Syllabus

VETERINARY PATHOLOGY DEPARTMENT, AFIP,

WEDNESDAY SLIDE CONFERENCE

1975-1976

ARMED FORCES INSTITUTE OF PATHOLOGY

Washington, D.C. 20306

M11076

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100 microslides

Prepared by

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PREFACE

The Department of Veterinary Pathology, Armed Forces Institute of Pathology, has conducted the Wednesday Slide Conference for more than two decades. The cases presented each Wednesday throughout the academic year are also distributed to 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 for each case and a synopsis of the discussion for most cases are 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 some cases in this syllabus for succinctness.

A selection of 100 cases, including 100 microslides, has been made from the 120 cases studied during the 1975-1976 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

Slice number	Animal	Tissue	Diagnosis
1	Dog	Skin	Lymphosarcoma
2	Opossum	Skin	Besnoitiosis
3	Goat	Skin	Contagious ecthyma
4	Chicken	Peritoneum	Adenocarcinoma of ovary
5	Pigeon	Liver	Granulomatous hepatitis caused by *Escherichia coli*
6	Chicken	Heart	Pullorum disease
7	Quail	Liver	Tuberculosis
8	Horse	Liver	Rhinopneumonitis
9	Cat	Lung	Feline rhinotracheitis
10	Horse	Liver	Equine infectious anemia
11	Pig	Nasal cavity	Inclusion body rhinitis
12	wallaby	Brain	Actinobacillosis
13	Chimpanzee	Tongue, esophagus	Candidiasis
14	Dog	Tumor	Osteoclastoma (giant cell tumor)
15	Mouse	Spleen	Megakaryocytic myelosis

16	Mouse	Liver	Mast cell leukemia
17	Rat	Brain	Granular cell myeloblastoma
18	Horse	Brain	Candidiasis
19	Cow	Brain	Salt poisoning
20	Dog	Tumor	Calcifying aponeurotic fibroma (chondroma rodens)
21	Rabbit	Cecum	Typhlitis associated with vibrio
22	Cat	Small intestine	Acute intestinal radiation injury
23	Calf	Small intestine	Enteritis induced by reovirus, coronavirus, and Cryptosporidium
24	Rhesus monkey	Colon	Cystic hyperplasia due to polychlorinated biphenyls
25	Sheep	Kidney	Hemoglobin nephrosis due to copper toxicity
26	Horse	Kidney	Coccidiosis caused by Klossiella equi
27	Sea lion	Kidney	Transitional cell carcinoma
28	Rat	Heart	Endomyocardial disease
29	Mastomys	Stomach	Gastric carcinoid
30	Rat	Adrenal	Pheochromocytoma
31	Cat	Lung	Toxoplasmosis
32	Rat	Lung	Pneumocystosis

33	Rhesus monkey	Lung	Nocardial pneumonia
34	Dog	Lung, liver, kidney, spleen	Histoplasmosis
35	Rhesus monkey	Lung	Measles pneumonia
36	Cynomolgus monkey	Liver	Capillaria hepatica
37	Deer	Tumor	Cutaneous fibroma (viral)
38	Dog	Liver	Postcaval syndrome caused by Dirofilaria immitis
39	Chinchilla	Lung	Extension of trophoblast to lungs
40	Bear monkey	Lung	Pulmonary fibrosis from paraquat toxicity
41	Camel	Heart	Nutritional cardiomyopathy resulting from vitamin E deficiency
42	Dog	Brain	Hexachlorophene toxicity
43	Dog	Liver	Toxic hepatitis resulting from aflatoxin
44	Cow	Liver	Infarct, bacillary hemoglobinuria
45	Cow	Lung	Allergic bronchiolo-alveolitis
46	Cow	Rumen	Mucormycotic rumenitis
47	Cow	Lung	Fibrinous pneumonia (pasteurellosis)
48	Mouse	Skin	Normal skin from a nude mouse
49	Mouse	Lung	Sendai virus infection

50	Degu	Middle ear	Otitis media caused by *Pseudomonas aeruginosa*
51	Rabbit	Intestine, liver	Tyzzer's disease
52	Duck	Cloaca	Duck viral enteritis
53	Cynomolgus monkey	Liver, spleen	Visceral leishmaniasis caused by *Leishmania donovani*
54	Cat	Mass	Juvenile mammary hypertrophy
55	Guinea pig	Brain	Encephalitozoonosis
56	Dog	Kidney	Focal interstitial nephritis resulting from infectious canine hepatitis virus
57	Dog	Ovotestis	Hermaphrodite
58	Chicken	Mass	Gout
59	Mouse	Liver, kidney, lung	*Klebsiella pneumoniae* septicemia
60	Dog	Mass	Mummified extrauterine fetus
61	Crane	Eye	Cataract
62	Horse	Mass	Hemorrhagic nasal polyp
63	Mouse	Ovary	Granulosa cell tumor
64	Goat	Liver, spleen, lymph node, pancreas	Johne's disease
65	Rat	Salivary gland	Sialoadenitis (viral)
66	Dog	Small intestine	Chronic atrophic enteritis

67	Cat.	Tumor	Malignant mixed mammary tumor
68	Chicken	Bursa	Infectious bursal disease
69	Cat	Lung	Pulmonary parasitism caused by *Aelurostrongylus abstrusus*
70	Sturgeon	Heart	Normal epicardium containing lymphoid tissue
71	Marmoset monkey	Intestine, lymph node	Acanthocephaliasis and cysticercosis
72	Guinea pig	Lymph node	Lymphadenitis caused by group C streptococci
73	Dog	Brain	Focal encephalomalacia caused by *Dirofilaria immitis*
74	Lamb	Brain	Polioencephalomalacia
75	Rat	Vessels	Polyarteritis nodosa
76	Dog	Tumor	Malignant melanoma
77	Steer	Skin	Mycotic dermatitis probably caused by *Trychophyton verrucosum*
78	Lizard	Skin	Lesions caused by *Dermatophilus congolensis*
79	Pig	Kidney	Polyarteritis
80	Dog	Uterus	Subinvolution of placental sites
81	Goat	Bone	Fibrous osteodystrophy
82	Cat	Liver	Feline herpesvirus infection
83	Rhesus monkey	Kidney	Toxic nephrosis from gentamycin
84	Chicken	Tumor	Teratoma

85	Mastomys	Tumor	Thymoma
86	Dog	Liver	Trematodiasis
87	Dog	Spleen, liver	Tuberculosis
88	Sheep	Lung	Infection from Protostrongylus rufescens and Pasteurella hemolytica
89	Dog	Tumor	Benign calcifying epithelioma
90	Falcon	Liver, spleen	Inclusion body disease (herpesvirus)
91	Cow	Kidney	Toxic nephrosis caused by Amaranthus retroflexus
92	Dog	Tumor	Dysgerminoma
93	Mastomys	Spinal column	Multiple herniated inter-vertebral discs
94	Rhesus	Heart	Myocarditis caused by Trypanosoma cruzi
95	Duck	Skeletal muscle, gizzard	Nutritional myopathy resulting from vitamin E deficiency
96	Calf	Lung	Pneumonitis from consumption of diesel fuel
97	Cat	Bone	Osteodystrophy, nutritional
98	Rat	Tumor	Osteosarcoma
99	Dolphin	Lung	Phycomycosis
100	Rat	Kidney	Chronic renal disease

COMMENTARY ON SLIDES

Slide 1

History. This tissue is from a 10-year-old male Scotty dog. The dog had pruritis, thick scales and crusts, plus lichenification over the body of six months' duration. There were multiple thick skin eruptions along the side and flank.

Diagnosis. Lymphosarcoma with cutaneous involvement.

Comment. Infiltrations of neoplastic lymphocytes were seen in the liver, kidneys, adrenals, spleen, lymph nodes, and skin. Many attendees commented on the distribution of the cells about hair follicles and wondered if this was related to the vascular distribution or to some other factor.

Contributor. Department of Veterinary Medicine, Oregon State University, Corvallis, Oregon.

Slide 2

History. This tissue is from a wild opossum that was observed to be acting abnormally. After it was killed, concern was expressed about numerous irregularly scattered focal white nodules apparent on all areas of the skin. The nodules were approximately 1 mm in diameter and were found in hairy and bare areas. Similar nodules were found in skeletal and cardiac muscle and in lung.

Diagnosis. Besnoitiosis.

Suggested reading. Conti-Diaz, I. A., Turner, C., Tweeddale, D., et al.: Besnoitiasis in the opossum (Didelphis marsupialis). J. Parasitol. 56(3): 457-460, 1970.

Flatt, R. E., Nelson, L. R., and Patton, N. M.: *Besnoitia darlingi* in the opossum. Lab. Anim. Sci. 21(1): 106-109, 1971.

Contributor. Department of Veterinary Science, University of Nebraska, Lincoln, Nebraska.

Slide 3

History. This tissue from a goat is a biopsy specimen of a lesion of the oral mucosa. The lesion was 4 mm in diameter, elevated, and roughened.

Diagnosis. Ulcerative cheilitis, consistent with contagious ecthyma.

Comment. Eosinophilic inclusion bodies were present in several of the ballooned and degenerated epithelial cells.

Suggested reading

Grieg, H. S.: Contagious ecthyma in sheep. I. Attempts to infect other hosts. Can. J. Comp. Med. & Vet. Sci. 20: 448-452, 1956.

Kluge, J. P.: Ultrastructural studies of contagious ecthyma in sheep. Am. J. Vet. Res. 33: 1191-1200, 1972.

Contributor. Bureau of Biologics, Food & Drug Administration, Bethesda, Maryland.

Slide 4

History. This is tissue from an adult chicken. The material submitted consisted of multifocal, white, firm nodules adhering to the mesentery and intestines.

Diagnosis. Adenocarcinoma of the ovary.

Comment. Some attendees felt that the oviduct was a more likely site of origin for this neoplasm, but most attendees' experience with this tumor was limited and no conclusion was reached.

Contributor. Department of Veterinary Medicine, Oregon State University, Corvallis, Oregon.

Slide 5

History. This is tissue from an 8-year-old female white Carneau pigeon that had been on neuropharmacology experiments for the last six years and had received a restricted diet and multiple intramuscular (pectoral) injections of distilled water. A day before death the bird was listless.

Diagnosis. Multiple granulomas of the liver consistent with Escherichia coli septicemia.

Comment. This markedly debilitated pigeon presented an encapsulated reddish brown mass (1 x .4 x 5 cm) that replaced the pectoral muscles. The cut surface of the mass resembled indurated hematoma. Multiple tan masses (1-5 mm in diameter) were present in the lungs, liver, kidneys, and spleen. E. coli and Salmonella typhimurium (var. Copenhagen) were cultured from these granulomas. Attempts to isolate Mycobacterium tuberculosis were unsuccessful. Special stains of tissues failed to reveal any causative organisms. S. typhimurium is probably a secondary invader.

Contributor. National Environmental Research Center, Research Triangle Park, North Carolina.

Slide 6

History. The mortality rate in a flock of 1,500 2-week-old chickens was 15 percent. Signs were "crying-up" and "chilling."

Diagnosis. Pullorum disease.

Comment. Salmonella pullorum was cultured from the liver and abdominal cavity.

Contributor. C. E. Kord Animal Disease Diagnostic Laboratory, Nashville, Tennessee.

Slide 7

History. This is tissue from a 1-year-old bobwhite quail that died suddenly. This bird was 1 of 4 purchased from a breeder 4 months earlier and added to an existing flock of 10. All other birds appeared normal to the owner.

Diagnosis. Granulomatous hepatitis; tuberculosis.

Comment. Numerous acid-fast bacilli were demonstrated by the Ziehl-Neelsen method for acid-fast bacteria. Culture material was not available. Many attendees commented on the fibrillar, eosinophilic material in the sinusoids. This was thought to be amyloid. Amyloidosis is a frequent finding in cases of avian tuberculosis seen at the National Zoo.

Contributor. Veterinary Pathology Branch, Edgewood Arsenal, Aberdeen, Maryland.

Slide 8

History. This is tissue from an aborted foal. No other abortions had occurred from the herd of 32 animals. The mare had been off feed for 2 days and then aborted a foal at 9 months' gestation. She had been vaccinated for equine rhinopneumonitis on July 1, 1974, and on Sept 4, 1974. The abortion occurred on Feb 5, 1975.

Diagnosis. Equine rhinopneumonitis viral abortion.

Comment. Grossly, there was hyperemia and hemorrhage on the tracheal and esophageal mucosa. Petechial hemorrhages were present on the pleural surfaces of the lung, with much edema in the interlobular spaces. There was a large amount of a pale-yellow clear fluid in the thoracic cavity. Numerous pinpoint white foci were visible on the capsular surface of the liver. The virus was isolated and identified.

Contributor. Department of Pathology, Michigan State University, East Lansing, Michigan.

Slide 9

History. Four kittens from the same litter became sick at eleven days of age, exhibiting clinical signs of sneezing, coughing, gasping, and ocular discharge. The kittens were from a cattery that had problems with Salmonella infections, panleukopenia, and aspergillosis.

Diagnosis. Necrotizing bronchiolitis; feline rhinotracheitis.

Comment. There was a generalized pneumonia, with approximtely 80 percent of the lungs being affected, and inflammation of the tracheal and nasal mucosa. Numerous intranuclear inclusion bodies were present within the lung.

A virus was isolated that resembled the herpesvirus of feline rhinotracheitis. No specific antiserum was available for definitive identification.

Contributor. Department of Pathology, Michigan State University, East Lansing, Michigan.

Slide 10

History. This is tissue from a 7-year-old horse that had signs of depression, anorexia, anemia, and biphasic temperature rise.

Diagnosis. Equine infectious anemia (EIA).

Comment. A gel precipitation test for equine infectious anemia antibody was positive. Inflammatory changes in the heart, liver, and kidney were consistent with EIA. Many attendees commented on the marked bile stasis and questioned whether bile stasis was characteristic of the disease.

Contributor. C. E. Kord Animal Disease Diagnostic Laboratory, Nashville, Tennessee.

Slide 11

History. This is tissue from 4-week-old pigs with a history of "crying up."

Diagnosis. Inclusion body rhinitis.

Contributor. C. E. Kord Animal Disease Diagnostic Laboratory, Nashville, Tennessee.

Slide 12

History. This is tissue from a 2-year-old female wallaby. The eye and orbital tissue were removed 3 months prior to death because the eye had become proptosed and the cornea was lacerated. The wallaby continued to get weaker and was apparently blind for 2 or 3 weeks before death. A soft yellowish-green mucoid material was found at the base of the brain in the area of the optic chiasma.

Diagnosis. Suppurative meningoencephalitis; actinobacillosis.

Comment. An organism similar to those of Actinobacillus genus was isolated from the eye lesion. The brain lesion was apparently an extension from the eye lesion via the optic nerve. The sulfur granules were gram-negative when a MacCallum-Goodpasture stain was applied to sections of this tissue. Many attendees were interested in the peculiar arrangement of vessels within some of the sections in which an artery and vein were immediately adjacent to one another and both were surrounded by eosinophilic material. This is a normal finding in this species. In addition, some attendees found a protozoan cyst morphologically compatible with Toxoplasma gondii within some of the sections. This was not present in all sections and was considered an incidental finding. It should be noted that a lumpy jawlike syndrome has been reported in macropods.

Contributor. Department of Veterinary Science, University of Nebraska, Lincoln, Nebraska.

Slide 13

History. This is tissue from an 8-month-old chimpanzee (Pan troglodytes) that had recently been imported from Africa. The animal developed an upper respiratory condition, was treated, became anorectic and depressed, and was found dead.

Diagnosis. Candidiasis, tongue and esophagus.

Comment. Excessive antibiotic therapy was probably contributory.

Contributor. Bureau of Biologics, Food & Drug Administration, Bethesda, Maryland.

Slide 14

History. This is tissue from a 12-year-old female St. Bernard. The tissue submitted is a biopsy specimen from a growth on the right side of the face.

Diagnosis. Osteoclastoma (giant cell tumor).

Comment. Radiographs revealed lysis of the zygomatic arch and maxilla. Many attendees expressed confusion over what constitutes a giant cell tumor in animals. Most considered it to be a distinct entity with behavior somewhat different from an osteosarcoma.

Contributor. Department of Veterinary Medicine, Oregon State University, Corvallis, Oregon.

Slide 15

History. This is tissue from a 20-month-old male NZB mouse that died spontaneously.

Diagnosis. Megakaryocytic myelosis, spleen.

Comment. Other organs with similar lesions included lymph nodes, bone marrow, and, to a lesser degree, liver.

Suggested reading. Rappaport, H.: Tumors of the Hematopoietic System. Atlas of Tumor Pathology, Section III, Fascicle 8, Washington, D.C., Armed Forces Institute of Pathology, 1966, pp. 294-300.

Contributor. Institute for Experimental Gerontology, TNO, Rijswijk, The Netherlands.

Slide 16

History. This is tissue from a 26-month-old Swiss Webster (NIH) mouse. Grossly, liver and spleen were markedly enlarged.

Diagnosis. Mast cell leukemia.

Comment. The diagnosis was confirmed by the toluidine blue stain.

Contributor. Merck Institute for Therapeutic Research, West Point, Pennsylvania.

Slide 17

History. This is tissue from a 35-month-old female BN/Bi rat that died spontaneously. It was in a colony of rats maintained for gerontological studies and had not been subjected to any experimental procedures.

Diagnosis. Granular cell tumor (granular cell myeloblastoma).

Comment. The PAS reaction confirmed the presence of PAS-positive, diastase-resistant granules in the cytoplasm of the tumor cells. (This rat also had a pituitary adenoma that is not included.)

Suggested reading. Hollander, C. F., Burek, J. D., Boorman, G. A., et al.: Granular cell tumors of the central nervous system of the rat. Arch. Pathol. Lab. Med. 100(8): 445-447, 1976.

Contributor. Institute for Experimental Gerontology, TNO, Rijswijk, The Netherlands.

Slide 18

History. A mature quarter mare was a known equine infectious anemia carrier. After a sudden episode that caused her to go through a high woven-wire fence, she became blind in the right eye. The mare would force her head against the ceiling of the stall and stagger in a circular direction. This occurred several times daily for 3 weeks. Her temperature never exceeded 101°F. She eventually became recumbent and died.

Diagnosis. Candidiasis. (C. parapsilosis was isolated.)

Comment. Many of the giant cells were shown by special staining techniques to contain fungal elements. It was suggested by some attendees that the extensive necrosis noted in some of the slides was ischemic and perhaps reflected vascular damage by the fungus.

Contributor. Pathology Department, The Animal Medical Center, New York, New York.

Slice 19

History. Fifty-one Holstein heifers and dry cows were moved to a pasture on June 10. On August 8, 21 were found dead and 5 recumbent. The remaining 25 were gaunt and depressed and stood motionless. Several were blind. One of the recumbent heifers had gone through two fences before collapsing in a field about a mile from the pasture.

Diagnosis. Laminar necrosis of the cerebrum associated with drinking water of a high saline content.

Comment. The source of the drinking water was a slough with a new dugout at its edge. The slough had dried up shortly before August 8. Analysis of the dugout water as to dissolved solids is as follows:

Substance	Quantity (ppm)
Ca	400
Mg	2,017
Na	958
P	102
HCO3	200
CO3	120
SO4	10,500
NO3	0
Cl	52

Contributor. Department of Veterinary Science, South Dakota State University, Brookings, South Dakota.

Slide 20

History. This tissue was removed from the subcutis over the occipital area of a 9-year-old Boston terrier. The mass was reported to be attached to the skull. The specimen submitted for examination was approximately 3 inches in diameter and was gritty on cut surface.

Diagnosis. Calcifying aponeurotic fibroma (chondroma rodens).

Comment. This neoplasm elicited a discussion at the conference as to its histogenesis. All agreed that it represented the same tumor as described by Liu and Dorfman and termed a "calcifying aponeurotic fibroma." Differentiating the lesion from an extracranial meningioma that contained cartilage was also discussed. It was mentioned that the malignant potential of the neoplasm was unclear except for its local invasive properties. The conference attendees agreed that the neoplasm, although its histogenesis was not clearly understood, represented a distinct entity characterized by a multilobular pattern of fibroblastic cells surrounding variable amounts of cartilaginous and osseous tissue. During the conference it was brought out that the WHO Committee on the histologic classification of animal neoplasms had chosen the name "chondroma rodens" because of the cartilaginous component of the neoplasm and its apparent close similarity to the tumor originally described by Jacobson.

Suggested reading

Geib, L. W.: Ossifying meningioma with extracranial metastasis in a dog. Path. Vet. 3: 247-254, 1966.

Jacobson, S. A.: The Comparative Pathology of Tumors of Bone. Thomas Publishers, Springfield, Ill., 1971, pp. 102-109.

Liu, S. K., and Dorfman, H. D.: The cartilage analogue of fibromatosis (juvenile aponeurotic fibroma) in dogs. Vet. Path. 11: 60-67, 1974.

Contributor. Department of Comparative Medicine, The Milton S. Hershey Medical Center, Pennsylvania State University, Hershey, Pennsylvania.

Slide 21

History. This is a section of cecum from a weanling rabbit with an acute diarrheal disease. Such a problem, with a mortality rate less than 5 percent, had persisted in a low percentage of rabbits from the colony for several years.

Diagnosis. Acute typhlitis associated with vibrio.

Suggested reading. Moon, H. W., Cutlip, R. C., Amtower, W. C., et al.: Intraepithelial vibrio associated with acute typhlitis of young rabbits. Vet. Path. 11: 313-326, 1974.

Contributor. National Animal Disease Laboratory, Ames, Iowa.

Slide 22

History. These are sections from the midportion of the small intestine of two adult female cats. One specimen is from a cat in clinically good health, and the other is from a cat that died 4 days following experimental treatment. The latter animal had no appetite following treatment, but she continued to drink water. She vomited yellow, frothy liquid frequently on the third post-treatment day and became severely depressed. There was no diarrhea.

Laboratory results were as follows:

Days post treatment	Wt.(g)	Temp. (°F.)	PCV	WBC (per mm3)	Neutrophils(%)	Lymphocytes(%)	Monocytes	Eosinophils(%)
0	3,300	100.6	39	9,400	66	30	2	2
1		100.0	42	5,500	100	0	0	0
2	3,200.	101.0	42	3,800	100	0	0	0
3		101.4	47	160	------too few to count------			
4	3,020	Dead						

Diagnosis. Acute intestinal radiation injury.

Suggested reading

Thomassen, R. W.: Acute intestinal radiation injury in the cat. Abstracts of intestinal pathology cases. Vet. Path. 9: 78-88, 1972.

Kent, T. H., and Moon, H. W.: The comparative pathogenesis of some enteric diseases. Vet. Path. 10: 414-469, 1973.

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

Slide 23

History. This is tissue from a 15-day-old calf submitted from a herd of 80 cows. In December 1973 seven cows were introduced into the herd. In January 1974 the incidence of neonatal calf diarrhea (NCD) began to increase. Morbidity was 100 percent, mortality 30 percent. The calf submitted for necropsy had a watery, yellowish diarrhea that had started at 10 days of age. Grossly, severe dehydration and distension of the small intestine by yellow liquid were observed. The intestinal mucosa was normal.

Diagnosis. Enteritis (neonatal calf diarrhea) induced by a combination of reovirus, corona-like virus, and Cryptosporidium.

Comment. Large numbers of organisms with the morphological characteristics of cryptosporidia were observed on the surface of degenerating or cuboid cells covering the atrophic villi. By fluorescent antibody technique, the two Nebraska NCD viruses (reo-like and corona-like) were detected in the cytoplasm of absorptive cells in the small intestine. Reo-like virus antigen was not detected in the absorptive and crypt cells of

the colon, but coronavirus-like antigen was. Gram-stained direct smears revealed a poor bacterial flora at all levels of the jejunum, and only a few Escherichia coli were isolated.

Suggested reading

Mebus, C. A., Stair, E. L., Underdahl, N. R., et al.: Pathology of neonatal calf diarrhea induced by a reo-like virus. Vet. Path. 8: 490-505, 1971.

Mebus, C. A., Stair, E. L., Underdahl, N. R., et al.: Pathology of neonatal calf diarrhea inouced by a coronavirus-like agent. Vet. Path. 10: 45-64, 1973.

Morin, M.: A case of viral neonatal calf diarrhea in a Quebec dairy herd. Can. J. Comp. Med. 38: 236-242, 1974.

Menten, D. J., Van Kruiningen, H. J., and Lein, D. H.: Cryptosporidiosis in a calf. J. Am. Vet. Med. Assoc. 165: 914-917, 1974.

Contributor. Department of Pathology, University of Montreal, St-Hyacinthe, Quebec, Canada.

Slide 24

History. This is tissue from a 3- to 4-year-old male rhesus monkey that exhibited progressive weight loss, conjunctivitis, and generalized alopecia. Terminally there was an intractable diarrhea.

Diagnosis. Cystic hyperplasia of the colon with a light mononuclear infiltrate consistent with intoxication with polychlorinated biphenyl compounds.

Comment. This animal also had severe hypertrophic gastritis. Polychlorinated biphenyl in toxic levels was recovered from the tissues.

Suggested reading. Allen, J. R., Abrahamson, L. J., and Norback, D. H.: Biological effects of polychlorinated biphenyls and triphenyls on the subhuman primate. Environ. Res. 6: 344-354, 1973.

Contributor. Comparative Pathology Section, National Institutes of Health, Bethesda, Maryland.

Slide 25

History. Seven male sheep in a herd of 40 animals died over a period of 3 weeks. The animals had been purchased 3 months previously and were maintained in a pasture around an old school house. The animal attendant stated that up until death the submitted animal was "bicycling" with all four feet while lying on his side. Necropsy showed the animal to be in excellent condition and relatively free of gastrointestinal parasites. All of the body fat was very yellow, and there was a moderate amount of peripancreatic fat necrosis. The urine was "coffee colored" and was positive for occult blood and negative for bilirubin.

Diagnosis. Hemoglobin nephropathy associated with chronic copper toxicity.

Comment. Liver analysis showed 280 ppm of copper. It was later determined that prior to purchase animals were heavily parasitized and were treated with copper sulfate. Some attendees commented that while they agreed with the diagnosis they considered the kidney lesions not to be entirely typical of an "acute" lethal episode of chronic copper poisoning. That is, there was little or no ongoing necrosis of tubular epithelial cells but rather a dilatation of tubules with some regenerative-appearing epithelial cells and some interstitial looseness and fibroblastic proliferation. This may indicate

a previous acute episode. The liver content of copper is below critical levels. These findings suggest that other factors may have also contributed to the death of this animal.

Suggested reading. Brown, S. R., Weiss, F. R., Keller, A. I., et al.: Evaluation of the renal toxicity of heme proteins and their derivatives: A role in the genesis of acute tubule necrosis. J. Exp. Med. 131: 443-460, 1970.

Contributor. Department of Pathology, University of Florida, Gainesville, Florida.

Slide 26

History. A 2-year-old standard-bred mare was presented for left head-tilt and circling to the right. Euthanasia was recommended, after neurological examination. The kidneys appeared congested at the time of necropsy.

Diagnosis. Renal coccidiosis; etiology, Klossiella equi.

Comment. Numerous schizogonic and sporogenous stages of Klossiella equi can be seen in the epithelial cells of the thick limb of Henle's loop. The proposed life cycle of this parasite is discussed in the reference cited. In addition, focal hemorrhage and malacia were observed in the left pyriform lobe of the brain, pons, and medulla, grossly and histologically. Organisms resembling Toxoplasma gondii were present in these lesions.

Suggested reading. Vetterling, J. M., and Thompson, D. E.: Klossiella equi Bauman, 1946 (Sporozoa: Eucoccidia: Adeleina) from equids. J. Parasitol. 58: 589-594, 1972.

Contributor. Department of Veterinary Pathology, Ohio State University, Columbus, Ohio.

Slide 27

History. This is tissue from a sea lion that was found stranded on the beach of Los Angeles County. Despite attempts to treat the animal, it died.

Diagnosis. Transitional cell carcinoma.

Comment. Necropsy revealed a large, solid, white mass in the wall and adjacent tissue of the urinary bladder. Numerous solid, white nodules were found in the kidneys, liver, and lungs.

Contributor. Los Angeles County Department of Health, Downey, California.

Slide 28

History. This is tissue from a 33-month-old female BN/Bi rat. The rat was untreated and was killed when found moribund.

Diagnosis. Endomyocardial disease.

Comment. There were also mild changes in the kidney consistent with chronic renal disease of rats.

Suggested reading. Boorman, G. A., Hollander, C. F., and Feron, V. J.: Naturally occurring endocardial disease in the rat. Arch. Path. 96: 39-45, 1973.

Contributor. Institute for Experimental Gerontology, Rijswijk, The Netherlands.

Slide 29

History. This is tissue from a 23-month-old male Mastomys.

Diagnosis. Gastric carcinoid.

Comment. Slides stained with the Sevier-Munger silver method demonstrated the diagnostic granules in the cytoplasm of the tumor cells. These tumors are common in aged mastomys, occurring in approximately two-thirds of the males

and a third of the females. Carcinoids originate from the argyrophil cells of the gastric fundus. These cells proliferate and infiltrate the muscularis mucosa and submucosa and quickly invade the lymphatics and blood vessels. Metastasis may occur to lymph nodes, pancreas, liver, and lungs. Large amounts of histamine have been found in some of these tumors. There may be gastric and/or duodenal ulcers in tumor-bearing animals, apparently related to the excess histamine production.

Suggested reading

Stewart, H. C., and Snell, K. C.: Mastomys: Their rare disease patterns make them distinctive animal models. Comp. Path. Bull. 6(3): 1-4, 1974.

Hollander, C. F., and Higginson, J.: Spontaneous cancers in Praomys (Mastomys) natalensis. J. Nat'l. Cancer Inst. 46: 1343-1355, 1971.

Contributor. Tumor Pathology Section, National Cancer Institute, Bethesda, Maryland.

Slide 30

History. This is tissue from a 2-year-old rat.

Diagnosis. Pheochromocytoma.

Comment. Widespread metastatic lesions were seen in the abdominal cavity.

Contributor. Merck Institute for Therapeutic Research, West Point, Pennsylvania.

Slide 31

History. This is tissue from a female adult cat purchased from a vendor and treated for 3 weeks prior to death for a respiratory condition. She had received antibiotics, steroids, and fluids.

Diagnosis. Toxoplasmosis.

Comment. At autopsy the cat was seen to have a sinusitis, pleural edema, and heavy, moist, mottled lungs. Pasteurella multocida was isolated from the upper respiratory exudates. Feline rhinotracheitis or calicivirus infection had been suspected clinically. The toxoplasma pneumonia was not suspected, and other agents were not identified.

Suggested reading. Jones, S. R.: Toxoplasmosis: A review. J. Am. Vet. Med. Assoc. 163(9): 1038-1042, 1973.

Contributor. Department of Pathology, School of Veterinary Medicine, Kansas State University, Manhattan, Kansas.

Slide 32

History. This is tissue from a female Sprague-Dawley rat that died spontaneously. The animal had been on an experimental regimen in which cortisone had been injected twice weekly for 5 months. The rat was maintained on a protein-free diet for 2 weeks prior to death.

Diagnosis. Pneumocystosis.

Suggested reading. Frenkel, J. K., Good, J. T., and Shulty, J. A.: Latent pneumocystis infection of rats, relapse and chemotherapy. Lab. Invest. 15: 1559, 1966.

Contributor. Department of Pathology, University of Florida, Gainesville, Florida.

Slide 33

History. This is tissue from a female rhesus monkey being held in quarantine. The animal underwent a rapid decline in health, experiencing dyspnea and anorexia, which were unresponsive to antibiotic and supportive therapy.

Diagnosis. Nocardial pneumonia.

Comment. At autopsy purulent material was seen extended up the entire bronchial tree. There were firm nodules throughout the lungs. The left lobes were adhered to the rib cage. Fine filamentous branching gram-positive organisms were scattered throughout the lesions. The organisms were weakly acid-fast. Cultures obtained at necropsy revealed Nocardia asteroides.

Contributor. Pathology Department, Hazleton Laboratories, Vienna, Virginia.

Slide 34

History. This is tissue from a 9-month-old female Siberian husky. The owners had purchased the dog in Missouri at 4 months of age. Presenting clinical signs were temperature of 103.6°F., ascites, listlessness, and poor appetite. X-ray revealed that 40 to 50 percent of the thoracic space (mediastinum) contained fluid or a space-occupying lesion. Small densities were throughout the lung.

Laboratory results. Laboratory studies disclosed a white blood cell (WBC) count of 8,300/ul, with 75 percent segmented forms, 24 percent lymphocytes, and 1 percent bands; a hemoglobin level of 10 g/dl; and a packed cell volume (PCV) of 30 percent. Glucose was 83 mg/dl (normal, 60-110); BUN, 24 mg/dl (normal, 10-20); and total bilirubin, 1.3 mg/dl (normal, 0-.65), with a direct

of .4 mg/dl (normal, 0-.14). Protein was 6.4 g/dl (normal, 6-7.8), with albumin being 3.0 g/dl (normal, 2.2-4). SGPT was 35 mu/ml (normal, 3-35); SGOT, 73 mu/ml (normal, 0-34); alkaline phosphatase, 3.4 mu/ml (normal, .8-2.3); and creatine, 1.3 mg/dl (normal, 0-1.4). Urine was normal.

The possible diagnosis of thymoma was offered. Prednisolone tablets were prescribed, and the dog was sent home. Three weeks later he was returned, with a history of depression for 1 week and decreased appetite. The owners found the dog comatose and bleeding from the rectum. The temperature was 105°F., and the lung sounds were harsh. Despite intensive supportive care, the dog died.

Diagnosis. Disseminated histoplasmosis.

Comment. At autopsy the lungs contained no obvious masses. The mesentery and peritoneum were markedly thickened. The stomach had ruptured, and the contents were in the peritoneal cavity. The liver was greatly enlarged. Severe hemorrhagic enteritis was noted throughout the gastrointestinal tract. PAS and GMS stains revealed numerous Histoplasma capsulatum organisms in macrophages.

Contributor. Department of Pathology, Hazleton Laboratories, Vienna, Virginia.

Slide 35

History. This is tissue from an adult male rhesus monkey that was put to death because of a respiratory condition and questionable tuberculin test. This animal had been in a colony for one year.

Diagnosis. Giant cell pneumonia resulting from measles virus, with secondary bacterial pneumonia.

Contributor. Pathology Branch, Toxic Hazards Division, Wright-Patterson Air Force Base, Ohio.

Slide 36

History. This is tissue from a cynomolgus monkey (Macaca fascicularis) that was imported from Malaysia and died during the quarantine period.

Diagnosis. Multifocal granulomatous hepatitis caused by Capillaria hepatica.

Comment. Cross sections of adults and eggs can be seen.

Contributor. Pathobiology & Primatology Branch, Bureau of Biologics, Food & Drug Administration, Bethesda, Maryland.

Slide 37

History. This is tissue from a 4-year-old female white-tailed deer that was hit by a car. Routine necropsy revealed multiple pedunculated .5- to 5-cm nodules on the ventral aspect of the head and limbs.

Diagnosis. Cutaneous fibroma.

Suggested reading

Fay, L. D.: Neoplastic Diseases of White-Tailed Deer. Proc. 1st National White-Tailed Deer Symposium, University of Georgia, Athens, 1962, pp. 132-137.

Shope, R. E.: An infectious fibroma of deer. Proc. Soc. Exptl. Biol. Med. 88: 533-535, 1955.

Shope, R. E., Mangold, R., MacNamara, L. G., et al.: An infectious cutaneous fibroma of the Virginia white-tailed deer. J. Exptl. Med. 108: 797-802, 1958.

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

Slide 38

History. This is tissue from a 5-year-old female boxer. The animal's SGPT had been over 500 mμ/ml for the past year. There were no other clinical signs, and a chemical screen, CBC, and urinalysis were normal.

Diagnosis. Postcaval syndrome; etiology, Dirofilaria immitis.

Suggested reading. Otto, G. F., and Jackson, R. F.: Pathology of heartworm disease. J. Am. Vet. Med. Assoc. 154(4): 382, 1969.

Contributor. Gillette Research Laboratory, Rockville, Maryland.

Slide 39

History. This is tissue from a chinchilla that died.

Diagnosis. Trophoblast extension associated with normal pregnancy.

Suggested reading. Billington, W. D., and Weir, R. J.: Deportation of trophoblasts in the chinchilla. J. Reprod. Fertil. 13: 593-595, 1967.

Contributor. Geographic Pathology Division, Armed Forces Institute of Pathology, Washington, D.C.

Slide 40

History. This is tissue from an adult male "bear" monkey (Macaca speciosa) used in a toxicology experiment.

Diagnosis. Pulmonary fibrosis and edema from paraquat toxicity.

Comment. This animal received 100 mg/kg of paraquat chloride 9 days prior to being put to death in respiratory distress.

Suggested reading. Murry, R. E., and Gibson, J. E.: A comparative study of paraquat intoxication in rats, guinea pigs, and monkeys. Exp. & Molec. Path. 17: 317-325, 1972.

Contributor. Department of Pathology, School of Veterinary Medicine, University of California, Davis, California.

Slide 41

History. This is tissue from a 2-month-old female camel from the Baltimore Zoo. The animal was noticed to be sick at 2 p.m. and was treated for pneumonia. She died at 5 p.m.

Diagnosis. Nutritional cardiomyopathy as a result of vitamin E deficiency.

Comment. Note the normal elliptical shape of camel erythrocytes.

Suggested reading

Finlayson, R.: Calcific cardiomyopathy in young camels. J. Comp. Path. 81: 71-77, 1971.

Symposium on the Functions of Vitamin E and Se. Fed. Proc. 34(11): 2082-2100, Oct 1975.

Contributor. Department of Pathology, The Johns Hopkins University Hospital, Baltimore, Maryland.

Slide 42

History. This is tissue from a 2-week-old golden retriever with tremors and exaggerated voluntary movements that precluded nursing. All nine puppies in the litter were affected, but seven recovered. No symptoms occurred when the puppies were asleep or when not attempting any voluntary movement.

Diagnosis. Hexachlorophene toxicity.

Comment. The entire litter was treated with 3% hexachlorophene (pHisoHex) diluted 1:3 with water. This was applied over the majority of the body surface to treat a refractory pyoderma. The solution was allowed to stay on the skin for 5 minutes and was then rinsed off with water. The treatment was effective for the pyoderma, but two of the nine puppies died. Treatment for the survivors was thorough washing of the body and feeding with a medicine dropper, along with washing of the bitch's mammary glands. The seven surviving pups gradually resumed normal nursing and made complete clinical recoveries.

Suggested reading

Towfighi, J., Gonatas, M. K., and McCree, L.: Hexachlorophene neuropathy in rats. Lab. Invest. 29(4): 428-436, 1973.

Ward, B. C., Jones, B. D., and Rubin, G. J.: Hexachlorophene toxicity in dogs. J. Am. Anim. Hosp. Assoc. 9: 167-169, 1973.

Contributor. Wellcome Research Laboratories, Research Triangle Park, North Carolina.

Slide 43

History. This is tissue from a 2- to 3-year-old female deerhound, one of two dogs that died from a kennel of eight. All dogs in the group were affected to some degree.

Diagnosis. Toxic hepatitis; etiology, aflatoxin.

Comment. An analysis of the dog food detected a concentration of 700 ppb aflatoxin.

Suggested reading. Edds, G. T.: Acute aflatoxicosis: A review. J. Am. Vet. Med. Assoc. 162(4): 304-309, 1973.

Contributor. Veterinary Diagnostic & Investigative Laboratory, College of Veterinary Medicine, University of Georgia, Tifton, Georgia.

Slide 44

History. This is tissue from a 3-year-old cow found dead one morning in March. The animal had not appeared sick the day before, and no other animals had appeared sick at this time. The cow was in a good plane of nutrition. Necropsy revealed dried blood around the nares and rectum, clear, red urine, and several flukes in the liver. The cow was from a herd of 30 beef-type cattle that were grazing on a Mississippi River levee in southern Louisiana.

Diagnosis. Hepatic infarct; bovine bacillary hemoglobinuria.

Suggested reading

Boyd, A. G.: Bovine Bacillary Hemoglobinuria. Monthly Bulletin, Department of Agriculture, State of California 18: 534--538, 1929.

Meyer, V. F.: Studies to diagnose a fatal disease of cattle in the mountainous regions of California. J. Am. Vet. Med. Assoc. 48: 552-565, 1916.

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

Slide 45

History. This is tissue from a 6-year-old Holstein cow that was killed because of low milk production. In the herd of 60 cows, coughing had been observed for the last 15 months and had been accompanied by lowered production of milk. The cough was dry, repetitive, and more intense at feeding time.

Diagnosis. Allergic bronchiolo-alveolitis.

Comment. Grossly, the lung did not collapse completely and bronchi and alveoli were surrounded by small zones of white, firm tissue.

Suggested reading. Pirie, H. M., Dawson, C. O., Breeze, R. G., et al.: A bovine disease similar to farmer's lung extrinsic allergic alveolitis. Vet. Rec. 88: 346-351, 1971.

Contributor. Faculté de Médecine Vétérinaire, Quebec, Canada.

Slide 46

History. This is tissue from a 2-year-old Jersey that for months had been on a maintenance-level diet consisting of rye and hay. Prior to illness, a grain mixture of milo and corn was added to the diet to improve the cow's physical condition. Several of the herd of eight developed diarrhea from the new diet, and after a few days, two were prostrate. This tissue is from one of these animals that was put to death after 5 days.

Diagnosis. Mucormycotic rumenitis, secondary to rumen acidosis.

Comment. The rumen and omasum showed extensive mucosal necrosis at necropsy.

Contributor. Veterinary Diagnostic & Investigative Laboratory, College of Veterinary Medicine, University of Georgia, Tifton, Georgia.

Slide 47

History. This is tissue from an 8-year-old cow found dead. She had calved 2 weeks previously and had been progressively becoming emaciated.

Diagnosis. Fibrinous pneumonia (pasteurellosis).

Comment. The apical and cardiac lobes and anteroventral third of the diaphragmatic lobe were swollen and firm. The affected areas were a mottled red and gray. Fibrin was present on the pleural surface. One of the foreign guests noted that this lesion is very similar to that of contagious bovine pleuropneumonia.

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

Slide 48

History. This is tissue from a mouse.

Diagnosis. Skin from a hairless nude mouse, illustrating hair follicle changes.

Suggested reading. Riddon, R. H., and Packchanian, A. A.: Histologic study of the skin of congenitally athymic "nude" mice. Texas Reports Biol. Med. 32: 711-723, 1974.

Contributor. National Cancer Institute, Bethesda, Maryland.

Slide 49

History. This is tissue from a mouse with dyspnea.

Diagnosis. Sendai virus infection in an athymic "nude" mouse.

Comment. The lungs were fixed in Bouin's fixative. Note the intranuclear viral inclusions. The occurrence of intranuclear inclusion in mice infected with the Sendai virus has only been described in the "nude" mouse.

Suggested reading. Ward, J. M.: Naturally occurring Sendai virus disease of mice. Lab. Anim. Sci. 24: 938, 1974.

Slide 50

History. This is tissue from a degu (Octodon degus), one of a small colony held at the National Zoo for research in behavior. The animal is a hystricomorphic rodent indigenous to the Andes in South America.

Diagnosis. Otitis media, chronic, suppurative; etiology, Pseudomonas aeruginosa.

Comment. Pseudomonas aeruginosa was cultured from the ears of three degus showing unilateral involvement of the middle ear. The organisms were also isolated from the animals' water bottles, which parallels the situation of Pseudomonas-induced otitis media in laboratory rodents. Increased attention to sanitation in the form of more frequent cleaning and sterilization of the water bottles and acidifying of the water eliminated the problem.

Suggested reading

McDougall, P. T., and Wolf, N. S.: Control of Pseudomonas aeruginosa in an experimental mouse colony. Lab. Anim. Care 17: 204, 1967.

Wright, J. W.: The degu broadens its role as a laboratory animal. Lab. Anim. 4(2): 17, 1975.

Contributor. National Zoological Park, Washington, D.C.

Slide 51

History. This is tissue from an adult virgin female New Zealand white rabbit, which was one of a group of 90 purchased and reportedly specific pathogen free (SPF). The animals had been on a medicated commercial ration containing sulfaquinoxaline for 5 days preceding the death of this animal. All animals had appeared normal the preceding day, and this rabbit was

observed to have a brief convulsion followed by death. Necropsy was performed within 15 minutes of death.

Diagnosis. Tyzzer's disease.

Comment. In the intestinal tract gross lesions were confined to the lower ileum and proximal colon. Also, multiple pinpoint pale foci were in the liver. A Giemsa-stained section demonstrated the causative organism, Bacillus piliformis, in the liver. Most of the organisms in the cecum are not B. piliformis. The literature implicates sulfonamide medication as a precipitating cause of Tyzzer's disease. This was the only animal affected in a group of 90.

Suggested reading. Weisbroth, S. H., Flatt, R. E., and Kraus, A. C. (Eds.): The Biology of the Laboratory Rabbit. Academic Press, New York, 1974, pp. 214-219.

Contributor. Wellcome Research Laboratories, Research Triangle Park, North Carolina.

Slide 52

History. This tissue is from a North American black duck (Anas rubripes) that died without premonitory signs. The bird was in the waterfowl collection at the National Zoo.

Diagnosis. Duck viral enteritis (duck plague) (cloacitis with intranuclear herpetic inclusion bodies).

Comment. This duck died in an outbreak that affected approximately 35 birds in the waterfowl collection at the National Zoo. DVE virus was isolated from the livers of a number of affected ducks. Grossly, the lesions included

epicardial and serosal hemorrhages, pinpoint to 1-mm white foci in the liver, and a variety of digestive tract lesions, including ulcers, necrotic plaques, and annular bands of lymphoid necrosis. The disease was believed to be brought in by wild migratory waterfowl. Vaccination of all susceptible birds appeared to quell the epornitic in less than 1 week.

Suggested reading. Leibovitz, L.: The comparative pathology of duck plague in wild anseriformes. J. Wildlife Management 33: 294-303, 1969.

Contributor. National Zoological Park, Washington, D.C.

Slide 53

History. This is tissue from an adult cynomolgus monkey (Macaca fascicularis) experimentally inoculated with an infectious agent.

Diagnosis. Visceral leishmaniasis.

Comment. This animal was given 40 million Leishmania donovani organisms per kilogram of body weight intravenously. Clinical signs consisted of splenomegaly, anemia, thrombocytopenia, leukopenia, and progressive weight loss. The animal died 98 days postinoculation. Hepatomegaly was observed at necropsy.

Contributor. Experimental Pathology Division, Walter Reed Army Institute of Research, Washington, D.C.

Slide 54

History. This is a section of a 6-cm subcutaneous mass removed from the left inguinal area of a 1-year-old intact domestic short-hair cat. The practitioner described the mass as resembling lymph node with some edema in the area.

Diagnosis. Feline mammary hypertrophy.

Suggested reading. Allen, H. L.: Feline mammary hypertrophy. Vet. Path. 10: 501-508, 1973.

Contributor. Department of Veterinary Science, University of Arizona, Tucson, Arizona.

Slide 55

History. This is tissue from a female guinea pig that was one of a group of animals used in a neurovirulence test of a new Western equine encephalomyelitis vaccine. The animal was clinically normal.

Diagnosis. Encephalitis, granulomatous; etiology, Encephalitozoon cuniculi.

Comment. This parasite is rare in gulnea pigs, in the experience of the authors.

Contributor. Department of Pathology, US Army Medical Research Institute of Infectious Disease, Fort Detrick, Maryland.

Slide 56

History. This is tissue from a young dog that died of automobile injuries. Irregularly distributed radially oriented gray streaks were present near the corticomedullary junction of the kidney.

Diagnosis. Focal interstitial nephritis; etiology, infectious canine hepatitis virus.

Suggested reading. Wright, N. G., Cornwell, H. J. C., and Thompson, H.: Canine adenovirus nephritis. J. Small Anim. Pract. 12: 657-664, 1971.

Contributor. Department of Pathology, College of Veterinary Medicine, Oklahoma State University, Stillwater, Oklahoma.

Slide 57

History. This is tissue from a dog being utilized in a drug safety trial.

Comment. This dog had the external genitalia of a female as well as a vestigial penis (2 cm long and 1 cm in diameter) in the floor of the vagina. The submitted tissue grossly appeared to be normal ovary.

Contributor. Medical Research Laboratories, Pfizer, Inc., Groton, Connecticut.

Slide 58

History. This is tissue from a tumor on the leg of an adult white Leghorn chicken.

Diagnosis. Gout.

Contributor. Letterman Army Institute of Research, San Francisco, California.

Slide 59

History. This mouse was one of many that died during an epizootic in a large, densely populated modular cage used for animal behavioral studies. The bedding was infrequently changed.

Diagnosis. Klebsiella septicemia.

Comment. The gross findings were marked splenomegaly, focal white lesions (1-3 mm) in the liver, pneumonia, and pulmonary abscesses. Bacteriologic studies demonstrated Klebsiella pneumoniae in the spleen, liver, and lung. Many septic thrombi can be seen.

Contributor. Comparative Pathology Section, National Institutes of Health, Bethesda, Maryland.

Slide 60

History. This section is from a 4 x 5 x 3-cm firm, encapsulated mass removed from the abdomen of an intact mature female dachshund. The mass was located ventral to the anterior pole of the left kidney and was attached only to the mesentery.

Diagnosis. Mummified extrauterine fetus.

Contributor. Pathology Branch, Toxic Hazards Division, Wright-Patterson Air Force Base, Ohio.

Slide 61

History. This tissue is from a Stanley crane that was presented with a complaint of muscle weakness. The bird died soon after examination.

Diagnosis. Degenerative changes in the secondary lens fibers at the equator and anterior pole of the lens compatible with the histologic appearance of cataract.

Comment. The bird also had extensive degeneration of the skeletal muscles and was considered to have been on a diet deficient in vitamin E. Artifactual tears in the lens central to the lesion can be seen in some sections. A note of caution as to the diagnosis of cataract was injected by some of the attendees, who cited the existence of a cleft, the lens chamber, in the normal bird eye. However, most of the attendees, as well as a consultant from the Ophthalmic Pathology Division, considered the eye to be cataractous.

Contributor. School of Aerospace Medicine, Brooks Air Force Base, Texas.

Slide 62

History. This is tissue from a 5-year-old quarter horse gelding that presented with a seromucoid discharge from the left nostril. The discharge had persisted for 6 months. There was no air flow in the nostril. Euthanasia was recommended following endoscopic examination. A 15 x 18 x 3-cm greenish-brown mass was present in the left ethmoid turbinate. It extended anteriorly into the dorsal nasal meatus and posteriorly into the nasopharynx.

Diagnosis. Hemorrhagic nasal polyp (progressive ethmoidal hematoma).

Suggested reading

Cook, W. R., and Littlewort, M. C. G.: Progressive hematoma of the ethmoid region in the horse. Equine Vet. J. 6: 101, 1974.

Platt, H.: Hemorrhagic nasal polyps of the horse. J. Path. 115: 51-55, 1975.

Contributor. Department of Veterinary Pathlogy, Ohio State University, Columbus, Ohio.

Slide 63

History. This is tissue from a clinically normal 476-day-old female BALB/c mouse. Necropsy revealed a 10-mm reddish mass in the right abdomen.

Diagnosis. Granulosa cell tumor, ovary.

Contributor. National Center for Toxicological Research, University of Arkansas, Jefferson, Arkansas.

Slide 64

History. This is tissue from a 4-year-old domestic goat that had been losing weight for 3 to 4 weeks prior to death. Grossly, the mesenteric lymph nodes were enlarged and the lobular pattern of the liver was prominent. The lungs failed to collapse and the interlobular septa were prominent and distended.

Diagnosis. Johne's disease.

Comment. There was severe histiocytic infiltration of the mucosa and submucosa of the colon. Mycobacterium paratuberculosis was isolated on culture.

Contributor. Comparative Pathlogy Section, National Institutes of Health, Bethesda, Maryland.

Slide 65

History. This is tissue from a young adult rat with bilateral swelling of the upper cervical region.

Diagnosis. Sialoadenitis; etiology, sialodacryoadenitis virus.

Comment. Clinically, sialodacryoadenitis is usually recognized by detecting of either upper neck swelling or bulging eyes, often unilateral. Protrusion of the eyeball is due to inflammation of the Harderian gland. The orbital gland is also commonly affected. Virus isolation was not attempted in this case.

Suggested reading

Innes, J. R. M., and Stanton, M. F.: Acute diseases of the submaxillary and Harderian glands (sialodacryoadenitis) of rats with cytomegaly and no inclusion bodies. Am. J. Path. 38: 455-468, 1961.

Jacoby, R. O., Bhatt, P. M., and Jonas, A. M.: Pathogenesis of sialodacryoadenitis in gnotobiotic rats. Vet. Path. 12: 196-209, 1975.

Jonas, A. M., Craft, J., Black, L., et al.: Sialodacryoadenitis in the rat: A light and electron microscopic study. Arch. Path. 88: 613-622, 1969.

Contributor. Armed Forces Radiobiology Research Institute, Bethesda, Maryland.

Slide 66

History. This is tissue from a 5-year-old border collie-type mixed-breed male dog presented with a history of ascites and thoracic fluid accumulation of three months' duration. Stools were loose, and there was some dependent edema.

Laboratory results. Plasma proteins: on admission, 3.6 g/dl, and at euthanasia, 2.3 g/dl; BUN: 13.3 mg/dl; SGPT: 24 IU; BSP retention: 1.5 percent at 30 minutes; alkaline phosphatase: 3.0 IU; cholesterol: 104.5 mg/dl; fat absorption test: positive at 1 hour; fecal trypsin: positive; fecal starch, fat, and muscle fibers: negative; serum electrophoresis: albumin 1.04, and globulin, .19, .45, .61, and .27 for alpha 1, alpha 2, beta, and gamma, respectively; urine: specific gravity of 1.015-1.044 and trace-positive or negative for protein; abdominal effusion: specific gravity, 1.006, total protein, 0, and occasional neutrophils and lymphocytes.

Diagnosis. Canine intestinal lymphangiectasis (chronic atrophic enteritis).

Comment. Cr-labeled albumin was injected. Fecal excretion (expressed as a percentage of the total injected dose) was 83.8 percent for the 3 days of fecal collection. Four control dogs averaged 4.6 percent excretion. The number of milliliters of plasma albumin lost per day (expressed as the ratio of the radioactivity in the stool per day to the radioactivity in the plasma in the same day) totaled 75.7 over the 3 days. Control dogs lost an average of 2.88 ml over the 3-day period. While attendees agreed with the diagnosis, many felt that lymphangiectasis, though present, was not a prominent feature of the lesion.

Suggested reading

Bisgard, G.: Intestinal lymphangiectasis in a dog. J. Am. Vet. Med. Assoc. 153: 1050-1054, 1968.

Finco, D. R., Duncan, J. R., Schall, W. D., et al.: Chronic enteric diseases and hypoproteinemia in nine dogs. J. Am. Vet. Med. Assoc. 163: 262-271, 1973.

Matthews, D., DeRick, A., Thoonen, H., et al.: Intestinal lymphangiectasis in a dog. J. Small Anim. Pract. 15: 757-761, 1974.

Contributor. College of Veterinary Medicine, Texas A&M University, College Station, Texas.

Slide 67

History. This is tissue from a 4-year-old female domestic short-hair cat with a mass in the left inguinal region.

Diagnosis. Malignant mixed tumor of the mammary gland.

Comment. Although lymphatic invasion was observed in the biopsy specimen, there was no evidence of metastasis at necropsy 2 weeks later. Mixed tumors of the mammary gland are rare in cats, differing from their incidence in dogs.

Contributor. Tumor Pathology Section, National Institutes of Health, Bethesda, Maryland.

Slide 68

History. These are tissues from a sick and from a normal 6-week-old chick that were part of a flock of chicks with clinical signs of depression, anorexia, and apathy. Severely affected birds would stagger, and a few chicks would fall over and die.

Diagnosis. Infectious bursal disease; etiology, infectious bursal virus.

Suggested reading. Winterfield, R. W., Fadly, A. M., and Bickford, A.: Infectivity and distribution of infectious bursal disease virus in the chicken: Persistence of the virus and lesions. Avian Dis. 16: 622-632, 1972.

Contributor. Department of Pathology, School of Veterinary Medicine, University of Missouri, Columbia, Missouri.

Slide 69

History. This is tissue from a 4-year-old female domestic short-hair cat with signs of respiratory difficulty. The cat failed to respond to therapy and died within a few days.

Diagnosis. Pulmonary parasitism; etiology, Aelurostrongylus abstrusus.

Suggested reading. Scott, D. W.: Current knowledge of Aelurostrongylosis in the cat. Cornell Vet. 63: 483-500, 1973.

Contributor. Letterman Army Institute of Research, Presidio of San Francisco, California.

Slide 70

History. This is tissue from an Atlantic sturgeon (Acipenser oxyrhynchus) caught in coastal North Carolina.

Diagnosis. Normal sturgeon epicardium containing lymphoid tissue.

Comment. The exact nature of the tissue is unknown, but it appears to be a normal structure of the sturgeon and a few other related fish.

Suggested reading. Grasse, P. P.: Traite de Zoologie Tome XIII Agnathes et Poissons. Masson et Cie, Paris, 1958, p. 1452.

Contributor. National Marine Fisheries Service, Laurel, Maryland.

Slide 71

History. This is tissue from a golden-handed marmoset (Saguinus midas) newly imported from Guyana and one of seven dying during the quarantine period.

Diagnosis. Acanthocephaliasis with superimposed bacterial enteritis. Cysticercus spp. in lymph node.

Comment. A cross section of an acanthocephalid is on the slide. Hooks can be seen in many sections of the larval cestode.

Contributor. Bureau of Biologics, Food & Drug Administration, Bethesda, Maryland.

Slide 72

History. This is tissue from a female Hartley albino guinea pig that was put to death because of two large, firm masses in the area of the internal iliac lymph nodes.

Diagnosis. Lymphadenitis with abscess formation; etiology, Lancefield group C streptococci.

Comment. At necropsy, the masses were thin-walled abscesses containing copious amounts of thick yellow-white pus. Culture yielded Lancefield group C streptococci. Lymphadenitis is a common disease of the guinea pig, but it usually occurs in the cervical lymph nodes.

Suggested reading. Fraunfelter, F. C., Schmidt, R. E., Beattie, R. J., et al.: Lancefield type C streptococcal infections in strain 2 guinea pigs. Lab. Anim. 5: 1-13, 1976.

Contributor. Pathology Branch, Toxic Hazards Division, Wright Patterson Air Force Base, Ohio.

Slide 73

History. This is tissue from an 8-year-old male mixed-breed dog that had abdominal distension for about 2 weeks before being killed.

Diagnosis. Focal encephalomalacia.

Comment. Numerous Dirofilaria immitis were in the postcava, right heart, and pulmonary arteries. The liver was firm and coarsely nodular, and the kidneys were enlarged and pale. Multiple foci of necrosis were randomly scattered throughout the brain. Microfilariae were observed in several necrotic foci. In one focus, a small vessel was thrombosed and a microfilaria was situated in the vessel lumen adjacent to the thrombus. The authors believe that the microfilariae were in some way related to thrombosis of the microvasculature in the brain resulting in multiple small infarcts. Adult heartworms were not observed in the cerebral vasculature. Perhaps the mechanism of injury to the small vessels in the brain of this dog is similar to that to the glomerular capillaries where glomerulosclerosis is present, as it was in this dog.

Suggested reading

Patton, C. S., and Garner, F. M.: Cerebral infarction caused by heartworms (Dirofilaria immitis) in a dog. J. Am. Vet. Med. Assoc. 56: 600-605, 1970.

Simpson, C. F.: Glomerulosclerosis in canine heartworm infection. Vet. Path. 11: 506-514, 1974.

Contributor. Department of Veterinary Medicine, Oregon State University, Corvallis, Oregon.

Slide 74

History. This is tissue from a 3-month-old Suffolk lamb that was presented in convulsions and with torticollis and grinding of the teeth. Another lamb had died suddenly 1 month previously, and about eight had died during the previous year. The lambs had been housed in a building previously used for swine and had licked paint in an old, painted cement-block building. There was no evidence of disease in the ewes.

Diagnosis. Polioencephalomalacia.

Comment. The characteristic laminar necrosis associated with this condition is most prominent on the tips of some gyri and involves the middle and superficial lamellae. Assays of the blood, liver, and kidney for lead were negative. Pyruvate, transketolase, and thiamine levels were not determined.

Contributor. Department of Veterinary Pathology, School of Veterinary Medicine, Ohio State University, Columbus, Ohio.

Slide 75

History. This is tissue from a 2 1/2-year-old male Sprague-Dawley control rat sacrificed at the termination of a research project.

Diagnosis. Polyarteritis nodosa.

Comment. Grossly, the involved arteries were red, markedly thickened, moderately tortuous, and nodular.

Suggested reading. Yang, Y. H.: Polyarteritis nodosa in laboratory rats. Lab. Invest. 14: 81-88, 1965.

Contributor. Armed Forces Radiobiology Research Institute, Bethesda, Maryland.

Slide 76

History. This is tissue from a lesion on the buccal mucosa of an 11-year-old female mixed-breed dog.

Diagnosis. Malignant melanoma.

Comment. Note the invasion of the buccal squamous mucosa and of underlying skeletal muscle.

Contributor. Department of Veterinary Science, University of Wisconsin, Madison, Wisconsin.

Slide 77

History. This is tissue from an experimentally infected steer.

Diagnosis. Mycotic dermatitis; etiology, probably Trycophyton verrucosum.

Comment. The animal was experimentally infected with Trypanosoma congolense. The skin lesion was an incidental finding.

Contributor. Veterinary Pathology Division, Walter Reed Army Institute of Research, Washington, D.C.

Slide 78

History. This is tissue from an adult female Australian bearded lizard (Amphibolurus barbatus), one of three received at the National Zoo from an importer in California. Upon arrival the lizards were thin and had multiple 3- to 5-ml firm, yellowish cutaneous nodules.

Diagnosis. Dermatophilosis.

Comment. Dermatophilus congolensis was cultured from the skin lesions of two of the lizards. The branching filamentous gram-positive rods with their characteristic multiphasic divisions are more clearly visualized by Giemsa and azure-eosin stains. The lizards were treated with organic iodide soaks and chlortetracycline, to which the isolant was sensitive. Although the lesions appeared to regress over a period of several weeks, all three lizards died in poorly nourished states associated with stress and maladaptation.

Suggested reading

Simmons, G. C., Sullivan, N. D., and Green, P. E.: Dermatophilosis in a lizard (Amphibolurus barbatus). Austr. Vet. J. 48: 465-466, 1972.

Montali, R. J., Smith, E. E., Davenport, M., et al.: Dermatophilosis in Australian bearded lizards (Amphibolurus barbatus). J. Am. Vet. Med. Assoc. 167(5): 553, 1975.

Contributor. Department of Pathology, National Zoological Park, Washington, D.C.

Slide 79

History. This is tissue from a 6-month-old female Hampshire gilt presented with posterior paresis. Grossly, there were peritoneal and epicardial adhesions and small (.1-.3 cm) whitish foci in the kidney and liver.

Diagnosis. Polyarteritis.

Comment. The lesion is believed to be a polyarteritis and has been compared to periarteritis nodosa in man. The lesion in swine, while not unusual, is not understood. It may be secondary to a viral infection or a type of immune response. The paralysis was explained by an extensive diffuse axonal degeneration at the T3 - L1 level of the spinal cord. Its cause was not recognized.

Contributor. Department of Pathology, School of Veterinary Medicine, Kansas State University, Manhattan, Kansas.

Slide 80

History. This is tissue from a 1-year-old mixed collie bitch presented because of continual bloody discharge from the vulva.

Diagnosis. Subinvolution of placental sites.

Comment. A hysterectomy was performed. The uterine horn had several ampullary dilatations, and the lumen contained a caseous exudate.

Suggested reading. Beck, A. M., and McEntee, K.: Subinvolution of placental sites in a postpartum bitch. A case report. Cornell Vet. 56: 269-277, 1966.

Slide 81

History. This is tissue from a 1 1/2-year-old male Nubian goat presented with stertorous breathing, lameness, and weight loss. The animal died during anesthesia for radiography.

Diagnosis. Fibrous osteodystrophy of mandible with hyperostosis.

Comment. The animal had been penned with younger goats and fed grain, hay, and molasses. A firm, bilaterally symmetrical enlargement of the mandible appeared responsible for obstruction of the pharyngeal airway. A blood sample prior to death revealed a normal hemogram; calcium was 6.2 mg/dl; HPO4, 5.8 percent; alkaline phosphatase, >70 IU; and creatinine, .8 mg/dl. The parathyroids were histologically hyperplastic, and there was generalized skeletal osteopenia with less severe lesions of fibrous osteodystrophy. The rumen was about half full of grain, and it was presumed there was a nutritional secondary hyperparathyroidism from overeating of grain.

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

Slide 82

History. This is tissue from a 13-day-old cat that had been delivered by caesarian section and did not receive colostrum. At 10 days of age the kitten became anorectic.

Diagnosis. Feline herpes infection.

Comment. There were ulcers on the tongue and an ocular and nasal discharge. At necropsy, white spots on the liver and mottled lungs were seen. Histologically there was an extensive interstitial pneumonia but no inclusions in the lung.

Suggested reading. Hoover, E. A., and Griesemer, R. A.: Experimental feline herpesvirus infection in the pregnant cat. Am. J. Path. 65(1): 173-184, 1971.

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

Slide 83

History. This is tissue from a mature female rhesus monkey being treated with an antibacterial agent in an effort to control severe diarrhea.

Diagnosis. Gentamycin toxicity accentuated by dehydration.

Contributor. Letterman Army Institute of Research, Presidio of San Francisco, California.

Slide 84

History. This is tissue from an 8-week-old white Leghorn chicken with a large (10 x 7 x 4 cm) encapsulated mass in the retroperitoneum of the abdominal cavity.

Diagnosis. Teratoma.

Contributor. National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina.

Slide 85

History. This is tissue from a 32-month-old Mastomys that was emaciated and had difficulty breathing.

Diagnosis. Thymoma.

Comment. The tumor had replaced the left thymic lobe and was compressing the heart, lungs, and great vessels. Thymic hyperplasia and thymomas are common in old mastomys, especially in females. This animal also had myocarditis and myositis, which are associated with thymomas in mastomys.

Suggested reading. Stewart, H. C., and Snell, K. C.: Thymomas and thymic hyperplasia in Praomys (Mastomys) natalensis. J. Natl. Cancer Inst. 40: 1135-1159, 1968.

Contributor. Tumor Pathology Section, National Institutes of Health, Bethesda, Maryland.

Slide 86

History. This is tissue from a Labrador retriever.

Diagnosis. Fluke infection, possibly Metorchis conjunctus.

Comment. The fluke can be seen within enlarged bile ducts, and an occasional operculated egg can be seen in or near the bile ducts. Adults are not present in all slides.

Contributor. Department of Veterinary Science, University of Wisconsin, Madison, Wisconsin.

Slide 87

History. This is tissue from a 6-year-old female Basset hound that had recurrent bouts of chills and fever. She had been bred three times but had never produced a litter. A Brucella titer was positive, and she was destroyed for removal from a large kennel.

Diagnosis. Disseminated tuberculosis.

Comment. There were abundant small acid-fast organisms, suggesting the avian tubercle bacillus. An exhaustive epizootiological inquiry was made, but no illuminating information could be obtained.

Contributor. US Army Medical Research Institute of Infectious Disease, Fort Detrick, Maryland.

Slide 88

History. This is tissue from a captive adult bighorn ewe that died with widespread consolidation of both lungs.

Diagnosis. Concurrent Protostrongylus rufescens and Pasteurella hemolytica infection.

Comment. The number of parasites (probably first-stage larvae) in the sections of lung varied from one to many in the various slides examined. It was considered that the Pasteurella pneumonia was the principal cause of death.

The common presence of two species, Protostrongylus stilesi and Protostrongylus rushi, of lungworms in Rocky Mountain bighorn sheep is noted in the reference below.

Suggested reading. Anderson, R. C.: Lungworms. In Parasitic Diseases of Wild Mammals, edited by Davis, J. W., and Anderson, R. C., Ames, Iowa State University Press, 1971, p. 106.

Contributor. Department of Veterinary Science, South Dakota State University, Brookings, South Dakota.

Slide 89

History. This is a section of a firm 2 X 3-cm mass removed from the rib cage behind the front leg of a 7-year-old 22-pound female poodle. Duration of the mass was unknown.

Diagnosis. Benign calcifying epithelioma.

Comment. It was agreed by the majority that the lesion was appropriately named by the contributor as it is described in Smith, Jones, and Hunt. A parallel and acceptable term would be "necrotizing and calcifying epithelioma," as used in the World Health Organization classification.

Suggested reading

Smith, H. A., Jones, T. C., and Hunt, R. D.: Veterinary Pathology, ed. 4. Philadelphia, Lea & Febiger, 1972, pp. 230-232.

Weiss, E., and Frese, K.: Tumors of the skin. Bull. Wrld. Hlth. Org. 50: 79-100, 1974.

Contributor. Department of Veterinary Science, University of Arizona, Tucson, Arizona.

Slide 90

History. This is tissue from a 4-month-old male Prairie falcon (Falco mexicanus) that died after a 48-hour period of anorexia and listlessness.

Diagnosis. Inclusion body disease of falcons; etiology, herpesvirus.

Comment. Gross lesions consisted of focal yellow-tan .2- to 1.5-cm necrotic foci in the liver, spleen, and small intestine.

Suggested reading. Graham, D. C.: Inclusion bbdy disease (herpesvirus infection) of falcons. J. Wildlife Dis. 11: 83-91, 1975.

Contributor. Department of Pathology, School of Veterinary Medicine, University of Missouri, Columbia.

Slide 91

History. This is tissue from one of a herd of 36 young cows that died after showing posterior weakness, recumbency, dribbling of urine, and marked proteinuria. BUN was 122 mg/dl; SGOT, 1,900 IU, and creatine phosphokinase (CPK), 3,993 IU. Massive ascites and marked retroperitoneal perirenal edema were seen at necropsy.

Diagnosis. Subacute toxic tubular nephrosis caused by red root pigweed (Amaranthus retroflexus).

Comment. The cattle had grazed on a heavy growth of pigweed for 5 days. The growth occurred in a recently cultivated paddock without the presence of oak species. This lesion is similar to the "pathognomonic changes" seen in oak bud nephrosis.

Suggested reading

Jeppesen, O. E.: Bovine perirenal disease associated with pigweed. J. Am. Vet. Med. Assoc. 149: 11, 1954.

Osweiler, G. D., Buck, W. B., and Bicknell, E. J.: Experimental production of perirenal edema in swine with Amaranthus retroflexus. Am. J. Vet. Res. 30: 557-566, 1969.

Stuart, B. P., Nicholson, S. S., and Smith, J. B.: Perirenal edema and toxic nephrosis in cattle associated with ingestion of pigweed (Amaranthus retroflexus). J. Am. Vet. Med. Assoc. 167(10): 949-950, 1975.

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

Slide 92

History. This surgical specimen is from a 9-year-old bitch.

Diagnosis. Dysgerminoma.

Contributor. Bionetics Research Laboratory, Kensington, Maryland.

Slide 93

History. This is tissue from a 23-month-old mastomys. This animal was untreated and had rear limb paralysis for several weeks before being killed.

Diagnosis. Multiple herniated intervertebral discs with spinal cord degeneration.

Comment. This condition was found in 38 of 91 males and 4 of 109 females from a colony of aging animals.

Suggested reading. Sokoloff, L., Snell, V. C., and Stewart, H. L.: Degenerative joint disease in Praomys (Mastomys) natalensis. Ann. Rheum. Dis. 26: 146-154, 1967.

Contributor. Institute for Experimental Gerontology, The Netherlands.

Slide 94

History. This is tissue from an approximately 10-year-old female Macaca mulatta that was part of a chronic radiation study. The animal was found dead 2 days following clinical observations that she was not eating, was slightly bloated, and had a soft stool. A CBC showed leukocytosis. An abdominal radiograph was negative. The animal died during the night in a sitting position eating an apple.

Diagnosis. Myocarditis, chronic, multifocal, moderate, heart; etiology, probably Trypanosoma cruzi.

Comment. The organisms, which were morphologically compatible with the leishmanial form of a T. cruzi, were also found in muscle, reticulo-endothelial cells in skeletal muscle, adipose tissue, wall of the intestine, oral cavity, and smooth muscle of the cervix. Trypanosoma cruzi is endemic in the south Texas area, as the required mammalian reservoir hosts and arthropod vectors (Triatoma) are indigenous.

Contributor. School of Aerospace Medicine, Veterinary Sciences Division, Brooks Air Force Base, Texas.

Slice 95

History. This is tissue from one of a group of laboratory ducklings placed on a special diet at hatching. The ducklings grew poorly and were killed and necropsied at 4 weeks of age.

Diagnosis. Vitamin E deficiency.

Suggested reading. Scott, M. L., and Krook, L.: Nutritional deficiency diseases. In Diseases of Poultry, ed. 6, edited by Hofstad, M. S., Calnek, B. W., and Helmboldt, C. F., Ames, Iowa State University Press, 1972.

Contributor. National Animal Disease Laboratory, Ames, Iowa.

Slide 96

History. This is tissue from a 2-month-old calf that had consumed an unknown quantity of diesel fuel 18 hours prior to death.

Diagnosis. Pneumonitis from cosumption of diesel fuel.

Comment. Necropsy revealed lungs that were somewhat overinflated, lobules that were alternately tan or deep purple and cut surface that exuded blood-tinged fluid. Bronchi and bronchioles contained frothy oleaginous fluid. Some of the discussions during and after the conference focused on whether the lesions were due to the presence of the oil in the lungs or to the volatility of the components of the ingested or inhaled oil. Neither the discussions nor the references resolved the question entirely, although the latter indicate that the lesions were caused by the presence of oil in the lungs. In the section presented at the conference, no oil or resultant spaces were noted, even though the necropsy documents the presence of oily fluid in the airways.

Suggested reading

Gerarde, H. W.: Toxocological studies on hydrocarbons: Kerosene. Toxic Appl. Pharmacol. 1: 462-474, 1959.

Rowe, C. D., Dollahite, J. W., and Camp, B. J.: Toxicity of two crude oils and kerosene to cattle. J. Am. Vet. Med. Assoc. 162: 61-66, 1973.

Contributor. Department of Pathology, College of Veterinary Medicine, Oklahoma State University, Stillwater, Oklahoma.

Slice 97

History. This is tissue from a 15-year-old male domestic short-hair cat that had been limping on the right foreleg for 2 weeks.

Diagnosis. Osteodystrophy.

Comment. X-ray revealed generalized irregular demineralization of the bones. The cat had been fed beef liver for the last 15 years.

Suggested reading. Riser, W.: Osteodystrophy in mature cats: A nutritional disease. J. Am. Vet. Radiol. Soc. 9: 37-46, 1968.

Contributor. Pathology Department, The Animal Medical Center, New York, New York.

Slice 98

History. This is a section of a large mass filling the thoracic cavity of a 442-day-old male Long-Evans rat.

Diagnosis. Osteosarcoma.

Comment. The tumor involved the lung, diaphragm, liver, and the wall of the thoracic cavity.

Contributor. Drug Safety Evaluation, Medical Research Laboratories, Pfizer, Inc., Groton, Connecticut.

Slide 99

History. This is tissue from an Atlantic bottlenosed dolphin (Tursiops truncatus) that had been kept in a seaquarium.

Diagnosis. Granulomatous pneumonia; etiology, phycomycete, possibly Entomophthora coronata.

Comment. Most attendees felt that a specific diagnosis should not be made on animal tissue without cultural confirmation.

Suggested reading. Migaki, G., and Blumer, P. W.: Case for diagnosis [on phycomycosis in a dolphin]. Milit. Med. 140(8): 544, 549, August 1975.

Contributor. Division of Comparative Pathology, Armed Forces Institute of Pathology, Washington, D.C.

Slide 100

History. This is tissue from a 28-month-old Fischer 344 rat.

Diagnosis. Chronic renal disease of aged rats.

Suggested reading. Snell, K. C.: Renal disease of the rat. In Pathology of Laboratory Rats and Mice, edited by Cotchin, E., and Roe, F. J. Oxford, Blackwell Scientific Publications, 1967.

Contributor. Department of Comparative Medicine, University of Alabama Medical Center, Birmingham, Alabama.