 p.m. winter. 1959 *Attendance*: 1,000,000 + 15,000 season tickets. 15 hectares. 30 employees. *Mammals* 65 species, 175 specimens; *Birds* 60 species, 260 specimens; *Reptiles & Amphibians* 3 species, 9 specimens. *Total*: 128 species, 444 specimens. *Film Unit*; occasional *Radio Prog.*; *Vet. Dept.* Pony rides on Wed., Sat. & Sun.

KREFELD

Krefelder Tierpark, Krefeld, Uerdingerstr. 377, Germany. *Tel*: 51578. *Zoo Director*—Dr Walter Encke. Founded 1934 by the City of Krefeld which gives financial support. *Admission Fees*: Adult 0.70 DM; Child 0.30 DM. *Hours*: 8 a.m.—dark, throughout year. 1959 *Attendance*: 200,000. 11 hectares. 21 employees. *Mammals* 65 species, 202 specimens; *Birds* 214 species, 515 specimens; *Reptiles & Amphibians* 3 species, 17 specimens; *Invertebrates* 3 species, 10 specimens. *Total*: 285 species, 744 specimens. *Library* of zool., botanical & palaeontological books; *Publication*: *Zoo Guide* (0.50 DM). Pony & pony-cart rides. 1959/60 *Building*: reconstruction following extensive war damage.

KRONBERG im TAUNUS

Georg von Opel-Freigehege für Tierforschung e.V., Kronberg im Taunus, Germany. *Tel*: Königstein 2866. *Zoo Staff*: *Zoo Director*—Fritz Walther, Dipl. Psych.; *Manager*—Otto Dose. Founded by a Society, "Verein für Tierforschung des Georg von Opel-Freigeheges". Income supplemented by an endow-

ment. Free admission at any time. 1959 *Attendance*: 145,000 approx. 14 hectares. 10 employees. *Mammals* 23 species, 105 specimens; *Birds* 22 species, 112 specimens. *Total*: 45 species, 217 specimens. *Publications*: *Monthly Report & Yearbook*; *Radio & TV Progs.*; *Zool. Research* undertaken by the Scientific Director & other scientists, currently working on animal breeding. 1959/60 *Building*: general expansion of the Zoo.

LANDAU

Tiergarten Landau (Pfalz), Landau in der Pfalz, Städtisches Verkehrsamt, Neues Rathaus, Germany. *Tel*: 3321, App. 285. Founded 1912 by the people of the City which gives financial support. *Admission Fees*: Adult 30 Pfg.; Child 15 Pfg. *Hours*: 7 a.m.—7 p.m. summer; 9 a.m.—dark, winter. 1959 *Attendance*: 100,000+. 5 employees. *Mammals* 52 species; *Birds* 107 species; *Fish* 40 species. *Total*: 199 species. *Aquarium*; *Botanical Section*; *Radio Prog.*; 1959/60 *Building*: various new enclosures.

LEIPZIG

Zoologischer Garten, Leipzig, C.I., Pfaffen-dorferstrasse 29, Germany. *Zoo Director*—Dr N. Dathe.

MAGDEBURG

Zoologischer Garten Magdeburg, Magdeburg, Am Vogelgesang 12, Germany. *Tel*: 51379 *Zoo Director*—Dr Klaus-Günther Witstruk. Founded 21.7.50 by Magdeburg Town Council which gives financial support. *Admission Fees*: Adult 0.50 DM; Child 0.25 DM. *Hours*: 8 a.m.—8 p.m. summer; 9 a.m.—dusk, winter. 1959 *Attendance*: 387,719. 20 hectares; 42 employees. *Mammals* 56 species, 232 specimens; *Birds* 157 species, 744 specimens; *Reptiles, Amphibians & Fish* 14 species, 101 specimens. *Total* 227 species, 1077 specimens. *Botanical Section*; *Children's Corner*; *Library*; *Publications*—*Zoo Guide* (annual, 1.00 DM), *Pictorial Zoo Books* (15.00 DM). Pony rides, children's parties, concerts. 1959 *Building*: Lion Enclosure; 2 Pheasant Aviaries, Heron Aviary, Waders' Aviary. 1960 *Building*: drainage system; Jackal Enclosure; Antelope House.

MUNICH

Tierpark Hellabrunn, München 9, Sieben-brunnerstr. 6, Germany. *Tel*: 494221 & 494222. *Zoo Director*—Dr Heinz Heck. Founded 22.5.1928 by Dr Heck, and is now a Joint Stock Co. Financial support received from the City. *Admission Fees*: Adult 1.50 DM; Child (under 14) 0.80 DM. *Hours*: 7.30 a.m.—7 p.m. summer; 8 a.m.—5 p.m. winter. 1959 *Attendance*: approx. 1,000,000. 70 hectares. 70 employees (not including building

staff). *Mammals* 210 species, 1487 specimens; *Birds* 240 species, 1434 specimens; *Reptiles & Amphibians* 31 species, 747 specimens; *Fish* 216 species, 7928 specimens. *Total*: 697 species, 11,596 specimens. *Aquarium*; *Children's Zoo*; *Library* (small); *Publication*—annual *Zoo Guide* (0.50 DM); *Radio & TV Progs.* at regular intervals; *Vet. Dept.*—pathology, veterinary & zoological research carried on in co-operation with the Institute of Munich University. Animal rides. 1959/60 *Building*: new enclosures for domestic animals; various open enclosures.

MUNSTER

Zoologischer Garten Munster-Westf., Germany. *Zoo Director*—Dr Helmut Reichling.

NEUMUNSTER

Heimattiergarten Neumünster, Neumünster/Holstein, Geerdstrasse 100, Germany. *Tel.*: Neumünster 3280. *Zoo* managed by the Society of Neumünster Zoo—*President*—Bürgermeister Max Kupfer. Founded by a Society "Tiergarten Vereinigung Neumünster e.V." Financial support from the City and from Society members. *Admission Fees*: Adult 0.75 DM; Child (under 15) 0.20 DM; Students, Unemployed, Pensioners, War-disabled 0.30 DM; Groups of over 20, 0.50 DM each. *Hours*: 9 a.m.—7 p.m. summer; 9 a.m.—dark, winter. 1959 *Attendance*: 110,000. 16 hectares. 5 employees. *Mammals* 23 species, 94 specimens; *Birds* 41 species, 142 specimens; *Fish* 19 species, 460 specimens. *Total*: 83 species, 696 specimens. *Aquarium*; *Botanical Section*—specialising in German plants & trees; *Children's Playground*; *Educational Facilities*—lecture rooms for sporting instruction, also several short films available; *Publications*—*Zoo Guide* with map (1.20 DM), *Folding Guide* (free) & *Zoo Bulletin* (to Society members, free); *Radio Prog.*—Norddeutschen Rundfunk; *TV Prog.*—Deutschen Fernsehens; 1959 *Building*: Otter Run, Reindeer Enclosure, Food Store, Cold Storage Plant, Toilets, Memorial Pavilion. 1960 *Building*: various reconstructions, new enclosures for Antelopes; 3 flats.

NEUSCHIEDT

Zoologischer Garten Saarbrücken, Neuscheidt, Germany.

NEUSTADT/PFALZ

Tiergarten, Neustadt/Pfalz, Germany.

NURENBERG

Tiergarten Nürnberg, Nürnberg, Am Tiergarten 30, Germany. *Tel.*: 571348. *Zoo Staff*: *Zoo Director*—Dr Alfred Seitz; *Scientific Asst.*—Dr Manfred Kraus. Founded 1912 by Joint Stock Co. of the Zoo; taken over 1939

by Nuremberg City which gives financial support. *Admission Fees*: Adult 1.00 DM; Child 0.40 DM. *Hours*: 8 a.m.—6.30 p.m. summer; 8 a.m.—5 p.m. winter. 1959 *Attendance*: 650,000. 60 hectares; 48 employees. *Mammals* 69 species, 311 specimens; *Birds* 91 species, 274 specimens; *Reptiles & Amphibians* 2 species, 7 specimens; *Fish* 45 species, 467 specimens; *Invertebrates* 1 species, 3 specimens. *Total*: 208 species, 1062 specimens. *Aquarium* (temporarily in the Ape House); *Children's Zoo* with pony rides; *Educational Facilities*—colour film about the Zoo for use in schools. *Publications*—*Zoo Guide* (1.00 DM), *Annual Report*, *Zoo Prospectus* in German & English; *Radio & TV Progs.* at intervals. 1959 *Building*: new Bison Stable. 1960 *Building*: Giraffe & Rhino. House; Aviary.

OSNABRÜCK

Tiergarten Osnabrück e.V., Osnabrück/Schölerberg, Germany. *Tel.*: 51-424. *Zoo Staff*: *Zoo Director*—Paul Andreae; *Manager*—Kaufm. Leiter. Founded 28.8.36 by a Society "Tiergarten Verein e.V.". Financial support received from the City. *Admission Fees*: Adult 0.80 DM; Child 0.40 DM. *Hours*: 8 a.m.—7.30 p.m. summer; 9 a.m.—dark, winter. 1959 *Attendance*: 245,000. 5 hectares. 14 employees. *Mammals* 58 species, 252 specimens; *Birds* 160 species, 449 specimens; *Reptiles & Amphibians* 6 species, 24 specimens. *Total*: 224 species, 725 specimens. *Library*; *Regional Radio & TV Progs.*; *Publication*—*Zoo Guide* (0.50 DM). Pony rides. 1959 *Building*: enlargement of Antelope & Raccoon Enclosures; road construction; 1960 *Building*: Elephant House & Ape House.

ROSTOCK

Zoologischer Garten Rostock, Rostock, Tiergartenallee 10, Germany. *Tel.*: 25802. *Zoo Director*—Siegfried Seifert. Founded 1956 by the Rostock City Council which gives financial support; income also received from lotteries. *Admission Fees*: Adult 0.50 DM; Child 0.20 DM. *Hours*: 8 a.m.—hour before sunset, summer; 9 a.m.—hour before sunset, winter. 1959 *Attendance*: 600,000. 20 hectares. 45 employees. *Mammals* 53 species, 178 specimens; *Birds* 90 species, 493 specimens. *Total*: 143 species, 671 specimens. *Aquarium* (marine); *Botanical Section*; *Children's Zoo*—riding, railway, playground; *Radio Prog.* for children; special *TV Progs.* on Deutschen Fernsehfunks; *Zoo Speciality*—outdoor enclosure for sea mammals and sea birds at Ostseestrand (Rostock-Warnemünde). Pony rides. 1959 *Building*: open-air Bear Enclosure; Part I of Anthropoid Ape House. 1960 *Building*: Pachyderm House.

STENDAL

Tiergarten Stendal, Bezirk Magdeburg, Stendal, Germany. *Tel.*: 980. *Zoo Director* (part-time)—Dr Joh. Kummer. Founded 1953 by the people of the City in co-operation with the Education Dept. of the Town Council. *Admission Fees*: Adult 0.25 DM; Child 0.10 DM. *Hours*: 7 a.m.—dusk, summer; 8 a.m.—dusk, winter. *1959 Attendance*: 100,000. 3 hectares. 11 employees. *Mammals* 27 species, 108 specimens; *Birds* 63 species, 209 specimens; *Reptiles & Amphibians* 1 species, 5 specimens; *Fish* 6 species, 80 specimens. *Total*: 97 species, 402 specimens. *Botanical Section*—native plants, poisonous plants & herbs; *Children's Zoo* (planned); *Vet. Dept.*—in co-operation with the Dept. of Magdeburg Area Council; *Zoo Specialities*—ringing Grey Geese, Hare breeding & research into the evolution of the domestic animal.

STRAUBING

Tiergarten der Stadt Straubing, Straubing/Niederbayern, Germany. *Tel.*: 2459. *Zoo Director*—Hans Schäfer. Founded 1939 by the City of Straubing which gives financial support as does a Society, "Verein der Freunde des Tiergartens der Stadt Straubing e.V." *Admission Fees*: Adult 70 Dpfg; Child 30 Dpfg. *Hours*: 7 a.m.—8 p.m. summer; 8 a.m.—dusk, winter. *1959 Attendance*: 80,000 approx. 7½ hectares. 5 employees. *Mammals* 46 species, 153 specimens; *Birds* 81 species, 223 specimens; *Fish* approx. 80 specimens. *Total*: 127+ species, 456 approx. specimens. *Aquarium* (small). *1959 Building*: heated Ape House rebuilt; *Aquarium & Terrarium* rebuilt; new Stork House. *1960 Building*: Ape House for Chimpanzees; extension of Pheasantry.

STUTTGART

Wilhelma, Botanisch-Zoologischer Garten, Stuttgart-Bad Cannstatt, Postschliessfach 1227. *Tel.*: 54 951/2. *Zoo Director*—Albert Schöchle. Zoo built 1842–1853, finally completed 1949. Founded by the State. *Admission Fees*: Adult 1.20 DM., Child 0.40 DM. *Hours*: 7 a.m.—8 p.m. summer, 8 a.m.—dusk, winter. *1959 Attendance*: 1,500,000. 12 hectares (+155 hectares of public park); 120 employees. *Mammals* 88 species, 323 specimens; *Birds* 183 species, 633 specimens; *Reptiles & Amphibians* 72 species, 192 specimens; *Fish* 149 species, 1693 specimens; *Invertebrates* 20 species, 93 specimens. *Total*: 512 species, 2934 specimens. *Aquarium*—special coral fish section; *Botanical Section*—18 large greenhouses, aquatic plants a speciality; *Library*: *Publications*: Zoo Guide (1.50 DM), Yearly Calendar (3.00 DM.). Occasional *Radio & TV Progs.* *1959/60 Building*: combined plant & animal house.

WUPPERTAL-ELBERFELD

Zoologischer Garten Wuppertal, Wuppertal-Elberfeld, Hubertusallee 30, Germany. *Zoo Staff*: *Zoo Director*—Dr Richard Müller; *Scientific Asst.*—Dr Gerhard Haas; *Supt.*—Karl Herbst; *Vet.*—Dr Franz Henning. Founded 3.11.1879 by a society, "Aktien-gesellschaft". Financial support received from the City since 1937. *Admission Fees*: Adult 1.00 DM; Child 0.50 DM. *Hours*: 8 a.m.—8 p.m. summer; 8 a.m.—5 p.m. winter. *1959 Attendance*: 948,056. 16 hectares. 65 employees. *Mammals* 80 species, 286 specimens; *Birds* 116 species, 386 specimens; *Reptiles & Amphibians* 65 species, 166 specimens; *Fish* 192 species, 3810 specimens; *Invertebrates* 8 species, 22 specimens. *Total*: 461 species, 4670 specimens. *Aquarium*; *Library*; *Radio Prog.*—4 transmissions during 1959 on research at the Zoo; 3 *TV Progs.* during 1959. *1959/60 Building*: new Bird House; new open-air Bear Enclosure.

GREAT BRITAIN

BELFAST

Bellevue Zoological Gardens, Bellevue, Belfast, Northern Ireland, G.B. *Tel.*: 76277. *Zoo Staff*: *Zoo Director & Vet. Surgeon*—A. McLean, J.P., B.Sc., M.R.C.V.S., D.V.H.; *Hon. Pathologist*—Dr Morton. Founded 1933 by Belfast Corporation which meets all expenditure excess of revenue; Zoo restocked 1947. *Admission Fees*: Adult 2s.; Child 1s. *Hours*: 10 a.m.—30 minutes after sunset (Sun. opens at 2 p.m.). *1959 Attendance*: 200,000 approx. 13 acres approx. 20/25 employees. *Mammals* 150/200 species; *Birds* 100/150 species; *Reptiles & Amphibians* 40/50 species; *Fish* 8 tanks. *Total*: 290/400 species, + fish. *Aquarium* (small); *Children's Zoo*; *Pathology Dept.*; *Vet. Dept.* *1959/60 Building*: new Deer House; new Zebra House.

BIRMINGHAM

Birmingham Botanical & Horticultural Soc. Ltd., Westbourne Road, Edgbaston, Birmingham, G.B. *Tel.*: Edgbaston 1860. *Zoo Curator*—G. E. Collins, N.D.H., A.Inst., P.A. Gardens founded 1829 by the Society, Zoo opened 1910. The Society gives financial support. *Admission Fees*: Adult 1s.; Child 6d. *Hours*: 10 a.m.—8 p.m. summer; 10 a.m.—5 p.m. winter. *1959 Attendance*: 76,003. 2 employees. *Mammals* 6 species, 60 specimens; *Birds* 27 species, 80 specimens; *Reptiles & Amphibians* 2 species, 3 specimens; *Fish* 2 species, 2 specimens. *Total*: 37 species, 143 specimens. *Botanical Section*—main feature; *Library* (small).

BLACKPOOL

The Blackpool Tower Zoo & Aquarium, The Blackpool Tower Co. Ltd., Zoo & Aquarium Dept., Blackpool, Lancashire, G.B. Tel: Blackpool 25252. **Curator—R. E. Legge.** Founded 1894 by a commercial company. **Admission Fees:** Adult 3s. (1s. winter); Child 1s. 6d. (6d. winter). **Hours:** 9 a.m.–10.30 p.m. summer; 10 a.m.–5 p.m. winter. Zoo occupies 3 floors in one building. 14 employees. **Mammals** 35 species, 72 specimens; **Birds** 33 species, 200 specimens; **Reptiles & Amphibians** 7 species, 16 specimens; **Fish** 300 species, 2000 specimens; **Invertebrates** 18 specimens. **Total:** 393+ species, 2288 specimens. **Aquarium—**wide & comprehensive collection, British marine fish a speciality; **Educational Facilities—**school parties & aquarist societies conducted free or at concessional rates; **Radio Prog.** on Children's Hour (B.B.C.); featured on "News from the Zoos" TV Prog. 1959 **Building:** Roof Garden menagerie. 1960 **Building:** coral fish section in the aquarium.

BRISTOL

Bristol, Clifton & West of England Zoological Society, Clifton, Bristol 8, G.B. Tel: 38951/2. **Zoo Director—R. E. Greed.** Founded by the Society 1835. **Admission Fees:** Adult 2s. 6d. (Wed. 2s.); Child 1s. (Wed. 9d.). **Hours:** 9 a.m.–7.30 p.m. (Sun. 11 a.m.–7 p.m.) summer; 9 a.m.–4.30 p.m. (Sun. 11 a.m.–4.30 p.m.) winter. 1959 **Attendance:** 891,602+ members & subscribers. 12 acres. 66 employees+10/20 catering staff, according to the season. **Mammals** 91 species, 230 specimens; **Birds** 180 species, 742 specimens; **Reptiles & Amphibians** 54 species, 118 specimens; **Fish** approx. 600 specimens. **Total:** 325 species, approx. 1690 specimens. **Aquarium; Botanical Section—**important feature; **Educational Facilities—**educational visits encouraged, lectures by members of the staff; **Library** (small); **Pathology** services provided by the Path. Dept. of Bristol University; **Publications:** Book & Guide (bi-annual, 1s. 6d.), Plan & Information Leaflet (6d.), Annual Report; occasional **Radio & TV Progs.**; **Vet.** services provided by the Vet. Dept. of Bristol University. Elephant & Camel rides. 1960 **Building:** Birds of Prey Aviary; enclosures for Beavers; Isolation Quarters, Post-Mortem Room & Laboratory, new buildings for botanical section: new gardening unit outside Zoo to free existing site for development as animal enclosures.

CHESSINGTON

Chessington Zoo, Chessington Zoo Ltd., Chessington, Surrey, G.B. Tel: Epsom 413. **Zoo Staff:** Zoo Director—H. E. Snazle, M.B.E.; Secretary—D. C. Rogers, A.C.A.; Chief Engineer—D. J. Witney; Catering

Manager—W. A. Thompson, M.H.C.I.; Head Gardener—R. Colegate; Head Keeper—J. Young; Head Keeper Pets' Corner—A. Smith; Aquarist—F. S. George; Party Organiser—Mrs. B. Whichelo. Founded 1931 by R. S. Goddard and sold to a public company in 1946. **Admission Fees:** Adult 2s. 6d. (Friday 2s.), groups of 30+ 2s. each; Child 1s. 6d. (Friday 1s. 3d.), groups of 30+ 1s. 3d. each. **Hours:** 9.30 a.m.–sunset or 8 p.m., whichever is earlier, in the summer; 10 a.m.–4 p.m. winter. 1959 **Attendance:** 490,850. 65 acres. 40 employees + seasonal staff. **Mammals** 82 species, 457 specimens; **Birds** 102 species, 504 specimens; **Reptiles & Amphibians** 22 species, 122 specimens; **Fish** 61 species, 876 specimens. **Total:** 267 species, 1959 specimens. **Aquarium—**25 tanks (1 marine, 16 tropical, 8 cold water); **Botanical Section; Children's Zoo—**7 acres, most domestic animals, young wild animals & Rabbit, Mouse & Guinea Pig "Villages"; **Educational Facilities—**school parties encouraged; **Films** made by member of the Staff; occasional **TV Progs.**; **Publications,** —Zoo Guide (annual, 1s.), handbook of species & specimens for schools (annual, free), Animal Painting Book (annual, 1s.). Pony rides. 1959/60 **Building:** new Giraffe House, Polar Bear Pool, Crane Aviaries.

CHESTER

The North of England Zoological Society, The Zoological Gardens, Upton-by-Chester, Chester, G.B. Tel: Chester 20106/7. **Zoo Director—**George Saul Mottershead. Founded 1930 by the Director. **Admission Fees:** Adult 2s. 6d.; Child 1s. **Hours:** 10 a.m.–8 p.m. summer; 10 a.m.–4 p.m. winter. 1959 **Attendance:** 785,351. 75 acres (+64 acres available). 78 employees (+200 catering staff at height of season). **Mammals** 120 species, 359 specimens; **Birds** 150 species, 530 specimens; **Reptiles & Amphibians** 30 species, 120 specimens; **Fish** 150 species, 3000 specimens. **Total:** 450 species, 4009 specimens. **Aquarium** (freshwater); **Botanical Section—**many of the animal houses contain tropical plants; **Educational Facilities** provided on request to authorised schools, colleges & universities; **Publications—**"Our Zoo News" (quarterly, 6d.), "Focus on Chester Zoo" (monthly, free to coach proprietors); occasional **Radio & TV Progs.**; Boat rides. 1959 **Building:** new Bird House. 1960 **Building:** Small Mammal House; Pachyderm House; Restaurant.

DONCASTER

Doncaster Zoo, Museum & Art Gallery, Waterdale, Doncaster, Yorkshire, G.B. Tel: 2095. **Zoo Director—**E. F. Gilmour, F.M.A., M.S.B.E. Founded by the Corporation of Doncaster which gives financial support.

Admission Fees: Adult 6d.; Child 3d. *Hours:* 10 a.m.-5 p.m. (Sun. 2 p.m.-4.30 p.m.) summer; 10 a.m.-4.30 p.m. winter. *1959 Attendance:* 42,387. $\frac{1}{2}$ acre. 3 employees. *Mammals* 15 species, 36 specimens; *Birds* 40 species, 180 specimens; *Reptiles & Amphibians* 10 species, 18 specimens; *Fish* 12 species, 70 specimens. *Total:* 77 species, 304 specimens. *Educational Facilities*—lecture tours available for schools; *Film Unit* if required; *Publication*—Guide to the Zoological Garden by E. F. Gilmour (6d.); *Reference Library*; *Zool. Research* in association with the Zool. Dept. of the Museum. *1960 Building:* plans for rebuilding the Zoo are being drawn up.

DUDLEY

The Dudley Zoological Society Ltd., Castle Hill, Dudley, Worcestershire, G.B. *Tel:* Dudley 52401. *Zoo Staff:* General Manager—D. H. S. Risdon; Secretary & Registrar—G. W. Whiston; Catering Manager—P. A. Pegg. Founded by the Society. *Admission Fees:* Adult 3s. 6d. (Wed. 1s. 6d.); Child 1s. 6d. (Wed. 9d.). *Hours:* 10 a.m.-sunset or 7 p.m., whichever is earlier, throughout year. *1959 Attendance:* 607,250. 38 acres; 50 employees (average) + 40 catering (average). *Mammals* 55 species, 273 specimens; *Birds* 160 species, 522 specimens; *Reptiles & Amphibians* 52 species, 239 specimens; *Fish* 101 species, 1493 specimens; *Invertebrates* 4 species, 31 specimens. *Total:* 372 species, 2558 specimens. *Aquarium;* *Children's Zoo;* *Educational Facilities*—reduced rates for school parties accompanied by teachers; *Publication*—Zoo Guide (annual, 1s.); *Radio & TV* facilities as requested by the B.B.C. & ITV. Elephant, Camel & Pony rides. *1960 Building:* Giraffe House.

EDINBURGH

The Royal Zoological Society of Scotland, Zoological Park, Murrayfield, Edinburgh 12, Scotland, G.B. *Tel:* CORstorphine 5353. *Cable ZOOLOGICAL EDINBURGH.* *Zoo Director*—G. D. Fisher, M.B.O.U. Founded by the Society, 1909 and incorporated by Royal Charter 1913. The Society has approximately 2000 elected Fellows each paying a subscription of £2 2s. 0d. p.a. *Admission Fees:* Adult 2s. 6d.; Child 1s. 3d. *Hours:* 9 a.m.-7 p.m. summer; 9 a.m.-dusk, winter. *1959 Attendance:* 545,596. 70 acres; 150 employees. *Mammals* 101 species, 281+ specimens; *Birds* 229 species, 1054 approx. specimens; *Reptiles & Amphibians* 67 species, 183 specimens. *Total:* 397 specimens, 1518+ specimens. *Aquarium*—donated by the Carnegie United Kingdom Trust, varied collection of tropical & marine specimens; *Children's Zoo* with miniature farm, including miniature

farm implements which the children can use under supervision, & pony rides; *Children's Club*—associate membership of the Society for children under 18 (10s. 6d. p.a.) entitles them to free admission, monthly meetings & badge; *Educational Facilities*—half-hour talks by Head Keepers, free admission for groups of Edinburgh school children accompanied by teachers, conducted tours during summer by the students at the Royal (Dick) School of Vet. Medicine, detailed informative labelling system used throughout the Zoo; *Library;* *Publications*—Zoo Guide (2s.), Annual Report for Fellows of the Society; *Radio Prog.*—the Director broadcasts regularly in 'Nature Scrapbook' of the B.B.C. Scottish Children's Hour; *TV Prog.*—the Zoo was featured 4 times during 1959 in "Round the Zoos" (B.B.C.); *Vet. Dept.*—in association with the Royal (Dick) School of Vet. Studies, register kept of post-mortems of animals that have died in the Zoo. *Zoo Specialities*—lectures for children during the Christmas holidays. *1959 Building:* new Animal Hospital, additions to the Giraffe House. *1960 Building:* extension to the Tiger Den & various other reconstruction work.

GLASGOW

The Zoological Society of Glasgow & West of Scotland, Calderpark, Broomhouse, Glasgow, Scotland, G.B. *Tel:* Bailliestone 1185 & 1186. *Zoo Director*—S. H. Benson. Society founded by S. H. Benson 1936, Zoo opened July, 1947. Financial support received from the City of Glasgow, the County of Lanark & private donations. *Admission Fees:* Adult 2s.; Child 1s. *Hours:* 9.30 a.m.-7 p.m. summer; 9.30 a.m.-sunset, winter. *1959 Attendance:* 170,000. 30 acres (+ 76 available). 15 employees (+ 20 in summer). *Mammals* 54 species, 125 specimens; *Birds* 40 species, 320 specimens. *Total:* 94 species, 445 specimens. *Educational Facilities*—organised parties for schools; *Library;* *Publications*—Guide Book, Annual Report, Pathology Reports for Council; *Vet., Pathology & Zool. Research* work carried out by the University of Glasgow. Pony rides. *1959 Building:* Polar Bear Den; new Main Gates. *1960 Building:* new Lion Den, large Flamingo Pond, Pay Boxes.

ILFRACOMBE

Ilfracombe Zoo Park, Comyn Hill, Ilfracombe, Devon, G.B. *Tel:* Ilfracombe 702. *Zoo Director*—Charles H. Trevisick. Founded by C. H. Trevisick 1949. *Admission Fees:* Adult 1s. 9d. (+ 3d. for Aquarium); Child 9d. (+ 3d. for Aquarium). *Hours:* 10 a.m.-dark, summer; 10 a.m.-4.30 p.m. winter. *1959 Attendance:* 70,000 approx. $4\frac{1}{2}$ acres. 4 employees. *Mammals* 200 specimens; *Birds* 250

specimens; *Reptiles & Amphibians* 50 specimens; *Fish* 300 specimens. *Total* 800 specimens. *Children's Zoo* + 3 small ones at Bude, Lynmouth & Newquay during the summer; Zoo animals featured on *Radio & TV Progs.* 1959 *Building*: new Pets' Corner; new Aviaries.

ISLE OF WIGHT

Isle of Wight Zoo Ltd., Sandown, Isle of Wight, British Isles. *Tel*: Sandown 898. *Zoo Director*—R. G. Bateman. Founded as a commercial company 1955. *Admission Fees*: Adult 2s. 6d.; Child 1s. 3d. *Hours*: 10 a.m.—dusk, summer; closed in winter. 1959 *Attendance*: 110,000. 5 acres. 6 employees. *Mammals* 50 species, 150 specimens; *Birds* 4 species, 100 specimens; *Reptiles & Amphibians* 12 species, 40 specimens; *Fish* 20 species, 130 specimens. *Total*: 86 species, 420 specimens. *Aquarium*—tropical & freshwater; *Children's Zoo*; *Educational Facilities* for local school parties; Zoo featured on *Radio & TV*. Pony & Donkey rides. 1959 *Building*: Sea Lion Pond, Aquarium, Lion Cages, 20 small cages. 1960 *Building*: new Monkey Block; extension to the Aquarium.

JERSEY

Jersey Zoological Park, Les Augres Manor, Jersey, Channel Islands, G.B. *Tel*: Jersey North 949. *Zoo Staff*: *Zoo Director*—Gerald Durrell; *Supt.*—K. J. Smith; *Vet.*—Miss C. Scutt. Founded by the Director 26.3.59. *Admission Fees*: Adult 2s. 6d.; Child 1s. *Hours*: 10 a.m.—dusk, throughout year. 1959 *Attendance* (9 months): 68,628. 8 acres. 10 employees. *Mammals* 71 species, 154 specimens; *Birds* 129 species, 233 specimens; *Reptiles & Amphibians* 34 species, 112 specimens. *Total*: 234 species, 499 specimens. *Botanical Section*; *Film Unit* (as from 1960); *Library* for staff; *Pathology* work done by Dr Osman Hill & the British Museum (Natural History); *Publication*: Zoo Guide (annual, 1s.); frequent appearances on *Radio & TV* by the Director; *Zool. Research*—breeding methods & new techniques for keeping "difficult" species in captivity. 1959 *Building*: all Zoo buildings constructed during 1959. 1960 *Building*: Parrot House, Children's Zoo, Gorilla Cage.

LONDON

The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, G.B. *Tel*: PRImrose 3333. *Cable*: "Zoological, Phone, London". *Hon. Secretary*, Prof. Sir Solly Zuckerman, C.B., M.A., M.D., D.Sc., F.R.S. *Scientific Staff*: *Scientific Director*—Dr L. Harrison Matthews, M.A., Sc.D., F.R.S.; *Curator of the Aquarium & Acting Curator of Reptiles & Invertebrates*—Dr H. Gwynne Vevers, M.B.E., M.A.,

D.Phil; *Curator of Birds*—J. J. Yealland, F.L.S.; *Curator of Mammals*—Dr D. J. Morris, B.Sc., D.Phil.; *Vet. Officer*—O. Graham-Jones, M.R.C.V.S.; *Prosecutor*—Dr W. C. Osman Hill, M.D., F.R.S.E., F.L.S.; *Pathologist*—R. N. Fiennes, M.A., M.R.C.V.S.; *Librarian & Clerk of Publications*—G. B. Stratton, M.B.E., A.L.S. *Administrative Staff*: *Controller*—Maj.-Gen. C. J. G. Dalton, C.B., C.B.E.; *Accountant & Clerk to the Council*—S. A. Westwood; *Private Secretary*—Miss G. E. Gay; *Architect*—F. A. Stengelhofen, L.R.I.B.A.; *Establishments Officer & Chief Clerk*—W. N. Pickford, M.M., A.C.I.S.; *Head of the General Dept.*—Miss E. Owen, O.B.E., B.A.; *Education Officer* (until 31.12.59)—D. G. Lambert, M.A. *Administration Regent's Park*: *Catering Manager*—W. N. Hill, F.H.C.I.; *Supplies Officer*—C. G. Nicholls, M.P.O.A.; *Transport Executive*—C. G. Harwood; *Head Gardener*—H. Hemmings; *Gardens Executive*—L. M. Flewin; *Clerk of Works*—F. J. Myers. Zoo founded by The Zoological Society of London, incorporated by Royal Charter 1829. Income derived from gate receipts, membership subscriptions & private donations. *Admission Fees*: Adult 3s. 6d.; Child 2s.; cheap tickets on Mon., special price Sun. morning. *Hours*: 9 a.m.—7 p.m. or dusk whichever is earlier, in the summer; 10 a.m.—dusk, winter. 1959 *Attendance*: 1,955,355. 36 acres. 377 employees (95 keepers, 88 services, 64 admin. & scientific, 13 gardening, 117 + catering). *Mammals* 270 species, 722 specimens; *Birds* 666 species, 1496 specimens; *Reptiles & Amphibians* 172 species, 480 specimens; *Aquarium* 303 species, 2815 specimens. *Total*: 1411 species, 5513 specimens. *Aquarium*; *Children's Zoo*—Chimpanzee Den with daily training demonstrations, glass sided chick-hatching incubator, exhibition demonstrating the care of pets, Camel, Donkey, Pony & pony-cart & llama-cart rides. *Children's Club*—Young Zoologists' Club for children between 11 & 18, subscription 10s. p.a., members receive badge, magazine, meetings, competitions, free tickets to the London Zoo & Whipsnade Park, & an Information Bureau; *Educational Facilities*—daily lecture prog. Sept-April for school children to supplement school teaching syllabus, cheap rates for groups & students; *Film Unit & Animal Film Library*—resident Film Unit established jointly by the Society & Granada TV Network Ltd., films made at the Zoo are televised regularly, in addition, a video-taped TV Prog. is broadcast from the London Zoo; *Library*—started in 1835, now has more than 100,000 vols.; *Radio Prog.*—items of news provided for the B.B.C.; *Vet. Dept.*—operates modern hospital (1957);

Pathology Dept. attached to Hospital; Research undertaken by the scientific staff; *Publications*—Proceedings of The Zoological Society (8 parts a year, 30s. per part, issued free to Scientific Fellows of the Soc.), Symposia of The Zoological Society (published as necessary), Transactions (published at irregular intervals, price varies), Nomenclator Zoologicus (at irregular intervals, price varies), Zoological Record (published in sections, annual vol. £8), Zoo Magazine (3 p.a. to members of Young Zoologists' Club only), Zoo Guide (2s. 6d.), Zoo Plan (6d.), various leaflets (3d.-9d.). 1959 *Building*: new Works Dept; new Supplies Building, Children's Zoo rebuilt, Education Centre built, Giant Panda Enclosure built. 1960 *Building*: completion of Supplies Building, alterations to Giraffe House (new wings to be added), new quarters for Ungulates & terracing of the South Bank of Regent's Park Canal.

MANCHESTER

Belle Vue Zoological Gardens, Manchester 12, G.B. Tel: Manchester East 1331. *Zoo Director*—William Wilson. Founded 1836 by John Jennison. *Admission Fees*: Adult 2s. (party rate 1s. 6d.); Child 1s. (party rate 9d.). *Hours*: 10 a.m.-dusk, summer; 10 a.m.-5 p.m. winter. 1959 *Attendance*: 500,000 approx. 70 acres; 23 employees. *Mammals* 127 species, 1258 specimens; *Birds* 118 species, 481 specimens; *Reptiles & Amphibians* 30 species, 205 specimens; *Fish* 1104 specimens. *Total*: 275+ species; 3048 specimens. *Aquarium*; *Children's Zoo* (Adult 1s., Child 6d.); *Educational Facilities*—conducted tours & lectures; *Library* (small); *Publications*—Zoo Guide (annual, 1s. 3d.), various leaflets (annual, free); occasional *Radio & TV Progs.*; *Zoo Speciality*—Sea Lion Performances in indoor pool (1s.). Elephant rides. 1959 *Building*: Monkey House reconstructed; small Ape House; Pelican Pool; Ruminants Enclosure. 1960 *Building*: Giraffe House reconstructed; new Bear Pits; new Penguin Pool; new Acclimatisation House.

PAIGNTON

Paignton Zoological & Botanical Gardens Ltd., Paignton, Devon, G.B. Tel: Paignton 57479. *Zoo Staff*: *Zoo Director*—Norman Harry Dixon, F.C.A.; *Supt.*—Lawrence Cahill; *Consultant Vet. Surgeon*—J. A. Dall, B.Sc., M.R.C.V.S. Founded 1923 by Herbert Whitley, incorporated 1946. *Admission Fees*: Adult 3s.; Child 1s. *Hours*: 10 a.m.-8 p.m. summer, 10 a.m.-dusk, winter. 1959 *Attendance*: 308,384. 47.41 acres. 60 employees (+50 in summer). *Mammals* 133 species, 304 specimens; *Birds* 280 species, 1091 specimens; *Reptiles & Amphibians* 95 species,

227 specimens; *Fish* 57 species; *Invertebrates* 8 species. *Total*: 573 species, 1622+ specimens. *Aquarium*—mainly tropical freshwater; *Botanical Section*—3 large Houses; *Children's Zoo*—series of artificially illuminated enclosures containing animals in their environments; *Educational Facilities*—for schools & colleges through the agency of the Herbert Whitley Trust; *Publication*—Plan & Guide (annual, 1s.); occasional *TV Progs.*; zool. material sent to Exeter University. 1959 *Building*: dens & grass enclosure for Cheetahs; rock terraces for Barbary Sheep.

SOUTHPORT

Southport Zoological Society, Princes Park, Southport, Lancashire, G.B. Tel: 57434. *Zoo Director*—Frank N. Farrar. *Curator*—Helena Farrar. Founded 1928; reopened 1952. Financial support received from members of the Society (sub. £2. 2s. 0d. p.a.). *Admission Fees*: Adult 1s. 3d.; Child 9d. *Hours*: 9 a.m.-dusk, summer; 10.30 a.m.-4.30 p.m. winter. 1959 *Attendance*: 250,000. 20 acres. 12 employees. *Mammals* 200 specimens; *Birds* 200 specimens. *Reptiles & Amphibians* 100 specimens; *Fish* 100 specimens. *Total*: 600 specimens. *Aquarium*; *Children's Zoo*; *Educational Facilities*—lectures & conducted tours; *Publication*—Zoo Guide; regular *TV Progs.* on B.B.C. & ITV. 1960 *Building*: House for baby Elephants.

WHIPSNAD

The Zoological Society of London, Whipsnade Zoological Park, Whipsnade, Dunstable, Bedfordshire, G.B. Tel: Dunstable 900. (For policy, & Scientific & Administrative Staff, see under The Zoological Society of London, London). *Director of Whipsnade Park*—E. H. Tong, F.L.A.S.; *Asst. Director*—E. D. Day; *Catering Manager*—E. G. Rhodes; *Clerk of Works*—A. C. W. Corbett; *Farm Bailiff*—W. H. Zealand; *Asst. Accountant*—B. J. Iken; *Overseer*—O. C. Chamberlain; *Head Gardener*—R. Tully; *Hon. Vet. Surgeon*—Martin Senior, M.R.C.V.S. Founded 1927 by The Zoological Society of London to complement the Regent's Park collection. *Admission Fees*: Adult 3s. 6d.; Child 2s. *Hours*: 10 a.m.-7 p.m. summer; 10 a.m.-4 p.m. winter. 1959 *Attendance*: 666,655. 567 acres. 114 employees (40 keepers, 32 works, 15 admin. & Scientific, 13 garden, farm & forestry, 14 catering). *Mammals* 88 species, 706 specimens; *Birds* 156 species, 1021 specimens; *Reptiles & Amphibians* 10 species, 17 specimens. *Total*: 254 species, 1744 specimens. *Children's Zoo* (1956). For *Children's Club*, *Library*, *Publications*; *Radio & TV Progs.*, *Vet. & Pathology Depts.*—see under The Zoological Society of London, London. Elephant, Camel & Pony Rides. 1959 *Building*: Rhino. House & Paddock.

1960 Building: new Entrance Gates & Subway to Gates from Car Park.

GREECE

GREECE

There is no Zoological Garden in Greece.

HUNGARY

BUDAPEST

Budapest Főváros Állat-és Növénykertje (Zoological & Botanical Garden), Budapest, Hungary. Tel: 228-029. **Zoo Staff:** Zoo Director—Prof. Csaba G. Anghi, Cand. Sci., Dipl. Eng.; Asst. Director—Dr. G. Doman, D.pol.; Chief Manager—D. Vajda; Curator of the First Mammal Section—I. Orbanyi, Dipl. Biol.; Curator of the 2nd Mammal Section—G. Szilagy, Dipl. Eng.; Curator of Birds—Th. Fodor, Dipl. Eng.; Curator of the Aquarium & Terrarium—B. Penzes, Dipl. Eng.; Curator of the Botanical Section—Mrs. M. Kiacz-Sulyok, Dipl. Eng.; Asst. Curator—G. Harnoczi, Dipl. Eng.; Technical Supt.—A. Fischer, Dipl. Eng.; Technical Manager—E. Bakonyi; Chief Vet.—Dr. I. Dodzsa, D.med.vet.; Asst. Vet.—Dr. L. Pasztor, D.med.vet. Founded 1866 by the Society of the Zoological Garden. Financial support received from the City of Budapest. **Admission Fees:** Adult Ft.2; Child Ft.1. **Hours:** 8.30 a.m.—8 p.m. summer; 8.30 a.m.—4.30 p.m. winter. **1959 Attendance:** 1,541,080. 12 hectares. 127 employees. **Mammals** 102 species, 446 specimens; **Birds** 160 species, 966 specimens; **Reptiles, Amphibians & Fish**—157 species, 1718 specimens. **Total:** 419 species, 3130 specimens. **2 Aquaria**—one tropical, one freshwater & marine for native & temperate water fish; **Botanical Section**—445 species of plants; **Educational Facilities**—zoology lectures & guided tours; **Library** with vols. in 6 languages; **Publications:** Zoo Guide (annual), Guide to the Tropicarium, Aquarium & Terrarium, True Stories from the Zoo, Short History of the Zoo; regular **Radio & TV Progs.**; **Vet. Dept.** with pathology section; **Zool. Research** carried out by the scientific staff. **1959/60 Building:** Tropical Bird House; Hibernation House; reconstruction work.

ICELAND

There is no Zoological Garden in Iceland.

INDIA

BOMBAY

Bombay Natural History Society, Victoria Gardens, Municipal Park, Apollo Street, Bombay, India.

CALCUTTA

Alipore Zoological Gardens, Calcutta 27, West Bengal, India. Tel: 45-4150. **Zoo Staff:** Hon. Secretary—Shri Brindaban Chandra Sinha, M.A., L.I.B.; Supt. & Joint Secretary—Shri R. K. Lahiri, M.Sc., G.V.Sc. Founded 1875 by the Government of Bengal & inaugurated by the Prince of Wales. Financial support received from the State Government & the Calcutta City Corporation. **Admission Fees:** 19 nP.; Child (under 5) free. **Hours:** 6 a.m.—5 p.m. throughout year. **1959 Attendance:** 1,749,895 (of which 94,835 free). 50 acres. 194 employees. **Mammals** 283 specimens; **Birds** 1416 specimens; **Reptiles & Amphibians** 49 specimens. **Total:** 1748 specimens. **Botanical Section:** floral & arboretum sections; **Children's Zoo** with young animals; **Educational Facilities** for schools & college students; **Library**—Sir Jatindra Mohan Tagore Library; **Publication**—Administrative Report (free); **Vet. Dept.**—separate hospital for zoo animals, **Pathology Section;** facilities for Zool. Research; regular broadcasts by the Supt. & Deputy Supt. on **All India Radio;** **Zoo Specialities**—Bird Sanctuary, avicultural ornithology, depot for animals in transit across India & abroad. **Elephant & Pony rides.** **1959 Building:** hospital buildings with pharmacy & laboratory, operation theatre, segregation shed, & post-mortem room; open-air enclosure for Carnivores. **1960 Building:** Children's Zoo.

DELHI

Delhi Zoological Park, New Delhi, India. Tel: 43500. **Cable WILDLIFE.** **Zoo Director**—B. V. Ramanjulu. Founded 1957 by the Government of India which gives financial support. **Admission Fees:** Adult 20 Naya Paisa; Child 10 Naya Paisa. **Hours:** 8 a.m.—6.30 p.m. summer; 9 a.m.—5 p.m. winter. **1959 Attendance:** 717,454. 300 acres. 102 employees. **Mammals** 46 species, 302 specimens; **Birds** 96 species, 556 specimens; **Reptiles & Amphibians** 5 species, 5 specimens. **Total:** 147 species, 863 specimens. **Botanical Section** (small); **Library** (small). **Elephant rides.** **1959 Building:** 25 buildings constructed. **1960 Building:** 21 buildings planned.

MYSORE

Sri Chamarajendra Zoological Gardens, Mysore, South India, India. Tel: 300. **Zoo Staff:** Zoo Director—Dr. M. H. Mari Gowda, M.Sc., Ph.D.; Curator—Sri M. V. Anantharamaiah; Warden—Sri M. Shivane Gowda; Official—Sri I. Gopala Rao; Vet. Inspector—Sr. K. N. Subba Rao. Founded by H. H. Sri Chamarajendra Wodeyar. Financial support received from the Mysore State Government. **Admission Fees:** 0.20 Naya Paisa; Child (under 12) free. **Hours:** 8 a.m.—noon, 3 p.m.—

6 p.m. (Sun. & Public Holidays 8 a.m.—6 p.m.) throughout year. 1959 Attendance: 295,006. 45 acres. 50 employees. *Mammals* 51 species, 281 specimens; *Birds* 38 species, 338 specimens; *Reptiles & Amphibians* 5 species, 31 specimens. Total: 94 species, 650 specimens. *Aquarium* being planned; *Botanical Section*; *Children's Corner*; *Educational Facilities*—school children admitted free; *Library* (small) specialising in Bombay Natural History; *Pathology Dept.*; *Vet. Dept.*; *Zool. Research Dept.* under consideration. Elephant & Camel rides. 1959 Building: Wolf Cage; American Bison Enclosure. 1960 Building: Vet. Hospital & Research Section; Piggery.

INDONESIA

BANDOENG

Bandoeng Zoological Park, Bandoeng, Java.

BATAVIA

Zoological Gardens, Batavia, Java.

DJAKARTA

Kebun Binatang Djakarta (formerly Baraviache Planten en Dierentuin), Djawa, Djakarta, Str. Tjikini Raya 73, Indonesia. Zoo Staff: Zoo Director—B. Gaulstaun; Asst. Director—Mhd. Machboeb. Founded 1864 by Zoo Society. Admission Fees: Adult 3.00 Rupiah; Child 1.50 Rupiah. Hours: 8 a.m.—6 p.m. throughout year. 1959 Attendance: 425,000. 85,000 sq. metres. *Mammals* 65 species, 168 specimens; *Birds* 52 species, 184 specimens; *Reptiles & Amphibians* 4 species, 17 specimens. Total: 121 species, 369 specimens. Owing to government taxation & disorganisation caused by the war, the Zoo is not expanding; it is also trying to find a new site outside the City.

MALANG

Gemeente Dierentuin, Malang, Java.

WELTEVREDEN

Dierenpark, Waltevredden, Java.

REPUBLIC OF IRELAND

DUBLIN

Royal Zoological Society of Ireland, Phoenix Park, Dublin, Eire. Tel: 71426. Zoo Staff: Zoo Director—E. T. Murphy; Asst. Secretary—Miss B. J. Good, B.A. Founded by the Society in 1830. Financial support from the State (annual grant of up to £1,000) & members' subscriptions. Admission Fees: Adult 2s.; Child 1s. Hours: 9.30 a.m.—6 p.m. summer; 9.30 a.m.—sunset, winter. 1959 Attendance: 341,699. 32 acres. 71 employees. *Mammals* 66 species, 170 specimens; *Birds*

125 species, 356 specimens; *Reptiles & Amphibians* 20 species, 83 specimens. Total: 211 species, 609 specimens. *Botanical Section*; *Children's Zoo*; *Educational Facilities*—tours for children in conjunction with State Transport; *Library* (small); *Publication*—Annual Report; *Vet. & Pathology* work in association with the Vet. College of Ireland. Elephant & Pony rides.

ISRAEL

HAIFA

Gan Hachajoth shel Hamachon Habiologi (The Zoological Garden of the Biological Institute), Hatishbi Str. 126, Haifa-Mt. Carmel, Israel. Tel: Haifa 81886. Zoo Director—Shlomoh Farber-Moran. Founded 1950 by Mr. Pinchas Cohen & the Biological Institute (also founded by him). Financial support received from Haifa. Admission Fees: Adult 0.35 L.; Child 0.25 L. Hours: 8 a.m.—noon, 5 p.m.—7 p.m. summer; 8 a.m.—noon, winter. 1959 Attendance: 80,000 approx. 25,000 sq. metres. 5 employees. *Mammals* 15 species, 53 specimens; *Birds* 22 species, 48 specimens; *Reptiles & Amphibians* 9 species, 11 specimens; *Fish* 14 species, 22 specimens; *Invertebrates* 9 species, 15 specimens. Total: 69 species, 149 specimens. *Aquarium*—10 tanks; *Botanical Section*; *Educational Facilities*—guided tours for school children, 300 advanced students use the scientific & educational facilities of the Institute, natural history course for teachers; *Film Unit* & library of natural history & biological films; *Library*—approx. 800 vols.+scientific journals; *Natural History Museum*; *Publications*—Lecture Programme (annual), Annual Report, Catalogue of film-strips, scientific books, specimens, etc., for loan to schools. 1959 Building: several large open-air enclosures for large animals. 1960 Building: Prehistorical Museum.

JERUSALEM

Jerusalem Biblical Zoological Garden Ltd., Romema, Jerusalem, Israel. Tel: 5829. Zoo Director—Prof. Aharon S. Shulov, D.Sc. Founded 17.9.1940 as an "Animal Corner"; opened on present site 5.10.50. Financial support received from the Ministry of Education, the Municipality of Jerusalem & a society, "Friends of Jerusalem Biblical Zoo." Admission Fees: Adult 50 Agurot; Child 25 Agurot. Hours: 8 a.m.—7 p.m. summer; 9 a.m.—sunset, winter. 1959 Attendance: 80,000. 10 hectares. 10 employees. *Mammals* 52 species, 300 specimens; *Birds* 61 species, 233 specimens; *Reptiles & Amphibians* 20 species, 51 specimens; *Invertebrates* 10 species, 33 specimens. Total: 143 species, 617 speci-

mens. *Botanical Section*—Biblical plants; *Publication*—"Alon Tedidei Hagan" (Bulletin of the Friends of the Zoo); *Zoo Speciality*—exhibition of Biblical animals. Camel & Donkey rides. 1959 *Building*: Aquarium. 1960 *Building*: Flamingo & Swan Ponds.

TEL AVIV

Gan Hakhayot Tel Aviv (Tel Aviv Zoological Garden), Keren Kayemeth Blvd., Tel Aviv, Israel. *Tel*: 23088. *Zoo Staff*: *Zoo Director*—B. Goffer; *Zoologist*—M. Lerner, M.Sc.; *Inspector*—J. Suchier; *Vet. Surgeon*—Dr C. H. Gorovitz. Founded by the Zoological Garden Society of Tel Aviv, sponsored by Dr Rabbi M. Schornstein. Financial support from the City of Tel Aviv & private donations. *Admission Fees*: Adult 70 Agurot; Child 35 Agurot. *Hours*: 7.30 a.m.–7.30 p.m. summer; 8 a.m.–4.30 p.m. winter. 1959 *Attendance*: 324,680. 10 acres. 48 employees. *Mammals* 55 species, 120 specimens; *Birds* 100 species, 508 specimens; *Reptiles & Amphibians* 7 species, 34 specimens; *Fish* 30 species, 100+ specimens. *Total*: 192 species, 762+ specimens. *Aquarium* (small) containing Red Sea & Tropical Fish; *Library* with over 300 vols.; *Publication*—"Bevar" (25 Agurot); *Vet. Dept.* under supervision of local vet. 1959/60 *Building*: Aviary for Saddle-billed Storks & Flamingos.

ITALY

MILAN

Giardino Zoologico di Milano, Milano, Italy.

NAPLES

Giardino Zoologico di Napoli, Campi Flegrei, Napoli, Italy. *Tel*: 304483. *Zoo Director*—Franco Cuneo. Founded by a society, "Ente Autonomo Mostra d'Oltremare e del Lavoro Italiana nel Mondo", 25.10.1950. Financial support received from the City of Naples. *Admission Fees*: Adult 100 Lire; Child 50 Lire. *Hours*: 9 a.m.–sunset throughout year. 1959 *Attendance*: 310,000. 10 hectares (+8 available). 14 employees. *Mammals* 127 species, 311 specimens; *Birds* 71 species, 584 specimens; *Reptiles & Amphibians* 11 species, 47 specimens. *Total*: 209 species, 942 specimens. *Botanical Section*; *Children's Zoo* planned; *Educational Facilities*; *Library*; *Pathology Dept.* in association with the Pathology Dept. of Naples University; occasional *Radio & TV Progs.*; *Vet. Dept.* with one vet. & one vet. surgeon; *Zool. Research* in association with the "Zooprofilactic Station" of the State. 1959/60 *Building*: Maternity Section for Mammals; Nursery; 4 buildings for large Antelopes; Penguin Enclosure; several Deer Enclosures; extension to Bird House; renovation of Monkey House.

ROME

Comune di Roma Giardino Zoologico e Museo di Zoologia, viale Giardino 20, Roma, Italy. *Tel*: 870.564, 870.531 & 870.031. *Zoo Director*—Prof. Dr Ermanno Bronzini. Founded 1911 by a society. Financial support received from the Municipality of Rome. *Admission Fees*: Adult 200 Lire (100 L. on Sun. & public holidays, 50 L. on last Sun. of month); Child (under 1.20 m.) free. *Hours*: 8 a.m.–sunset throughout year. 1959 *Attendance*: 650,000 approx. 17 hectares. 89 employees. *Mammals* 193 species, 456 specimens; *Birds* 525 species, 1504 specimens; *Reptiles & Amphibians* 80 species, 733 specimens; *Fish* 45 species, 536 specimens. *Total*: 843 species, 3229 specimens. *Aquarium* (temp. closed for repairs); *Botanical Section*; *Educational Facilities*—cheap rates for schools (25 L. per child) & cultural societies; *Film Unit*; *Library* (in Zool. Museum) with 10,000 vols. & subscriptions to 100 periodicals; Zoo featured on educational *Radio Prog.* & on *TV Progs.*; *Publications*—"Il Giardino Zoologico" (twice monthly, 200 L.), *Zoo Guide* (50 L.), "Andiamo allo Zoo" (200 L.); *Vet. Dept.*; *Parasitology Centre*; *Zool. Research* in association with university depts. 1959 *Building*: completion of staff buildings. Pony rides. 1960 *Building*: new Elephant House; new Bird House; restoration of Cervidae Section; new Birds of Prey Aviary; new Aquarium.

TURIN

Giardino Zoologico di Torino, Torino, Italy. Founded 22.10.55 by Augusto & Guido Molinar with the help of the City Council. *Publication*—Zoo Guide.

JAPAN

FUKUOKA CITY

Fukuoka Zoological Gardens, South Park, Fukuoka City, Kyushu Island, Japan. *Tel*: 4-7189. *Zoo Director*—A. Kagawa. Founded by Fukuoka City which gives financial support. *Admission Fees*: Adult 40 ¥, Child 20 ¥. *Hours*: 9 a.m.–5 p.m. throughout year. 1959 *Attendance*: 500,000. 50 employees. *Mammals* 46 species, 132 specimens; *Birds* 124 species, 326 specimens; *Reptiles & Amphibians* 10 species, 13 specimens; *Fish* 2 species, 76 specimens. *Total*: 182 species, 547 specimens. *Botanical Section*; *Library*; regular *Radio & TV Progs.*; *Vet. Dept.*; *Zool. Research & Pathology* in association with the University. 1959 *Building*: Orang-utan House; Baboon building. 1960 *Building*: Deer & Antelope Houses.

HAMAMATSU CITY

Hamamatsu Municipal Zoo, Matsushiro Machi, Hamamatsu City, Japan.

HIMEJI CITY

Himeji Municipal Zoo, Himeji City, Hyogo Prefecture, Japan. *Zoo Director*—Shigeo Machi.

INUYAMA CITY

Japan Monkey Centre, Inuyama City, Aichi Prefecture, Japan. *Zoo Director*—Tsuyoshi Tamura. Private Zoo.

KAGOSHIMA CITY

Kamoiike Municipal Zoo, Kagoshima City, Kagoshima Prefecture, Japan. *Zoo Director*—Shigemori Ibaragi.

KOBE

Kobe Oji Zoo, Ojicho 3-chome, Nada-Ku, Kobe, Japan. *Tel:* Kobe 8-2361. *Zoo Director*—Shizuro Yamamoto. Founded 20.3.1951 by Kobe Municipality which owns & manages the Zoo. *Admission Fees:* Adult 40 ¥; Child 20 ¥ (children under 6 free). *Hours:* 9 a.m.—5 p.m. summer; 9 a.m.—4.30 p.m. winter. 1959 *Attendance:* 460,770 (including 14,812 free of charge). 17.3 acres. 33 employees. *Mammals* 58 species, 260 specimens; *Birds* 77 species, 378 specimens; *Reptiles & Amphibians* 12 species, 79 specimens; *Fish* 1 species, 2 specimens; *Invertebrates* 1 species, 30 specimens. *Total:* 149 species, 749 specimens. *Aquarium & Botanical Section* separate from Zoo; *Children's Zoo* under construction; *Film Unit;* *Library* for staff; *Publication*—*Zoo Guide* (3 p.a.); occasional *Radio & TV Progs.*; *Vet. Dept.* 1959 *Building:* Rhino. & Ostrich Enclosure for African Section. 1960 *Building:* Entrance & Administration Building; Reptile House.

KOKURA

Itozu Zoo Park, Kokura City, Fukuoka, Japan. *Tel:* Kokura 5-1895 & 5756. *Zoo Staff:* *Zoo Director*—Shigeru Kobayashi; *Asst. Director*—Kazuma Kidosaki; *Curator & Vet. Officer*—Tadao Moritomo; *Pathology Dept. Staff*—Prof. Dr Yoshitomi Takano; *Asst. Prof. Dr* Athushi Urano, *Asst. Yoshiro Kaneko*. Founded 1.8.1932 by the Nishinippon Rail Road Co. which gives financial support. *Admission Fees:* Adult 50 ¥; Child 20 ¥. *Hours:* 9 a.m.—5 p.m. summer; 9 a.m.—3 p.m. winter. 1959 *Attendance:* 511,001. 125,400 sq. metres. 50 employees. *Mammals* 50 species, 278 specimens; *Birds* 67 species, 240 specimens; *Reptiles & Amphibians* 9 species, 78 specimens; *Fish* 3 species, 1500 specimens; *Total:* 129 species, 2096 specimens. *Botanical Section;* *Children's Zoo;* *Educational Facilities*—summer school, mobile zoo for local schools; *Film Unit;* *Library*, including a library for

children; *Pathology Dept.* in association with the Path. Dept. of Kyushu Dental College; *Vet. Dept.* 1959 *Building:* Monkey House; Bird House. 1960 *Building:* Elephant House.

KUMAMOTO CITY

Kumamoto Municipal Zoo, Kumamoto City, Kumamoto Prefecture, Japan. *Zoo Director*—Juji Ibaragi.

KYOTO CITY

Kyoto Memorial Zoo, Okazaki Park, Kyoto City, Japan. *Zoo Director*—Sampei Satoji.

MATSUYAMA CITY

Dogo Prefectural Zoo, Maysuyama City, Ehime Prefecture, Japan. *Zoo Director*—Eisei Shimizu.

MISAKI

Misaki Natural Zoo, Misaki Machi, Osaka Prefecture, Japan.

NAGOYA

Nagoya Municipal Higashiyama Zoo, 215 2-chome, Higashiyamamoto-machi, Chikusa-ku, Nagoya, Japan. *Tel:* Nagoya 73-0790. *Zoo Director*—Yoshio Kano. Founded at Tsuruma Park April 1918, moved to present site March 1937. Financial support received from the City. *Admission Fees:* Adult (above 12) 40 ¥; Child 10 ¥; Child under 6 free. *Hours:* 9 a.m.—4.30 p.m. throughout year. 1959 *Attendance:* 1,800,000. 41 acres; 56 employees. *Mammals* 87 species; *Birds* 188 species; *Reptiles & Amphibians* 21 species. *Total:* 296 species. *Botanical Section* separate from Zoo; *Children's Zoo*—1.6 acres; *Vet. Dept.* with two vets. Pony rides, recreational centre & fair-ground. 1959 *Building:* Anthropoid Ape House; Flamingo House. 1960 *Building:* Crane House.

NARA CITY

Ayameike Zoo, Nara City, Nara Prefecture, Japan. *Zoo Director*—Nobuo Yamawaki. Private Zoo.

NISHINOMIYA CITY

Hanshin Park Zoo, Nishinomiya City, Hyogo Prefecture, Japan. *Zoo Director*—Hiroyuki Doi. Private Zoo.

OKAYAMA CITY

Ikeda Industrial Zoo, Okayama City, Okayama Prefecture, Japan. *Zoo Director*—Takamasa Ikeda. Private Zoo.

OSAKA CITY

Tennoji Municipal Zoo, Tennoji, Osaka City, Japan. *Zoo Director*—Shinz o Terauchi.

SAPPORO

Maruyama Zoo, 3-1 Myagaoka Maruyama, Sapporo Hokkaido, Japan. *Tel:* (3) 31426 *Zoo Director*—M. Nakamata. Founded by Sapporo City which gives financial support.

Admission Fees: Adult 40 ¥; Child 15 ¥. *Hours:* 9 a.m.-5 p.m. summer; closed Nov.-March. 1959 *Attendance:* 506,729. 225,000 sq. metres. 35 employees. *Mammals* 45 species, 104 specimens; *Birds* 61 species, 191 specimens; *Reptiles & Amphibians* 4 species, 26 specimens; *Fish* 7 species, 600 specimens. *Total:* 117 species, 921 specimens. 1959 *Building:* Giraffe, Reptile & Snake Houses; 1960 *Building:* Camel, Monkey & Ape Houses.

TAKAMATSU

Ritsurin Park Zoo, Ritsurin Park, Takamatsu, Kagawaken, Japan. *Tel:* Takamatsu 4911. *Zoo Staff:* *Zoo Director*—M. Kagawa. *Asst. Director & Curator*—Mitami Kagawa; *Manager*—Hayami Kagawa; *Curator & Vet.*—Kazumi Kagawa. *Admission Fees:* Adult 40 ¥; Child 15 ¥. *Hours:* 8 a.m.-6 p.m. summer; 9 a.m.-5 p.m. winter. 1959 *Attendance:* 467,726. 3 acres. 21 employees. *Mammals* 49 species, 64 specimens; *Birds* 21 species, 61 specimens; *Reptiles & Amphibians* 6 species, 14 specimens; *Fish* 25 species; *Invertebrates* 145 specimens. *Total:* 125 species, 252 specimens. *Aquarium*—10 freshwater, 10 seawater tanks; *Children's Zoo*; *Educational Facilities*—lectures, special room for students; *Film Unit*; *Publication*—"What Animals Do You Like" (free); *Radio & TV Progs.*; *Vet. Dept.*; 1959 *Building:* Lavatories. 1960 *Building:* 20 houses for Pheasants.

TAKARAZUKA CITY

Takarazuka Zoo, Takarazuka City, Hyogo Prefecture, Japan. *Zoo Director*—Torao Matsumoto. Private Zoo.

TOKUSHIMA CITY

Tokushima Municipal Zoo, Tokushima City, Tokushima Prefecture, Japan. *Zoo Director*—Kazuo Tomiyama.

TOKYO

Tama Zoological Park, Hino-machi, Minami-tama-gun, Tokyo, Japan. See under Ueno Zoological Gardens.

TOKYO

Ueno Zoological Gardens, Ueno Park, Daitoku, Tokyo, Japan. *Tel:* Tokyo (828) 0300. *Zoo Staff:* *Zoo Director*—Tadamichi Koga. *General Supt.*—Takeo Koyama; *Supt. of Staff, Information & Tickets*—Genji Watanabe; *Animal Curator*—Nobumasa Fukuda; *Construction & Maintenance*—Eiichi Imaizumi; *Director of Tama Zoo*—Juro Hayashi. Founded 20.3.1882 by Tokyo Metropolitan Government as part of the National Museum; Tama Zoological Park which comes under the direction of Ueno Zoo, opened 5.5.58. *Admission Fees:* Adult 50 ¥; Child 10 ¥. *Hours:* 9 a.m.-4.30 p.m.

throughout year. 1959 *Attendance:* 3,158,707. 128,770 sq. metres. 118 employees. *Mammals* 122 species, 366 specimens; *Birds* 234 species, 1254 specimens; *Reptiles & Amphibians* 30 species, 88 specimens; *Fish* 57 species, 453 specimens; *Invertebrates* 3 species, 7 specimens. *Total:* 446 species, 2168 specimens. *Aquarium*—15 seawater tanks, 1 sea-turtle pond 5 aquatic reptiles' tanks, 8 tropical fish tanks; *Children's Zoo* (1948); *Educational Facilities*—annual Summer School; *Publication*—"Animals & Zoo" (monthly, \$1.00 p.a.); regular *TV Prog.* on N.E.T. Network; *Animal Lovers' Club*—monthly meetings & lectures. 1959/60 *Building:* Japanese Enclosure around the Five-storied Pagoda; African Ecological Enclosure; new Bear Grotto.

TOYOHASHI CITY

Toyohashi Municipal Zoo, Toyohashi City, Japan. *Zoo Director*—Kizo Ogino.

YOKOHAMA

Nogeyama Municipal Zoo, Nogeyama, Yokohama City, Japan. *Zoo Director*—Rikio Yamada.

JORDAN

There is no Zoological Garden in Jordan.

KOREA

SEOUL

National Zoological Gardens of Korea, Changgyong Park, Seoul, Korea. *Zoo Director*—Ha Toon Kong. Founded 1940. *Admission Fees:* Adult 200 Hwan; Child 100 Hwan; Soldiers in uniform 100 Hwan. *Mammals* 27 species, 65 specimens; *Birds* 46 species, 322 specimens; *Reptiles* 1 species, 4 specimens. *Total:* 74 species, 391 specimens.

LAOS

There is no Zoological Garden in Laos.

LEBANON

There is no Zoological Garden in the Lebanon.

LUXEMBOURG

There is no Zoological Garden in Luxembourg.

MEXICO

There are several Zoological Gardens in Mexico—addresses not known.

MOROCCO

CASABLANCA

Ain-Sebaa Zoo, Casablanca, Morocco.

MEKNES

The Zoological Gardens, Meknes, Morocco.

RABAT

The Zoological Gardens, The King's Palace, Rabat, Morocco.

NETHERLANDS

AMSTERDAM

Koninklijk Zoologisch Genootschap Natura Artis Magistra (Royal Zool. Soc. N.A.M.), Plantage Kerklaan 40, Amsterdam, Netherlands. Tel: Amsterdam 948181. Zoo Director—Dr E. F. Jacobi. Founded May 1838 by J. F. Westerman, J. W. H. Werleman, J. J. Wijsmuller. Financial support from City of Amsterdam & Province of Noord-Holland. Admission Fees: Adult Hfl. 1.50; Child Hfl. 0.75. Hours: Mar.—Apr. 8.30 a.m.—6 p.m.; May 8.30 a.m.—8 p.m.; Jun.—Jul. 8.30 a.m.—9 p.m.; Aug. 8.30 a.m.—8 p.m.; Sept./Oct. 8.30 a.m.—6 p.m.; Oct./Feb. 8.30 a.m.—5 p.m. 1959 Attendance: Zoo 588,296; Aquarium 263,246. 25 acres. 105 employees. Mammals 175 species, 579 specimens; Birds 252 species, 934 specimens; Reptiles & Amphibians 193 species, 771 specimens; Fish 356 species, 1800+ specimens; Invertebrates 139 species, 1400 specimens. Total: 1115 species, 5484 (approx.) specimens. Aquarium; Botanical Section. Children's Farmyard; Educational Facilities—employment given during summer to teenage volunteers; lectures and demonstrations for children; excursions; Film Unit started in 1959—1st film "Life of the Mudskipper" (*Periophthalmus*); Library; Veterinary, Pathology and Zoological Research work in association with the University of Amsterdam, University of Utrecht & Tropical Institute; Publications—"Bijdrage tot de Dierkunde" (annual); "Artis" (bi-monthly Hfl. 6, Hfl. 7 for postage abroad). 1959 Building: Amphibian Department in the Aquarium; 1960 Building: Penguin House with islands & cooling-room.

ARNHEM

Burgers' Natuur-Dierenpark, Schelmseweg 85, Arnhem, Netherlands. Tel: K.8300-24534. Zoo Staff: Zoo Director—Mr. R. A. Th. van Hooft, J. D.; Vet.—Dr S. Mulder. Founded 31.3.13 by Joh. G. H. Burgers. Private Zoo—no external financial support. Admission Fees: Adult Hfl. 1.00; Child Hfl. 0.50. Hours: 8 a.m.—sunset, throughout year. 1959 Attendance: 350,000 (approx.). 45 acres (approx). 23 Zoo employees + 11 catering. Mammals 65 species, 266 specimens; Birds 122 species, 769 speci-

mens; Reptiles & Amphibians 3 species, 11 specimens. Total: 190 species, 1046 specimens. Apes' Tea-Party; Educational Facilities—special rates for schools. Publication—Zoo Guide & Plan. 1959 Building: new Anthropoid Ape House, new Hippopotamus House; 1960 Building: new Houses for Rhinoceroses, Tapirs, Antelope, Camels.

EMMEN

Emmen Zoo, Northern Province, Netherlands.

RHENEN

Ouwehand Zoo, Rheden, Netherlands.

ROTTERDAM

Koninklijke Rotterdamse Diergaarde (Royal Rotterdam Zoological Garden), van Aerssenlaan 49, Rotterdam, Netherlands. Tel: Rotterdam 82965. Zoo Staff: Zoo Director—Ir. F. J. Appelman; Assistant Director & Editor of "Blijdorp Geluiden"—Dr A. C. V. van Bommel; Administrator—A. Okkerse; Superintendent of Animal Department—C. van Doorn; Superintendent of Plant Department—I. L. Mark; Chief Technician—G. J. P. van der Lee; Catering Manager—L. H. B. van den Berg; Public Relations Officer—K. van Zwieten; Curator of Natural History Museum—H. Landsman; Vet.—Dr J. C. Peters; Pathologist—P. Zwart; Architect—H. D. Bakker. Founded 27.3.1857 by Society—"Rotterdamse Diergaarde"; new Blijdorp Gardens opened 6.12.1940. Small financial subsidy from the Province. Admission Fees: Adult 1.50 Hfl.; Child 0.60 Hfl. Hours: 8 a.m.—sunset (summer), 9 a.m.—5 p.m. (winter). 1959 Attendance: 666,773 + 6679 season ticket-holders. 15 hectares. 31 keepers; 24 gardeners; 18 technicians; 6 gatekeepers & control; 2 propaganda; 9 administration; 9 staff; 2 Natural History Museum; Restaurant 35+ = 136+. Mammals 117 species 363 specimens; Birds 225 species, 800 specimens; Reptiles & Amphibians 40 species, 99 specimens; Fish 50 species, c.4000 specimens. Total: 432 species, c.5262 specimens. No Aquarium building but separate aquariums in central hall; Botanical Section—Hothouse with large collection of orchids & pond; large playgrounds for children; Educational Facilities—guided tours for groups and school classes, lectures with films over whole country; 1959 film produced by M. Toonder Stud. on behalf of Zoo—"Oasis in a City" (colour, ½ hour); Scientific Library for staff & students; Pathology Research done by Instituut voor Tropische en Protozoaire Ziekten, University of Utrecht; occasional Radio & TV Progs.; Veterinary Department; Zoological Research in association with Zoological Laboratories at Leiden & Amsterdam Universities; Natural History Museum—collection of birds, insects and

shells; special exhibition of *Nature Conservancy* in the Gardens; *Publication*—"Zoo Guide", "Blijdorp Geluiden" (monthly, Hfl. 1.90). Elephant & pony-cart rides. 1959 *Building*: Okapi House, Otter Pond, Suricata Enclosure, Rhinoceros Stable; 1960 *Building*: Pheasantry, Parakeet House, Baboon Rock.

TILBURG

Tilburg's Natuur-Dierenpark, Bredaseweg 429, (Office: Bisschop-Allenstraat 24), Tilburg, Netherlands. *Tel*: Tilburg 24536; *Office*—21930. *Zoo Directors*—N. C. van Dijk, Q. P. C. van Dijk, H. A. van Dijk. Founded 1952 by C. van Dijk & Zonen (commercial). No external financial support. *Admission Fees*: Adult 1.00 Holl. Guilder; Child 0.50 Holl. Guilder. *Hours*: daylight. 1959 *Attendance*: 153,000. 11 hectares. 12 employees. No figures for species & specimens. *Publication*—"Dierenpark" (monthly, Hfl. 2.50 p.a.).

WASSENAAR

Dierenpark Wassenaar, 658 Rijksstraatweg, Wassenaar, Netherlands. *Tel*: Wassenaar 9801; *Telegrams*—Hollandzoo Wassenaar; *Telex* 31305. *Zoo Director*—P. W. Louwman. Founded by Wassenaar Zoological Society. No outside financial support. *Admission Fees*: Adult Hfl. 1.25; Child Hfl. 0.60. *Hours*: 8 a.m.—sunset (summer), 9 a.m.—sunset (winter). 1959 *Attendance*: 314,700. 60 acres (36 open to public). 76 employees. *Mammals* 76 species, 193 specimens; *Birds* 404 species, 1332 specimens; *Reptiles & Amphibians* 38 species, 86 specimens; *Fish* 87 species, 1200 specimens. *Total*: 605 species, 2811 specimens. *Aquarium* with tropical seawater section; *Educational facilities*—Wassenaar schools attend Natural History lessons at the Zoo, conducted tours for school parties; *Library* with approximately 3200 volumes; *Publications*: "Nieuws uit het Park" (regularly, Hfl. 3.50 p.a.); *Veterinary Department*; *Zoological Research* in association with universities. Donkey & Pony rides. 1959 *Building*: Extension to Birds of Prey Aviary. 1960 *Building*: Bird House to be enlarged by new semi-outdoor aviary 200' x 55'; new Monkey House.

NEW ZEALAND

AUCKLAND

Auckland Zoological Park, Auckland, New Zealand. *Tel*: 14785. *Zoo Staff*: *Head of Parks Department*—George Dean, D.I.P.A.; *Zoo Superintendent*—D. Woods. Founded by Auckland City Council which gives financial support. *Admission Fees*: Adult 2s. 6d. (groups of 25+ 2s. each); Child 1s. (groups of 25+ 9d. each). *Hours*: 9.30 a.m.—5.30 p.m. throughout year. 1959 *Attendance*: 222,533.

32 acres. 26 employees. *Mammals* 60 species, 316 specimens; *Birds* 78 species, 348 specimens; *Reptiles & Amphibians* 7 species, 34 specimens; *Fish* 30 species, c.1000 specimens. *Total*: 175 species, c.1698 specimens. *Aquarium*; *Botanical Section*; *Children's Zoo*; *Junior Zoo Club*—40 members; *Consultant Vet.*; *Publication*: Zoological Society's Newsletter (quarterly, free). Elephant rides & electric train. 1959 *Building*: Giraffe House, two ponds, prehistoric animal (dragon); 1960 *Building*: Addition to Polar Bear Enclosure, new Monkey Cage, Children's Zoo extension, Stage II Prehistoric animals.

WELLINGTON

Wellington Zoological Gardens, Newtown Park, Wellington, New Zealand. *Tel*: Wellington 86-564; 86-903; 86-803; *Cables* SUPREMA. *Zoo Staff*: *Zoo Director*—C. J. Cutler; *Secretary*—Miss E. Miles; *Hon. Veterinaries*—M. Price, M.R.C.V.S., Trounson, B.Vsc., J. Gill, B.Vsc. Founded 1904 by Wellington City Corporation. Financial support from the City. *Admission Fees*: Adult 2s. (family ticket: 2 adults & 2 children, 4s.); Child 6d. (school parties 4d. per child). *Hours*: 9 a.m.—5 p.m. (summer), 9 a.m.—4.30 p.m. (winter). 1959 *Attendance*: 354,397. 34 acres + 120 acres grazing not open to public. 25 employees. *Mammals* 48 species, 511 specimens; *Birds* 156 species, 2989 specimens; *Reptiles & Amphibians* 10 species, 74 specimens; *Fish* 12 species, 595 specimens. *Total*: 226 species, 4169 specimens. *Small Aquarium*; *small Botanical Section*; *Lecture Hall & small Theatre*; *Library*; weekly *Radio Programme* by Director (since 1940); *TV* when it is established in New Zealand; *Veterinary Department*; *Pathology & Zoological Research* in association with Government Departments; *Publications*: *Catalogue & Guide* (bi-annual, 1s.); *W.C.C. Yearbook* (free). 1959 *Building*: New Dove Aviary; extension of Chimpanzee Block; Giraffe House. 1960 *Building*: New Orang-utan House; new cage for Drills & Mandrills; Wombat House; new enclosure for Echidnas; new Ostrich House; completion of Children's Zoo.

FEDERATION OF NIGERIA

JOS

Jos Museum Zoo, Jos, Federation of Nigeria. *Tel*: Jos 2465. *Zoo Staff*: *Zoo Director*—B. E. B. Fagg; *Hon. Veterinary Surgeon*—E. D. Wright, M.R.C.V.S. Founded by B. E. B. Fagg; First steps taken in March 1960 to form a Zoological Society of Jos to manage the Jos Museum Zoo. Financial support from voluntary contributions. *Admission Fees*: Adult 3d. & 6d.; Child 1d. *Hours*: daylight (keepers 7 a.m.—7 p.m.). 1959

Attendance: 45,056. Approximately 1½ acres developed out of 40 acres available. 3 employees, 2 voluntary gatekeepers full-time; all other staff voluntary & part-time. *Mammals* 17 species, 34 specimens; *Birds* 5 species, 7 specimens; *Reptiles & Amphibians* 7 species, 20 specimens; *Fish* 2 species. *Total:* 31 species, 61+ specimens. *Arboretum;* *Children's Corner* & contact area; small *Zoological Section* in *Jos Museum Library*; much help given by *Veterinary Research Department* of Vom and the *Ministry of Animal Health*; development of *Folk Museum* within Zoo Grounds—dancing, dramatic performances, architecture. *1959 Building:* Double Leopard Cage. *1960 Building:* Cage for Desert Lynx; Ostrich Enclosure; Hyena Enclosure with rock lair; Klipspringer Paddock; enlarged Duiker Paddock; Cheetah Enclosure.

NORWAY

There is no Zoological Garden in Norway.

PAKISTAN

KARACHI

Gandhi Garden Zoo, Karachi, Pakistan.

PANAMA

There is no Zoological Garden in Panama.

PERSIA (IRAN)

TEHRAN

Zoo of Tehran, Shemiran Road, Tehran, Iran. *Zoo Director*—from Hamburg, Germany. Founded 1958 by private investor. *Admission Fees:* Adult 20 rials; Child 10 rials. *Hours:* 8 a.m.–10 p.m. summer. 9 a.m.–6 p.m. winter. 15,000 sq. metres. 50 employees. *1960 Building:* various new buildings.

PERU

LIMA

Jardin Zoologico, Barranco, Lima, Peru.

POLAND

Polish Zoos are under the supervision of: Mgr. Zb. Wolinski, Zoo-Inspector, Ministers-two Gospodarki; Komunalnej, Warszawa, ul. Nowogrodzka 1/3, Poland.

LÓDŹ

Miejski Ogród Zoologiczny, Łódź, ul. Konstantynowska 8/10, Poland. *Zoo Director*—Aleksander Gaworkiewicz. Founded 1938 by City of Łódź. Financial support from City of Łódź. *Admission Fees:* Adult 3.00 zł.; Child

1.00 zł. *Hours:* 9 a.m.–8 p.m. summer, 9 a.m.–4 p.m. winter. *1959 Attendance:* 401,700. 16.5 hectares. 76 employees. *Mammals* 96 species, 602 specimens; *Birds* 70 species, 356 specimens; *Reptiles & Amphibians* 4 species, 7 specimens; *Fish* 26 species, 380 specimens. *Total:* 196 species, 1345 specimens. *Aquarium;* *Veterinary Department;* Animal rides. *1959 Building:* Large Paddock for Wisent. *1960 Building:* Enclosures for Bison, Camels & Llamas; Children's Zoo.

GDANSK

Gdansk Zoo, Gdansk, Oliwa, ul. Karwienska 8/10, Poland. *Zoo Director*—Ing. M. Massalski.

KATOWICE

Katowice Zoo, Katowice, Dolina Szwajcarska, P.O. Box 385, Poland. *Zoo Director*—Ing. I. Kotarba.

KRAKOW

Krakow Zoo, Krakow, Poland. *Zoo Director*—A. Koziarz.

OPOLE

Opole Zoo, Opole, Wyspa, Isle, Bolko, Poland. *Zoo Director*—Ing. Lucjan Kielisz.

PLOCK

Plock Zoo, Plock, Poland. *Zoo Director*—Ing. T. Taworski.

POZNAN

Miejski Ogród Zoologiczny, Poznan, ul. Zwierzyniecka 19, Poland. *Zoo Director*—Dr Bolesław Witkowski. Founded 1874 by a Society; state-aided. *Admission Fees:* Adult 5.00 zł.; Child 2.00 zł. *Hours:* 9 a.m.–7 p.m. summer, 9 a.m.–4 p.m. winter. *1959 Attendance:* 460,000. 5.25 hectares. 54 employees. *Mammals* 83 species, 340 specimens; *Birds* 90 species, 318 specimens; *Reptiles & Amphibians* 3 species, 13 specimens; *Fish* 4 species, 29 specimens. *Total:* 180 species, 700 specimens. *Children's Zoo;* *Club of Young Friends of the Zoo;* *Educational Department* directed by one Assistant; *Library* with 450 volumes; *Programmes on Radio & TV;* *Veterinary Department.* Pony-cart rides.

WARSAW

Miejski Ogród Zoologiczny w Warszawie, Warszawa-4 Ratuszowa str. 1/3, Poland. *Tel:* 923-83 & 929-01. *Zoo Director*—Dr Jan Landowski. Founded 11.3.1928 by the City of Warsaw which gives financial support. *Admission Fees:* Adult 5 zł.; Child 2 zł. (groups 1 zł. ea.). *Hours:* 9 a.m.–8 p.m. summer, 9 a.m.–4 p.m. winter. *1959 Attendance:* 930,000. 45 hectares; 110 employees. *Mammals* 105 species, 860 specimens; *Birds* 99

species, 456 specimens; *Reptiles & Amphibians* 10 species, 32 specimens; *Fish* 38 species, 641 specimens. *Total*: 252 species, 1989 specimens. *Aquarium*; *Educational Facilities*; *Library*; *Publication* "30 lat Warszawski Zoo" (60 zł.); *Radio & TV Progs.*; *Vet. Dept.* with physiological research institute & quarantine station. *1959 Building*: Penguin Enclosure. *1960 Building*: Polar Bear Enclosure.

WROCLAW

Miejski Ogród Zoologiczny, Wrocław, ul Wroblewskiego 1, Poland. *Tel.*: Wrocław 2-30-24. *Zoo Director*—Karol Jan Łukasiewicz. Founded 1865 by society—"Aktien-gesellschaft Zoologischer Garten Breslau"; taken over by University of Wrocław 1948; since 1952 Municipal Zoo. State-aided. *Admission Fees*: Adult 4 zł.; Child 1 zł. *Hours*: 8 a.m.—8 p.m. (summer), 9 a.m.—dusk (winter). *1959 Attendance*: 544,500. 30 hectares. 110 employees. *Mammals* 117 species, 272 specimens; *Birds* 152 species, 560 specimens; *Reptiles & Amphibians*: 45 species, 108 specimens; *Fish*: 72 species, 1452 specimens. *Total*: 386 species, 2392 specimens. *Aquarium*: *Children's Zoo*; *Children's Club*; *Library* with 3,000 volumes; *Publications*: 1957 Guide Book (8 zł.), "Ten Years of Activity at the Wrocław Zoological Garden" (1958), articles in "Biuletyn Techniczny Ogrody Zool. 1959" edited by the Supervision of Polish Zoos, Warsaw; *Radio Programme*; *Veterinary Department*; *Zoological Research Department*; *Animal rides*. *1959 Building*: Water Birds' Aviary; Part I of Aquarium. *1960 Building*: new Outdoor Monkey Cages; new Reptile House.

ZAMOSC

Zamosc Zoo, Zamosc, ul. 1 Maja 1, Poland. *Zoo Director*—Ing. T. Grabowski.

PORTUGAL

LISBON

Jardim Zoologico e de Acclimação em Portugal, Estrada de Benfica, Lisboa, Portugal. *Tel.*: Lisbon 72041 & 72042. *Zoo Staff*: *Zoo Director*—Dr Fernando Emygdio da Silva; *Veterinarian*—Dr Joaquim Soares Lopes; Sr. Mario Barreiros Maymone; Sra. Otilia das Dores Costa; Sr. Diniz Ferreira do Amaral. Founded in 1913 by Sociedade do Jardim Zoologico e de Acclimação em Portugal. Financial support from the State, Lisbon and the Society. *Admission Fees*: Adult 6 escudos; Child (under 10) 1.50 escudos. *Hours*: from 9 a.m.—sunset. *1959 Attendance*: 423,264. 26 hectares. 200 employees. *Mammals* 907 specimens; *Birds*

2389 specimens; *Reptiles & Amphibians* 85 specimens. *Total*: 3381 specimens. 1559 births. *Children's Zoo*; *Educational facilities*—free entrance for students & school-children; *Library*—small; *Animal Hospital*; *Publications*: Annual Report, Zoo Guide. Elephant & Pony rides. *1959 Building*: Elephant House; Children's Zoo; Lecture & Conference Hall; Store House at Quinta de San Antonio.

SOUTHERN RHODESIA

BULAWAYO

Zoological Park, North Park. Bulawayo, S.R.

SAN SALVADOR

SAN SALVADOR

Jardin Zoologico, Calle Modelo, Colonia Nicaragua, San Salvador, El Salvador, Central America.

SOUTH AFRICA

BLOEMFONTEIN

Bloemfontein Zoo, Curator Zoo, Bloemfontein, South Africa. *Tel.*: Bloemfontein 5208. *Zoo Director*—C. A. van Ee. Founded 1920 by City of Bloemfontein. Financial support from Bloemfontein Municipality. *Admission Fees*: free admission. *Hours*: 7.30 a.m.—6 p.m. summer, 7.30 a.m.—5 p.m. winter. *1959 Attendance*: 50,000 approximately. 35 acres. One curator and 11 employees. *Mammals* 42 species, 320 specimens; *Birds* 195 species, 700 specimens; *Reptiles & Amphibians* 15 species, 45 specimens. *Total*: 252 species, 1065 specimens. *Publication*: 1960 Zoo Guide (2s.). *1959 Building*: Pheasant Cages. *1960 Building*: Pig Enclosures; Dromedary Enclosures.

CAPE TOWN

Groote Schuur Menagerie, Cape Town, South Africa.

DURBAN

Zoological Gardens of the Municipality of the Borough of Durban, Milton Street, Smith Street, Durban, Natal.

EAST LONDON

The Queen's Park Zoo, Queen's Park, P.O. Box 134, East London, South Africa. *Tel.*: East London 4034. *Zoo Staff*: *Zoo Director*—T. A. Linley, F.Inst.P.A.(S.A.), A.Inst.P.A. (Inc.); *Curator*—A. E. Parkin, B.Sc. Founded 1933 by Municipality of East London; small grant from Cape Provincial Administration. *Admission Fees*: Free except for Lion Enclosure (Adult 6d., Child 3d.). *Hours*: Daylight. *1959 Attendance*: 69,605. 10 acres. 10

employees. *Mammals* 6 species, 107 specimens; *Birds* 315 specimens; *Reptiles and Amphibians* 70 specimens. *Total*: 6+ species, 492 specimens. *Aquarium* (administered separately from the Zoo by East London Parks & Amenities Department); *Educational* conducted tours; Hon. *Veterinarian*; Pony-carriage rides. 1959 *Building*: Modern bar-less Lion Enclosure. 1960 *Building*: minor improvements.

JOHANNESBURG

City of Johannesburg, Parks & Community Services Department, Zoological Gardens, Hermann Eckstein Park, P.O. Box 2824, Johannesburg, South Africa. *Tel*: Johannesburg 41-2000. *Zoo Staff*: *Zoo Director*—vacant; *Acting Curator*—A. H. Lambrechts. Founded by City of Johannesburg which gives financial support. *Admission Fees*: free. *Hours*: 8 a.m.—sunset, throughout year. 1959 *Attendance*: 1,250,000 (estimated). 134 acres; 62 employees. *Mammals* 124 species, 679 specimens; *Birds* 201 species, 1188 specimens; *Reptiles & Amphibians*—18 species, 75 specimens. *Total*: 343 species, 1942 specimens. Animal rides on Elephants, Ponies, Donkeys & pony-carts.

PRETORIA

National Zoological Gardens of South Africa, P.O. Box 754, Boom Street, Pretoria, S.A. *Tel*: Pretoria 2-2306. *Telegrams*—"Zoo". *Zoo Staff*: *Zoo Director*—R. Bigalke, M.A., D.Phil.; *Assistant Director*—D. J. Brand, B.Sc., M.Sc.; *Foreman & Storekeeper*—G. C. Temlett; *Head Gardener*—R. Heeg. Founded by Dr J. W. B. Gunning. State-aided. *Admission Fees*: Adult 1s. 6d.; Child (under 14) free. *Hours*: 8 a.m.—6 p.m. summer, 8 a.m.—5.30 p.m. winter. 1959 *Attendance*: 461,205. 103 acres, 91 employees. *Mammals* 140 species, 692 specimens; *Birds* 233 species, 2421 specimens; *Reptiles & Amphibians* 19 species, 160 specimens; *Fish* 4 species, 300+ specimens. *Total*: 396 species, c. 3573 specimens. *Educational Facilities*—free entrance to school-children, white pupils given lectures by Educational Schools Journeys Service of Transvaal Education Department, native teachers give instruction to native pupils; *Library*—approximately 1500 volumes+ journals; *Publication*: Guide Book (2s. 6d.); *Part-time Veterinarian*. 1959 *Building*: New service building; Australian Animals' Enclosure; New Aviary. 1960 *Building*: Large new Waterfowl Pond & new Pig Enclosure.

SPAIN

BARCELONA

Parque Zoologico Barcelona, Parque de la Ciudadela, Barcelona, Spain. *Tel*: 254227—

251829. *Zoo Staff*: *Zoo Director*—Antonio Jonch; *Curator & Veterinary*—Roman Luera; *Vet.-Pathologist*—Miguel Luera; *Manager*—Ramon Bosch. Founded 1894 by Municipality of Barcelona. Financial support from Municipality. *Admission Fees*: Adult 5 ptas. (aquarium 2 ptas. extra); Child (under 7) free. *Hours*: 9 a.m.—sunset, throughout year. 1959 *Attendance*: 3,033,581. 12 hectares. 76 employees. *Mammals* 170 species, 393 specimens; *Birds* 88 species, 970 specimens; *Reptiles & Amphibians* 90 species, 512 specimens; *Fish* 220 species, 1501 specimens; *Invertebrates* 15 species, 93 specimens. *Total*: 583 species, 3469 specimens. *Acclimatisation Garden* at Bindung (Spanish Guinea), specialising the capture and acclimatisation of West African animals; *Aquarium*—freshwater & marine, cold & temperate; *Children's Zoo* with theatre & dolls' houses; *Conferences* on animal biology; *Infirmary*; *Laboratory lecture hall*—also for films; 1959 *Film* (45 mins. 16 mm.) "Barcelona Zoological Park"; new zoological *Library*; *Pharmacy*; *Publications*: articles in the review, "Destino" (monthly); *Quarantine Station*; 10 *Radio Programmes* during 1959; occasional *TV Programmes*; *Veterinary Department*. Camel & Pony rides; Skating rink. 1959 *Building*: Enclosure for American Bison; Exotic Bird House; Small Mammal House; Small Cat House; open enclosure with ditch for Monkeys; Houses for European & Sambar Deer. 1960 *Building*: enclosure with ditch for Bengal Tigers; Houses for Hippos., Rhinos., Bulls, Buffalo; Penguins; House for Giraffe, Okapi, Kudu and large African Antelope.

JEREZ DE LA FRONTERA

Parque Zoologico de Jerez de la Frontera, Tempul, Jerez de la Frontera, Spain. *Tel*: Jerez de la Frontera 43397. *Zoo Director*—Alberto Duran Tejera. Founded by the Municipality of Jerez & Don Alberto Duran Tejera. Financial support from Municipality. *Admission Fees*: Adult 3 ptas, Child 1 ptas. *Hours*: 9 a.m.—sunset, throughout the year. 1959 *Attendance*: 250,000. 3 hectares (6 has. available). 7 employees. *Mammals* 44 species, 120 specimens; *Birds* 112 species, 745 specimens; *Reptiles & Amphibians* 3 species, 5 specimens. *Total*: 159 species, 870 specimens. *Small Aquarium*; *Botanical Section*; *Children's Zoo*; free entrance for Educational Institutions; *small Library*; *Vet.* Zoo specialises in local mammals, native birds, and animals from Spanish Guinea. 1959/60 *Building*: Monkey House; Mammal House; Bird House.

MADRID

Jardino Zoologico, Casa de Fieras, Madrid. *Zoo Director*—Ramon Ortiz Ferre.

SUDAN

KHARTOUM

Khartoum Zoological Gardens, Khartoum, Sudan. *Zoo Director*—Ahmed Abdel Nabi.

PORT SUDAN

Zoological Gardens, Port Sudan.

SWEDEN

ESKILSTUNA

Parken, Eskilstuna, Sweden. *Tel:* Eskilstuna 334-06, 473-81. *Zoo Director*—Eric Andersson. Founded 1950 by a society "AB Folkets Hus & Park". Financial support from City of Eskilstuna. *Admission Fees:* Adult 1.75 sw. kr., Child 0.75 sw. kr. *Hours:* 9 a.m.—8 p.m. summer, 10 a.m.—4 p.m. winter. *1959 Attendance:* 369,381. 25 acres. 27 employees. *Mammals* 35 species; *Birds* 47 species. *Total:* 82 species.

FURUVIK

AB Furuviksparken, Furuvik, Sweden. *Tel:* Furuvik 026/64208. *Zoo Director*—Lars Nygren. Founded 1936 by Directors Gösta Nygren & Sven Engwall; no external financial support. *Admission Fees:* Adult 2.00 kr. Child 0.50 kr. *Hours:* 9 a.m.—8 p.m. summer, closed in winter. *1959 Attendance:* 500,000. 175,000 sq. metres. 35 employees winter. 325 summer. *Mammals* 40 species, 171 specimens; *Birds* 29 species, 208 specimens. *Total:* 69 species, 379 specimens. *Children's Zoo & Theatre; Publication:* Zoo Plan; Animal rides. *1959 Building:* Giraffe House. *1960 Building:* Outdoor enclosure for Monkeys.

HOOR

The Game Park of Scone, Höör, Sweden. *Zoo Director*—Count Björn Hamilton. Founded 1950 by the Zoological Society of the Game Park of Scone. *Admission Fees:* Adult 2.00 sw.kr., Child 0.50 sw.kr. *Hours:* 9 a.m.—7 p.m. summer, 10 a.m.—4 p.m. winter. *1959 Attendance:* 167,000. 250 acres. 10 employees. *Mammals* 26 species, 71 specimens; *Birds* 30 species, 159 specimens; *Reptiles & Amphibians* 3 species, 15 specimens. *Total:* 59 species, 245 specimens. All animals are kept in large open enclosures in as natural surroundings as possible; no cages; only Scandinavian Animals are kept in the Collection; *Publications:* Visitors' Guide (1.00 sw.kr.), Children's Guide (0.50 sw.kr.); 2 Swedish, 1 Danish *Radio Programme*; 1 Swedish *TV Programme*; *Zoological Research* by zoologists at Scone University. *1959/60 Building:* large pond (50 m. × 20 m.) for Seals & Otters.

STOCKHOLM

Nordiska Museet och Skansen, Stockholm, Sweden. *Tel:* Stockholm 63-05-00. *Zoo Staff:* *Zoo Director*—Kai Curry-Lindahl; *Assistant Director & Chief Veterinary*—Karl Borg; *Temporary Assistant Director & Veterinarian*—Uno Plazikowski; *Ecologist (botany)*—Björn Berglund; *Ecologist (zoology)*—Gunnar Markgren; *Ecologist (zoology)*—Viktor Olsson; *Curator of Animals at the Julita Estate*—Nils Adlercreutz. Founded by Artur Hazelius in the form of a foundation which soon became recognised by the state as an official institution. Salaries of scientific staff paid for by the State. *Admission Fees:* Adult 2.00 sw.kr. (summer), 1.50 sw.kr. (winter); Child 0.75 sw.kr. (summer), 0.50 sw.kr. (winter). *Hours:* 8 a.m.—12 p.m. (zoo), 11 a.m.—5 p.m. (museum). *1959 Attendance:* 1,968,619. 75 acres. 350 employees. *Mammals* 44 species, 304 specimens; *Birds* 95 species, c. 600 specimens; *Reptiles & Amphibians* 15 species, 123 specimens; *Fish* 83 species, 350 specimens. *Total:* 237 species, c. 1377 specimens. *Aquarium; Botanical Section; Children's Zoo; Educational Facilities; Film Unit; Library; Publications:* "Acta Vertebratica" (1-2 issues p.a., price varies according to size), Guide book, weekly news-letter in summer giving details of evening concerts, etc.; occasional *Radio & TV Programmes; Pathology & Veterinary work* in association with the Swedish Veterinary Research Institute; the Zoo specialises in Scandinavian mammals & birds, and in animal conservation & ecological research; Rides on Gottland & Shetland ponies. *1959 Building:* Monkey Hill. *1960 Building:* new Elephant House with modern enclosure.

SWITZERLAND

BASLE

Zoologischer Garten Basle, Switzerland. *Tel:* Basle 250044. *Zoo Staff:* *Zoo Director & Vet.*—Dr Ernst M. Lang; *Assistant Director*—W. Wendnagel; *Scientific Assistant*—Dr H. Wackernagel; *Technical Assistant*—P. Steinemann; *Head-keepers*—Max Engler, Carl Stemmler and Jakob Thommen. Founded 1874 by the Ornithological Society of Basle. Private Society—no external financial support. *Admission Fees:* Adult 2.00 fr. Child 0.80 fr. *Hours:* 8 a.m.—7 p.m. summer, 8 a.m.—5 p.m. winter. *1959 Attendance:* 814,771. 11 hectares. 44 employees. *Mammals* 101 species, 444 specimens; *Birds* 317 species, 1253 specimens; *Reptiles & Amphibians* 47 species, 195 specimens; *Fish* 46 species, 311 specimens; *Invertebrates* 13 species, 97 specimens. *Total:* 524 species, 2390 specimens. *Aquarium; Educational Facilities*—annual meeting of the

"Freundverein" with animal demonstrations; 1959 Films—"The Biology of the Armoured Rhinoceros" and "Flamingo Hatching at the Basle Zoo"; Publications: Zoo Guide, "Zolli" (bulletin of the Basle Zoo 2 p.a., 5 fr.), Annual Report; regular broadcasts on Basle Radio; several programmes on Swiss TV; Elephant (5 African) rides; Pony-cart rides. 1959 Building: new Rhino-Hippo. House opened. 1960 Building: extension of the Zoo.

BERNE

Tierpark Dählhölzli, Berne, Switzerland. Tel: Berne 2-32-16. Zoo Director—Mrs. Monica Meyer-Holzappel, Ph.D. Founded 1937 by the City of Berne with the help of a legacy from Louis William Gabus (d. 1901). Financial support from the City, "Berner Tierparkverein" & legacies. Admission Fees: (only for Vivarium, rest of park free & always open) Adult 50 cts.; Child 20 cts. (school parties 10 cts. each). Hours: 8 a.m.–6.30 p.m. summer, 9 a.m.–5.30 p.m. winter. 1959 Attendance: 139,628 paid visitors, 13 hectares. 10 employees. Mammals 26 species, 178 specimens; Birds 218 species, 905 specimens; Reptiles & Amphibians 38 species, 135 specimens; Fish 84 species, 414 specimens; Invertebrates 7 species, 158 specimens. Total: 373 species, 1790 specimens. Aquarium with sea & freshwater tanks; small Library; Publication: Guide-book (1954, 1 fr.). Research Work being done in the park on Animal Behaviour; Zoo Speciality: European animals and, in particular, animals that live and have lived in Switzerland; Pony & Donkey rides in summer. 1959 Building: European Bison enclosure; Birds of Prey Aviary; 1960 Building: new Pheasant Aviary.

GOLDAU

Goldau Zoo, Goldau, Switzerland.

ZÜRICH

Zoologischer Garten, Zürich 44, Switzerland. Tel: Zurich (051) 24-33-11. Zoo Staff: Zoo Director—Professor Dr H. Hediger; Veterinary—Dr P. Weilenman; Scientific Asst.—E. Kummer; Zoologist—Dr Graber. Founded 1929 by "Genossenschaft Zoologischer Garten Zürich" (Zurich Zoological Garden Society). Admission Fees: Adult 1.50 fr. (+0.15 fr. tax) Child 0.50 fr. (+0.05 tax). Hours: 7.30 a.m.–6.30 p.m. summer, 8 a.m.–5.30 p.m. winter. 1959 Attendance: 526,000. 7 hectares. 25 employees. Mammals 83 species, 328 specimens; Birds 99 species, 399 specimens; Reptiles & Amphibians 69 species, 293 specimens; Fish 66 species, 410 specimens; Invertebrates 9 species, 23 specimens. Total: 326 species, 1453 specimens. Aquarium with sea & freshwater fish & reptiles & inverte-

brates; Educational Facilities available to schools through Dr Graber; Library—private collection of books belonging to Dr Hediger, Animal Psychology section in the University Library; Pathology work done by the Veterinary Pathology Institute of Zürich University; Publication: Zoo Guide; occasional Radio Programmes; frequent TV Programmes; Veterinary Department; Research into Animal Psychology in association with Zürich University; Zoo Speciality—Free-flying Aviary. 1959 Building: new Ape House. 1960 Building: new Rhino & Hippo House.

TUNISIA

There is no Zoological Garden in Tunisia.

TURKEY

ANKARA

Ankara Zoo, Atatürk Orman, Ciftligi Md., Hayvanet Bahcesi, Ankara, Turkey. Tel: Ankara 32851. Zoo Director—Haki Semsettinoglu. Founded 1940 by the State. Financial support received from Atatürk State Farm. Admission Fees: Adult 75 Kurus. Child 40 Kurus. Hours: 6.30 a.m.–7 p.m. summer, 7 a.m.–6 p.m. winter. 1959 Attendance: 382,703. 20 acres, 40 employees. Mammals 35 species, 684 specimens; Birds 33 species, 1460 specimens; Reptiles & Amphibians 5 species, 10 specimens; Fish 23 species, 468 specimens. Total: 96 species, 2622 specimens. Educational Facilities—free admission for school parties; Library is open to public; Veterinary Department. Elephant rides.

UNITED ARAB REPUBLIC

CAIRO

Giza Zoological Gardens, Cairo, U.A.R. Tel: Cairo 896758 & 897922. Zoo Director—Dr A. El Moraieri. Founded 1890 by the State. Financial support from the State. Admission Fees: Adult 2 piasters, Child (under 6) free. Hours: 8 a.m.–7 p.m. summer, 8 a.m.–5 p.m. winter. 1959 Attendance: 2,126,610. 80 Feddans (1 feddan=4200 sq. m.). 7 specialists & veterinaries; 24 employees; 88 keepers; 87 gardeners; 36 workers=242. Mammals 122 species, 641 specimens; Birds 198 species, 2971 specimens; Reptiles & Amphibians 39 species, 171 specimens. Total: 359 species, 3783 specimens. Educational Facilities—free admission for schools; special Library for Zoo Staff. Publications: Zoo Guide & Map (2 pt.), Guide in Arabic. Elephant & Pony rides.

UNITED STATES OF AMERICA AND PUERTO RICO

ALABAMA

BIRMINGHAM

Birmingham Lane Park Zoo, 2630 Cahaba Road, Birmingham 9, Alabama, U.S.A. Tel: TR 15275. *Zoo Director*—Tom M. Briskey.

ARIZONA

PHOENIX

Jungle Park Zoo, 6232 N. Seventh Street, Phoenix, Arizona, U.S.A. Tel: Crestwood 4-2665. *Zoo Director*—Les Lindvig (Owner).

ARKANSAS

LITTLE ROCK

Little Rock Zoo, 5100 West Eighth Street, Little Rock, Arkansas, U.S.A. Tel: MOhawk 3-4733. *Zoo Director*—Raymond A. Squires.

CALIFORNIA

FRESNO

Roeding Park Zoo, 890 West Belmont Street, Fresno 5, California, U.S.A. Tel: Adams 33935. *Zoo Director*—Eldon M. Blocker.

IMPERIAL

California Mid-Winter Fair and Zoo, S. Imperial Avenue, Imperial, California, U.S.A. Tel: Flanders 5-1181. *Zoo Director*—D. V. Stewart (*Secretary-Manager*).

LA JOLLA

T. Wayland Vaughan Aquarium-Museum, Scripps Institution of Oceanography (University of California), La Jolla, California, U.S.A. Tel: GL-4-4214. *Zoo Director*—Sam Hinton (Curator).

LODI

Micke Grove Zoological Garden, Rt. 4, Box 325, Lodi, California, U.S.A. Tel: ENdicott

8-2374. *Zoo Director*—Ronald T. Reuther (*Manager*).

LOS ANGELES

Griffith Park Zoo, Room 305, City Hall, Los Angeles 12, California, U.S.A. Tel: NOrmandy 1-3940. *Zoo Director*—Dr W. A. Young. Founded by the Recreation & Parks Department of Los Angeles & some private individuals. Financial support from Los Angeles. *Admission Fees*: Adult 25 c., Child (under 16) free. *Hours*: 10 a.m.-6 p.m. summer, 10 a.m.-5 p.m. winter. *1959 Attendance*: 856,000. 17 acres. 30 employees. No species & specimen figures. *Children's Zoo*; *Junior Zoological Society of Los Angeles*; small *Library*; *Pathology Work* done in association with Los Angeles County Veterinary Laboratory; *Publication*: Brochure in progress; Zoo featured on *Red Rowe TV Show* (93 stations); *Veterinary & Zoological Research Department* under the Director. Elephant Train; Children's Farmyard; Seal Show. *1959/60 Building*: General renovation.

MARINELAND

Marineland of the Pacific Oceanarium, Marineland, California, U.S.A. Tel: FRontier 7-1571. *Vice President & General Manager*—William F. Monahan.

OAKLAND

Knowland State Arboretum and Park, 98th Avenue and Mountain Blvd., Oakland 5, California, U.S.A. Tel: LO 8-2470. *Zoo Director*—Sidney A. Snow.

OCEAN PARK

Pacific Ocean Park, Ocean Park, California, U.S.A. Tel: EX 9-5258. *Zoo Director*—A. D. McBride.

SACRAMENTO

William Land Park Zoo, Land Park Drive & Sutterville Road, Sacramento, California, U.S.A. Tel: Gladstone 6-0611. *Superintendent*—Anthony A. Spencer.

✓SAN DIEGO

San Diego Zoological Garden, Balboa Park, Box 551, San Diego 12, California, U.S.A. Tel: BELmont 4-5151. *Zoo Staff*: *Zoo Director*—Charles Robbins Schroeder,

D.V.M.; Assistant Director & Curator of Reptiles—Charles E. Shaw, B.Sc.; Curator of Birds—Kenton C. Lint, B.S.; Curator of Mammals—George H. Pournelle, B.S., Ph.D.; Assistant Curator of Mammals—Clyde A. Hill, B.S., M.S.; Vet. Manager of Hospital & Laboratory, and Secretary of Research Council—Werner P. Heuschele, D.V.M.; Director of Public Relations—Wallace B. Wade, B.S.; Assistant to Director of Public Relations—Frederic S. Mabbatt, B.A., M.A.; Superintendent of Buildings & Grounds—Robert Jarboe; Superintendent of Public Services—Lisle Vinland; Controller—Ella Hoover; Superintendent Children's Zoo—John Muth; Designer—Charles Faust; Consultant Botanist—Reid V. Moran, Ph.D. Zoo founded by the Zoological Society of San Diego, a California Corporation. Financial support from City in form of 2 c. tax on every \$100 of personal & property tax evaluation. (about 4% of operating costs—\$130,000); also membership dues & endowment. Admission Fees: Adult 75 c. (Children's Zoo 15 c. extra); Child under 17 free (Children's Zoo 15 c.). Hours: 9 a.m.—6 p.m. summer, 9 a.m.—4.30 p.m. winter. 1959 Attendance: 1,889,806. 91.4 acres (+ parking area). 280–363 employees. Mammals 206 species, 640 specimens; Birds 559 species, 2109 specimens; Reptiles & Amphibians 226 species, 850 specimens. Total: 991 species, 3599 specimens. Botanical Section—entire Zoological Garden is an arboretum, foreign trees a speciality; Children's Zoo—1½ acres, 17 employees (22 in summer), \$280,000 construction costs, \$150,000 operating costs p.a.; Educational Facilities—education building, all 2nd grade school-children (city & county) visiting Zoo with teacher are transported to and from school by Zoo Bus, Lecture Series for 4th, 5th & 6th grades, summer school, work experience in laboratory for high school students; Library—cross-indexed with San Diego scientific library; Publications: "Zoonooz" (monthly, 20 c.), Guide Book (annual, 75 c.), Special Bulletins, reprints, scientific papers; Vet. Section—animal hospital, laboratory, pathology department & Biological Research Institute. Guided Tours in 12 large buses—50 min., 3 mile tours with factual information from college student bus-drivers (Child 25 c.; Adult 50 c.). 1959 Building: Children's Zoo—Theatre with Geodesic Dome, Turtleorium, Toucan Cage, Lath House, Mouse House; Koala Enclosure; Walk-through Bird of Paradise Enclosure; Macaw Terrace; Okapi Enclosure; Golden Marmoset Enclosure; Tree Kangaroo Enclosure; Seal Pool; Renovated Galapagos Tortoise Exhibit; Grain Storage Building. 1960 Building: Tropical Rain Forest

(170' × 80' × 90' high); 2 Hippo. Enclosures; 3 Alligator Enclosures; Prairie Dog Enclosure; Children's Zoo Elephant Stockade; Monkey Quadrangle; Plastic Coating for Penguin & other Pools (Apoxo resin); small Great Ape Observation Building; Speedramp for visitors; Elephant Compound; Giraffe Enclosure; moated enclosure for Moose; addition to Administration Building.

SAN FRANCISCO

San Francisco Zoological Gardens, San Francisco 16, California, U.S.A. Tel: Ov. 1-5877. Zoo Director—Carey N. Baldwin. Founded by Herbert Fleishhacker. Financial support received from the City & the Society. Admission Fees: free. Hours: 10 a.m. to dark, summer & winter. 1959 Attendance: approx. 1,500,000 to 2,000,000. 76 acres. 45 employees. Mammals 60 species, 650 specimens. Birds 102 species, 350 specimens. Total: 162 species, 1,000 specimens. Children's Zoo—planned; Educational Facilities; Library (small); Pathology work in association with the University; Publications: monthly by Society; Radio Programme—occasional; TV Programme—co-operation with Academy of Science. 1959 Building: Large Buildings, but mostly outside exhibits. 1960 Building: Gorilla Island and new acreage planned for 1960–61.

Steinhart Aquarium, Garden Gate Park, San Francisco 18, California, U.S.A. Tel: BA 1-5100. Aquarium Director—Dr Robert C. Miller.

SAUGUS

Nature's Haven Wild Animal Rentals, Route 1—Box 163—H, Saugus, California, U.S.A. Tel: Wi 7-1582. Zoo Director—Ralph D. Helfer. Founded by Ralph D. Helfer. Financial support: Motion Picture and Television Rentals. Admission Fees: Adult \$1.00, Child 50 c. Hours: 10 a.m. to 6 p.m. (summer & winter, weekends only). 1959 Attendance: 50,000. 50 acres. 20 employees. Mammals 45 species, 70 specimens; Birds 35 species, 60 specimens; Reptiles & Amphibians 20 species, 45 specimens; Invertebrates 12 species, 24 specimens. Total: 112 species, 199 specimens. Educational Facilities—Group Lectures; Library; Radio Programme—occasional; TV Programme—average of three a month; Veterinary Department—private veterinary; Other Specialities—Wild Animal Arena Act. 1959 Building: small hospital erected.

COLORADO

COLORADO SPRINGS

Cheyenne Mountain Zoo, Box 158, Colorado Springs, Colorado, U.S.A. Tel: MELrose 3-3522. *Zoo Director & President*—Robert V. Menary.

DENVER

Denver Zoological Gardens, City Park, Denver 5, Colorado, U.S.A. Tel: MA 3-1133. *Zoo Director*—Clyde E. Hill.

CONNECTICUT

BRIDGEPORT

Beardsley Park Zoo, Beardsley Park, Bridgeport 8, Connecticut, U.S.A. Tel: FO 6-0064. *Zoo Director*—Henry Breen.

SOUTHBURY

Pearsons Bird & Animal Farm, Southbury, Connecticut, U.S.A. Tel: CO 4-8629. *Zoo Director*—H. Pearson.

DISTRICT OF COLUMBIA

WASHINGTON

National Aquarium, Commerce Building, Washington, D.C., U.S.A. Tel: Sterling 3-9260 Ext. 3435. *Director of the Aquarium*—George D. Messerly. Founded 1888 by U.S. Govt. Financial support from U.S. Government, Department of the Interior, Fish & Wildlife Service. *Admission Fees*: Free entrance. *Hours*: 9 a.m.—5 p.m. daily throughout year. *1959 Attendance*: 250,000. Public area of aquarium 150' x 50'. 6 employees. *Reptiles & Amphibians* 21 species, 141 specimens; *Fish* 95 species, 2136 specimens. *Total*: 116 species, 2277 specimens.

WASHINGTON

National Zoological Park, Washington 9, D.C., U.S.A. Tel: CO 5-0743. *Zoo Staff*: *Zoo Director*—Theodore H. Reed, D.V.M.; *Assistant Director*—J. Lear Grimmer; *Veterinarian*—Dr James F Wright; *Head Gardener*—Michael Dubik. Founded 1890 by U.S. Government—a Bureau of the Smithsonian

Institute. Financial support from the District of Columbia. *Admission Fees*: Free entrance. *Hours*: (Buildings) 9.30 a.m.—5 p.m. summer, 9.30 a.m.—4.30 p.m. winter. *1959 Attendance*: 4,053,673 (est.). 176 acres, 186 employees. *Mammals* 234 species, 628 specimens; *Birds* 309 species, 891 specimens; *Reptiles & Amphibians* 210 species, 754 specimens; *Fish* 20 species, 86 specimens. *Total*: 773 species, 2359 specimens. *Botanical Section*; *Bacteriology* in association with the Livestock Sanitary Laboratory, U.S. Department of Agriculture & the Mayo Foundation; *Educational Facilities*—guided tours for specialist societies; Zoo regularly featured on *Radio & TV Programmes*; *Veterinary Department* and veterinary work in association with New England Institute for Medical Research; *Pathology* in association with the Armed Forces Institute of Pathology; *Publication*: Annual Report (free to members). *1959 Building*: visitors' safety fence; repairs to Birdhouse & Reptile House; new Deer Pen. *1960 Building*: new aquatic mammal area; plans for new administration building & modernisation of Zoo.

FLORIDA

GOULDS

Monkey Jungle, P.O. Box 256, Goulds, Florida, U.S.A. Tel: CE-51611. *Zoo Director*—Frank V. DuMond. Founded 1933 by Joseph DuMond. *Admission Fees*: Adult \$1.40, Child \$0.50. *Hours*: 9.30 a.m.—5.15 p.m., summer & winter. *1959 Attendance*: 100,000. 15 acres, 15 employees. *Mammals* 37 species, 250 specimens; *Birds* 3 species, 7 specimens; *Reptiles & Amphibians* 2 species, 5 specimens. *Total*: 45 species, 259 specimens. *Botanical Section*—5 acres under development with collection of palms and tropical plants; *Zoo Specialities*—Chimpanzee show & colony of approximately 200 wild Java Monkeys living in complete freedom in a 10 acre jungle. *1959 Building*: Gibbon Cage, new walkways, Gelada Baboon Cage, 4 new small Monkey cages. *1960 Building*: development of 5 acres of jungle for small South American exhibit.

JACKSONVILLE

Jacksonville Municipal Zoo, 8605 Zoo Road, Jacksonville 2, Florida, U.S.A. Tel: POPular 5-4431. *Zoo Director*—Gus A. Basford.

MIAMI

Crandon Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Florida, U.S.A. Tel: EM 1-2515. **Zoo Staff:** *Zoo Director*—Robert H. Mattlin; *Secretary*—Mrs. Elinor K. Williams; *Head Zookeeper*—Wayne C. Homan; *Assistant Head Zookeeper*—William H. Lunsford; *Specialist Zookeeper Bird & Waterfowl Department*—Leon Campbell; *Zookeeper Specialist, Reptile Department*—Jim Eggert; *Zookeeper Specialist, Mammal Department*—John Mazerik; *Zookeeper Specialist, Mammal Department*—Edward L. Goodwin. Founded 1948 by Dade County, Florida. Financial support from the County. **Admission Fees:** free entrance. **Hours:** 9.30 a.m.–5 p.m. summer, 9.30 a.m.–4.30 p.m. winter. 1959 **Attendance:** 639,765. 22 acres. 34 employees. **Mammals** 39 species, 74 specimens; **Birds** 132 species, 449 specimens; **Reptiles & Amphibians** 53 species, 146 specimens. **Total:** 224 species, 669 specimens. **Children's Zoo** with miniature barn for small and young farm animals, contact area, special exhibits; reference *Library* for personnel. 1959 **Building:** Walk-through Aviary; Extension to Children's Zoo; Rest Room; Flamingo Island. 1960 **Building:** Elephant House; Ape House; Small Mammal House; Reptile Moats (6).

Seaquarium, Rickenbacker Causeway, Miami 49, Florida, U.S.A. Tel: Emerson 1-5471. **Aquarium Director**—C. H. Ball. Founded by commercial company. Self-supporting. **Admission Fees:** Adult \$2.20, Child \$1.10. **Hours:** 9 a.m.–5 p.m. throughout the year. 55 acres. 85 employees. **Mammals** 6 species, 25 specimens; **Birds** 6 species, 15 specimens; **Reptiles & Amphibians** 2 species, 12 specimens; **Fish** 275 species, 20,000 specimens. **Total:** 289 species, 20,052 specimens. **Aquarium**—32 500-gallon tanks, 1 565,000-gallon tank; 1 385-gallon tank; **Film Library** of 10 films—1959 "Ocean Show Rooms"; occasionally featured on international *TV Programmes*; **Pathology Department**; **Publication:** "Sea Wonders of the World" (50 c.); **Zoological Research** facilities available to scientists; **Zoo Specialities**—animal training, specimen collecting, supplying specimens. 1959 **Building:** new pools. 1960 **Building:** Golden Geodesic Aluminium Dome.

Miami Serpenterium, 12655, South Dixie Highway, Miami 56, Florida, U.S.A. Tel: CEder 5-5722. **Director**—W. E. Haast.

Zoological Society of Florida, P.O. Box 589, Miami 31, Florida, U.S.A. Tel: Newton

4-2800. **Zoo Director**—Wynant Davis Hubbard.

SILVER SPRINGS

Ross Allen's Reptile Institute, Silver Springs, Florida, U.S.A. Marion 2-6369. **Director & Owner**—Ross Allen.

SOUTH DAYTONA

Sea Zoo, Rt.1 (P.O. Box 4205), South Daytona, Florida, U.S.A. Tel: CL 2-2073. **Zoo Director**—Dr Perry A. Sperber.

GEORGIA

ATLANTA

G. V. Gress Zoo, Cherokee Avenue, S.E., Atlanta 3, Georgia, U.S.A. Tel: Market 7-2771. **General Manager**—George I. Simons.

HAWAII

HONOLULU

Honolulu Zoo, Kalakaua and Kapahulu Avenue, Kapiolani Park, Honolulu 15, Hawaii, U.S.A. Tel: Honolulu 937723. **Zoo Director**—Paul L. Breese.

Waikiki Aquarium (University of Hawaii), 2777 Kalakaua Avenue, Honolulu, Hawaii, U.S.A. Tel: Honolulu 939741. **Aquarium Director**—Spencer Tinker. Foundation—original building provided by a private company and individuals and opened 1904; building rebuilt and opened 1955 by the Territory of Hawaii. Financial support from the State of Hawaii (approximately half operating costs). **Admission Fees:** Adult 25 c., Child (under 16) free. **Hours:** 10 a.m.–5 p.m. (Tues.-Sat.), 1 p.m.–5 p.m. (Sun.). Closed (Mon.). 1959 **Attendance:** 257,712. 102,210 sq. ft.; 12 full time employees (+7 part-time). **Mammals** 1 species, 4 specimens; **Reptiles & Amphibians** 25 species, 50 specimens; **Fish** 150 species, 1500 specimens; **Invertebrates** 30 species, 200 specimens. **Total:** 206 species, 1754 specimens. **Aquarium** specialises in fish, molluscs, crustacea, etc. of the Indo-Pacific; **Educational facilities**—lecture room with movie & slide projectors; a number of 35 mm. slides are produced annually; **Library** for use of staff; occasional *TV Programme*.

ILLINOIS

CHICAGO

Chicago Zoological Society, Brookfield, Chicago, Ill., U.S.A. Tel: HA 4-6481. *Zoo Director*—Robert Bean.

Lincoln Park Zoological Gardens, 100 West Webster Avenue, Chicago 14, Illinois, U.S.A. Tel: LIncoln 9-3009. *Cable* LINPARZOO. *Zoo Staff*: *Zoo Director*—R. Marlin Perkins; *Curator*—George H. Irving; *Curator*—William J. Hoff; *Curator*—Ronald L. Blakely, B.S.; *Zoologist*—F. Bob Truett, B.S.; *Zoologist*—Donald C. Nickon, B.S. Founded approx. 1873 by the City. Financial support from Chicago Park District and newly formed Lincoln Park Zoological Society. *Admission Fees*: Free entrance. *Hours*: 9 a.m.—5 p.m. (weekdays), 10 a.m.—6 p.m. (Sat., Sun. & hols.). 1959 *Attendance*: 3,500,000 (est.). 26 acres. 55 employees (many services performed by Chicago Park District). *Mammals* 130 species, 416 specimens; *Birds* 254 species, 1195 specimens; *Reptiles & Amphibians* 144 species, 816 specimens; *Invertebrates* 5 species, 8 specimens; *Total*: 533 species, 2435 specimens. *Children's Zoo* (outside unfinished); *Publications*: Zoomap Folder (free), bulletins on care of some wild animals as pets (5 c.); old *TV Programme* "Zoo Parade" discontinued, new one planned; *Travelling Zoo* which visits children's day camps—lectures from a zoologist. 1959 *Building*: Children's Zoo Building opened in May.

John G. Shedd Aquarium, 1200 South Lake Shore Drive, Chicago 5, Illinois, U.S.A. Tel: Webster 9-4681. *Aquarium Director*—Walter H. Chute.

LIBERTYVILLE

Hawthorn Melody Zoo, Hawthorn Melody Farms, Libertyville, Illinois, U.S.A. Tel: Li 2-2025. *Zoo Director*—Robert Bullermann.

PEORIA

Glen Oak Zoo, Glen Oak Park, Peoria 6, Illinois, U.S.A. Tel: Peoria 2-2534. *Zoo Director*—R. G. Houlihan.

INDIANA

EVANSVILLE

Mesker Park Zoo, Bement Avenue, Evansville, Indiana, U.S.A. Tel: HA 4-6481. *Zoo Director*—Blount R. Wagner.

MICHIGAN CITY

Washington Park Zoo, North Franklin at Lake Front, Michigan City, Indiana, U.S.A. Tel: TRiangle 4-8505. *Zoo Director*—Dr James Carver.

SOUTH BEND

Potawatomi Park Zoo and Storyland Zoo, Rum Village Park, 301 S. St. Louis Boulevard, South Bend, Indiana. Tel: Central 3-6557. *Zoo Director*—Ralph A. Newman (Supt. of Parks).

KANSAS

GARDEN CITY

Lee Richardson Zoo, Garden City, Kansas, U.S.A. Tel: Bridge 6-4778. *Zoo Director*—Claude Owens.

GREAT BEND

City Park Zoo, Great Bend, Kansas, U.S.A. Tel: Gladstone 3-6562. *Zoo Director*—Brit D. Spaugh (Supt.).

MANHATTAN

Sunset Zoo, Kansas State College, Manhattan, Kansas, U.S.A. Tel: Manhattan 8-5129. *Zoo Director*—Edwin J. Frick.

TOPEKA

Gage Park Zoo, 6th-10th and Gage Street, Topeka, Kansas, U.S.A. Tel: CF 2-6188. *Zoo Director*—Ted McCarthy.

WICHITA

Municipal Zoo, Central Riverside Park, Nims & Murdock Street, Wichita 5, Kansas, U.S.A. Tel: FForest 3-2811. *Zoo Director*—Emory L. Cox.

LOUISIANA

NEW ORLEANS

Audubon Park Zoo, Audubon Park, New Orleans, Louisiana, U.S.A. Tel: UN 12537. *Zoo Director*—George Douglass (Supt. & Secretary).

MARYLAND

BALTIMORE

Baltimore Zoo, Druid Hill Park, Baltimore 17, Maryland, U.S.A. Tel: TUxedo 9-4466. *Zoo Director*—Arthur R. Watson. Founded 1876 by Act of State Legislature for the City of Baltimore. Financial support from the City. *Admission Fees*: free entrance. *Hours*: 10 a.m.–5 p.m. throughout year. *1959 Attendance*: 1,000,000. 200 acres. 45 employees. *Mammals* 118 species, 452 specimens; *Birds* 148 species, 364 specimens; *Reptiles & Amphibians* 77 species, 119 specimens. *Total*: 343 species, 935 specimens. Collection of preserved reptiles & amphibians. *Educational facilities*—guide service, guide book, leaflets; *Library*—1000 reprints & periodicals; *Photographic Department & Laboratory*; *1959 Film Production*—500' 16 mm., 1500 negatives; *Publications*: Pictorial Guide to Zoo (50 c.), 8 educational leaflets (free); Zoo featured occasionally on *Radio & TV Programmes*. *1959 Building*: Rock Island. *1960 Building*: Wading Bird Exhibit. Children's Zoo in planning stage.

MASSACHUSETTS

BOSTON

Franklin Park Zoo, 1 Columbia Road, Boston 21, Massachusetts, U.S.A. (see Stoneham, Mass.). Tel: JA 2-2370. *Zoo Director*—Walter D. Stone. Founded by City of Boston, taken over 1958 by Massachusetts Metropolitan District Commission. *Admission Fees*: Free. *Hours*: 10 a.m.–6 p.m. (10 a.m.–7 p.m. Sun.) summer; 10 a.m.–5 p.m. winter. *1959 Attendance*: No means of estimating attendance. 53.2 acres. 41 employees. *Mammals* 71 species, 241 specimens; *Birds* 73 species, 242 specimens. *Reptiles & Amphibians* 2 species, 2 specimens; *Total* (including Stoneham) 146 species, 485 specimens. *Rose Garden*; *Library*—c.250 volumes & 25 periodicals—to be expanded; *Publications*: Newsletter (monthly to members), bulletin being planned; occasional spot *Radio Programmes*; regular weekly *TV Programme* & spot showings; part-time *Veterinarian*; *Zoological Research* in association with schools & research centres. *1960 Building*: Children's Zoo; complete service area with offices, commissary, hospital, and work areas; educational facilities & research area also included.

SPRINGFIELD

Forest Park Zoo, Forest Park, Springfield, Massachusetts, U.S.A. Tel: Republic 3-9218. *Zoo Director*—Ernest Gralia (Head Zoo Keeper).

STONEHAM

Middlesex Falls Zoo, 149 Pond Street, Stoneham, Massachusetts, U.S.A. (see Boston, Mass.). Tel: ST 6-3662. *Zoo Director*—Walter D. Stone. Founded by Massachusetts Metropolitan District Commission which also gives financial support. *Admission Fees*: Free. *Hours*: 10 a.m.–6 p.m. (10 a.m.–7 p.m. Sun.) summer; 10 a.m.–5 p.m. winter. *1959 Attendance*: No means of estimating attendance. 10 acres. 10 employees. **Mammals* 71 species, 241 specimens; *Birds* 73 species, 242 specimens; *Reptiles & Amphibians* 2 species, 2 specimens. *Total*: 146 species, 485 specimens. (*Figures include animals at Boston Zoo.)

MICHIGAN

DETROIT

Detroit Zoological Park, 8450 W. 10 Mile Road, Royal Oak, Michigan, U.S.A. Tel: JORDAN 4-6260. (Also Belle Isle—15 miles from Zoological Park in the Detroit River). *Zoo Staff*: *Zoo Director*—Frank G. McInnis, B.S.; *Assistant Director*—Jonathan A. Truxton; *Chief Animal Keeper*—George Bromley; *Associate Curator*—William K. Appelhof, D.V.M.; *Assistant Curator Aquarium*—Leo C. Finneran; *Assistant Curator Education & Children's Zoo*—Douglas C. Covert, B.S.; *Supervisor, Horticulture & Ground Maintenance*—Herbert R. Leighton, B.S.; *Supervisor, Building & Mechanical Maintenance*—Arthur Roche; *Supervisor, Public Service*—John O'Burke; *Office Manager*—Edgar H. Boulton. Founded by City of Detroit which also gives financial support. *Admission Fees*: Free. *Hours*: Summer only, 3rd Thur. May–1st Sun. Nov., 10 a.m.–5 p.m. (weekdays), 9 a.m.–6 p.m. (Sun. & Hols.). *1959 Attendance*: 1,900,000. 122 acres. 300 employees (105 permanent)—fig. includes Belle Isle Staff. *Mammals* 67 species, 515 specimens; *Birds* 206 species, 690 specimens; *Reptiles & Amphibians* 71 species, 253 specimens; *Fish* 169 species, 1391 specimens; *Invertebrates* 1 species, 6 specimens. *Total*: 514 species, 2855 specimens. *Freshwater Aquarium* on Belle Isle—free; *Children's Zoo* on Belle Isle—3 acres with exhibits based on Mother Goose theme (10 c.); *Misc. films* by

staff photographer & "Zoolandia"; small Library; Publications: "Your Detroit Zoo" (4 p.a. free), Guide Book (annual, 50 c.), Tourist Bulletins (free); Zoo featured occasionally on Radio & TV Programmes; Zoological Research carried on in animal hospital; Veterinary Department—vet., animal technician & 1 keeper operate the hospital. 1959/60 Building: Holden Museum of Living Reptiles; Sea Lion Exhibit at Belle Isle Children's Zoo.

GRAND RAPIDS

John Ball Zoological Gardens, 301 Market Street, S.W., Grand Rapids, Michigan, U.S.A. Tel: GI 6-5839. Zoo Director—Fred A. Meyer.

LANSING

Potter Park Zoo, 717 E. Shiawassee, Lansing 12, Michigan, U.S.A. Tel: IV 59911. Zoo Director—E. Downey.

TRAVERSE CITY

Clinch Park Zoo, Grandview Parkway, Traverse City, Michigan, U.S.A. Zoo Director—G. M. Williams.

MINNESOTA

ST. PAUL

Saint Paul's Como Zoo, 1224 Lexington Avenue N., St. Paul (3), Minnesota, U.S.A. Tel: HUmboldt 8-3221. Zoo Staff: Zoo Director—John A. Fletcher, B.Sc.; Curator & Assistant—Daniel A. Watson; Senior Keeper—Richard Dean; Vets. (on call from Minnesota College of Vet. Med.)—Dr Donald H. Clifford, D.V.M. & Prof.; Dr Dale K. Sorenson, D.V.M. & Prof. Founded 1897 by City of St. Paul which gives financial support as does the Citizens' Zoo Committee. Admission Fees: Free. Hours: 8 a.m.—sunset summer, 8 a.m.—6 p.m. winter. 1959 Attendance: 1,000,000 (est.). 10 acres, 9 employees (incl. Director). Mammals 62 species, 178 specimens; Birds 31 species, 101 specimens; Reptiles & Amphibians 20 species, 35 specimens; Fish 4 species, 15 specimens; Invertebrates 2 species, 4 specimens. Total: 119 species, 333 specimens. Botanical Section—conservatory containing tropical plants & palms; Educational facilities—lectures to schools; Library—120 volumes; Publications: "Como Park Zoo" (information bulletin, monthly, free), "Como Zoo Guide" (50 c.); weekly TV Programme—WCCO-TV & KMSP-TV; Veterinary, Pathology & Zoological Research work in association with University of Minnesota Veterinary Medicine Clinic, &

Mayo Foundation, Rochester, Minnesota. 1960 Building: Giraffe & Antelope House; Combination Building, Auditorium, offices & native wild-life exhibit.

MISSOURI

KANSAS CITY

Swope Park Zoological Gardens, 6701 Lister Avenue, Kansas City 30, Missouri, U.S.A. Tel: Delmar 3-2763. Zoo Director—William T. A. Cully.

ST. LOUIS

St. Louis Zoological Garden, Forest Park, St. Louis 10, Missouri, U.S.A. Tel: Sterling 1-0900. Zoo Director—George P. Vierheller. Founded by City of St. Louis which gives financial support. Additional income from operation of refreshment stands. Admission Fees: Free. Hours: 9.30 a.m.—5 p.m. summer, 9.30 a.m.—4.30 p.m. winter. 1959 Attendance: 2,500,000. 83 acres. 90 employees (extra in summer). Mammals 146 species, 470 specimens; Birds 295 species, 800 specimens; Reptiles & Amphibians 75 species, 180 specimens. Total: 516 species, 1450 specimens. Children's Contact Areas; Animal Training Shows—Asiatic & African Elephants, Lions & Tigers—permanent seating area, free; Publication: St. Louis Zoo Album (51). 1959/60 Building: Aquatic House for Aquatic Birds & Mammals.

MONTANA

RED LODGE

See 'Em Alive Zoo, Box 185, Red Lodge, Montana, U.S.A. Tel: 234-J. Zoo Directors—L. W. Lyons & D. W. Columbus.

NEBRASKA

LINCOLN

Lincoln Municipal Zoo, 1300 South 27th Street, Lincoln 10, Nebraska, U.S.A. Tel: GA 4316. Zoo Director—James H. Ager. Founded by City of Lincoln which gives financial support. Admission Fees: Free. Hours: 9 a.m.—4.45 p.m. throughout year. 1959 Attendance: approx. 51,000. 35 acres.

5 employees. *Mammals* 41 species, 128 specimens; *Birds* 42 species, 231 specimens; *Reptiles & Amphibians* 5 species, 12 specimens; *Fish*: 10 species, 80 specimens. *Total*: 98 species, 451 specimens. Small *Aquarium*. 1960/61 *Building*: Children's Zoo.

SCOTTSBLUFF

Riverside Park Zoo, City Hall, Scottsbluff, Nebraska, U.S.A. *Superintendent of Parks and Recreation*—Arnold D. Gesterfield.

NEW MEXICO

ALBUQUERQUE

Rio Grande Park Zoo, 903 10th Street, S.W., Albuquerque, New Mexico, U.S.A. *Chapel* 3-4241. *Zoo Staff*: *Zoo Director*—Dr Ivo Poglayen; *Assistant Director*—Hans-Peter Roth; *Curator*—Frank Lovato. Founded 1929 by Major Clyde Tingley & Albuquerque City which gives financial support. *Admission Fees*: Free. *Hours*: 9 a.m.–6.30 p.m. summer, 9 a.m.–5 p.m. winter. 1959 *Attendance*: 180,000. 24 acres. 10 employees. *Mammals* 61 species, 129 specimens; *Birds* 74 species, 300 specimens; *Reptiles & Amphibians* 19 species, 30 specimens. *Total*: 154 species, 459 specimens. *Educational Facilities*—slides of zoo animals available for special occasions; occasional *Radio Programme*; regular half-hour *TV Programme*. 1959 *Building*: African Mixed Species Exhibit; Concession & Restroom Buildings. 1960 *Building*: Wading Bird Exhibit; 5 Ungulate Shelters; general landscaping.

NEW YORK

BUFFALO

Buffalo Zoological Gardens, Delaware Park, Buffalo 14, New York, U.S.A. *Tel*: ATwater 3559. *Zoo Director*—Joseph A. Abgott (Curator). *Publication*—"Zoo Logic".

CATSKILL

Catskill Game Farm, Inc., Route 1, Catskill, New York, U.S.A. *Tel*: Catskill 1141. *Zoo Director*—Roland Lindemann. Founded 1923 by Roland Lindemann. No outside financial support. *Admission Fees*: Adult \$1.25, Child 50 c. *Hours*: 9 a.m.–6 p.m. (April 15th–November 15th). 1959 *Attendance*: 410,000. 135 acres open to public—785 acres breeding

preserves; 40 employees (+130 during summer). *Mammals* 113 species, 1465 specimens; *Birds* 52 species, 569 specimens; *Reptiles & Amphibians* 6 species, 43 specimens. *Total*: 171 species, 2077 specimens. *Film Unit*; *Library*; *Publication*: Guide Booklet (\$0.15); *Radio & TV Programmes*: *Pathology & Veterinary Departments*; *Zoological Research* in conjunction with Rachelwood Wildlife Preserve. The Game Farm specialises in preservation & breeding of rare ungulates—several hundred tame animals of various species roam free with the public at all times. 1959 *Building*: new Goat Buildings and Enclosures; new cafeteria; new wading bird pool. 1960 *Building*: Extension to Animal Nursery (Children's Zoo)

NEW YORK

Central Park Zoo—Prospect Park Zoo, 64th Street & Fifth Avenue, The Arsenal, N.Y.21, New York. *Tel*: Regent 4-1000. *Zoo Director*—John Galm (Supervisor).

NEW YORK

New York Aquarium, Boardwalk at West 8th Street, Brooklyn 24, New York, U.S.A. *Tel*: Coney Island 6-8500. *Aquarium Staff*: *Aquarium Director*—Christopher Coates; *Associate Curator*—James W. Atz, Ph.D.; *Assistant to the Director*—Carleton Ray, Ph.D.; *Pathologist*—Ross F. Nigrelli, Ph.D.; *Superintendent*—Aage Olsen. Founded 10.12.1896 by New York City and taken over 31.10.1902 by New York Zoological Society. Financial support received from New York City & New York Zoological Society. *Admission Fees*: Adult 90 c. (50 c. in special groups), Child 45 c. (25 c. in special groups), free in organised school classes). *Hours*: 10 a.m.–10 p.m. summer; 10 a.m.–5 p.m. winter. 1959 *Attendance*: 188,781. 12 acres. 40 employees, incl. 5 senior staff. *Mammals* 7 species, 17 specimens; *Birds* 1 species, 8 specimens; *Reptiles & Amphibians*—15 species, 35 specimens; *Fish* 123 species, 421 specimens; *Invertebrates* 11 species, 30 specimens; *Total*: 157 species, 511 specimens. *Botanical Section*—flora of local sand dunes; *Film Unit*—part of New York Zoological Society; *Library*—part of New York Zoological Society; *Pathology Department*; *Department of Marine Biochemistry & Ecology Genetics Laboratory*; *Publication*: Guide & Historical Souvenir (64 pp. illus. 40 c.). 1959/60 *Building*: 2 deep salt-water wells, large water-filtering plant, exhibit of local sand-dune flora.

✓ **NEW YORK**

New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A. Tel: Wellington 3-1500. **Zoo Staff:** *General Director*—John Tee-Van, D.Sc.; *Associate Curator, Mammals*—Joseph A. Davis, Jr., B.S.; *Curator, Birds*—William G. Conway, B.A.; *Associate Curator, Reptiles*—Herndon G. Dowling, Ph.D.; *Editor & Curator, Publications*—William Bridges, Litt.D.; *Veterinarian*—Charles P. Gandal, D.V.M.; *Assistant Curator, Mammals & Birds*—Grace Davall; *Comptroller*—Herbert F. Schiemann, B.C.S.; *Superintendent of Operations*—Charles B. Driscoll, B.S.; *Membership Chairman & Administrative Associate*—Gordon Cuyler; *Manager, Facilities Department*—Edward J. Kearney; *Associate Curator, Education*—Herbert Knobloch; *Photographer*—Sam Dunton; *General Curator, Emeritus*—Lee S. Crandall; *Director Emeritus, Department of Tropical Research*—William Beebe, D.Sc., LL.D.; *Assistant Director, Department of Tropical Research*—Jocelyn Crane, M.S.; *Entomologist, Department of Tropical Research*—Henry Fleming. Founded by the New York Zoological Society; Zoo opened 8.11.1899. Financial support received from New York City, the New York Zoological Society, gate receipts and proceeds of facilities. *Admission Fees:* Adult 25 c. Tues., Wed., Thurs. (other days & holidays free); Child (under 5) free, Child (over 5) 25 c. Tues., Wed., Thurs. *Hours:* 10 a.m.–5 p.m. summer weekdays, 10 a.m.–5.30 p.m. summer Sun. & hols.; 10 a.m.–4.30 p.m. winter. 1959 *Attendance:* 2,119,685. 252 acres. 254 employees (503 in summer). *Mammals* 192 species, 574 specimens; *Birds* 631 species, 1663 specimens; *Reptiles & Amphibians* 255 species, 702 specimens. *Total:* 1078 species, 2939 specimens. *Aquarium*—separate institution at Coney Island, New York, but operated by the Zoological Society; *Children's Zoo*—continuous summer operation since 1941; *Educational Facilities*—Education Department under Curator of Education since 1926; *Film Unit*—Staff Photographer since 1899 taking stills & motion pictures, 5 1959 Films; *Library*—7024 volumes + current publications; *Publications:* "Zoologica" (technical, quarterly, \$6.00), "Animal Kingdom" (popular, bi-monthly, \$3.50), Annual Report, Guide Book (\$1.00); occasional *Radio & TV Programmes*; *Veterinary Department*—full-time vet. who also does pathology work; *Department of Tropical Research*—established 1916. Pony, Llama, Donkey & Camel rides. 1959 *Building:* Monkey House interior; Heads & Horns Museum interior rebuilt; Crotona Parking Field (50% Society, 50% City). 1960 *Building:* new

Aquatic Bird House started (75% City, 25% Society).

ROCHESTER

Seneca Park Zoo, Rochester, New York, U.S.A. Tel: Congress 6-6846. *Zoo Director*—Earl B. Wells.

STATEN ISLAND

Staten Island Zoo, 614 Broadway, Staten Island 10, New York, U.S.A. Gibraltar 2-3100. **Zoo Staff:** *Zoo Director*—Clyde Gordon; *Vet.*—Dr Patricia O'Connor, D.V.M.; *Consultant Vet.*—Dr John L. Halloran; *Staff Curator of Reptiles*—Carl F. Kauffeld; *Associate Curator of Reptiles*—Harold J. O'Connell; *Associate Curator of Birds*—Dr James P. Chapin; *Staff Aquarist*—John T. Muntzner; *Zoo Superintendent*—Kenneth Bancker; *Office Manager*—Henrietta C. von der Osten. Founded 1936 by The Staten Island Zoological Society. City of New York, under an annual budget appropriation, pays for annual maintenance & operation; the Society furnishes all exhibits, educational programmes, etc. *Admission Fees:* Free. *Hours:* 10 a.m.–5 p.m. throughout year. 1959 *Attendance:* 533,000. 6½ acres. 24 employees. *Mammals* 57 specimens; *Birds* 196 specimens; *Reptiles & Amphibians*—667 specimens; *Fish* 445 specimens. *Total:* 1335 specimens. *Aquarium*—tropical fish; *Educational Facilities*—weekly biology classes, nature clubs, guided tours and lectures by zoo staff at Zoo and outside; small reference *Library*; *Publications:* "In Animaland" (monthly, free to members), Guide, Annual Report; occasional guest appearances on *Radio & TV*; *Vet., Pathology & Zoological Research Work* under Dr O'Connor; very large & comprehensive collections of reptiles. 1959/60 *Building:* new cages & tanks; new roof solarium; new hospital cages.

OHIO✓ **CINCINNATI**

Zoological Society of Cincinnati, Inc., 3400 Vine Street, Cincinnati, Ohio Zone 10, U.S.A. Tel: Avon 1-4700. *Zoo Director*—John F. Heusser. Founded 1873 by State of Ohio & Zoological Society of Cincinnati. Financial support of \$10,000 p.a. from subscriptions; aid from City for capital improvements; income from food & other concessions. *Admission Fees:* Adult 50 c.; Child (2–12 yrs. inclusive)

World Zoos

25 c. *Hours*: 9 a.m.-5.30 p.m. (spring), 9 a.m.-7 p.m. summer, closed Nov. 15th-Mar. 15th. 57 acres. 1959 *Attendance*: 688,000. 39 employees (84 in summer). *Small Aquarium*; *small Children's Zoo*; *Educational Facilities*—school visits, lectures; part-time *Vet.*; *Publication*: "Zoo News" (monthly to members).

CLEVELAND

Cleveland Zoological Park, Cleveland 9, Ohio, U.S.A. *Tel*: Ontario 1-6500. *Zoo Staff*: *Zoo Director*—Leonard J. Goss, D.V.M., Ph.D.; *General Curator*—Ronald T. Reuther, B.A.; *General Superintendent*—Joseph P. Chery; *Vet.* (part-time)—Wallace E. Wendt, D.V.M. Founded 1882 by the City of Cleveland. Financial support from members of Zoological Society. *Admission Fees*: Adult 50 c., Child (under 12) free; all free on Tuesday. *Hours*: 10 a.m.-5 p.m. throughout year, 10 a.m.-7 p.m. (Apr. 1-Oct.) Sun. & hols. 1959 *Attendance*: 584,665 (turnstile count). 110 acres. 70 Employees. *Mammals* 61 species, 294 specimens; *Birds* 272 species, 781 specimens; *Reptiles & Amphibians* 19 species, 39 specimens. *Total*: 352 species, 1114 specimens. *Children's Farm*; *Library* for staff; *Publications*: "Zoo News" (quarterly, free to members), *Guide Book* (50 c.); spot shows on *Radio & TV*; part-time *Vet.*; post-mortems done by Pathology Department of County Hospital; Train tour with commentary round Zoo; all rare trees labelled. 1959 *Building*: *Children's Farm*, *Bongo House*.

COLUMBUS

Columbus Zoo, Columbus, Ohio, U.S.A. *Tel*: Tuxedo 9-8336. *Zoo Staff*: *Zoo Director*—Earl F. Davis; *Assistant Superintendent*—Louis R. DiSabato; *Head Keeper*—Clyde Seitz; *Vet.*—Dr James H. Vickers; *Curator Mammals*—Patrick Gorman; *Curator Reptiles & Amphibians*—Philip Amorose; *Curator Aquarium*—George Landis. Founded 1927 by City of Columbus which gives financial support. *Admission Fees*: Adult 35 c., Child (under 12) free. *Hours*: 10 a.m.-6 p.m. (Sun. & Hols. until 7 p.m.). Closed in winter. 1959 *Attendance*: 540,000. 92 acres. 46 employees. *Mammals* 201 species, 408 specimens; *Birds* 55 species, 290 specimens; *Reptiles & Amphibians* 48 species, 180 specimens; *Fish* 104 species, 1970 specimens. *Total*: 408 species, 2778 specimens. *Aquarium*; *Travelling Zoo*; *Film Unit* (1500 ft., 16 mm. during 1959); *Publications*: *Circular* (annual, 10 c.); *Spot Radio & TV Programmes*; *Vet. & Pathology Departments* under Dr Vickers; *Zoological Research Department*. 1959 *Building*: *Ape House*; *Bear Grotto*; *Lion House*.

TOLEDO

Toledo Zoo Aquarium, 2700 Broadway, Toledo 9, Ohio, U.S.A. *Tel*: Elgin 2531. *Zoo Director*—Philip C. Skeldon.

OKLAHOMA

OKLAHOMA CITY

Lincoln Park Zoo, Rt. 1, Box 478, Lincoln Park, Oklahoma City, Oklahoma, U.S.A. *Tel*: GA 7-3321. *Zoo Staff*: *Zoo Director*—Dr Warren D. Thomas; *Foreman*—Marvin Crain; *Assistant Foreman*—James Ward. Founded 1904 by Oklahoma City which gives financial support as does the Society. *Admission Fees*: Free. *Hours*: 8 a.m.-8 p.m. summer, 10 a.m.-5 p.m. winter. 1959 *Attendance*: 978,683. 604 acres. 13 employees. *Mammals* 62 species, 245 specimens; *Birds* 34 species, 205 specimens; *Reptiles & Amphibians* 56 species, 230 specimens. *Total*: 152 species, 680 specimens. Lectures and guided tours; occasional *Radio & TV Programmes*; full-time *Vet.*; *Zoological Research* on drugs and feeding; experimental breeding of albino wapiti.

OREGON

PORTLAND

Portland Zoological Gardens, Portland, Oregon.

PORTLAND

Washington Park Zoo, 4001 S.W. Canyon Road, Portland, Oregon, U.S.A. *Tel*: Capitol 3-4027. *Zoo Director*—Jack Marks.

PENNSYLVANIA

PHILADELPHIA

Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pennsylvania, U.S.A. *Tel*: Baring 2-5300. *Zoo Staff*: *Zoo Director*—Freeman M. Shelly; *Curator of Reptiles & Amphibians*—Roger Conant; *Curator of Birds*—John A. Griswold; *Curator of Mammals*—Frederick A. Ulmer, Jr.; *Associate Curator, Public Relations*—Joseph Bonaduce; *Comptroller*—R. Benton Hendershott; *Superintendent Maintenance*—Thomas Farley; *Catering Manager*—Miers F. Parra-more; *Service Manager*—Walter E. Knipe, II;

Head Keeper—Patrick Menichini; **Superintendent Children's Zoo**—William J. Maloney; **Photographer**—Franklin Williamson; **Director Penrose Research Laboratory**—Herbert L. Ratcliffe, Sc.D. Founded 21.3.1859 by Zoological Society of Philadelphia. Financial support: annual grant from City of Philadelphia; membership dues from Zoological Society of Philadelphia, income from endowment fund, gate money, donations, refreshments & souvenirs. **Admission Fees:** Adult 75 c., Child (2-11) 25 c. **Hours:** 10 a.m.-6 p.m. (Apr.-Sept. Sats.); 10 a.m.-7 p.m. (Apr.-Sept. Sun. & Hols.); 10 a.m.-5 p.m. winter. **1959 Attendance:** 753,116. 42 acres. 100 employees (200 in summer). **Mammals** 145 species, 327 specimens; **Birds** 335 species, 1067 specimens; **Reptiles & Amphibians** 91 species, 158 specimens; **Total:** 571 species, 1552 specimens. **Children's Zoo** (15 c.); **Publication:** Guide Book; "America's First Zoo" (quarterly, free to members); **Radio Programme**—WRCV "Let's Visit the Zoo", Sun. 10.15 a.m.; **TV Programme**—guest appearances on various programmes. **Pathology & Zoological Research** by Penrose Research Laboratory. Elephant & Pony rides.

PITTSBURGH

Highland Park Zoological Gardens, Highland Park, Pittsburgh 6, Pennsylvania, U.S.A. **Zoo Staff:** **Superintendent**—Edward J. House; **Supervisor**—Howard Hays; **Superintendent Children's Zoo**—Mrs. Everett. Founded 1895 by City of Pittsburgh; administered by Zoological Society of Pittsburgh (a non-profit making corporation) on behalf of the City. **Admission Fees:** Free (except for Children's Zoo, Pony rides & miniature railroad trips). **Hours:** 9 a.m.-6 p.m. summer; 9 a.m.-7 p.m. (summer Sun. & Hols.); 9 a.m.-5 p.m. winter. **1959 Attendance:** summer average 7,000 per day (50,000 Sun.). 50 acres approximately. 40 employees (+15 in summer). **Mammals** 110 species, 424 specimens; **Birds** 208 species, 785 specimens; **Reptiles & Amphibians** 92 species, 212 specimens; **Fish** 12 species, 32 specimens; **Invertebrates** 2 species, 2 specimens. **Total:** 424 species, 1455 specimens. **Children's Zoo** with miniature trains and Pony rides; small **Laboratory**; **Superintendent's Library**; **Publication:** Illustrated Guide Book (50 c.); occasional **Radio & TV Programmes:** Vet. on call.

PUERTO RICO

MAYAGUEZ

University of Puerto Rico Zoo, College Station, Mayaguez, Puerto Rico, U.S.A.

Tel: Mayaguez 390. **Zoo Director**—Dr Juan A. Rivero.

SOUTH DAKOTA

RAPID CITY

Black Hills Reptile Gardens, S. Eighth Street, Rapid City, South Dakota, U.S.A. **Tel:** Fi-2-5873. **Zoo Director**—Earl Brocklesby (Owner).

Hill City Zoo, Box 1791, Rapid City, South Dakota, U.S.A. **Zoo Director & Owner**—Harold D. Wheaton.

TENNESSEE

MEMPHIS

Memphis Zoological Garden & Aquarium, Memphis 12, Tennessee, U.S.A. **Tel:** BR4-2887. **Zoo Staff:** **Director**—Raymond F. Gray; **Chief Curator**—W. Carter Anderson; **Assistant Chief Curator**—John W. Tapp; **Curator of Fish & Reptiles**—Ronald S. Graves. Founded 1906 by City of Memphis which gives financial support; Society gives grants for animal purchases. **Admission Fees:** Free. **Hours:** 9.30 a.m.-5.30 p.m. summer; 9.30 a.m.-6 p.m. summer weekends & hols.; 9.30 a.m.-5 p.m. winter; 9.30 a.m.-5.30 p.m. winter weekends & hols. **1959 Attendance:** 1,250,000. 31 acres, 35 employees. **Mammals** 81 species, 403 specimens; **Birds** 86 species, 405 specimens; **Reptiles & Amphibians** 45 species, 144 specimens; **Fish** 99 species, 1496 specimens. **Total:** 311 species, 2448 specimens. **Aquarium** (Adult 25 c., Child 10 c.); **Botanical Section**; **Children's Zoo**; office reference **Library**; **Publication:** "Zoo Logic" (monthly, free to members); Pony rides. **1959 Building:** Aquarium; amphitheatre for animal shows; Pony Barn; animal hospital. **1960 Building:** New Children's Zoo; Penguin House; 8 Ungulate moats; outside Flamingo Lagoon.

TEXAS

DALLAS

The Dallas Zoo, 524 S. Marsalis Avenue, Dallas 3, Texas, U.S.A. **Tel:** WH3-8845. **Zoo Staff:** **Zoo Director**—Pierre A. Fontaine;

Curator—Elvie Turner, Jr.; **Aquarium Supervisor**—Jefferson W. Moore; **Supervisor Game Fish Hatchery**—J. Leslie French. Founded 1904 by City of Dallas which gives financial support. **Admission Fees**: Free. **Hours**: 8 a.m.—dark, throughout year. **1959 Attendance**: approximately 2,000,000. 55 acres. 29 employees (+2 Aquarium; 2 Fish Hatchery). **Mammals** 112 species, 392 specimens; **Birds** 114 species, 499 specimens; **Reptiles & Amphibians** 17 species, 53 specimens; **Fish** 183 species, 1507 specimens. **Total**: 426 species, 2451 specimens. **Aquarium**—8 major display tanks (2–3000 galls. each), 8 aquaria (20–100 galls.); **Library**: 500 volumes & pamphlets; occasional **Radio & TV Programmes**. **1959 Building**: new moated Ungulate Enclosure; new moated enclosures for Elephants, Rhinos., Giraffe, Pygmy Hippos. & river Hippos. **1960 Building**: new Main Entrance; new Anthropoid Ape House; new Bird & Reptile House.

HOUSTON

Houston Zoological Gardens, 509 City Hall, Houston, Texas, U.S.A. **Tel**: Jackson 30149. **Zoo Staff**: **Zoo Director**—Thomas J. Baylor; **Assistant Director**—Robert Marley; **General Curator**—John E. Werler. Founded by City on land given by the George H. Herman estate; financial support from the City. **Admission Fees**: Free. **Hours**: 9.30 a.m.—sunset, throughout year. **1959 Attendance**: approximately 1,000,000. 42 acres. 36 employees. **Mammals** 98 species, 384 specimens; **Birds** 71 species, 1045 specimens; **Reptiles & Amphibians** 31 species, 109 specimens; **Fish** 1 species, 2 specimens. **Total**: 201 species, 1540 specimens. Small Animal Hospital with 3 wards & treatment rooms; **Library**: regular **TV Programme**; part-time **Vet**. **1959 Building**: Hippo. House (\$38,000). **1960 Building**: Reptile House (\$160,000).

SAN ANTONIO

San Antonio Zoological Society, Zoological Park, San Antonio, Texas. **Zoo Director**—Fred Stark.

UTAH

SALT LAKE CITY

Hogle Zoological Garden, P.O. Box 2337, Salt Lake City, Utah, U.S.A. **Tel**: DA 2-1631. **Zoo Director**—Gerald de Bary. Founded by the City. Financial support from the City & the Zoological Society. **Admission Fees**: Adult 25 c., Child (5–14) 10 c. **Hours**: 9.30 a.m.–7 p.m. summer, 9.30 a.m.–5 p.m. winter.

1959 Attendance: 239,236. 20 acres. 10 employees. **Mammals** 38 species, 110 specimens; **Birds** 38 species, 111 specimens; **Reptiles & Amphibians** 32 species, 80 specimens; **Invertebrates** 2 species, 7 specimens. **Total**: 110 species, 308 specimens. **Children's Zoo**; **Library**. **1959/60 Building**: old Monkey Island and Bear cages remodelled; new house for small mammals, reptiles & birds in 3 zones: tropical, temperate & desert.

VIRGINIA

NEW MARKET

Zoorama, New Market, Richmond, Virginia, U.S.A. **Zoo Director**—V. D. Rider Jr. Children's Farm; mixed species exhibits; educational guided tours; miniature train rides, circus.

WASHINGTON

SEATTLE

Woodland Park Zoological Gardens, 5400 Phinney Avenue, Seattle 3, Washington, U.S.A. **Tel**: SUNset 2-5045. **Zoo Staff**: **Zoo Director**—Edward J. Johnson; **Vet.**—Dr Kenneth L. Binkley, D.V.M. Founded 1900 by the City which gives financial support. **Admission Fees**: Free. **Hours**: 8 a.m.—sunset, throughout year. **1959 Attendance**: approximately 1,600,000. 90 acres. 32 employees. **Mammals** 129 species, 612 specimens; **Birds** 242 species, 1079 specimens; **Reptiles & Amphibians** 42 species, 139 specimens; **Total**: 413 species, 1830 specimens. **Pony Club** for children; **Educational Facilities**—conducted tours & lectures for school classes; **Publication**: "Who's Who at the Zoo" (every 5 years, 97 c.); occasional **Radio**, regular educational **TV Programmes**; **Veterinary & Zoological** research work by Dr Binkley. **Pony & Elephant rides**. **1959 Building**: moated enclosure for Camels. **1960 Building**: Children's Zoo.

WISCONSIN

MADISON

Henry Vilas Park Zoo, 500 S. Randall, Madison 5, Wisconsin, U.S.A. **Tel**: Alpine 5-7031. **Zoo Director**—Daniel M. Watson.

MILWAUKEE

Washington Park Zoo, 4500 W. Vliet St., Milwaukee, Wisconsin, U.S.A. (old zoo).

Milwaukee County Zoological Gardens, 101 N. 100 St., Milwaukee, Wisconsin, U.S.A. (new zoo). **Zoo Staff:** *Zoo Director*—George Speidel; *Assistant Director*—Robert Bullerman; *Head Keeper*—Ray Callahan; *Aquarist*—Leonard Pampel; *Park Supervisor*—James Lynch. Founded 1892 by City of Milwaukee; 1937 taken over by the County which pays for construction and maintenance; The Zoological Society provides specimens. *Admission Fees:* Free. *Hours:* 9.30 a.m.–4.50 p.m. throughout year. 1959 *Attendance:* 1,069,650 (old zoo). 22.8 acres (old zoo); 120 acres (new zoo). 38 employees. *Mammals* 348 specimens; *Birds* 379 specimens; *Reptiles & Amphibians* 71 specimens; *Total:* 798 specimens. Because of reconstruction, the number of animals on show is at a minimum. *Film Unit*—2 films made during 1959; *Publication:* Milwaukee Zoo News (bi-monthly free to members); occasional *Radio & TV Programmes*; *Pathology* work by pathology department of local University. Miniature train ride round new zoo; Pony rides (old zoo). 1959 *New Zoo Building:* 4 Bear Dens; Monkey Island by Monkey House; Pachyderm & Lion Hospital begun. 1960 *New Zoo Building:* Completion of Pachyderm & Lion Houses; Service Building.

PRAIRIE DU CHIEN

Rose Park Zoo, Prairie du Chien, Wisconsin, U.S.A. *Zoo Director & Owner*—John Pettera.

RACINE

Racine Zoological Park, 2131 North Main Street, Racine, Wisconsin, U.S.A. *Tel:* Melrose 2-4046. *Zoo Director*—Emil J. Rokosky. Founded by City of Racine & Racine Zoological Society. Salaries & maintenance paid for by City; animals bought by Society. *Admission Fees:* Free. *Hours:* 10 a.m.–6 p.m. summer, 10 a.m.–4.30 p.m. winter. 1959 *Attendance:* 240,000. 32 acres. 10 employees (2 extra in summer). *Mammals* 54 species, 248 specimens; *Birds* 33 species, 191 specimens; *Reptiles & Amphibians* 29 species, 76 specimens; *Fish* 14 species, 44 specimens; *Invertebrates* 1 species, 3 specimens. *Total:* 131 species, 562 specimens. *Publication:* Racine Zoo Bulletin (quarterly, free to members).

URUGUAY

MONTEVIDEO

Jardin Zoológico Municipal, Montevideo, Uruguay. *Zoo Director*—Dr Enrique Parietti.

U.S.S.R.

LENINGRAD

Zoo Park, Lenin Park, Leningrad, U.S.S.R., *Zoo Director*—N. A. Riabov.

MOSCOW

Moskovski Zoologicheski Park Upravleniya Kultur Moskovsogo Gorodckogo Soveta (Moscow Zoological Park of the City of Moscow's Ministry of Culture), 1 Bolshaya Gruzinskaya Y1., Moscow C.-242, U.S.S.R. *Zoo Director*—Igor Petrovitch Sosnovskii. Founded 1864 by the Russian "Animal & Plant Acclimatisation Society". Financial support—the Zoo receives an annual subsidy from the State of 1½ million roubles which is used for the maintenance and feeding of animals, payment of the staff and various other economic needs. Apart from this the cost of repairs, decorations and rebuilding comes to 2½–3 million roubles; the amount allowed for buying animals is 250,000–300,000 roubles. *Admission Fees:* Adult 2 roubles, Child of school age 1 rouble. *Hours:* 10 a.m.–9 p.m. summer, 10 a.m.–5 p.m. winter. 1959 *Attendance:* 3,000,000 approximately. 20 hectares. 320 workers and keepers. *Mammals* 143 species, 379 specimens; *Birds* 208 species, 1704 specimens; *Reptiles & Amphibians* 90 species, 376 specimens; *Fish* 89 species, 830 specimens. *Total:* 538 species, 3328 specimens. *Publications:* collected papers of zoological interest published occasionally—so far 2 volumes, 3rd in the press. 1959 "Among Animals & Birds" by I. P. Sosnovskii, "Animals at the Zoo"; 1960 "Moscow Zoo Park". In addition, articles appear in various journals & periodicals. During 1959 more than 20 scientific & popular papers were published. 1959/60 *Building:* Ponds cleaned; new Main Entrance; new Monkey House; new Giant Panda enclosure; new Supplies & Kitchen Department. A new Moscow Zoo is being planned.

VENEZUELA

CARACAS

Jardin Zoológico "El Pinar", Caracas, Venezuela. *Tel:* Caracas 413478. *Zoo Staff:* *Zoo Director*—Dr C. Pedro Trebbau Millo-witsch; *Assistant Director*—Sr. A. Suarez; *Head Keeper*—Sr. T. Nuñez. Founded by the Ministry of Agriculture. Financial support from the State. *Admission Fees:* Free. *Hours:* 8 a.m.–6 p.m. throughout the year. 1959 *Attendance:* approximately 500,000. 2 hectares. 17 employees. *Mammals* 25 species, 140 specimens; *Birds* 83 species, 210 specimens; *Reptiles & Amphibians* 9 species, 79 specimens. *Total:* 117 species, 429 specimens. *Small Library; Vet. Department*—under the Director; *Pathology & Zoological Research* work

World Zoos

by the Faculty of Natural Science at the University; *TV Programme*—occasional. 1959 *Building*: enclosure for Deer & Tapir; enclosure for Foxes and Giant Anteaters; Peccary Enclosure; White Deer Enclosure. 1960 *Planned Building*: small Aquarium; Serpenterium; several small or medium cages for birds and small mammals; new Zoo planned outside Caracas—80 hectares.

MARACAIBO

Jardin Zoologico "Maracaibo", Maracaibo, Ed. Zulia, Venezuela. *Zoo Director*—Dr Pons.

MARACAY

Jardin Zoologico "Las Delicias", Maracay, Ed. Aragua, Venezuela. *Zoo Director*—Dr Olinto Benedetti.

VIETNAM

SAIGON

Thao-Cam-Vien, Saigon, Vietnam. *Zoo Director*—Vo-Doan-Minh. Founded 1865 by the Government which gives financial support (Min. of Agric.). *Admission Fees*: Free. *Hours*: 7 a.m.—7 p.m. throughout year. 1959 *Attendance*: 1,000,000+. 18 hectares. 200 employees. *Mammals* 17 species; *Birds* 30 species; *Reptiles & Amphibians* 5 species; *Fish* 1 species. *Total*: 53 species, 420 specimens. *Botanical Section*—orchids, palm & forest trees. *Publication*: *Delectus*, *Seminum* (annual).

WEST INDIES

TRINIDAD

PORT OF SPAIN

Emperor Valley Zoo, Royal Botanic Gardens, Port of Spain, Trinidad, West Indies. *Tel.*: Port of Spain 23530. *Zoo Superintendent*—

G. C. Roots. Founded by Zoological Society of Trinidad & Tobago; subsidised by State & City. *Admission Fees*: Adult 25 c. W.I., Child 5 c. W.I. *Hours*: 8 a.m.—15 mins. before sunset, throughout year. 1959 *Attendance*: 66,000. 15 acres. 7 employees. *Mammals* 33 species, 83 specimens; *Birds* 50 species, 159 specimens; *Reptiles & Amphibians* 10 species, 47 specimens. *Total*: 93 species, 289 specimens. Children can join the Zoological Society of Trinidad & Tobago; small *Library*. 1959 *Building*: Buffalo Enclosure; Lion cage; Ocelot cage. 1960 *Building*: 6 Bird cages; Aquarium; cold storage plant.

YUGOSLAVIA

ILIDZE

Ilidze Zoological Gardens, Ilidze, Yugoslavia.

LJUBLJANA

Zoological Gardens, Ljubljana, Yugoslavia.

ZAGREB

Zooloski vrt grada Zagreba, Postbox 349, Zagreb, Yugoslavia. *Tel.*: Zagreb 41-185, 41-467. *Zoo Director*—Matejak Ivan. Founded 1925 by ing. Mijo Philipovich. Financial support from the City. *Admission Fees*: Adult 40 Dinar, Child 10 Dinar. *Hours*: 8 a.m.—7 p.m. summer, 8 a.m.—4 p.m. winter. 1959 *Attendance*: 650,000. 13 hectares. 30 employees. *Mammals* 42 species, 230 specimens; *Birds* 60 species, 1300 specimens; *Reptiles & Amphibians* 4 species, 10 specimens. *Total*: 106 species, 1540 specimens. *Library* with 210 volumes; *Publication*: "Bulletin" (quarterly, free). *Vet. Department*. 1959 *Building*: Elephant House. 1960 *Building*: Californian Sea Lion Enclosure; Bear Enclosure.

SENIOR ZOO STAFF OF THE WORLD

Abeyagoonewardane, R. D. *Office Asst.* The Government Zoological Gardens of Ceylon, (Dehiwala Zoo), Allan Avenue, Dehiwala, Ceylon.

Abgott, Joseph A. *Curator.* Buffalo Zoological Gardens, Delaware Park, Buffalo 14, N.Y., U.S.A.

Acevedo, Galo Perez. *Zoo Director.* Cerro San Cristobal, Santiago de Chile, Chile.

Adlercreutz, Nils. *Curator of Animals on the Julia Estate.* Nordiska Museet och Skansen, Stockholm, Sweden.

Aeschliman, Harold. *Zoo Keeper.* Clinch Park Zoo, Grandview Parkway, Traverse City, Mich., U.S.A.

Ager, James H. *Zoo Director.* Lincoln Municipal Zoo, 1300 South 27th Street, Lincoln 10, Nebr., U.S.A.

Akhurst, F. C. *Overseer of the Aquarium.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Allen, Ross. *Owner & Director.* Ross Allen's Reptile Institute, Silver Springs, Fla., U.S.A.

Amorose, Philip. *Curator of Reptiles & Amphibians.* Columbus Zoo, Columbus, Ohio, U.S.A.

Anantharamaiah, Sr. M. V. *Curator.* Sri Chamara-jendra Zoological Gardens, Mysore, South India.

Andersen, Svend, cand. mag. *Zoo Director.* Zoological Garden of Copenhagen, Roskildevej 32, Copenhagen F., Denmark.

Anderson, W. Carter. *Chief Curator.* Memphis Zoological Garden & Aquarium, Memphis 12, Tenn., U.S.A.

Andersson, Eric. *Zoo Director.* Parken, Eskilstuna, Sweden.

Andreane, Paul. *Zoo Director.* Tiergarten Osnabrück e.V., Osnabrück/Schölerberg, Germany.

Anghi, Prof. G. Csaba, Cand.Sc., Dipl.Eng. *Scientific Director.* Budapest Főváros Állat—És Növénykertje, Budapest, Hungary.

Aperon, W. Van. *Head Keeper.* Zoological Gardens, Royal Park, Parkville N.2, Melbourne, Victoria, Australia.

Appelhof, Dr. William K., D.V.M., *Associate Curator.* Detroit Zoological Park, 8450, W.10 Mile Road, Royal Oak, Mich., U.S.A.

Appelman, Ir. F. J. *Zoo Director.* Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.

Ashby, G. J. *Overseer of Insects.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Atz, Dr. James W., Ph.D., *Associate Curator.* New York Aquarium, Boardwalk at West 8th Street, Brooklyn 24, New York, U.S.A.

Autuori, Mario. *Zoo Director.* Fundação Parque Zoológico de São Paulo, Avenida Agua Funda, São Paulo, Caixa Postal 12.954, Brazil.

Backhaus, Dr. Dieter. *Curator of the Exotarium.* Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz 16, Germany.

Badalec, Jiří. *Zoo Director.* Severočeská zoologická zahrada, Liberec, Czechoslovakia.

Baines, Thomas R., *Zoo Director & Secretary of American Association of Zoological Parks & Aquariums.* Calgary Zoological Gardens, St. George's Island, Calgary, Alberta, Canada.

Bakker, H. D. *Architect.* Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.

Bakonyi, E. *Technical Manager.* Budapest Főváros Állat—És Növénykertje, Budapest, Hungary.

Baldwin, Carey. *Zoo Director.* San Francisco Zoological Gardens, Skyline & Sunset Boulevards, San Francisco 16, Calif., U.S.A.

Ball, C. H. *Aquarium Director.* Seaquarium, Rickenbacker Causeway, Miami 49, Fla., U.S.A.

Baneker, Kenneth. *Zoo Superintendent.* Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.

Bancroft, H. E. *Managing Secretary.* Zoological Gardens, South Perth, Labouchere Road, South Perth, Western Australia.

Banvenisti, Yanko. *Zoo Manager.* The Zoological Garden, 15 Tolbuhin Bul., Sofia, Bulgaria.

Bartušek, Jan. *Zoo Director.* Zoologická zahrada města Brna, Bystre u Brna, Czechoslovakia.

Basford, Gus A. *Zoo Director.* Jacksonville Municipal Zoo, 8605 Zoo Road, Jacksonville 2, Fla., U.S.A.

Bateman, Ronald G. *Zoo Director.* Isle of Wight Zoo, Sandown, Isle of Wight, Great Britain.

Baylor, Thomas J. *Zoo Director.* Houston Zoological Gardens, 509 City Hall, Houston, Texas, U.S.A.

Bean, Robert. *Zoo Director.* Chicago Zoological Society, Brookfield, Chicago, Ill., U.S.A.

Beattie, Jack. *Asst. Director.* Knowland State Arboretum & Park, 98th Avenue and Mountain Boulevard, Oakland 5, Calif., U.S.A.

Beebe, Dr. William, D.Sc., LL.D. *Director Emeritus.* Department of Tropical Research, New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Belknap, Curator of Birds. Audubon Park Zoo, Audubon Park, New Orleans, La., U.S.A.

Bennel, Dr. A. C. V. Van. *Asst. Director, Editor "Blijdorp Geluiden".* Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.

Benedetti, Olinto. *Zoo Director.* Jardim Zoológico "Las Delicias", Maracay, Ed. Aragua, Venezuela.

Benson, S. H. *Zoo Director.* The Zoological Society of Glasgow & West of Scotland, Calderpark, Broomhouse, Glasgow, Scotland, Great Britain.

Berg, L. H. B. Van Den. *Catering Manager.* Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.

Berger, Ernst. *Zoo Director.* Braunschweiger Zoo e.V., Braunschweig, Münzstrasse 5, Germany.

Bergh, Walter Karel Van Den. *Zoo Director.* Société Royale de Zoologie d'Anvers, Place Reine Astrid, 26, Anvers, Belgium.

Berglund, Björn. *Ecologist (botany).* Nordiska Museet och Skansen, Stockholm, Sweden.

Bernard, Dr. Richard, Ph.D. *Assistant Zoo Director.* Le Jardin Zoologique de Québec, Orsainville (via Charlesbourg), R.54, Province de Québec, Canada.

Bisbal, Dr. R., B.A., M.A., D.Phil., C.M.Z.S. *Zoo Director.* National Zoological Gardens of South Africa, P.O. Box 754, Boom Street, Pretoria, South Africa.

Binkley, Dr. Kenneth L., D.V.M. *Veterinarian.* Woodland Park Zoological Gardens, 5400 Phinney Avenue, Seattle 3, Washington, U.S.A.

Birkmann, Dr. Karl. *Zoo Director.* Zoo Karlsruhe, Ettlingerstrasse 6, Karlsruhe, Germany.

Blakely, Ronald L., B.S. *Curator.* Lincoln Park Zoological Gardens, 100 West Webster Avenue, Chicago 14, Ill., U.S.A.

Blocker, Eldon M. *Zoo Director.* Roeding Park Zoo, 890 West Belmont Street, Fresno 5, Calif., U.S.A.

- Boley, John.** *Curator of Reptiles.* Audubon Park Zoo, Audubon Park, New Orleans, La., U.S.A.
- Bonaduce, Joseph.** *Associate Curator, Public Relations.* Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
- Bonnet, M. P.** *Architectural Assistant.* Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.
- Boorer, M. K.** *Education Officer.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.
- Borg, Karl.** *Assistant Director, Chief Veterinarian.* Nordiska Museet och Skansen, Stockholm, Sweden.
- Bornild, Vera.** *Book-keeper.* Zoological Gardens Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Bosch, Ramon.** *Manager-Administrator.* Parc Zoologico de Barcelona, Parc de la Ciudadela, Barcelona, Spain.
- Boulton, Edgar H.** *Office Manager.* Detroit Zoological Park, 8450 W.10 Mile Road, Royal Oak, Mich., U.S.A.
- Braker, William P.** *Asst. Curator.* John G. Shedd Aquarium, 1200 South Lake Shore Drive, Chicago 5, Ill., U.S.A.
- Brand, D. J., B.Sc., M.Sc.** *Asst. Director.* National Zoological Gardens of South Africa, P.O. Box 754, Boom Street, Pretoria, South Africa.
- Brandstätter, R.** *Inspector.* Tiergarten Schönbrunn, Wien XIII, Austria.
- Brassard, Dr. J. Armand, M.V.** *Zoo Director.* Le Jardin Zoologique de Quebec, Orsainville (via Charlesbourg), R.54, Province de Quebec, Canada.
- Breen, Henry.** *Zoo Director.* Beardsley Park Zoo, Beardsley Park, Bridgeport 8, Conn., U.S.A.
- Breese, Paul L.** *Zoo Director.* Honolulu Zoo, Kalakaua & Kapahulu Avenues, Kapiolani Park, Honolulu 15, Hawaii, U.S.A.
- Bridges, Dr. William, Litt.D.** *Editor & Curator, Publications.* New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.
- Briskley, Tom M.** *Zoo Director.* Birmingham Lane Park Zoo, 2630 Cahaba Road, Birmingham 9, Ala., U.S.A.
- Brocklesby, Earl.** *Zoo Director & Owner.* Black Hills Reptile Gardens, S. Eighth Street, Rapid City, S.D., U.S.A.
- Bromley, George.** *Head Animal Keeper.* Detroit Zoological Park, 8450 W.10 Mile Road, Royal Oak, Mich., U.S.A.
- Bronzini, Prof. Dr. Ermanno, D.Sc.** *Zoo Director.* Comune di Roma, Giardino Zoologico e Museo di Zoologia, viale Giardino Zoologico 20, Roma, Italy.
- Brown, David.** *Aquarist.* Marineland of the Pacific Oceanarium, Marineland, Calif., U.S.A.
- Bulir, Luboš.** *Asst. Director.* Severočeská zoologická zahrada, Liberec, Czechoslovakia.
- Bullerman, Robert.** *Asst. Director.* Washington Park (old zoo) & Milwaukee County Zoological Gardens (new zoo), 4500 W. Vliet Street (old zoo) & 101 N.100 Street (new zoo), Milwaukee, Wis., U.S.A.
- Bullier, Dr. P., D.vet.** *Veterinary & Pathology Officer.* Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.
- Bürger, Manfred.** *Asst. Curator for Mammals.* Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Germany.
- Burke, John O.** *Supervisor, Public Service.* Detroit Zoological Park, 8450 W.10 Mile Road, Royal Oak, Mich., U.S.A.
- Busche, Helge.** *Head Gardener.* Zoological Gardens Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Cahill, William Lawrence.** *Superintendent.* Paignton Zoological & Botanical Gardens Ltd., Paignton, Devon, Great Britain.
- Callahan, Ray.** *Head Keeper.* Washington Park Zoo, 4500 Vliet Street (old zoo) & Milwaukee County Zoological Gardens, 101 N.100 Street (new zoo), both Milwaukee, Wis., U.S.A.
- Campbell, Leon.** *Zookeeper Specialist—Birds & Waterfowl Dept.* Crandon Park Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Fla., U.S.A.
- Carver, Dr. James.** *Zoo Director.* Washington Park Zoo, North Franklin at Lake Front, Michigan City, Ind., U.S.A.
- Cavazos, Henry.** *Keeper of Mammals.* Roeding Park Zoo, 890 West Belmont Street, Fresno 5, Calif., U.S.A.
- Cayouette, Raymond.** *Bird Curator.* Le Jardin Zoologique de Quebec, Orsainville, (via Charlesbourg), R.54, Province de Quebec, Canada.
- Cervenka, J.** *Asst. Director.* Zoological Garden, Prague, Czechoslovakia.
- Chamberlain, O. C.** *Overseer.* The Zoological Society of London, Whipsnade Park, Dunstable, Beds., Great Britain.
- Chan-P'ing, Tsui.** *Zoo Director.* Peking Zoological Garden, Peking, People's Republic of China.
- Chapin, Dr. James P.** *Associate Curator of Birds.* Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.
- Charbonneau, Gilles.** *General Administrator.* Société Zoologique de Granby Inc., Rue Bourget, Granby, Province de Quebec, Canada.
- Chery, Joseph P.** *General Superintendent.* Cleveland Zoological Park, Cleveland 9, Ohio, U.S.A.
- Christensen, Dr. N. O.** *Veterinarian & Head of Mobile Clinic of the Royal Veterinary & Agricultural College.* Zoological Gardens Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Clifford, Prof. Donald H., D.V.M.** *Veterinarian.* St. Paul's Como Zoo, 1224 Lexington Avenue N., St. Paul 3, Minn., U.S.A.
- Cimarko, Ing. Gustav.** *Zoo Director.* Zoologická zahrada-Bojnice, Bojnice, okr. Prievidza, Czechoslovakia.
- Coates, Christopher.** *Director of the Aquarium.* New York Aquarium, Boardwalk at West 8th Street, Brooklyn 24, N.Y., U.S.A.
- Colgate, R.** *Head Gardener.* Chessington Zoo, Chessington, Surrey, Great Britain.
- Collins, G. E., N.D.H., A.Inst.P.A.** *Zoo Curator.* Birmingham Botanical & Horticultural Society Ltd., Westbourne Road, Edgbaston, Birmingham 15, Great Britain.
- Columbus, D. W.** *Zoo Director.* See "Em Alive Zoo, Box 185, Red Lodge, Mont., U.S.A.
- Conant, Roger.** *Curator of Reptiles; Public Relations.* Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
- Conway, William G., B.A.** *Curator of Birds.* New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.
- Corbett, A. C. W.** *Clerk of Works.* Zoological Society of London, Whipsnade Park, Dunstable, Beds., Great Britain.
- Corson, Dr. P.** *Bacteriologist & Photographer.* Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.
- Coupe, Education & Public Relations Officer. Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.**
- Covert, Douglas C., B.S.** *Asst. Curator, Education & Children's Zoo.* Detroit Zoological Park, 8450 W.10 Mile Road, Royal Oak, Mich., U.S.A.
- Cox, Emory L.** *Zoo Director.* Municipal Zoo, Central Riverside Park, Nims & Murdock Street, Wichita 5, Kan., U.S.A.
- Crain, Marvin.** *Foreman.* Lincoln Park Zoo, R.t.1, Box 478, Lincoln Park, Oklahoma City, Okla., U.S.A.
- Crandall, Lee S.** *General Curator, Emeritus.* New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Crane, Jocelyn, M.S. Asst. Director, Department of Tropical Research. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Creuse, Georges P. Aquarium Director. "Aquarium Tropical de la Ville de Nice", Promenade des Anglais, Nice, A.M., France.

Cross, Dr. Robert. Veterinarian & Pathologist. Honolulu Zoo, Kalakaua & Kapahulu Avenues, Kapiolani Park, Honolulu 15, Hawaii, U.S.A.

Cully, William T. A. Zoo Director. Swope Park Zoological Gardens, 6701 Lister Avenue, Kansas City 30, Mo., U.S.A.

Cuneo, Franco. Zoo Director. Giardino Zoologico di Napoli, Campo Flegrei, Napoli, Italy.

Curry-Lindahl, Kai. Zoo Director. Nordiska Museet och Skansen, Stockholm, Sweden.

Cutler, C. J. Zoo Director. Wellington Zoological Gardens, Newtown Park, Wellington, New Zealand.

Cuyler, Gordon. Membership Chairman & Administrative Associate. New York Zoological Park, (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Dall, J. A., B.Sc., M.R.C.V.S. Consultant Veterinary Surgeon. Paignton Zoological & Botanical Gardens Ltd., Paignton, Devon, Great Britain.

Dalton, Major-General C. J. G., C.B., C.B.E. Controller. The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Dathe, Prof. Dr. Heinrich. Zoo Director & Director of Zoological Research Dept. of the German Academy of Science. Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Germany.

Davall, Grace. Asst. Curator, Mammals & Birds. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Davis, Don G. Zoo Director. Cheyenne Mountain Zoo, Box 158, Colorado Springs, Colo., U.S.A.

Davis, Earl F. Zoo Director. Columbus Zoo, Columbus, Ohio, U.S.A.

Davis, Joseph A. Jr., B.S. Associate Curator, Mammals. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Day, E. D. Asst. Director. The Zoological Society of London, Whipsnade Park, Dunstable, Beds., Great Britain.

Dean, George, D.I.P.A. Director of Parks Administration. Auckland Zoological Park, Auckland, New Zealand.

Dean, Richard. Senior Keeper. St. Paul's Como Zoo 1224 Lexington Avenue N., St. Paul 3, Minn., U.S.A.

De Alwis, W. L. E., B.Sc. Director-in-Training. The Government Zoological Gardens of Ceylon, (Dehiwala Zoo), Allan Avenue, Dehiwala, Ceylon.

De Bary, Gerald. Zoo Director. Hogle Zoological Garden, P.O. Box 2337, Salt Lake City, Utah, U.S.A.

De Latté, F. Labour Foreman. Audubon Park Zoo Audubon Park, New Orleans, La., U.S.A.

Douglass, George. Superintendent & Secretary. Audubon Park Zoo, Audubon Park, New Orleans, La., U.S.A.

Dijk, H. A. Van. Zoo Director. Tilburg's Natuur-Dierenpark, Bredaseweg 429, Tilburg, Netherlands.

Dijk, N. C. Van. Zoo Director. Tilburg's Natuur-Dierenpark, Bredaseweg 429, Tilburg, Netherlands.

Dijk, Q. P. C. Van. Zoo Director. Tilburg's Natuur-Dierenpark, Bredaseweg 429, Tilburg, Netherlands.

DiSanto, Louis R. Asst. Superintendent. Columbus Zoo, Columbus, Ohio, U.S.A.

Dixon, Norman Harry, F.C.A. Managing Director. Paignton Zoological & Botanical Gardens Ltd., Paignton, Devon, Great Britain.

Dobronucka, L. Curator of Ungulates. The Zoological Gardens, Prague, Czechoslovakia.

Doi, Hiroyuki. Zoo Director. Hanshin Park Zoo, Nishinomiyama City, Hyogo Prefecture, Japan.

Domán, Dr. G., D.pol. Asst. Director. Budapest Főváros Állat-És Növénykertje, Budapest, Hungary.

Doorn, C. Van. Superintendent of the Animal Department. Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.

Dose, Otto. Administrator. Georg von Opel-Freigehege für Tierforschung e.V., Kronberg im Taunus, Germany.

Dowling, Dr. Herndon, G., Ph.D. Associate Curator, Reptiles. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Downey, Theron E. Zoo Director. Potter Park Zoo, 717 E. Shawassee, Lansing 12, Mich., U.S.A.

Dozza, L., Dr. med. vet. Chief Veterinarian. Budapest Főváros Állat-És Növénykertje, Budapest, Hungary.

Driscoll, Charles B., B.S. Superintendent of Operations. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Dubik, Michael. Head Gardener. National Zoological Park, Washington 9, D.C., U.S.A.

DuMond, Frank V. Zoo Director. Monkey Jungle, P.O. Box 256, Goulds, Fla., U.S.A.

Dunton, Sam. Photographer. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Durrell, Gerald. Zoo Director. Jersey Zoological Park, Les Augres Manor, Trinity, Jersey, Channel Islands, Great Britain.

Ee, C. A. Van. Zoo Director. Bloemfontein Zoo, Curator Zoo, Bloemfontein, South Africa.

Eggert, Jim. Zookeeper Specialist—Reptile Department. Crandon Park Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Fla., U.S.A.

Ehlers, Dr. Kurt. Zoo Director & Veterinarian. Tiergarten und Nordsee-Aquarium, Bremerhaven, Germany.

Emmerik, H. Head Gardener. Zoological Gardens Royal Park, Parkville N.2, Melbourne, Victoria, Australia.

Encke, Dr. Walter. Zoo Director. Krefelder Tierpark, Krefeld, Uerdingerstr. 377, Germany.

Enchjelm, Curt af. Zoo Director. Högholmens Djurgård (Swedish) or Korkeasaaren Eläintarha (Finnish), Helsingfors, Finland.

Engler, Max. Head Keeper. Zoologischer Garten Basle, Basle, Switzerland.

Everett, Mrs. Superintendent of Children's Zoo (during summer). Highland Park Zoological Gardens, Highland Park, Pittsburgh 6, Pa., U.S.A.

Fagg, B. E. B. Zoo Director. Jos Museum Zoo, Jos, Nigeria.

Falck-Nyberg, Nina. Private Secretary. Zoological Gardens, Copenhagen, Roskildevej 32, Copenhagen, Denmark.

Farber-Moran, Shimon. Zoo Director. The Zoological Garden of the Biblical Institute, Hatishibi Str. 126, Haifa-Mt. Carmel, Israel.

Farley, Thomas. Superintendent of Maintenance. Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.

Farrar, Frank N. Zoo Director. Southport Zoological Society, Princes Park, Southport, Lancs., Great Britain.

Farrar, Helena. Curator. Southport Zoological Society, Princes Park, Southport, Lancs., Great Britain.

Fauntelroy, Travis E. Jr. Administrative Officer. National Zoological Park, Washington 9, Washington D.C., U.S.A.

Faust, Charles. Designer. San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.

Faust, Dr. Richard. Chief Assistant. Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz, 16, Germany.

Felix, J. Curator of Birds & Reptiles. The Zoological Gardens, Prague, Czechoslovakia.

Ferre, Ramon Ortiz. Zoo Director. Jardin Zoologico, Case de Fieras, Madrid, Spain.

Fiedler, Dr. W. Zoological Director. Tiergarten Schönbrunn, Wien XIII, Austria.

Flennes, R. N., M.A., M.R.C.V.S. Pathologist. The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Finneran, Leo. C. Asst. Curator, Aquarium. Detroit Zoological Park, 8450 W.10 Mile Road, Royal Oak, Mich., U.S.A.

Fischer, A., Dipl. Eng. Technical Superintendent. Budapest Főváros Állat-És Növénykertje, Budapest, Hungary.

Fisher, G. D., M.B.O.U. Zoo Director (Secretary). The Royal Zoological Society of Scotland, Zoological Park, Murrayfield, Edinburgh 12, Scotland, Great Britain.

Fleming, Henry. Entomologist, Dept. of Tropical Research. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Fletcher, John A., B.Sc. Zoo Director. St. Paul's Como Zoo, 1224 Lexington Avenue, N., St. Paul 3, Minn., U.S.A.

Flewin, L. M. Gardens Executive Officer. The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Floessler, Lloyd. Asst. Zoo Director. Washington Park Zoo, 4001 S.W. Canyon Road, Portland, Ore., U.S.A.

Fodor, Th., Dipl. Eng. Curator of Birds. Budapest Főváros Állat-És Növénykertje, Budapest, Hungary.

Fontaine, Pierre A. Zoo Director & Director of Aquarium & Game Fish Hatchery. The Dallas Zoo, 524 So. Marsalis Avenue, Dallas 3, Texas, U.S.A.

Fooks, Frank Edward. Zoo Director. Parc Zoologique de Clères, Clères, S.M., France.

Franccke, Heinrich. Veterinary Surgeon. Zoologischer Garten Berlin, Hardenbergplatz 8, Berlin West 30, Germany.

French, J. Leslie. Supervisor, Game Fish Hatchery. The Dallas Zoo, 524 So. Marsalis Avenue, Dallas 3, Texas, U.S.A.

Frick, Edwin, J. Zoo Director. Sunset Zoo, Kansas State College, Manhattan, Kan., U.S.A.

Fruchnicht, J. W. Office Manager. Audubon Park Zoo, Audubon Park, New Orleans, La., U.S.A.

Fukuda, Nobumasa. Animal Curator. Ueno Zoological Gardens, Ueno Park, Daito-ku, Tokyo, Japan.

Galm, John. Supervisor. Central Park Zoo—Prospect Park Zoo, 64th Street & Fifth Avenue, The Arsenal, New York 21, N.Y., U.S.A.

Galstaun, B. Zoo Director. Kebun Binatang Djakarta, Str. Tjiki Raya 73, Djawa, Djakarta, Indonesia.

Gandal, Dr. Charles P., D.V.M. Veterinarian. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Gaworkiewicz, Aleksander. Zoo Director. Miejski Ogród Zoologiczny, ul. Konstantynowska 8/10, Łódź, Poland.

Gay, Miss Grace E. Private Secretary. The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Gedack, Anni. Technical Asst. Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Germany.

George, F. S. Aquarist. Chessington Zoo, Chessington, Surrey, Great Britain.

Gesterfeld, Arnold G. Superintendent of Parks & Recreation. Riverside Park Zoo, City Hall, Scottsbluff, Neb., U.S.A.

Gewalt, Dr. Wolfgang. Scientific Asst. Zoologischer Garten Berlin, Hardenbergplatz 8, Berlin West 30, Germany.

Gill, J., B.V.S.C. Hon. Veterinarian. Wellington Zoological Gardens, Newtown Park, Wellington, New Zealand.

Gilmour, E. F., F.M.A., M.S.B.E. Zoo Director. Doncaster Zoo, Museum & Art Gallery, Waterdale, Doncaster, Yorks., Great Britain.

Gladman, F. L. Senior Head Keeper. The Zoological Society of London, Whipsnade Park, Dunstable, Beds., Great Britain.

Glaser, J., Hofrat Dipl. Ing. General Director. Tiergarten Schönbrunn, Wien XIII, Austria.

Glespen, Raymond. Public Relations Officer. Central Park Zoo—Prospect Park Zoo, 64th Street & Fifth Avenue, The Arsenal, New York 21, N.Y., U.S.A.

Glocker, Konrad. Zoo Director. Tierpark Dortmund, Dortmund - Brünninghausen, Mergelsteichstr. 80, Germany.

Godoy, Ing. Agr. E. A. de. Zoo Director. Jardin Zoologico, Mendoza, Republic of Argentina.

Goffer, B. Zoo Director. Gan Hakhayot Tel Aviv, Keren Kayemeth BLVD, Tel Aviv, Israel.

Good, Miss Barbara J., B.A. Asst. Secretary. Royal Zoological Society of Ireland, Phoenix Park, Dublin, Eire.

Goodwin, Edward L. Zookeeper Specialist, Mammals. Crandon Park Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Fla., U.S.A.

Gordon, Clyde. Zoo Director & General Curator. Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.

Gordon, J. Fritz. President. Zoological Society of Florida, P.O. Box 589, Miami 31, Fla., U.S.A.

Gorman, Patrick. Curator of Mammals. Columbus Zoo, Columbus, Ohio, U.S.A.

Gorovitz, Dr. C. H. Veterinary Surgeon. Gan Hakhayot Tel Aviv, Keren Kayemeth BLVD, Tel Aviv, Israel.

Goss, Dr. Leonard J., D.V.M., Ph.D. Zoo Director. Cleveland Zoological Park, Cleveland 9, Ohio, U.S.A.

Gowda, Dr. M. H. Mari, M.Sc., Ph.D. Zoo Director. Sri Chamarajendra Zoological Gardens, Mysore, South India.

Gowda, Sri M. Shivane. Warden. Sri Chamarajendra Zoological Gardens, Mysore, South India.

Graber, Dr. Zoologist. Zoologischer Garten, Zürich 44, Switzerland.

Grabowski, Ir. T. Zoo Director. Zamosc Zoological Gardens, Zamosc, Poland.

Grac, Ludvik. Zoo Director. Zoologická zahrada Decin, Decin, Czechoslovakia.

Graham-Jones, O., M.R.C.V.S. Veterinary Officer. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.

Graves, Ronald S. Curator of Fish & Reptiles. Memphis Zoological Garden & Aquarium, Memphis 12, Tenn., U.S.A.

Gray, Raymond F. Zoo Director. Memphis Zoological Garden & Aquarium, Memphis 12, Tenn., U.S.A.

Greed, R. E. Zoo Director. Bristol, Clifton & West of England Zoological Society, Clifton, Bristol 8, Great Britain.

Grigera, Dr. Thomas Enrique. Zoo Director. Jardin Zoologico, La Plata, Republic of Argentina.

Grimmer, J. Lear. Associate Director. National Zoological Park, Washington 9, Washington D.C., U.S.A.

Griswold, John Augustus. Curator of Birds. Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.

Grummt, Wolfgang. Dipl. Biol. Head Asst., Curator for Birds. Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Germany.

Grünbergrova, Marie. Treasurer. Zoologická zahrada Ostrava, Ostrava, Czechoslovakia.

Grüner, Manfred, *Dipl. Biol. Asst. at the Zoological Research Dept. of the German Academy of Science*, Tierpark Berlin, Schloss strasse, Berlin-Friedrichsfelde, Germany.

Grzimek, Dr. Bernhard, *Zoo Director*, Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz 16, Germany.

Guldal, J. A., *and. mag. Consultant Pathologist*, Zoological Gardens Copenhagen, Roskildevej 32, Copenhagen F., Denmark.

Haas, Dr. Gerhard, *Scientific Asst.*, Zoologischer Garten Wuppertal, Wuppertal-Elberfeld, Hubertusallee 30, Germany.

Haast, Clarita Matthews, *Asst. Director*, Miami Serpentarium, 12655 South Dixie Highway, Miami 56, Fla., U.S.A.

Haast, W. E., *Director*, Miami Serpentarium, 12655 South Dixie Highway, Miami 56, Fla., U.S.A.

Haggard, Vincent D., *Zoo Director*, Adelaide Zoological Gardens, Frome Road, Adelaide, South Australia, Australia.

Halloran, Dr. John L., *Consultant Veterinarian*, Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.

Hallstrom, Sir Edward, *Zoo Director*, Taronga Zoological Park Trust, Mosman, Sydney, New South Wales, Australia.

Hamilton, Count Björn, *Zoo Director*, The Game Park of Scone, Höör, Sweden.

Hansen, Leth H., *Consultant Engineer*, Zoological Gardens Copenhagen, Roskildevej 32, Copenhagen F., Denmark.

Harnóczy, G., *Dipl. Eng. Asst. Curator*, Budapest Fővárosi Állat-és Növénykertje, Budapest, Hungary.

Harwood, C. G., *Transport Officer*, The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Hayashi, Juro, *Director of Tama Zoo (see Ueno Zoo, Tokyo)*, Tama Zoological Park, Hino-machi, Minamitama-gun, Tokyo, Japan.

Hays, Howard, *Supervisor*, Highland Park Zoological Gardens, Highland Park, Pittsburgh 6, Pa., U.S.A.

Heck, Dr. Heinz, *Zoo Director*, Tierpark Hellabrunn, München 9, Siebenbrunnerstr. 6, Germany.

Hediger, Prof. Dr. H., *Zoo Director*, Zoologischer Garten, Zürich 44, Switzerland.

Heeg, R., *Head Gardener*, National Zoological Gardens of South Africa, P.O. Box 754, Boom Street, Pretoria, South Africa.

Helfer, Ralph D., *Zoo Director*, Nature's Haven Wild Animal Rentals, Route 1, Box 163 H, Saugus, Calif., U.S.A.

Hendershott, R. Benton, *Comptroller*, Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.

Henning, Dr. Franz, *Consultant Veterinary Surgeon*, Zoologischer Garten Wuppertal, Wuppertal-Elberfeld, Hubertusallee 30, Germany.

Henning, Rolf W., *Head Keeper*, Assiniboine Park Zoo, Winnipeg, Manitoba, Canada.

Herald, Dr. Earl S., *Curator of Aquatic Biology*, Steinhart Aquarium, Garden Gate Park, San Francisco 18, Calif., U.S.A.

Herbst, Karl, *Superintendent & State Inspector*, Zoologischer Garten Wuppertal, Wuppertal-Elberfeld, Hubertusallee 30, Germany.

Herzberger, Arthur, *Veterinarian*, Cheyenne Mountain Zoo, Box 158, Colorado Springs, Colo., U.S.A.

Heuschele, Dr. Werner P., *D.V.M. Veterinarian, Manager of the Hospital & Laboratory, Secretary of the Research Council*, San Diego Zoological Gardens, Balboa Park, Box 551, San Diego, Calif., U.S.A.

Heusser, John F., *Zoo Director*, Zoological Society of Cincinnati, Inc., 3400 Vine Street, Cincinnati, Ohio-Zone, U.S.A.

Hill, Clyde A., B.S., M.S., *Asst. Curator of Mammals*, San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.

Hill, Clyde E., *Denver Zoological Gardens, City Park*, Denver 5, Colo., U.S.A.

Hill, Dr. W. C. Osman, M.D., F.R.S.E., F.L.S., *Prosecutor*, The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Hill, W. N., F.H.C.I., *Catering Manager*, The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.

Hinton, Sam, *Curator*, T. Wayland Vaughan Aquarium-Museum, Scripps Institute of Oceanography, University of California, La Jolla, Calif., U.S.A.

Hoff, William J., *Curator*, Lincoln Park Zoological Gardens, 100 West Webster Avenue, Chicago 14, Ill., U.S.A.

Højgaard, Mogens, *Mag.sc. Aquarium Director*, Danmarks Akvarium, Charlottenlund, Denmark.

Homan, Wayne C., *Head Zookeeper*, Crandon Park Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Fla., U.S.A.

Hooff, R. A. Th. Van, J.D., *Zoo Director*, Burgers' Natuur-Dierenpark, Schelmsweg 85, Arnhem, Netherlands.

Hoover, Ella, *Controller*, San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.

Hoppe, Engelbert, *Manager*, Verein Bochumer Tierparkfreunde e.V., Geschäftstestell, Tierpark im Stadtpark, Bochum, Germany.

Horten, Helmut, *President*, Duisburger Tierpark A.G., Mülheimerstrasse 273, Duisburg, Germany.

Hoshino, Toshikane, *Zoo Director*, Misaki Natural Zoo, Misaki Machi, Osaka Prefecture, Japan.

House, Edward J., *Superintendent*, Highland Park Zoological Gardens, Highland Park, Pittsburgh 6, Pa., U.S.A.

Hubbard, Wynant Davis, *Zoo Director*, Zoological Society of Florida, P.O. Box 589, Miami 31, Fla., U.S.A.

Hulme, Mrs. M., *Cafeteria & Kiosk Manageress*, Zoological Gardens, Royal Park, Parkville N.2, Melbourne, Victoria, Australia.

Hume, Rex, *Superintendent*, Marineland of the Pacific Oceanarium, Marineland, Calif., U.S.A.

Ibaragi, Juji, *Zoo Director*, Kumamoto Municipal Zoo, Kumamoto City, Kumamoto Prefecture, Japan.

Ikedo, Takamasa, *Zoo Director*, Ikeda Industrial Zoo, Okayama City, Okayama Prefecture, Japan.

Iken, B. J., *Asst. Accountant*, The Zoological Society of London, Whipsnade Park, Dunstable, Beds., Great Britain.

Iles, Gerald T., *Zoo Director*, Montreal Children's Zoo (Jardin de Merveilles), 4000 Avenue Calixa-Lavallée, Lafontaine Park, Montreal 24, Canada.

Irving, George H., *Curator*, Lincoln Park Zoological Gardens, 100 West Webster Avenue, Chicago 14, Ill., U.S.A.

Ivanov, Dr. Arseni, *Veterinary Surgeon*, The Zoological Garden, 15 Tolbuhin Bul., Sofia, Bulgaria.

Jacobi, Dr. E. F., *Zoo Director*, Koninklijk Zoologisch Genootschap Natura Artis Magistra, Plantage Kerklaan 40, Amsterdam, Netherlands.

Jaksztien, Dr. Klaus-Peter, *Chief Veterinary Asst.*, Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Germany.

Jarboe, Robert, *Superintendent of Buildings & Grounds*, San Diego Zoological Garden, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.

Jaros, MVDr. Z., *Head of the Veterinary Department*, The Zoological Garden, Prague, Czechoslovakia.

Jarvis, Caroline B.A., *Associate Editor of the International Zoo Yearbook, Secretary of the Young Zoologists' Club*, The Zoological Society of London, The

Senior Zoo Staff

- Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
- Jenkins, Richard C.** *Borough Director*. Central Park Zoo—Prospect Park Zoo, 64th Street & Fifth Avenue, The Arsenal, New York 21, N.Y., U.S.A.
- Jensen, S.** *Superintendent of Buildings & Grounds*. Zoological Gardens of Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Johnch, Antonio.** *Zoo Director*. Parc Zoologico de Barcelona, Parc de la Ciudadela, Barcelona, Spain.
- Johnson, Edward J.** *Zoo Director*. Woodland Park Zoological Gardens, 5400 Phinney Avenue, Seattle 3, Washington, U.S.A.
- Junge, Carlos.** *Zoo Director*. Jardin Zoologico de Chillan Viejo, Chile.
- Kagawa, A. I.** *Zoo Director*. Fukuoka Zoological Gardens, South Park, Fukuoka City, Kyushu Island, Japan.
- Kagawa, Hayami.** *Manager*. Ritsurin Park Zoo, Ritsurin Park, Takamatsu, Kagawaken, Japan.
- Kagawa, Kazumi.** *Curator & Veterinarian*. Ritsurin Park Zoo, Ritsurin Park, Takamatsu, Kagawaken, Japan.
- Kagawa, Matsutaro.** *Zoo Director*. Ritsurin Park Zoo, Ritsurin Park, Takamatsu, Kagawaken, Japan.
- Kagawa, Mitami.** *Asst. Director & Curator*. Ritsurin Park Zoo, Ritsurin Park, Takamatsu, Kagawaken, Japan.
- Kajiwaru, Shigemori.** *Zoo Director*. Kamoike Municipal Zoo, Kagoshima City, Kagoshima Prefecture, Japan.
- Kaneko, Yoshiro.** *Asst. Pathologist* (Kyushu Dental College). Itozu Zoo Park, Kokura City, Fukuoka Province, Japan.
- Kano, Yoshio.** *Zoo Director*. Nagoya Municipal Higashiyama Zoo, 215 2 chome, Higashiyamamoto, machi, Chikusa-ku, Nagoya, Japan.
- Kaufeld, Carl F.** *Staff Curator of Reptiles*. Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.
- Kearney, Edward J.** *Manager, Facilities Dept.* New York Zoological Park (Bronx Zoo) 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.
- Klacz-Sulyok, Mrs. M.** *Dipl. Eng. Curator of the Botanical Section*. Budapest Főváros Állat-és Növénykertje, Budapest, Hungary.
- Kidosaki, Kazuma.** *Asst. Zoo Director*. Itozu Zoo Park, Kokura City, Fukuoka Province, Japan.
- Kill, Martin.** *Overseer*. Zoological Gardens Copenhagen, Roskildevej, 32, Copenhagen F., Denmark.
- Kirchsofer, Dr. Rosel.** *Zoologist & Scientific Asst.* Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz 16, Germany.
- Klöppel, Dr. Günther.** *Consultant Veterinary Surgeon*. Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz 16, Germany.
- Klöß, Dr. Heinz-Georg.** *Zoo Director*. Zoologischer Garten Berlin, Berlin West 30, Hardenbergplatz 8, Germany.
- Knipe, Walter E.H.** *Service Manager*. Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
- Knobloch, Herbert.** *Asst. Curator, Education*. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.
- Kobayashi, Shigeru.** *Zoo Director*. Itozu Zoo Park, Kokura City, Fukuoka Province, Japan.
- Koga, Tadachichi.** *Zoo Director*. Ueno Zoological Gardens, Ueno Park, Daito-ku, Tokyo, Japan.
- Kolář, MVDr. Zdeněk.** *State Veterinarian*. Zoologická zahrada Ostrava, Ostrava, Czechoslovakia.
- Kong, Ha Toon.** *Zoo Director*. The National Zoological Gardens of Korea, Changgyong Park, Seoul, Korea.
- Kotarba, Ir. I.** *Zoo Director*. Pole Zoological Gardens, Pole, Poland.

- Koyama, Takeo.** *General Superintendent*. Ueno Zoological Gardens, Ueno Park, Daito-ku, Tokyo, Japan.
- Kozlars, A.** *Zoo Director*. Krakow Zoological Gardens, Krakow, Poland.
- Kraus, Dr. Manfred.** *Scientific Asst.* Tiergarten Nürnberg, Am Tiergarten 30, Nürnberg, Germany.
- Kummer, H.** *Scientific Asst.* Zoologischer Garten, Zürich 44, Switzerland.
- Kummer, Dr. Joh.** *Zoo Director (part-time)*. Tiergarten Stendal, Stendal, Bezirk Magdeburg, Germany.
- Kupfer, Max.** *President*. Heimattiergarten Neumünster, Neumünster/Holstein, Geerdstrasse 100, Germany.
- Lahiri, Shri R. K., M.Sc., G.V.Sc.** *Superintendent & Joint Secretary*. Alipore Zoological Gardens, Calcutta 27, West Bengal, India.
- Lambert, D. G., M.A.** *Education Officer* (until 31.12.59). The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
- Lambrechts, A. H.** *Head Keeper, Acting Curator*. City of Johannesburg, Parks & Community Services Department, Zoological Gardens, Hermann Eckstein Park, P.O. Box 2824, Johannesburg, South Africa.
- Landis, George.** *Curator of the Aquarium*. Columbus Zoo, Columbus, Ohio, U.S.A.
- Landowski, Dr. J.** *Zoo Director*. Miejski Ogród Zoologiczny w Warszawa-4, Ratuszowa str. 1/3, Poland.
- Landsman, H.** *Curator of the Natural History Museum*. Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.
- Lang, Dr. E. M.** *Zoo Director & Veterinarian*. Zoologischer Garten Basle, Basle, Switzerland.
- Lanworn, A. R.** *Overseer of Reptiles*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
- Lee, G. J. P. Van Der.** *Chief Technician*. Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.
- Legge, R. E.** *Curator*. The Blackpool Tower Zoo & Aquarium, The Blackpool Tower Co. Ltd., Zoo & Aquarium Dept., Blackpool, Lancs., Great Britain.
- Leighton, Herbert R., B.S.** *Supervisor, Horticulture & Ground Maintenance*. Detroit Zoological Park, 8450 W. 10 Mile Road, Royal Oak, Mich., U.S.A.
- Lel, James S.** *Superintendent*. British Guiana Zoo, Botanical Gardens, Georgetown, British Guiana.
- Lensmeyer, F. Sr.** *Asst. Superintendent*. Audubon Park Zoo, Audubon Park, New Orleans, La., U.S.A.
- Lerner, M., M.Sc.** *Zoologist*. Gan Hakhyot Tel Aviv, Keren Kayemeth BLVD, Tel Aviv, Israel.
- Lindemann, Roland.** *Director*. Catskill Game Farm Inc., Route 1, Catskill, N.Y., U.S.A.
- Lindvig, Leona.** *Asst. Zoo Director*. Jungle Park Zoo, 6232 N. Seventh Street, Phoenix, Ariz., U.S.A.
- Lindvig, Les.** *Zoo Director & Owner*. Jungle Park Zoo, 6232 N. Seventh Street, Phoenix, Ariz., U.S.A.
- Linley, T. A., F.Inst.P.A.(S.A.), A.Inst.P.A.(Inc.).** *Zoo Director, Parks & Amenities Dept.* The Queen's Park Zoo, P.O. Box 134, East London, South Africa.
- Lint, Kenton C., B.S.** *Curator of Birds*. San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
- Lopes, Dr. Joaquim Soares.** *Veterinarian*. Jardim Zoologico e de Aclimação em Portugal, Estrada de Benfica, Lisboa, Portugal.
- Lopez, Jorge Rivera.** *Asst. Director*. University of Puerto Rico Zoo, College Station Mayaguez, Puerto Rico.
- Louwman, P. W.** *Zoo Director*. Wassenaar Zoo, 657 Rijksstraatweg, Wassenaar, Netherlands.
- Lovato, Frank.** *Curator*. Rio Grande Park Zoo, 903 10th St. S.W., Albuquerque, N.M., U.S.A.
- Luera, Miguel.** *Veterinarian & Pathologist*. Parc Zoologico de Barcelona, Parc de la Ciudadela, Barcelona, Spain.

Luera, Ramon. *Veterinary Curator.* Parc Zoologico de Barcelona, Parc de la Ciudadela, Barcelona, Spain.
Lukaszewick, Karol Jan. *Zoo Director.* Miejski Ogród Zoologiczny, ul. Wroblewskiego 1, Wrocław, Poland.
Lumsford, William H. *Asst. Head Zookeeper.* Crandon Park Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Fla., U.S.A.
Lyall, W. K. *Superintendent.* Zoological Gardens South Perth, Labouchere Road, South Perth, Western Australia, Australia.
Lynch, James. *Park Supervisor.* Washington Park Zoo, 4500 W. Vliet Street (old zoo) & Milwaukee County Zoological Gardens, 101 N.100 Street (new zoo), Milwaukee, Wisc., U.S.A.
Lyons, L. W. *Zoo Director.* See 'Em Alive Zoo, Box 185, Red Lodge, Mont., U.S.A.

Mabbatt, Frederic S., B.A., M.A. *Asst. Director of Public Relations.* San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
McBride, A. D. *Zoo Director.* Pacific Ocean Park, Ocean Park, Calif., U.S.A.
McCabe, Luke. *Head Keeper.* Central Park Zoo—Prospect Park Zoo, 64th Street & Fifth Avenue, The Arsenal, New York 21, N.Y., U.S.A.
McCarthy, Ted. *Zoo Director.* Gage Park Zoo, 6th-10th & Gage Street, Topeka, Kan., U.S.A.
Machob, Mhd. *Asst. Director.* Kebun Binatang Djakarta, Str Tjikini Raya 73, Djawa, Djakarta, Indonesia.
Machi, Shigeo. *Zoo Director.* Himeji Municipal Zoo, Himeji City, Hyogo Prefecture, Japan.
McInnis, Frank G., B.S. *Zoo Director.* Detroit Zoological Park, 8450 W.10 Mile Road, Royal Oak, Mich., U.S.A.
McLean, A., J.P., B.Sc., M.R.C.V.S., D.V.H. *Zoo Director & Veterinary Surgeon.* Bellevue Zoological Gardens, 3 Stewart Street, Belfast, Northern Ireland, Great Britain.
Majek, Jan. *Zoo Director.* Zoological Garden, Bratislava, Czechoslovakia.
Maloney, William J. *Superintendent.* Children's Zoo, Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
Mark, I. L. *Superintendent Plant Dept.* Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.
Markgren, Gunnar. *Ecologist (zoology).* Nordiska Museet och Skansen, Stockholm, Sweden.
Marks, Jack. *Zoo Director.* Washington Park Zoo, 4001 S.W. Canyon Road, Portland, Ore., U.S.A.
Marley, Robert. *Asst. Zoo Director.* Houston Zoological Gardens, 509 City Hall, Houston, Texas, U.S.A.
Massalski, M. *Zoo Director.* Gdansk Zoological Gardens, Gdansk, Poland.
Matejak, Ivan. *Zoo Director.* Zooloski vrt Grada Zagreba, Post Box 349, Zagreb, Yugoslavia.
Matsumoto, Torao. *Zoo Director.* Takarazuka Zoo, Takarazuka City, Hyogo Prefecture, Japan.
Matthews, Dr L. Harrison, M.A., Sc.D., F.R.S. *Scientific Director.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
Mattlin, Robert H. *Zoo Director.* Crandon Park Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Fla., U.S.A.
Mauersberger, Gottfried, Dipl.Biol. *Assistant—Zoological Research Dept. of the German Academy of Science.* Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfeld, Germany.
Mazerik, John. *Zookeeper Specialist—Mammal Dept.* Crandon Park Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Fla., U.S.A.
Menary, Robert V. *President & Director.* Cheyenne Mountain Zoo, Box 158, Colorado Springs, Colo., U.S.A.

Menichini, Patrick. *Head Keeper.* Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
Messerly, George D. *Aquarium Director.* National Aquarium, Commerce Building, Washington, D.C., U.S.A.
Meyer, Fred A. *Zoo Director.* John Ball Zoological Gardens, 301 Market Street, Grand Rapids, Mich., U.S.A.
Meyer-Holzappel, Dr Monica, Ph.D. *Zoo Director.* Zoological Park, Berne, Switzerland.
Mikoláš, Jiří. *Educational Asst.* Severočeská zoologická zahrada, Liberec, Czechoslovakia.
Miles, Miss E. *Secretary.* Wellington Zoological Gardens, Newtown Park, Wellington, New Zealand.
Mille-Baretto, Henrique Lahmeyer de. *Zoo Director.* Jardim Zoologico, Rio de Janeiro, Brazil.
Miller, Dr Robert C. *Director.* Steinhart Aquarium, Garden Gate Park, San Francisco 18, Calif., U.S.A.
Millowitsch, Dr C. Pedro Trebbau. *Zoo Director & Veterinarian.* Jardin Zoologico El Pinar, Caracas, Venezuela.
Monahan, William F. *Vice-President & General Manager.* Marineland of the Pacific Oceanarium, Marineland, Calif., U.S.A.
Monsiery, Dr A. El. *Zoo Director.* Giza Zoological Gardens, Cairo, United Arab Republic.
Moore, Jefferson W. *Supervisor.* Dallas Aquarium, The Dallas Zoo, 524 Marsalis Avenue, Dallas 3, Texas, U.S.A.
Moran, Dr Reid V., Ph.D. *Consultant Botanist.* San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
Moritomo, Tadao. *Curator & Veterinarian.* Itozu Zoo Park, Kokura City, Fukuoka Province, Japan.
Morris, Dr D. J., D.Phil. *Curator of Mammals.* Editor of the *International Zoo Yearbook.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1.
Morton, Dr Pathologist (Hon.). Bellevue Zoological Gardens, 3 Stewart Street, Belfast, Northern Ireland, Great Britain.
Mottershead, George Saul. *Zoo Director.* The North of England Zoological Society, Zoological Gardens, Upton-by-Chester, Chester, Great Britain.
Mulder, Dr S. *Veterinary Surgeon.* Burgers' Natuur-Dierenpark, Schelmseweg 85, Arnhem, Netherlands.
Müller, Dr Richard. *Zoo Director.* Zoologischer Garten Wuppertal, Wuppertal-Elberfeld, Hubertusallee 30, Germany.
Muntzner, John T. *Staff Aquarist.* Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.
Murphy, E. T. *Zoo Director.* Royal Zoological Society of Ireland, Phoenix Park, Dublin, Eire.
Muth, John. *Superintendent of Children's Zoo.* San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
Myers, Clifford L. *Superintendent.* Cheyenne Mountain Zoo, Box 158, Colorado Springs, Colo., U.S.A.
Myers, F. J. *Clerk of Works.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.

Nabi, Ahmed Abdel. *Zoo Director.* Khartoum Zoological Gardens, Khartoum, Sudan.
Naidenov, Naiden. *Senior Accountant.* The Zoological Garden, 15 Tolbuhin Bul., Sofia, Bulgaria.
Nakamura, M. *Zoo Director.* Maruyama Zoo, 3-1 Miyagaoka Maruyama, Sapporo-Hokkaido, Japan.
Neill, Wilfred T. *Director of Research Dept.* Ross Allen's Reptile Institute, Silver Springs, Fla., U.S.A.
Neubüser, Hellmut. *Zoo Inspector.* Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz 16, Germany.
Newman, Murray A. *Aquarium Curator.* Vancouver Public Aquarium, Stanley Park, Vancouver 8, B.C., Canada.

Senior Zoo Staff

- Newman, Ralph A.** *Zoo Director (Supt. of Public Parks).* Potawatomi Park Zoo & Storyland Zoo, Rum Village Park, 301 S. St. Louis Blvd., South Bend, Ind., U.S.A.
- Nicholls, C. G., M.P.O.A.** *Supplies Officer.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
- Nickon, Donald C., B.S.** *Zoologist.* Lincoln Park Zoological Gardens, 100 West Webster Avenue, Chicago 14, Ill., U.S.A.
- Nigrelli, Dr. Ross F., Ph.D.** *Pathologist.* New York Aquarium, Boardwalk at West 8th Street, Brooklyn 24, N.Y., U.S.A.
- Norcross, Park Superintendent.** Sunset Zoo, Kansas State College, Manhattan, Kan., U.S.A.
- Norgaard, Johanne.** *Cashier.* Zoological Gardens Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Norris, Kenneth.** *Curator of Mammals & Amphibians.* Marineland of the Pacific Oceanarium, Marineland, Calif., U.S.A.
- Novel, Dr. Prof. J., D.vet., Professor at the National Natural History Museum.** Zoo Director, Parc Zoologique, 53 Avenue de St.-Maurice, Paris XIIème, France & Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.
- Novotny, Miroslav.** *Zoo Director.* Zoopark Lesna u Gottwaldova, Posta Stipa, okr. Gottwaldov, Czechoslovakia.
- Nunez, T.** *Head Keeper.* Jardin Zoologico El Pinar, Caracas, Venezuela.
- Nyberg, Lars.** *Zoo Director.* AB Furuviksparken, Furuvik, Sweden.
- O'Connell, Harold J.** *Associate Curator of Reptiles.* Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.
- O'Connor, Dr. Patricia.** *Staff Veterinarian.* Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.
- Odening, Dr. Klaus.** *Head Asst.—Zoological Research Department of the German Academy of Science.* Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Germany.
- Oehme, Hans.** *Dipl.Biol. Asst.—Zoological Research Department of the German Academy of Science.* Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Germany.
- Oestreich, Oberinspektor Heinz.** *Head of Staff.* Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz 16, Germany.
- Ogino, Kizo.** *Zoo Director.* Toyohashi Municipal Zoo, Toyohashi City, Japan.
- Ohlman, J. G. L.** *Senior Animal Overseer.* The Government Zoological Gardens of Ceylon (Dehiwala Zoo), Allan Avenue, Dehiwala, Ceylon.
- Okkerse, A.** *Administrator.* Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.
- Olsen, Aage.** *Superintendent.* New York Aquarium, Boardwalk at West 8th Street, Brooklyn 24, New York, U.S.A.
- Olsson, Viking.** *Ecologist (zoology).* Nordiska Museet och Skansen, Stockholm, Sweden.
- Orbán, L.** *Dipl.Biol. Curator of First Mammal Section.* Budapest Főváros Állat—És Növénykertje, Budapest, Hungary.
- Osten, Henrietta C. von der.** *Office Manager.* Staten Island Zoo, 614 Broadway, Staten Island 10, N.Y., U.S.A.
- Owen, Miss E., O.B.E., B.A.** *Head of the General Department.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
- Owens, Claude.** *Superintendent.* Lee Richardson Zoo, Garden City, Kan., U.S.A.

- Pampel, Leonard.** *Aquarist.* Washington Park Zoo—4500 W. Vliet Street (old zoo) & Milwaukee County Zoological Gardens, 101 N.100 St. (new zoo), Milwaukee, Wis., U.S.A.
- Parietti, Dr. Enrique.** *Zoo Director.* Jardin Zoologico Municipal, Montevideo, Uruguay.
- Parkin, A. E., B.Sc.** *Curator of Aquarium & Zoo.* The Queen's Park Zoo, Queen's Park, East London, South Africa.
- Parramore, Miers F.** *Refreshment Manager.* Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
- Pasquier, Mlle. M.A.** *Licenciée en sciences.* Museum Asst.—Mammology, Ornithology, Library. Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.
- Pásztor, Dr. L., D.med.vet.** *Asst. Veterinarian.* Budapest Főváros Állat—És Növénykertje, Budapest, Hungary.
- Patterson, A. C.** *Superintendent of Parks Dept.* Borden Park Zoo, City of Edmonton Parks Dept., Civic Block, Edmonton, Alberta, Canada.
- Pearson, H. E.** *Zoo Director & Owner.* Pearson's Bird & Animal Farm, Southbury, Conn., U.S.A.
- Pearson, Mrs. H. E.** *Asst. Director.* Pearson's Bird & Animal Farm, Southbury, Conn., U.S.A.
- Pegg, P. A.** *Catering Manager.* The Dudley Zoological Society Ltd., Castle Hill, Dudley, Worcs., Great Britain.
- Pénzes, B.** *Dipl.Eng. Curator of Aquarium & Terrarium.* Budapest Főváros Állat—És Növénykertje, Budapest, Hungary.
- Perkins, R. Marlin.** *Zoo Director.* Lincoln Park Zoological Gardens, 100 West Webster Avenue, Chicago 14, Ill., U.S.A.
- Peters, Dr. J. C.** *Veterinarian.* Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.
- Pettera, John.** *Director & Owner.* Rose Park Zoo, Prairie du Chien, Wis., U.S.A.
- Pettigrew, Virgil L.** *Asst. Zoo Director.* Swope Park Zoological Gardens, 6701 Lister Avenue, Kansas City, Mo., U.S.A.
- Petzold, Dr. Hans-Günther.** *Asst. Director, Curator of Reptiles, Amphibians & Fish.* Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Berlin, Germany.
- Pickford, W.N., M.M., A.C.I.S.** *Establishments Officer & Chief Clerk.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
- Pillai, P. B. K.** *Veterinarian.* The Government Zoological Gardens of Ceylon (Dehiwala Zoo), Allan Avenue, Dehiwala, Ceylon.
- Pitschke, Helga.** *Radiographer.* Tierpark Berlin, Schloss strasse 1, Berlin-Friedrichsfelde, Berlin, Germany.
- Plazikowski, Uno.** *Temporary Asst. Director, Veterinarian.* Nordiska Museet och Skansen, Stockholm, Sweden.
- Poglayen, Dr. Ivo.** *Zoo Director.* Rio Grande Park Zoo, 903 10th Street S.W., Albuquerque, N.M., U.S.A.
- Pons, Dr.** *Zoo Director.* Jardin Zoologico Maracaibo, Maracaibo, ed Zulia, Venezuela.
- Poulsen, Dr. Holger.** *D.Phil. Curator of Birds.* Zoological Garden of Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Pournelle, Dr. George H., B.S., Ph.D.** *Curator of Mammals.* San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
- Price, M., M.L.C.V.S. Hon. Veterinarian.** Wellington Zoological Gardens, Newtown Park, Wellington, New Zealand.
- Quigley, George L.** *Director of Maintenance & Operations.* Central Park Zoo—Prospect Park Zoo, 64th Street & Fifth Avenue, The Arsenal, New York 21, N.Y., U.S.A.

- Ramanjulu, B. V.** *Zoo Director*. Delhi Zoological Park, New Delhi, India.
- Rao, Sri K. Gopala.** *Official—Sheristedar*. Sri Chamarajendra Zoological Gardens, Mysore, India.
- Rao, Sri K. N. Subba.** *Veterinary Inspector*. Sri Chamarajendra Zoological Gardens, Mysore, South India.
- Ratliffe, Dr Herbert L., Sc.D.** *Director of the Penrose Research Laboratory*. Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
- Ray, Carleton.** *Asst. to the Director*. New York Aquarium, Boardwalk at West 8th Street, Brooklyn 24, New York, N.Y., U.S.A.
- Reed, Dr Theodore H., D.V.M.** *Zoo Director*. National Zoological Park, Washington 9, D.C., U.S.A.
- Reichling, Dr Helmut.** *Scientific Asst. (until 1953.60 when was appointed Director of the Zoological Gardens, Münster, Westfalen, Germany)*. Zoologischer Garten Berlin, Hardenbergplatz 8, Berlin West 8, Germany.
- Reimers, Louis.** *Curator*. John G. Shedd Aquarium, 1200 South Lake Shore Drive, Chicago 5, Ill., U.S.A.
- Reuther, Ronald T., B.A.** *General Curator*. Cleveland Zoological Park, Cleveland 9, Ohio, U.S.A.
- Rhéalme, Ovide.** *General Superintendent*. Le Jardin Zoologique de Québec, Orsainville (via Charlesbourg), R. 54, Québec, Canada.
- Rhodes, E. G.** *Catering Manager*. The Zoological Society of London, Whipsnade Park, Dunstable, Beds., Great Britain.
- Rider, V. D., Jr.** *Zoo Director*. Zoorama, New Market, Richmond, Va., U.S.A.
- Rinard, Dr J., D.Vet.** *Veterinary Officer & Pathologist*. Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.
- Risdon, D. H. S.** *General Manager*. The Dudley Zoological Society Ltd., Castle Hill, Dudley, Worcs., Great Britain.
- Rivero, Dr Juan A.** *Director*. University of Puerto Rico Zoo, College Station, Mayaguez, Puerto Rico.
- Roche, Arthur.** *Supervisor, Building & Mechanical Maintenance*. Detroit Zoological Park, 8450 W.10 Mile Road, Royal Oak, Mich., U.S.A.
- Rogers, D.C., A.C.A.** *Secretary*. Chessington Zoo, Chessington, Surrey, Great Britain.
- Rohr, Wolfgang.** *Scientific Asst. (replacing Dr. H. Reichling)*. Zoologischer Garten Berlin, Hardenbergplatz 8, Berlin West 30, Germany.
- Rokosky, Emil J.** *Zoo Director*. Racine Zoological Park, 2131 North Main Street, Racine, Wis., U.S.A.
- Roots, G. C.** *Superintendent Designate*. Emperor Valley Zoo, Royal Botanic Gardens, Port of Spain, Trinidad, West Indies.
- Roth, A. E.** *Asst. Director*. Jacksonville Municipal Zoo, 8605 Zoo Road, Jacksonville 2, Fla., U.S.A.
- Roth, Hans-Peter.** *Asst. Director*. Rio Grande Park Zoo, 903 10th St. S.W., Albuquerque, N.M., U.S.A.
- Roth, Dr Harald H.** *Zoo Director*. Thüringer Zoopark, Erfurt, Roter Berg, Germany.
- Roth, Vincent, O.B.L., J.P., F.R.G.S.** *Zoo Director*. British Guiana Zoo, Botanical Gardens, Georgetown, British Guiana.
- Russold, A.** *Administrator (finance, etc.)*. Tiergarten Schönbrunn, Wien XIII, Austria.
- Rysgaard, Jens B.** *Asst. Director*. Zoological Gardens Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Saez, Dr M. E.** *Mycologist*. Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.
- Sameem, S. K.** *Superintendent, Gardens, Works*. The Government Zoological Gardens of Ceylon (Dehiwala Zoo), Allan Avenue, Dehiwala, Ceylon.
- Saporiti, Dr Enrique J.** *Zoo Director*. Jardín Zoológico de la Ciudad de Buenos Aires, Acevedo No. 2900, Buenos Aires, Republic of Argentina.
- Sarret, R.** *General Supervisor*. Ménagerie du Muséum, 3 Quai St.-Bernard, Paris 5ème, France.
- Satoji, Sempel.** *Zoo Director*. Kyoto Memorial Zoo, Okazaki Park, Kyoto City, Japan.
- Savona, Anthony.** *Asst. Director, Keeper of Birds*. Roeding Park Zoo, 890 West Belmont Street, Fresno 5, Calif., U.S.A.
- Schäfer, Hans.** *Zoo Director*. Tiergarten der Stadt Straubing, Straubing/Niederbayern, Germany.
- Schiemann, Herbert F., B.C.S.** *Comptroller*. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.
- Schlotz, Arne, cand. mag.** *Curator of Reptiles*. Zoological Garden Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Schlegel, Frits, M.A.A.** *Consultant Architect*. Zoological Garden Copenhagen, Roskildevej 32, Copenhagen F., Denmark.
- Schmitt, Dr Jakob.** *Veterinarian, Scientific Asst.* Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz, Germany.
- Schöchle, Albert.** *Zoo Director*. Wilhelma, Botanisch-Zoologischer Garten, Stuttgart-Bad Canstatt, Postschliessfach 1227, Germany.
- Schröder, Werner.** *Director of the Aquarium*. Zoologischer Garten Berlin, Hardenbergplatz 8, Berlin West 30, Germany.
- Schroeder, Dr Charles Robbins, D.V.M.** *Zoo Director*. San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
- Scollard, Dr Norman D., D.V.M., V.S.** *Zoo Director*. The Municipality of Metropolitan Toronto Riverdale Zoo, Winchester Street, Toronto, Ontario, Canada.
- Scutt, Miss C.** *Veterinarian*. Jersey Zoological Park, Les Augres Manor, Trinity, Jersey, Channel Islands, Great Britain.
- Sedlar, MVDr Dusan.** *Zoo Director*. Zoologická zahrada v Usti nad Labem, Svermova ul 870/23, Usti nad Labem, Czechoslovakia.
- Seekamp, Mrs. J.** *Publicity & Public Relations Officer*. Zoological Gardens, Royal Park, Parkville N.2., Melbourne, Victoria, Australia.
- Seifert, Siegfried.** *Zoo Director*. Zoologischer Garten Rostock, Rostock, Tiergartenallee 10, Germany.
- Seitz, Dr Alfred.** *Zoo Director*. Tiergarten Nürnberg, Am Tiergarten 30, Nürnberg, Germany.
- Seitz, Clyde.** *Head Keeper*. Columbus Zoo, Columbus, Ohio, U.S.A.
- Semsettinoglu, Haki.** *Zoo Director*. Ankara Zoo, Atatürk Orman Ciftligi Md., Hayvanat Bahçesi, Ankara, Turkey.
- Senior, Martin, M.R.C.V.S.** *Hon. Veterinary Surgeon*. The Zoological Society of London, Whipsnade Park, Dunstable, Beds., Great Britain.
- Shaw, Charles E., B.S.** *Asst. Managing Director & Curator of Reptiles*. San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
- Shelley, Freeman M.** *Zoo Director*. Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
- Shimizu, Eisei.** *Zoo Director*. Dogo Prefectural Zoo, Matsuyama City, Ehime Prefecture, Japan.
- Shulov, Prof. Aharon S., D.Sc.** *Zoo Director*. Jerusalem Biblical Zoological Garden Ltd., Roema, Jerusalem, Israel.
- Shute, Walter H.** *Director*. John G. Shedd Aquarium, 1200 South Lake Shore Drive, Chicago 5, Ill., U.S.A.
- Sieffoff, Horst.** *Zoo Director*. Löbbecke-Museum-Aquarium, Museumsbunker am Zoo, Düsseldorf, Germany.
- Silva, Dr Fernando Emygdio da.** *Zoo Director*. Jardim Zoológico e de Acclimação em Portugal, Estrada de Benfica, Lisboa, Portugal.
- Simpson, D. M.** *Asst. Curator of Aquatic Biology*. Steinhart Aquarium Garden Gate Park, San Francisco 18, Calif., U.S.A.
- Sinha, Shri Brindaban Chandra, M.A., LL.B.** *Hon. Secretary*. Alipore Zoological Gardens, Calcutta 27, West Bengal, India.

Senior Zoo Staff

Skeldon, Philip C. *Zoo Director*. Toledo Zoo Aquarium, 2700 Broadway, Toledo 9, Ohio, U.S.A.

Smith, A. *Head Keeper Pets' Corner*, Chessington Zoo, Chessington, Surrey, Great Britain.

Smith, K. J. *Superintendent*. Jersey Zoological Park, Les Augres Manor, Trinity, Jersey, Channel Islands, Great Britain.

Snazle, H. A. *General Manager*. Chessington Zoo, Chessington, Surrey, Great Britain.

Snow, Sydney. *Zoo Director*. Knowland State Arboretum & Park, 98th Avenue & Mountain Boulevard, Oakland 5, Calif., U.S.A.

Sorenson, Prof. Dale K., D.V.M. *Veterinarian*. St. Paul's Como Zoo, 1224 Lexington Avenue North, St. Paul 3, Minn., U.S.A.

Sosnovskii, Igor Petrovitch. *Zoo Director*. Moscow Zoo Park, Dom No. 1, Bolshaya Groozinskaya Yl., Moscow G-242, U.S.S.R.

Spaugh, Brit. D. *Superintendent*. City Park Zoo, Great Bend, Kan., U.S.A.

Speidel, George. *Zoo Director*. Washington Park Zoo, 4500 W. Vliet Street (old zoo) & Milwaukee County Zoological Gardens, 101 N.100 Street (new zoo), Milwaukee, Wis., U.S.A.

Spencer, Anthony A. *Superintendent*. William Land Park Zoo, Land Park Drive & Sutterville Road, Sacramento, Calif., U.S.A.

Sperber, Dr Perry A. *Director*. Sea Zoo, R.L.I., P.O. Box 4205, South Daytona, Fla., U.S.A.

Sprunck, O. *Managing Director (Administrative & Commercial)*. Duisburger Tierpark A.G., Mülheimerstrasse 273, Duisburg, Germany.

Squires, Raymond A. *Zoo Director*. Little Rock Zoo, 5100 West Eighth Street, Little Rock, Ark., U.S.A.

Stausberg, Robert. *Public Relations Officer*. Zoologischer Garten Frankfurt/Main, Frankfurt am Main, Alfred-Brehm-Platz, Germany.

Steinemann, P. *Technical Asst.* Zoologischer Garten Basle, Basle, Switzerland.

Stemmler, Carl. *Head Keeper*. Zoologischer Garten Basle, Basle, Switzerland.

Stengelhofen, F. A., L.R.I.B.A. *Architect*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.

Stewart, George. *Foreman*. The Municipality of Metropolitan Toronto Riverdale Zoo, Winchester Street, Toronto, Ontario, Canada.

Stone, Walter D. *Zoo Director*. Franklin Park Zoo, Columbia Road, Boston 21, and Middlesex Falls Zoo, 149 Pond Street, Stoneham, both Mass., U.S.A.

Stratton, G. B., M.B.E., A.L.S. *Librarian & Clerk of Publications*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.

Suarez, A. *Asst. Director*. Jardín Zoológico El Pinar, Caracas, Venezuela.

Suchier, J. *Inspector*. Gan Hakhayot Tel Aviv, Keren Kayemeth Blvd, Tel Aviv, Israel.

Szilgyi, G., Dipl.Eng. *Curator of Second Mammal Section*. Budapest Főváros Állat-és Növénykertje, Budapest, Hungary.

Takano, Dr Prof. Yoshitomi. *Pathologist (Kyushu Dental College)*. Itozu Zoo Park, Kokura City, Fukuoka Province, Japan.

Tamura, Tsuyoshi. *Zoo Director*. Japan Monkey Centre, Inuyama City, Aichi Prefecture, Japan.

Tapp, John W. *Asst. Chief Curator*. Memphis Zoological Garden & Aquarium, Memphis 12, U.S.A.

Taworski, Jr. T. *Zoo Director*. Plock Zoological Gardens, Plock, Poland.

Tee-Van, Dr John, D.Sc. *General Director*. New York Zoological Park (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.

Tejera, Alberto Duran. *Zoo Director*. Parque Zoológico de Jerez de la Frontera, Tempul, Jerez de la Frontera, Spain.

Temlett, G. C. Foreman & Storekeeper. National Zoological Gardens of South Africa, P.O. Box 754, Boom Street, Pretoria, South Africa.

Terauchi, Shinzo. *Zoo Director*. Tennoji Municipal Zoo, Tennoji, Osaka City, Japan.

Thein, U Kyaw, G.M.V.C. *Zoo Director*. Rangoon Zoological Gardens, Kandawgalay Post Office, Rangoon, Burma.

Thienemann, Dr H. G. *Zoo Director*. Duisburger Tierpark A.G., Duisburg, Mülheimerstrasse 273, Germany.

Thomas, Dr Warren D., D. vet. med., B.Sc. *Zoo Director*. Lincoln Park Zoo, Rt. 1, Box 478, Lincoln Park, Oklahoma City, Okla., U.S.A.

Thommen, Jakob. *Head Keeper*. Zoologischer Garten Basle, Basle, Switzerland.

Thompson, W. A., M.H.C.I. *Catering Manager*. Chessington Zoo, Chessington, Surrey, Great Britain.

Tinker, Spencer. *Director of the Aquarium*. Waikiki Aquarium, (University of Hawaii), 2777 Kalakaua Avenue, Honolulu, Hawaii, U.S.A.

Tomiyama, Kazuo. *Zoo Director*. Tokushima Municipal Zoo, Tokushima City, Tokushima Prefecture, Japan.

Tong, E. H., F.L.A.S. *Director of Whipsnade Park* (see Zoological Society of London). The Zoological Society of London, Whipsnade Park, Dunstable, Beds, Great Britain.

Trevisick, Charles H. *Zoo Director*. Ilfracombe Zoo Park, Comyn Hill, Ilfracombe, Devon, Great Britain.

Trousen, R., B.V.S.C. *Hon. Veterinarian*. Wellington Zoological Gardens, Newtown Park, Wellington, New Zealand.

Truett, F. Bob, B.S. *Zoologist*. Lincoln Park Zoological Gardens, 100 West Webster Avenue, Chicago 14, Ill., U.S.A.

Truxton, Jonathan A. *Asst. Director*. Detroit Zoological Park, 8450 W. Ten Mile Road, Royal Oak, Mich., U.S.A.

Tully, R. *Head Gardener*. The Zoological Society of London, Whipsnade Park, Dunstable, Beds., Great Britain.

Turek, Ing. A. *Head of the Technical Dept.* The Zoological Gardens, Prague, Czechoslovakia.

Turner, Elvie Jr. *Curator*. The Dallas Zoo, 524 Marsalis Avenue, Dallas 3, Texas, U.S.A.

Tussey, Clyde. *Public Relations Officer*. Marineland of the Pacific Oceanarium, Marineland, Calif., U.S.A.

Tuthill, C. Carr. *Asst. Curator*. T. Wayland Vaughan Aquarium-Museum, Scripps Institute of Oceanography, (University of California), La Jolla, Calif., U.S.A.

Ulrich, Dr Wolfgang. *Zoo Director*. Zoologischer Garten der Stadt Dresden, Dresden A.20, Tiergarten Strasse 1, Germany.

Ulmer, Frederick A., Jr. *Curator of Mammals*. Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.

Urago, Dr Athushi. *Asst. Professor of Pathology (Kyushu Dental College)*. Itozu Zoo Park, Kokura City, Fukuoka Province, Japan.

Vajda, D. *Chief Manager*. Budapest Főváros Állat-és Növénykertje, Budapest, Hungary.

Velichkova, Raina. *Zoo Technician*. The Zoological Garden, 15 Tolbuhin Bul., Sofia, Bulgaria.

Veselsky, Dr Zdenek. *Zoo Director*. The Zoological Gardens, Prague, Czechoslovakia.

Vevers, Dr H. Gwynne., M.B.E., M.A., D.Phil. *Curator of the Aquarium, Acting Curator of Reptiles, Acting Curator of Invertebrates*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.

Vickers, Dr James H. *Veterinarian*. Columbus Zoo, Columbus, Ohio, U.S.A.

Vierheller, George P. *Zoo Director*. St. Louis Zoological Garden, Forest Park, St. Louis 10, Mo., U.S.A.

Vinall, H. *Overseer of Mammals*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
 Vinland, Lisle. *Superintendent of Public Services*. San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
 Vitek, Bohumil. *Zoo Director*. Zoologická zahrada Ostrava, Ostrava, Czechoslovakia.
 Vo-Doan-Minh. *Zoo Director*. Thao-cam-Vien, Saigon, Vietnam.
 Volf, J. *Curator of Small Mammals & Primates*. The Zoological Gardens, Prague, Czechoslovakia.
 Voss, Dr. Guenter. *Zoo Director*. Assiniboine Park Zoo, Winnipeg, Manitoba, Canada.

Wackernagel, Dr. H. *Scientific Asst.* Zoologischer Garten Basle, Basle, Switzerland.
 Wade, Wallace B., B.S. *Director of Public Relations*. San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
 Wagner, Blount R. *Zoo Director*. Mesker Park Zoo, Bement Avenue, Evansville, Ind., U.S.A.
 Waldo, Raymond. *Asst. Zoo Director*. Gage Park Zoo, 6th-10th and Gage Street, Topeka, Kan., U.S.A.
 Walther, Fritz. *Dipl. Psychologe*. *Zoo Director*. Georg von Opel-Freigehege für Tierforschung e.V., Kronberg im Taunus, Germany.
 Ward, J. *Overseer of Birds*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
 Ward, James. *Asst. Foreman*. Lincoln Park Zoo, Rt.1 Box 478, Lincoln Park, Oklahoma City, Okla., U.S.A.
 Watanabe, Genji. *Superintendent of Staff, Information & Tickets*. Ueno Zoological Gardens, Ueno Park, Dito-ku, Tokyo, Japan.
 Watson, Arthur R. *Zoo Director*. Baltimore Zoo, Druid Hill Park, Baltimore 17, Md., U.S.A.
 Watson, Daniel M. *Zoo Director*. Henry Vilas Park Zoo, 500 S. Randall, Madison 5, Wisconsin, U.S.A.
 Watts, Dr. P. S., D.Sc., Ph.D., F.R.C.V.S. *Hon. Veterinary Officer*. Adelaide Zoological Gardens, Frome Road, Adelaide, South Australia, Australia.
 Weilenmann, Dr. P. *Veterinarian*. Zoologischer Garten, Zürich 44, Switzerland.
 Weimann, Major Aubrey Neil, O.B.E., C.M.Z.S. *Zoo Director*. The Government Zoological Gardens of Ceylon (The Dehiwala Zoo), Ailan Avenue, Dehiwala, Ceylon.
 Wells, Earl B. *Curator-Director*. Seneca Park Zoo, Rochester, N.Y., U.S.A.
 Wendelboe, Kaj. *Zoo Director*. A/S Aalborg Zoologiske Have, Molleparkvej, Aalborg, Denmark.
 Wendt, W. *Asst. Director*. Zoologischer Garten Basle, Basle, Switzerland.
 Wendt, Dr. Wallace E., D.V.M. *Veterinarian (part-time)*. Cleveland Zoological Park, Cleveland 9, Ohio, U.S.A.
 Werler, John E. *Curator*. Houston Zoological Gardens, 509 City Hall, Houston, Texas, U.S.A.
 Westwood, S. A. *Accountant & Clerk to the Council*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
 Wheaton, Harold D. *Zoo Director & Owner*. Hill City Zoo, Box 1791, Rapid City, S.D., U.S.A.
 Whichelo, Mrs. B. *Party Organiser*. Chessington Zoo, Chessington, Surrey, Great Britain.
 Whiston, G. W. *Secretary & Registrar*. The Dudley Zoological Society Ltd., Castle Hill, Dudley, Worcs., Great Britain.
 Whittam, A. G. *Zoo Director*. Zoological Gardens, Royal Park, Parkville, N.2, Melbourne, Victoria, Australia.
 Willemann, Antoine. *Zoo Director*. Jardin Zoologique de la Ville de Mulhouse, 1 Avenue de la Ge. D.I.C., Mulhouse, H.R., France.

Williams, Mrs. Elinor K. *Secretary*. Crandon Park Zoological Garden, 4000 Crandon Boulevard, Key Biscayne, Miami, Fla., U.S.A.
 Williams, G. M. *Zoo Director*. Clinch Park Zoo, Grandview Parkway, Traverse City, Mich., U.S.A.
 Williamson, Franklin. *Photographer*. Philadelphia Zoological Garden, 34th Street & Girard Avenue, Philadelphia 4, Pa., U.S.A.
 Wilson, William. *Zoo Director*. Belle Vue Zoological Gardens, Manchester 12, Great Britain.
 Windecker, Dr. Wilhelm. *Zoo Director*. Aktiengesellschaft Zoologischer Garten Köln, Köln, Riehlerstrasse 173, Germany.
 Witowski, Dr. Beleslaw. *Zoo Director*. Miejski Ogród Zoologiczny, Poznań, ul. Zwierzyniecka 19, Poland.
 Witney, D. J. *Chief Engineer*. Chessington Zoo, Chessington, Surrey, Great Britain.
 Wittstruck, Dr. Klaus-Günther. *Zoo Director*. Zoologischer Garten Magdeburg, Magdeburg, Am Vogel-sang 12, Germany.
 Woods, D. *Superintendent*. Auckland Zoological Park, Auckland, New Zealand.
 Wright, E. D., M.R.C.V.S. *Hon. Veterinary Surgeon*. Jos Museum Zoo, Jos, Nigeria.
 Wright, James F., V.M.D. *Veterinarian*. National Zoological Park, Washington 9, D.C., U.S.A.

Yamada, Rikio. *Zoo Director*. Noge-yama Municipal Zoo, Noge-yama, Yokohama City, Japan.
 Yamamoto, Shizuro. *Zoo Director*. Kobe Oji Zoo, Ojicho 3 Chome, Nada-ku, Kobe, Japan.
 Yamawaki, Nobuo. *Zoo Director*. Ayameike Zoo, Nara City, Nara Prefecture, Japan.
 Yealland, J. J., F.L.S. *Curator of Birds*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London, N.W.1, Great Britain.
 Young, J. *Head Keeper*. Chessington Zoo, Chessington, Surrey, Great Britain.
 Young, Dr. W. A. *Zoo Director*. Griffith Park Zoo, Room 305, City Hall, Los Angeles, 12, Calif., U.S.A.

Zdarsky, RNDr. Vladimír. *Asst. Director*. Zoologická zahrada Ostrava, Ostrava, Czechoslovakia.
 Zealand, W. H. *Farm Bailiff*. The Zoological Society of London, Whippsnade Park, Dunstable, Beds., Great Britain.
 Zuckerman, Prof. Sir Solly, C.B., M.A., M.D., D.Sc., F.R.S. *Hon. Secretary of the Zoological Society of London*. The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
 Zwart, P. *Pathologist*. Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.
 Zwieten, K. Van. *Public Relations Officer*. Koninklijke Rotterdamse Diergaarde, van Aerssenlaan 49, Rotterdam, Netherlands.

ZOO STAFF APPOINTMENTS 1959

Boorer, M. K. *Education Officer* (for 1960). The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
 Dowling, Dr. Herndon G., Ph.D. *Assoc. Curator of Reptiles*. New York Zoological Park, (Bronx Zoo), 185th Street & Southern Boulevard, New York 60, N.Y., U.S.A.
 Dubik, Michael. *From Asst. Head Gardener to Head Gardener*. National Zoological Park, Washington 9, D.C., U.S.A.
 Fiedler, Dr. W. *Zoological Director*. Tiergarten Schönbrunn, Wien XIII, Austria.
 Mabbatt, Frederic S., B.A., M.A. *Director of Public Relations*. San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.

Senior Zoo Staff

Muth, John. *Superintendent of Children's Zoo.* San Diego Zoological Gardens, Balboa Park, Box 551, San Diego 12, Calif., U.S.A.
Reichling, Dr. Helmut. *From Scientific Asst. at Zoologischer Garten Berlin to Zoo Director of Münster Zoo.* Zoological Gardens, Münster, Westfalen, Germany.
Reuther, Ronald T., B.A. *General Curator.* Cleveland Zoological Park, Cleveland 9, U.S.A.
Rohr, Wolfgang. *Scientific Asst.* Zoologischer Garten Berlin, Hardenbergplatz 8, Berlin West 30, Germany.
Roth, Hans-Peter. *Asst. Director.* Rio Grande Park Zoo, 903 10th St. S.W., Albuquerque, N.M., U.S.A.
Thompson, W. A. *Catering Manager.* Chessington Zoo, Chessington, Surrey, Great Britain.
Veselovsky, Dr. Zdenek. *Zoo Director.* The Zoological Gardens, Prague, Czechoslovakia.
Voss, Dr. Guenter. *From Manager Krefeld Zoo-park Germany, to Zoo Director, Assiniboine Park Zoo.* Winnipeg, Manitoba, Canada.
Woods, D. *From Chester Zoo, G.B. to Zoo Superintendent, Auckland Zoological Park.* Auckland, New Zealand.
Young, J. *Head Keeper.* Chessington Zoo, Chessington, Surrey, Great Britain.

ZOO STAFF RESIGNATIONS

1959

Appleby, Dr E. C. *Veterinary Surgeon* to the Royal Zoological Society of Scotland, Edinburgh, Great Britain; resigned to take up a new post in London.

Bricknell, G. *Catering Manager* at Chessington Zoo, Chessington, Surrey, Great Britain.
Burris, Lee O. *Head Gardener* at the National Zoological Park, Washington, U.S.A.
Engler, E. *Superintendent* at Chessington Zoo, Chessington, Surrey, Great Britain.
Lambert, D. G., M.A. *Education Officer.* The Zoological Society of London, The Zoological Gardens, Regent's Park, London N.W.1, Great Britain.
Oliver, Dr James A., Ph.D. *Curator of Reptiles* at the New York Zoological Park, New York, U.S.A., resigned to become *Director* of the American Museum of Natural History.
Purkyne, Dr. C. *Zoo Director* of the Prague Zoological Gardens, Czechoslovakia.

ZOO STAFF DEATHS

1959

Baxter, Henry. *Senior Animal Keeper* at the Belle Isle Zoo, Detroit Zoological Park, Detroit, Mich., U.S.A.
Chollet, Louis. *Landscape Architect* at the Orsainville Zoological Gardens, Quebec, Canada.
Déry, Dr Alexis. *Founder of the Bird Section* at the Orsainville Zoological Gardens, Quebec, Canada.
Gordon, Dr Myron, Ph.D. *Geneticist* at the New York Aquarium, New York, U.S.A.
Priemel, Dr Kurt. *Director* of the Frankfurt Zoological Gardens, Germany, 1908-1938; founder of the Wisent Society and President 1923-1938.

UNIVERSITY DEPARTMENTS OF ZOOLOGY

The names of the professors in charge of the university departments are included and, where known, their degrees. This list is a preliminary one and in certain respects incomplete. It will be improved and expanded in the second volume of the Yearbook.

ARGENTINA

Universidad de Buenos Aires,
Calle Viamonte 444,
Buenos Aires.

J. C. RADICE

R. A. RINGUELET, Dr. en Sc. Nat.

E. F. DEL PONTE, Dr. es Sc.

Cordoba National University,
Cordoba.

J. M. DE FUNE

AUSTRALIA

University of Adelaide,
Adelaide, South Australia.

W. P. ROGERS, M.Sc., Ph.D., F.A.A.

University of Melbourne,
Melbourne, Victoria.

M. J. D. WHITE, D.Sc., F.A.A.

University of New England,
Armidale, New South Wales.

A. F. O'FARRELL, B.Sc., A.R.C.S., F.R.E.S.

University of Queensland,
George Street, Brisbane.

W. STEPHENSON, B.Sc., Ph.D.

University of Sydney,
Sydney, New South Wales.

P. D. F. MURRAY, M.A., D.Sc., F.A.A.

University of Tasmania,
Hobart, Tasmania.

V. V. HICKMAN, D.Sc., C.M.Z.S., F.R.E.S.

University of West Australia,
Perth.

H. WARING, M.Sc., D.Sc.

AUSTRIA

Universitat Wien,
Vienna.

W. KUHNELT, Dr.

Universitat Graz,
Graz.

E. REISINGER

Universitat Innsbruck,
Innsbruck.

O. STEINBOCK

BELGIUM

Université Libre de Bruxelles,
50 Avenue Franklin Roosevelt,
Brussels.

P. BRIEN, Dr. en Sc.

Rijksuniversiteit de Gent,
Voldersstraat 9, Ghent.

L. DE CONINCK

Université de Liège,
Place du XX-Août 7,
Liege.

M. DUBUISSON

Université Catholique de Louvain,
4 Rue Kraeken, Louvain.

H. DEBAUCHE

H. KOCH, Dr. en Sc.

Université Coloniale de Belgique,
1 Avenue Middelheim, Antwerp.

W. ADAM, Dr. es Sc. Nat.

BRAZIL

Universidade de Parana,
Caixa Postal 441, Curitiba,
Parana.

P. J. MOURE

Universidade de São Paulo,
Rua Helvetia 55, Caixa Postal 191B,
São Paulo.

E. MARCUS

BULGARIA

Sofiiski Universitet,
Sofia.

G. PASPALEV

BURMA

University Rangoon,
Rangoon.

J. LYNSDALE, B.Sc., Ph.D.

CANADA

University of Alberta,
Edmonton.

P. B. MILLER, M.A., Ph.D.

J. E. MOORE, M.A., Ph.D.

CANADA—continued.

University of British Columbia,
Vancouver 8.

J. R. ADAMS, M.Sc., Ph.D.

W. S. HOAR, M.A., Ph.D., F.R.S.C.

Dalhousie University,
Halifax, Nova Scotia.

F. R. HAYES, Ph.D., D.Sc., F.R.M.S.,
F.R.S.C.

Laval University,
Quebec.

G. FILTEAU, D.Sc.

University of Manitoba,
Winnipeg, Manitoba.

J. A. McLEOD, M.Sc., Ph.D., Dip.Ed.

R. A. WARDLE, M.Sc., F.R.S.C.

McGill University,
Montreal 2, Quebec.

J. STANLEY, M.A., Ph.D.

McMaster University,
Hamilton, Ontario.

H. KLEEREKOPER, M.A., Ph.D., Dr. es
Sc.

University of Toronto,
Toronto 5, Ontario.

E. H. CRAIGIE, Ph.D., F.R.S.C.

K. C. FISHER, M.A., Ph.D., F.R.S.C.

F. E. J. FRY, M.B.E., M.A., Ph.D.

F. A. URQUHART

University of Western Ontario,
London, Ontario.

H. BATTLE, M.A., Ph.D.

CEYLON

University of Ceylon,
Peradeniya,

W. FERNANDO, B.Sc., Ph.D.

CHILE

Universidad de Chile,
Avenida Bernardo O'Higgins, 1058,
Casilla 10D, Santiago.

G. MANN FISCHER

Universidad de Concepcion,
Concepcion.

F. JELDRES ARAVENA

CHINA

National Taiwan University,
Taipei, Taiwan, Formosa.

YU-HSI MOLTZE WANG

COSTA RICA

Universidad de Costa Rica,
San Jose,

F. L. A. SALAS

CUBA

Universidad de la Habana,
Havana.

C. AGUAYO, Sc.D.

A. MORENO, Dr. Nat. Sc.

CZECHOSLOVAKIA

Karlova Universita,
Prague 1.

E. BARTOS, D.Sc.

K. WENIG, R.N.Dr.

DENMARK

Copenhagen University,
Copenhagen.

H. V. BRONSTED

ECUADOR

Universidad Central del Ecuador,
Garcia Moreno 887 y Espejo 945,
Casilla 166, Quito.

G. ORCES

EGYPT

Cairo University,
Sharia Hadiket el-Ormane,
Cairo.

A. HASSAN, Ph.D., D.I.C.

F. KHALIL, M.Sc., Ph.D.

M. R. TOUBY

Alexandria University,
Bulkeley, Ramleh,
Alexandria.

F. M. EL-GHAZZAWI

FINLAND

Helsingin Yliopisto-Helsingfors Universitet,
Helsinki.

E. P. PALMEN, D.Phil.

P. PALMGREN

P. SUOMALAINEN, Ph.D.

FRANCE

Université de Paris à la Sorbonne,
47 Rue des Ecoles, Paris 5e.

P. DRACH, D. es Sc.

G. TEISSIER

Université d'Aix-Marseille,
Paris.

M. ABELOOS

Université de Besançon,
Besançon, Doubs.

A. JULLIEN

Université de Bordeaux,
29 Cours d'Albret, Bordeaux.

J. BOUNHIOL

Université de Caen,
Caen, Calvados.

BOCQUET

FRANCE—continued.

Université de Clermont-Ferrand,
Clermont-Ferrand, Puy de Dôme.
R. HOVASSE

Université de Dijon,
Dijon, Côte d'Or.
J. R. DENIS, Dr. es Sc.

Université de Grenoble,
Grenoble, Isère
A. DORIER, Dr. es Sc.

Université de Lille,
Lille, Nord.
H. HEIM DE BALSAC
M. LAMOTTE, Dr. es Sc.

Université de Lyon,
30 Rue Cavenne, Lyons.
V. NIGON

Université de Montpellier,
2 Rue du Faubourg-St. Jaumes,
Montpellier.
P. MATHIAS, Dr. es Sc.
O. TUZET

Université de Nancy,
13 Place Carnot,
Nancy, Moselle.
P. A. REMY

Université de Poitiers,
5 Ciet de la Traverse,
Poitiers, Vienne
M. DE LARAMBERGUE, Dr. es Sc.

Université de Rennes,
19 Boulevard de Sevigné,
Rennes, Ille Vilaine.
R. A. POISSON

Université de Strasbourg,
Strasbourg, Bas Rhin.
J. H. VIVIEN, Dr. es Sc.

Université de Toulouse,
Toulouse, Haute Garonne.
A. VANDEL

GERMANY

Freie Universität Berlin,
Boltzmannstrasse 4,
Berlin, West Zone
K. HERTER, Dr. Phil.
W. ULRICH

Universität Zu Bonn,
Liebfrauenweg 3, Bonn.
R. DANNEEL, D.Phil.

Universität Zu Erlangen,
Schlossplatz 4, Erlangen, Bavaria.
H. J. STAMMER, Dr.

Universität Zu Frankfurt-am-Main,
Mertonstrasse 17, Frankfurt-am-Main.
H. GIERBERG, Dr. Phil.

GERMANY—continued.

Albert-Ludwigs Universität,
Freiburg 1, Belfortstrasse 11.
O. KOEHLER, Dr.

Ernst Moritz Arndt Universität,
Greifswald.
R. KEILBACH

Universität Zu Hamburg,
Hamburg 13, Edmund Siemers Allee 1.
C. KOSSWIG, Dr. Phil.

Universität Zu Heidelberg,
Heidelberg, Grabengasse 1.
W. LUDWIG, Dr. Phil.

Freidrich Schiller Universität,
Jena, East Germany.
M. GERSCH

Neue Universität Olshausenstrasse,
Kiel, Schleswick-Holstein.
A. REMANE

Universität Koln,
Cologne, Albertus Magnus Platz.
O. KUHN

Karl Marx Universität,
Leipzig.
W. FISCHER

Universität Mainz,
Mainz.
W. VON BUDDENBROCK

Philipps Universität,
Marburg,
F. SEIDEL

Universität Munchen,
Munich.
A. KAESTNER
K. R. VON FRISCH

Universität Munster,
Schlossplatz 2, Munster.
B. RENSCH, Dr. Phil.

Universität des Saarlandes,
Saarbrücken 15.
G. KOLLER

Universität Tübingen,
Tübingen.
F. P. MOHRES, Dr. Phil.
H. WEBER, Dr. Rer. Nat., F.R.E.S.

Julius Maximilians Universität,
Würzburg, Sanderring 2.
K. GOSSWALD, Dr. Phil., Dr. Habil. Rer.
Nat.

GHANA

University College of Achimota,
Ghana.
E. E. EDWARDS, M.Sc., D.Sc.

GREAT BRITAIN

University of Aberdeen,
Scotland.

V. C. WYNNE-EDWARDS, M.A., F.R.S.E.,
F.R.S.C.

University of Birmingham,
Edmund St. Birmingham 3.

O. E. LOWENSTEIN, Ph.D., D.Phil., D.Sc.,
M.I.Biol., F.R.S.E.

University of Bristol,
Bristol, England.

J. E. HARRIS, M.A., Ph.D., F.R.S.

University of Cambridge,
Cambridge, England.

SIR JAMES GRAY, Sc.D.

University of Durham,
46 North Bailey,

Durham, England.

J. B. CRAGG, M.Sc.

A. D. HOBSON, M.A., F.R.S.E.

University of Edinburgh,
Edinburgh, Scotland.

M. M. SWANN, M.A., Ph.D.

University of Exeter,
Exeter, Devon, England.

L. A. HARVEY, M.Sc., A.R.C.S., D.I.C.

University of Glasgow,
Glasgow W.2., Scotland.

C. M. YONGE, C.B.E., Ph.D., D.Sc., F.R.S.

University of Hull,
Cottingham Road, Hull,

Yorkshire, England.

P. G. 'ESPINASSE, M.A.

University of Leeds,
Leeds 2, England.

E. SPAUL, Ph.D., D.Sc.

University of Leicester,
Leicester, England.

H. P. MOON, M.A., F.L.S.

University of Liverpool,
Brownlow Hill, Liverpool 3,
England.

R. J. PUMPHREY, Sc.D., F.R.S.

University of London,
Senate House, London W.C.1.

W. S. BULLOUGH, D.Sc.

G. CHAPMAN, Ph.D.

J. F. DANIELLI, Ph.D., D.Sc., F.R.S.

P. B. MEDAWAR, C.B.E., M.A., D.Sc., F.R.S.

N. MILLOTT, M.Sc., Ph.D.

O. W. RICHARDS, M.A., D.Sc.

J. E. SMITH, M.A., Ph.D., Sc.D., F.R.S.

G. P. WELLS, M.A., Sc.D., F.R.S.

University of Manchester,
Manchester 13, England.

R. DENNELL, D.Sc.

H. GRAHAM CANNON, M.A., Sc.D., D.Sc.,
F.R.S.

GREAT BRITAIN—continued.

King's College,
Newcastle-upon-Tyne, 1.

A. D. HOBSON

University of Nottingham,
Nottingham, England.

E. J. W. BARRINGTON, M.A., D.Sc.,
F.L.S.

University of Oxford,
Oxford, England.

SIR A. C. HARDY, M.A., D.Sc., F.R.S.

University of Reading,
Reading, Berkshire, England.

A. GRAHAM, M.A., D.Sc.

University of St. Andrews,
St. Andrews, Fife, Scotland.

H. G. CALLAN, M.A., D.Sc., F.R.S.E.

University of Sheffield,
Sheffield 10, England.

I. C. JONES

University of Southampton,
Southampton, England.

J. E. G. RAYMONT, B.Sc., A.M.

University of Wales,
Cathays Park, Cardiff,

South Wales.

T. A. STEPHENSON, D.Sc., F.R.S.

Queen's University,
Belfast, Northern Ireland.

R. A. R. GRESSON, Ph.D., D.Sc.

GREECE

Aristotelion Panepistimion Thessalonikis,
Salonika, Greece.

G. ATHANASSOPOULOS

GUATEMALA

Universidad de San Carlos,
Calle 2a Avenue sur No. 12-40.

Guatemala.

R. FAILLACE

HAITI

Université d'Haiti,
Port au Prince, Guillaou.

L. CANTAVE

HONG KONG

University of Hong Kong,
Hong Kong.

D. BARKER, M.A., D.Phil.

HUNGARY

Lorand Eotvos Scientific University,
Egyetem-Ter 1, Budapest.

E. DUDICK

G. MODLINGER

University of Szeged,
Dugonics-Ter 13, Szeged.

G. KOLOZSVARY

INDIA

Aligarh Muslim University,
Aligarh, U.P.
M. B. MIRZA, D.Ph., B.Sc., F.R.M.S.
N. A. B. KHAN, Ph.D., D.Sc.

University of Allahabad,
Allahabad, U.P.
N. D. L. SRIVASTAVA, D.Sc.

Andhra University
Waltair,
Andhra Pradesh,
S. India.
P. N. GANAPATI, D.Sc.

Annamali University,
South Arcot, Madras State.
R. V. SESHAIYA, M.A.

The Maharaja Sayajirao University,
Baroda 2.
J. C. GEORGE, M.Sc., Ph.D.

University of Bombay,
Bombay—St. Xavier's College,
Cruickshank Road,
Bombay, 1.
M. MUNSHI

University of Calcutta,
Calcutta.
J. L. BHADURI, D.Sc.

University of Delhi,
Delhi 8.
M. L. BHATIA, Ph.D., D.Sc.

University of Lucknow,
Lucknow.
M. B. LAL, D.Sc., F.A.Sc.

University of Madras,
Chepauk, Madras 5.
C. P. GHANAMUTHU, M.A., D.Sc.
T. N. ANANTHAKRISHNAN, B.Sc.
B. BONNELL
H. ENDOCH, M.A.
J. P. JOSHUA

University of Mysore,
Mysore.
B. R. SESHACHAR, D.Sc.

University of Nagpur,
Nagpur.
S. M. H. KHATIB, M.Sc., Ph.D.

Osmania University,
Hyderabad, Deccan 7.
S. N. SINGH, M.Sc., Ph.D.

Panjab University,
Chandigarh.
V. NATH, M.Sc., Ph.D.

University of Saugar,
Saugar,
D. S. SHRIVASTAVA, M.Sc., Ph.D.

INDIA—continued.

Banaras Hindu University (College of Science),
Banaras 5,
Uttar Pradesh.
A. B. MISRA

Karnatak University,
Chota-Mahabaleshwar,
Dharwar,
Mysore State,
South India.
K. R. KARANDIKAR

Patna University,
Patna 5,
Bihar State.
S. KESHAHA, Ph.D., M.Sc.
R. K. SHARAN

University of Poona,
Ganeshkhino,
Poona 7,
Bombay State.
L. MULHERKAR, M.Sc., Ph.D.

Sri Venkateswara University,
Tirupati,
Andhra Pradesh,
S. India.
S. G. MANAVALA RAMANUJAM

University of Travancore,
University Buildings,
Trivandrum,
Kerala State,
S. India.
K. NAIR BAASKARAN, D.Sc.
Utkal University,
Cuttack I,
Orissa.
U.C. PANDA

INDONESIA

Universitet Indonesia,
Djalan Salemba 4, Djakarta.
C. J. JASKI, Dr.
L. J. TOXOPEUS, Dr.
H. C. VOS, Dr.

IRAN

University of Teheran,
Avenue Shah-Reza, Teheran.
M. FATIMI, Dr.

IRELAND

University of Dublin,
Trinity College, Dublin.
J. B. GATENBY
National University of Ireland,
Dublin.
C. F. HUMPHRIES, D.Sc.

ISRAEL

The Hebrew University,
Jerusalem.
G. HAAS, Ph.D.

ITALY

Universita Delgi Studi,
Bari.
B. DE LERMA, Dr. en Sc. Natur.
Universita Delgi Studi,
Via Zamboni 33, Bologna.
E. VANNINI
Universita di Cagliari,
Cagliari, Sardinia.
C. GUARESCHI
Universita di Catania,
Catania.
B. MONTEROSSO
Universita Delgi Studi,
Piazza San Marco 4, Florence.
G. COLOSI, Dr. es Sc.
Universita Delgi Studi,
Genoa.
G. SCORTECCI
Universita Delgi Studi,
Messina.
F. DULZETTO
Universita Delgi Studi,
Via Passione 12, Milan.
G. MARTINI
S. RANZI
Universita Delgi Studi,
Modena.
G. BACCI
Universita Delgi Studi,
Naples.
M. SALFI, Dr. en Sc.
Universita Delgi Studi,
Padua.
U. D'ANCONA
Universita Delgi Studi,
Palermo.
G. REVERBERI
Universita Delgi Studi,
Via Universita 12, Parma.
B. SCHREIBER, Dr. en Sc. Natur.
Universita Delgi Studi,
Pavia.
C. JUCCI
Universita Delgi Studi,
Rome.
P. PASQUINI
Universita Delgi Studi,
Sassari, Sardinia.
G. BACCI

ITALY—continued.

Universita di Torino,
Via G. Verdi, 8-Via Po 17,
Turin.
L. PARDI

JAPAN

Hokkaido University,
Sapporo.
T. UCHIDA
Kyoto University,
Kyoto.
M. ICHIKAWA
D. MIYAJI
K. NAKAMURA
Tohoku University,
Katahiracho, Sendai, Honshu.
J. HASHIMOTO
T. HATANO
S. NISHIDA
Y. TORIU
M. UMETSU

MALAYA

University of Malaya,
Singapore, Malaya.
R. D. PURCHON, B.Sc., Ph.D., F.L.S.

MEXICO

Universidad Michoacana de San Nicolas,
Ocampo 351, Morelia, Michoacan.
A. GUZMAN CARREON
J. RIVERA ESPINOZA

NETHERLANDS

State University of Leyden,
Rapenburg 67-73, Leyden.
H. BOSCHMA, D.Sc.
C. J. VAN DER KLAUW
D. J. KUENEN, Dr.
State University of Utrecht,
Domplein 28, Utrecht.
C. P. RAVEN, Dr. Sc.
State University of Groningen,
Groningen.
G. P. BAERENDS, Dr.
University of Amsterdam,
Oudemanhuispoort 4, Amsterdam.
H. ENGEL, Dr.
A. PUNT, Phil. Dr.
E. J. SLIJPER, Dr.
Vrije Universiteit,
Keizersgracht 160-166,
Amsterdam.
K. H. VOOUS

NEW ZEALAND

University of Auckland,
Box 2553, C.P.O.,
Auckland, N.Z.

W. R. MCGREGOR, B. Sc.

J. E. MORTON

University of Canterbury,
Christchurch.

G. KNOX, M.Sc.

E. PERCIVAL, B.Sc., F.R.S.N.Z.

University of Otago,
Dunedin.

B. J. MARPLES, M.A., M.Sc.

Massey University College,
Palmerston North.

J. H. TETLEY, D.Sc.

Victoria University,
Wellington.

L. R. RICHARDSON, M.Sc., Ph.D.

NIGERIA

University College, Ibadan,
Nigeria,

West Africa.

J. E. WEBB, Ph.D., D.Sc.

NORWAY

Universitet i Oslo,
Oslo.

B. FOYN

Universitet i Bergen,
Bergen.

A. BRINKMANN, Mag. Scient.

PAKISTAN

University of Sind,
Hyderabad,
W. Pakistan.

A. J. FARUQI, M.Sc., Ph.D.

University of Karachi,
Princess Street,
Karachi,

W. Pakistan.

M. A. H. QADRI, M.Sc., Ph.D.

University of the Punjab,
Lahore.

M. SHARIF, D.Sc., Ph.D.

PANAMA

Universidad de Panama,
Apartado 3277,
Panama City.

A. LLANA

PERU

Universidad de Lima,
Apartado 454,
Lima.

L. GONZALEZ MUGABURU

PHILIPPINES

University of Manila,
665 Alejandro Vi,
Sampaloc, Manila.

F. ALAGAR

University of the Philippines,
Quezon City.

L. S. CLEMENTE

POLAND

Marie Curie-Sklodowska University,
Pl. Litewski 5, Lublin.

S. DLUZEWSKI

K. STRAWINSKI

University of Warsaw,
Krakowskie Przedmiescie 26-28,
Warsaw.

T. JACZEWSKI

Z. RAABE

PORTUGAL

Universidade de Lisboa,
Rua da Escola Politecnica, 42,
Lisbon.

J. ANTUNES SERRA

A. R. JORGE, Dr. es Sc.

Universidade de Coimbra,
Coimbra.

A. X. O. CUNHA MARQUES

FEDERATION OF RHODESIA & NYASALAND

The University College of Rhodesia &
Nyasaland.

E. B. EDNEY, D.Sc., Ph.D.

RUMANIA

Universitatea "C.I. Parhon",
Bucharest,

Bulevardul 6, Martie 64.

R. CODREANU

A. GROSU,

M. IONESCU

Universitatea "Al. I. Cuza" Din Iasi,
Iasi.

O. MARCU

SPAIN

Universidad de Barcelona,
Barcelona.

E. GADEA BUISAN

Universidad de Madrid,
Madrid.

R. ALVARADO BALLESTER, Dr. es Sc.

F. BERNIS MADRAZO

J. GOMEZ-MENOR ORTEGA, Dr. Sc. Nat

THE SUDAN

The University of Khartoum,
Khartoum.

H. SANDON, M.A., Ph.D.

SWEDEN

Stockholm Höghskola (Univ. of Stockholm),
Drottninggatan 116,
Stockholm.

O. LINDBERG

L. SILEN, Dr. es. Sc.

University of Uppsala,
Uppsala.

S. O. HÖRSTADIUS, Fil. Dr., F.R.S.

K. JÄGERSTEN, Fil. Dr.

M. GOSTA

SWITZERLAND

Universität Basel

A. PORTMANN, Dr. es. Sc.

Universität Bern,
Bern.

F. LEHMANN, Dr. Phil.

Université de Fribourg,
Fribourg.

J. KALIN

Université de Genève,
Genève.

E. GUYENOT, Dr. es. Sc.

Université de Lausanne,
Lausanne.

R. MATTHEY, Dr. es. Sc.

SYRIA

Syrian University,
Damascus.

A. H. SUWEIDAN

TURKEY

University of Ankara.

T. KARABAG,

S. OKAY

M. TOLUNAY

Istanbul University,
Bayezit,
Istanbul.

R. ERMIN, Dr. Rer. Nat.

F. S. GIZ, M.A., Ph.D.

A. SENGÜN, Dr. Rer. Nat.

UNION OF SOUTH AFRICA

University of Cape Town,
P.O. Box 594,
Cape Town.

J. H. O. DAY, B.Sc., Ph.D.

The University of Natal,
King George V Avenue, Durban,
P.O. Box 375, Pietermaritzburg.

S. F. BUSH, M.Sc., D.Phil., F.R.S.S.Af.

University of The Orange Free State,
Bloemfontein.

J. J. D. DE WIT, Phil. Nat. D.

Potchefstroom University
for Christian Higher Education,
Potchefstroom,
Transvaal.

G. T. S. EISELEN, M.Sc., Dr. Rer. Nat.

UNION OF SOUTH AFRICA—continued.

University of Pretoria,
Brooklyn,
Pretoria.

F. C. ELOFF, D.Sc.

Rhodes University,
Grahamstown,
Cape Province.

D. W. EWER, M.A., Ph.D., M.B.E., F.R.E.S.

University of Stellenbosch,
Stellenbosch.

C. G. S. DE VILLIERS, M.A., Ph.D.

C. A. DU TOIT, M.Sc., Ph.D.

University of The Witwatersrand,
Johannesburg,
Transvaal.

B. I. BALINSKY, D.Sc.

U.S.A.

University of California
Berkeley Campus

W. BALAMUTH, Ph.D.

K. B. DE OME, Ph.D.

R. M. EAKIN, Ph.D.

J. E. GULLBERG, A.B.

M. HARRIS, Ph.D.

A. S. LEOPOLD, Ph.D.

D. MAZIA, Ph.D.

A. H. MILLER, Ph.D.

P. NEEDHAM, Ph.D.

C. STERN, Ph.D.

Santa Barbara College, S.B.

M. M. ERICKSON, Ph.D.

G. J. HARDIN, Ph.D.

E. R. NOBLE, Ph.D.

B. B. OAKESON, Ph.D.

Riverside Campus

H. T. SPIETH, Ph.D.

Davis Campus

M. A. MILLER, Ph.D.

L. E. ROSENBERG, Ph.D.

Los Angeles Campus

G. H. BALL, Ph.D.

T. H. BULLOCK, Ph.D.

R. B. COWLES, Ph.D.

F. CRESCITELLI, Ph.D.

W. H. FURGASON, Ph.D.

T. L. JAHN, Ph.D.

E. L. LAZIER, Ph.D.

A. M. SCHECHTMAN, Ph.D.

The University of Chicago
Chicago 37,
Illinois.

A. E. EMERSON, Ph.D.

T. PARK, Ph.D.

D. PRICE, Ph.D.

H. B. STEINBACH, Ph.D.

H. H. STRANDSKOV, Ph.D.

U.S.A.—continued.

Columbia University,
Morningside Heights,
New York 27, N.Y.
L. G. BARTH, Ph.D.
T. DOBZHANSKY, Sc.D.
L. C. DUNN, Sc.D.
A. GORBMAN, A.B., M.S., Ph.D.
T. HAYASHI, B.S., Ph.D.
J. A. MOORE, Ph.D.
A. W. POLLISTER, Ph.D.
F. J. RYAN, A.M., Ph.D.
F. SCHRADER, B.S., Ph.D.

Cornell University,
Ithaca, New York.
L. C. COLE, M.S., Ph.D.
P. W. GILBERT, A.B., Ph.D.
W. J. HAMILTON, Ph.D.
S. L. LEONARD, Ph.D.
E. C. RANEY, M.S., Ph.D.
M. SINGER, B.S., A.M., Ph.D.
W. WIMSATT, Ph.D.

Duke University,
Durham,
North Carolina.
C. G. BOOKHOUT, Ph.D.
I. E. GRAY, M.S., Ph.D.
K. SCHMIDT-NIELSEN, Mag.Sc., Ph.D.
K. M. WILBUR, A.M., Ph.D.

Harvard University,
Cambridge 38,
Massachusetts.
J. C. BEQUAERT, Dr. es Sc.
F. M. CARPENTER, A.B., S.D.
A. B. DAWSON, B.A., Ph.D., D.Sc.
D. R. GRIFFIN, B.S., A.M., Ph.D.
F. L. HISAW, S.B., Ph.D., LL.B.
L. HOADLEY, A.B., Ph.D.
E. MAYR, Dr. Phil.
A. S. ROMER, A.B., Ph.D., S.D.
J. H. WELSH, Ph.D.
C. M. WILLIAMS, Ph.D., M.D.

Howard University,
2441 Sixth Street, N.W.,
Washington 1,
D.C.
L. HANSBOROUGH, Ph.D.

University of Illinois,
Urbana,
Illinois.
F. B. ADAMSTONE, Ph.D.
B. V. HALL, Ph.D.
L. INGLE, Ph.D.
S. C. KENDEIGH, Ph.D.
W. M. LUCE, Ph.D.
S. M. ROSE, Ph.D.
L. J. THOMAS, Ph.D.

U.S.A.—continued.

Indiana University,
Bloomington and Indianapolis,
Indiana.
W. R. BRENNEMAN, A.B., Ph.D.
D. G. FREY, A.B., Ph.D.
H. J. MULLER, A.M., Ph.D., Sc.D.
T. SONNEBORN, A.B., Ph.D.
T. TORREY, A.B., A.M., Ph.D.

State University of Iowa,
Iowa City,
Iowa.
H. W. BEAMS, M.A., Ph.D.
R. L. KING, B.A., Ph.D.
G. MARSH, Ph.D.
E. WITSCHI, Ph.D.

Johns Hopkins University,
Baltimore 18,
Maryland.
R. K. BURNS, Ph.D.
B. H. WILLIER, Ph.D.

University of Kansas,
Lawrence,
Kansas.
E. R. HALL, Ph.D.
A. B. LEONARD, Ph.D.
E. H. TAYLOR, Ph.D.

University of Michigan,
Ann Arbor,
Michigan.
M. BATES, Ph.D., D.Sc.
D. E. S. BROWN, Ph.D.
W. H. BURT, A.M., Ph.D.
D. C. CHANDLER, Ph.D.
L. R. DICE, Ph.D.
F. E. EGGLETON, Ph.D.
A. M. ELLIOTT, Ph.D.
T. H. HUBBELL, Ph.D.
K. F. LAGLER, Ph.D.
A. H. STOCKARD, A.M., Ph.D.
F. H. TEST, Ph.D.
H. VAN SCHALIE, Ph.D.

University of Minnesota,
Minneapolis 14,
Minnesota.
S. EDDY, A.M., Ph.D.
D. E. MINNICH, A.B., Ph.D.
O. H. SCHMITT, Ph.D.
N. T. SPRATT, Ph.D.
H. B. STEINBACH, Ph.D.

U.S.A.—continued.

University of Missouri,
Columbia,
Missouri.

R. S. CAMBELL, Ph.D.
W. H. ELDER, Ph.D.

University of Nebraska,
Lincoln,
Nebraska.

I. H. BLAKE, A.B., A.M., Ph.D.
H. W. MANter, A.M., Ph.D.
D. MILLER, B.A.
O. WADE, Ph.D.

University of North Carolina,
Chapel Hill,
North Carolina.

C. D. BEERS, Ph.D.
D. P. COSTELLO, Ph.D.
W. L. ENGELS, Ph.D.
M. WHITTINGHILL, Ph.D.

Northwestern University
Evanston and Chicago,
Illinois.

F. A. BROWN, Ph.D.
O. PARK, Ph.D.

Ohio State University,
Columbus 10,
Ohio.

C. R. CUTRIGHT, Ph.D.
D. M. DE LONG, Ph.D., D.Sc.
W. J. KOSTIR, M.A.
T. H. LONGLOIS, Ph.D.
D. F. MILLER, Ph.D.
J. A. MILLER, Ph.D.
C. R. NEISWANDER, Ph.D.
R. B. NEISWANDER, B.Sc., M.S., Ph.D.
A. PETERSON, Ph.D.
J. W. PRICE, Ph.D.
D. C. RIFE
J. P. SLEEMAN

University of Pennsylvania,
Philadelphia,
Pennsylvania.

H. B. BAKER, B.S., Ph.D.
H. G. BOREI, Ph.D., Phil. Dr.
H. S. COLTON
L. V. HEILBRUNN, Ph.D.
C. W. METZ, A.B., Ph.D.

University of Pittsburgh,
Pittsburgh 13,
Pennsylvania.

R. BUCHSBAUM, Ph.D.
P. GRAY, Ph.D., D.I.C.
C. A. TRYON, Ph.D.

Princeton University,
Princeton,
New Jersey.

E. G. BUTLER, Ph.D., Sc.D.

U.S.A.—continued.

University of Rochester,
Rochester,
New York.

J. F. K. HOLTRETER, Ph.D.

Stanford University,
Stanford,
California.

V. C. TWITTY

The University of Texas,
Austin 12,
Texas.

W. F. BLAIR, Ph.D.
O. P. BRELAND, Ph.D.
J. E. MYERS, Ph.D.
C. P. OLIVER, Ph.D.
T. S. PAINTER, Ph.D., D.Sc., LL.D.
W. S. STONE, Ph.D.

Tulane University of Louisiana,
New Orleans, 18,
Louisiana.

F. R. CAGLE, Ph.D.
G. H. PENN, Ph.D.

University of Virginia
Charlottesville,
Virginia.

B. D. REYNOLDS

University of Wisconsin,
Madison 6,
Wisconsin.

J. G. BAIER
J. F. CROW, Ph.D.
J. EMLER, Ph.D.
A. D. HASLER, Ph.D.
W. H. McSHAN, Ph.D.
R. K. MEYER, Ph.D.
L. E. NOLAND, Ph.D.
H. RIS, Ph.D.
H. R. WOLFE, Ph.D.

Yale University,
New Haven,
Connecticut.
E. J. BOELL, Ph.D.
G. E. HUTCHINSON, M.A.

YUGOSLAVIA

University of Belgrade,
Belgrade,
Yugoslavia.

S. GARZIĆ
M. RADOVANOVIĆ
S. STANKOVIĆ
P. STEFANOVIĆ

University of Ljubljana
Ljubljana,
Yugoslavia.

J. HADŽI, Dr. Phil.
M. ZEJ, Dr. Nat. Hist.

INTERNATIONAL LIST OF ANIMAL DEALERS

(The dealers are listed alphabetically under the countries and towns where their main offices are situated. The Editors would like to emphasise that this is a reference list and not a list of recommendation).

ARGENTINE REPUBLIC

BUENOS AIRES

L. Gaillard, General E. Martinez 2136 (Suc. 30), Buenos Aires, Argentina. Tel: 52-6236. Branch: Casilla de Correo 16 Florida Prov., Buenos Aires. Branch Tel: 6186 740-4681. Specialities: Pumas, Jaguars, Maned Wolves, Wild Cats, Nandus, Wildfowl.

Francisco H. Walz, Reconquista 453, Buenos Aires, R., Argentina. Tel: 31-1207. Specialities: Moths, Butterflies, Insects.

AUSTRALIA

LIDCOMBE

Stan Clifford, 18 Keating Street, Lidcombe, N.S.W., Australia. Tel: YX 8201. Specialities: Australian Finches, Parrots, Quail, Doves. (On sale to zoos only; export subject to the consent of the Australian Government, Export Section).

AUSTRIA

VIENNA

Heini Demmer, Mahlerstrasse 7, Wien I, Austria. Tel: 52-55-88. Cable: TIER-FREUND WIEN. Specialities: Gorillas, Okapis, Pigmy Hippos & other African fauna; Kiang, Kulan, Siberian Tigers, Snow Leopards & various ruminants from Asia.

BELGIUM

BRUSSELS

A. Vifquin, 53 Rue d'Anderlecht, Bruxelles, Belgium. Tel: 11-41-84. Cable: VIFOI-SEAUX. Specialities: birds & mammals.

SEHILDE

Avicentra, (C. Van Dyk), Goudbloemlaan 12, Sehilde, Belgium. Tel: 53-63-43. Cable: AVICENTRA—SEHILDE BELGIUM. Specialities: Cranes, Flamingoes, Storks, Herons, Duck, Geese, Swans, Parrots, Parrakeets, Pheasants, Touracos, Doves, Pigeons, Penguins, Quail, Partridges; up to 20,000 assorted finches & softbills in stock; Chimpanzees & various monkeys.

SPA

Jardin Zoologique Spa (J. F. H. Peeters), 21 Chemin de la Havette à Spa, Chateau de Havette, Spa, Belgium. Tel: 719150. Cable: PEETERSBIRD SPA. Branch: Sucursale, 12 Rue Gustave Fussel, Bruxelles, Belgium. Specialities: Tigers, Pumas, Leopards (including Black Leopards), Lynx, Caracals, Ocelots, Foxes, Hyenas, Brown & Black Bears, Tapirs, Porcupines, Capibaras, Agutis, Pacas, Monkeys, Mouflon, Dwarf Sheep, Watussi Cattle, Wisent, Sea Lions, Elephants, Kangaroos; Duck, Geese, Swans, Macaws, Cockatoos, Parrots, Parakeets, Doves, Vultures (King, Condor & Royal), Owls; Pythons.

BRAZIL

RECIFE

G. Randau, Caixa Postal 1252, Rua Joaquim Nabuco 586, Recife, Pernambuco, Brazil. Cable: RANDAUZOO. Specialities: Brazilian mammals, birds & reptiles.

RIO DE JANEIRO

Avifauna Brasiliensis (R. H. H. Gerwing) Caixa Postal 126, Petropolis, Estado do Rio de Janeiro, Brazil. Cable: AVIFAUNA PETROPOLIS. Specialities: Macaws, Parrots, Parrakeets, Toucans, Toucanettes, Doves,

Animal Dealers

Innamou, Wild Fowl, Tanagers, Bell Birds, singing birds; monkeys, Marmosets, Coati Mundis, & other Brazilian fauna.

BRITISH GUIANA

ABERDEEN

General Animal Dealer (Willie Shaw), Aberdeen, Essequibo Coast, British Guiana. *Branch:* 73 Wellington Street, Georgetown, B.G. *Branch Cable:* 73 WELLINGTON STREET. *Specialties:* Squirrel Monkeys, Saki Monkeys, Capuchin Monkeys, Howler Monkeys, Porcupines, Acouchis, Aardvarks, Bush-dogs, Tapirs; Anaconda; Iguanas, Salapantas, Tegus Lizards, Camoudi, young Alligators, Electric Eels; Black Spiders; birds.

GEORGETOWN

Louis Chung & Co. Ltd. (Louis Chung), 42 Wellington Street, P.O. Box 231, Georgetown, British Guiana. *Tel:* 52-72. *Cable:* LOUIS-CHUNG. *Branch:* Atkinson Field, B.G. *Branch Tel:* Atkinson 253. *Specialties:* tropical fish, reptiles & mammals; also plants.

Rene Nardin, 184 Almond Street, Queens-town, Georgetown, British Guiana. *Speci-*alities: Butterflies.

Walter G. Roth, Lot 9, Hadfield & Camp Streets, Georgetown, British Guiana. *Speci-*alities: mammals, birds & reptiles.

CONGO

KABUNGA

Charles Cordier, B.P. 12 Kabunga Par Bukayu, Congo. *Specialties:* Central African Forest Guinea Fowl, African Peacock, Touracos, *Corytheola ruwenzorornis*, *Rossae calaos*, Black, & Black & White Tropicranus Finnfoot, Scaly Ibis, Hartlaub Duck, Crowned & Crested Eagles; all Forest Duiker, Water Chevrotain, Congo Aardvark, Giant Pangolin, Colobus Monkey, Pigs (Bay, Abyssinian & Congo), Lowland & Mountain Gorillas.

ECUADOR

GUAYAQUIL

Animal Supply (L. Schwark & C. Oheim), P.O. Box 4072, Guayaquil, Ecuador. *Tel:* 17-729. *Cable:* IMEXPORT. *Specialties:* a wide variety of mammals, birds & reptiles from the South American continent, in particular mammals & birds from the Ecuador Andes & their western slopes, and fauna from the Columbian-Pacific area.

FRANCE

PARIS

Zoo Notre Dame (Cornier), 15 Quai Monte-bello, Paris V, France. *Tel:* ODEon 98-66. *Cable:* CORZOO, PARIS. *Specialties:* Parrots, Pheasants, Waterfowl, Cranes, Flam-ingos; Monkeys; small mammals, am- phibians, tortoises, turtles, & reptiles.

GERMANY

MANNHEIM

Togare, Mannheim, Circus Sarrasani, Lüttch-kaserne, Ulmenweg, Germany. *Cable:* TO- GARE MANNHEIM SARRASANI. *Branch:* Togare, Krefeld/Rhld, Schroersstr 13, Ge. *Specialties:* Lions & Tigers.

PADERBORN

Zoo Tierhandel (Conrad Finke), Paderborn Westphalia, Germany. *Cable:* FINKEZOO. *Specialties:* Zoo animals.

VIERSEN

Samen-Eckers KG Import-Export (Josef Claas) 106 a Hauptstrasse, Viersen, Germany. *Tel:* Viersen 12078. *Cable:* SAMENECKERS. *Branch:* Animal Hostel, Dusseldorf Airport. *Branch Tel:* Dusseldorf 434073. *Specialties:* exotic birds & all species of monkeys.

GHANA

ACCRA

Benkosafo Cheapsale Stores (Ben K. Osafo), P.O. Box 1482, Accra, Ghana, West Africa. Tel: Accra 2771. *Specialties*: mammals, birds, reptiles & insects from West & Equatorial Africa.

AKIM ODA

Acheampong's (Andrews P. Acheampong), House No. C-71-Agona Street, Akim Oda, Ghana, West Africa. *Specialties*: Finches, Parrots; Chimpanzees, & various monkeys; various other African forest animals.

GREAT BRITAIN

BEDFORD

Ravensden Zoological Co. (Timothy Pape), "Hollington", Kimbolton Road, Bedford, Great Britain. Tel: Bedford 66966. *Cable*: RAVENS DEN ZOO. *Branch (Advisory & Book Dept.)*: F. E. B. Johnson, Willow Close, Mill Lane, Hulcot, Bletchley, Beds., G.B. *Branch Tel*: Woburn Sands 3355. *Specialties*: foreign cage-birds, Pheasants, Waterfowl, Cranes, Storks, Birds of Prey; Monkeys, Squirrels; small mammals; reptiles & amphibians. Stock imported direct from the Americas, Africa, India & the Far East.

BEXLEY

The Butterfly Farm Ltd. (L. Hugh Newman, F.R.E.S., F.R.H.S.), The Butterfly Farm, Bexley, Kent. Tel: Crayford 22686. *Branch*: "Betsoms", The New Breeding Grounds, Westerham, Kent. *Branch Tel*: Westerham 2193. *Specialties*: living Lepidoptera in all stages, specialising in British Butterflies & Moths; also Saturniids from North & South America, Canada, Mexico, India, Assam, Ceylon, Formosa, Borneo, Australia, etc., supplied as ova, larvae, pupae & cocoons; wild stock & also stock bred in captivity; Stick Insects & Silk-worms; all stock guaranteed free from parasites.

BIRMINGHAM

Tyseley Pet Stores Ltd. (L. J. Williams), 771 Warwick Road, Tyseley, Birmingham 11,

Great Britain. Tel: ACO 1954. *Cable*: ZOO-FAUNA B'HAM. *Specialties*: Finches, Macaws, Cockatoos, Lovebirds; Monkeys, Chimpanzees, Bush-babies; fish & reptiles.

BRIDPORT

Robert C. Goodden, Seafields House, Charmouth, Bridport, Dorset, G.B. Tel: Charmouth 133. *Specialties*: living insects, in particular Lepidoptera, but enquiries for other orders welcomed. British Sphingidae, Arctiidae, etc. are always in stock; Saturniidae, Sphingidae, Papilionidae, etc., from all parts of the world are usually available in all stages according to season. Microlepidoptera not dealt with.

GLASGOW

Wilsons of Glasgow (Andrew Wilson), 68/76 Oswald Street, Glasgow, Scotland, G.B. Tel: CENTRAL 8391. *Specialties*: Lions, Bears, Chimpanzees, Monkeys & small mammals; Alligators, Crocodiles, snakes (poisonous & harmless), & other reptiles; birds of various species, also pet animals & tropical fish; large circus animals a speciality.

GT. GRANSDEN

Bleak Hill Bird Farm (D. S. Redman, Prop., & C. C. Coles, Manager), Great Gransden, Sandy, Beds., G.B. Tel: Great Gransden 368. *Specialties*: Canaries, Psittaciformes, Indian Softbills, South American species, Softbills, Seed-eaters, Sunbirds, Senegal Finches & rare African species.

HALE

Robert Jackson Ltd. (Robert Jackson), Holly Bank Nurseries, Grove Lane, Hale, Cheshire, G.B. Tel: Ringway 3301. *Specialties*: reptiles & amphibians, also tropical & cold-water fish, mammals & birds; hardy & tropical water plants; house plants & cacti.

HENFIELD

Shamrock Farms (Great Britain) Ltd. (F. V. Lonsdale), Upper Horton Farm, Small Dole, Nr. Henfield, Sussex, G.B. Tel: Steyning 2391. *Cable*: ZOOCOL. BRIGHTON. *Branches*: 9 Colebrook Road, Withdean, Brighton, Sussex. (Tel: Brighton 5391); 8 Havenside, Shoreham-by-Sea, Sussex (Tel: Shoreham by Sea 4138); Browns Meadow, Edburton, Small Dole,

Animal Dealers

Henfield, Sussex (Tel: Poynings 239). *Specialities*: Rhesus, Vervet, Squirrel & Cynomolgous Monkeys, Marmosets, Baboons, Chimpanzees; also various other wild and domestic animals.

LONDON

Big Game Ltd., 79/81 Wigmore Street, London W.1, G.B. Tel: HUNTER 1814. *Cable*: WYTEHUNTER LONDON. *Specialities*: wild animals, in particular all animals of which the term "Big Game" is descriptive. Arrangement of Big Game hunting, photographic & scientific safari tours.

Regent Pet Stores (Palmer) Ltd. (J. E. Palmer), 33-37 Parkway, London N.W.1, G.B. Tel: GULLIVER 5163. *Cable*: DOMESTIPET. *Specialities*: Cranes, Storks, Flamingos, Peafowl, Pheasants, Quail, Duck, Geese, Swans, Macaws, Cockatoos, Parrots, Parakeets, Lovebirds, Budgerigars, Canaries, Cardinals, foreign Finches, Tanagers, Mynahs, Toucans, Hornbills; also Monkeys, rodents, squirrels, Flying Foxes, Galagos, Mongooses, Deer; reptiles & cold water fish.

NEWDIGATE

L. Haig & Co. Ltd. (T. B. Rothwell), Beam Brook, Newdigate, Surrey, G.B. Tel: Norwood Hill 51. *Specialities*: British & European amphibians & reptiles, British & European freshwater fish; also zoological specimens & aquatic plants.

PORTSMOUTH

P. H. Hastings, 182 Sultan Road, Portsmouth, Hampshire, G.B. Tel: 21582. *Cable*: STIMULITE. *Branch*: 1 Northbrook Street, Portsmouth. *Specialities*: Humming Birds from Argentine Republic, Brazil & Ecuador; East & West African Sunbirds; Tanagers (including rare mountain species from Ecuador), Toucans, Toucanettes, Mot-Mots, Cotingas, Cock-of-the-Rocks, Trumpeters, Sun Bitterns, Touracos, rare softbills & seed-eaters.

SOUTHPORT

Farrar's Southport Zoo (Frank N. Farrar), Princes Park, Southport, Lancashire, G.B. Tel: 57434. *Branch*: Alton Towers 200, Alton, Staffs. *Specialities*: Old & New World

Monkeys, small mammals, Bears & Big Cats, elephants (on request), some ruminants; Parrots.

STOCKBRIDGE

Leckford Estate Ltd. (Terry Jones), Leckford Abbas, Stockbridge, Hants., G.B. Tel: Stockbridge 48. *Specialities*: 60 species of waterfowl & 15 varieties of pheasants. All birds offered for sale are hand-reared, home-bred & pinioned.

ICELAND

HUSAVIK

William F. Palsson, Hallsdorstadir Laxardal, via Husavik, Iceland. *Specialities*: rare northern duck eggs for hatching.

INDIA

CALCUTTA

K. L. Acooli (Baidyanath Acooli), 8/5A Barrackpore Road, P.B. 12008, Calcutta 2, India. Tel: 56-2807. *Cable*: ORNIS, CALCUTTA. *Specialities*: Lesser Pandas, domesticated Yaks, Elephant, Leopards, Hyenas, Tiger & Himalayan Bear cubs, Spotted Deer, various Monkeys; Storks, Cranes, Hill Birds, Great Hill Mynahs, Finches, Parakeets, Pigeons, Doves, Partridges, Pheasants, Duck, waterfowl; reptiles.

Fauna (B. De), 38/2 Nilmoney Mitra Street, Calcutta 6, India. *Specialities*: mammals & birds; also biological specimens, skeletons, stuffed animals, etc.

Kamala Zoo (Kartick Ch. Sen.), 30 Jelipara Lane, Calcutta 12, India. *Specialities*: all species of Indian birds available throughout the year—Himalayan coloured birds, Finches, Parakeets, Duck, Geese, Pheasants, Partridges; also reptiles. •

Khan Wild Animal Farm (Original Trappers est. 1915) (Dr K. M. Y. Khan), 53 Chowringhee Road, Calcutta 16, India. Tel: 44-3476. *Cable*: WILDERNESS. *Specialities*: jungle bred Tiger cubs, Leopard, Hyena & Bear cubs,

Elephants, Lesser Pandas, various species of deer & monkeys; Duck, Cranes, Greater Hill Mynahs, Shamas, Tiger Finches, Spotted Nuns, etc.; Pythons, Cobras & King Cobras, etc.; tropical fish. List available on application.

George Munro, 86 Ripon Street, Calcutta 16, India. *Tel:* 44-1885. *Cable:* MUNRO-FAUNA. *Specialities:* Tigers, Leopards, Hyenas, Bears, Elephants, various deer, Porcupines, Lesser Pandas, Squirrels, Rhinoceros by special arrangement (only for export to Zoological Gardens), various monkeys; Cranes, Storks, Duck, Geese, various Finches, Parrots, Hornbills, Pheasants, Hill Mynahs & rare Himalayan birds; snakes, tortoises & reptiles.

L. K. Sen, 2 Kalidas Dutta Lane, Calcutta 12, India. *Cable:* TIGERHILL. *Branch:* Showroom 14, New Block Poultry Range, S.S. Hogg Market, Calcutta 13, India. *Specialities:* Himalayan mammals, reptiles, fish and birds, in particular Shama Thrushes, Goldfronted Cloropsis, Giant Hornbill, Pied Hornbill, Hunting Cissas, Greater Himalayan Barbet, Racket-tailed Drongo, Pekin Robin, Scarlet Minivet, Indian Pitta, Indian Greater Hill Mynah, Green Avadavats, Woodpeckers, Parrots, Finches, etc.

The Variety of Birds Emporium (K. C. Sen), 9/16 New Block, Poultry Range, S.S. Hogg Market, Calcutta 13, India. *Tel:* 24-4287. *Cable:* OSTRICH. *Specialities:* Gibbons, Rhesus & other monkeys, Flying Foxes, Lorises, Leopards, Elephants, Camels, Bear cubs, small Indian mammals; all species of Indian softbill and seedeaters, including Doves, Finches, Parakeets, Peacocks, Cranes, Pheasants, Partridges, Hornbills; King Cobras.

DELHI

M. L. Kohli (Mandanlal), 2678 Kucha Chelan, Delhi 7, India. *Tel:* 20876. *Cable:* BOTANISTS. *Branch:* M. L. Kohli, Indergunj, Gwalior, India. *Branch Tel:* 237. *Specialities:* Tigers, Leopards, Elephants.

ITALY

TURIN

L. Molinar s.p.A. (Aruino Terni), Via Goldoni 4, Torino, Italy. *Tel:* 21-008. *Cable:* MOLINAR—TORINO. *Branches:* Piazza Castello,

Torino; Via Principe Amedeo 12, Torino; Via A. Gramsci 127, Genova. *Specialities:* all kinds of wild mammals & birds.

JAPAN

TOKYO

Aritake Chojuten Co. Ltd. (Aritake Birds & Animals Co. Ltd.), (Ginichi Aritake), No. 6 Muromachi 4-chome, Nihonbashi, Chuo-Ku, Tokyo, Japan. *Tel:* Tokyo (241) 1742 & (241) 4629. *Cable:* ARICHOJU TOKYO. *Branch:* No. 16, Kajicho 2-chome, Kanda, Chiyoda-Ku, Tokyo, *Tel:* (251) 8887. *Specialities:* importation of all animals, export of small birds & Japanese animals.

KENYA

NAIROBI

John Seago (John Seago & Anthony Parkinson), 90 Barclays Bank, P.O. Box 30011, Nairobi, Kenya Colony. *Tel:* Kabete 330. *Cable:* SEAGO, c/o BARCLAYDOM NAIROBI. *Branch:* Hall Common, Ludham, Norfolk, G.B. *Branch Tel:* Potter Heigham 292. *Branch Cable:* SEAGO LUDHM U.K. *Specialities:* collections of mammals, birds & reptiles undertaken by the directors are made up to order in East Africa for Zoological Societies or similar organisations. Very little stock is held, as per Game Dept. regulations.

NARO MORU

Cecil S. Webb, Providence Farm, Naro Moru, Kenya Colony. *Tel:* Naro Moru 24Y6. *Cable:* WEBB NARO MORU KENYA. *Specialities:* Touracos, Sunbirds, various Whydahs, rare Waxbills & other seedeaters, Robin-chats, various Glossy Starlings, Plovers, Vulturine & Crested Guineafowl, East African Crowned Cranes; various small mammals. Owing to local regulations, dealers not supplied.

NETHERLANDS

AMERSFOORT

Dierenpark Amersfoort (W. G. Tertoolen & P. J. Knoester), Barchman Wuytterslaan 224,

Animal Dealers

Amersfoort, Netherlands. Tel: K. 3490-6658. Cable: ZOO AMERSFOORT. *Specialties:* Elephants, Lions, Leopards, Black Leopards, Tigers, Brown & Black Bears, Camels, Raccoons, monkeys, Water Buffalo, Hyenas, Wolves, Foxes; Parrots, Duck, Owls & various other birds.

AMSTERDAM

J. J. van den Brink, Herengracht 96, Amsterdam, Netherlands. Tel: 242888-242165-66702. Cable: JABRIA AMSTERDAM. *Specialties:* Waterfowl & Cranes; mammals & birds for Zoological Gardens.

EINDHOVEN

Animal Birdparc (H. N. J. van Dijk), Roostenlaan 303, Eindhoven, Netherlands. Tel: 13738. Cable: ANIMALI EINDHOVEN. *Specialties:* Duck, Swans, Emus, Rheas, Cranes, Flamingos, Penguins, Macaws, Pheasants, Nicobar Doves, Touracos, Toucans; up to 200 species of birds kept in stock; also various species of monkeys.

HELMOND

J. Amijs & Zonen (A. Amijs & G. Amijs), Binderseind 50, Helmond, Netherlands. Tel: 2919 (04920). Cable: AMIJS-HELMOND. *Specialties:* Canaries (all colours) and birds from all parts of the world.

NIJVERDAL

Den Boer's Dierenhandel (I. G. den Boer), Bonteweg 55, Nijverdal, Netherlands. Tel: 05486/2930. Cable: BOERSDIERENHAND-EL. *Specialties:* ornamental waterfowl, Pheasants, Canaries, exotic birds, Swans, Parrots, Parrakeets; also monkeys.

PUTTEN

Drs. W. De Rover, Import-Export (W. de Rover), Sprielderweg 2, Putten (Gld), Netherlands. Tel: 03418-247. Branch: G. A. Izzard, 13 Romney Close, Chessington, Surrey, G.B. *Specialties:* European, Asiatic, American, Australian & African species of lizards, snakes, turtles & tortoises; young specimens of crocodiles under 4 feet; European amphibians, as well as a few African & American species.

SOEST

G. van den Brink (Frans M. van den Brink), P.O. Box 15, or Den Bliklaan 55, Soest, Netherlands. Tel: 2844. Cable: GEBRIAM SOESTUT. *Specialties:* Chimpanzees, Rhesus & other species of monkeys, Camels, Polar Bears, Lynx, animals from India.

TILBURG

Fa. C. van Dyk en Zonen, Tilbuurg's Natuur-Dierenpark (N. C. van Dijk, Q. P. C. van Dijk & H. A. van Dijk), Bisschop Aelenstraat 24 & Bredaseweg 429, Tilburg, Netherlands. Head Office—Bisschop Aelenstraat 24, Tilburg. Tel: 21930 & 24536. Cable: ZOOPARK TILBURG. *Specialties:* all kinds of animals (including birds) from all over the world on request; many held in stock.

Ornisa Vogel—En Dierenhandel (H. C. van Dijk & C. H. W. van Dijk), Fabriekstraat 6, Tilburg, Netherlands. Tel: 22293 & 22504. *Specialties:* Apes (including Chimpanzees), Kangaroos: Bengal Finches, Budgerigars, Bulbuls, Buntings, Canaries, Cardinals, Cockatoos, Cranes, Doves, Duck, Finches, Flamingos, Fruitsuckers, Geese, Hangnests, Lovebirds, Macaws, Manikins, Magpies, Mocking Birds, Mynahs, Nuns, Parrakeets, Parrotlets, Parrots, Partridges, Pigeons, Quail, Robins, Starlings, Swans, Thrushes, Waxbills, Weavers, Wydahs, Zosterops.

NIGERIA

KANO

Nwoji Brothers—Bird & Animal Exporters (Emmanuel Nwoji), 89 Niger Road, Sabon Gari, Kano, Nigeria. Cable: NWOJI BROS. KANO. Branch: 9 Amore Street, Apapa, Lagos, Nigeria. *Specialties:* Chimpanzees, Ginger & Mona Monkeys, Baboons, Mandrills, Spotted Hyenas, Porcupines; African Grey Parrots, Great Bustards, Crowned Cranes, Saddle Bill Storks, Pelicans, Canaries; Pythons.

Thomy Brothers (Rowland V. Thomas), P.O. Box 566, 25 Middle Road, Kano, Northern Nigeria. Tel: 1127. Cable: ZOOPARK KANO. Branch: P.O. Box 119, Eoute Metta, Nigeria & P.O. Box 130, Nguru, Northern

Nigeria. *Specialties*: Chimpanzees, Drills, Mona, Green, Ginger, Mangabey & Baboon Monkeys; Crocodiles, Iguanas, Monitor Lizards, Pythons & Royal Pythons, African Chameleons, Skinks; Saddle-Bills, Marabous, Pelicans, Wood Ibis, Sacred Ibis, Ostriches, Hornbills, Duck & Geese, Crowned Cranes, Secretary Birds, Pigmy Geese, Hawks & Eagles, Francolins, Rails, Crakes, Jacanas, various Doves, Purple Gallinules, young & adult African Grey Parrots, Long-tailed Starlings, Spree Starlings, Green Singing Finches, Lovebirds, Cordon Bleus, Plovers, Cut-throats, Waxbills, etc.

PERU

LIMA

Peru-Fauna S. C. de R. Ltd. (Rudolf Schott), Lima, P.O. Box 783, Peru. *Tel*: 57-7-59. *Cable*: PERUFAUNA LIMA. *Branch*: Miraflores Bolivar 399, Animal Farm, Santiago de Surco. *Branch Tel*: Tacna 365-367. *Specialties*: South American fauna, in particular South American Tapirs, Spectacled Bears, Monkeys; Condors, King Vultures, Penguins, various small birds.

SOUTHERN RHODESIA

BULAWAYO

Rusty Mollentze—White Hunters (Rusty Mollentze & S. H. Smith), P.O. Box 2314, Bulawayo, Southern Rhodesia. *Tel*: Bulawayo 2314. *Specialties*: Elephant, Lion, Leopard, Zebra, Giraffe, Eland, Kudu, Wildebeeste, Sable Antelope, Roan Antelope, Gemsbok, Impala, Duiker, Steinbok; Crocodiles; snakes; birds.

SWITZERLAND

BERNE

Reichmuth Big Game Capture (G. P. Reichmuth), 19 Keltenstr., Berne 18, Switzerland. *Tel*: 66-32-81. *Specialties*: annual expedition to Central & West African forest to obtain mammals, reptiles & birds.

BIENNE

Peter R. Ryhiner, Bienne 5, Switzerland. *Tel*: 032-2-80-10. *Cable*: RHINOCEROS ZUR-ICH. Rare Asian fauna (India, Siam, Malaya, Indonesia)—Tapirs, Elephants, Tigers, Leopards, Black Leopards, Gibbons & various Monkeys, Great Indian Rhinoceros (*R. unicornis*), & Sumatran Rhinoceros (*Didermocerous sumatrensis*), various small mammals, reptiles & insects.

ST. MARGRETHEN

Tierhandlung Schmid Import-Export (E. Rüsch), St. Margrethen (St. G.), Switzerland. *Tel*: 071-74321. *Specialties*: Birds of Prey, Duck; Bears.

THAILAND

BANGKOK

Lao Asia (Suphin Phinpraphat), 182-184 Ban Moh Road, Bangkok, Thailand. *Tel*: 24111. *Specialties*: Gibbons, various Monkeys, young Elephants; Greater Hill Mynahs, Nicobar Pigeons; Lizards, young Tortoises.

UNITED STATES OF AMERICA

CALIFORNIA

HERMOSA BEACH

F. F. Hofer, 1115 Strand, Hermosa Beach, California, U.S.A. *Tel*: Frontier 69940. *Cable*: AQUARIUM. *Specialties*: Sea Lions (any size & at various stages of training), Harbour Seals (limited supply), Californian fish.

N. CAROLINA

WILMINGTON

Tote Em In Zoo (George R. Tregembo), Rt. 2, Box 368, Wilmington, N. Carolina, U.S.A. *Tel*: RO 35496. *Cable*: ZOOGEMBO. *Specialties*: Bears, New & Old World

Animal Dealers

Monkeys, Lions, Squirrels of various species, Porcupines, Wolves, Coyotes, Foxes, Otters, Buffalo, Deer; alligators, snakes; turtles, amphibians; tropical birds of many species.

CONNECTICUT

SOUTHBURY

Pearsons Birds & Animal Farm (H. E. Pearson), Southbury, Connecticut, U.S.A. *Tel:* Woodbury Co. 4-8629. *Specialities:* North American fauna; also animals from all over the world.

FLORIDA

KENDALL

Miami Rare Bird Farm Inc. (Alton V. Freeman), P.O. Box 100, Kendall, Florida, U.S.A. *Tel:* Mohawk 1-4272. *Cable:* RAR-BIRD. *Specialities:* larger species of birds; also all Zoo animals with the exception of reptiles.

MISSOURI

KANSAS CITY

Trans World Animal Inc. (Dr Deets Picket, D.V.M., M.Sc.), 8505 Lee Boulevard, Kansas City 15, Missouri, U.S.A. *Tel:* Mitchell 9-1165. *Branch:* B.P. 1158, Yaounde, Cameroun. *Specialities:* Gorillas, Chim-

panzees, Elephants, Hippopotamus. All animals guaranteed free of contagious or infectious disease, intestinal parasites and to be negative to intradermal tuberculosis test.

NEW YORK

NEW YORK

Trefflich Bird & Animal Co. Inc. (Henry Trefflich), 228 Fulton Street, New York 7, N.Y., U.S.A. *Tel:* Digby 9-0592. *Cable:* TREFFLICH—NEW YORK. *Branches:* 2 May Street, Freetown, B.W. Africa (*Tel:* Freetown 2899, *Cable:* AFRICA-RHESUS FREETOWN); A. W. Chater, Calcutta, India; W. Otremsky, Singapore, Malaya. *Specialities:* Gorillas, Orang-utans, Chimpanzees, young female Indian Elephants, Black Leopards, African Green Monkeys, Sooty Mangabey & Mona Monkeys, South American Monkeys; Reticulated Pythons, Indian Cobras & other snakes; birds from all over the world.

LA ROCHELLE

F. J. Zeehandelaar Inc. (Fred Zeehandelaar), 405 North Avenue, New Rochelle, N.Y., U.S.A. *Tel:* NE6-2096. *Cable:* ZEEBONGO. *Specialities:* All Pachyderms, Gorillas, Orang-utans, Gibbons, Guerezas, Langurs; Siberian Tigers, Snow Leopards, Clouded Leopards, Bengal Tigers, Black Leopards, Jaguars, Sumatra Tigers, various species of Antelope, Zebras; Monkey-eating Eagles; Cassuaries, Ostriches, Flamingos, Cranes, Storks; Reticulated Pythons, Giant Tortoises.

FILMS AND TELEVISION

FILMS MADE AT ZOOS DURING 1959

(* indicates that the Zoo has its own Film Unit)

BELGIUM

Société Royale de Zoologie d'Anvers*, Antwerp. No films produced during 1959.

BURMA

Rangoon Zoological Gardens, Rangoon. Film by United Press Movietone News.

CANADA

Calgary Zoological Gardens*, Calgary. Both British & Canadian Broadcasting Companies made films, also Zoo made own film "A Day in Your Zoo".

CEYLON

The Government Zoological Gardens of Ceylon (The Dehiwala Zoo), Dehiwala. News Reels.

CHILE

Jardin Zoologico Nacional, Santiago. Documentary film, with commentary lasting 10 minutes.

CZECHOSLOVAKIA

Zoopark Lesna u Gotwaldova, Lesna. "Spaziergang durch Zoo Lesna". 350 m. (A Walk round Lesna Zoo).

DENMARK

Zoological Garden, Copenhagen. A 60 minute colour-film about the zoo.

GERMANY

Zoologischer Garten Berlin, Berlin. "The Strange Menu"; "Children of Worries"; "The Registry-Office for Animals". Zoologischer Garten der Stadt Dresden, Dresden. A Film about Wild Life of East Africa in Colour.

Duisburger Tierpark, Duisburg. Private film by Dr Thienemann about his journey to South-West Africa.

Thüringer Zoopark, Erfurt. Film Unit, belonging to separate department of Erfurt City Council; Film: "The Building of Thüringer Zoo".

Zoologischer Garten Frankfurt/Main*, Frankfurt.

Tierpark Göppingen, Göppingen. One film. Zoo Karlsruhe, Karlsruhe. "Around the Zoo". Heimattiergarten Neumünster*, Neumünster. For cultural education, the Zoo Society has made several short films at the Heimattiergarten, Neumünster, for use during lectures.

Tiergarten Nürnberg, Nürnberg. One colour film about the Zoo for schools.

GREAT BRITAIN

Ilfracombe Zoo Park, Ilfracombe. 1 Pathe Pictorial: The Lion and Lamb (the 43rd Lion Cub bred and reared in this zoo by one adult pair of Lions since 1952).

The Zoological Society of London*, London. Resident Film Unit established jointly by the Society & Granada TV Network Ltd. 13 half-hour films on animal behaviour made during 1959 for the Film Library.

The Zoological Society of London, Whipsnade Park*, Whipsnade. Film Unit—see under London, the Z.S.L., Regent's Park.

HUNGARY

Budapest Fovaras Allat—Es Novenykertje (Zool. & Botanical Garden), Budapest. "Living World behind the Bars"; "The History of a Moment".

ISRAEL

Gan Hachajoth shel Hamachon Habiologi* (Zool. Garden of the Biol. Inst.), Haifa. Film Unit producing natural history & biol. films & filmstrips for visual teaching; lecture hall & apparatus for showing them. 5 short biol. educational films.

ITALY

Comune di Roma, Giardino Zoologico e Museo di Zoologia, Rome. "La pêche des perles" made in the Indies (Gulf of Madras).

JAPAN

Ritsurin Park Zoo*, Kagawaken. Film Unit—1 16 mm. camera; 1 35 mm. camera; 2 projectors. "Orangutan", 16 mm.

Kobe Oji Zoo, Kobe. Films taken by Director —Birth of a Giraffe; Anatomy of the Elephant.

NETHERLANDS

Royal Zoological Society Natura Artis Magistra, Amsterdam. "Life of the Mudskipper" (*Perophthalmus*).

Royal Rotterdam Zoological Garden, Rotterdam. On behalf of the Zoo a film "Oasis in a Metropolis" (colour, $\frac{1}{2}$ hour) was produced by M. Toonder Stud.

SPAIN

Parque Zoológico Barcelona, Barcelona. "Parque Zoológico de Barcelona" 45 mins.; 16 mm.; Kodachrome.

SWITZERLAND

Zoologischer Garten Basle, Basle. 1. Biology of the armour-plated rhinoceros; 2. Flamingo incubations at the Basle Zoo.

U.S.A.

Seaquarium,* Miami, Fla. "Ocean Show Rooms".

Baltimore Zoo, Baltimore, Maryland. 500' 16 mm. 1,500 Negatives.

Detroit Zoological Park, Detroit, Michigan. Miscellaneous films by zoo staff photographer. Not for release.

New York Zoological Park* (Bronx Zoo), New York, N.Y. Since 1899 there has been a Staff Photographer who takes stills and motion pictures.

Films: "This is the Bronx Zoo" (20 mins., colour & sound).

"One Hot Day in the Zoo" (5 mins., colour & sound).

"Taking Trails in Burma" (11 mins., colour & sound).

"Background for a Baby Walrus" (8 mins., colour & sound).

"Rare Birds in Trinidad" (9 mins., colour & sound).

Philadelphia Zoo, Philadelphia, Penn. 10 Educational films for the National Education Radio & Television Centre at WHYY-TV (Philadelphia's non-commercial Television studios). These are to be shown on more than 40 educational stations round the county. Copies of the films sold to the Philadelphia Zoo at a nominal cost.

Milwaukee County Zoological Gardens* (new zoo) Washington Park Zoo (old zoo) Milwaukee, Wisconsin. Film on new zoo, including miniature train ride; film of Director's trip to Europe and return with 2 Indian rhino. Films are made periodically of any special event.

ZOO TELEVISION PROGRAMMES DURING 1959

AUSTRALIA

Zoological Board of Victoria, Melbourne. A regular programme in a children's session on one Channel from February to June, 1959.

BELGIUM

Société Royal de Zoologie d'Anvers, Antwerp. Zoo featured on TV Prog. twice a month.

CZECHOSLOVAKIA

Zoologická zahrada, Bratislava. Von Tieren des unseren Zoolog. Gartens.

GERMANY

Tierpark Berlin, Berlin. Two programmes per month—3 broadcasts and Children's Programme.

Tiergrotten und Nordsee-Aquarium Bremerhaven, Bremerhaven. 50 min. film every year.

Zoologischer Garten der Stadt Dresden, Dresden. Der geFilmte Brehm.

Zoologischer Garten Frankfurt/Main, Frankfurt. Regular TV Programme. "A Place for Animals" by Dr. Grzimek.

Heimattiergarten Neumünster, Neumünster. Reports in the "Nordschau", TV programme from the "Flensberg Studio".

GREAT BRITAIN

The Blackpool Tower Zoo & Aquarium, Blackpool, England. "News from the Zoos"; Further Feature planned for 1960.

The Royal Zoological Society of Scotland, Edinburgh, Scotland. Zoo featured at 3-monthly intervals in TV Programme "Round the Zoos".

The Zoological Society of London, London. Resident Film Unit established jointly by the Society and Granada TV Network Ltd. During 1959 films made by the Unit were televised regularly on Granada TV Network. In addition a video-taped programme was

sent out from the London Zoo & Whipsnade by Granada Outside Broadcast Unit.

Paignton Zoological & Botanical Gardens Ltd., Paignton. "News from the Zoos" twice televised from Paignton. Incidental items have been televised by B.B.C. and I.T.A.

The Zoological Society of London, Whipsnade Park, Whipsnade. TV Programme—see under London, The Z.S.L. Regent's Park.

HUNGARY

Budapest Fovaras Allat-Es Novenykertje (Zool. & Botanical Garden) Budapest. Budapest Zoo is featured regularly on Budapest Broadcasting & TV.

JAPAN

Fukuoka Zoological Gardens, Fukuoka. Featured regularly on TV Programme.

Ueno Zoological Gardens, Tokyo. Regular TV Programme on N.E.T. Network.

U.S.A.

Griffith Park Zoo, Los Angeles, Calif. Zoo Director appears on a weekly CBS programme that goes out to 93 stations.

San Francisco Zoological Gardens, San Francisco, Calif. TV. Programme in co-operation with the Academy of Science.

Nature's Haven Wild Animal Rentals, Saugus, Calif. Featured on TV Programmes on an average 3 times a month.

Lincoln Park Zoological Gardens, Chicago, Illinois. "Zoo Parade" discontinued, other programme developing.

Saint Paul's Como Zoo, Saint Paul, Minnesota. Weekly WCCO-TV and KMSP-TV television. Animal & Keeper appear, 5 min. spot.

The following Zoos have been featured on TV Programmes during 1959

AUSTRALIA. Adelaide Zoo, Melbourne Zoo, Sydney (Taronga Park) Zoo.

CANADA. Calgary Zoo, Winnipeg (Assiniboine Park) Zoo, Granby Zoo.

CEYLON. Dehiwala Zoo.

CZECHOSLOVAKIA. Lesna Zoo, Liberec Zoo, Ostrava Zoo, Prague Zoo.

DENMARK. Aalborg Zoo, Copenhagen Zoo.

FRANCE. Mulhouse Zoo, Paris Zoo.

GERMANY. Dresden Zoo, Duisburg Zoo, Erfurt Zoo (Fernsehfunk-Aufnahmen TV), Kronberg Zoo, Munich Zoo, Nuremberg Zoo, Rostock Zoo (Deutschen Fernsehfunke), Stuttgart Zoo, Wuppertal Zoo (three transmissions on zoological research).

GREAT BRITAIN. Bristol Zoo, Chessington Zoo, Chester Zoo, Dudley Zoo, Ilfracombe Zoo, Isle of Wight Zoo, Jersey Zoo, Manchester Zoo, Southport Zoo.

ITALY. Naples Zoo, Rome Zoo.

JAPAN. Kobe Oji Zoo, Takamatsu (Ritsurin Park) Zoo.

NETHERLANDS. Rotterdam Zoo.

POLAND. Poznan Zoo, Warsaw Zoo.

SPAIN. Barcelona Zoo (five transmissions).

SWEDEN. Hoor Zoo, Stockholm Zoo.

SWITZERLAND. Basle Zoo, Zurich Zoo.

U.S.A. Albuquerque (Rio Grande Park) Zoo, N.M.; Baltimore Zoo Md.; Boston (Franklin Park) Zoo, Mass.; Catskill Game Farm, N.Y.; Chicago (Lincoln Park) Zoo, Ill.; Cleveland Zoo, Ohio; Columbus Zoo, Ohio; Dallas Zoo, Texas; Detroit Zoo, Mich.; Honolulu (Waikiki) Aquarium, Hawaii; Honolulu Zoo, Hawaii; Houston Zoo, Texas; Miami Seaquarium, Fla.; New York (Bronx) Zoo, N.Y.; Oklahoma (Lincoln Park) Zoo, Okla.; Philadelphia Zoo, Pa.; Pittsburgh (Highland Park) Zoo, Pa.; Seattle (Woodland Park) Zoo, Washington; Staten Island Zoo, N.Y.; Washington (National Zoological Park) Zoo, D.C.

ZOO PUBLICATIONS

MAGAZINES, PAMPHLETS & JOURNALS PUBLISHED BY ZOOS

ARGENTINA

Jardín Zoológico de la Ciudad de Buenos Aires, Buenos Aires. Illustrated Guide (1950, \$3.60).

AUSTRALIA

Adelaide Zoological Gardens, Adelaide. Annual Report (free to members); Zoo News (quarterly to members).

Zoological Board of Victoria, Melbourne. Zoo Plan (6d.).

Taronga Zoo Park, Sydney. Zoo Guide (3s.).

BELGIUM

Société Royale de Zoologie d'Anvers, Antwerp. Review "ZOO" (quarterly, free to Soc. members, 50 F.p.a. for students); Bulletins of the Société Royale de Zoologie d'Anvers (periodic, sent to Univs. & sc. institutions of the world).

BRITISH GUIANA

British Guiana Zoo, Georgetown. Journal of British Guiana Museum and Zoo (quarterly; 25c.).

BULGARIA

The Zoological Garden, Sofia. Scientific papers by Zoo staff published in the Bulletin of the Zoological Institute at the Bulgarian Academy of Science.

CANADA

Calgary Zoological Gardens, Calgary, Alberta. Guide Book (Annual; 50c.); "Honker" Bulletin (irregular intervals).

Assiniboine Park Zoo, Winnipeg, Manitoba. Annual Pictorial Guide (25c.); "Zoolog" (quarterly, free to members of Zool. Soc.).

Montreal Children's Zoo (also known as: Jardin des Merveilles), Montreal, Quebec. Children's Zoo Souvenir Booklet (15c.).

Le Jardin Zoologique de Quebec, Orsainville, Quebec. Les Carnets de Zoologie; Tracts; Guide.

CEYLON

The Government Zoological Gardens of Ceylon (The Dehiwala Zoo). Zoo Guide Book (Rs.1.00); Pamphlets (free).

CZECHOSLOVAKIA

Zoologická zahrada Bojnice, Bojnice. "Our Zoo" (1.00 Kcs.).

Zoologická zahrada města Brno, Brno. Zoo Guide (2.00 Kcs.).

Severoceska zoologická zahrada, Liberec. Zoo Guide. (3.00 Kcs.).

Zoologická zahrada Ostrava, Ostrava. Zoo Guide (2.00 Kcs.).

Zoologická zahrada Praha, Prague. Guide-book (annual).

Zoologická zahrada v Ustí nad Labem, Ustí nad Labem. Short articles in various specialist journals.

DENMARK

A/S Aalborg Zoologiske Have, Aalborg. Zoo Guide (1.00 Kr.).

Zoologisk Have, Copenhagen. Zoo Guide.

EIRE

Royal Zoological Society of Ireland, Dublin. Annual Report (1s.).

FRANCE

Le Parc Zoologique de Clères, Clères. Guide du Parc (0.40 Frs.).

Parc Zoologique, Paris. "Les Amis du Zoo"; Zoo Guide.

GERMANY

Tierpark Berlin, Berlin (East). "Milu" (annual); Zoo Guide (annual, 1 DM); "Der Zoologische Garten" and "Beiträge zur Vogelkunde" (Essays on Bird Studies).

Zoologischer Garten, Berlin (West). "Guide to the Zoological Gardens" (1 p.a.; 0.75 DM).

Tiergrotten und Nordsee-Aquarium Bremerhaven, Bremerhaven. Zoo Guide; various articles on the Hooded Seal (*Cystophora cristata*) in "Zoologische Garten"; also articles in "Orion".

Aktiengesellschaft Zoologischer Garten Köln, Cologne. Zoo-magazin "Friends of the Cologne Zoo" (quarterly).

Tierpark Dortmund, Dortmund. "Children's Party" (summer; 0.10 DM).

Zoologischer Garten der Stadt Dresden, Dresden. Various books (all in German)—"The Zoo Director Tells (0.75–2.50 DM);

"Otherwise there would be no animals" (9.75 DM); "And then Animals would be our Companions" (9.75 DM); "African Animals" (15.00 DM); "Where the Rhinos Wallow" (16.00 DM.); "When the Giraffe come to Drink" (16.00 DM).

Duisburger Tierpark, Duisburg. Annual Report.

Lobbecke-Museum-Aquarium, Dusseldorf. "A Hundred Years of Neanderthals" (Hundert Jahre Neandertaler) (2.00 DM); Aquarium Catalogue (2.00 DM); Native Animals (2.00 DM).

Thüringer Zoopark, Erfurt. Zoo Guide (0.20 DM); "Erfurt's Roter Berg—Building Thüringer Zoopark" (1.50 DM); Zoopark Corner reserved in various local publications.

Zoologischer Garten Frankfurt/Main, Frankfurt. Annual Report. Zoo Guide.

Ruhr-Zoo, Gelsenkirchen. Zoo Guide.

Krefelder Tierpark, Krefeld. Zoo Guide (0.50 DM)

Georg von Opel-Freigehege für Tierforschung e.V., Kronberg. Monthly report; Yearbook.

Zoologischer Garten Leipzig, Leipzig. Zoo Guide.

Zoologischer Garten Magdeburg, Magdeburg. Zoo Guide (annual, 1.00 DM); pictorial Zoo Book (irregular intervals, 15.00 DM).

Tierpark Hellabrunn, Munich. Zoo Guide (50 DM; annual).

Heimattiergarten Neumünster, Neumünster. Zoo guide complete with map (1.20 DM); Zoo Plan (free); Zoo bulletin for Society members (free); articles in several papers and magazines.

Tiergarten Nürnberg, Nuremberg. Guide to the Nuremberg Zoo; Annual Report of the Nuremberg Zoo; Zoo prospectus in German and English.

Tiergarten Osnabrück e.V., Osnabrück. Zoo Guide.

Wilhelma, Botanisch - Zoologischer Garten, Stuttgart. Zoo Guide (1.50 DM); Annual Zoo Calendar (3.00 DM).

GREAT BRITAIN

Bristol, Clifton & West of England Zoological Society, Bristol. Book & Guide (bi-annual; 1s. 6d.); Plan & Information (bi-annual; 6d.); Annual Report.

Chessington Zoo, Chessington. Official Zoo Guide (Annual; 1s.); Animal Painting Book (Annual; 1s.); Handbook of species & specimens for schools (annual; free).

The North of England Zoological Society, Chester. Our Zoo News (quarterly 6d.); Focus on Chester Zoo (monthly; free to coach proprietors).

Doncaster Zoo, Doncaster. Guide to the Zoological Gardens, Doncaster (6d.).

The Dudley Zoological Society Ltd., Dudley. Zoo Guide (annual; 1s.).

The Royal Zoological Society of Scotland, Edinburgh, Scotland. Annual report (free to Fellows of Soc.); Zoo Guide (2s.).

The Zoological Society of Glasgow & West of Scotland, Glasgow, Scotland. Annual Report;

Zoo Guide; Pathology Reports for Council.

Jersey Zoological Park, Jersey, Channel Islands. The Jersey Zoo Guide (annual; 1s.).

The Zoological Society of London, London. Proceedings of the Zoological Society (8

times a year, 30s. per part, issued free to Sc. Fellows of the Soc.); Symposia of the Zoo-

logical Society (as necessary); Transactions

(at irregular intervals, price varies); No-

menclator Zoologicus (at irregular intervals,

price varies); Zoological Record (Published

in sections, annual vol. £8); Zoo Guide

(2s. 6d.); Zoo Plan (6d.); Pet Leaflets (3d.);

Various Leaflets (3d.-6d.); Zoo Magazine (3

times a year to members of Young Zoologists'

Club only); International Zoo Yearbook

(annual); Annual Report (free to Fellows of

the Society).

Belle Vue Zoological Gardens, Manchester. Belle Vue Zoological Guide (annual, 1s. 3d.);

Miscellaneous Folders (annual, free).

Paignton Zoological & Botanical Gardens Ltd., Paignton. Plan & Guide (annual; 1s.).

Southport Zoological Society, Southport. Photos & Guide.

The Zoological Society of London, Whipsnade Park, Whipsnade. Guide & Zoo Plans.

HUNGARY

Budapest Fovaros Allat—Es Novenykertje (Zoological & Botanical Garden of Budapest), Budapest. Zoo Guide (Annual); Guide to the

Tropicarium, Aquarium & Terrarium (oc-

casional); Animals of Special Interest at the

Zoo (occasional); A Short History of the

Zoo (occasional).

INDIA

Alipore Zoological Gardens, Alipore, Calcutta. Administrative Report (free).

ISRAEL

Gan Hachajoth Shel Hamachon Habiologi (Zool. Garden of the Biol. Inst.) Haifa. Annual

Report; Annual Lecture Programme for the

Public; Catalogue of specimen exhibits,

filmstrips, scientific books etc. available for

loan to schools.

Jerusalem Biblical Zoological Garden Ltd., Jerusalem. "Alon Tedidei Hagan" (Bulletin

of Friends of the Zoo).

Gan Hakhayot Tel Aviv, Tel Aviv. "Bevar" (periodical; 25 agurot).

ITALY

Giardino Zoologico di Napoli, Naples. Regular articles in *Il "Giardino Zoologico"* (ed. Rome, every 2 months).

Comune di Roma Giardino Zoologico e Museo di Zoologia, Rome. *"Il Giardino Zoologico"* (6 a year; L.200); Zoo Guide (L.50); *"Andiamo allo Zoo"* (Let's Go to the Zoo), (L.200).

Giardino Zoologico Torino, Turin. Zoo Guide.

JAPAN

Ritsurin Park Zoo, Kagawaken. "What Animals Do You Like?" (free).

Kobe Oji Zoo, Kobe. Zoo Guide (3 p.a.; free).

Ueno Zoological Gardens, Tokyo. *"Animals & Zoo"* (monthly, \$1.00 a year, free to members of the "Animal Lovers' Club").

NETHERLANDS

Royal Zoological Society Natura Artis Magistra, Amsterdam. *Bijdrage tot de Dierkunde* (annual, price varies); *"Artis"* (quarterly; Hfl. 6 Holland, Hfl. 7 abroad).

Burgers' Natuur-Dierenpark, Arnhem. Zoo Guide.

Koninklijke Rotterdamse Diergaarde (Royal Rotterdam Zool. Gardens), Rotterdam. *"Blijdorp Geluiden"* (monthly; Hfl. 1.90); Zoo Guide.

Tilburg's Natuur Dierenpark, Tilburg. *"Dierenpark"* (monthly; Hfl. 2.50 a year).

Dierenpark Wassenaar, Wassenaar. *Nieuws uit het Park* (regularly; Hfl. 3.50 a year).

NEW ZEALAND

Auckland Zoological Park, Auckland. Zoological Society's Newsletter (quarterly, free).

Wellington Zoological Gardens, Wellington. *Catalogue & Guide* (bi-annual; 1s.); *W.C.C. Yearbook* (annual; free).

POLAND

Miejski Ogród Zoologiczny Warszawa, Warsaw. "Thirty Years at Warsaw Zoo" (60 zł.).

Miejski Ogród Zoologiczny, Wrocław (Municipal Zool. Garden). Wrocław. 1957 Guide Book (8 zł.); 1958—Ten Years Activity in the Wrocław Zool. Garden; articles in the *"Biuletyn Techniczny Ogrody Zool."* 1959 (edited by Polish Zoos, Warszawa).

PORTUGAL

Jardim Zoologico e de Acclimação em Portugal, Lisbon. Zoo Guide; Annual Report.

SOUTH AFRICA

Bloemfontein Zoo, Bloemfontein. 1960 Zoo Guide (2s.).

National Zoological Gardens of South Africa, Pretoria. Guide-book; Annual Report.

SPAIN

Parque Zoologico Barcelona, Barcelona. Zool. articles published in *"Destino"* (monthly).

SWEDEN

AB Furuviksparken, Furuvik. Zoo Plans.

The Game Park of Scone, Höör. Visitors' Guide; Children's Guide.

Nordiska Museet och Skansen, Stockholm. *Acta Vertebratica* (1-2 issues a year); Books, guides etc.; In summer a weekly periodical containing news about the institution and programmes for the evening concerts.

SWITZERLAND

Zoologischer Garten Basle, Basle. *"Zolli"*, the Bulletin of Basle Zoo (bi-annual; 5 frs.); Annual Report; Zoo Guide.

Tierpark Dählhölzli, Berne. Guide-book (1954 1 Fr.).

Zoologischer Garten, Zurich. Zoo Guide (published at irregular intervals).

UNITED ARAB REPUBLIC

Giza Zoological Gardens, Cairo. A Guide map for the Zoo (2 P.T.); Postcards, photos. (½ P.T.); Zoo Guide in Arabic language.

U.S.A.

Roeding Park Zoo, Fresno, California. Guide Book.

Pacific Ocean Park, Ocean Park, Calif. Guide Book (25c.); Free Pamphlets.

William Land Park Zoo, Sacramento, Calif. Guide Book (50c.).

San Diego Zoological Garden, San Diego, Calif. *"Zoonooz"* (monthly; \$0.20); Guide Book (usually revised annually, \$0.75); Special Bulletins; Reprints of scientific papers. **San Francisco Zoological Gardens**, San Francisco, Calif. Guide book; Monthly bulletin to Society members.

Steinhart Aquarium, San Francisco, Calif. Guide Book (35c.).

Denver Zoological Gardens, Denver, Colorado. Guide Book (25c.).

Beardsley Park Zoo, Bridgeport, Connecticut. Guide Book; Monthly Bulletin; Pamphlets.

National Zoological Park, Washington, District of Columbia. Annual Report (free). **Seaquarium**, Miami, Florida. *"Sea Wonders of the World"*. (50c.).

Ross Allen's Reptile Institute, Silver Springs, Fla. Ross Allen's Reptile Institute (25c.).

John G. Shedd Aquarium, Chicago, Illinois. Guide Book (\$1.15).

Lincoln Park Zoological Gardens, Chicago, Illinois. Bulletins on the care of some wild animals as pets (set of 12) at 5c.; Zoomap folder containing some data (free).

Hawthorn Melody Zoo, Libertyville, Illinois. Zoo Guide (25c.).

Audubon Park Zoo, New Orleans, Louisiana. History of Audubon Park.

Baltimore Zoo, Baltimore, Maryland. Pictorial Guide to the Baltimore Zoo (50c.); Eight Educational Leaflets (free).

Franklin Park Zoo, Boston, Massachusetts. Newsletter to Society Members (free); A bulletin is projected (1st issue in preparation).

Detroit Zoological Park, Detroit, Michigan. Your Detroit Zoo (4 times a year; free); Guide Book (annual; 50c.); Tourist Bulletins (free).

Clinch Park Zoo, Traverse City, Michigan. Guide Book (25c.).

Saint Paul's Como Zoo, Saint Paul, Minnesota. "Como Park Zoo" information bulletin (monthly; free); "Como Zoo Guide" (\$0.50).

Swope Park Zoological Gardens, Kansas City, Missouri. Free pamphlets.

St. Louis Zoological Garden, St. Louis, Missouri. St. Louis Zoo Album (\$1.00).

Riverside Park Zoo, Scottsbluff, Nebraska. Free Pamphlets.

Buffalo Zoological Gardens, Buffalo, New York. "Zoo Logic" (quarterly, 50c. a year).

Catskill Game Farm Inc., Catskill, New York. Guide Booklet (15c.).

New York Aquarium, New York, New York. "Guide & Historical Souvenir" (64 pp. illus., 40c.).

New York Zoological Park (Bronx Zoo), New York, N.Y. "Animal Kingdom" (popular, bi-monthly \$3.50 p.a.); Zoologica (technical, quarterly \$6.00 p.a.); Annual Report (annual); Guide Book (\$1.00).

Seneca Park Zoo, Rochester, New York. Zoological Society Publication (\$5 to members).

Staten Island Zoo, Staten Island, N.Y. "In Animal-land" (bi-monthly; free to members); Annual Report; Zoo Guide.

Zoological Society of Cincinnati, Inc., Cincinnati, Ohio. "Zoo News" (monthly; to members).

Cleveland Zoological Park, Cleveland, Ohio. Zoo News (quarterly; free to members); Guide Book (\$0.50).

Columbus Zoo, Columbus, Ohio. Circular (annual; \$0.10).

Toledo Zoo Aquarium, Toledo, Ohio. Guide Book (50c.); "Safari News" (to members).

Philadelphia Zoological Garden, Philadelphia. "America's First Zoo" (quarterly; free to members); Zoo Guide.

Highland Park Zoological Gardens, Pittsburgh, Penn. Illustrated Guide (\$0.50).

Memphis Zoological Garden & Aquarium, Memphis, Tennessee. "Zoo Logic" (monthly, free, but only to Zool. Soc. members).

Woodland Park Zoological Gardens, Seattle, Washington. "Who's Who at the Zoo" (every 5 years; \$0.97).

Washington Park Zoo (old zoo), **Milwaukee County Zoological Gardens** (new zoo), Milwaukee, Wisconsin. "Milwaukee Zoo News" (bi-monthly; free to members of Zool. Soc. of Milwaukee County).

Racine Zoological Park, Wisconsin. "Racine Zoo Bulletin" (quarterly; to members only).

U.S.S.R.

Moskovski Zoologicheski Park (Moscow Zoo Park), Moscow. Collection of papers of zool. interest. 2 vols. published, 3rd in the press. 1959 "Among Animals & Birds" by I. P. Sosnovskii; "Animals at the Zoo"; 1960 "Moscow Zoo Park"; in addition, more than 20 scientific & popular papers have been published in various journals during 1959; Zoo Guide.

VIETNAM

Thao-Cam-Vien, Saigon. Delectus, Seminum (annual).

YUGOSLAVIA

Zooloski vrt grada Zagreba, Zagreb. Bulletin (quarterly; free).

SPECIES OF MAMMALS AND BIRDS BRED IN CAPTIVITY DURING 1959

In compiling the following lists of breeding successes at zoos during 1959 an attempt has been made to standardise and bring up to date the scientific and popular names used. In future editions of the Yearbook it will be possible to allocate more space to this section and additional data will then be included, giving the alternative names listed for various species by the different zoos. It is hoped, in the meantime, that the simplified list compiled here will not give rise to confusion. The Editors will be very pleased to answer any queries from zoos about the changes that have been made.

In order to simplify the mammalian list and for reasons of space, sub-species and domestic species have been omitted. Exceptions have been made, however, where a particular sub-species is strikingly characteristic as a zoo exhibit. In these cases the special forms have been included under the species heading but indicated separately by asterisks.

Works of reference on nomenclature consulted by the Editors were "The Families and Genera of Living Rodents" (J. R. ELLERMAN, British Museum, 1949), "Checklist of Palaearctic and Indian Mammals, 1758-1946" (J. R. ELLERMAN and T. C. S. MORRISON-SCOTT, British Museum, 1951), "Southern African Mammals, 1758-1951" (J. R. ELLERMAN, T. C. S. MORRISON-SCOTT and R. W. HAYMAN, British Museum, 1953), "A Checklist of African Mammals" (G. M. ALLEN, Cambridge, Mass., U.S.A., 1939), "Catalogo de los Mamiferos de America del Sur" (A. CABRERA, Buenos Aires, 1957), "Land Mammals of New Guinea, Celebes" (E. M. O. LAURIE and J. E. HILL, British Museum, 1954) and "Checklist of Birds of the World" (PETERS, and E. MAYR and J. C. GREENWAY, Harvard University Press, 1931-1960).

Breeding lists were received from the following Zoos—

Aalborg Denmark, Adelaide Australia, Albuquerque USA, Amsterdam Netherlands, Ankara Turkey, Antwerp Belgium, Arnhem Netherlands, Auckland New Zealand, Barcelona Spain, Basle Switzerland, Belfast GB, Berlin (E.) Germany, Berlin (W.) Germany, Berne Switzerland, Blackpool GB, Bochum Germany, Bremerhaven Germany, Bristol GB, Brno Czechoslovakia, Budapest Hungary, Cairo UAR, Caracas Venezuela, Dehiwala Ceylon, Chessington GB, Chester GB, Chicago (Lincoln Park Zoo) USA, Cleveland USA, Cologne Germany, Copenhagen Denmark, Dallas USA, Detroit USA, Dresden Germany, Dublin Eire, Dudley GB, Duisburg Germany, Edinburgh GB, Frankfurt Germany, Glasgow GB, Georgetown British Guiana, Goppingen Germany, Granby Canada, Helsinki Finland, Houston USA, Hoor Sweden, Ilfracombe GB, Jersey GB, Johannesburg South Africa, Jos Nigeria, Karlsruhe Germany, Kobe Japan, Kokura Japan, Krefeld Germany, Kronberg Germany, Landau Germany, Lesna Czechoslovakia, Liberec Czechoslovakia, Lisbon Portugal, Lodz Poland, London GB, Magdeburg Germany, Melbourne Australia, Memphis USA, Miami (Crandon) USA, Milwaukee USA, Montreal Canada, Mulhouse France, Mysore India, New Delhi India, New York (Bronx) USA, Nuremberg Germany, Oklahoma (Lincoln Park Zoo) USA, Osnabruck Germany, Paignton GB, Pittsburgh USA, Perth Australia, Poznan Poland, Prague Czechoslovakia, Pretoria South Africa, Rostock Germany, Rotterdam Netherlands, St. Paul USA, San Diego USA, Seattle USA, Southport GB, Stendal Germany, Stockholm Sweden, Straubing Germany, Stuttgart Germany, Sydney Australia, Tel Aviv Israel, Toronto Canada, Vienna Austria, Warsaw Poland, Washington (National Zoological Park) USA, Wassenaar Netherlands, Whipsnade GB, Winnipeg Canada, Wuppertal Germany, Zurich Switzerland.

We hope that the few zoos which were unable to send us lists this year will be able to do so next year and help us to make the breeding survey more nearly complete.

MAMMALS

ORDER MARSUPIALIA

Squirrel-like Flying Phalanger (*Petaurus norfolcensis*)
London GB.

Short-headed Flying Phalanger (*Petaurus brevipes*)
London GB.

Koala (*Phascolarctos cinereus*)
Melbourne Austral; Sydney Austral.

Wallaby (*Unspecified*)
Albuquerque USA; Ceylon; Osnabruck Ge; Pittsburgh USA.

Black-flanked Rock Wallaby (*Petrogale lateralis*)
Adelaide Austral.

Yellow-footed Rock Wallaby (*Petrogale sps.*)
Adelaide Austral.

Short-tailed Wallaby or Quokka (*Setonix brachyurus*)
Antwerp Bel; Bristol GB; Dublin Eire; Edinburgh GB; Jersey GB; Frankfurt Ge; San Diego USA.

Dama Wallaby (*Thylogale eugenii*)
Adelaide Austral; Edinburgh GB; Montreal Ca.

Rufous-bellied Wallaby (*Thylogale pillardieui*)
Melbourne Austral.

Agile Wallaby (*Protemnodon agilis*)
Amsterdam N; San Diego USA.

Black-tailed Wallaby (*Protemnodon bicolor*)
Melbourne Austral.

Red-necked Wallaby (*Protemnodon rufogrisea*)
(Includes Bennett's Wallaby & Bennett's Kangaroo)

Amsterdam N; Antwerp Bel; Berlin E.Ge; Berlin W.Ge; Bristol GB; Chessington GB; Chester GB; Duisburg Ge; Frankfurt Ge; Glasgow GB; Liberec Cz; London GB; Nuremberg Ge; Paignton GB; Pretoria SA; Straubing Ge; Vienna Austria; Wassenaar Ge; Whipsnade GB; Wuppertal Ge.

Walleroo (*Macropus robustus*)
Albuquerque USA; Dallas USA; Melbourne Austral; Oklahoma USA; San Diego USA; Sydney Austral.

Kangaroo (*Unspecified*)
Lesna Cz; Lisbon Por; Mysore Ind.

Red Kangaroo (*Macropus rufus*)
Adelaide Austral; Amsterdam N; Antwerp Bel; Berlin E.Ge; Bristol GB; Cairo UAR; Chester GB; Detroit USA; Dresden Ge; Frankfurt Ge; Straubing Ge; Stuttgart Ge; Sydney Austral; Vienna Austria.

Great Grey Kangaroo (*Macropus kangaroo*)
Basle Switz; Bristol GB; Budapest H; Sydney Austral; Zurich Switz.

Tasmanian Kangaroo (*Macropus tasmaniensis*)
San Diego USA.

Kangaroo Island Kangaroo (*Macropus fuliginosus*)
Adelaide Austral; Melbourne Austral.

Rothals Kangaroo (Sps?)
Brno Cz.

Matschie's Tree Kangaroo (*Dendrolagus matschiei*)
Melbourne Austral.

Tree Kangaroo (*Unspecified*)
Perth Austral; Sydney Austral.

Musk Rat-Kangaroo (*Hypsiprymnodon moschatus*)
Washington N.Z.P. USA.

ORDER INSECTIVORA

European Hedgehog (*Erinaceus europaeus*)
London GB.

ORDER CHIROPTERA

Fruit Bat (*Pteropus sps*)
Berlin W.Ge.

Fruit Bat (*Pteropus giganteus*)
Jersey GB.

ORDER EDENTATA

Armadillo (*Unspecified*)
Lodz Pol.

Mammals Bred in Captivity

Nine-banded Armadillo (*Dasypus novemcinctus*)
Dresden Ge.

Two-toed Sloth (*Choloepus didactylus*)
Philadelphia USA; Washington N.Z.P. USA.

Three-toed Sloth (*Bradypus tridactylus*)
Georgetown BG.

ORDER PRIMATES

Slow Loris (*Nycticebus cougari*)
San Diego USA.

Potto (*Perodicticus potto*)
Jersey GB.

Bushbaby (*Galago senegalensis*)
Bristol GB; Chester GB; Paignton GB; Pretoria SA;
San Diego USA; Tel Aviv Is; Washington (N.Z.P.)
USA.

Ring-tailed Lemur (*Lemur catta*)
Berlin W.Ge; Bristol GB; Chester GB; Frankfurt
Ge; Pretoria SA.

Mongoose Lemur (*Lemur mongoz*)
San Diego USA.

Douroucouli (*Aotus trivirgatus*)
London GB; Washington N.Z.P. USA.

Common Marmoset (*Hapale jacchus*)
Frankfurt Ge; Stockholm Swe.

White-eared Marmoset (*Hapale aurita*)
Copenhagen D.

Cotton-headed Tamarin (*Leontocebus oedipus*)
Liberec Cz.

Tamarin Hybrid (*Leontocebus midas* ×
Leontocebus bicolor)
Cologne Ge.

Capuchin (*Cebus apella*)
Cairo UAR; Liberec Cz; Prague Cz.

Weeper Capuchin (*Cebus nigrivittatus*)
Caracas V; Dallas USA.

White-fronted Capuchin (*Cebus albifrons*)
Houston USA; Washington N.Z.P. USA.

Sapajou Monkey (*Cebus* sps.)
Seattle USA.

Cinnamon Capuchin (*Cebus* sps.)
Memphis USA.

Squirrel Monkey (*Saimiri sciurea*)
Copenhagen D; San Diego USA; Tel Aviv Is.

Spider Monkey (*Ateles* sps.)
Miami Crandon USA; San Diego USA

Vervet Monkey (*Cercopithecus aethiops*)
(Includes Green Monkey and Grivet
Monkey)
Cairo UAR; Ceylon; Chicago L.P.Z. USA; Cologne
Ge; Dallas USA; Johannesburg SA; Memphis
USA; Prague Cz; Pretoria SA; Seattle USA;
Wassenaar N.

Owl-faced Monkey (*Cercopithecus hamlyni*)
Rotterdam N.

Pluto Monkey (*Cercopithecus mitis*)
(Includes Sykes Monkey and White-Throated
Monkey)
Antwerp Bel; Ceylon; Memphis USA.

Mona Monkey (*Cercopithecus mona*)
Ceylon; Dallas USA; Liberec Cz; Lisbon Por;
Oklahoma L.P.Z. USA.

Brazza's Monkey (*Cercopithecus neglectus*)
San Diego USA; Washington N.Z.P. USA.

Talapoin Monkey (*Cercopithecus talapoin*)
Frankfurt Ge.

Cercopithecus sps.
Mulhouse Fr.

Allen's Baboon-like Monkey (*Allenopithecus
nigroviridis*)
San Diego USA.

Mangabey (*Cercocebus* sps.)
Copenhagen D.

Common Mangabey (*Cercocebus torquatus*)
(Includes Sooty Mangabey, White-crowned
Mangabey & White-collared Mangabey)
Amsterdam N; Houston USA; Magdeburg Ge.
Paignton GB; Washington N.Z.P. USA.

Agile Monkey (*Cercocebus galeritus*)
Liberec Cz.

Grey-cheeked Mangabey (*Cercocebus albigena*)
Oklahoma L.P.Z.

Barbary Ape (*Macaca sylvana*)
Berlin W.Ge; Chessington GB; Edinburgh GB;
Paignton GB; Washington N.Z.P. USA; Wassenaar
N.

Rhesus Monkey (*Macaca mulatta*)

Adelaide Austral; Albuquerque USA; Amsterdam N; Arnhem N; Auckland NZ; Belfast GB; Berlin E.Ge; Berlin W.Ge; Bochum Ge; Bremerhaven Ge; Bristol GB; Budapest H; Chessington GB; Dallas USA; Dresden Ge; Dudley GB; Frankfurt Ge; Goppingen Ge; Houston USA; Kokura J; Liberec Cz; Lodz Pol; Magdeburg Ge; Melbourne Austral; Memphis USA; Milwaukee USA; Nuremberg Ge; Oklahoma L.P.Z. USA; Paignton GB; Perth Austral; Prague Cz; Rostock Ge; Seattle USA; Stockholm Sw; Stuttgart Ge; Washington N.Z.P. USA; Wassenaar N; Whipsnade GB; Winnipeg Ca.

Himalayan Macaque (*Macaca assamensis*)
Berlin E.Ge.

Formosan Rock Monkey (*Macaca cyclops*)
Kokura J.

Crab-eating Macaque (*Macaca irus*)
Adelaide Austral; Auckland NZ; Berlin E.Ge; Kokura J; Lodz Pol; Melbourne Austral; Prague Cz; Wassenaar N.

Lion-tailed Monkey (*Macaca silenus*)
Adelaide Austral; Milwaukee USA; San Diego USA.

Pig-tailed Macaque (*Macaca nemestrina*)
Arnhem N; Ceylon; Memphis USA; Pittsburgh USA.

Bonnet Macaque (*Macaca radiata*)
Adelaide Austral; Houston USA.

Stump-tailed Macaque (*Macaca speciosa*)
Ceylon; Melbourne Austral.

Moor Macaque (*Macaca maurus*)
Adelaide Austral; Zurich Switz.

Toque Monkey (*Macaca sinica*)
Berlin Ge; Bochum Ge.

Hybrid Macaque (*M. mulatta* × *M. irus*)
Warsaw Pol.

Hybrid Macaque (*M. philippensis* × *M. irus*)
Washington N.Z.P. USA.

Chacma Baboon (*Papio ursinus*)
Auckland NZ; Chessington GB; Melbourne Austral.

Dog-faced Baboon (*Papio cynocephalus*)
Ceylon; Dallas USA.

Olive Baboon (*Papio anubis*)
Chester GB; Copenhagen D; Lodz Pol; Warsaw Pol.

Guinea Baboon (*Papio papio*)
Antwerp Bel; Berlin W.Ge; Ceylon; Detroit USA; Houston USA; Nuremberg Ge; Pittsburgh USA.

Hamadryas Baboon (*Comopithecus hamadryas*)
(Includes Sacred Baboon)

Amsterdam N; Barcelona Sp; Berlin W.Ge; Budapest H; Ceylon; Cleveland USA; Cologne USA; Copenhagen D; Frankfurt Ge; Goppingen Ge; Johannesburg SA; Kobe J; Kokura J; Liberec Cz; Lodz Pol; Prague Cz; Stuttgart Ge; Warsaw Pol; Wassenaar N; Zurich Switz.

Mandrill (*Mandrillus sphinx*)
Berlin W.Ge; Houston USA; Karlsruhe Ge; Kobe J; Kokura J; Stuttgart Ge; Wassenaar N.

Drill (*Mandrillus leucophaeus*)
Berlin W.Ge; Dallas USA; Osnabruck Ge; Paignton GB.

Gelada Baboon (*Theropithecus gelada*)
Quebec Ca; Rotterdam N; Wuppertal Ge.

Baboon (*Unspecified*)
Arnhem N; Mulhouse Fr; Mysore Ind.

Purple-faced Leaf Monkey (*Presbytis senex*)
Ceylon; Pretoria SA.

Colobus Monkey (*Colobus polykymos*)
Frankfurt Ge; New York Bronx USA; San Diego USA.

Gibbon (*Hylobates* spp)
Detroit USA; Memphis USA; San Diego USA; Washington N.Z.P. USA; Whipsnade GB.

Orang-utan (*Pongo pygmaeus*)
Basel Switz; Berlin W.Ge; Rotterdam N; Sydney Austral; Vienna Austria.

Chimpanzee (*Pan satyrus*)
Bremerhaven Ge; Bristol GB; Chester GB; Dallas USA; Dresden Ge; Johannesburg SA; Pittsburgh USA; San Diego USA; New York Staten Island USA; Paris Vincennes Fr; Sydney Austral; Vienna Austria; Washington N.Z.P. USA.

Gorilla (*Gorilla gorilla*)
Basle Switz.

ORDER LAGOMORPHA

European Hare (*Lepus europaeus*)
Frankfurt Ge.

ORDER RODENTIA

Grey Squirrel (*Sciurus* spp)
Granby Ca.

Indian Squirrel (*Unspecified*)
Amsterdam N.

Prairie Dog (*Cynomys ludovicianus*)
Washington N.Z.P. USA; Whipsnade GB.

Mammals Bred in Captivity

Chipmunk (*Tamias sibiricus*)
Prague Cz.

Flying Squirrel (*Glaucomys volans*)
Frankfurt Ge; Granby Ca.

Himalayan Flying Squirrel (*Petaurista petaurista*)
New Delhi Ind.

Beaver (*Castor canadensis*)
Bochum Ge; Edinburgh GB; Granby Ca; Rotterdam N; Whipsnade GB; Zurich Switz.

Chinese Hamster (*Cricetulus barabensis*)
Jersey GB.

Vole (*Lagurus lagurus*)
Berlin W.Ge.

Musk Rat (*Ondatra* sps)
Granby Ca.

Brandt's Vole (*Microtus brandti*)
Berlin E.Ge.

Fat-tailed Gerbil (*Pachyuromys duprasi*)
Washington N.Z.P. USA.

Gerbil (*Meriones tamariscinus*)
Berlin E.Ge.

Mongolian Gerbil (*Meriones unguiculatus*)
Washington N.Z.P. USA.

Egyptian Jerboa (*Jaculus orientalis*)
Washington N.Z.P. USA.

Porcupine (*Unspecified*)
Amsterdam N; Osnabruck G; Southport GB.

African Brush-tailed Porcupine (*Atherurus africanus*)
Detroit USA.

Indian Porcupine (*Hystrix leucura*)
Adelaide Austral; Berlin E.Ge; Prague Cz; Warsaw Pol.

South African Porcupine (*Hystrix africae-australis*)
Frankfurt Ge; Nuremberg Ge; Pretoria SA.

Crested Porcupine (*Hystrix cristata*)
Antwerp Bel; Blackpool GB; Budapest H; Cairo UAR; Dudley GB; Whipsnade GB.

East African Porcupine (*Hystrix galeata*)
Washington N.Z.P. USA.

Canadian Porcupine (*Erethizon dorsatum*)
Prague Cz.

Greater Tree Porcupine (*Coendu* sps.)
Georgetown BG.

Pampas Cavy (*Cavia fulgida*)
London GB.

Capybara (*Hydrochoerus hydrochoeris*)
Caracas V.

Patagonian Cavy or Mara (*Dolichotis patagona*)
Antwerp Bel; Copenhagen D; Frankfurt Ge; Pretoria SA; Rotterdam N; Whipsnade GB.

Agouti (*Dasyprocta aguti*)
Auckland NZ; Basle Switz; Cairo UAR; Georgetown BG; Granby Ca; Lodz Pol; London GB; Melbourne Austral; Paignton GB; Pittsburgh USA; Rotterdam N; Straubing Ge; Whipsnade GB.

Azara's Agouti (*Dasyprocta azarae*)
Berlin W.Ge.

Sooty Agouti (*Dasyprocta fuliginosa*)
Berlin E.Ge.

Acouchy (*Myoprocta pratti*)
Georgetown BG.

Chinchilla (*Chinchilla* spp.)
Basle Switz; Blackpool GB.

Coypu (*Myocastor coypus*)
Barcelona Sp; Berlin E.Ge; Budapest H; Chessington GB; Chester GB; Dublin Eire; Edinburgh GB; Goppingen Ge; Granby Ca; Magdeburg Ge; Memphis USA; Paignton GB; Pretoria SA; Zurich Switz.

ORDER CARNIVORA

Wolf (*Canis lupus*)
Ankara T; Antwerp Bel; Berlin E.Ge; Cologne Ge; Liberec Cz; Lisbon Por; London GB; Melbourne Austral; Memphis USA; Osnabruck Ge; Rotterdam N; Wassenaar N; Whipsnade GB; Zurich Switz.

Coyote (*Canis latrans*)
Berlin E.Ge; Cologne Ge; Dallas USA; Nuremberg Ge; Perth Austral; Prague Cz; Seattle USA; Zurich Switz.

Jackal (*Canis aureus*)
Amsterdam N; Berlin E.Ge; Budapest H; Liberec Cz; Paignton GB; Prague Cz; Pretoria SA.

New Guinea Wild Dog (*Canis hallstromi*)
San Diego USA.

Dingo (*Canis* sps.)
Barcelona Sp; Belfast GB; Jersey GB; Liberec Cz; Poznan Pol; Pretoria SA; San Diego USA; Washington N.Z.P. USA; Whipsnade GB.

Arctic Fox (*Alopex lagopus*)
Copenhagen D.

Grey Fox (*Urocyon cinereoargenteus*)
Albuquerque USA.

Red Fox—Old World (*Vulpes vulpes*)
Lodz Pol; Melbourne Austral; Rotterdam N.

American Red Fox (*Vulpes fulva*)
(Includes Silver Fox)
Aalborg D; Dallas USA; Granby Ca; Liberec Cz;
Magdeburg Ge; Washington N.Z.P. USA.

Raccoon Dog (*Nyctereutes procyonoides*)
Liberec Cz.

Cape Hunting Dog (*Lycan pictus*)
Ceylon; New York Bronx USA; Pretoria SA;
Rotterdam N; Washington N.Z.P. USA.

Brown Bear (*Ursus arctos*)
(Includes Kodiak*, Grizzly† and Syrian‡
Bears)

Albuquerque† USA; Amsterdam N; Arnhem N;
Berlin E.Ge; Berlin W.Ge; Bochum Ge; Budapest
H; Cologne Ge; Detroit USA; Detroit* USA;
Dresden Ge; Duisburg Ge; Hoor Sw; Krefeld Ge;
Liberec Cz; Lodz Pol; London‡ GB; Magdeburg
Ge; Memphis USA; Nuremberg Ge; Oklahoma
L.P.Z.† USA; Osnabruck Ge; Prague Cz; Pretoria
SA; Rostock Ge; San Diego† USA; Stockholm Sw;
Straubing Ge; Warsaw Pol; Washington† N.Z.P.
USA; Whipsnade GB; Winnipeg† Ca; Wuppertal
Ge.

Black Bear (*Ursus americanus*)
Albuquerque USA; Berlin E.Ge; Duisburg Ge;
Miami Crandon USA; Pretoria SA; Quebec Ca;
Sydney Austral.

Polar Bear (*Thalarctos maritimus*)
Bremerhaven Ge; Budapest H; Chester GB; Copen-
hagen D; Detroit USA; Prague Cz; San Diego USA;
Seattle USA.

Sloth Bear (*Melursus ursinus*)
San Diego USA.

Himalayan Black Bear (*Selenarctos thibe-
tanus*)
Seattle USA.

Spectacled Bear (*Tremarctos ornatus*)
Basle Switz.

Hybrid Bear (*Thalarctos maritimus* × *Ursus
arctos*)
Washington N.Z.P. USA

Red Panda (*Ailurus fulgens*)
Chester GB; Prague Cz; Whipsnade GB.

Raccoon (*Procyon lotor*)
Amsterdam N; Barcelona Sp; Bristol GB; Chicago
L.P.Z. USA; Frankfurt Ge; Ilfracombe GB; Kobe
J; Liberec Cz; Memphis USA; Oklahoma L.P.Z.
USA; Pretoria SA; San Diego USA; Seattle USA;
Winnipeg Ca.

Coati (*Nasua nasua*)
Albuquerque USA; Berlin W.Ge; Chester GB;
Dallas USA; Dresden Ge; Jersey GB; Miami
Crandon USA; San Diego USA; Southport GB;
Washington N.Z.P. USA; Wuppertal Ge.

Kinkajou (*Potos flavus*)
Albuquerque USA; Berlin W.Ge; Caracas V;
Frankfurt Ge; Memphis USA.

Badger (*Unspecified*)
Granby Ca.

Polecat (*Mustela putorius*)
Prague Cz.

Pine Marten (*Martes martes*)
Warsaw Pol.

Stone Marten (*Martes foina*)
Prague Cz.

Spotted Skunk (*Spilogale putorius*)
Blackpool GB.

Striped Skunk (*Mephitis mephitis*)
Albuquerque USA; Dublin Eire; London GB.

Small-spotted Genet (*Genetta genetta*)
Barcelona Sp; Duisburg Ge; Prague Cz; Washington
N.Z.P. USA.

Large-spotted Genet (*Genetta tigrina*)
Berlin W.Ge; Chester GB.

Striped Genet (*Genetta abyssinica* ?)
Osnabruck Ge.

Banded Mongoose (*Mungos mungo*)
Berlin W.Ge; Wuppertal G.

Meerkat (*Suricata suricatta*)
Cologne Ge; Frankfurt Ge; Krefeld Ge; Rostock Ge.

Spotted Hyena (*Crocota crocuta*)
Amsterdam N; Barcelona Sp; Budapest H; Cairo
UAR; Warsaw Pol; Wuppertal Ge; Zurich Switz.

Striped Hyena (*Hyaena hyaena*)
Washington N.Z.P. USA.

Hyena (*Unspecified*)
Dallas USA; Duisburg Ge; Krefeld Ge; Lodz Pol.

Caracal Lynx (*Felis caracal*)
Ankara T; Basle Switz; Rotterdam N; Rostock Ge.

Jungle Cat (*Felis chaus*)
Amsterdam N; Berlin E.Ge; Prague Cz.

Serval (*Felis serval*)
Amsterdam N; Basle Switz; Frankfurt Ge.

European Wild Cat (*Felis silvestris*)
Copenhagen D.

Mammals Bred in Captivity

Wild Cat (*Unspecified*)

Granby Ca.

Bobcat (*Felis rufa*)

Dallas USA.

Puma (*Felis concolor*)

Amsterdam N; Antwerp Bel; Barcelona Sp; Basle Switz; Ceylon; Chester GB; Copenhagen D; Dallas USA; Detroit USA; Helsinki Fi; Liberec Cz; Lodz Pol; Memphis USA; Oklahoma L.P.Z. USA; Perth Austral; Poznan Pol; Rotterdam N; Seattle USA.

Leopard (*Panthera pardus*)

(Includes Black form*)

Amsterdam N; Amsterdam* N; Arnhem N; Basle Switz; Berlin W.Ge; Cairo UAR; Ceylon*; Chester GB; Cleveland USA; Copenhagen D; Dallas* USA; Dresden Ge; Duisburg* Ge; Frankfurt Ge; Lisbon Por; Lodz Pol; Pittsburgh USA; Pittsburgh* USA; Poznan Pol; Prague Cz; Rotterdam* N; San Diego USA; Seattle USA; Warsaw Pol; Wuppertal Ge.

Lion (*Panthera leo*)

Albuquerque USA; Amsterdam N; Ankara Tur; Antwerp Bel; Arnhem N; Auckland NZ; Barcelona Sp; Basle Switz; Belfast GB; Budapest H; Cairo UAR; Ceylon; Copenhagen D; Dallas USA; Detroit USA; Dresden Ge; Dublin Eire; Duisburg Ge; Glasgow GB; Ilfracombe GB; Johannesburg SA; Kobe J; Kokura J; Lodz Pol; Nuremberg Ge; Oklahoma L.P.Z. USA; Perth Austral; Pittsburgh USA; Poznan Pol; Prague Cz; Pretoria SA; Rostock Ge; San Diego USA; Seattle USA; Southport GB; Vienna Austria; Warsaw Pol; Washington N.Z.P. USA; Winnipeg Ca; Wuppertal Ge.

Hybrid Leopard × Lion or Leopen (*P. pardus* × *P. leo*)

Koshien J.

Tiger (*Panthera tigris*)

Aalborg D; Amsterdam N; Basle Switz; Berlin E.Ge; Berlin W.Ge; Budapest H; Ceylon; Chester GB; Chicago L.P.Z. USA; Copenhagen D; Detroit USA; Dublin Eire; Dresden Ge; Glasgow GB; New York Bronx USA; Prague Cz; Rotterdam N; St. Paul USA; Seattle USA; Sydney Austral; Warsaw Pol; Whipsnade GB; Wuppertal Ge; Zurich Switz.

Jaguar (*Panthera onca*)

Amsterdam N; Ceylon; Cologne Ge; Frankfurt Ge; Lisbon Por; Pittsburgh USA; Pretoria SA; Rotterdam N.

Snow Leopard (*Panthera uncia*)

Copenhagen D.

ORDER PINNIPEDIA

Seal (*Unspecified*)

Bremerhaven Ge.

Californian Sealion (*Zalophus californianus*)

Bremerhaven Ge; Edinburgh GB; Karlsruhe GB; London GB; Rotterdam N; Seattle USA.

Harbour Seal (*Phoca vitulina*)

San Diego USA.

Elephant Seal (*Mirounga angustirostris*)

San Diego USA.

ORDER HYRACOIDEA

Cape Hyrax (*Procavia capensis*)

Prague Cz; Pretoria SA.

ORDER PERISSODACTYLA

Brazilian Tapir (*Tapirus terrestris*)

Arnhem N; Frankfurt Ge; San Diego USA.

Tapir (*Unspecified*)

Wuppertal Ge.

Black Rhinoceros (*Diceros bicornis*)

Sydney Austral.

Mountain Zebra (*Equus zebra*)

Berlin W.Ge.

Common Zebra (*Equus burchelli*)

(Includes Grant's Zebra)

Barcelona Sp; Basle Switz; Berlin E.Ge; Berlin W.Ge; Budapest H; Chester GB; Cologne Ge; Copenhagen D; Dallas USA; Dresden Ge; Duisburg Ge; Glasgow GB; Kronsberg Ge; Lodz Pol; Mysore Ind; Nuremberg Ge; Oklahoma L.P.Z. USA; Poznan Pol; Prague Cz; San Diego USA; Stuttgart Ge; Washington N.Z.P. USA; Wassenaar N; Wuppertal Ge; Zurich Switz.

Grevy's Zebra (*Equus grevyi*)

Kobe J.

Asiatic Wild Ass (*Equus hemionus*)

(Includes Onager & Kiang)

Prague Cz; Rotterdam N.

Przewalski's Horse (*Equus przewalskii*)

Munich Ge; Prague Cz; Rotterdam N.

ORDER ARTIODACTYLA

Wild Boar (*Sus scrofa*)

Aalborg D; Antwerp N; Arnhem N; Barcelona Sp; Basle Switz; Berlin E.Ge; Berlin W.Ge; Berne; Budapest H; Ceylon; Cologne Ge; Copenhagen D; Hoor Sw; Lodz Pol; Magdeburg Ge; Mysore Ind; Nuremberg Ge; Poznan Pol; Stendal Ge; Wuppertal Ge.

Wart Hog (*Phacochoerus aethiopicus*)

Frankfurt Ge; Tel Aviv Is.

Collared Peccary (*Tayassu tajacu*)

Albuquerque USA; Arnhem N; Barcelona Sp; Berlin E.Ge; Caracas V; Detroit USA; Duisburg Ge; London GB; Prague Cz; Whipsnade GB; Zurich Switz.

White-lipped Peccary (*Tayassu pecari*)

Georgetown BG.

Pigmy Hippopotamus (*Choeropsis liberiensis*)

Basle Switz.

Hippopotamus (*Hippopotamus amphibius*)

Antwerp N; Auckland NZ; Berlin W.Ge; Budapest H; Cologne Ge; Copenhagen D; Detroit USA; Frankfurt Ge; Karlsruhe Ge; Memphis USA; Nuremberg Ge; Rotterdam N; New York Bronx USA; Warsaw Pol; Washington N.Z.P. USA.

Camel (*Unspecified*)

Aalborg D; Ankara T; Duisburg Ge; Lisbon P; Miami Crandon USA; Straubing Ge.

Bactrian Camel (*Camelus bactrianus*)

Berlin W.Ge; Budapest H; Dresden Ge; Edinburgh GB; Liberec Cz; Nuremberg Ge; Pittsburgh USA; Prague Cz; Rostock Ge; Wassenaar N; Whipsnade GB; Zurich Switz.

Arabian Camel (*Camelus dromedarius*)

Amsterdam N; Belfast GB; Berlin E.Ge; Berlin W.Ge; Copenhagen D; Dresden Ge; Dublin Eire; Nuremberg Ge; Oklahoma L.P.Z. USA; Prague Cz; San Diego USA.

Llama (*Lama glama*)

Adelaide Austral; Antwerp Bel; Arnhem N; Auckland NZ; Basle Switz; Berlin E.Ge; Berlin W.Ge; Bremerhaven Ge; Chester GB; Copenhagen D; Detroit USA; Dresden Ge; Glasgow GB; Granby Ca; Helsinki Fi; Johannesburg SA; Lisbon Por; Lodz Pol; Mulhouse Fr; Nuremberg Ge; Paignton GB; Pittsburgh USA; Poznan Pol; Prague Cz; Pretoria SA; Rotterdam N; Rostock Ge; San Diego USA; Seattle USA; Southport GB; Vienna Austria; Washington N.Z.P. USA; Whipsnade GB; Wuppertal Ge; Zurich Switz.

Guanaco (*Lama huanacus*)

Antwerp Bel; Auckland NZ; Berlin E.Ge; Berlin W.Ge; Bremerhaven Ge; Chicago L.P.Z. USA; Cleveland USA; Cologne Ge; Copenhagen D; Dallas USA; Granby Ca; Houston USA; Lisbon Por; Lodz Pol; Magdeburg Ge; Memphis USA; Osnabruck Ge; Paris Fr; Perth Austral; Pittsburgh USA; Poznan Pol; Prague Cz; San Diego USA; Straubing Ge; Wassenaar N; Winnipeg Ca; Wuppertal Ge; Zurich Switz.

Alpaca (*Lama pacos*)

Antwerp Bel; Johannesburg SA; Washington N.Z.P. USA.

Vicuna (*Lama vicugna*)

Antwerp Bel; Frankfurt Ge; Johannesburg SA.

Giraffe (*Giraffa camelopardalis*)

Antwerp Bel; Bristol GB; Ceylon; Cleveland USA; Copenhagen D; Dallas USA; Dublin Eire; Duisburg Ge; Frankfurt Ge; Kobe J; London GB; Rotterdam N; Sydney Austral; Vienna Austria; Whipsnade GB.

Okapi (*Okapia johnstoni*)

Antwerp Bel; New York Bronx USA.

Mouse Deer (*Tragulus* sps.)

Ceylon.

Muntjac (*Muntiacus muntjak*)

Adelaide Austral; Berlin E.Ge; Berlin W.Ge; Ceylon; Dallas USA; New Delhi Ind; Pretoria SA.

Reeve's Muntjac (*Muntiacus reevesi*)

Albuquerque USA; San Diego USA.

Fallow Deer (*Dama dama*)

Albuquerque USA; Antwerp Bel; Arnhem N; Auckland NZ; Basle Switz; Berlin W.Ge; Berne Switz; Bochum Ge; Budapest H; Cairo UAR; Chicago L.P.Z. USA; Cologne Ge; Dallas USA; Dresden Ge; Granby Ca; Helsinki Fi; Hoor Sw; Houston USA; Ilfracombe GB; Johannesburg SA; Kronberg Ge; Lesna Cz; Liberec Cz; Lisbon Por; Lodz Pol; Magdeburg Ge; Memphis USA; Milwaukee USA; Mysore Ind; Nuremberg Ge; Oklahoma L.P.Z. USA; Osnabruck Ge; Paignton GB; Poznan Pol; Pretoria SA; Rostock Ge; San Diego USA; Seattle USA; Stendal Ge; Straubing Ge; Stuttgart Ge; Toronto Ca; Vienna Austria; Washington N.Z.P. USA; Whipsnade GB; Winnipeg Ca; Wuppertal Ge; Zurich Switz.

Axis Deer (*Axis axis*)

Berlin E.Ge; Berlin W.Ge; Ceylon; Cologne Ge; Copenhagen D; Dallas USA; Dudley GB; Mysore Ind; New Delhi Ind; Pittsburgh USA; San Diego USA; Seattle USA; Stuttgart Ge; Vienna Austria; Washington N.Z.P. USA; Whipsnade GB; Wuppertal Ge; Zurich Switz.

Hog Deer (*Axis porcinus*)

Berlin W.Ge; Cairo UAR; Ceylon; Pretoria SA; Whipsnade GB.

Sambar Deer (*Cervus unicolor*)

Auckland NZ; Berlin E.Ge; Cairo UAR; Ceylon; Johannesburg SA; Melbourne Austral; Pittsburgh USA; Sydney Austral; Wassenaar N.

Swamp Deer or Barasingha (*Cervus duvauceli*)

Cleveland USA; Pittsburgh USA; Whipsnade GB.

Sika Deer (*Cervus nippon*)

(Includes Japanese Deer & Pekin Deer)

Antwerp Bel; Basle Switz; Belfast GB; Berlin E.Ge; Berlin W.Ge; Budapest H; Ceylon; Chessington GB; Cleveland USA; Cologne Ge; Copenhagen D; Detroit USA; Frankfurt Ge; Granby Ca; Helsinki Fi; Kobe J; Lesna Cz; Liberec Cz; Memphis USA; Mulhouse Fr; Nuremberg Ge; Oklahoma L.P.Z. USA; Pittsburgh USA; Prague Cz; San Diego USA; Seattle USA; Vienna Austria; Washington N.Z.P. USA; Whipsnade GB; Winnipeg Ca; Wuppertal Ge; Zurich Switz.

Red Deer (*Cervus elaphus*)
(Includes Wallich's Deer)

Amsterdam N; Ankara T; Arnhem N; Auckland NZ; Barcelona Sp; Basle Switz; Berlin E.Ge; Berlin W.Ge; Berne Switz; Budapest H; Chessington GB; Cologne Ge; Copenhagen D; Dresden Ge; Dudley GB; Helsinki Fi; Hoor Sw; Kronberg Ge; Johannesburg SA; Landau Ge; Lisbon Por; Magdeburg Ge; Melbourne Austral; Milwaukee USA; Mulhouse Fr; Nuremberg Ge; Oklahoma L.P.Z. USA; Osnabruck Ge; Paignton GB; Pittsburgh USA; Poznan Pol; Prague Ca; Pretoria SA; Rostock Ge; Seattle USA; Stendal Ge; Stockholm Sw; Straubing Ge; Vienna Austria; Washington N.Z.P. USA; Whipsnade GB; Wuppertal Ge.

Wapiti (*Cervus canadensis*)

Albuquerque USA; Antwerp Bel; Chester GB; Copenhagen D; Detroit USA; Granby Ca; Houston USA; Memphis USA; Milwaukee USA; Nuremberg Ge; Oklahoma L.P.Z. USA; Rotterdam N; San Diego USA; Seattle USA; Toronto Ca; Washington N.Z.P. USA; Whipsnade GB; Winnipeg Ca.

Pere David's Deer (*Elaphurus davidianus*)

Basle Switz; Berlin E.Ge; Cleveland USA; Rotterdam N; Whipsnade GB.

Mule Deer (*Odocoileus hemionus*)

Albuquerque USA; Dallas USA; Pittsburgh USA; San Diego USA.

White-tailed Deer (*Odocoileus virginianus*)
(Includes Virginian Deer)

Berlin W.Ge; Caracas V; Dallas USA; Houston USA; Milwaukee USA; Oklahoma L.P.Z. USA; Philadelphia USA; Pittsburgh USA; Toronto Ca; Washington N.Z.P. USA; Winnipeg Ca.

Moose (*Alces alces*)

Berne Switz; Hoor Sw; Stockholm Sw.

Reindeer (*Rangifer tarandus*)

Antwerp Bel; Basle Switz; Berlin E.Ge; Berlin W.Ge; Cologne Ge; Copenhagen D; Dallas USA; Helsinki Fi; New York Bronx USA; Nuremberg Ge; Pittsburgh USA; Prague Cz; San Diego USA; Seattle USA; Vienna Austria; Washington N.Z.P. USA; Wuppertal Ge.

Chinese Water Deer (*Hydropotes inermis*)

Cologne Ge; Rotterdam N; Whipsnade GB.

Roe Deer (*Capreolus capreolus*)

Berlin E.Ge; Dresden Ge; Goppingen Ge; Granby Ca; Hoor Sw; Osnabruck Ge; Stendal Ge.

Deer (*Unspecified*)

Basle Switz; Duisburg Ge.

Water Deer (*Unspecified*)

Copenhagen D.

Sika Deer (*Cervus* sps. ?)

Mulhouse Fr.

Greater Kudu (*Tragelaphus strepsiceros*)

Frankfurt Ge; Pretoria SA; Zurich Switz.

Lesser Kudu (*Tragelaphus imberbis*)

Basle Switz.

Bushbuck (*Tragelaphus scriptus*)

Johannesburg SA; Lisbon Por.

Sitatunga (*Tragelaphus spekei*)

Antwerp Bel; Berlin W.Ge; Cleveland USA; Cologne Ge; Copenhagen D; Frankfurt Ge.

Nyala (*Tragelaphus angasi*)

Pretoria SA.

Eland (*Taurotragus oryx*)

Berlin E.Ge; Cleveland USA; Detroit USA; Duisburg Ge; Frankfurt Ge; Karlsruhe Ge; Kronberg Ge; Miami Crandon USA; Mysore Ind; New York Bronx USA; Rotterdam N; San Diego USA; Wuppertal Ge.

Nilgai (*Boselaphus tragocamelus*)

Aalborg D; Antwerp Bel; Barcelona Sp; Berlin E.Ge; Cairo UAR; Ceylon; Copenhagen D; Dallas USA; Johannesburg SA; Kobe J; Lodz Pol; Magdeburg Ge; Mysore Ind; Philadelphia USA; Poznan Pol; Prague Cz; Pretoria SA; Rotterdam N; San Diego USA; Stuttgart Ge; Vienna Austria; Whipsnade GB.

Four-horned Antelope (*Tetracerus quadricornis*)

New Delhi Ind.

Asiatic Buffalo (*Bubalus bubalis*)

Antwerp Bel; Arnhem N; Berlin E.Ge; Berlin W.Ge; Copenhagen D; Granby Ca; Johannesburg SA; Nuremberg Ge; Prague Cz; Pretoria SA; Toronto Ca; Vienna Austria.

Pigmy Buffalo (*Anoa depressicornis*)

San Diego USA.

Banteng (*Bos banteng*)

Antwerp Bel; Berlin W.Ge; Rotterdam N.

Yak (*Bos grunniens*)

Antwerp Bel; Basle Switz; Berlin E.Ge; Berlin W.Ge; Brno Cz; Cleveland USA; Cologne Ge; Copenhagen D; Duisburg Ge; Lisbon Por; Nuremberg Ge; Osnabruck Ge; Pittsburgh USA; Prague Cz; Rostock Ge; Vienna Austria; Warsaw Pol; Wassenaar N; Winnipeg Ca.

American Bison (*Bison bison*)

Albuquerque USA; Antwerp Bel; Arnhem N; Barcelona Sp; Basle Switz; Belfast GB; Berlin E.Ge; Berlin W.Ge; Chessington GB; Chester GB; Cleveland USA; Copenhagen D; Dallas USA; Dresden Ge; Granby Ca; Houston USA; Johannesburg SA; Lisbon Por; Melbourne Austral; Miami Crandon USA; Milwaukee USA; New York Bronx USA; Nuremberg Ge; Oklahoma L.P.Z. USA; Pittsburgh USA; Prague Cz; Rotterdam N; San Diego USA; Vienna Austria; Wassenaar N; Whipsnade GB; Winnipeg Ca; Zurich Switz.

European Bison (*Bison bonasus*)

Amsterdam N; Berlin W.Ge; Copenhagen D; Duisburg Ge; Prague Cz; Stockholm Sw; Warsaw Pol; Washington N.Z.P. USA.

Bison (*Unspecified*)
Lodz Pol; Wuppertal Ge.

Bay Duiker (*Cephalophus dorsalis*)
Antwerp Bel.

Yellow-backed Duiker (*Cephalophus sylvicultor*)
Antwerp Bel.

Common Duiker or Grey Duiker (*Sylvicapra grimmia*)
Antwerp Bel; Jos Nig; Krefeld Ge; Pretoria SA.

Waterbuck (*Kobus ellipsiprymnus*)
Detroit USA; Pretoria SA.

Defassa Waterbuck (*Kobus defassa*)
Basle Switz; Cairo UAR; Whipsnade GB.

Lechwe Waterbuck (*Kobus leche*)
Cairo UAR; Chester GB; Detroit USA; Johannesburg SA; Pretoria SA.

Buffon's Kob Antelope (*Kobus kob*)
Cairo UAR.

Reedbuck (*Redunca arundinum*)
Antwerp Bel; Johannesburg SA.

Sable Antelope (*Hippotragus niger*)
San Diego USA.

Beisa Oryx (*Oryx beisa*)
Basle Switz; Cologne Ge; Dallas USA; Mysore Ind; Paris Fr; San Diego USA; Zurich Switz.

Gemsbok (*Oryx gazella*)
Johannesburg SA; Pretoria SA.

White Oryx (*Oryx tao*)
Berlin W.Ge.

Blesbok (*Damaliscus dorcas*)
(Includes Bontebok)
Johannesburg SA; Pretoria SA; Rotterdam N; San Diego USA.

White-tailed Gnu (*Connochaetes gnou*)
Amsterdam N; Barcelona Sp; Frankfurt Ge; Johannesburg SA; Pretoria SA; Wassenaar N; Zurich Switz.

Brindled Gnu (*Connochaetes taurinus*)
(Includes White-bearded Gnu)
Berlin E.Ge; Cairo UAR; Chester GB; Cologne Ge; Dudley GB; Johannesburg SA; Prague Cz; Stuttgart Ge.

Gnu (*Connochaetes* sps)
Mysore Ind.

Oribi (*Ourebia ourebi*)
Cairo UAR; Johannesburg SA.

Blackbuck (*Antelope cervicapra*)
Amsterdam N; Berlin E.Ge; Berlin W.Ge; Cairo UAR; Ceylon; Cleveland USA; Copenhagen D; Dallas USA; Dresden Ge; Kronberg Ge; New Delhi Ind; Nuremberg Ge; Pittsburgh USA; Pretoria SA; Rotterdam N; San Diego USA; Wassenaar N.

Impala (*Aepyceros melampus*)
London GB; Johannesburg SA; Pretoria SA.

Persian Gazelle (*Gazella subgutturosa*)
Cairo UAR; Karlsruhe Ge; Zurich Switz.

Dorcas Gazelle (*Gazella dorcas*)
Barcelona Sp; Cairo UAR; Detroit USA.

Korin Gazelle (*Gazella rufifrons*)
Cairo UAR.

Thomson's Gazelle (*Gazella thomsoni*)
Whipsnade GB.

Arabian Gazelle (*Gazella arabica*)
Cairo UAR.

Chinkara Gazelle (*Gazella bennetti*)
New Delhi Ind.

Speke's Gazelle (*Gazella spekei*)
Chicago L.P.Z. USA.

Soemmerring's Gazelle (*Gazella soemmerringi*)
Paris Fr.

Gazelle (*Unspecified*)
Ankara T.

Springbok (*Antidorcas marsupialis*)
Cairo UAR; Copenhagen D; Johannesburg SA; Philadelphia USA; Pretoria USA; San Diego USA.

Marsh Antelope (?)
Basle Switz.

Sassin Antelope (*Bubalis hunctus* ?)
Albuquerque USA.

Chamois (*Rupicapra rupicapra*)
Berne Switz; Kronberg Ge.

Tahr (*Hemitragus* spp.)
Adelaide Austral; Berlin W.Ge; Cleveland USA; Johannesburg SA; Melbourne Austral; Pittsburgh USA; Pretoria SA; San Diego USA; Seattle USA; Sydney Austral.

Wild Goat (*Capra aegagrus*)
Ankara T.

Ibex (*Capra ibex*)
(Includes Nubian Ibex*)
Amsterdam N; Berlin W.Ge; Berne Switz; Cleveland* USA; Copenhagen D; Frankfurt* Ge; Helsinki Fi; Kronberg Ge; Prague Cz; Stuttgart Ge; Vienna Austria.

Birds Bred in Captivity

Tur (*Capra caucasica*)
Kronberg Ge.

Markhor (*Capra falconeri*)
Kronberg Ge.

Barbary Sheep or Aoudad (*Ammotragus lervia*)

Adelaide Austral; Albuquerque USA; Antwerp Bel; Arnhem N; Basle Switz; Berlin W.Ge; Budapest H; Cairo UAR; Ceylon; Cleveland USA; Copenhagen D; Dallas USA; Detroit USA; Dudley GB; Frankfurt Ge; Granby Ca; Helsinki Fi; Johannesburg SA; Kokura J; Lodz Pol; London GB; Memphis USA; Miami Crandon USA; Milwaukee USA; Mysore Ind; Pittsburgh USA; Poznan Pol; Prague Cz; Pretoria SA; Rotterdam N; San Diego USA; Seattle USA; Toronto Ca; Vienna Austria.

Bighorn Sheep (*Ovis canadensis*)
London GB; San Diego USA.

Argali (*Ovis ammon*)
(Includes Marco Polo Sheep*)
Kronberg* Ge.

Red Sheep (*Ovis orientalis*)
Kronberg Ge.

Mouflon (*Ovis musimon*)
Arnhem N; Barcelona Sp; Basle Switz; Berlin E.Ge; Berlin W.Ge; Berne Switz; Budapest H; Ceylon; Cologne Ge; Copenhagen D; Frankfurt Ge; Helsinki Fi; Johannesburg SA; Liberec Cz; Mulhouse Fr; Nuremberg Ge; Pittsburgh USA; Pretoria SA; Rotterdam N; San Diego USA; Toronto Ca; Vienna Austria; Whipnade GB; Wuppertal Ge.

BIRDS

ORDER STRUTHIONIFORMES

Ostrich (*Struthio camelus*)
Frankfurt Ge; Miami Crandon USA; Oklahoma L.P.Z. USA; Stuttgart Ge.

ORDER RHEIFORMES

Rhea (*Rhea americana*)
(Includes white form *)
Adelaide Austral; Detroit USA; Berlin W.Ge; Frankfurt Ge; Kronberg Ge; Nuremberg Ge; Prague Cz; Rotterdam N; San Diego USA; San Diego* USA; Whipnade GB; Zurich Switz.

ORDER CASUARIIFORMES

Emu (*Dromiceius novae hollandiae*)
Arnhem N; Basle Switz; Cleveland USA; Detroit USA; Frankfurt Ge; Lesna Cz; Melbourne Austral.

ORDER TINAMIFORMES

Chilean Tinamou (*Nothoprocta perdicaria*)
Antwerp Bel.

ORDER SPHENISCIFORMES

King Penguin (*Aptenodytes patagonica*)
Basle Switz; Edinburgh GB.

Gentoo Penguin (*Pygoscelis papua*)
Edinburgh GB.

Black-footed Penguin (*Spheniscus demersus*)
Antwerp Bel; Basle Switz; Berlin W.Ge; Bristol GB; Chessington GB; Dudley GB; Lisbon Por; Nuremberg Ge.

Humboldt's Penguin (*Spheniscus humboldti*)
Bremerhaven Ge; Cleveland USA; Whipnade GB.

ORDER PELECANIFORMES

Gannet (*Morus bassanus*)
London GB.

Cormorant (*Phalacrocorax carbo*)
Antwerp Bel; Copenhagen D; London GB; Melbourne Austral.

ORDER CICONIIFORMES

Heron (*Ardea cinerea*)
Stockholm Sw.

Little Egret (*Egretta garzetta*)
Cairo UAR.

Snowy Egret (*Leucophoyx thula thula*)
New York Bronx USA. •

Night Heron (*Nycticorax n. nycticorax*)
Cairo UAR; Helsinki Fi.

Black-crowned Night Heron (*Nycticorax nycticorax hoactli*)
San Diego USA; Washington N.Z.P. USA.

Little Bittern (*Ixobrychus minutus*)
Dresden Ge.

White Stork (*Ciconia ciconia*)
Lisbon Por; Prague Cz.

Stork (*Unspecified*)
Basle Switz.

Sacred Ibis (*Threskiornis aethiopicus*)
Basle Switz; Cairo UAR.

Red-cheeked Ibis (*Geronticus eremita*)
Basle Switz.

Glossy Ibis (*Plegadis falcinellus*)
Magdeburg Ge.

Straw-necked Ibis (*Carphibis spinicollis*)
Basle Switz.

American Flamingo (*Phoenicopterus r. ruber*)
Basle Switz; San Diego USA.

Chilean Flamingo (*Phoenicopterus ruber chilensis*)
Basle Switz.

ORDER ANSERIFORMES

Horned Screamer (*Anhima cornuta*)
San Diego USA.

Black-billed Whistling Duck or Cuban Tree Duck (*Dendrocygna arborea*)
Cologne Ge; Miami Crandon USA.

Fulvous Whistling Duck or Fulvous Tree Duck (*Dendrocygna bicolor*)
Miami Crandon USA.

Red-billed Whistling Duck or Black-bellied Tree Duck (*Dendrocygna autumnalis*)
Miami Crandon USA; Washington N.Z.P. USA.

Black Swan (*Cygnus atratus*)
Adelaide Austral; Barcelona Sp; Berlin E.Ge; Berlin W.Ge; Cologne Ge; Houston USA; Johannesburg SA; Melbourne Austral; Montreal Ca; Pretoria SA; Rotterdam N; Toronto Ca; Wassenaar N.

Mute Swan (*Cygnus olor*)
Berlin W.Ge; Helsinki Fi; Kronberg Ge; Prague Ca; San Diego USA; Stockholm Sw; Straubing Ge; Toronto Ca; Vienna Austria; Winnipeg Ca; Wuppertal Ge.

Black-necked Swan (*Cygnus melancoriphus*)
Berlin W.Ge.

Whooper Swan (*Cygnus c. cygnus*)
Berlin E.Ge; Washington N.Z.P. USA; Whipsnade GB.

Chinese Goose or Swan Goose (*Anser cygnoides*)
Berlin E.Ge; Cairo UAR; Chicago L.P.Z. USA; Cologne Ge; Georgetown BG; Granby Ca.

Grey Lag Goose (*Anser anser*)
Basle Switz; Berlin E.Ge; Berlin W.Ge; Lodz Pol; Magdeburg Ge; Nuremberg Ge; Prague Cz; Stendal Ge.

White-fronted Goose (*Anser albifrons*)
Lesna Cz.

Lesser White-fronted Goose (*Anser erythropus*)
Rotterdam N.

Lesser Snow Goose (*Anser c. caerulescens*)
(Includes blue form*)
Detroit USA; Dudley GB; Nuremberg* Ge; Prague* Cz; Rotterdam* N; San Diego* USA.

Greater Snow Goose (*Anser caerulescens atlanticus*)
Granby Ca; Whipsnade GB.

Emperor Goose (*Anser canagicus*)
Dudley GB; Rotterdam N.

Bar-headed Goose (*Anser indicus*)
Dublin Eire; Prague Cz; Rotterdam N; Toronto Ca.

Canada Goose (*Branta canadensis*)
Auckland NZ; Chicago L.P.Z. USA; Magdeburg Ge; Nuremberg Ge; Paignton GB; Prague Cz; San Diego USA; Toronto Ca; Whipsnade GB.

Barnacle Goose (*Branta leucopsis*)
Amsterdam N; Copenhagen D.

Red-breasted Goose (*Branta ruficollis*)
Edinburgh GB; Whipsnade GB.

Brant Duck (?)
Bremerhaven Ge; Cologne Ge; Montreal Ca.

Cereopsis Goose or Cape Barren Goose (*Cereopsis novae-hollandiae*)
Amsterdam N; Auckland NZ; Cologne Ge; Melbourne Austral; Prague Cz; Rotterdam N; San Diego USA.

Andean Goose (*Chloephaga melanoptera*)
Rotterdam N.

Ashy-headed Goose (*Chloephaga poliocephala*)
Prague Cz; Rotterdam N.

Ruddy-headed Goose (*Chloephaga rubidiceps*)
Rotterdam N.

Magellan Goose (*Chloephaga picta*)
Basle Switz; Detroit USA; London GB; Paignton GB; Prague Cz; Whipsnade GB.

Birds Bred in Captivity

Egyptian Goose (*Alopochen aegyptiaca*)
Adelaide Austral; Cairo UAR; Johannesburg SA;
Helsinki Fi; Liberec Cz; Lisbon Por; Prague Cz;
Pretoria Cz; Rotterdam N.

South African Shelduck (*Tadorna cana*)
Rotterdam N.

Ruddy Shelduck (*Tadorna ferruginea*)
Basle Switz; Prague Cz; Rotterdam N.

Common Shelduck (*Tadorna tadorna*)
Basle Switz; Cologne Ge; London GB; Miami
Crandon USA; Prague Cz.

Hybrid Shelduck: New Zealand Shelduck $\times$
South African Shelduck (*T. variegata* $\times$ *T.*
cana)
Edinburgh GB.

African Black Duck (*Anas sparsa*)
Rotterdam N.

Mallard (*Anas platyrhynchos*)
Adelaide Austral; Barcelona Sp; Berlin E.Ge;
Berlin W.Ge; Granby Ca; Kronberg Ge; Prague Cz;
San Diego USA; Stockholm Sw; Toronto Ca;
Washington N.Z.P. USA; Winnipeg Ca.

Grey Duck (*Anas superciliosa*)
Basle Switz.

Philippine Duck (*Anas luzonica*)
Basle Switz.

Black Duck (*Anas fulvigula rubripes*)
San Diego USA; Toronto Ca.

Spot-billed Duck (*Anas poecilorhyncha*)
Berlin W.Ge; Rotterdam N.

Yellow-billed Duck (*Anas undulata*)
Chester GB.

Chestnut-breasted Teal (*Anas castanea*)
Basle Switz; Miami Crandon USA; Rotterdam N.

Yellow-billed Teal (*Anas flavirostris*)
Rotterdam N.

Green-winged Teal (*Anas crecca carolinensis*)
Miami Crandon USA; San Diego USA.

Falcated Teal (*Anas falcata*)
New York Bronx USA.

Gadwall (*Anas strepera*)
Prague Cz.

Wigeon (*Anas penelope*)
Berlin W.Ge.

Chiloe Wigeon (*Anas sibilatrix*)
Basle Switz; Berlin E.Ge; Berlin W.Ge; London
GB; Rotterdam N.

Bahama Pintail (*Anas bahamensis*)
Prague Cz; New York Bronx USA.

Chilean Pintail (*Anas georgica spinicauda*)
Berlin E.Ge.

Pintail (*Anas acuta*)
Basle Switz; San Diego USA.

Cape Teal (*Anas capensis*)
Basle Switz; New York Bronx USA.

Blue-winged Teal (*Anas discors*)
Miami Crandon USA.

Cinnamon Teal (*Anas cyanoptera*)
Basle Switz; Miami Crandon USA.

Shoveler (*Anas clypeata*)
Prague Cz.

Red-crested Pochard (*Netta rufina*)
Basle Switz; Berlin E.Ge; Chicago L.P.Z. USA;
Prague Cz; Rotterdam N.

Rosy-billed Duck (*Netta peposaca*)
Basle Switz; Miami Crandon USA; Rotterdam N.

Common Pochard (*Aythya ferina*)
Edinburgh GB; Prague Cz; Rotterdam N.

Redhead (*Aythya americana*)
Basle Switz; Miami Crandon USA; San Diego USA;
Winnipeg Ca.

White-eyed Pochard or Ferruginous Duck
(*Aythya nyroca*)
Basle Switz; New York Bronx USA; Rotterdam N.

Tufted Duck (*Aythya fuligula*)
Basle Switz; Berlin W.Ge; Miami Crandon USA;
Prague Cz.

Scaup (*Aythya marila*)
Prague Cz.

Maned Goose (*Chenonetta jubata*)
Miami Crandon USA.

Wood Duck or Carolina Duck (*Aix sponsa*)
Antwerp Bel; Berlin E.Ge; Berlin W.Ge; Bochum Ge;
Bristol GB; Chester GB; Dudley GB; Ilfracombe
GB; Liberec Cz; Magdeburg Ge; Miami Crandon
USA; Osnabruck Ge; Paignton GB; Prague Cz;
Rotterdam N; Toronto Ca; Washington N.Z.P.
USA.

Mandarin Duck (*Aix galericulata*)
Basle Switz; Berlin E.Ge; Dudley GB; Granby Ca;
Liberec Cz; Magdeburg Ge; Miami Crandon USA;
Nuremberg Ge; Prague Cz; Rotterdam N.

ORDER FALCONIFORMES

Condor (*Vultur gryphus*)
Frankfurt Ge.

ORDER GALLIFORMES

Brush Turkey (*Alectura lathamii*)

Adelaide Austral.

Razor-billed Curassow (*Mitu mitu*)

Adelaide Austral; Auckland NZ.

Powis (*Crax* sps)

Georgetown BG.

Slater's Curassow (*Crax fasciolata*)

Frankfurt Ge; Rotterdam N.

Globose Curassow (*Crax globicera*)

Arnhem N.

White-browed Guan (*Penelope superciliosa*)

Wassenaar N.

Scaled Quail (*Callipepla squamata*)

Rotterdam N.

Gambel's Quail (*Lophortyx gambeli*)

Antwerp Bel; Copenhagen D; San Diego USA.

Bob-white Quail (*Colinus virginianus texanus*)

Copenhagen D; San Diego USA.

Capoeira Partridge (*Odontophorus capueira*)

Antwerp Bel.

Chukor (*Alectoris graeca*)

Cairo UAR; Copenhagen D; San Diego USA; Wassenaar N.

Gray's Francolin (*Francolinus pondicerianus*)

San Diego USA.

Erckel's Francolin (*Francolinus erckeli*)

Antwerp Bel; Houston USA; San Diego USA.

Sharpe's Francolin (*Francolinus sharpi*)

San Diego USA.

Gray's Bare-throated Francolin (*Pternistes**leucoscepus*)

San Diego USA.

Common Quail (*Coturnix coturnix*)

Prague Cz.

Japanese Quail (*Coturnix c. japonica*)

San Diego USA.

Harlequin Quail (*Coturnix delegorguei*)

San Diego USA.

Painted Quail (or King Quail) (*Excalfactoria**chinensis*)

Copenhagen D; Dublin Eire; Helsinki Fi; Melbourne Austral; Prague Cz.

Rouloul or Red-crested Wood Partridge

(Rollulus rouloul)

Wassenaar N.

Chinese Bamboo Partridge (*Bambusicola t. thoracica*)

Prague Cz; San Diego USA.

Temminck's Tragopan (*Tragopan temminckii*)

London GB.

Impeyan Pheasant or Monal Pheasant

(Lophophorus impejanus)

Antwerp Bel; London GB; Prague Cz.

Brown Eared Pheasant (*Crossoptilon mantchuricum*)

Amsterdam N; Prague Cz.

Pallas's Eared Pheasant (*Crossoptilon auritum*)

Berlin W.Ge; Goppingen Ge; Prague Cz; Rotterdam N.

Silver Pheasant (*Gennaeus nycthemerus*)

Adelaide Austral; Berlin E.Ge; Berlin W.Ge; Cairo UAR; Goppingen Ge; Helsinki Fi; Houston USA; Paignton GB; Prague Cz; San Diego USA; Stendal Ge; Toronto Ca; Winnipeg Ca.

Nepal Kalij Pheasant (*Gennaeus l. leucomelanus*)

Berlin W.Ge; Frankfurt Ge; Prague Cz; Rotterdam N; Washington N.Z.P. USA.

Black-breasted Kalij Pheasant (*Gennaeus h. horsfieldi*)

London GB.

Edwards's Pheasant (*Hierophasis edwardsi*)

Dresden Ge; Rotterdam N.

Swinhoe's Pheasant (*Hierophasis swinhoii*)

Berlin W.Ge; Prague Cz; Rotterdam N; Winnipeg Ca.

Vieillot's Fire-backed Pheasant (*Lophura rufa*)

Amsterdam N.

Ceylon Jungle Fowl (*Gallus lafayetii*)

Antwerp Bel; Budapest H; London GB; Prague Cz.

Red Jungle Fowl (*Gallus gallus*)

San Diego USA; Washington N.Z.P. USA.

Junglefowl (*Unspecified*)

Copenhagen D; Ilfracombe GB.

Cheer Pheasant (*Catreus wallichii*)

Antwerp Bel; Berlin W.Ge; Prague Cz; Rotterdam N; Winnipeg Ca.

Common Pheasant (*Phasianus colchicus*)

(Includes black form*)

Barcelona Sp; Berlin* E.Ge; Berlin W.Ge; Bristol GB; Granby Ca; Johannesburg SA; Melbourne* Austral; Prague Cz; Rostock Ge; Stockholm Sw.

Mongolian Pheasant (*Phasianus colchicus mongolicus*)

Adelaide Austral; Barcelona Sp.

Birds Bred in Captivity

Ring-necked Pheasant (*Phasianus colchicus torquatus*)

Chicago L.P.Z. USA; Houston USA; San Diego USA; Toronto Ca.

Versicolor Pheasant (*Phasianus colchicus versicolor*)

Rotterdam N.

Reeves's Pheasant (*Syrnaticus reevesi*)

Barcelona Sp; Berlin E.Ge; Helsinki Fi; Ilfracombe GB; London GB; Melbourne Austral; Prague Cz; Rotterdam N; San Diego USA; Straubing Ge; Toronto Ca; Winnipeg Ca.

Elliot's Pheasant (*Syrnaticus ellioti*)

Amsterdam N; London GB; Prague Cz; Rotterdam N; San Diego USA.

Lady Amherst's Pheasant (*Chrysolophus amherstiae*)

Antwerp Bel; Barcelona Sp; Berlin W.Ge; Frankfurt Ge; London GB; Prague Cz; Rotterdam N; San Diego USA; Straubing Ge; Vienna Austria.

Golden Pheasant (*Chrysolophus pictus*)

Adelaide Austral; Barcelona Sp; Cairo UAR; Chester GB; Cologne Ge; Frankfurt Ge; Goppingen Ge; Houston USA; Ilfracombe GB; Kronberg Ge; London GB; Miami Crandon USA; Perth Austral; Prague Cz; San Diego USA; Straubing Ge; Toronto Ca; Washington N.Z.P. USA; Whipsnade GB; Winnipeg Ca.

Sumatran Bronze-tailed Peacock Pheasant (*Chalcophaps indica*)

New York Bronx USA.

Palawan Peacock Pheasant (*Polyplectron emphanum*)

San Diego USA.

Grey Peacock Pheasant (*Polyplectron bicalcaratum*)

Rotterdam N.

Peacock Pheasant (*Polyplectron* sps.)

Amsterdam N.

Argus Pheasant (*Argusianus argus*)

Arnhem N; Antwerp Bel; Miami Crandon USA.

Indian Peafowl (*Pavo cristatus*)

(Includes white form* and black-winged form†)

Adelaide Austral; Ankara T; Antwerp Bel; Antwerp* Bel; Antwerp† Bel; Arnhem N; Arnhem* N; Arnhem† N; Auckland NZ; Berlin E.Ge; Berlin W.Ge; Budapest H; Cairo UAR; Cairo* UAR; Cologne Ge; Copenhagen D; Dublin Eire; Frankfurt Ge; Georgetown BG; Granby Ca; Ilfracombe GB; Helsinki Fi; London GB; Miami Crandon USA; Oklahoma L.P.Z. USA; Osnabruck Ge; Paignton GB; Prague Cz; Rotterdam† N; San Diego USA; Stockholm Sw; Straubing Ge; Toronto Ca; Vienna Austria; Washington N.Z.P. USA; Whipsnade GB; Winnipeg Ca.

Green Peafowl (*Pavo muticus*)

Adelaide Austral; Antwerp Bel; Cairo UAR; San Diego USA.

Grey-breasted Helmeted Guinea Fowl (*Numida meleagris galeata*)

Antwerp Bel; Cairo UAR.

Helmeted Guinea Fowl (*Numida meleagris*)

Berlin E.Ge; Johannesburg SA; San Diego USA; Winnipeg Ca.

Kenya Crested Guinea Fowl (*Guttera pucherani*)

Rotterdam N.

Vulturine Guinea Fowl (*Acryllium vulturinum*)

Johannesburg SA.

Turkey or North American Turkey (*Meleagris gallopavo*)

Cologne Ge; Copenhagen D; Lisbon Por; San Diego USA; Washington N.Z.P. USA; Whipsnade GB.

ORDER GRUIFORMES

White-necked Crane (*Grus vipio*)

Seoul K.

Sarus Crane (*Grus antigone*)

Detroit USA; Rotterdam N.

East African Crowned Crane (*Balearica pavonina gibbericeps*)

Milwaukee USA; Tel Aviv Is.

Stanley Crane (*Anthropoides paradisea*)

Detroit USA.

Grey-necked Wood Rail (*Aramides cajanea*)

Detroit USA.

Black Crake (*Limnecorax flavirostris*)

Prague Cz.

Tasmanian Water-hen (*Tribonyx mortieri*)

Basle Switz.

Dusky Moorhen (*Gallinula tenebrosa*)

Melbourne Austral.

Moorhen (*Gallinula chloropus* L.)

Antwerp Bel; Basle Switz; Magdeburg Ge; Prague Cz.

Florida Gallinule (*Gallinula chloropus cacinans*)

Miami Crandon USA.

Gough Island Moorhen (*Porphyrio commeri*)

Antwerp Bel; Basle Switz.

Purple Gallinule (*Porphyrio porphyrio*)
Basle Switz.

Great Bustard (*Otis t. tarda*)
Budapest H.

ORDER CHARADRIIFORMES

Lapwing (*Vanellus vanellus*)
Budapest H.

Cayenne Lapwing (*Belonopterus chilensis*)
Detroit USA.

Latham's Wattled Lapwing (*Lobibyx novae-hollandiae*)
Rotterdam N.

Banded Plover or Australian Black-breasted Plover (*Zonifer tricolor*)
Wassenaar N.

Kentish Plover (*Charadrius alexandrinus*)
Budapest H.

Redshank (*Tringa totanus*)
Budapest H.

American Black-necked Stilt (*Himantopus mexicanus*)
San Diego USA.

Avocet (*Recurvirostra avosetta*)
Budapest H.

Stone Curlew (*Burhinus oedipnemus*)
Budapest H.; Wassenaar N.

Thick-knee Plover (*Burhinus bistriatus vocifer*)
San Diego USA.

Pacific Gull (*Gabianus pacificus*)
Perth Austral.

Kelp Gull or Dominican Gull (*Larus dominicanus*)
Washington N.Z.P. USA.

Herring Gull (*Larus argentatus*)
Nurenberg Ge; Osnabruck Ge.

Lesser Black-backed Gull (*Larus fuscus*)
London GB.

Great Black-backed Gull (*Larus marinus*)
Whipsnade GB.

Silver Gull (*Larus novae-hollandiae*)
London GB.

Black-headed Gull (*Larus ridibundus*)
London GB.

ORDER COLUMBIFORMES

Zoe's Fruit Pigeon (*Ducula zoeae*)
Rotterdam N.

Rock Dove (*Columba livia*)
Antwerp Bel; Basle Switz; Washington N.Z.P. USA;

Stock Dove (*Columba oenas*)
Antwerp Bel; Berlin W.Ge.

Wood Pigeon (*Columba palumbus*)
Antwerp Bel; Berlin W.Ge.

White-crowned Pigeon (*Columba leucocephala*)
Antwerp Bel; Wassenaar N.

Picazuro Pigeon (*Columba picazuro*)
Antwerp Bel.

Speckled Pigeon (*Columba guinea*)
Antwerp Bel; Berlin W.Ge; San Diego USA; Wassenaar N.

Mourning Dove (*Zenaidura macroura*)
Wassenaar N.

White-winged Dove (*Zenaida asiatica*)
San Diego USA.

Galapagos Dove (*Nesopelia galapagoensis*)
Berlin W.Ge; Copenhagen D; Jersey GB; San Diego USA.

Turtle Dove (*Streptopelia turtur*)
Antwerp Bel; Bristol GB; Wassenaar N.

Collared Turtle Dove (*Streptopelia decaocto decaocto*)
Cairo UAR; Chessington GB; Copenhagen D; San Diego USA; Straubing Ge; Wassenaar N.

Barbary Turtle Dove (*Streptopelia decaocto roseogrisea*)
Adelaide Austral; Antwerp Bel; Berlin E.Ge; Berlin W.Ge; Cairo UAR.

Red-eyed Dove (*Streptopelia semitorquata*)
Helsinki Fi.

Mourning Dove (*Streptopelia decipiens*)
Antwerp Bel; Copenhagen D.

Ring-necked Dove (*Streptopelia capicola*)
Antwerp Bel.

Ruddy Turtle Dove (*Streptopelia tranquebarica humilis*) (?)
Adelaide Austral.

Necklace Dove (*Streptopelia chinensis*)
Paignton GB; San Diego USA.

Laughing Dove or Palm Dove (*Streptopelia senegalensis*)
Antwerp Bel; Berlin E.Ge; Cairo UAR.

Birds Bred in Captivity

Bar-shouldered Dove (*Geopelia humeralis*)
Adelaide Austral; Copenhagen D.

Peaceful Dove (*Geopelia striata placida*)
Adelaide Austral.

Diamond Dove (*Geopelia cuneata*)
(Includes pale form*)
Adelaide Austral; Adelaide* Austral; Cairo UAR;
Prague Cz.

Passerine Ground Dove (*Columbigallina passerina*)
Wassenaar N.

Talpacoti Dove (*Columbigallina talpacoti*)
Georgetown BG; London GB.

Common Bronze-winged Pigeon (*Phaps chalcoptera*)
Adelaide Austral.

Brush Bronze-winged Pigeon (*Phaps elegans*)
Adelaide Austral.

Crested Pigeon (*Ocyphaps lophotes*)
Adelaide Austral; Berlin W. Ge; Copenhagen D;
Dudley GB; London GB; Prague Cz; Wassenaar N.

Grey-headed Quail Dove (*Oreopeleia caniceps*)
Antwerp Bel.

Blood-breasted Pigeon (*Gallicolumba luzonica*)
Wassenaar N.

Nicobar Pigeon (*Caloenas nicobarica*)
Wassenaar N.

Crowned Pigeon (*Goura cristata*)
Berlin W.Ge; Rotterdam N.

Victoria Crowned Pigeon (*Goura victoria*)
San Diego USA.

Ring-necked Dove (?)
Copenhagen D.

ORDER PSITTACIFORMES

Kea (*Nestor notabilis*)
San Diego USA.

Forsten's Lorikeet (*Trichoglossus haematod forsteni*)
Wassenaar N.

Blue-faced Lorikeet (*Trichoglossus haematod intermedius*)
London GB.

Red-collared Lorikeet (*Trichoglossus haematod rubritorquis*)
Adelaide Austral; Melbourne Austral; San Diego
USA; Wassenaar N.

Swainson's Lorikeet (*Trichoglossus haematod moluccanus*)
Melbourne Austral; San Diego USA; Wassenaar N.

Banksian Cockatoo (*Calyptorhynchus m. magnificus*)
San Diego USA.

Bare-eyed Cockatoo (*Kakatoe s. sanguinea*)
San Diego USA.

Slender-billed Cockatoo (*Kakatoe tenuirostris*)
San Diego USA.

Cockatiel (*Nymphicus hollandicus*)
Antwerp Bel; Berlin E.Ge; Bremerhaven Ge;
Cairo UAR; Copenhagen D; London GB; Lodz Pol;
Magdeburg Ge; Prague Cz; San Diego USA; Whips-
nade GB.

Blue & Yellow Macaw (*Ara ararauna*)
Chessington GB; Detroit USA; Poznan Pol.

Jendaya Conure (*Aratinga jandaya*)
Prague Cz; Whipsnade GB.

Patagonian Conure (*Cyanoliseus patagonus*)
Prague Cz.

Quaker Parakeet (*Myiopsitta monachus*)
Adelaide Austral; Berlin E.Ge; Copenhagen D;
Liberec Cz; Prague Cz; San Diego USA.

Lineolated Parakeet (*Bolborhynchus lineola*)
San Diego USA.

White-winged Parakeet (*Brotogeris v. versicolurus*)
San Diego USA.

(*Polycephalus picta*)
Antwerp Bel.

Red-sided Eclectus Parrot (*Lorius roratus pectoralis*)
San Diego USA.

Indian Ring-necked Parakeet (*Psittacula krameri manillensis*)
Adelaide Austral; Prague Cz.

Derbyan Parakeet (*Psittacula derbyana*)
Prague Cz.

Barraband's Parakeet (*Polytelis swainsoni*)
Whipsnade GB.

Queen Alexandra's Parakeet (*Polytelis alexandrae*)
Adelaide Austral; San Diego USA.

Green-winged King Parakeet (*Alisterus chloropterus*)
London GB.

King Parrakeet (*Alisterus s. scapularis*)
San Diego USA.

Rosy-faced Lovebird or Peach-faced Lovebird (*Agapornis roseicollis*)
Adelaide Austral; Cairo UAR; Copenhagen D; Rostock Ge; San Diego USA.

Fischer's Lovebird (*Agapornis fischeri*)
Cairo UAR; Chester GB; Copenhagen D; London GB.

Masked Lovebird (*Agapornis personata*)
Berlin E.Ge; Copenhagen D; Houston USA; London GB; San Diego USA.

Nyasa Lovebird (*Agapornis lilianae*)
Adelaide Austral.

Hanging Parrot (Hybrid) (*Loriculus galgulus* × *L. beryllinus*)
Chester GB.

Adelaide Parrakeet (*Platycercus elegans adalaidae*)
Adelaide Austral; Antwerp N.

Rosella Parrakeet (*Platycercus eximus eximus*)
Adelaide Austral; Chester GB; Dudley GB; Prague Cz; San Diego USA.

Brown's Parrakeet (*Platycercus venustus*)
Adelaide Austral; San Diego USA.

Stanley Parrakeet (*Platycercus ictyotus*)
San Diego USA.

Red-rumped Parrakeet (*Psephotus haematonotus*)
Paignton GB; Whipsnade GB.

Elegant Parrakeet (*Neophema elegans*)
Adelaide Austral.

Blue-winged Parrakeet (*Neophema chrysostomus*)
Adelaide Austral.

Bourke's Parrakeet (*Neophema bourkii*)
Adelaide Austral.

Budgerigar (*Melopsittacus undulatus*)
Adelaide Austral; Ankara T; Antwerp Bel; Berlin E.Ge; Budapest H; Cairo UAR; Copenhagen D; Georgetown BG; Ilfracombe GB; San Diego USA; Washington N.Z.P. USA.

ORDER CUCULIFORMES

Road-runner (*Geococcyx californianus*)
Prague Cz.

ORDER STRIGIFORMES

Eagle Owl (*Bubo bubo*)
Basle Switz; Copenhagen D; Frankfurt Ge; Landau Ge; Nuremberg Ge; Stockholm Sw; Wassenaar N.

Spotted Eagle Owl (*Bubo africanus*)
Copenhagen D; London GB.

ORDER CAPRIMULGIFORMES

Tawny Frogmouth (*Podargus strigoides*)
Wassenaar N.

ORDER APODIFORMES

Streamer-tailed Hummingbird (*Trochilus polytmus*)
Cleveland USA.

ORDER CORACIIFORMES

Laughing Kingfisher (*Dacelo novaeguineae*)
Wassenaar N.

Red-billed Hornbill (*Tockus erythrorhynchus*)
Wassenaar N.

ORDER PASSERIFORMES

Shama (*Copsychus malabaricus*)
Wassenaar N.

Red-billed Leiothrix or Pekin Robin (*Leiothrix lutea*)
Wassenaar N.

White-throated Laughing Thrush (*Garrulax albogularis*)
Wassenaar N.

Sayaca Tanager (*Tanagra sayaca*)
Wassenaar N.

Green Cardinal (*Gubernatrix cristatus*)
Antwerp Bel.

Saffron Finch (*Sicalis flaveola*)
Berne Switz.

Cuban Olive Finch (*Tiaris olivacea*)
San Diego USA.

Greenfinch (*Chloris chloris*)
London GB.

Bullfinch (*Pyrrhula pyrrhula*)
Berlin E.Ge.

Birds Bred in Captivity

Red-browed Waxbill (*Aegintha temporalis*)
San Diego USA.

Senegal Firefinch (*Lagonosticta s.senegalae*)
Copenhagen D; Stockholm Sw.

African Firefinch (*Lagonosticta* sps.)
Copenhagen D.

Lavender Finch (*Lagonosticta caerulea*)
San Diego USA.

Gouldian Finch (*Poephila gouldiae*)
San Diego USA; Wassenaar N.

Long-tailed Grassfinch (*Poephila acuticauda*)
Copenhagen D; San Diego USA; Wassenaar N.

Grassfinch (*Poephila* sps.)
Adelaide Austral.

Zebra Finch (*Taeniopygia castanotis*)
Adelaide Austral; Berne Switz; Cairo UAR; Frankfurt Ge; London GB; Magdeburg Ge; San Diego USA; Stockholm Sw; Straubing Ge.

Diamond Finch (*Steganopleura guttata*)
Adelaide Austral.

Bichenov's Finch or Double-barred Finch
(*Steganopleura bichenovi*)
Melbourne Austral; San Diego USA.

Crimson Finch (*Neochmia phaeton*)
San Diego USA.

Plum-head Finch (*Aidemosyne modesta*)
San Diego USA.

African Silver-bill (*Euodice malabarica cantans*)
San Diego USA.

Bronze Mannikin (*Spermestes cucullatus*)
Berne Switz.

Chestnut-breasted Finch (*Lonchura castaneothorax*)
Adelaide Austral; San Diego USA.

Nutmeg Finch (*Lonchura punctulata*)
Adelaide Austral.

Rice Bird or Java Sparrow (*Padda oryzivora*)
Cairo UAR; Chicago L.P.Z. USA; San Diego USA.

Cut-throat Finch (*Amadina fasciata*)
Detroit USA.

Burchell's Glossy Starling (*Chalcopsar australis*)
Chester GB.

Superb Glossy Starling (*Spreo superbus*)
Dresden Ge.

Malayan Glossy Starling (*Aplonis panayensis strigatus*)
London GB.

Andaman Starling or Mynah (*Sturnia malabarica andamanensis*)
Copenhagen D.

Red-billed Blue Pie (*Urocissa erythrorhynchos*)
Zürich Switz.

Raven (*Corvus corax*)
Zürich Switz.

Black Heart Finch (?)
Adelaide Austral.

Weaver Finch (?)
Helsinki Fi.

ORDER & SPECIES UNKNOWN

Andinochenodes melanopterus (Prague Cz.);
Mallee Ringneck (Adelaide, Austral.);
Eastern Swamphe (Adelaide, Austral.);
Madras Quail (Helsinki, Fi.).

MAMMALIAN GESTATION PERIODS

THE gestation figures given here are shown in days. They represent average values and should only be considered as approximations. They have been compiled from a variety of sources and, where these have differed only slightly, an average of the averages has been listed. In a few cases, the average figures from different sources have disagreed strongly and there the highest average and the lowest average have both been indicated. Some of these special cases are instances of delayed fertilisation (certain bats), or delayed implantation (certain martens, weasels, armadillos, deer, seals, bears and badgers).

In future editions of the yearbook it is hoped to augment and improve this gestation table, as more information becomes available. Other tabulated data will also be added, including such items as life span, body weight, breeding season and litter size.

	G (days)		G (days)
MONOTREMATA		DERMOPTERA	
Echidna (<i>Tachyglossus aculeatus</i>)	12-28	Flying Lemur. (<i>Cynocephalus variegatus</i>)	60
(Inter-uterine Incubation)			
Platypus (<i>Ornithorhynchus anatinus</i>)	7-10		
MARSUPIALIA		CHIROPTERA	
American Opossum (<i>Didelphis marsupialis</i>)	13	Fruit Bat (<i>Pteropus giganteus</i>)	180
Dasyure (<i>Dasyurus viverrinus</i>)	11	Greater Horseshoe Bat (<i>Rhinolophus ferrum-equinum</i>)	70
Tasmanian Devil (<i>Sarcophilus ursinus</i>)	31	Vampire Bat (<i>Desmodus rotundus</i>)	105
Cuscus (<i>Phalanger</i> spp)	13	Brown Bat (<i>Myotis lucifugus</i>)	55
Australian Opossum (<i>Trichosurus vulpecula</i>)	21	Mouse-eared Bat (<i>Myotis myotis</i>)	49
Grey Kangaroo (<i>Macropus canguru</i>)	39	Pipistrelle Bat (<i>Pipistrellus pipistrellus</i>)	35
Red Kangaroo (<i>Macropus rufus</i>)	35	Noctule Bat (<i>Nyctalus noctula</i>)	38/70
Red-necked Wallaby (<i>Protemnodon rufogrisea</i>)	40	Brown Bat (<i>Eptesicus fuscus</i>)	35
Rat Kangaroo (<i>Bettongia cuniculus</i>)	42	Free-tailed Bat (<i>Tadarida cynocephala</i>)	77
Rat Kangaroo (<i>Potorous tridactylus</i>)	42		
INSECTIVORA		EDENTATA	
European Hedgehog (<i>Erinaceus europaeus</i>)	30/48	Giant Anteater (<i>Myrmecophaga tridactyla</i>)	190
Cape Hedgehog (<i>Erinaceus frontalis</i>)	30	Three-toed Sloth (<i>Bradypus tridactylus</i>)	120/180
Elephant Shrew (<i>Elephantulus rupestris</i>)	56	Hairy Armadillo (<i>Euphractus villosus</i>)	65
Common Shrew (<i>Sorex araneus</i>)	16/42	Nine-banded Armadillo (<i>Dasypus novemcinctus</i>)	150/260
Water Shrew (<i>Neomys fodiens</i>)	21		
Short-tailed Shrew (<i>Blarina brevicauda</i>)	20		
European Mole (<i>Talpa europaea</i>)	30	PRIMATES	
Hairy-tailed Mole (<i>Parascalops breweri</i>)	30	Philippine Tree Shrew (<i>Urogale</i> sps)	56
Eastern American Mole (<i>Scalopus aquaticus</i>)	42	Black Lemur (<i>Lemur macaco</i>)	146
		Indris (<i>Indri indri</i>)	60
		Slender Loris (<i>Loris tardigradus</i>)	174

PRIMATES—continued.		G (days)	RODENTIA—continued.		G (days)
Slow Loris (<i>Nycticebus cougang</i>)		90	Yellow Ground Squirrel (<i>Citellus richardsoni</i>)		30
Bushbaby (<i>Galago senegalensis</i>)		120	Columbian Ground Squirrel (<i>Citellus columbianus</i>)		24
Red Howler Monkey (<i>Alouatta seniculus</i>)		139	13-Striped Ground Squirrel (<i>Citellus tridicemlineatus</i>)		27
Capuchin Monkey (<i>Cebus</i> spp)		180	Chipmunk (<i>Tamias striatus</i>)		31
Spider Monkey (<i>Ateles ater</i>)		139	Flying Squirrel (<i>Glaucomys volans</i>)		39
Woolly Monkey (<i>Lagothrix lagotricha</i>)		139	Eastern Pocket Gopher (<i>Geomys breviceps</i>)		45
Common Marmoset (<i>Callithrix jacchus</i>)		144	Pocket Gopher (<i>Thomomys quadratus</i>)		40
Golden Tamarin (<i>Leontocebus rosalia</i>)		140	Kangaroo Rat (<i>Dipodomys</i> spp)		30
Crab-eating Macaque (<i>Macaca irus</i>)		165	European Beaver (<i>Castor fiber</i>)		42/120
Rhesus Monkey (<i>Macaca mulatta</i>)		164	Canadian Beaver (<i>Castor canadensis</i>)		65/128
Bonnet Macaque (<i>Macaca radiata</i>)		163	Rice Rat (<i>Oryzomys palustris</i>)		25
Pig-tailed Macaque (<i>Macaca nemestrina</i>)		190	Harvest mouse (<i>Reithrodontomys</i> spp)		22
Barbary Ape (<i>Macaca sylvana</i>)		210	Peromyscus (<i>Peromyscus</i> spp)		24
Chacma Baboon (<i>Papio ursinus</i>)		210	Grasshopper Mouse (<i>Onychomys leucogaster</i>)		33
Sacred Baboon (<i>Comopithecus hamadryas</i>)		183	Cotton Rat (<i>Sigmodon hispidus</i>)		27
Mandrill (<i>Mandrillus sphinx</i>)		245	Wood Rat (<i>Neotoma</i> spp)		34
Guenon (<i>Cercopithecus</i> spp)		213	Common Hamster (<i>Cricetus cricetus</i>)		21
Vervet Monkey (<i>Cercopithecus aethiops</i>)		210	Giant Hamster (<i>Cricetus triton</i>)		17
White-nosed Monkey (<i>Cercopithecus ascanius</i>)		180	Golden Hamster (<i>Mesocricetus auratus</i>)		16
Langur (<i>Presbytis entellus</i>)		196	Vole (<i>Clethrionomys</i> spp)		18
Gibbon (<i>Hylobates</i> spp)		210	Vole (<i>Lagurus curtatus</i>)		25
Orang-utan (<i>Pongo pygmaeus</i>)		233	Vole (<i>Microtus</i> spp)		21
Chimpanzee (<i>Pan satyrus</i>)		231	Musk Rat (<i>Ondatra zibethica</i>)		21
Gorilla (<i>Gorilla gorilla</i>)		255	Pigmy Gerbil (<i>Dipodillus simoni</i>)		20
Man (<i>Homo sapiens</i>)		266	Fat-tailed Gerbil (<i>Pachyuromys duprasi</i>)		20
PHOLIDOTA			Sand Rat (<i>Meriones</i> spp)		21
Pangolin (<i>Manis</i> spp)		?	Harvest Mouse (<i>Micromys minutus</i>)		21
LAGOMORPHA			Field Mouse (<i>Apodemus fodiens</i>)		21
European Hare (<i>Lepus europaeus</i>)		39	Field Mouse (<i>Apodemus sylvaticus</i>)		26
Californian Hare (<i>Lepus californicus</i>)		43	Black Rat (<i>Rattus rattus</i>)		25
Snowshoe Hare (<i>Lepus americanus</i>)		35	Brown Rat (<i>Rattus norvegicus</i>)		21
Cottontail (<i>Sylvilagus</i> spp)		28	House Mouse (<i>Mus musculus</i>)		20
Rabbit (<i>Oryctolagus cuniculus</i>)		31	Spiny Mouse (<i>Acomys cahirinus</i>)		12
RODENTIA			Gambian Rat (<i>Cricetomys gambiensis</i>)		42
Grey Squirrel (<i>Sciurus carolinensis</i>)		39	Common Dormouse (<i>Muscardinus avellanarius</i>)		22
Red Squirrel (<i>Sciurus vulgaris</i>)		33	Jerboa (<i>Jaculus orientalis</i>)		42
Fox Squirrel (<i>Sciurus niger</i>)		45	Crested Porcupine (<i>Hystrix cristata</i>)		112
American Red Squirrel (<i>Tamiasciurus hudsonicus</i>)		40	South African Porcupine (<i>Hystrix africae-australis</i>)		49/112
Grizzled Hill Squirrel (<i>Ratufa macroura</i>)		28	Canadian Porcupine (<i>Erethizon dorsatum</i>)		113/210
Marmot (<i>Marmota marmota</i>)		38	Yellow-haired Porcupine (<i>Erethizon epixanthum</i>)		270
Woodchuck (<i>Marmota monax</i>)		30	Guinea Pig (<i>Cavia porcellus</i>)		67
Prairie Marmot (<i>Cynomys leucurus</i>)		29	Capybara (<i>Hydrochoerus hydrochoeris</i>)		122
European Suslik (<i>Citellus citellus</i>)		25	Agouti (<i>Dasyprocta aguti</i>)		104
Californian Ground Squirrel (<i>Citellus beecheyi</i>)		27	Vizcacha (<i>Lagostomus maximus</i>)		145

RODENTIA—continued.		G (days)	CARNIVORA—continued.		G (days)
Mountain Vizcacha (<i>Lagidium peruanum</i>)		90	European Otter (<i>Lutra lutra</i>)		62
Chinchilla (<i>Chinchilla laniger</i>)		110	Canadian Otter (<i>Lutra canadensis</i>)		58
Coypu (<i>Myocastor coypus</i>)		130	Cape Clawless Otter (<i>Aonyx capensis</i>)		63
CETACEA			Sea Otter (<i>Enhydra lutris</i>)		255
Ganges Porpoise (<i>Platanista gangetica</i>)		255	Mongoose (<i>Herpestes edwardsi</i>)		60
Sperm Whale (<i>Physeter catodon</i>)		365/480	Spotted Hyaena (<i>Crocuta crocuta</i>)		98
Pigmy Whale (<i>Kogia breviceps</i>)		270	Brown Hyaena (<i>Hyaena brunnea</i>)		90
Common Dolphin (<i>Delphinus delphis</i>)		276	European Wild Cat (<i>Felis silvestris</i>)		68
Bottlenose Porpoise (<i>Tursiops truncatus</i>)		330/390	Leopard Cat (<i>Felis bengalensis</i>)		56
Porpoise (<i>Phocaena phocaena</i>)		183	Lynx (<i>Felis lynx</i>)		63
Blue Whale (<i>Balaenoptera musculus</i>)		305	Bobcat (<i>Felis rufa</i>)		50
Fin Whale (<i>Balaenoptera physalus</i>)		335	Canadian Lynx (<i>Felis canadensis</i>)		60
Sei Whale (<i>Balaenoptera borealis</i>)		365	Caffer Cat (<i>Felis libyca</i>)		56
Humpback Whale (<i>Megaptera novaeangliae</i>)		335	Jaguarundi (<i>Felis yaguarondi</i>)		270
Right Whale (<i>Eubalaena glacialis</i>)		276/360	Puma (<i>Felis concolor</i>)		92
CARNIVORA			Lion (<i>Panthera leo</i>)		109
Wolf (<i>Canis lupus</i>)		62	Tiger (<i>Panthera tigris</i>)		108
Coyote (<i>Canis latrans</i>)		62	Leopard (<i>Panthera pardus</i>)		92
Jackal (<i>Canis aureus</i>)		62	Jaguar (<i>Panthera onca</i>)		101
Arctic Fox (<i>Alopex lagopus</i>)		56	Snow Leopard (<i>Panthera uncia</i>)		93
Old World Red Fox (<i>Vulpes vulpes</i>)		56	Cheetah (<i>Acinonyx jubatus</i>)		92
New World Red Fox (<i>Vulpes fulva</i>)		52	PINNIPEDIA		
Grey Fox (<i>Urocyon cinereoargenteus</i>)		63	Cape Sealion (<i>Arctocephalus pusillus</i>)		350
Fennec (<i>Fennecus zerda</i>)		51	Fur Seal (<i>Arctocephalus australis</i>)		330
Raccoon Dog (<i>Nyctereutes procyonides</i>)		67	Californian Sealion (<i>Zalophus californianus</i>)		343
Dhole (<i>Cuon alpinus</i>)		63	Southern Sealion (<i>Otaria byronii</i>)		335
Cape Hunting Dog (<i>Lycaon pictus</i>)		68	Northern Fur Seal (<i>Callorhinus ursinus</i>)		340
Big-eared Fox (<i>Otocyon megalotis</i>)		65	Atlantic Walrus (<i>Odobenus rosmarus</i>)		260/365
Brown Bear (<i>Ursus arctos</i>)		219	Harbour Seal (<i>Phoca vitulina</i>)		245/300
Black Bear (<i>Ursus americanus</i>)		212	Ringed Seal (<i>Phoca hispida</i>)		276
Polar Bear (<i>Thalarctos maritimus</i>)		240	Leopard Seal (<i>Hydrurga leptonyx</i>)		242
Sloth Bear (<i>Melursus ursinus</i>)		210	Weddell's Seal (<i>Leptonychotes weddelli</i>)		310
Raccoon (<i>Procyon lotor</i>)		66	Elephant Seal (<i>Mirounga leonina</i>)		335
Coati (<i>Nasua nasua</i>)		77	TUBULIDENTATA		
Mink (<i>Mustela vison</i>)		50	Aardvark (<i>Orycteropus afer</i>)		?
Polecat (<i>Mustela putorius</i>)		48	PROBOSCIDEA		
Long-tailed Weasel (<i>Mustela frenata</i>)		232	African Elephant (<i>Loxodonta africana</i>)		650
Stoat (<i>Mustela erminea</i>)		62	Indian Elephant (<i>Elephas maximus</i>)		632
Weasel (<i>Mustela nivalis</i>)		35	HYRACOIDEA		
Pine Marten (<i>Martes martes</i>)		55/103	Cape Hyrax (<i>Procavia capensis</i>)		225
American Marten (<i>Martes americana</i>)		267	SIRENIA		
Sable (<i>Martes zibellina</i>)		274	Dugong (<i>Dugong dugon</i>)		365
Stone Marten (<i>Martes foina</i>)		59/265	Manatee (<i>Trichechus manatus</i>)		152/365
Fisher (<i>Martes pennanti</i>)		353			
Wolverine (<i>Gulo gulo</i>)		60/120			
Ratel (<i>Mellivora capensis</i>)		180			
Common Badger (<i>Meles meles</i>)		65			
American Badger (<i>Taxidea taxus</i>)		287			
Common Skunk (<i>Mephitis mephitis</i>)		55			
Hog-nosed Skunk (<i>Conepatus mesoleucus</i>)		42			

	G (days)		G (days)
PERISSODACTYLA			
Asiatic Wild Ass (<i>Equus hemionus</i>)	330/365	Roe Deer (<i>Capreolus capreolus</i>)	151/280
Burchell's Zebra (<i>Equus burchelli</i>)	351	Okapi (<i>Okapia johnstoni</i>)	426
Mountain Zebra (<i>Equus zebra</i>)	300/365	Giraffe (<i>Giraffa camelopardalis</i>)	443
Grevy's Zebra (<i>Equus grevyi</i>)	390	Kudu (<i>Tragelaphus strepsiceros</i>)	212
Brazilian Tapir (<i>Tapirus</i>		Bushbuck (<i>Tragelaphus scriptus</i>)	220
<i>terrestris</i>)	335/400	Eland (<i>Taurotragus oryx</i>)	260
Malayan Tapir (<i>Tapirus indicus</i>)	392	Nilgai (<i>Boselaphus tragocamelus</i>)	247
Indian Rhinoceros (<i>Rhinoceros</i>		Four-horned Antelope (<i>Tetraceros</i>	
<i>unicornis</i>)	530	<i>quadricornis</i>)	183
Sumatran Rhinoceros (<i>Didermoceros</i>		Asiatic Buffalo (<i>Bubalus bubalis</i>)	315
<i>sumatrensis</i>)	210	Pigmy Buffalo (<i>Anoa depressicornis</i>)	295
White Rhinoceros (<i>Diceros simus</i>)	548	Yak (<i>Bos grunniens</i>)	258/304
Black Rhinoceros (<i>Diceros bicornis</i>)	540	Gaur (<i>Bos gaurus</i>)	270
ARTIODACTYLA		African Buffalo (<i>Syncerus caffer</i>)	330
Wart Hog (<i>Phacochoerus</i>		American Bison (<i>Bison bison</i>)	274
<i>aethiopicus</i>)	125/175	European Bison (<i>Bison bonasus</i>)	276
Forest Hog (<i>Hylochoerus mein-</i>		Duiker (<i>Sylvicapra grimmia</i>)	121
<i>ertshageni</i>)	125	Buffon's Kob Antelope (<i>Kobus kob</i>)	280
Babirusa (<i>Babirusa babirusa</i>)	137	Waterbuck (<i>Kobus ellipsiprymnus</i>)	240
Hippopotamus (<i>Hippopotamus</i>		Lechwe Waterbuck (<i>Kobus lechwe</i>)	210
<i>amphibius</i>)	239	Reedbuck (<i>Redunca arundinum</i>)	233
Pigmy Hippopotamus (<i>Choeropsis</i>		Sable Antelope (<i>Hippotragus niger</i>)	274
<i>liberiensis</i>)	186/270	Roan Antelope (<i>Hippotragus equinus</i>)	270
Llama (<i>Lama glama</i>)	170/330	Beisa Oryx (<i>Oryx beisa</i>)	280
Alpaca (<i>Lama pacos</i>)	240/330	Arabian Oryx (<i>Oryx leucoryx</i>)	240
Vicuña (<i>Lama vicugna</i>)	300	Blesbok (<i>Damaliscus dorcas</i>)	233
Bactrian Camel (<i>Camelus</i>		Bontebok (<i>Damaliscus pygargus</i>)	230
<i>bactrianus</i>)	396	Cape Hartebeest (<i>Alcelaphus</i>	
Arabian Camel (<i>Camelus dromedarius</i>)	336	<i>buselaphus</i>)	242
Chevrotain (<i>Tragulus meminna</i>)	120	Lichtenstein's Hartebeest	
Musk Deer (<i>Moschus moschiferus</i>)	162	(<i>Alcelaphus lichtensteini</i>)	240
Muntjac (<i>Muntiacus muntjak</i>)	183	White-tailed Gnu (<i>Connochaetes gnou</i>)	248
Fallow Deer (<i>Dama dama</i>)	236	Brindled Gnu (<i>Connochaetes taurinus</i>)	255
Axis Deer (<i>Axis axis</i>)	226	Klipspringer (<i>Oreotragus oreotragus</i>)	214
Hog Deer (<i>Axis porcinus</i>)	237	Oribi (<i>Ourebia ourebi</i>)	210
Red Deer (<i>Cervus elaphus</i>)	236	Steinbok (<i>Raphiceros campestris</i>)	210
Wapiti (<i>Cervus canadensis</i>)	252	Blackbuck (<i>Antelope cervicapra</i>)	180/257
Barasingha (<i>Cervus duvaucellii</i>)	245	Impala (<i>Aepyceros melampus</i>)	195
Eld's Deer (<i>Cervus eldi</i>)	183	Springbok (<i>Antidorcas marsupialis</i>)	171
Sambar Deer (<i>Cervus unicolor</i>)	246	Tibetan Antelope (<i>Pantholops hodgsoni</i>)	180
Sika Deer (<i>Cervus nippon</i>)	225	Goral (<i>Naemorhedus goral</i>)	180
Pere David's Deer (<i>Elaphurus</i>		Chamois (<i>Rupicapra rupicapra</i>)	162
<i>davidianus</i>)	250	Tahr (<i>Hemitragus jemlahicus</i>)	180/242
Virginian Deer (<i>Odocoileus</i>		Bighorn Sheep (<i>Ovis canadensis</i>)	180
<i>virginianus</i>)	230	Mouflon (<i>Ovis musimon</i>)	150
Black-faced Brocket (<i>Mazama</i>		Markhor (<i>Capra falconeri</i>)	153
<i>rufina</i>)	217	Ibex (<i>Capra ibex</i>)	158
Moose (<i>Alces alces</i>)	253	Barbary Sheep (<i>Ammotragus lervia</i>)	158
Reindeer (<i>Rangifer tarandus</i>)	236	Serow (<i>Capricornis sumatraensis</i>)	240
		Rocky Mountain Goat (<i>Oreamnos</i>	
		<i>americanus</i>)	147

Gestation periods of common domestic mammals.

Rabbit	31	Donkey	371
Rat	22	Horse	339
Mouse	19	Pig	115
Dog	62	Cow	282
Ferret	42	Goat	150
Cat	57	Sheep	150