6. Report on Deaths occurring in the Society's Gardens during the Year 1941. By Brevet-Colonel A. E. Hamerton, C.M.G., D.S.O., F.Z.S., late R.A.M.C.

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During the year under review the number of deaths investigated by post-mortem examination was 430, of which 152 were Mammalian, 264 Avian, and 14 Amphibian and Reptilian.

The average strength of Mammals (inclusive of many short-lived species) and Birds respectively, and the ratio of deaths for the year 1941, are tabulated below :—

Table 1.

1941.	Average strength.	Deaths.	Ratio of deaths per average strength.
Mammals	514	152	29·5 per cent.
Birds	1066	264	24·7 ,, ,,
Total	1580	416	26·3 ,, ,,

The death of one Mammal only was caused by enemy action during the year under review. Diet restrictions due to the war were probably a contributory cause of death amongst a few fish-eating mammals and birds—notably Seals and Penguins and fruit-eating tropical creatures, viz., the Two-toed Sloth and certain small birds.

The commonest causes of death amongst all classes of Mammals and Birds were :—

	Mammals.	Birds.
I. Diseases of the Respiratory System	27 (or 17·7 p.c.)	38 (or 14·4 p.c.)
II. Diseases of the Digestive System .	18 (or 11·8 p.c.)	55 (or 20·8 p.c.)
III. Injuries and Accidents	25 (or 16·4 p.c.)	35 (or 13·2 p.c.)

Diseases Due to Infection.

Under this heading is recorded an outbreak of Anthrax which caused the deaths of fourteen Mammals and two Birds, all of which were carnivorous species, that died suddenly in the period from June 8th to June 15th. There were no cases after the latter date. Eight deaths occurred in the Cat House, three in the Raccoons enclosure, one in the Lion House, one in the Badgers' Den, North Bank, and two Eagles died in the Eagles' Aviary.

Record of Cases.

On Sunday, June 8th, an Eyra Cat (*Felis eyra*) and an Ocelot (*Felis pardalis*) were found dead in their dens in the Small Cat House. A Blotched

Genet (*Genetta tigrina*) in an adjoining den was moribund when I saw it at 10 a.m.; it died in the afternoon. Anthrax was suspected and confirmed in all cases by microscopical examination of preparations of the peripheral blood stained by McFadyean's method with polychrome methylene blue.

Since correct staining by this method shows up the Anthrax bacilli in a specific colour reaction, it is possible for the bacteriologist to determine immediately a precise diagnosis if *Bacillus anthracis* is present in the blood, as is always the case in acute infections with this microbe. Mr. Edmondson, M.R.C.V.S., of the Ministry of Agriculture Service, informs me that the Ministry does not now consider it necessary to carry out any confirmatory tests in cases wherein the morphological characteristics of the anthrax bacillus can be demonstrated in suitable preparations of the blood of the infected animal. In such cases, therefore, it is unnecessary and inadvisable to risk spreading the disease by contaminating the premises through opening up the corpses, which, however, should not be destroyed until they have been inspected by the Veterinary Officer from the Ministry of Agriculture. This procedure was carried out in all the cases now recorded. Dr. Vevers notified the Ministry of Agriculture and Public Health and arranged for the necessary sanitary precautions to be carried out immediately.

On Monday morning, June 9th, a Puma (*Felis concolor*) and a Golden Cat (*Felis temminckii*) were found dead in their dens in the Cat House. In both cases examination of the peripheral blood showed infection with *Bacillus anthracis*.

Another Puma, reported sick in the Lion House, was seen at about 10 a.m. It was listless and its eyes glazed and staring; at 11 a.m. it was found dead. *Bacillus anthracis* was found in the peripheral blood.

On Tuesday, June 10th, the following mammals were found dead in their dens on the keeper's arrival in the morning :—

A Caracal Lynx (*Felis caracal*) seen the previous evening to be sick, with eyes fixed and glazed.

Three Raccoons (*Procyon lotor*) in the Raccoon's enclosure, and a Northern Lynx (*Felis lynx*) in the North Mammal House. *Bacillus anthracis* was found in the blood of all these animals.

On Wednesday, June 11th, a Leopard Cat (*Felis bengalensis*) and a Silver Badger from the North Bank, were found dead in their dens. *Bacillus anthracis* was found in their blood.

A Golden Eagle (*Aquila chrysaetos*) suddenly collapsed and fell from its perch in the Eagles' Aviary on the evening of June 10th, when I found it flopped on the floor with wings and tail spread out head down and eyes glazed. It was unable to make any co-ordinate movements and died during the night. Peripheral blood was examined the next morning, June 11th, and showed a very heavy infection with *Bacillus anthracis*. Necropsy was carried out on this bird and the following points noted :—Anthrax bacilli (morphological identification confirmed by culture) were found in the excreta from the cloaca. There was no enteritis. The spleen was enlarged. Impression preparations made from the splenic pulp were found heavily infected with anthrax bacilli. There was slight effusion of blood-stained fluid in the pericardium and small hæmorrhagic points on the surface of the heart, but no other lesions could be seen in the abdominal or thoracic viscera by naked-eye examination. In view of the fact that flesh-eating birds are liable to be infected with anthrax and may excrete the bacilli *via* the bowel, it is advisable to examine microscopically the blood of rapacious birds that may die during an outbreak of anthrax in menageries.

On Sunday, June 15th, a Crowned Hawk Eagle (*Stephanoætus coronatus*) was found dead in its cage at 2 p.m. The blood, examined immediately after death, showed a heavy infection with anthrax bacilli. Noteworthy points in this case are :—

(1) The length of the incubation period—7 to 9 days.

(2) The absence of any recognizable morbid anatomical changes internally.

(3) Excretion of anthrax bacilli in fæces.

Source of Infection.

Samples of the cow-meat obtained from the contractors that was fed to the Carnivores on Thursday, Friday, and Saturday, June 5th, 6th, and 7th, *i. e.*, three days before the first case of anthrax occurred, were retained for examination by Veterinary authorities from the Ministry of Agriculture, who, in due course, reported that *Bacillus anthracis* was isolated from one of the samples of this meat. Subsequent inquiries by the Ministry disclosed that the most likely source of infection was from a cow which died suddenly on a farm at Stapleford, Herts. The carcase of this cow was collected by the contractors and was branded as unfit for human consumption, but was sold to the Zoo as food for the Menagerie and eaten by the creatures above mentioned, with the result that eight out of sixteen animals housed in the Small Cat House died from anthrax.

The survivors that also ate the infected meat were :—A Serval, a Genet, three Red Pandas, and two Binturongs.

All the animals in the Lion House were fed with the infected meat, but only one Puma contracted anthrax. The meat was also issued to the Foxes, Hyænas, and Wolves, but none of these animals were infected. The Birds of Prey also had the meat ; but only one Golden Eagle out of three in the same cage became infected, and only one of a pair of Crowned Hawk Eagles in another cage.

No further cases have occurred. All the men employed in the distribution of the infected meat were inspected daily for a week—no human case occurred.

Diseases of the Respiratory System.

An infant male Gorilla (*Gorilla gorilla beringeri*), presented to the Society by the Belgian Government in August 1938, arrived in good condition. He remained healthy and developed normally until August 13th, 1941, when he suddenly fell sick with symptoms of acute coryza, mucous discharge from nose, short barking cough and respiratory discomfort, as indicated by shallow and rather rapid breathing, with dilation of the alæ nasi, and temperature of 102° F.

On the fifth day of illness, herpes appeared on the lower lip. By the end of the second week of illness respirations increased to 60–70 per minute. The temperature, when over 100°, was controlled by treatment with Daganan M. and B. 760, which caused a rapid fall in temperature, but failed to arrest the gradually increasing toxæmia. The animal seemed to have no resistance against the extension of the inflammatory process down the respiratory passages, and by the end of the third week of illness it was evident that the respiratory area of the lungs was gravely reduced by bronchiolitis and pulmonary consolidation. Respiratory distress increased, and cyanosis of the buccal mucosa indicated deficient aeration of the blood.

Administration of oxygen gave only temporary relief, as it was impossible to maintain the supply continuously.

Finally the animal became comatose and died on September 6th, after an illness of 24 days.

Although the patient was a perfectly docile creature in the hands of his keeper, he was suspicious of strangers and resented any attempt at clinical examination or the administration of food or medicines.

The *post-mortem* findings were as follows :—

Extreme wasting of all tissues.

Larynx acutely inflamed and shows a few small ulcers situated below the vocal cords.

Tracheal and bronchial mucosa inflamed. Respiratory passages water-logged by purulent exudate. The lungs of this specimen are abnormal in that the right lung is divided into four lobes, and the left into three lobes. They were much swollen out with œdematous exudate, the surface showed grey mottling, marginal collapse, and deep areas of consolidation. The middle lobes of both lungs were completely consolidated and contained many small alveolar abscesses. The apical and basal lobes contained hard nodules of consolidation which on section showed beads of thick pus blocking the bronchioles. There was no pleural effusion. The pericardium was distended with serous fluid and the chambers of the heart were dilated and engorged with blood clot.

The animal was a male about four years old. The bones were well formed and ossification was normal for age. The skull showed a perfect set of milk teeth. The testes were normal for age and were descended into the scrotum. Enterobius (*vermicularis* ?) were found in the large intestine.

Three Lions (*Felis leo*) died from the chronic form of putrid broncho-pneumonia associated with the formation of pulmonary abscesses and extensive gangrenous cavitation of the lungs. This condition is the commonest cause of death amongst our large Felidæ. It especially affects the old inhabitants, whose lungs have become fibrosed and discoloured with deposits of soot dust. They are then especially liable to infection with pyogenic and putrefactive organisms which destroy the pulmonary tissue. Experience shows that when one case of this disease occurs in the Lion House, other cases among the older inhabitants may shortly follow. The disease is uncommon among the small cats which, in their old age, usually die from cirrhosis of the liver or kidneys.

One old male Lion that had been in the Zoo for 12 years and 3 months was destroyed because of senile decrepitude and difficult breathing. At necropsy the lungs were found to be emphysematous and blackened with anthracotic deposit.

There was evidence of chronic catarrh of the bronchial epithelium which had disappeared from the smaller tubes.

In the basal lobes many of the bronchioles were plugged with pus and surrounded by nodules of pulmonary consolidation. Some of these nodules were broken down in the centre to form abscesses, or gangrenous cavities discharging foul pus and tissue debris into the bronchi.

In the Lioness that died of the same disease, the lobes of the lungs were extensively excavated by the coalescing of two or more gangrenous cavities.

Of 38 Birds that died from pulmonary inflammations there were 19 small granivorous species and 7 small insectivores, including 2 Humming Birds.

Of losses among larger birds the following are noted :—

Species.	Cause of Death.
Swinhoe's Pheasant (*Gennæus swinhoii*) ..... (8 years in Zoo.)	Pneumonia.
Lesson's Parrot (*Amazona lilacina*) ..... (16 years in Zoo.)	,,

Species.	Cause of Death.
Yellow Conure (*Eupsittula solstitialis*) ..... (10 years in Zoo.)	Pneumonia.
Viellot's Fire-backed Pheasant (*Lophura rufa*) ..... (An aged bird.)	Fibrosis and gangrene of lung.
A Senegal Plantain Eater (*Musophaga violacea*)	Pneumonia.

Diseases of the Digestive System.

A Pileated Gibbon (*Hylobates pileatus*) died from chronic subacute enteritis affecting the cæcum and large intestine, the mucous membrane of which showed inflammatory thickening with erosions, and, in some areas, atrophy of the epithelial lining and glands. The submucous tissues were infiltrated with inflammatory exudate and the muscular coats obscured by proliferation of fibrous tissue. All the mesenteric glands were inflamed, there was an abscess in the retroperitoneal tissue behind the liver. Dr. Annie Porter, who had this animal under observation for some weeks before death, reported heavy infestation of the bowel with the protozoal parasites *Balantidium* and *Amœbæ* and Oxyurid worms. It is probable that the heavy infestation of the bowel with these parasites was the cause of the enteritis.

A Humboldt's Woolly Monkey (*Lagothrix humboldtii*) died suddenly from hæmorrhage from the stomach, which originated from one or more deep gastric ulcers about 3 mm. in diameter, several of which were found in the mucosa around the pylorus.

A Wapiti Deer (*Cervus canadensis*), born in the Menagerie 14 years ago, was killed by order on account of progressive wasting. The animal was so weak that it seemed unable to bear the weight of its antlers, which weighed 26 lbs. 8 ozs. Finally it collapsed in its stable. Examination of the abdominal viscera revealed atrophy of the mucosa and muscularis of the small intestine from the upper end of the ileum to the ileo-cæcal junction. Extensive lengths of the small intestine were completely devoid of epithelial structures, mucosa and glands, and the walls of the gut were attenuated and diaphanous in texture. The progressive wasting and feebleness were caused by atrophy of the intestinal mucosa and muscularis, with consequent failure of food absorption. No other gross lesion was found in other abdominal organs or in the thorax.

A Two-Toed Sloth (*Cholœpus didactylus*) that had been six years and six months in the Menagerie died from intestinal obstruction due to impaction of the alimentary canal with undigested foodstuff. The food of this animal since it arrived at the Zoo mainly consisted of lettuce leaves, of which it would eat six large bunches a day. An adequate supply of lettuce was unobtainable since the autumn of last year, and it was not possible to supply it with more than two or three small bunches daily. It would not eat cabbage or turnip tops, and no other greenstuff was available. Raisins and chopped-up carrots were given to make up the lack of green food.

At necropsy the glandular compartment of this creature's complex stomach was found impacted and over-distended with undigested raisins and chewed carrot, the presence of which apparently failed to induce the normal digestive response. Below the pylorus the small intestine was empty ; but the large intestine was impacted with hard fæcal concretions containing undigested carrot and raisins. There was considerable wasting of the tissues of the body, but no gross pathological lesion could be detected.

A Patagonian Cavy (*Dolichotis magellanica*) died from gastric hæmorrhage arising from one, or more, of three deep-seated ulcers about 6 mm. in diameter and situated in the pyloric end of the stomach. The stomach and intestines were flooded with blood.

A Blackbuck (*Antilope cervicapra*) was sent to the Prosectorium as having died from a broken leg. The right thigh was much swollen and discoloured. On reflecting the skin the surface of the muscles of the inner side of the thigh was found covered with fæcal matter that had escaped through the bursting of a strangulated loop of the small intestine which had ruptured through the inguinal canal and the abdominal ring. The strangulated loop of the small bowel was gangrenous. General peritonitis was the terminal event. There was no bone fracture or other sign of injury.

Of 55 Birds that died from disorders of the alimentary canal, there were 16 small granivorous species and 10 among small insectivores, all of which were common aviary birds.

Other Avian deaths noted under this heading :—

Two Hunstein's Magnificent Birds of Paradise (*Diphyllodes magnificus*), one of which had been four years in the Zoo, died from chronic catarrhal inflammation of the intestines.

A Cock of the Rock (*Rupicola rupicola*) that had been six years in the Zoo died from chronic enteritis and secondary degenerative and inflammatory foci in the liver.

A female Resplendent Trogon (*Pharomacrus mocinno*), one of two survivors of six nestlings of this species that were imported in November 1937 and were hand-reared, died from gastro-enteritis and hepatitis.

A Great Indian Hornbill (*Dichoceros bicornis*) and a Black-thighed Hornbill (*Bycanistes cylindricus*) died from acute hæmorrhagic enteritis, with duodenal ulceration in the case of the Indian bird.

In the cases above specified it is believed that war-time restrictions of diet were a contributory cause of the fatal disease.

A White-backed Vulture (*Pseudogyps africanus*) died from hæmorrhage arising from a large ulcer of the proventriculus.

A Rheinard's Argus Pheasant (*Rheinardia ocellata*), bred in the Zoo last year, died from acute gangrenous typhlitis and peritonitis due to impaction of the right cæcum with fæcal concretion. No intestinal parasites were found.

A Crested Screamer (*Chauna cristata*) that had been over sixteen years in the Zoo died from acute necrotic inflammation of the crop and gizzard and hæmorrhagic enteritis. This bird showed senile degenerative changes in the arteries, heart, liver, and kidneys.

The following Reptiles died from intestinal disease :—

A Chinese Alligator (*Alligator sinensis*) that had been thirty-four years in the Zoo died from necrotic ulceration of the upper part of the large intestine. There was no indication of senile degeneration in any of the internal organs or structures.

A Gharial (*Gavialis gangeticus*), that had been twenty-eight years and nine months in the Zoo and was 10 feet long, died from hæmorrhage arising from a deep circular ulcer near the pyloric end of the stomach. The whole length of the intestinal canal was flooded with blood. The liver and kidneys showed signs of senile fibrosis and both ureters were obstructed by renal calculi.

Injuries and Accidents.

The following animals died from injuries as specified :—

A Barbary Ape (*Macaca sylvana*), an aged animal, recorded to have been thirty years in captivity, had been twelve years and six months in the Zoo, when it had to be destroyed because of senile decrepitude and a septic wound of the

tendon sheaths of the right hand. Necropsy revealed advanced spinal osteo-arthritis with calcification of the intervertebral discs and complete rigidity of the dorsal and lumbar regions of the spine. Bony outgrowths from the diseased vertebræ compressed the nerves of the lumbar plexus as they emerged from the spinal foramina and this caused paresis of the legs.

A Nylghaie (*Boselaphus tragocamelus*) " panicked " in its stable during a nocturnal air raid, and died from multiple contusions, myocardial hæmorrhages, and acute cardiac dilatation and hæmorrhage into the base of the right lung.

A Tigress (*Felis tigris*) that was bred in the Menagerie over three years ago, was suddenly killed by her male companion, who seized her just behind the posterior border of the scapulæ. The canine teeth of her assailant penetrated both sides of the chest and lacerated the right lung. The right side of the thorax was filled with blood and pneumothorax of the left side had caused partial collapse of the left lung. The muscles of the neck were severely lacerated and the right scapula was fractured.

A Blackbuck (*Antilope cervicapra*) that was born in the Menagerie three years ago had swallowed a pin 4 cm. in length. The pin perforated the œsophagus and entered the pericardium ; septic pericarditis followed, the pericardium became distended with purulent fluid and ruptured into the left pleural cavity, causing death from collapse of the left lung and empyema.

A Black-necked Stork (*Xenorhynchus asiaticus*), a Night Heron (*Nycticorax nycticorax*), a Tiger Bittern (*Tigrisoma lineatus*) and a Hybrid Imperial × Silver Pheasant (*Gennæus imperialis* × *G. nycthemerus*) died from injuries received in attempts to escape from their aviaries, probably when alarmed during air raids.

TUBERCULOSIS caused the deaths of 16 Mammals, 9 Birds, and 1 Reptile.

A young Male Chimpanzee (*Pan satyrus*), presented about twenty months ago, arrived in rather poor condition, and was therefore kept in the Sanatorium during the whole of its time in the Zoo. It suffered from " colds " during the winter. During the spring and early summer it became very thin and died in August. Tuberculosis was suspected, but could not be confirmed by clinical examination. It was not practicable to apply the tuberculin test to this animal.

At necropsy the left lung was found to be adherent to the chest wall and almost entirely consolidated by caseative tuberculous broncho-pneumonia. Superficial erosions and small ulcers in the lower part of the ileum marked the site of tuberculous deposits in the solitary glands and the follicles of Peyer's patches.

Miliary tubercles were freely scattered over the peritoneum and the mesenteric glands were enlarged and caseous. The spleen was much enlarged and stuffed with innumerable tubercles, many of which were caseous or purulent.

The Ape was probably infected with tuberculosis on arrival.

Another male Chimpanzee, presented two years ago, was an ill-conditioned youngster on arrival and was kept under treatment in the Sanatorium until the spring of this year, when it was lent to the Maidstone Zoo in the hope that it would benefit by open-air conditions in the country.

The ape was returned to London in September, still in poor condition, and died in the Sanatorium from tuberculosis affecting the lungs, liver, spleen, pancreas, mesenteric glands, and small intestine. The left lung was almost entirely destroyed by tuberculous broncho-pneumonia ; in both lobes there were cavities containing pus and surrounded by gangrenous pulmonary tissue. Miliary tubercles were thinly scattered throughout the tissues of the right lung. There were numerous tuberculous ulcers scattered throughout the whole length of the small intestine.

A Brown Capuchin Monkey (*Cebus fatuellus*), presented five months ago

in poor condition, died in the Tortoise House from generalized tuberculosis. A large pulmonary abscess had burst into the right pleural cavity which was distended with pus swarming with tubercle bacilli. This monkey was tested for tuberculosis by the intrapalpabral tuberculin test with Koch old tuberculin (Bayer Product) on December 27th. A positive reaction was recognized on the following day and was most pronounced 48 hours after inoculation. The animal died on December 31st.

A Great Indian Rhinoceros (*Rhinoceros unicornis*) that had been seventeen years in the Zoo was said to have been in good health until a week before its death, when its breathing became wheezy and laboured.

On the morning of its death the mucous membrane of its mouth became cyanosed, and it appeared to be very ill.

At necropsy no pleural effusion or adhesions were found. The lungs were œdematous with marginal emphysema ; in the basal lobes there were extensive areas of dense broncho-pneumonic consolidation. Small tubercles surrounded by isolated nodules of consolidation were thinly scattered throughout both lungs, which were intersected in all directions by coarse strands of fibrous tissue enclosing many necrotic areas and cavities filled with fœtid muco-pus in which tubercle bacilli were found. The disease in this case was essentially chronic and had probably existed for many years, to end in the reticular form of tuberculous pulmonary cirrhosis. The tracheal and bronchial lymph glands were greatly enlarged and contained fibrosed tubercles swarming with tubercle bacilli. The disease was confined to the lungs and pulmonary lymph glands and showed none of the characteristics of the usual bovine type of tuberculosis. There was no caseation or purulent breaking down of affected glands and none of the " pearly " tubercles, that are characteristic of the bovine variety of this disease, were found in the serous membranes. No tuberculous lesions could be found in any other part of the body.

A Watussi Ox (*Bos taurus gar*), male, was killed by order on account of progressive wasting. The animal was so emaciated as to be unfit for exhibition. Small tuberculous foci, about the size of peas, were thinly scattered throughout both lungs. Some of these foci were purulent and contained large numbers of tubercle bacilli. In the mesentery there were great masses of agglomerated tuberculous glands that had formed hard round tumours like Dutch cheeses. The disease was of long standing, and probably the recent active foci in the lungs accounted for the rapid wasting during the last three months.

Both testicles had been sterilised by operation of ligature of spermatic cord and vessels. Many liver flukes were found in the hepatic ducts.

A White-tailed Gnu (*Connochætus gnou*) that had been in the Zoo for five years died from miliary tuberculosis.

Both lungs were stuffed with miliary tubercles, and the left lung was firmly adherent to the chest-wall and the diaphragm. In this case there was extensive tuberculous ulceration of the inner aspect of the larynx, but the vocal cords were not affected. Tuberculous laryngitis is commonly found in cases of human tuberculosis, but is rarely found in the lower animals affected with this disease.

A Blesbok (*Damaliscus albifrons*), born in the Menagerie in July 1938, was said to have injured its left elbow-joint and was lame for about a month before it died from pulmonary tuberculosis.

At necropsy no injury of the left elbow was found, but the joint was disorganised by tuberculous arthritis. The joint cavity was distended with pus and nodular tubercles were attached to the swollen and inflamed synovial membrane. The articular surfaces of the bones were destroyed by ulceration

and there was diffuse inflammatory thickening of the surrounding ligaments and soft tissues. Tubercle bacilli were found in great numbers in the pus from the joint and from the deposits in the synovial fringes.

The lungs were extensively consolidated and stuffed with caseating tubercles. Tubercles were also found in the liver, spleen, and peritoneum, and there was tuberculous peritonitis.

A White-nosed Coati (*Nasua narica*) died from tuberculosis affecting the lungs and spine. Numerous tubercles, about the size of peas, were scattered throughout both lungs. The lumbar vertebræ were eroded by tuberculous disease, and an extensive psoas abscess had formed in the psoas muscles and spread down the fascial planes into the muscles of both thighs. There was destructive tuberculous arthritis affecting the left sacro-iliac joint and both knee and shoulder joints. The joints were distended with pus containing swarms of tubercle bacilli.

A Harpy Eagle (*Harpia harpyja*) that had been three years in the Zoo died from multiple caseating tubercles in the thoracic and abdominal air-sacs and lungs. The spleen and liver were enlarged and stuffed with caseating tubercles. The blood of this bird showed a very heavy infection of large, sheathed, microfilaria. The adult worm was not found.

Mycosis.—Six birds died from mycotic growths in the thoracic and abdominal air-sacs.

Diseases of the Blood and Circulatory System caused the deaths of 2 Mammals, 23 Birds, and 1 Reptile.

A female Tiger (*Felis tigris*) that had been seven years in the Zoo suffered from loss of appetite and progressive wasting for twenty-six days before death. No clinical examination was possible.

At necropsy the pericardium was found distended with blood-stained purulent fluid and the opposing surfaces of the membrane were covered with a thick layer of fibrinous inflammatory exudate. The right ventricle of the heart was dilated and affected with mural endocarditis, with fibrinous vegetations attached to the papillary muscles. Some of these vegetations had become detached to form circular nodules, the size of peas, that lay free in the ventricular cavity—and appeared to be too large to pass through the valves of the pulmonary artery. Both lungs were collapsed by the pressure of a terminal pleural effusion.

A male Emperor of Germany's Bird of Paradise (*Paradisea gulielmi*) that had been over eight years in the Zoo had just completed its eighth moult when it succumbed to old age, as indicated internally by fibrotic and parenchymatous degeneration in the tissues of the glandular organs, particularly the liver and kidneys, associated with fibro-fatty degeneration of the heart-muscle and widespread arterio-sclerosis.

A male Empress Augusta Victoria's Bird of Paradise (*Paradisea augustæ-victoriæ*) that had been over eight years in the Zoo died shortly after completing its eighth moult in the Zoo. This bird showed external signs of old age and was very emaciated.

At necropsy the only pathological condition found was myocardial degeneration.

Both these Birds of Paradise were in full nuptial plumage on arrival, and it is estimated therefore that they were not less than twelve years old at death.

A Wallace's Bird of Paradise (*Semioptera wallacei*) that had been ten years and six months in the Zoo, died from lymphatic leukæmia associated with senile degenerative changes in the glandular organs, particularly the liver and pancreas.

A Lesser Bird of Paradise (*Paradisea minor*) died from myocarditis and pericarditis after three years in the Zoo.

A Shoebill (*Balæniceps rex*) that had been six and a half years in the Gardens was killed by order as it was unable to stand or move its legs. Both tarsal and meta-tarso-phalangeal joints were swollen. The scaly skin around these joints was partly detached and the underlying soft tissues were in a condition of wet gangrene, and dry gangrene had devitalised the shank (tarsus) of the left leg. The heart was enlarged and the right ventricle dilated. The aorta, the right and left innominate arteries, the carotid, brachial, and pectoral arteries were choked by atheromatous deposits, which obstructed the flow of blood and caused the gangrenous condition of the legs.

A Fawn-breasted Bower Bird (*Chlamydera cerviventris*), also an old bird, died from a myelogenous type of leuæmia associated with great enlargement of the spleen and liver.

A Crowned Pigeon (*Goura cristata*), that had been in the Zoo thirteen and a half years died from extensive atheromatous deposits in the arterial system, particularly in the renal arteries, which appeared to be blocked by the deposits.

A Rhinoceros Hornbill (*Buceros rhinoceros*), that was mature on arrival in the Zoo eleven years ago died from senile fibro fatty degeneration of the myocardium.

Two Bateleur Eagles (*Terathopius ecaudatus*) that had been twenty and twelve years respectively in the Zoo died from atheroma of the arteries and myocardial degeneration.

Diseases of the Urinary System caused the deaths of eight Mammals and thirty-six Birds.

A Toque Monkey (*Macaca sinica*), had been suffering for many months from gangrene of the tail following frost-bite. The final cause of death, however, was amyloid degeneration of the kidneys, associated with nephritis and septicæmia supervening on gangrene of the tail. As amyloid disease in so pronounced a degree is uncommon in captive wild animals the case is noted as follows :—

Both kidneys were much enlarged, the colour of putty, firm and rigid in consistence, with a waxy glistening appearance on section. Histological preparations stained with a solution of iodine and treated with acetic acid, showed the diagnostic staining reaction of amyloid substance which was widely distributed throughout the three zones of the kidney causing great distortion of the renal architecture. No gross amyloid infiltration was found elsewhere.

A Guinea Baboon (*Papio papio*) that had been six and a half years in the Zoo died in labour. The Baboon had been in labour for two days. The uterus contained a full-time fœtus in normal presentation. The os-uteri was dilated and the head of the fœtus was applied to it. The membranes were intact and the placenta in a normal position. There had been no hæmorrhage, but there was nephritic anæmia and œdema of all tissues including the lungs. The kidneys were enlarged, dirty greyish in colour, and extensively damaged by chronic parenchymatous nephritis. Examination of the stained blood revealed a high degree of anæmia with diminution in the number of red cells and hæmoglobin content.

A Grey Lemur (*Hapalemur griseus*), an old excessively fat animal that had been six years in the Zoo, died from chronic interstitial nephritis. Both kidneys were distorted by multiple cystic dilatation of the urinary tubules which were obstructed by overgrowth of interstitial tissue.

A Dorsal Squirrel (*Sciurus hypopyrrhus*) that had been in the Zoo for over

eleven years, died from chronic interstitial nephritis with extensive cystic distention of the tubules.

The following Birds died from disorders of the urinary system as specified :—

A male Resplendent Trogan (*Pharomacrus mocinno*) was the last survivor of six nestlings of this species brought to the Zoo in November 1937. They were hand-fed, and three of them were reared to maturity. The specimen now noted was the only male to develop its full adult plumage and resplendent colours. It lived in the Small Bird House for three years and seven months. Since the beginning of last winter it had not been possible to obtain its normal diet, and consequently the bird gradually lost condition and died on June 3rd in a very emaciated and dilapidated condition. At necropsy chronic parenchymatous nephritis and chronic subacute inflammation of the intestines were found to have caused death.

A female King Penguin (*Aptenodytes patagonica*) that had been five and a half years in the Zoo died from chronic interstitial nephritis associated with extensive degeneration and necrosis of the renal epithelium. A thick film of urate deposit was precipitated on the serous lining of the pericardium, which showed considerable inflammatory thickening. This bird apparently died in uræmic " fits " ?

A Stanley Crane (*Tetrapteryx paradisea*) that had been eleven and a half years in the Zoo died from chronic interstitial nephritis. The kidneys were large, tough, fibrotic, and dotted all over with white deposits of solid urates which obstructed the urinary tubules.

Other notable losses recorded under this heading include :—

A Sickle-bill Bird of Paradise (*Epimachus m. meyeri*), a Helena's Six Plumed Bird of Paradise (*Parotia helena*), and a Greater-crested Gardener Bower Bird (*Amblyornis inornatus*).

Diseases of the Generative System caused the deaths of two Mammals, three Birds, and one Reptile.

A female Leopard (*Felis pardus*) that had been ten and a half years in the Zoo died from peritonitis ensuing on ectopic gestation. On opening the body the peritoneal cavity was found distended with blood-stained purulent fluid. A movable fleshy body, the size of a golf-ball, was found lying in the body cavity alongside the fimbriated extremity of the left fallopian tube, the abdominal ostium of which was widely open. The tube and adjoining cornu of the uterus were enlarged and congested as compared with these organs on the opposite side, but there was no product of conception within any part of the uterus. Subsequent examination of the fleshy body revealed the presence of chorionic villi, so there can be no doubt it was a tubal mole, and evidence of an ectopic pregnancy that had occurred in the fallopian tube. Development of the fœtus failed, and the embryo, represented by a formless mass of fleshy tissue, had been expelled into the body cavity via the dilated abdominal ostium of the oviduct. The leopard had lived with a male companion during the last five months.

The following Birds died from inflammatory conditions of the genital tract and peritoneum, arising from retention and necrosis of products of conception :—

A Stanley Crane (*Tetrapteryx paradisea*) that had been eleven years in the Zoo died from rupture of a soft-shelled egg in the vaginal segment of the oviduct. Some of the egg contents had escaped into the peritoneum, but

most of the yolk had necrosed in the oviduct. Salpingitis and peritonitis were terminal events.

Diseases of the Nervous System.

A female Chimpanzee (*Pan satyrus*), "Jubilee," the first chimpanzee to be born in the Zoological Gardens (on February 15th, 1935), died on February 5th, 1941 from cerebral abscess.

Previous illnesses.

January 1938.—Pneumonia left lung, mild, duration one week, no complications.

March 1940.—Coryza, mild attack, duration four days.

Last illness.—Commenced January 21st, 1941, was obviously ailing; vomited after food, had slight cough. Next day the right side of the neck appeared to be swollen and there was left-sided facial palsy, as shown by drooping of the left corner of the mouth and lower lip. She remained in this condition until January 31st, when she became mentally apathetic and ceased to take any food or drink, but could still climb up the wire of her cage. Next day she fell into a semi-comatose condition, and on February 4th she collapsed in deep coma with the muscles of the neck and back rigidly contracted and the body in the position of opisthotonus; she died in a few hours without recovering consciousness.

At necropsy immediately after death, the brain was removed forthwith, as a lesion in this organ was suspected. The meninges appeared to be normal. An abscess half an inch in diameter was found deep in the right frontal lobe of the cerebrum, another abscess about the same size was situated in the right temporo-sphenoidal lobe; this abscess had burst into the posterior cornu of the lateral ventricle of the brain.

Cerebral abscess is nearly always secondary to some primary septic focus in the bony cavities of the skull or elsewhere. In this case the primary lesion was found to be a retro-pharyngeal abscess situated in the fascial planes between the muscles of the pharynx. There was necrosis of the numerous lymphatic glands and lymphoid tissue normally found in this region in young human and anthropoid children. The blood-vessels surrounding these deep pharyngeal glands are in direct connection with the interior of the cranium and presumably facilitate the access of pyogenic organisms to the brain, especially after such infections as mumps and acute inflammatory conditions of the nasopharynx.

Mr. McDonagh, F.R.C.S., kindly undertook bacteriological investigation of the pus from the cerebral abscess and isolated from it pneumococcus Type I. Smear preparations from both cerebral and pharyngeal abscesses showed numerous diplococci having the morphological appearance and staining reactions of the pneumococcus. No other pathological lesions and no parasites were found elsewhere in the body. The teeth and all the bones were well developed and normal in every respect and are preserved in the Museum of the Royal College of Surgeons. The healthy condition and normal development of the skeleton and soft tissues is attributable to the judicious dieting and cautious administration of vitamins under the direction of Dr. Vevers.

A Stair's Monkey (*Cercopithecus albogularis stairsi*), a well-nourished male monkey, mature on arrival in the Zoo five and a half years ago, was admitted to the Sanatorium on October 4, 1940, because of weakness of the hind legs. It was found to be suffering from spastic paraplegia and ataxia of the hind limbs

and volitional tremor of both hands. It was unable to climb up to its perch in the cage, but could walk with a wobbling gait and stiffness of the hind legs. No record of any previous illness.

Blood Examination.—R.B.C. 6,743,000, normal in size, shape and staining reaction, W.B.C. 22,000 per cm., excess mainly lymphocytes.

On October 20th the animal appeared to be losing condition, and the nervous symptoms getting rapidly worse.

Treatment by intramuscular injections of :—

2 c.c. of Campolon, October 29th.
2 c.c. of Campolon, November 5th.
2 c.c. of Campolon, November 12th.
2 c.c. of Campolon, December 10th.
2 c.c. of Campolon, December 17th. No response to treatment.
2 c.c. of Campolon, January 2nd, 1941. Worse ; complete flaccid paralysis of hind legs and tail.
2 c.c. of Campolon, January 9th. Now immobilised.
2 c.c. of Campolon, January 20th. Incontinence of urine and fæces, diarrhœa, emaciated, cannot keep clean.

January 25th, 1941. Destroyed by euthanasia as incurable.

Body injected immediately after death with 10 per cent. formalin by the gravitation method, tissues thus fixed *in situ*.

Necropsy.—Subcutaneous tissues and muscles wasted.

No abnormality found in thoracic viscera, abdominal viscera show moderate enlargement of lymph glands. The spleen also is large, but this is probably due to the injection.

There is catarrhal inflammation of the intestines as a terminal event.

Brain and Spinal Cord.—Show no macroscopic lesions.

Preparations made for study of pathologic histology.

In the cerebrum minute inflammatory foci were observed in the ventricular cortex of the optic thalamus, and there was one small inflammatory focus in the brain stem. No lesions seen in sections of other parts of the cerebrum, mesencephalon, or cerebellum.

Frozen sections of the spinal cord stained by Scharlach R dye showed fatty degeneration of the myelin as follows :—

Cervical region.—In the posterior columns only.

Dorsal region.—Extensive fatty degeneration of white matter all round the cord.

Lumbar region.—Very little degeneration.

Masson and hæmatoxylin stained preparations showed degeneration of motor nuclei in the anterior horns of the grey matter of the cervical, dorsal, and lumbar regions ; and demyelinisation of the white matter was most pronounced in the posterior, lateral, and ventral columns of the cord.

The demyelinisation and degeneration were confirmed in sections stained by the Weigert Pal and Marchi methods.

The sections of the cord are characterized by the presence of histiocytes and their modifications known as " compound granular corpuscles " in the demyelinated areas and amongst the degenerate large multipolar cells of the grey matter. The pathologic histology indicates that a terminal inflammatory reaction—cerebro-spinal lepto-meningitis—affecting the cord and cerebral ventricles and lymphatic leukæmia were associated with the demyelinating disease of the cord in this case ; eleven of these have now been described in these reports and are summarized in an Hunterian lecture published in ' Brain,' vol. 65, part 2, p. 193, 1942.

A Black Wallaby (*Macropus ualabatus*), born in the Zoo eight years ago, died from abscess of the brain.

On separating the head from the spinal column, pus was issuing from the foramen magnum. Further examination revealed an abscess in the left posterior fossa of the skull.

The abscess appeared to be a secondary infection from a chronic inflammation of the left auditory sinuses.

Diseases of the Liver and Gall Bladder caused the deaths of four Mammals, seven Birds, and one Reptile.

An Arabian Camel (*Camelus dromedarius*), presented to the Zoo by H. M. King Ibn Saudi of Arabia in December 1937, when it was stated to have been about thirteen years old, died from senile cirrhosis of the liver and kidneys and generalized dropsy as the terminal event.

At necropsy the peritoneal cavity and the pericardium were found greatly distended with clear serous fluid; the lungs were œdematous, and all the tissues waterlogged owing to obstruction of the circulation by sclerosis of the arterial system, cirrhosis of the kidneys, disorganization of the liver by advanced multilobular cirrhosis, and consequent cardiac hypertrophy and dilatation.

A Red Wallaroo (*Macropus robustus rubens*) that was born in the Zoo eight years ago had been "off its food," weak and apathetic for several weeks before death. At necropsy the liver was found to be pale yellow in colour, soft and friable, and about half its normal size. There were extensive areas of necrosis in which the liver tissue had lost all structure or consistency. Degeneration of the hepatic epithelium appeared to be general throughout the whole organ. The gall bladder contained only thin colourless watery fluid. The bile ducts showed no sign of inflammation, cirrhosis, or obstruction. Apparently death in this case was due to hepatic failure resulting from degeneration and necrosis of the hepatic epithelium. It was a curious condition of unknown origin, though familiar in the human subject in cases of yellow fever, certain acute bacterial infections, and poisoning by phosphorus, chloroform, and tri-nitro-toluene.

Neoplastic Disease caused the deaths of two Mammals and two Birds.

A female Leopard (*Felis pardus*) that had been in the Zoo for nearly eight years had suffered for over a year from recurrent tumours of the skin of the left flank, some of which broke down to form superficial abscesses. In May this year the skin over one of the tumours broke, and a large fungating ulcer developed. Treatment was impossible and the animal had to be destroyed.

At necropsy a hard fibrous tumour 2½ inches in diameter was found underlying the ulcerated surface. Smaller fibrous nodules were found in the surrounding skin, and a fibrous nodule resembling the cutaneous tumours was found in the right lung. The appearance of these tumours was suggestive of glanders, but there was no bacteriological evidence of *B. mallei* infection. On histological examination of the tumours they were diagnosed as simple fibromata.

A Guenther's Vole (*Microtus guentheri*) died from pressure effects of a tumour of the left eye-ball. The structures of the eye were entirely destroyed by the growth and difficult to recognize even by microscopic examination. The tumour was soft and vascular and had the histological characters of a spindle-celled sarcoma apparently arising from the choroid and containing portions of the retinal pigment cells; it was not, however, a true melanoma, and careful search through the tissues of the body failed to reveal any metastases.

A melanotic sarcoma in a Horse (*Equus callabus*) slaughtered for feeding the carnivores was detected in a sample of meat sent to the Prosectorium for inspection. These tumours are among the most malignant of all known forms of cancer affecting man and animals. They always arise from pigmented tissues, the retina or pigmented warts in man ; and in horses from warty growths of the black skin of the perineum.

The carcase of the horse was examined and secondary growths were disseminated through all tissues, including the bones. In such cases there is no reason to reject the carcase as unfit for feeding to the carnivores.

A Chilean Eagle (*Geranoætus melanoleucus*) that had been twenty-seven years in the Zoo died from the pressure effects of a relatively large tumour (2 by 1½ inches in size) that was found attached to the great vessels near the base of the heart. On microscopical examination the tumour was found to be a cystic fibroadenoma of the thyroid, a common tumour in mammals, but rare in birds.

A Red-fronted Parrot (*Chalcopsitta scintillata*) died from intestinal obstruction due to three papillomatous growths of the mucosa, each of which was about the size of a peppercorn. They were situated close together in the same segment of the bowel, the lumen of which was completely obstructed.

Diseases of the Pancreas.

A Stanley Crane (*Tetrapteryx paradisea*) died from inflammation of the bile and pancreatic ducts and abscess of the pancreas. The bile and pancreatic ducts were obstructed by inflammatory thickening, and by sloughs of mucous membranes. The gall bladder was distended with purulent fluid. There was an abscess in the head of the pancreas, and several ulcers of the duodenum were situated around the ampula of vater. Terminal event—peritonitis.

Diseases due to Disorders of Nutrition and Metabolism caused the deaths of five Mammals and two Birds.

A Siamang Gibbon (*Symphalangus syndactylus*) arrived in the Zoo two and a half years ago as a child ape and was able to feed itself. It was given a liberal diet, including milk and green vegetables, carrots, and Haverol-oil when obtainable, and appeared to thrive. After the outbreak of war its diet was restricted and it lived through the severe winters of 1940 and 1941 in a house much damaged by enemy action. It lost condition and became thin and weak and died of terminal broncho-pneumonia during the very cold weather of January 1941. The skeleton showed extreme rickety distortion and generalized osteomalacia. The sternum and ribs were inbent and beaded by acute epiphysitis. The long bones of the limbs were soft and distorted by curvature and enlargement of the carpal and tarsal epiphyses.

A Black-faced Spider Monkey (*Ateles ater*) that had been three years in the Zoo, died from terminal broncho-pneumonia following advanced rickets and osteomalacia. The long bones in this case were fantastically distorted and so soft that they were easily cut with a knife.

Deaths due to Animal Parasites.

A Brown Lemur (*Lemur fulvus*), born in the Menagerie three and three-quarter years ago, died from verminous pneumonia. Both lungs were firmly adherent to the chest-wall and distorted by emphysematous bullæ and marginal collapse. There were numerous Linguatulid larvæ beneath the parietal pleuræ and scattered throughout the interior substance of the lungs, which were

acutely inflamed and œdematous. None of the parasites were found elsewhere in the body.

It is probable that this Lemur became infected by eggs passed by a "contact" animal, viz.: Dog, Civet, or Cat that had occupied the Lemur's den some time during the last three years.

A Greater Flamingo (*Phœnicopterus antiquorum*) that had been six and a half years in the Zoo died from impaction of the small intestine with a tangled mass of cestode worms.

The impacted section of the bowel had become twisted on its mesenteric attachment with resulting strangulation of blood supply and gangrene of the affected parts.

Blood Parasites.

Dr. C. M. Wenyon, F.R.S., Director-in-Chief of the Wellcome Bureau of Scientific Research, has kindly continued to undertake the examination of 238 blood-films taken from dead animals during the year; infections of the blood with protozoal parasites were found in 28 cases, or 11·7 per cent. A list of blood parasites identified by Dr. Wenyon is given below.

Single Infections.

Parasite.	Host.
Hæmogregarine	*Python amethystinus.*
Hæmoproteus	*Estrilda melpoda, Temenuchus pagodarum.*
Plasmodium	*Carduelis carduelis, Chloropsis aurifrons, Cyanops asiatica, Emberiza melanocephala, Myristicivora bicolor, Plesiositagra cucullata, Psilopogon pyrolophus.*
Leucocytozoon	*Balæniceps rex, Epimachus M. meyeri.*
Microfilaria	*Diphyllodes magnificus, Plesiositagra cucullata, Rhamphocœlus brasilius, Turacus persa buffoni, Urocissa melanocephala occipitalis.*
Trypanosoma	*Diphyllodes magnificus hunsteini.*

Double Infections.

Leucocytozoon and Microfilaria	*Urocissa flavirostris.*
Plasmodium and Microfilaria	*Harpia harpyja.*
Plasmodium and Trypanosoma	*Paradisea minor.*

The Royal College of Surgeons has subsidized the Zoological Society for the supply of selected anatomical material to replace specimens of the Hunterian Collection that were destroyed by enemy action. Many specimens have been preserved and are stored in the Prosectorium pending the reconstruction of the Hunterian Museum at the Royal College of Surgeons. Anatomical material has been supplied to:—

The Royal College of Surgeons.
Dr. E. C. Amoroso, Royal Veterinary College.
Prof. Wood Jones, F.R.S., Manchester University.
Prof. Gray, F.R.S., Cambridge University.
Surgeon Rear-Admiral Gordon-Taylor, M.B., F.R.C.S., F.R.S.
Dr. Haines, St. Thomas's Hospital.
Mr. Brierly, Bristol Medical School.

In conclusion, I wish to express grateful acknowledgements for the advice and help I have received during the year from Pathologists attached to the following institutions :—

Wellcome Bureau of Scientific Research.
Mr. Barrington, University College Hospital.
Mr. McDonagh, the Nature of Disease Institute.
National Hospital for Paralysis, Queens Square, W.C.

Dr. Annie Porter, D.Sc. Lond., F.R.S.(S.Af.), the distinguished Parasitologist, has again rendered valuable honorary service to the Society by her identification of parasitic infections amongst the living animals in the Menagerie and the dead specimens examined in the Prosectorium. Her report is appended.

REPORT OF THE HONORARY PARASITOLOGIST FOR 1941.

By Annie Porter, D.Sc. Lond., F.R.S.(S.Af.).

During 1941 36 samples of fæces from animals were examined for animal parasites. The specimens were distributed as follows :—

Primates	28	specimens	from	6	hosts.
Carnivora	4	,,	,,	4	,,
Ungulata	1	,,	,,	1	,,
Rodentia	1	,,	,,	1	,,
Marsupialia	1	,,	,,	1	,,
Aves	1	,,	,,	1	,,

Of the Primates, six were from baby gorilla, Meng, five from baby chimpanzee, Jacqueline, and 14 from baby chimpanzee, Noel. One of the Carnivora was a husky dog, born in the Menagerie, which had been sold. It is of interest that, in addition to the intestinal Protozoon, *Isospora bigemina*, fragments of quartz and broken glass were present, probably having been ingested with meat from bombed animals. Multiple infestations with animal parasites were common. The term parasite is used in a wide, general sense.

The animal parasites and their hosts were :—

Protozoa	*Entamœba-histolytica* type	*Gorilla gorilla beringeri, Cercocebus fuliginosus, Acinonyx jubata.*
	Entamœba-coli type	2 *Pan satyrus.*
	Dientamœba sp.	*Gorilla gorilla beringeri.*
	Giardia sp.	*Acinonyx jubata.*
	Trichomonas sp.	*Cercocebus fuliginosus.*
	Isospora bigemina	*Canis familiaris.*
	Eimeria caviæ	*Cavia porcellus.*
Cestoda	*Davainea* sp.	*Rhea rothschildii.*
Trematoda	*Paragonimus ova* (?)	*Felis leo.*
Nematoda	*Toxascaris* sp.	2 *Felis leo, Acinonyx jubata.*
	Enterobius sp.	2 *Pan Satyrus, Gorilla gorilla beringeri.*
	Œsophagostomum sp.	*Cercocebus fuliginosus.*
	Ancylostoma sp.	*Felis leo, Acinonyx jubata.*
	Strongyle ova and larvæ	*Acinonyx jubata.*

Two animals, the Okapi and a Red Kangaroo, were suspected of helminthic infection and examined in detail, but neither ova nor adult worms were found. Epithelial shreds in numbers gave clue to constipation being the cause of the

trouble in each case, and appropriate treatment prescribed by Dr. Vevers and Col. Hamerton led to rapid and complete recoveries. The baby chimpanzee, Jacqueline, born in the Menagerie in 1937 and reared artificially by Keepers F. Shelley and A. S. Budd, has remained free from animal parasites throughout the year, though she was in the same house and the boon companion of the baby gorilla, Meng, which was parasitised by *Enterobius*. This he had certainly contracted from his former companion, baby gorilla Moko, on which a report was presented last year. Jacqueline has been extremely healthy, though she has lived with the two parasitised gorillas. She now has as companions two Sooty Mangabeys, *Cercocebus fuliginosus*, one of which has had a multiple infection of Protozoa and Helminthes, and checks have been instituted against her acquiring infection. So far, no attempt at coprophagy of mangabey fæces has been observed. Fourteen examinations of the baby chimpanzee, Noel, born in the Menagerie on December 25th, 1937, have been made. Reared by her elderly mother, she has always been a weakling and small compared with the " bottle baby " Jacqueline. During 1941 an originally heavy infection with *Enterobius* has been reduced and kept to a minimum by doses of phenothiazole after examination of fæces, but complete elimination of the worms has not been possible.

The parasitological history of baby gorilla Meng is of interest :—

Mountain Gorilla " Meng."

" Meng," a baby Mountain Gorilla from Kivu District, Belgian Congo, was presented to the Menagerie and became an inmate of the Experimental House on August 10th, 1938. On arrival Dr. Vevers found him to be infested with *Strongyloides* larvæ, but under dietetic treatment these were eliminated, and in February 1939 I could find none in the fæces. The interval between the examinations had allowed of the maturation of extremely few *Ascaris*, which also disappeared by September 1939. In 1940 six fæcal examinations were made, no helminthes being detected. In April 1940 he had an attack of diarrhœa, due to surreptitiously drinking a little water containing disinfectant, but the trouble was very transitory and, apart from encysted *Entamœbæ*, no animal parasites were detected. For some time " Meng " lived with the baby Gorilla " Moko," but after the death of the latter a check-up showed no parasites. He was extremely active, full of play, and a great attraction to the public. But latent infection was present, for on May 21st, 1941, fairly numerous cysts of the *Entamœba histolytica* type and some *Enterobius* ova were detected microscopically, and gravid *Enterobius* obtained on washing a sample of fæces. Dr. Vevers prescribed phenothiazole and the *Enterobius* was held in control until August, when Keeper A. S. Budd noticed scratching and gave me a sample of fæces. Though small, this sample contained 12 gravid, 1 immature female and 4 male *Enterobius*. After further phenothiazole, scratching ceased and he regained his usual activity. Unfortunately, early in September he developed constipation and pneumonic symptoms. On September 4th, after Col. Hamerton had prescribed calomel and Mr. Budd had coaxed the sick animal to take it, the much-needed bowel relief was obtained, and 42 *Enterobius* were found on washing a small sample. M. & B. sulphanilamide was given for the pneumonic condition after consultation between Col. Hamerton and Drs. Vevers and MacDonagh. The little fellow tried to co-operate, but became steadily weaker and died on September 6th from broncho-pneumonia. Examination of a small portion of intestinal contents disclosed adult female *Enterobius*, so that the infection, contracted from " Moko," had persisted to the time of death.