Syllabus

VETERINARY PATHOLOGY DEPARTMENT
ARMED FORCES INSTITUTE OF PATHOLOGY

Wednesday Slide Conference

1985–1986

ARMED FORCES INSTITUTE OF PATHOLOGY

Washington, D.C. 20306-6000

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Syllabus

VETERINARY PATHOLOGY DEPARTMENT, AFIP
WEDNESDAY SLIDE CONFERENCE
1985-1986

100 microslides

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MOD186

PREFACE

The Department of Veterinary Pathology, Armed Forces Institute of Pathology, has conducted the annual Wednesday Slide Conference for more than two decades. The cases presented each Wednesday throughout the academic year are also distributed to over 100 active participants, including military and civilian veterinary pathologists throughout the United States and Canada, as well as several foreign countries. The list of active contributors continues to grow. The diagnosis, comments, and a synopsis of the discussion for each case is forwarded to participants weekly.

This study set has been assembled in an effort to make the material presented at our weekly conferences available to a wider range of interested pathologists and other scientists. Discussion and comments are abbreviated in this syllabus for succinctness.

A selection of 94 cases, with 100 microslides has been made from the 120 cases studied during the 1985-1986 conferences.

We wish to thank each contributor for his or her participation and for the permission to use cases in this study set.

LIST OF SLIDES

Slide Number	Animal	Tissue	Diagnosis
1	Pigeon	Thyroid	Hyperplasia due to dietary iodine deficiency
2	Francolin	Liver	Histomonas meleagridis
3	Tapir	Lymph node	Coccidioides immitis
4	Dog	Kidney	Diabetic nephropathy
5	Cat	Liver	Salmonella typhimurium
6	Parakeet	Skin Kidney	Papovavirus
7	Dog	Liver	Infectious canine hepatitis
8	Pigeon	Liver	Cholangiocarcinoma
9	Monkey	Colon	Schistosoma mansoni
10	Pig	Liver	Toxoplasma gondii
11	Cow	Liver	Aflatoxicosis
12	Cow	Kidney	Vicia villosa toxicity
13	Dog	Lung	Blastomyces dermatitidis
14	Sheep	Liver	Phomopsis toxicosis ("lupinosis")
15	Horse	Spinal cord	Protozoal myelitis
16	Horse	Spinal cord	Cervical vertebral stenotic myelopathy
17	Cow	Brain	Medulloblastoma

Slide Number	Animal	Tissue	Diagnosis
18	Mouse	Liver Spleen	Mouse hepatitis virus
19,20	Rat	Lung	*Pneumocystis carinii*
21	Cow	Lung	*Salmonella dublin*
22	Sheep	Lung	Ovine progressive pneumonia
23	Horse	Lung	Exogenous lipid pneumonia
24	Dog	Lung	Canine infectious tracheo-bronchitis
25,26	Monkeys	Liver	*Mycobacterium tuberculosis*
27	Monkey	Colon	Endometriosis
28	Snake	Liver, skin, abdominal nodule	*Mycobacterium sp.*
29	Sheep	Lung	*Yersinia pseudotuberculosis*
30	Dog	Thymus	Thymoma
31	Fish	Gill	Cyanide toxicosis
32	Sheep	Brain	*Coenurus cerebralis*
33	Guinea pig	Lung	*Bordetella bronchiseptica*
34	Rat	Eye	Sialodacryoadenitis virus

Slide Number	Animal	Tissue	Diagnosis
35	Rat	Liver Spleen	Mononuclear cell leukemia
36	Chicken	Heart	Ionophore toxicity
37	Chicken	Skeletal muscle	Ionophore toxicity
38	Cat	Kidney Lung	Eosinophilic leukemia
39	Chicken	Skin	Marek's disease
40	Cat	Lung Lymph node	Feline coronavirus (FIP)
41	Mouse	Ovary	Teratoma
42	Monkey	Skeletal muscle	Coenurus (*Taenia serialis*)
43	Monkey	Oral cavity Lymph node	Squamous cell carcinoma
44	Rat	Lung	Squamous cell carcinoma, adeno-carcinoma, adenoma, and type II cell hyperplasia
45	Rat	Kidney	Malignant liponatous tumor

Slide Number	Animal	Tissue	Diagnosis
46	Rat	Nasal cavity	*Aspergillus* sp.
47	Rat	Small intestine	Rotavirus, atypical
48	Pig	Lung Liver Kidney	*Crotalaria spectabilis*
49	Sheep	Placenta	*Chlamydia psittaci*
50	Sheep	Placenta	*Toxoplasma gondii*
51	Ferret	Spleen	Aplasia secondary to prolonged estrus
52	Dog	Heart	Canine parvovirus
53	Dog	Ileum Cecum	Carcinoid
54	Monkey	Small intestine	*Mycobacterium paratuberculosis*
55	Monkey	Small intestine	Fibromatosis
56	Llama	Lymph node	*Bacillus anthracis*

Slide Number	Animal	Tissue	Diagnosis
57,58	Cat	Large intestine	Mast-cell tumor
59	Deer	Ileum	*Yersinia pseudotuberculosis*
60	Pig	Lung	*Mycoplasma hyopneumoniae*
61	Horse	Liver	*Bacillus piliformis*
62	Cow	Abomasum	*Clostridium septicum*
63	Dog	Lymph node	*Mycobacterium avium*
64	Dog	Brain	Canine distemper and toxoplasmosis
65	Dog	Lung Urinary bladder	Canine distemper and toxoplasmosis
66	Elephant	Cerebrum	Phaeohyphomycosis
67,68	Dog	Spinal cord	Fibrocartilaginous emboli
69	Dog	Larynx	Rhabdomyoma
70	Sheep	Liver Spleen	*Eperythrozoon ovis*
71	Cow	Heart	*Clostridium chauvoei*

LIST OF SLIDES (Cont'd)

Slide Number	Animal	Tissue	Diagnosis
72	Marmoset	Small intestine Colon	*Prosthenorchis elegans*
73	Cow	Kidney	Oak (*Quercus* sp.) toxicity
74	Cat	Multiple organs	*Cryptococcus neoformans*
75	Rat	Skin	Trichoepithelioma
76	Goat	Spinal cord	Idiopathic poliomyelomalacia
77	Dog	Spinal cord	Idiopathic granulomatous meningomyelitis
78	Dog	Brain	Hepatic encephalopathy
79	Dog	Brain	Lafora's-like bodies
80	Sheep	Lung	*Dictyocaulus filaria*
81	Cow	Spinal cord	Pseudorabies
82	Cow	Adrenal	Infectious bovine rhinotracheitis
83	Lizard	Skin	*Dermatophilus congolensis*
84	Dog	Skin	Malignant hair follicle tumor
85	Rabbit	Bone	Hypervitaminosis D

LIST OF SLIDES (Cont'd)

Slide Number	Animal	Tissue	Diagnosis
86	Dog	Aorta	Osteosarcoma
87	Dog	Skull	Malignant chondroma rodans
88	Dog	Salivary gland	Infarction
89	Dog	Skin	Thallium toxicosis
90	Cow	Skin	Ichthyosis fetalis
91	Dog	Skin	Erythema multiforme
92	Pig	Skin	*Demodex phylloides*
93	Horse	Ileum Colon	Aganglionosis
94	Horse	Kidney Liver	Neonatal isoerythrolysis
95	Horse	Uterus	Endometritis
96	Horse	Lip	Cutaneous mastocytosis
97	Swan	Pro-ventriculus	*Echinuria uncinata*
98	Bush baby	Pancreas	Islet cell carcinoma
99	Cow	Cerebrum	Bacterial meningoencephalitis
100	Cat	Ear	Cutaneous leishmaniasis

COMMENTARY ON SLIDES

Slide 1

History. Tissue from an adult white carneau pigeon found dead several weeks after it was reported to be losing condition.

Diagnosis. Thyroid hyperplasia secondary to dietary iodine deficiency.

Comment. Death associated with advanced goiter is assumed to be due to starvation or asphyxiation in most cases. A follicular thyroid adenoma was considered as a differential.

Contributor. Merrell Dow Pharmaceuticals, Inc., Indianapolis, IN.

Suggested reading. Hollander, W. F., and Riddle, O.: Goiter in domestic pigeons. Poult. Sci. 25: 20-27, 1946.

Slide 2

History. Tissue from a mature red-billed francolin (African partridge) found dead without any noted prior clinical signs.

Diagnosis. Hepatitis, necrotizing and granulomatous, caused by *Histomonas meleagridis*.

Comment. Gross hepatic lesions in this case had a typical circular depressed "targetlike" appearance. In addition to liver lesions, severe cecal involvement was present that had in fact caused perforation and a focally extensive peritonitis. Organisms are present in many areas, however, they may be somewhat difficult to recognize due to the extensive hepatic necrosis with some resemblance to individually degenerating hepatocytes.

Contributor. Department of Laboratory Animal Resources, University of Pittsburgh, Pittsburgh, PA.

Slide 3

History. Tissue from a male tapir with a 3-week history of weight loss, anorexia, and dyspnea. Since his capture in Ecuador 25 years earlier, the tapir had been housed in a zoo in the southeastern United States.

Diagnosis. Lymphadenitis, necrotizing and granulomatous, caused by Coccidioides immitis.

Comment. The etiology was confirmed by positive staining of the fungi by fluorescence-conjugated antiglobulins specific for the tissue form of C. immitis (Dr. F. Chandler, CDC). Fungi were in the liver and hilar lymph node of the lungs. This is an unusual case in that the tapir was in a location far from the geographic area known to be enzootic (lower Sonoran life zone) for 25 years before the disease developed.

Contributor. Department of Comparative Medicine, University of Alabama at Birmingham.

Suggested reading. Barsanti, J. A., and Jeffery, K. L.: Coccidioidomycosis. In Clinical Microbiology and Infectious Diseases of the Dog and Cat, edited by Greene, C. E. Philadelphia, W. B. Saunders Co., 1984, chap. 45, pp. 710-719.

Slide 4

History. Tissue from an 11-year-old wire-haired terrier with diabetes mellitus and persistent lipemia. The dog was put to death after two cystectomies for transitional cell carcinoma.

Diagnosis. Glomerular lipid emboli and tubular epithelial cell lipidosis; glomerulosclerosis, with basement membrane thickening (diabetic nephropathy); interstitial nephritis; and pyelitis.

Comment. This is an osmicated H&E-stained section. No lipid emboli were detected in osmicated sections of lung, liver, heart, or brain. EM confirmed the lipid's lumenal location, excluding glomerular lipoidosis. The H&E, PAS, and PAMS stains, and electron microscopy revealed lesions of diabetic nephropathy to include diffuse basement membrane thickening (glomerular capillaries, Bowman's capsule, and tubular epithelium) and diffuse glomerulosclerosis (increase in mesangial matrix with proliferation of mesangial cells).

Contributor. The University of Georgia, College of Veterinary Medicine, Athens, Georgia 30602.

Suggested reading. Brown, T. P., and Fitzpatrick, R. K.: Glomerular lipid emboli in a diabetic dog. Vet. Pathol. 23: 209-211, 1986.

Slide 5

History. Tissue from an 11-year-old castrated male DSH cat. One week after a perineal urethrostomy, this cat was readmitted to the hospital with vomiting, diarrhea, and dehydration.

Diagnosis. Purulent and necrotizing hepatitis.

Comment. Salmonella typhimurium was cultured from the bile. The bacterial necrotizing hepatitis was superimposed upon a lymphoplasmacytic infiltration around bile ducts. Bacterial rods were gram-negative on a Brown-Hopps Gram's stain and were numerous intracellularly and in sinusoids, being particularly abundant in areas of necrosis.

Contributor. Angel Memorial Animal Hospital, Boston, MA.

Suggested reading. Greene, C. E. Ed. Clinical Microbiology and Infectious Diseases of the Dog and Cat. Philadelphia, W. B. Saunders Co., 1984, pp. 617-623.

Slide 6

History. Tissue from 10-day-old budgerigars submitted to the diagnostic laboratory with a history of high mortality rates in birds under 15 days of age in most of the nests.

Gross Pathology. The birds submitted had congested lungs, ascites, hydropericardium, pale or congested kidneys exhibiting multiple pinpoint white spots and petechial hemorrhages in their parenchyma, and swollen, pale livers with multiple pinpoint white spots. The nesting down feathers were almost absent.

Diagnosis. Generalized inclusion body disease of the budgerigar caused by a papovavirus agent.

Comment. Electron microscopy revealed the presence of viral particles having the size and morphologic features of a papovavirus. The virus can replicate in many tissues of the body causing widespread lesions that are responsible for the high mortality rates in very young birds. Severe lesions in the feather follicles are probably responsible for the temporary absence, the retarded growth, and the incomplete development of feathers that are typical signs of the disease, particularly in those birds that survive. Some slides had both kidney and skin tissue specimens, while other slides had only one tissue specimen.

Contributor. Animal Pathology Laboratory, St. Hyacinthe, Quebec, Canada.

Suggested reading.

Bernier, G., Morin, M., and Morsolais, G.: A generalized inclusion body disease in the budgerigar (Melopsittacus undulatus) caused by a papovavirus-like agent. Avian Dis. 25(4): 1083-1092, 1981.

Bernier, G., Morin, M., and Morsolais, G.: Papovavirus induced feather abnormalities and skin lesions in the budgerigar: Clinical and pathological findings. Can. Vet. J. 25: 307-310, 1984.

Slide 7

History. Tissue from a 3-month-old male unvaccinated chow-chow with a 3-day history of anorexia, lethargy, distended painful abdomen, and pyrexia. There was prolonged bleeding after venapuncture.

Diagnosis. Hemorrhagic necrotizing hepatitis with eosinophilic and basophilic intranuclear inclusions caused by canine adenovirus I.

Comment. The lesions and intranuclear inclusions are pathognomonic for infectious canine hepatitis.

Contributor. New York State College of Veterinary Medicine, Pathology Department, Cornell University.

Suggested reading. Greene, C. E. (Ed.): Clinical Microbiology and Infectious Diseases of the Dog and Cat. Philadelphia, W. B. Saunders Co., 1984, Chap. 20.

Slide 8

History. Tissue from an 8-year-old female white carneau pigeon found dead with no prior clinical signs.

Diagnosis. Cholangiocarcinoma and periportal granulomatous hepatitis.

Comment. This carcinoma may have been induced by aflatoxin-contaminated feed. Staphylococcus species were cultured from the liver.

Suggested reading. Webster, W. S., Bullock, B. C., and Prichard, R. W.: A report of three bile duct carcinomas occurring in pigeons. J. Am. Vet. Med. Assoc. 155(7): 1200-1205, 1969.

Slide 9

History. Tissue from a female 15-year-old African green monkey with 16 episodes of bloody diarrhea over the course of 6 years following her arrival from Africa.

Diagnosis. Granulomatous and eosinophilic colitis with associated Schistosoma mansoni eggs.

Comment. The differentiation of S. mansoni from S. hematobium was made by observation of a thick lateral spine on the egg and positive acid-fast staining of the shell.

Contributor. Bowman Gray School of Medicine of Wake Forest University, Department of Comparative Medicine, NC.

Suggested reading. Binford, C. H., and Connor, D. H. (Eds.): Pathology of Tropical and Extraordinary Diseases. Washington, D.C., Armed Forces Institute of Pathology, 1976, Vol. 2, pp. 482-508.

Slide 10

History. Tissue from a 4-week-old crossbred male pig one of four nursing pigs that died from a group of 50 without prior signs of illness.

Diagnosis. Necrotizing hepatitis, with intracellular and extracellular tachyzoites of Toxoplasma gondii. Chronic eosinophilic periportal and perilobular hepatitis, probably caused by migrating larvae of either Ascaris suum or Stephanurus dentatus.

Comment. Serologic evidence indicates that Toxoplasma gondii infection is common in swine, but most infections are inapparent. Raw pork is a much greater threat to human health than raw beef as Toxoplasma is much more prevalent in swine than cattle, probably due because of diet and ground feeding habits of swine.

Contributor. Veterinary Science Department, South Dakota State University.

Slide 11

History. Tissue from an 18-month-old steer. Clinical signs included anorexia, depression, diarrhea, coughing, and dyspnea.

Diagnosis. Diffuse, severe fibrosis with bile-duct proliferation, due to aflatoxicosis.

Comment. Corn and mixed-feed samples collected from the farm contained high concentrations of aflatoxin. The main differential diagnosis is pyrrolidine alkaloid toxicity. Aflatoxins apparently infrequently cause clinical disease in cattle.

Contributor. Veterinary Diagnostic Laboratory, Tifton, GA.

Suggested reading. Colvin, B. M., Harrison, L. R., et al.: Aflatoxicosis in feeder cattle. J. Am. Vet. Med. Assoc. 184(8): 956-958, 1984.

Slide 12

History. Tissue from a 10-month-old Angus steer that had been losing weight for approximately 2 weeks. There was extensive hair loss on the head and neck, and there was posterior ataxia. The animal was on pasture.

Diagnosis. Nephritis, tubulointerstitial, granulomatous, with multinucleated giant cells.

Comment. The presence of multinucleated giant cells and a mixed cellular infiltrate is strongly suggestive of a systemic granulomatous disease reported in cattle and a horse grazing pastures of Vicia villosa (hairy vetch). The mechanism of toxicity is unknown.

Contributor. Livestock Disease Diagnostic Center, University of Kentucky, Lexington, KY.

Suggested reading. Anderson, C. A., and Divers, T. J.: Systemic granulomatous inflammation in a horse grazing hairy vetch. J. Am. Vet. Med. Assoc. 183(5): 569-570, 1983.

Slide 13

History. Tissue from a 7-year-old female Doberman pinscher that was presented with a history of difficulty breathing, not eating, losing weight, blindness, and convulsions of about 2 to 3 weeks' duration.

Gross Pathology. Multiple draining subcutaneous abscesses were present on the forehead and dorsum of the carcass. Multifocal greyish nodules, some with purulent exudate on cut surfaces, were present in the

right diaphragmatic lobe of the lungs, tracheobronchial lymph nodes, kidneys, and brain.

Diagnosis. Pyogranulomas, with intralesional budding yeasts, and microfilaremia, lung.

Comment. Exudates yielded pure cultures of Blastomyces dermatitidis

Contributor. Department of Pathology and Parasitology, School of Veterinary Medicine, Tuskegee University, AL.

Suggested reading. Barsanti, J. A.: Blastomycosis. In Clinical Microbiology and Infectious Diseases of the Dog and Cat, edited by Greene, C.E., Philadelphia, W. B. Saunders Co., 1984, Chap. 42, p. 675.

Slide 14

History. Tissue from a 9-month-old castrated male merino ovine that was dosed with a crude toxic preparation.

Diagnosis. Diffuse hepatocellular degeneration with single cell necrosis, mild diffuse fibrosis, numerous mitotic figures, bile ductule proliferation, and bile stasis caused by phomopsin intoxication. Pericholangitis.

Comment. The administered material was a crude toxic extract from Phomopsis leptostromiformis grown on wheat.

Contributor. Division of Veterinary Biology, School of Veterinary Studies, Murdoch University, Murdoch, Western Australia.

Suggested reading. Gardiner, M. R.: The pathology of lupinosis of sheep, gross and histopathology. Path. Vet. 2(5): 417-445, 1965.

Slide 15

History. Tissue from a 9-year-old standardbred mare with posterior paresis.

Diagnosis. Meningomyelitis, with malacia, hemorrhage, and protozoal cysts.

Comment. This case is unusual in that so many organisms were observable both extracellularly and intracellularly within neurons and other cells. Usually far fewer organisms are present, and often none can be found. Initially the etiologic agent of equine protozoal

myeloencephalitis was believed to be Toxoplasma gondii; however, serologic evidence and ultrastructural studies have revealed the probable agent to be a Sarcocystis species.

Contributor. University of Pennsylvania, School of Veterinary Medicine, New Bolton Center, Kennett Square, PA.

Suggested reading. Brown, T. T., Jr.: Protozoal encephalomyelitis in horses. J. Am. Vet. Med. Assoc. 171: 492, 1977.

Slide 16

History. This 2-year-old thoroughbred gelding was a chronic neurologic suspect. Clinical presentation varied from nearly normal to severe incoordination. Myelographic findings were nonspecific.

Gross Pathology. When the neck was flexed, the anterior end of the vertebral body of C5 protruded into the spinal canal. Less pronounced protrusions were noted at C3/4 and C5/6.

Diagnosis. Axonal degeneration and myelin loss (wallerian degeneration), ventral funiculi, spinal cord.

Comment. Equine cervical vertebral stenotic myelopathy ("wobbler syndrome") is a common entity in young horses.

Contributor. Hazleton Laboratories America, Inc., Vienna, Virginia.

Slide 17

History. A 4-month-old female Brown Swiss calf was presented with a progressive neurologic problem of 1 month's duration.

Gross Pathology. A necrotic haemorrhagic mass extended from the cerebellum folia cranially caudally and into the ventricular system.

Diagnosis. Medulloblastoma, fourth ventricle.

Comment. If it were not for the fact that the animal was very young and the gross finding that the mass originated in the cerebellum and then extended into the ventricular system, the tumor would have been diagnosed as an ependymoblastoma or ependymoma based solely on the glass slide of a mass in the ventricle.

Contributor. University of Georgia, College of Veterinary Medicine, Athens, Georgia.

Suggested reading. Jolly, R. D., and Alley, M. R.: Medulloblastoma in calves. Path. Vet. 6: 463-468, 1969.

Slide 18

History. Several mice in a group of adult BALB/c mice developed clinical signs of illness, including inappetance, hunched posture, depression, ascites, and death.

Diagnosis. (1) Necrotizing granulomatous hepatitis with multinucleated syncytial cells, liver. (2) Lymphoid necrosis with mild lymphoid hyperplasia and occasional syncytial cells, white pulp, spleen.

Comment. It is noteworthy that mouse hepatitis virus, a coronavirus, is considered ubiquitous in mice, and not only can it cause fatal disease, but, perhaps more significantly to the researcher, it causes widespread subclinical infections that can alter immune function therapy interfering with experimental results.

Contributor. Uniformed Services University of the Health Sciences, Bethesda, MD.

Suggested reading. Ward, J. M., Collins, M. J., Jr., and Parker, J. C.: Naturally occurring mouse hepatitis virus infection in the nude mouse. Lab. Anim. Sci. 27: 372-376, 1977.

Slide 19 and 20 (GMS)

History. Tissue from a female Sprague-Dawley rat that was put to death at the termination of a steroid dose-range-finding study. This rat was in the high-dose group.

Gross Pathology. The lungs failed to collapse and were firm.

Diagnosis. Pneumonitis, subacute, with intra-alveolar and bronchiolar foamy exudate and protozoal organisms, and diffuse type II pneumocyte hyperplasia.

Comment. The GMS stain demonstrates numerous silver-positive Pneumocystis carinii cysts within the foamy eosinophilic material in many alveolar spaces and bronchioles. Many rat colonies have subclinical latent Pneumocystis carinii infections that can be activated by treatment with immunosuppressive agents.

Contributor. Merrell Dow Pharmaceuticals, Indianapolis, IN.

Suggested reading.

Henshaw, N. G., Carson, J. L. and, Collier, A. M.: Ultrastructural observations of Pneumocystis carinii attachment to rat lung. J. Infect. Dis. 151(1): 181-186, 1985.

Lanken, D. N., Minda, M., et al.: Alveolar response to experimental Pneumocystis carinii pneumonia in the rat. Am. J. Pathol. 99: 561-588, 1980.

Slide 21

History. This 2-month-old female holstein calf was submitted for necropsy with a history of abdominal pain, rapid respiration, and diarrhea.

Diagnosis. Interstitial pneumonia caused by Salmonella dublin septicemia.

Comment. Lung and lymph node were cultured, and Salmonella dublin was isolated.

Contributor. Colorado State University, Department of Veterinary Pathology, Fort Collins, Colorado.

Slide 22

History. Tissue from a 2-year-old Columbia ewe, one of a group of ewes that sustained severe weight loss over the winter while receiving a ration that should have been adequate.

Diagnosis. Chronic, diffuse interstitial pneumonia with peribronchiolar and perivascular lymphoid hyperplasia and bronchiolar smooth muscle hyperplasia, caused by ovine progressive pneumonia virus (ovine lentivirus).

Comment. The differential diagnosis included Mycoplasma and Chlamydia because of the prominent lymphofollicular aggregates that occur in these diseases.

Contributor. Department of Veterinary Pathology, College of Veterinary Medicine, Iowa State University, Ames, Iowa.

Suggested reading. Olivar, R. E., Gocham, J. R., et al.: Ovine progressive pneumonia: Pathologic and virologic studies on the naturally occurring disease. Am. J. Vet. Res. 42(9): 1554-1559, 1981.

Slide 23

History. This 2-year-old quarter horse gelding had been dyspneic for five days.

Diagnosis. Exogenous lipid pneumonia.

Comment. The horse had been treated for colic by another veterinarian just prior to the onset of respiratory signs. Mineral oil was given by a stomach tube, and the horse coughed up oily material immediately afterward. Aspirated mineral oils incite a granulomatous and fibrous response and are eventually cleared by phagocytosis. A frozen oil red O demonstrated the large volume of mineral oil in the section.

Contributor. Tifton Veterinary Diagnostic and Investigational Laboratory, University of Georgia, Tifton, Georgia.

Suggested reading. Smith, B. J., Alley, M. R., and McPherson, W. B.: Lipid pneumonia in a cow. N. Z. Vet. J. 17: 65-67, 1968.

Slide 24

History. Tissue from an 8-week-old female basset puppy from a commercial kennel that had been experiencing a high incidence of upper respiratory disease after weaning.

Diagnosis. Suppurative tracheobronchitis and bronchopneumonia, tracheobronchial epithelial hyperplasia and respiratory epithelial basophilic intranuclear inclusions.

Comment. Bacterial cultures of lung and swabs taken from the nares, trachea, and large bronchi yielded Bordetella bronchiseptica. Indirect fluorescent antibody tests on frozen larynx and lung were positive for canine adenovirus type 2. Canine infectious laryngotracheobronchitis

(kennel cough) is a clinical syndrome with multiple and often combined etiologies. It is usually a mild self-limiting disease; however, severe diseases can occur, as in this puppy, with extension to bronchopneumonia.

Contributor. Veterinary Diagnostic Center, University of Nebraska-Lincoln.

Suggested reading. Thayer, G. W.: Canine infectious tracheobronchitis. In Clinical Microbiology and Infectious Diseases of the Dog and Cat, edited by Greene, C. E. Philadelphia, W. B. Saunders Co., 1984, Chap. 24, pp. 430-436.

Slides 25 and 26 (acid-fast)

History. Tissues from a 5-year-old and a 6-1/2-year-old cynomolgus monkey (Macaca fasciculata).

Diagnoses. Necrogranulomas and granulomatous hepatitis with acid-fast bacilli.

Comment. Mycobacterium tuberculosis was cultured.

Contributor. Division of Pathology, Walter Reed Army Institute of Research, Washington, DC.

Suggested reading. Fourie, P. B., and Odendaal, M. W.: Mycobacterium tuberculosis in a closed colony of baboons (Papio ursinus). Lab. Anim. 17: 125-128, 1983.

Slide 27

History. This moribund 13-year-old female cynomolgus monkey was presented to the pathology service for necropsy.

Diagnosis. Endometriosis, serosa and muscularis, colon.

Comment. Endometriosis involved the uterus, abdominal mesentery, parietal peritoneum, and serosal surface of ovary, oviduct, vagina, urinary bladder, and large intestine.

Contributor. Pfizer Central Research, Groton, CT.

Slide 28

History. This adult female Everglades rat snake (Elaphe obsoleta rossalleni) was found dead.

Diagnosis. Caseocalcareous granulomas, with numerous acid-fast bacilli, liver, subcutis, and abdomen.

Comment. Tissues were not cultured for mycobacteria. Mycobacteriosis in reptiles is primarily a management problem related to stress, husbandry, and nutrition.

Contributor. Division of Comparative Medicine, Johns Hopkins University, Baltimore, MD.

Suggested reading. Burke, T. J.: Infectious diseases of reptiles. In Zoo and Wild Animal Medicine, edited by Fowler, M. E., Philadelphia, W. B. Saunders Co., 1978, pp. 134-137.

Slide 29

History. Tissue from two crossbred ovine fetuses from different ewes that were aborted approximately 3 to 4 weeks before the scheduled parturition date.

Diagnosis. Purulent pneumonia with colonies of coccobacillary bacteria.

Comment. Yersinia pseudotuberculosis was isolated from the lung, kidney, and spleen.

Contributor. Livestock Disease Diagnostic Center, University of Kentucky, Lexington, KY.

Suggested reading. Karbe, E. and, Erickson, E. D.: Ovine abortion and stillbirth due to purulent placentitis caused by Yersinia pseudotuberculosis. Vet. Pathol. 27: 601-606, 1984.

Slide 30

History. An 11-year-old F/S dachshund was presented to a local veterinary clinic with a history of dysphagia and vomiting. Radiographs revealed a density in the mediastinum and anterior thorax.

Diagnosis. Thymoma.

Comment. Thymomas, although reported to occur in most species of animals, are rare tumors. A greater frequency of these tumors occurs in the domestic goat and in Mastromys natalensis. They arise from the thymic epithelium.

Contributor. FDA/Division of Veterinary Medical Research, Beltsville, MD.

Suggested reading. Aronsohn, M. G., Schunk, K. L., et al.: Clinical and pathologic features of thymoma in 15 dogs. J. Am. Vet. Med. Assoc. 184(11): 1355-1362, 1984.

Slide 31

History. Tissue from adult smallmouthed bass. These bass represent all species of fish along 8 miles of the Ohio River that exhibited a sudden high rate of mortality.

Diagnosis. Branchitis, with mucous-cell hyperplasia and secondary lamellar fusion, gill.

Comment. Water analysis revealed high cyanide levels. The lesions represented a nonspecific response of the gills to a long list of possible agents, including a wide range of physical and chemical pollutants (pesticides, heavy metals, nonmetals, sewage, particulate materials); microorganisms (myxobacteria, protozoans, fungi), and nutritional deficiencies (ascorbic acid, pantothenic acid).

Contributor. Department of Pathology, University of Maryland School of Medicine, Baltimore, MD.

Suggested reading. Eller, L. L.: Gill lesions in freshwater teleosts. In The Pathology of Fishes, edited by Ribelin, W. E., and Migaki, G. Madison, The University of Wisconsin Press, 1975, Chap. 11, p. 305.

Slide 32

History. Tissue from a 2-year-old Corriedale ram from Peru that showed circling, a head tilt, a peculiar high-stepping gait, grinding of teeth, and an aversion to flocking behavior.

Diagnosis. Granulomatous meningitis with a coenurus cyst, brainstem.

Comment. Coenurus cerebralis is the larval stage of Taenia multiceps.

Contributor. Department of Pathology, College of Veterinary Medicine, Colorado State University, Fort Collins, CO.

Suggested reading. Soulsby, E. J. L.: Helminths, Arthropods, and Protozoa of Domesticated Animals, ed. 7. Philadelphia, Lea & Febiger, 1982, pp. 117-118.

Slide 33

History. Tissue from female Hartley guinea pigs, weighing 180 to 200 g, that were acquired from a commercial supplier. Evidence of respiratory problems characterized by labored breathing and nasal and ocular discharges was noted.

Diagnosis. Fibrinopurulent bronchopneumonia with bacilli.

Comment. Pure culture of Bordetella bronchiseptica was isolated from pneumonic lung tissue. Bordetella bronchiseptica is harbored in the nasal cavity and trachea of normal carrier guinea pigs.

Contributor. Sterling-Winthrop Research Institute, Rensselaer, NY.

Suggested reading. Baskerville, M., Baskerville, A., and Wood, M.: A study of chronic pneumonia in a guinea pig colony with enzootic Bordetella bronchiseptica infection. Lab. Anim. 16: 290-296, 1982.

Slide 34

History. Tissue from a young adult Lewis:NHsd white male rat that was one of six in a group of 28 rats that spontaneously developed ocular lesions.

Diagnoses. 1. Dacryoadenitis, with squamous metaplasia, Harderian gland. 2. Keratoconjunctivitis and iridocyclitis, with anterior synechia, cataractous change, and intraocular hemorrhage, eye.

Comment. Serum from this rat was negative by fluorescent test for sialodacryoadenitis virus antibody; however, the lesions and history support an etiology of SDAV infection.

Contributor. Department of Comparative Medicine, Milton S. Hershey Medical Center, Penn State University, Hershey, PA.

Suggested reading. Weisbroth, S. H., and Peress, N.: Ophthalmic lesions and dacryoadenitis: A naturally occurring aspect of sialodacryoadenitis virus infection of the laboratory rat. Lab. Anim. Sci. 27(4): 466-473, 1977.

Slide 35

History. The submitted tissues are from an 8-month-old female control Sprague-Dawley rat used in a 6-month oral toxicity study.

Gross Pathology. Pale mucous membranes, hepatomegaly and splenomegaly were not found during necropsy.

Diagnosis. mononuclear cell leukemia, spleen and liver.

Comment. The mononuclear cell leukemia common in Fischer 344 rats has been clearly shown to be of large granular lymphocyte (LGL) origin. The cell of origin of the mononuclear cell leukemia reported in Sprague-Dawley rats has not been determined; however, it seems plausible that it too may be the large granular lymphocyte.

Contributor. Wyeth Laboratories, Inc., Department of Pathology, Paoli, PA.

Suggested reading.

Abbott, D. P., Prentice, D. E., and Cherry, C.P.: Mononuclear cell leukemia in aged Sprague-Dawley rats. Vet. Pathol. 20: 434-439, 1983.

Stromberg, P. C.: Large granular lymphocyte leukemia in F344 rats; model for human Ty lymphoma, malignant histiocytosis, and T-cell chronic lymphocytic leukemia. Am. J. Pathol. 119(3): 517-519, 1985.

Slides 36 (heart) and 37 (skeletal muscle)

History. Tissue from 43-week-old broiler breeder chickens. Hens began showing weakness and reluctance to move. Eventually 500 hens were affected, and some were in sternal recumbency with legs extended caudally.

Diagnosis. Degeneration and necrosis, myocardium and skeletal muscle.

Comment. Monensin and salinomycin were detected in feed samples. Ionophore coccidiostats are used in broiler feed rations but not in breeder rations. Mature birds acquire immunity to coccidia and need no chemical protection. An etiologic diagnosis of ionophore intoxication

was based upon the inappropriate presence of ionophores in the breeder ration, the signs, and the gross and microscopic lesions.

Contributor. Auburn University, Veterinary Diagnostic Laboratory, Auburn, AL.

Suggested reading.

Chalmers, G. A.: Monensin toxicity in broiler chickens. Can. Vet. J. 22: 21-22, 1981.

Hanrahan, L. E., Corrier, D. E., and Nagi, S.A.: Monensin toxicosis in broiler chickens. Vet. Pathol. 18: 661-665, 1981.

Slide 38

History. Tissue from a 12-year-old female DSH cat with anorexia and a persistent fever.

Laboratory results.
WBC - 54.6×10^3
HcT - 19.7%
Eos - 57%

Diagnosis. Eosinophilic leukemia, lung and kidney.

Comment. Many participants had difficulty identifying all of the infiltrating cells as eosinophils based on the H&E slide; however, the contributor provided us with a thin section of the kidney that clearly demonstrated that the infiltrating cells were eosinophils, about half mature/half various immature stages.

Contributor. Comparative Medical and Veterinary Services, Los Angeles Co. Department of Health Services, Downey, CA.

Suggested reading. Lewis, M. G., Kociba, G. J., Rojko, J. L., et al.: Retroviral- associated eosinophilic leukemia in the cat. Am. J. Vet. Res. 46(5): 1066-1070, 1985.

Slide 39

History. Tissue from a 7-week-old female broiler chicken.

Gross Pathology. Many of the feather follicles were enlarged, discolored, and inflamed.

Diagnosis. Lymphocytic perifolliculitis and dermatitis, with feather-follicle epithelial-cell eosinophilic intranuclear inclusions (Marek's disease—herpesvirus).

Comment. Marek's disease must always be differentiated from lymphoid leukosis, as both are widespread and characterized in part by similar gross lesions. Lymphoid leukosis only rarely affects the skin, while Marek's disease commonly causes lymphoid infiltration of feather follicles which can be composed of inflammatory and/or neoplastic cells.

Contributor. USDA, FSIS, Science, Eastern Laboratory, Russell Research Center, Athens, GA.

Suggested reading. Calnek, B. W., and Witter, H. T.: Marek's disease. In Diseases of Poultry, ed. 8, edited by Hofstad, M. S., Barnes, H. J., Calnek, B. W., Reid, W. M., and Yoder, H. W., Jr. Ames, Iowa State University Press, 1984, pp. 325-354.

Slide 40

History. A veterinarian palpated enlarged mesenteric lymph nodes in this 6-month-old domestic short-hair cat and informed the owners that he suspected the cat had lymphosarcoma. The owners requested euthanasia.

Diagnosis. Fibrinous pyogranulomatous pleuritis and necrotizing pyogranulomatous lymphadenitis.

Comment. The pleuritis and lymphadenitis are strongly suggestive of feline coronavirus infection (FIP).

Contributor. Center for Food Safety and Applied Nutrition, Food and Drug Administration, Washington, D.C.

Slide 41

History. This young adult B6C3F1 female mouse was part of a group in a toxicologic/carcinogenic study that received a drug in development.

Diagnosis. Teratoma, ovary.

Comment. This teratoma was considered to be a spontaneous occurrence.

Contributor. Battelle Columbus Laboratories, Columbus, OH.

Suggested reading. Goodman, D. G., and Strandberg, J. D.: Neoplasms of the female reproductive tract. In The Mouse in Biomedical Research, edited by Foster, H. L., Small, J. D., and Fox, J. G. Orlando, Academic Press, 1982, Vol. 4, pp. 398-403.

Slide 42

History. A clinically normal 8-year-old purple-faced langur (Presbytis senex nestor) imported from Sri-Lanka presented with a subcutaneous growth inside the upper proximal portion of the left thigh.

Diagnosis. Coenurus, with granulomatous inflammation, skeletal muscle.

Contributor. Department of Veterinary Pathology, School of Veterinary Medicine, Louisiana State University.

Suggested reading. Lozano-Alarcon, F., Steward, T. B., and Pirie, G. J.: Taeniasis in a purple-faced langur. J. Am. Vet. Med. Assoc. 187(11): 1271, 1985.

Slide 43

History. Tissue from a female rhesus monkey that was 20-plus years old with progressive weight loss, anemia, and an enlarging mass in the right mandibular region.

Diagnosis. Squamous cell carcinoma, oral mucosa and lymph node.

Comment. Squamous cell carcinomas have been reported in the oral cavity of rhesus monkeys and other nonhuman primates. The cause and pathogenesis of oral squamous cell carcinoma in man and animals is largely unknown, although in man there are associations with chewing betel nut, tobacco chewing, smoking, alcohol, syphilis, oral sepsis, iron deficiency, chronic candidiasis, and herpes simplex virus.

Contributor. Sterling-Winthrop Research Institute, Rensselaer, NY.

Suggested reading. Binnie, W. H., Rankin, K. V., and Mackenzie, I. C.: Etiology of oral squamous cell carcinoma. J. Oral Pathol. 12(1): 11-29, 1983.

Slide 44

History. Tissue from a male F344/NCr rat that was 1 year and 2 weeks old. At 6 weeks of age, the rat received the first of 10 weekly subcutaneous injections of the carcinogen, N-nitrosodiisopropanolamine.

Diagnosis. Squamous cell carcinoma, adenocarcinomas, adenomas, and multifocal alveolar type II cell hyperplasia, lung.

Comment. There is a continuum of lesions from hyperplasia to carcinoma. The vast majority of both natural and experimentally induced primary pulmonary tumors in the mouse and rat have been shown to originate from type II pneumocytes based on immunocytochemical techniques using antibodies to surfactant apoprotein and Clara cell antigen. This is in marked contrast to their origin in the human, where most primary pulmonary carcinomas arise from mucus-secreting cells of bronchial epithelium or their precursors and very few are of type II pneumocyte origin. In both the rat and human, squamous cell carcinomas are believed to arise in areas of bronchial epithelial squamous metaplasia.

Contributor. National Cancer Institute, Frederick, MD.

Suggested reading. Ohshima, M., Ward, J. M., et al.: Immunocytochemical and morphological evidence for the origin of N-Nitrosomethylurea-induced and naturally occurring primary lung tumors in F344/NCr Rats. Cancer Res. 45: 2785-2792, 1985.

Slide 45

History. Tissue from a CRCD S/D female rat, approximately 18 months old, that died with no premonitory signs from hemorrhage from a renal tumor.

Diagnosis. Lipomatous tumor, malignant, kidney.

Comment. The nomenclature is controversial because the histogenesis is uncertain for the lipomatous tumors seen in the kidneys of aged rats. It is theorized that this tumor might arise from an interstitial cell of the renal cortex that has been shown to produce a lipid hormonelike substance.

Contributor. Merck, Sharp & Dohme Research Labs, West Point, PA.

Suggested reading. Schoental, R., Hard, G. C., and Gibbard, S.: Histopathology of renal lipomatous tumors in rats treated with the "natural" products, pyrrolizidine alkaloids and alpha-beta-unsaturated aldehydes. J.N.C.I. 47(5): 1037-1044, 1971.

Slide 46

History. This 71-week-old male Wistar rat evidenced labored respiration at the time he was put to death.

Gross Pathology.. Nasal cavity--right and left passages blocked by a light-green globular mass.

Diagnosis. Necrosuppurative rhinitis, with nasal cavity fungus balls.

Comment. Within the compact mycelial masses or "fungus balls" in the nasal cavity, it was difficult to evaluate the branching and septation of the hyphae. No hyphae were noted within the tissues. The contributor provided a microslide from another affected rat that demonstrated many conidiophores typical of Aspergillus sp. in the fungus balls.

Contributor. National Cancer Institute, Frederick, MD.

Suggested reading. Chandler, F. W., Kaplan, W., and Ajello, L.: Color Atlas and Text of the Histopathology of Mycotic Diseases. London, Wolfe Medical Publishers Ltd., 1980, Chap. 6.

Slide 47

History. Tissue from 7-day-old CD rats. Suckling rats were experimentally inoculated with an infectious agent. Within 24 hours diarrhea developed in all inoculated animals. Intestinal tissue was collected at approximately 26 hours postinoculation.

Diagnosis. Vacuolar change, syncytia formation, and cytoplasmic inclusions, distal villar enterocytes, small intestine.

Comment. These rats were inoculated with an antigenically distinct rotavirus that was recently implicated as the cause of a spontaneous outbreak of diarrhea in suckling laboratory rats. The agent is morphologically identical to but antigenically distinct from the typical or group A rotaviruses. The disease has been named infectious diarrhea of infant rats (IDIR).

Contributor. Division of Comparative Medicine, Johns Hopkins University School of Medicine, Baltimore, MD.

Suggested reading. Wonderfecht, S. L., and Huber, A. C., et al.: Infectious diarrhea of infant rats produced by a rotavirus-like agent. J. Virol. 52(1): 94-98, 1984.

Slide 48

History. A mixed-breed male from a group of 120 to 125 feeder pigs 12 to 14 weeks of age, was killed and examined. The group as a whole had been unthrifty, with respiratory signs including cough and labored respiration for a 4-week period. The condition did not improve with antibiotic therapy. Thirty-five to 40 pigs died over the 4-week period.

Diagnosis. Liver--centrolobular congestion with cellular hypertrophy and karyomegaly. Kidney--cellular hypertrophy and karyomegaly, tubular epithelial cells, with glomerulopathy (eosinophilic globules). Lung--interstitial pneumonia, chronic.

Comment. Retrospective examination of whole-grain corn used in the preparation of the feed revealed contamination by seeds of Crotalaria spectabilis. The differential diagnosis includes other toxins known to induce cellular hypertrophy and karyomegaly such as aflatoxins and nitrosamines.

Contributor. Veterinary Diagnostic Laboratory, University of Georgia, Tifton, GA.

Suggested reading. Peckham, J. C., Sangster, L. T., and Jones, O. H.: Crotalaria spectabilis poisoning in swine. J. Am. Vet. Med. Assoc. 165(7): 633-638, 1974.

Slide 49

History. One group of ewes experienced an abortion outbreak. The aborted fetuses were near term and in a fresh state; 40 percent of the ewes were affected.

Gross Pathology. The majority of the placental cotyledons were necrotic and thickened. Pericotyledon chorionic areas were thickened and leathery. Fetal parenchymal lesions were not evident.

Diagnosis. Necropurulent placentitis with necrotizing vasculitis and intracellular coccoid organisms.

Comment. Placental Gimenez smears revealed a high number of chlamydialike organisms. Inoculation of chick embryos with placental tissue showed embryo death at 5 to 6 days, and Gimenez smears demonstrated high numbers of chlamydialike organisms. Fresh placenta and chick embryo isolates were sent to the National Animal Disease Laboratory, Ames, Iowa, where both isolates were reisolated and confirmed by fluorescent antibody procedures as C. psittaci.

Contributor. Oregon State University, College of Veterinary Medicine, Corvallis, OR.

Suggested reading. Blewett, D. A., Gisemba, F., et al.: Ovine enzootic abortion: The acquisition of infection and consequent abortion within a single lambing season. Vet. Rec. 111: 499-501, 1982.

Slide 50

History. Tissue from a 3-year-old Suffolk ewe. Five of 60 ewes aborted within 2 weeks.

Gross Pathology. There were no gross lesions in the fetuses. The cotyledons had multiple white nodules measuring 1 to 2 mm. Intercotyledonary placenta was normal.

Diagnosis. Necrotizing placentitis, with mineralization and occasional protozoal pseudocysts, placenta.

Comment. Infrequent free and pseudocyst forms of protozoa compatible with Toxoplasma gondii are present. The gross and microscopic lesions are characteristic of ovine abortion caused by Toxoplasma gondii.

Contributor. The Ohio State University, Department of Veterinary Pathobiology, Columbus, OH.

Suggested reading. Rhyan, J. C., and Dubey, J. P.: Ovine abortion and neonatal death due to toxoplasmosis in Montana. J. Am. Vet. Med. Assoc. 184(6): 661-664, 1984.

Slide 51

History. Tissue from a 14-month-old female ferret that presented with anorexia, depression, pale mucous membranes, and an enlarged vulva.

Laboratory Results.

PCV (%)	9
Plasma protein (g/dl)	5.9
Leukocytes/ul	1,910

Diagnosis. Diffuse moderate extramedullary hematopoiesis, with reticuloendothelial hyperplasia and hemosiderosis, spleen.

Comment. The clinical signs and hematologic findings are compatible with aplastic anemia associated with prolonged estrus in ferrets. Both the dog and the ferret are highly sensitive to the toxic effects of estrogen.

Contributor. The Ohio State University, Department of Veterinary Pathobiology, Columbus, OH.

Suggested reading. Sherrill, A., and Gorham, J.: Bone marrow hypoplasia associated with estrus in ferrets. Lab. Anim. Sci. 35(3): 280-286, 1985.

Slide 52

History. Tissue from a 5-week-old female Labrador retriever from a litter of 10. This pup was the fifth one to die. All the pups that died had a similar clinical course, characterized by the acute onset of coughing and crying, followed by death within a few hours.

Diagnosis. Myocarditis, with basophilic intranuclear inclusions, caused by canine parvovirus.

Comment. Both the myocardial and enteric forms of canine parvovirus disease have decreased in incidence due to an increase in protective antibody in the dog population.

Contributor. Department of Veterinary Pathobiology, University of Minnesota, St. Paul, MN.

Suggested reading. Hayes, M. A., Russell, R. G., and Bobick, L. A.: Sudden death in young dogs with myocarditis caused by parvovirus. J. Am. Vet. Med. Assoc. 174(11): 1197-1203, 1979.

Slide 53

History. Tissue from an 8-year-old male Irish setter. Routine physical examination revealed a mass in the dog's abdomen. No clinical abnormalities were present.

Diagnosis. Carcinoid, ileocecal junction.

Comment. Carcinoids arise from endocrine cells of the gastrointestinal tract, trachea, bronchi, liver, pancreas, or genitourinary tract that are part of the APUD (amine precursor uptake and decarboxylation) system. They contain granules demonstrable by electron microscopy that may stain with either argentaffinic or argyrophilic silver stains.

Contributor. University of Wisconsin-Madison, School of Veterinary Medicine, Madison, WI.

Suggested reading. Sykes, G. P., and Cooper, B. J.: Canine intestinal carcinoids. Vet. Pathol. 19: 120-131, 1982.

Slide 54

History. This 7-year-old stump-tailed macaque (Macaca arctoides) developed chronic diarrhea that was refractory to treatment.

Diagnosis. Granulomatous enteritis caused by Mycobacterium paratuberculosis.

Comment. The gross and histologic features of these animals were virtually identical to those described for M. avium infections, and this was initially thought to be the etiologic agent.

Contributor. Yerkes Primate Center, Emory University, and Centers for Disease Control, Atlanta, GA.

Suggested reading. McClure, H., Chiodini, R., et al.: Paratuberculosis in stumptailed macaques (Macaca arctoides). Abstracts of the 10th Congress of the International Primatological Society. Int. J. Primatol. 5(6): 395, 1984.

Slide 55

History. Tissue from an untreated adult male rhesus monkey.

Diagnosis. Retroperitoneal fibromatosis, pleural and inguinal. Etiology: Retrovirus (Type D).

Comment. Retroperitoneal fibromatosis (RF) is an aggressive proliferation of highly vascular fibrous tissue. It is observed in several macaque species, often in animals that develop simian acquired immunodeficiency syndrome (SAIDS).

Contributor. National Institutes of Health, Bethesda, MD.

Suggested reading. Giddens, W. E., Jr., Tsai, C.-C., et al.: Retroperitoneal fibromatosis and acquired immunodeficiency syndrome in macaques. Pathologic observations and transmission studies. Am. J. Pathol. 119(2): 253-263, 1985.

Slide 56

History. This tissue is from the third of three llamas that died on a Mississippi delta exotic animal farm.

Diagnosis. Necrotizing lymphadenitis, caused by Bacillus anthracis.

Contributor. Mississippi State, College of Veterinary Medicine.

Slides 57 and 58 (Giemsa)

History. This 12-year-old DSH castrated male cat had been anorectic, depressed, and vomiting for two days. A large abdominal mass was palpated.

Diagnosis. Mast-cell tumor, large intestine.

Comment. Feline intestinal mast-cell tumors differ from the more commonly reported cutaneous and visceral (splenic) forms of feline mast-cell tumors in the following ways: (1) circulating mastocytosis does not occur; (2) ulceration does not occur (other than where the tumor may ulcerate the overlying mucosa); (3) ultrastructurally the granules are not electron-dense or crystalline but are degranulated and appear as vesicles; and (4) freeze-cleave electron microscopy has revealed a different fine structure of the perigranular membranes.

Contributor. Department of Veterinary Microbiology and Pathology, Washington State University, Pullman, WA.

Suggested reading. Alroy, J., Leav, I., et al.: Distinctive intestinal mast cell neoplasms of domestic cats. Lab. Invest. 32(2): 159-167, 1975.

Slide 59

History. Tissue from a 6-month-old red deer hind. Two weeks after purchase, the hind developed a watery, blood-stained diarrhea, became hyperexcitable, and rapidly progressed to recumbency.

Diagnosis. Necrotizing enteritis caused by Yersinia pseudotuberculosis.

Comment. This hind also had an acute multifocal suppurative and necrotizing mesenteric lymphadenitis, but there were no lesions in the liver or other tissues. Yersiniosis is one of the most important diseases associated with New Zealand's rapidly expanding deer farming industry. It is also an important and serious pathogen in primate colonies and zoological parks, a potentially serious zoonotic disease with reports of transmission through contaminated milk and infected companion animals, and can cause abortions in ruminants and nonhuman primates.

Contributor. Palmerston North Animal Health Laboratory, New Zealand.

Suggested reading. Baskin, G. B.: Comparative aspects of Yersinia pseudotuberculosis infection in animals. In Proceedings of a Symposium on the Comparative Pathology of Zoo Animals, edited by Montali, R. J., and Migaki, G. Washington, DC, Smithsonian Institution Press, 1980, pp. 219-223.

Slide 60

History. This 3-month-old female Yorkshire pig went off feed for a couple of days and subsequently developed a hacking cough that persisted for 3 weeks.

Gross Pathology. Serofibrinous pleuritis, pericarditis, peritonitis and consolidation of the apical and cardiac lobes of both lungs.

Diagnosis. Interstitial pneumonia and necrotizing bronchitis and bronchiolitis caused by Mycoplasma hypopneumoniae.

Comment. There is probably a concurrent metastrongyle and/or ascarid infection. Both Mycoplasma hypopneumoniae and M. hyorhinis can cause pneumonia in pigs.

Contributor. St. Jude Children's Research Hospital, Memphis, TN.

Slide 61

History. Tissue from a 13-day-old male equine with sudden onset of respiratory distress and extensor rigidity to all limbs.

Diagnosis. Necrotizing hepatitis caused by Bacillus piliformis.

Comment. The random pattern of necrosis suggests an infectious agent rather than a toxin. The characteristic intracellular bacteria is pathognomonic for Tyzzer's disease.

Contributor. Maryland Department of Agriculture, College Park, MD.

Suggested reading. Nold, J. B., Swanson, T., and Spraker, T. R.: Bacillus piliformis infection (Tyzzer's disease) in a Colorado foal. J. Am. Vet. Med. Assoc. Vol. 185(3): 306-307, 1984.

Slide 62

History. Tissue from a 6-week-old male Simmental bovine from Rugby, North Dakota (the geographical center of North America), that was observed shortly before its death to have abdominal distension and "sunken" eyes.

Diagnosis. Suppurative abomasitis with superficial mucosal necrosis and hemorrhage, and necrosuppurative vasculitis, caused by Clostridium septicum.

Comment. The pathogenesis of the abomasitis reported in lambs and, rarely, in calves is uncertain; however, prior injury to the mucosa by frozen, spiney, or coarse ingesta may allow bacterial invasion.

Contributor. Veterinary Diagnostic Laboratory, North Dakota State University, Fargo, ND.

Suggested reading. Eustis, S. L., and Bergeland, M. E.: Suppurative abomasitis associated with Clostridium septicum infection. J. Am. Vet. Med. Assoc. 178(7): 732-734, 1981.

Slide 63

History. This 6-year-old terrier-cross canine was presented to the referring veterinarian with generalized lymphadenopathy and a cranial abdominal mass.

Gross Pathology. All nodes were enlarged, and all of the Peyer's patches were involved in a granulomatous inflammation.

Diagnosis. Granulomatous lymphadenitis caused by Mycobacterium avium.

Comment. Tuberculosis in the dog is most often caused by Mycobacterium tuberculosis, with M. bovis the second most common offender. Canine infections with M. avium are reported but are infrequent.

Contributor. California Veterinary Diagnostics, Inc., West Sacramento, CA.

Suggested reading. Snider, W. R.: Tuberculosis in canine and feline populations. Review of the literature. Am. Rev. Respir. Dis. 104: 877-885, 1971.

Slides 64 (brain) and 65 (urinary bladder, lung)

History. This 2-year-old female Yorkshire terrier was admitted to a veterinary clinic in a somewhat debilitated condition, with a low-grade persistent fever and labored respiration.

Diagnoses. 1. Pneumonitis and bronchiolitis, with syncytial giant cells containing eosinophilic intracytoplasmic inclusions, caused by canine distemper virus. 2. Intracytoplasmic eosinophilic inclusions, epithelial cells, urinary bladder, caused by canine distemper virus. 3. Spongy degeneration, with glial-cell eosinophilic intranuclear and intracytoplasmic .inclusions, cerebellum, caused by canine distemper virus. 4. Fibrinonecrotic pneumonia caused by Toxoplasma gondii.

Comment. The apparent synergistic and concomitant occurrence of canine distemper and toxoplasmosis has long been recognized. Apparently, the canine distemper virus causes immunosuppression, allowing the manifestation of toxoplasmosis, which may have been dormant in the dog at the time of the distemper infection.

Contributor. Comparative Medical & Veterinary Services, Los Angeles County Department of Health Services, Downey, CA.

Suggested reading. Moller, T., and Nielsen, S. W.: Toxoplasmosis in distemper-susceptible carnivora. Path. Vet. 1: 189-203, 1964.

Slide 66

History. This slide shows an incidental finding in a 6-year-old female African elephant (Loxodonta africana).

Diagnosis. Caseonecrotic granuloma caused by a pigmented fungus, cerebrum.

Comment. Specific identification of pigmented fungi (phaeohyphomycosis) can be made only by culturing the organisms, which was not done in this case.

Contributor. Department of Pathology, UTHSCD, Dallas, TX.

Suggested reading. Chandler, F. W., Kaplan, W., and Ajello, L.: Color Atlas and Text of the Histopathology of Mycotic Diseases. London, Wolfe Medical Publishers Ltd., 1980, Chap. 21, pp. 92-95.

Slides 67 and 68 (toluidine blue)

History. A 6-year-old female Labrador retriever with sudden onset of rear-limb paraplegia.

Diagnosis. Infarction, gray matter, with multiple arteriolar fibrocartillaginous emboli.

Comment. The clinical history and pathologic findings are compatible with spinal cord infarction caused by embolization of intervertebral disk material. The striking metachromasia of the emboli with toluidine blue proved helpful in locating them.

Contributor. University of Liverpool, U.K.

Suggested reading. De Lahunta, A.: Veterinary Neuroanatomy and Clinical Neurology, ed. 2. Philadelphia, W. B. Saunders Co., 1983, p. 194.

Slide 69

History. Tissue from a 2-year-old female Scottish terrier with progressive dyspnea and inspiratory stridor of 2 weeks' duration. Radiographs and physical exam detected a soft tissue mass located on the right side of the larynx.

Diagnosis. Rhabdomyoma, laryngeal.

Comment. In the past these tumors may have been diagnosed as oncocytomas. The ultrastructural features readily distinguish rhabdomyomas from oncocytomas.

Contributor. North Carolina State University, Raleigh, NC.

Suggested reading. Meuten, D. J., Mays, M. B. C., et al.: Canine laryngeal rhabdomyoma. Vet. Pathol. 22: 533-539, 1985.

Slide 70

History. Tissues from a 1-month-old merino ovine.

Laboratory Results. P.C.V.% - 6

Diagnosis. Hepatic centrolobular and paracentral necrosis, and splenic lymphoid hyperplasia with hemosiderosis, plasmacytosis, and neutrophilia caused by hemolytic anemia due to E. ovis.

Comment. Organisms with morphologic features consistent with Eperythrozoon ovis were detected in the peripheral blood smear.

Contributor. Regional Veterinary Laboratory, N.S.W. Department of Agriculture, Australia.

Slide 71

History. This adult jersey downer cow was treated for milk fever over a 2-day period. Whenever she was examined, skipped heart beats were noted. She fell dead while being hand milked.

Diagnosis. Necrotizing and fibrinohemorrhagic myocarditis with vasculitis and thrombosis, caused by Clostridium chauvoei.

Comment. The lesions of blackleg were limited to the interventricular septum; no gross skeletal muscle lesions were found.

Contributor. University of Tennessee, Knoxville, TN.

Slide 72

History. This 3-year-old male moustached marmoset (Saguinus mystax) stopped eating and gradually wasted away until it reached a debilitated condition and was put to death.

Diagnosis. Pyogranulomas and colitis, caused by Prosthenorchis elegans.

Comment. Prosthenorchis elegans, an acanthocephalid, is the most common intestinal parasite found in New World monkeys. Prosthenorchis spirula and Moniliformis moniliformis are the other acanthocephalids reported in nonhuman primates.

Contributor. Food and Drug Administration, Bethesda, Maryland.

Suggested reading. Toft, J. D., II: The pathoparasitology of the alimentary tract and pancreas of nonhuman primates: A review. Vet. Pathol. 19(Supp. 7): 44-92, 1982.

Slide 73

History. Tissue from a 4-month-old female Hereford bovine. In 2 days this herd lost fifteen 300-lb beef calves with acute central nervous signs.

Diagnosis. Renal tubular necrosis, with hyaline tubular casts. Etiology: Oak bud (Quercus spp.) toxicity.

Comment. More than 900 cattle from this area died spontaneously or were slaughtered, with an estimated financial loss to ranchers of $12 million. The toxic principle in Quercus spp. is the polyhydroxyphenolic moiety of the oak tannin (gallotannin) that is metabolized into gallic acid and pyrogallol, both of which have been found to be toxic to cattle, sheep, goats, rabbits, and guinea pigs.

Contributor. University of California, Davis, CA.

Suggested reading. Sandusky, G. E., Fosnaugh, C. J., et al.: Oak poisoning of cattle in Ohio. J. Am. Vet. Med. Assoc. 171(7): 627-629, 1977.

Slide 74

History. Tissue from a 12-year-old female Siamese cat.

Gross Pathology. Most of the major body organs contained miliary white nodules measuring 1 to 5 mm in size.

Diagnosis. Cryptococcosis, systemic.

Comment. There was little or no inflammation in the tissue examined except for the lymph node.

Contributor. Bushy Run Research Center, Export, PA.

Suggested reading. Wilkinson, G. T.: Feline cryptococcosis: A review and seven case reports. J. Small Anim. Pract. 20: 749-768, 1979.

Slide 75

History. This adult female Fischer 344 rat was a control animal used in a 2-year toxicologic/carcinogenic study.

Diagnosis. Trichoepithelioma.

Comment. Spontaneous trichoepitheliomas occur infrequently in the Fischer 344 rat.

Contributor. Battelle Columbus Laboratories, Columbus, OH.

Suggested reading. Baker, H. J., Lindsey, J. R., and Weisbroth, S. H. (Eds.): The Laboratory Rat: Biology and Diseases. Orlando, Academic Press, 1979, Vol. 1, pp. 336-337.

Slide 76

History. This 4-month-old female Alpine goat had diarrhea and coccidial parasitism 2 weeks before its death. Treatment with sulfamethazine for 5 days resulted in clinical recovery. Two days posttreatment the animal became paraparetic and sat in a "dog-sitting" position. The goat remained bright and alert but rapidly developed ascending paralysis, resulting in complete tetraplegia in 7 days. The goat was put to death.

Diagnosis. Bilaterally symmetrical poliomyelomalacia, ventral and intermediate gray horns, with secondary wallerian degeneration and lymphoplasmacytic perivascular cuffing, spinal cord, etiology: unknown.

Contributor. University of California, Davis, CA.

Suggested reading. Cordy, D. R., East, N. E. and Lowenstine, L. J.: Caprine encephalomyelomalacia. Vet. Pathol. 21: 269-273, 1984.

Slide 77

History. This 3-year-old female Afghan hound was examined for clinical signs of temperament change, flaccid tail, decreased proprioception and hyperreflexia of the hindlimbs, anisocoria, and papilledema (left eye).

Diagnosis. Granulomatous meningomyelitis, with marked perivascular cuffing, and axonal degeneration and demyelination, spinal cord, consistent with canine granulomatous meningoencephalomyelitis (GME).

Comment. A primary etiology is unknown, but canine distemper, rabies, and vaccine-induced reactions are suggested as potential causes.

Contributor. University of Illinois Veterinary Diagnostic Laboratory, Urbana, IL.

Suggested reading. Braund, K. G.: Granulomatous meningoencephalomyelitis. J. Am. Vet. Med. Assoc. 186(2): 138-141, 1985.

Slide 78

History. Tissue from an 11-week-old female shorthaired collie presented with a history of unusual behavior and circling for 3 weeks. This puppy is from a littler of four, the others being approximately twice the size of this dog.

Gross Pathology. A shunt between the portal vein and caudal vena cava was observed at the hilus of the liver. The brain was swollen with marked flattening of the cerebrocoortical gyri and caudal compression of the cerebellar folia.

Diagnosis. Spongy change, brain and cerebellum, secondary to portocaval shunt.

Comment. Spongy degeneration of the brain due to hepatic disease must be differentiated from other toxic etiologies and hereditary abnormalities. The exact pathogenesis of hepatic encephalopathy is uncertain.

Contributor. Texas A&M Veterinary Medical Diagnostic Laboratory, Amarillo, TX.

Suggested reading. Tams, T. R.: Hepatic encephalopathy. Vet. Clin. of North Am. [Small Anim. Pract.] 15(1): 177-195, 1985.

Slide 79

History. Tissue from an 11-year-old female basset hound with nervous signs and depression for 2 months.

Diagnosis. Neuronal basophilic intracytoplasmic bodies, cerebellum and brainstem.

Comment. Lafora-like inclusion bodies in the central nervous system are incidental findings in aging dogs and have been tentatively associated with a progressive familial epilepsy in the basset, poodle, and beagle.

Contributor. University of Melbourne, Werribee, Victoria, Australia.

Suggested reading. Suzuki, Y., Akiyama, K., and Suu, S.: Lafora-like inclusion bodies in the CNS of aged dogs. Acta Neuropathol. (Berl.) 44: 217-222, 1978.

Slide 80

History. Tissue from a 3-year-old rambouillet ewe. In the current outbreak, 15 to 18 ewes have died following a similar clinical course characterized by anorexia, depression, and death within a week's time.

Diagnosis. Eosinophilic and granulomatous bronchopneumonia caused by Dictyocaulus filaria.

Contributor. Maryland Department of Agriculture, College Park, MD.

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History. Tissue from a yearling Hereford crossbred steer exhibiting hyperesthesia, pruritus, excessive salivation, ataxia, and paralysis. Nine animals out of approximately 500 in the feedlot were affected and died. Approximately 200 hogs of various ages were allowed to run with the cattle in this feedlot.

Diagnosis. Poliomyelitis, with astrocytic eosinophilic intranuclear inclusion bodies, caused by pseudorabies virus.

Comment. The pseudorabies virus is distinctive among the herpes group because of its broad host range (pigs, dogs, cats, rabbits, guinea pigs, cattle, sheep, goats, and probably other species).

Contributor. Livestock Disease Diagnostic Center, University of Kentucky, Lexington, KY.

Slide 82

History. Tissue from a 1-day-old male Angus bovine. There was no cow vaccination program in this 120-cow herd. The rancher introduced new bulls during the prior breeding period. Thirty-one of 33 cows have aborted, generally near term.

Gross Pathology. Multiple petechial hemorrhages were present in the lungs and kidneys.

Diagnosis. Necrotizing adrenalitis with eosinophilic intranuclear inclusion bodies, caused by bovine herpesvirus (infectious bovine rhinotracheitis).

Comment. It was speculated that the virus selectively infected the cortical cells because they were still actively dividing—there are numerous mitotic figures in the viable cortical cells.

Contributor. North Dakota State University, Fargo, ND.

Suggested reading. Kendrick, J. W.: Effect of the infectious bovine rhinotracheitis virus on the fetus. J. Am. Vet. Med. Assoc. 163(7): 852-854, 1973.

Slide 83

History. Tissue from a Madagascar lizard that developed skin lesions over a 2-week period and then died.

Diagnosis. Dermatitis caused by Dermatophilus congolensis.

Comment. A Gram's stain reveals gram-positive branching filamentous bacteria that undergo septation in both transverse and longitudinal planes to form coccoid bodies.

Contributor. University of Pennsylvania, Philadelphia, PA.

Suggested reading. Montali, R. J., Smith, E. E., et al.: Dermatophilosis in Australian bearded lizards. J. Am. Vet. Med. Assoc. 167(7): 553-555, 1975.

Slide 84

History. Tissue from a 13-year-old female golden retriever. A multinodular dermal mass developed on the lateral aspect of the left thigh, with several recurrences over a 2-year period. Radiographs revealed metastatic pulmonary nodules.

Diagnosis. Malignant hair follicle tumor.

Comment. The morphologic differentiation between common benign hair follicle tumors and the rare malignant forms is often not clear, and that diagnosis requires careful observation of multiple sections.

Contributor. Department of Pathobiology, University of Tennessee, Knoxville, TN.

Suggested reading. Sells, D. M., and Conroy, J. D.: Malignant epithelial neoplasia with hair follicle differentiation in dogs. J. Comp. Pathol. 86: 121-129, 1976.

Slide 85

History. This mature female New Zealand white rabbit was one of seven females and five males that had died or were destroyed in an SPF colony. Affected animals were depressed and emaciated.

Gross Pathology. Kidneys were firm and gritty when cut. The aorta was mineralized.

Diagnosis. Osteodystrophy, with dysplastic osteoid and osteosclerosis, unspecified long bone.

Comment. Most bone surfaces are covered by abnormal osteoid that is highly cellular with a fibrillar-to-floccular basophilic matrix. The basophilia is not due to mineralization but to altered staining characteristics of the abnormal osteoid that has been produced by activated osteoblasts. The mechanism of alteration and the composition of this abnormal osteoid are unknown.

Contributor. Division of Veterinary Biology, Murdoch University, Western Australia.

Slide 86

History. This 11-year-old golden retriever was referred with a history of hindlimb paresis that progressed over 48 hours to bilateral hindlimb paraplegia.

Diagnosis. Osteosarcoma, metastatic, aorta.

Comment. Osteosarcoma was also found in the spinal cord and interventricular septum. A complete skeletal survey was not performed; therefore, the location of the primary tumor is not known.

Contributor. School of Veterinary Medicine, University of Wisconsin, Madison, WI.

Slide 87

History. Tissues from a 6-year-old female Saint Bernard. This dog developed two masses in the parietal and occipital bones of the skull. The masses were very firm and grew slowly for 5 to 6 months. Recently, a rapidly growing soft nodular tumor appeared to arise from one of the firm tumors and prompted the owners to request euthanasia.

Diagnosis. Osteoma and chondroma of the canine skull, malignant, multilobular (synonymous with chondroma rodans, malignant).

Comment. This case represents one of the less well-differentiated examples of the chondroma rodans of the canine skull that has only recently undergone a more malignant change.

Contributor. University of California, Davis, CA.

Suggested reading. Diamond, S. S., Raflo, C. P., and Anderson, M. P.: Brief communications—Multilobular osteosarcoma in the dog. Vet. Pathol. 17: 759-760, 1980.

Slide 88

History. Tissue from a 9-year-old male Irish setter dog with a sudden swelling of the mandibular salivary gland on the left side of the neck.

Diagnosis. Infarct, with peripheral neovascularization, fibrosis, and ductal regeneration.

Comment. The cause of the infarction was not apparent from the biopsy material received. This lesion has been reported to be idiopathic in the dog.

Contributor. Bushy Run Research Center, Export, PA.

Suggested reading. Kelly, D. F., Lucke, V. M., et al.: Histology of salivary gland infarction in the dog. Vet. Pathol. 16: 438-443, 1979.

Slide 89

History. This spayed female terrier cross dog was presented because of intermittent vomition, dyspnea, and anorexia of 1 week's duration. She had reddened oral mucous membranes, ulcers on the tongue, red pinnae, anisocoria, and glazed corneas and was ataxic.

Diagnosis. Suppurative dermatitis and folliculitis with parakeratotic hyperkeratosis and intraepidermal microabscesses, caused by thallium intoxication.

Comment. Thallitoxicosis used to be relatively common in this country until thallium was banned from general use over 20 years ago. The histologic findings of parakeratotic hyperkeratosis and intraepidermal and follicular spongiform microabscesses are diagnostic of thallitoxicosis.

Contributor. Veterinary Laboratory Services, Guelph, Ontario.

Suggested reading. Ruhr, L. P., and Andries, J. K.: Thallium intoxication in a dog. J. Am. Vet. Med. Assoc. 186(5): 498, 1985.

Slide 90

History. Tissue from a 1-day-old male Angus/Chianina cross bovine. This calf was very weak at birth, and the owner requested euthanasia.

Gross Pathology. The entire skin was covered with thick, horny epidermis that was divided into large plates by deep fissures. There was an absence of hair all over the body, but short stubbles were observed at the bottom of the fissures.

Diagnosis. Hyperkeratosis, with absence of the granular cell layer (hypogranulosis).

Comment. Congenital ichthyosis has been reported in cattle, dogs, and humans.

Contributor. School of Veterinary Medicine, Tuskegee University, AL.

Suggested reading. Muller, G. H., Kirk, R. W., and Scott, D. W.: Small Animal Dermatology, ed. 3. Philadelphia, W. B. Saunders Co., 1983, pp. 814-815.

Slide 91

History. Tissue from a 4-year-old terrier-schnauzer cross with a history of vomiting and diarrhea, followed 48 hours later by a sudden onset of erythema. There was marked sloughing of the epidermis 24 hours later. Treated with prednisolone (5mg BID) and Tribrissen (100 mg BID P.O.).

Diagnosis. Erythema multiforme, probably secondary to Tribrissen therapy.

Comment. The pathogenesis of erythema multiforme in humans, cats, cattle, horses, and dogs is not well understood; however, it is thought to be a hypersensitivity reaction. The severe dyskeratosis in this case is characteristic of erythema multiforme.

Contributor. University of Pennsylvania, Philadelphia, PA.

Suggested reading. Scott, D. W., Miller, W. H., and Goldschmidt, M.H.: Erythema multiforme in the dog. J. Am. Anim. Hosp. Assoc. 19: 453-459, 1983.

Slide 92

History. This 10-month-old swine stag was presented for slaughter. It had an unhealthy appearance at antemortem exam, with skin lesions covering the face, neck, shoulder, abdomen, flank, and thigh.

Diagnosis. Demodectic mange caused by Demodex phylloides.

Comment. Usually affected pigs are otherwise healthy, and demodex lesions are easily missed at antemortem inspection; however, after scalding, multiple epidermal nodules (enlarged follicles) are visible. Inflammation is typically absent or minimal around intact follicles.

Contributor. USDA FSIS Science Eastern Laboratory, Athens, GA.

Suggested reading. Harland, E. C., Simpson, C. F. and Neal, F. C.: Demodectic mange of swine. J. Am. Vet. Med. Assoc. 159(12): 1752-1754, 1971.

Slide 93

History. Tissue from an 8-hour-old all-white filly (from registered paint, overo spotted parents) that was normal at birth. She stood and nursed. No defecation was noted. Signs of colic began 6 hours after birth. Euthanasia was performed.

Diagnosis. Aplasia of the submucosal (Meissner's) and myenteric (Auerbach's) ganglia, ileum and colon.

Comment. Ileocolonic aganglionosis in white progeny of overo spotted horses should not be confused with the lethal dominant white gene, which is not associated with white spotting and results in embryonic death in homozygotes. Heterozygotes are white and normal. Congenital colonic aganglionosis has also been reported in the mouse and in humans.

Contributor. College of Veterinary Medicine, Oregon State University, Corvallis, OR.

Suggested reading. Vonderfecht, S. L., Bowling, A. T., and Cohen, T.: Congenital intestinal aganglionosis in white foals. Vet. Pathol. 20: 65-70, 1983.

Slide 94

History. This 14-day-old male thoroughbred equine was normal until it reached 4 days of age, when there was a sudden onset of depression, icterus, tachycardia, tachypnea, anorexia, incoordination, and a temperature of 104.2° F. Neonatal isoerythrolysis was diagnosed. Despite being given blood transfusions, fluids, antibiotics, and supportive therapy, the foal became weaker and more icteric and started to have seizures. Ten days after presentation the foal died.

Gross Pathology. All subcutaneous tissues, as well as the sclera and mucous membranes, were markedly icteric. The liver was green. The cortices of both kidneys were bright green. The stomach contained multiple ulcers of the squamous mucosa along the margo plicatus.

Diagnoses. 1. Hepatocellular degeneration, with individual hepatocyte necrosis, hepatocyte dissociation and megalocytosis, biliary hyperplasia, erythrophagocytosis, and hemosiderosis. 2. Nephrosis, with intratubular and tubular epithelial bile pigment. Lesions are secondary to neonatal isoerythrolysis.

Comment. Neonatal isoerythrolysis or hemolytic anemia of the newborn, a disease of passive immunity, can be induced iatrogenically or can occur naturally. The disease results when foal erythrocytes are destroyed by alloantibodies produced by the mare as a result of alloimmunization by foreign erythrocyte antigenic factors the foal inherited from the stallion that are not possessed by the mare.

Contributor. University of Pennsylvania, New Bolton Center, Kennett Square, PA.

Suggested reading. Becht, J. L.: Neonatal isoerythrolysis in the foal. Part 3. Background, blood group antigens, and pathogenesis. Compendium Continuing Education 5: S591-S599, 1983.

Slide 95

History. This 8-year-old quarter horse mare has been barren for 2 years. She successfully carried one foal to term 2 years ago.

Diagnosis. Chronic, mild endometritis.

Comment. This mare was placed in prognosis group II: Looks infected, no permanent damage, should have normal fertility when infection is cleared.

Contributor. Merck, Sharp, and Dohme Research Labs., West Point, PA.

Suggested reading. Gordon, L. R., and Sartin, E. M.: Endometrial biopsy as an aid to diagnosis and prognosis in equine infertility. J. Equine Med. Surg. 2: 328-336, 1978.

Slide 96

History. Mass from the upper lip of a 6-year-old castrated male Arabian horse. The mass was present about 1 month.

Diagnosis. Mastocytosis.

Comment. It is not clear whether this condition is neoplastic or inflammatory. The mast cells are well-differentiated; metastases are not reported; and spontaneous regression has been reported.

Contributor. Veterinary Laboratory Services, Guelph, Ontario, Canada.

Suggested reading. Cheville, N. F., Prasse, K., et al.: Generalized equine cutaneous mastocytosis. Vet. Path. 9: 394-407, 1972.

Slide 97

History. A flock of approximately 100 captive waterfowl representing 15 different species is maintained on a small enclosed pond. Recent weather had been hot and dry, and an

unusually large number of Daphnia were noticed in the pond. Recent bird mortality had been intermittent but had increased above normal. The submitted tissue is from a trumpeter swan, age unknown.

Diagnosis. Granuloma, proventriculus, caused by Echinuria uncinata.

Comment. The hot dry weather created good conditions for algal growth, which in turn led to an increase in the Daphnia population. Daphnia are the intermediate host for this parasite, and thus ideal conditions for parasite transmission developed. The cause of death is starvation. The parasite-containing nodules bulge into the lumen of the proventriculus at its junction with the esophagus and create a functional obstruction.

Contributor. University of New Hampshire, Durham, NH.

Suggested reading. Davis, J. W., Anderson, R. C., et al. (Eds.): Infectious and Parasitic Diseases of Wild Birds. Ames, Iowa State University Press, 1971, pp. 207-217.

Slide 98

History. An adult (11-year-old) female greater bush baby. The animal had appeared normal before it was found dead in its cage.

Diagnosis. Multihormonal islet cell carcinoma of the pancreas.

Comment. Immunohistochemical staining revealed positive reaction of antibody to insulin, glucagon, somatostatin, neuron-specific enolase, and pancreatic polypeptide.

Contributor. C. E. Kord Animal Disease Laboratory, Nashville, TN.

Suggested reading. Holscher, M. A., Sly, D. L., Wilson, R. B., Davis, B. W., and Jones, W. R.: Multihormonal islet cell carcinoma in a greater bushbaby (Galago crassicaudatus argentatus). Vet. Pathol. 23(1): 80-82, 1986.

Slide 99

History. This adult male crossbreed bovine died a few days after it was dehorned by the farmer.

Laboratory Results. No bacterial isolations were performed.

Diagnosis. Necrogranulomatous meningoencephalitis with necrotizing vasculitis, thrombosis, and hemorrhage.

Comment. Associated with these inflammatory foci, there are gram-negative fine filamentous rods that are compatible with Fusobacterium necrophorum and gram-positive coccobacilli.

Contributor. Veterinary Research Institute, Onderstepoort, Republic of South Africa.

Slide 100

History. Tissue from a 5-year-old male domestic long-hair feline with cutaneous nodules on the lateral margin of the left ear.

Diagnosis. Granulomatous dermatitis. Etiology--Leishmania sp.

Comment. No evidence exists that the cutaneous infection extends to visceral sites. The animal's health is excellent, without local recurrence.

Contributor. Department of Veterinary Pathology, Texas A&M University, College Station, TX.

Suggested reading. Chapman, W. L., Jr., and Hanson, W. L.: Leishmaniasis. In Clinical Microbiological and Infectious Diseases of the Dog and Cat, edited by Greene, C. E. Philadelphia, W. B. Saunders Co., 1984, Chap. 51, pp. 764-770.