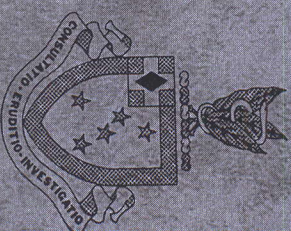


Syllabus

VETERINARY PATHOLOGY DEPARTMENT, AFIP,  
WEDNESDAY SLIDE CONFERENCE  
1974-1975



ARMED FORCES INSTITUTE OF PATHOLOGY  
Washington, D.C. 20306

M 22376



Syllabus

VETERINARY PATHOLOGY DEPARTMENT, AFIP,  
WEDNESDAY SLIDE CONFERENCE

1974-1975

100 microslides

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ARMED FORCES INSTITUTE OF PATHOLOGY  
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## PREFACE

The Wednesday Slide Conference of the Department of Veterinary Pathology, Armed Forces Institute of Pathology, has been a traditional activity for a number of years. Cases presented at the conference and distributed to the contributors are contributed by military and civilian veterinary pathologists throughout the United States and Canada. The diagnosis for each case and a synopsis of the discussion for most cases are forwarded weekly to the contributors.

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 than are able to participate on a weekly basis.

The number of slides has been reduced to 100 so as not to have a cumbersome set and, in some instances, to delete cases in which broken slides or other technical difficulties limited the number of slides available.

We wish to thank the contributors for their participation and for their permission to use their cases in this study set.

LIST OF SLIDES

Slide number	Animal	Tissue	Diagnosis
1	Goat	Brain	Listeriosis
2	Dog	Brain	Reticulosis
3	Pig	Brain	Eastern encephalomyelitis
4	Pig	Brain	Eosinophilic meningoencephalitis
5	Marmoset	Intestine	Adenocarcinoma
6	Dog	Subcutis	Myelosarcoma
7	Dog	Lung	Acanthamoebiasis and canine distemper
8	Dog	Brain	Parasitic infarct
9	Dog	Intestine	Histoplasmosis
10	Sheep	Lung	Chronic progressive pneumonia
11	Cow	Lung	Atypical interstitial pneumonia
12	Pig	Brain	Edema disease
13	Gecko	Subcutis	Neurofibroma
14	Mouse	Multiple	Pulmonary adenocarcinoma
15	Dog	Intestine	Carcinoid tumor
16	Macaque	Colon	Shigellosis
17	Dog	Brain	Rabies
18	Horse	Brain	Nematodiasis ( <u>Micronema</u> sp.)
19	Pig	Brain	Congenital neuronal lipodystrophy
20	Dog	Thyroid	Carcinoma
		iii	
21	Cow	Nares	Nasal granuloma
22	Sheep	Lip	Contagious ecthyma
23	Dog	Kidney	Renal cell carcinoma
24	Dog	Kidney	Glomerulonephritis
25	Pig	Kidney	Glomerular thrombosis (salmonellosis)
26	Cat	Kidney	Glomerulonephritis
27	Chicken	Multiple	Inclusion body hepatitis
28	Mouse	Lung	Alveolar carcinoma
29	Calf	Brain	Cerebellar hypoplasia
30	Cat	Intestine	Feline panleukopenia
31	Cat	Lung	Calicivirus (picornavirus) infection
32	Foal	Lung	Adenovirus pneumonia
33	Pig	Heart	Pseudorabies myocarditis
34	Mouse	Eye	Rodless retina
35	Calf	Kidney	Oak bud poisoning
36	Mouse	Liver	Ectromelia
37	Cow	Skin	Stephanofilariasis
38	Cow	Skin	Mastocytoma
39	Cow	Skin	Atypical bovine cutaneous papillomatosis
40	Dog	Heart	Primary myocardial disease
41	Horse	Ileum	Coccidiosis and hemomelasma ilei
42	Macaque	Duodenum	Ectopic pancreas
43	Foal	Liver	Tyzzers' disease
44	Parrot	Brain	Newcastle disease
45	Horse	Spinal Cord	Protozoal myelitis



46	Rabbit	Brain	Encephalitozoonosis	67	Horse	Spinal cord	Infarct
47	Horse	Ovary	Granulosa cell tumor	68	Steer	Trachea	Sudden death syndrome
48	Rat	Pancreas	Islet cell adenoma	69	Pigeon	Liver	Inclusion body hepatitis
49	Mouse	Urinary bladder	Multiple neoplastic and non-neoplastic lesions	70	Dog	Urinary bladder	Chemodectoma
50	Dog	Kidney	Familial nephropathy	71	Dog	Tarsal area	Malignant synovium
51	Dog	Brain	Toxoplasmosis	72	Rat	Lung	Monocrotaline poisoning
52	Cat	Brain	Thiamine deficiency	73	Hippopotamus	Liver	Schistosomiasis; cysticercosis; fascioliasis
53	Pheasant	Spleen	Marble spleen disease	74	Skunk	Lung	Pneumonia ( <u>Crenasoma canadensis</u> )
54	Dog	Lymph node	Metastatic transmissible venereal tumor	75	Dog	Lung	Pneumonia ( <u>Filaroides hirthi</u> )
55	Dog	Bone	Multiple cartilaginous exostotic growths	76	Duck	Liver & spleen	Duck plaque
56	Rhesus monkey	Urinary bladder	Nonspecific eosinophilic cytoplasmic inclusions	77	Nude mouse	Multiple	Experimental vaccinia infection
57	Chick	Lung	Pullorum disease	78	Horse	Brain	Eastern encephalomyelitis
58	Dog	Occipital region	Cartilage analogue of fibromatosis	79	Syrian hamster	Liver	Drug-induced centrilobular necrosis
59	Dog	Lung	Pneumonia ( <u>Filaroides milksi</u> )	80	Dog	Lung	Pneumonia; distemper and infectious canine hepatitis viruses and bacteria
60	Cat	Heart	Metastatic calcification	81	Dog	Liver	Hepatic syndrome caused by heartworms
61	Dog	Liver	Histoplasmosis	82	Rat	Salivary gland	Sialadenitis
62	Dog	Intestine	Histoplasmosis	83	Mouse	Lung	Neoplasia and hyperplasia
63	Gibbon	Intestine	Strongyloidiasis	84	Cat	Lung	Bronchiolar-alveolar tumor
64	Dog	Lung	Pneumonia ( <u>Paragonimus sp.</u> )	85	Mouse	Multiple	Ectromelia
65	Horse	Skin	Onchocerciasis				
66	Cebus monkey	Lung	Pneumonia ( <u>Filaripopsis arator</u> )				



86	Skunk	Kidney	Glomerular amyloidosis
87	Cat	Spleen, Lymph nodes	Megakaryocytic leukemia
88	Pig	Brain	Vasculitis caused by coliform toxin
89	Dog	Brain	Inflammatory reticulosis
90-92	Pig	Lung, liver & kidney	Crotolaria toxicity
93, 94	Cat	Skin	Sporotrichosis
95, 96	Rhesus monkey	Brain	Tuberculosis
97, 98	Dog	Kidney	Babesiosis
99, 100	Cow	Liver & spleen	Anthrax

COMMENTARY ON SLIDES

Slide 1

<sup>(4)</sup>  
HISTORY. This 1-year-old male goat of mixed breed had an episode described as acute convulsion, followed by a depressive state in which its head and neck were twisted to the right.

DIAGNOSIS. Encephalitis, suppurative, caused by Listeria monocytogenes.

COMMENT. At necropsy there were several poorly circumscribed soft areas in the pons and brain stem. L. monocytogenes was cultured from these areas.

CONTRIBUTOR. Johns Hopkins University, Baltimore, Maryland.  
(4)

Slide 2

HISTORY. An 8-year-old female dog exhibited circling to the right, loss of depth perception, and incoordination of the pelvic limbs.

DIAGNOSIS. Reticulosis of the CNS.

COMMENT. While differentiation between an inflammatory and a neoplastic process is difficult, the primary cellular reaction is that of proliferating reticuloendothelial cells arranged in wide bands around blood vessels, with secondary infiltration of lymphoid and plasma cells. Several multinucleated giant cells are present. There is one focus of necrosis in the center of the lesion.

SUGGESTED READING. Koestner, A., and Zeman, W.: Primary reticulosis of the central nervous system in dogs. Am. J. Vet. Res. 23: 381-393, 1962.

CONTRIBUTOR. Oregon State University, Corvallis.



Slide 3

**HISTORY.** In a drove of approximately 20 sows with their litters, the young pigs were affected with an unexplained illness. There had been approximately 10 deaths at 2 weeks of age, and 10 others were ill. The pigs showed anorexia, ataxia, and seizures, followed shortly by death. There were no remarkable gross lesions.

**DIAGNOSIS.** Eastern encephalomyelitis.

**COMMENT.** Results of bacteriologic examinations were negative; 960 *Strongyloides ransomi* and 660 ascarid larvae were recovered from the intestines. The FA test for hog cholera virus in the spleen and tonsil were negative. There was severe, disseminated meningoencephalitis, evidenced by malacia, neuronal necrosis, and marked infiltration of a mixture of inflammatory cells. Eastern encephalomyelitis virus was isolated from brain tissue cultured in porcine kidney tissue.

**SUGGESTED READING.** Pursell, A.R., Peckham, J.C., Cole, J.R., Stewart, W.C., and Mitchell, F.E.: Naturally occurring and artificially induced eastern encephalomyelitis in pigs. *J. Am. Vet. Med. Assoc.* 161: 1143-1147, 1972.  
**CONTRIBUTOR.** University of Georgia, Athens.

Slide 4

**HISTORY.** The subject of this case was a 3-month-old pig from a herd of 140 pigs. The owner was in the habit of feeding out several hundred hogs each year. He received from the local elevator and mill a fresh shipment of mixed ground feed on Wednesday. The following weekend, the family went on vacation. The man in charge was to check the watering and feeding devices, all of which were automated. On the following Monday, the worker found that all watering devices were shut down. Four shoots were dead and 20 appeared blind and lacked coordination.

**DIAGNOSIS.** Eosinophilic meningoencephalitis in a pig.  
**COMMENT.** Losses were quickly minimized by restoration of water. The weather fortunately was mild. The salt content of the ration was not analyzed. Some of the dead animals had an acute gastroenteritis. This is probably a case of salt poisoning, apparently caused by restricted water intake and marginally high sodium salt content in the ration. An additional possible complicating factor is urea, which is used commonly in some of these diets and which should always be evaluated if possible, especially if the condition appears several days after introduction to a new ration and other factors are believed to be stable.  
**CONTRIBUTOR.** Kansas State University, Manhattan.



Slide 5

**HISTORY.** An 8-year-old male cotton-top marmoset (Saguinus oedipus) with a palpable abdominal mass was anorectic and depressed for 2 weeks.

**DIAGNOSIS.** Adenocarcinoma, mucinous, colon.

**COMMENT.** A laparotomy revealed an irregular mass within the wall of the colon. The animal was euthanized and necropsied. The tumor involved the entire cecum and portions of the jejunum and large colon. There were tumor emboli in lymphatics and metastatic foci in the regional lymph nodes. No metastatic lesions were found in other viscera.

**CONTRIBUTOR.** Johns Hopkins University, Baltimore, MD

Slide 6

**HISTORY.** A 6- to 7-year-old poodle had a fast-growing, ulcerated tissue located on the posterior thigh near the pelvis.

**DIAGNOSIS.** Cutaneous myeloid sarcoma.

**COMMENT.** All attendees were in general agreement that the lesion represented a neoplasm arising from a myeloid element or elements, but a number of diagnoses were proffered that reflected the uncertainty of the cell type proliferating and the numerous names applied to this lesion in the literature.

**CONTRIBUTOR.** County of Los Angeles, Department of Health Services, California.

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Slide 7

**HISTORY.** Ten pups in two litters were affected in a northern Florida kennel of 300 greyhounds. There had been a single death, and the other nine pups had been ill for a few days with dysentery and lethargy. The pups had been dewormed recently and vaccinated against distemper-hepatitis. The section is from the 3- to 4-month-old greyhound that had died.

**DIAGNOSIS.** Acanthamoebiasis and canine distemper.

**CONTRIBUTOR.** University of Georgia, Athens.

Slide 8

**HISTORY.** This slide shows a section from a 3-1/2-year-old German shepherd that was euthanized after 3 weeks of a progressive CNS disturbance characterized by circling, ataxia, blindness, and dementia.

**DIAGNOSIS.** Cerebral infarction resulting from presence of adult Diriofilaria immitis\* in one of the superficial cerebral arteries.

**CONTRIBUTOR.** Johns Hopkins University, Baltimore, MD

\* Note: Only a few of the available slides contained the adult filarid; therefore, the slide for this case in some sets may not show the parasite.

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Slide 9

**HISTORY.** A 3-year-old miniature schnauzer was submitted for postmortem examination. The dog had a 6-month history of intermittent diarrhea and periods of severe depression over the preceding 2 years. There had also been a history of intermittent lameness that was treated with steroids. At necropsy, gross examination revealed that the entire mucosa of the small intestine was thickened and rough, with small, irregular ulcerated areas. The large intestine had thickened linear mucosal elevations with small areas of ulceration and hemorrhage. The mesenteric lymph nodes were three to four times normal size and were firm and fibrotic on cut surface.

**DIAGNOSIS.** Granulomatous enteritis caused by

Histoplasma capsulatum.

**CONTRIBUTOR.** University of Missouri, Columbia.

Slide 10

**HISTORY.** This slide shows a section from the lung of a 2-year-old Hampshire ewe that died in January. No apparent illness could be observed in the other 40 sheep in the flock. The ration consisted of alfalfa hay plus a mixture of grain that contained chlortetracycline. Gross examination revealed that nearly all of both lungs were firm, gray in color, and did not collapse.

**DIAGNOSIS.** Chronic progressive pneumonia.

**CONTRIBUTOR.** South Dakota State University, Brookings.

Slide 11

**HISTORY.** This section of lung is representative of a naturally occurring disease affecting a cattle herd in Georgia. Gross lesions were limited to the respiratory tract. The lungs were wet, firm, and did not collapse when the thorax was opened. There was diffuse emphysema and edema, with the interlobular septa particularly thickened.

**DIAGNOSIS.** Atypical interstitial pneumonia.

Fusarium solani was isolated from the moldy sweet potatoes that were being fed to the herd. The disease was experimentally reproduced in other steers by oral administration of homogenized sweet potato cultures infested with F. solani.

**SUGGESTED READING.** Peckham, J.C., Mitchell, F.E., Jones, O.H., and Douplik, B.: Atypical interstitial pneumonia in cattle fed moldy sweet potatoes. J. Am. Vet. Med. Assoc. 160: 169-172, 1972.

**CONTRIBUTOR.** University of Georgia, Athens.

Slide 12

**HISTORY.** This is a section of brain from a 6-week-old pig that was killed after having been in lateral recumbency for about 48 hours. Five of 125 pigs were affected; 2 had died. Signs included incoordination, staggering, circling, nystagmus, recumbency, sudden death, and some diarrhea. No gross lesions were found.

**DIAGNOSIS.** Edema disease.

**CONTRIBUTOR.** South Dakota State University, Brookings.



Slide 13

HISTORY. An encapsulated tumor was removed from the ventral tail region of a gecko.

DIAGNOSIS. Neurofibroma.

COMMENT. Some slides contained a focus of plumper cells and a modest number of mitotic figures that some attendees considered to constitute malignancy.

CONTRIBUTOR. County of Los Angeles, Dept. of Health Services, California.

Slide 14

HISTORY. Tissues from a 20-month-old control male Swiss Webster mouse. There were firm tumor nodules in the subcutis at the interscapular area, in the lung, and in the thoracic inlet attached to the rib cage.

DIAGNOSIS. Pulmonary adenocarcinoma with metastasis to the thoracic cavity and subcutis.

CONTRIBUTOR. Merck Sharp and Dohme Research Laboratories, West Point, Pennsylvania.

Slide 15

HISTORY. A 9-year-old male old English sheep dog had intermittent episodes of diarrhea and intestinal bleeding for a period of 9 months. The enteric signs were accompanied by a normocytic normochromic anemia, thrombocytopenia, and progressive emaciation. Post-mortem examination revealed a 3x4-cm. ulcerated mass at the ileocecal junction.

DIAGNOSIS. Ileocecal carcinoid tumor.

COMMENT. The ileocecal carcinoid tumor had metastasized to the liver. Argyrophil and argentaffin granules were demonstrated in the tumor cells with the Bodian silver and Gomori methenamine-silver techniques. SUGGESTED READING. Christie, G.S., and Jabara, A.G.: Two cases of malignant intestinal neoplasms in dogs. J. Comp. Pathol. 74: 90-93, 1964. Giles, Ralph C., Hildebrandt, Paul K., and Montgomery, C.A.: Carcinoid tumor in small intestine of a dog. Vet. Pathol. 11: 340-349, 1974.

CONTRIBUTOR. Walter Reed Army Institute of Research, Washington, D.C.

Slide 16

HISTORY. The tissue is from one of several young adult female Maccaca arctoides that had profuse watery diarrhea. The animal died 3 days after onset of signs.

DIAGNOSIS. Hemorrhagic colitis (shigellosis).

COMMENT. Group B Shigella organisms were cultured from all affected animals in the epizootic.

CONTRIBUTOR. Pennsylvania State University, Hershey Medical Center, Hershey.



Slide 17

**HISTORY.** A 4-year-old female shih-tzu was submitted to the veterinary clinic. At that time the dog walked slowly, was wobbly in the hind limbs, and was depressed. Tentative diagnoses of encephalitis, hepatitis, and endocarditis were made. The animal later suffered seizures and became semicomatose. She died 4 days after admission. At necropsy no significant gross changes were observed.

**DIAGNOSIS.** Rabies.

**COMMENT.** Subsequent to finding a small number of Negri bodies in hematoxylin and eosin sections of most areas of the brain, including the cerebellum, the diagnosis was verified by FA techniques and confirmed on materials submitted to the Center for Disease Control, Atlanta.

**CONTRIBUTOR.** Kansas State University, Manhattan.

Slide 18

**HISTORY.** A 7-year-old horse had signs of a central nervous system disturbance, including circling, hyperexcitability, and bruxism. Its temperature was 103.5°F. One week later stupor and anorexia were noted.

**DIAGNOSIS.** Cerebral nematodiasis (*Micronema* sp.)

**SUGGESTED READING.** Ferris, D.H., Levine, N.D., and Beamer, P.D.: *Micronema deletrix* in equine brain. *Am. J. Vet. Res.* 33: 33-38, 1972.

**CONTRIBUTOR.** National Animal Disease Laboratory, Ames, Iowa.

Slide 19

**HISTORY.** This tissue is from a 2-week-old piglet with posterior paralysis that had developed gradually since birth. This piglet was one of a litter of 11 from a Yorkshire sow that had been bred to a recently purchased Yorkshire boar. Three other littermates were born dead, and two others were ataxic. Two of five litters sired by this boar have been affected. The owner raises his own replacement sows.

**DIAGNOSIS.** Congenital neuronal lipodystrophy.

**SUGGESTED READING.** Read, W.K., and Bridges,

C.H.: Cerebrospinal lipodystrophy in swine. *Vet. Pathol.* 5: 67-74, 1968.

**CONTRIBUTOR.** U.S. Army, Edgewood Arsenal, Maryland.

Slide 20

**HISTORY.** Tissue taken from a 6-year-old Doberman that had a well-encapsulated tumor located between muscle layers on the right side of the neck midway between the mandible and the thoracic inlet.

**DIAGNOSIS.** Solid follicular carcinoma of the thyroid.

**COMMENT.** Some of those attending the conference reported the presence of an eosinophilic material resembling amyloid in some areas of the tumor.

**CONTRIBUTOR.** University of Arizona, Tucson.



Slide 21

**HISTORY.** This suspected tumor was first noticed during routine working of cattle. There was no other history of disease in this 7-year-old Hereford cow. A biopsy specimen was taken from tissue that completely obstructed the left nostril. Several additional growths were visible through the left nares.

**DIAGNOSIS.** Nasal granuloma.

**COMMENT.** PAS-stained sections demonstrated short, plump mycelial segments in the eosinophilic granular centers of numerous granulomatous foci. Some of the segments have local expansions that resemble chlamydospores. Although the practitioner who presented this material did not respond to a request for unfixed biopsy material to culture, it may be assumed from observation and the findings of others that the organism is Helminthosporium spiciferum, a common soil fungus associated with nasal granuloma and other forms of mycotic disease. The veterinarian likewise did not respond to a question about the origin of the cow. It may have shipped in from an area in which nasal granuloma has been recognized before.

**SUGGESTED READING.** Roberts, E.D., McDaniel, H.A., and Carbrey, E.A.: Maduromycosis of the bovine nasal mucosa. J. Am. Vet. Med. Assoc. 142: 42-48, 1963.

**CONTRIBUTOR.** University of Arizona, Tucson.

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Slide 22

**HISTORY.** This slide is from a biopsy of the lip from one of two ewes that exhibited pustular and scabby lesions on the lips and udders. The owner stated that several other members of the flock were similarly affected.

**DIAGNOSIS.** Contagious ecthyma.

**CONTRIBUTOR.** U.S. Army, Edgewood Arsenal, Maryland.

Slide 23

**HISTORY.** A 10-year-old German shepherd dog was submitted for postmortem examination with a 6-month history of anorexia, weight loss, polyuria, and polydipsia. A neoplasm 4 cm. in diameter was found within the cortex at the anterior pole of the right kidney.

**DIAGNOSIS.** Renal cell carcinoma.

**CONTRIBUTOR.** University of Missouri, Columbia.

Slide 24

**HISTORY.** A 6-month old beagle dog had been infected with Neorickettsia helminthoeca in March 1973. The dog became ill and then was treated with tetracycline. The infection cleared, and the dog appeared clinically normal. On December 31, 1973, the animal was observed to be near death and to have a strong odor of urine on the breath. At necropsy the animal was emaciated, and the kidneys were white and contracted. No other lesions were noted. Three other dogs followed this same clinical course.

**DIAGNOSIS.** Membranoproliferative glomerulonephritis.

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COMMENT. Examination of electron micrographs revealed thickening of glomerular basement membranes and proliferation of the mesangial matrix. Focal dense deposits were observed on the epithelial side of the basement membrane suggesting the deposition of immune complexes.

CONTRIBUTOR. Walter Reed Army Institute of Research, Washington, D.C.

#### Slide 25

HISTORY. Acute disease was seen in 3-month-old pigs. Of 450 pigs on the farm, 20 were febrile (106°F) and 6 had died. The practicing veterinarian observed petechiae on the kidney of this pig and an enlarged spleen. Tissues were submitted for histopathologic examination and culture.

DIAGNOSIS. Glomerular thrombosis.

COMMENT. Salmonella cholerae-suis organisms were isolated from the liver, kidney, spleen, and lung.

SUGGESTED READING. Horn, R.G.: Evidence for participation of granulocytes in the pathogenesis of the generalized Schwartzman reaction: A review. *J. Infect. Dis.* 128 (suppl.): 5134-5143 (July) 1973. Jubb, K.V.F., and Kennedy, P.C.: Pathology of Domestic Animals, vol. 2, ed. 2. New York, Academic Press, 1970, 123-127.  
CONTRIBUTOR. C.E. Kord Animal Disease Diagnostic Laboratory, Nashville, Tennessee.

#### Slide 26

HISTORY. A 5-year-old male domestic short-hair cat was presented with a history of anorexia, periodic vomiting, and depression of 10 days' duration. The owner stated that the cat was vomiting once every other day during this time and had lost weight. During the 7 days prior to admission, the cat had developed edema. Physical examination revealed moderate depression and pitting edema involving all four legs and the ventral skin. The mucous membranes were pale, and the cat was thin. The rectal temperature was 102° F.

Laboratory evaluation disclosed uremia, leukocytosis without a left shift, and anemia, which was nonregenerative. Urinalysis done on random samples showed albuminuria and normal sediments. Serum electrophoresis revealed marked hypalbuminuria and an alpha-2 elevation. A 24-hour urine collection was performed that documented significant proteinuria (albumin and globulin). Lupus erythematosus preparations and a fluorescent-antibody test for feline leukemia virus were negative. X-ray films of the chest and abdomen were normal. Light- and electron-microscopic examination of a renal biopsy specimen revealed membranous glomerulonephritis and chronic interstitial nephritis. In the following 5-1/2 months the cat had only periodic vomiting and transient episodes of depression, but the proteinuria and anemia persisted.

At the time of the last evaluation the cat was presented (anorectic) with severe weakness of 5 days' duration. The cat had vomited on several occasions. Physical examination showed 10 percent clinical dehydration, severe weakness, and pale mucous membranes. The rectal temperature was 101° F. After laboratory evaluation revealed further deterioration of renal function, the owner requested euthanasia. The slide is from necropsy material.



**DIAGNOSIS.** End-stage membranous glomerulonephritis.

**COMMENT.** Examination of electron micrographs revealed thickening of glomerular basement membranes with focal dense deposits in and on the epithelial side of the basement membrane. These changes were interpreted to represent the membranous form of immune complex glomerulonephritis.

**CONTRIBUTOR.** Animal Medical Center, New York.

Slide 27

**HISTORY.** These tissues are from a 7-day-old chick that was inoculated subcutaneously at 3 days of age with a 20 percent suspension of chick-kidney tissue-culture material. The liver was swollen, hemorrhagic, and icteric. Random zones of petechial and ecchymotic muscular hemorrhages were also present, as well as icterus throughout the carcass of the chick.

The original source of infective material was from 8- to 10-week-old chickens that died with hemorrhages. Generalized icterus and anemia were present throughout the carcasses of the chickens. The infective material was comprised of a 20 percent suspension of liver that was passaged three times through chick kidney cells and subsequently purified three times by the plaque-purification technique prior to inoculation of the chicks.

**DIAGNOSIS.** Inclusion body hepatitis-hemolytic anemia syndrome.

**CONTRIBUTOR.** Texas A & M University, College Station.

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Slide 28

**HISTORY.** A grayish-white nodule measuring 8 mm. in diameter was found in the lung of a clinically normal 12-month-old BALB/c mouse.

**DIAGNOSIS.** Alveolar cell tumor or alveologenic carcinoma of the lung.

**COMMENT.** The typical lung tumor of the mouse is alveologenic. Alveologenic tumors occur spontaneously in high incidence in A, SWR, and BALB/c mice. These tumors have been variously diagnosed as adenoma, papillary cystadenoma, and adenocarcinoma. All are probably morphologic variants of a single malignant neoplastic process.

**CONTRIBUTOR.** National Center for Toxicological Research, Jefferson, Arkansas.

Slide 29

**HISTORY.** Cerebellum from a calf born at full term. The animal was unable to stand and nurse. A section of cerebellum from a normal calf is on the slide for comparison.

**DIAGNOSIS.** Cerebellar hypoplasia.

**COMMENT.** Bovine viral diarrhea virus was isolated from lymph node and spleen.

**SUGGESTED READING.** Brown, T.T., de Lahunta, A., Scott, F.W., and Kahrs, R.F.: Virus-induced congenital anomalies of the bovine fetus. II. Histopathology of cerebellar degeneration (hypoplasia) induced by the virus of bovine viral diarrhea-mucosal disease. *Cornell Vet.* 63: 562-578, 1973. Kahrs, R.F., Scott, F.W., and de Lahunta, A.

Congenital cerebellar hypoplasia and ocular defects in calves following bovine viral diarrhea-mucosal disease infection in pregnant cattle. *J. Am. Vet. Med. Assoc.* 156: 1443-1450, 1970.

**CONTRIBUTOR.** Cornell University, Ithaca, New York.

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Slide 30

**HISTORY.** Tissue from a 5- or 6-month-old cat. Owner reported losses of 2 pigs and 18 cats within 3 days. All ages of cats were affected. Gross lesions in the cats were confined to the intestine and mesenteric lymph nodes and consisted of severe hyperemia with some hemorrhage.

**DIAGNOSIS.** Feline panleukopenia (with inclusion bodies).  
**CONTRIBUTOR.** University of Nebraska, Lincoln.

Slide 31

**HISTORY.** This section of lung is from the diaphragmatic lobe of a 3-month-old cat killed 7 days after aerosol infection with an experimental agent.

**DIAGNOSIS.** Experimental feline calicivirus (picornavirus) infection.

**COMMENT.** The major histologic features are foci of intense pneumonia characterized by alveolar congestion, hemorrhage, necrosis, and seropurulent exudate. In the more peripheral aspects of the lesions adenomatoid proliferation of type II pneumocytes is prominent. Here the alveolar exudate becomes mononuclear with abundant exfoliated alveolar type II cells. These reactions typify pneumonia induced by the highly virulent strains of feline caliciviruses.

**SUGGESTED READING.** Hoover, E.A., and Kahn, D.E.: Lesions produced by feline picornaviruses of different virulence in pathogenfree cats. *Vet. Pathol.* 10: 307-322, 1973.  
**CONTRIBUTOR.** Ohio State University, Columbus.

Slide 32

**HISTORY.** Tissue from a 3-week-old Arabian filly. The dam had VEE 11 days after foaling. The filly became noticeably ill 2 or 3 days later.

**DIAGNOSIS.** Adenovirus pneumonia.

**COMMENT.** In the discussion of this case, attendees considered various ramifications of infectious diseases in Arabian foals, including the probability of a predisposing combined immunodeficiency.

**CONTRIBUTOR.** Charles Louis Davis, D.V.M. Foundation, Morristown, New Jersey.

Slide 33

**HISTORY.** Tissue from a 1-week-old Yorkshire cross porcine. In the 16 days prior to submission of these pigs, the owner reportedly lost 400 baby pigs and 3 adult pigs, including a boar. Some sows had aborted or delivered still-born or mummified fetuses. Baby pigs had clinical signs that included head tilt, opisthotonus, convulsions, and paddling while on their side. On necropsy examination, white foci were found in the liver, spleen, and myocardium of this baby pig and other baby pigs examined.

**DIAGNOSIS.** Focal necrotizing nonsuppurative myocarditis resulting from pseudorabies infection.

**COMMENT.** There was positive immunofluorescence for pseudorabies virus in tonsil, heart, liver, kidney, and spleen. All pigs examined had a nonsuppurative encephalitis. The contributor indicated that inclusion bodies were found in all tissues with necrotizing lesions, but most attendees were unable to recognize good examples of herpetic inclusions in the heart sections examined.

**CONTRIBUTOR.** University of Nebraska, Lincoln.



Slide 34

**HISTORY.** This slide has a section of tissue from a clinically normal mature female CD1 mouse.

**DIAGNOSIS.** Rodless retina.

**COMMENT.** Rodless retinal disease is a recessive inherited condition of several strains of mice, characteristically affecting C3H and CBA mice. Superficial observation gives no indication of blindness. There appears to be normal development of the retina anywhere from 6 to 14 days after birth. Then a degeneration occurs, and nothing remains of the rods or their nuclei by 28 days. Later the outer layers of the retina are lost, and there may be degeneration of the pigmented epithelium of the retina.

**SUGGESTED READING.** Fuller, J.L., and Wimer, R.E.: Neural, sensory and motor functions. In *Biology of the Laboratory Mouse*, edited by Green, E.L. New York, McGraw-Hill, 1966, chap. 32, pp. 614-616. Sidman, R.L., and Green, M.C.: Retinal degeneration in the mouse. Location of the rd locus in linkage group XVII. *J. Hered.* 56: 23-29, 1965.

**CONTRIBUTOR.** National Center for Toxicological Research, Jefferson, Arkansas.

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Slide 35

**HISTORY.** Five days after a 9-inch June snowstorm, death losses commenced in a herd of 1,000 long yearling heifers and steers on highland meadow and hill pasture. One hundred and twelve calves died within 30 days of the storm. Clinically affected animals were depressed and off feed, passed small amounts of black or tan feces, demonstrated tenesmus at defecation, and died quickly. In some calves, the abdomen was distended with fluid, and there was pendant subcutaneous edema; others were gaunt and dehydrated. Temperature, pulse, and respirations were normal. Samples for clinicopathologic study showed (a) normal WBC, PCV, total protein, and differential; (b) fibrinogen 500-2,000 mg.; creatinine 5-30%; BUN 50-120 mg/100 ml.; Ca 4. 5-8 mg/100 ml.; P 6-9 mg/100 ml.; (c) urinalysis: Sp. grav. 1.0007-1.019; pH 7-8; protein negative to 3+.

**DIAGNOSIS.** Oak bud poisoning.

**COMMENT.** The snow had covered the grass and left only the oak sprouts and other tall plants to eat.

**CONTRIBUTOR.** Colorado State University, Fort Collins.

Slide 36

**HISTORY.** Tissue from a mouse that died after an inoculation of tumor cells approximately 7 days prior to death.

**DIAGNOSIS.** Ectromelia.

**COMMENT.** This mouse was one of a group of mice that were from a laboratory in England where an ectromelia outbreak was recognized shortly after these animals were sent to the National Institutes of Health.

**CONTRIBUTOR.** Comparative Pathology Section, National Institutes of Health, Bethesda, Maryland.

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Slide 37

**HISTORY.** Section of skin from a 15-year-old Angus cow. The lesion was considered incidental at the time of death and consisted of approximately 10 circumscribed raised, hairless areas on the ventral midline near the umbilicus. The lesions ranged in size from 1x1 cm. to 4x6 cm.

**DIAGNOSIS.** Stephanofilarial dermatitis.

**COMMENT.** Chronic dermatitis characterized by parakeratosis, hyperkeratosis, acanthosis, and infiltration of the dermis by a population of mixed inflammatory cells is evident. In some sections foci of epidermal necrosis are present. Careful examination reveals microfilaria in the dermis compatible with those of *Stephanofilaria stilesi*.

**CONTRIBUTOR.** Ohio State University, Columbus.

Slide 38

**HISTORY.** Tissue from the udder of a cow.

**DIAGNOSIS.** Mastocytoma.

**CONTRIBUTOR.** Charles Louis Davis, D.V.M. Foundation, Morristown, New Jersey.

Slide 39

**HISTORY.** A bovine skin lesion. Other animals of various ages in the herd had similar lesions, which persisted in some animals for 4 years.

**DIAGNOSIS.** Atypical bovine cutaneous papillomatosis.

**COMMENT.** The tumor, a papilloma with no dermal fibroplasia, differs from the typical bovine wart, which is a fibropapilloma. In this regard, the atypical bovine papilloma resembles the papillomas of other species. The typical bovine wart usually regresses in less than a year, with evidence of cell-mediated immunity.

**SUGGESTED READING.** Barthold, S.S., Koller, L.D., et al: Atypical warts in cattle. *J. Am. Vet. Med. Assoc.* 165: 276-280, 1974.

**CONTRIBUTOR.** University of Wisconsin, Madison.

Slide 40

**HISTORY.** A 3-year-old great Dane dog was presented with anorexia, weight loss, increased respiratory rate, ascites, and depression. EKG revealed pulmonary edema and general cardiomegaly. The animal died shortly after release from the veterinary hospital.

**DIAGNOSIS.** Primary myocardial disease (congestive cardiomyopathy)

**SUGGESTED READING.** Ettinger, S.J., and Suter, P.F.: *Canine Cardiology.* Philadelphia, Saunders, 1970, pp. 383-402. Tilley, L.P., and Liu, S.K.: Cardiomyopathy in the dog. In *Proceedings, 7th Annual Meeting of International Study Group for Research in Cardiac Metabolism*, edited by Roy, P.E., and Rona, G. Baltimore, University Park Press, 1975.

**CONTRIBUTOR.** Animal Medical Center, New York.



Slide 41

**HISTORY.** Incidental finding from the ileum of a 26-year-old horse euthanized because of a fractured femur. This section was taken to study a raised, reddish-brown plaque on the serosal surface of the small intestine.

**DIAGNOSIS.** Equine coccidiosis (macrogametes and microgametes of Eimeria leukarti in the lamina propria). "Hemomelasma ilei"---serosal hemorrhage and proliferation of granulation tissue, generally attributed to migration of strongyle larvae.

**CONTRIBUTOR.** Colorado State University, Fort Collins.

Slide 42

**HISTORY.** Section through the papilla of Vater of a young female Maccaca arctoides that died during an epizootic of shigellosis.

**DIAGNOSIS.** Ectopic pancreas or hamartomatous maldevelopment.

**CONTRIBUTOR.** Pennsylvania State University, Hershey Medical Center, Hershey.

Slide 43

**HISTORY.** Tissue from a 17-day-old debilitated foal.

**DIAGNOSIS.** Tyzzer's disease.

**COMMENT.** Diagnosis was confirmed with special stains and electron microscopy.

**SUGGESTED READING.** Hall, W.C., and Van Kruningen, H.J.: Tyzzer's disease in a horse. *J. Am. Vet. Med. Assoc.* 164: 1187-1190, 1974.

**CONTRIBUTOR.** University of California, Davis.

Slide 44

**HISTORY.** This is a section of brain from a parrot that was inoculated with an agent isolated from another parrot.

**DIAGNOSIS.** Newcastle disease (WVN strain).

**COMMENT.** In contrast to chickens, no lesions were seen in the gastrointestinal tract of parrots inoculated with the WVN strain of the virus.

**CONTRIBUTOR.** National Animal Disease Laboratory, Ames, Iowa.

Slide 45

**HISTORY.** A 500-kg, 4-year-old paint stallion was presented for treatment of lameness of the right hind limb. Two days prior to admission the horse was hit by a car from behind while being transported in a trailer. Symptomatic treatment with dexamethasone (20 mg. intramuscularly on days 1, 2, and 3), penicillin, and butazolidin did not improve the condition, and the horse died 13 days after hospitalization. Grossly, focal malacia and hemorrhage were observed in the spinal cord from the level of T9 to L5. The brain appeared normal. Changes in other organs were unrelated to the syndrome described.

**DIAGNOSIS.** Parasitic myelitis with myelomalacia due to Toxoplasma-like organism.

**SUGGESTED READING.** Dubey, J.P., Davis, G.W., et al.: Equine encephalomyelitis due to a protozoan parasite resembling Toxoplasma gondii. *J. Am. Vet. Med. Assoc.* 165: 249-255, 1974.

**CONTRIBUTOR.** Ohio State University, Columbus.

Slide 46

**HISTORY.** This is brain tissue from a 2-1/2-month-old rabbit that was bred and raised by a local rabbit producer. The animal was clinically normal when it was slaughtered for human consumption. No gross lesions were observed.

**DIAGNOSIS.** Granulomatous encephalitis (nosematosis) caused by Encephalitozoon cuniculi.

**CONTRIBUTOR.** Texas A&M University, College Station.

Slide 47

**HISTORY.** This ovary, which is from a 9-year-old mare, is 6.2 cm. in diameter and irregular to oval in shape, with a knobby appearance and a thickened capsule. The animal was reported to be infertile and apparently to be almost constantly in estrus.

**DIAGNOSIS.** Granulosa cell tumor, unilateral, ovary, mare.

**CONTRIBUTOR.** Kansas State University, Manhattan.

Slide 48

**HISTORY.** This neoplasm was found in a 736-day-old rat derived from the Sprague-Dawley strain. The rat was one of 400 in a chronic toxicity study. The over-all frequency of this tumor was 12 percent, with no difference between experimental and control groups of animals.

**DIAGNOSIS.** Islet cell adenoma, pancreas.

**CONTRIBUTOR.** Environmental Protection Agency, Research Triangle, North Carolina.

Slide 49

**HISTORY.** Tissue is from the urinary bladder of an NIH Swiss mouse with hematuria. This mouse had received 14 weekly injections of methylazoxyoctane and was put to death 33 weeks after the first injection.

**DIAGNOSIS.** Hemangiosarcoma; transitional cell carcinoma; hyperplastic and inflammatory lesions of the bladder.

**SUGGESTED READING.** Ward, J.M., Weisburger, E.K., Benjamin, T., and Moss, R.A.: Brief communication: Shift of organotropy of azoxy compounds--replacement of methyl with an octyl group. J. Natl. Cancer Inst. 53: 1181-1183, 1974.

**CONTRIBUTOR.** National Cancer Institute, Bethesda, Maryland.

Slide 50

**HISTORY.** This tissue is from the kidney of a 3-month-old Lhasa apso that had vomiting, diarrhea, depression, an elevated BUN (215 mg./100 ml.), and leukocytosis with a degenerative left shift.

**DIAGNOSIS.** Familial nephropathy in Lhasa apso.

**COMMENT.** This peculiar renal disease in the Lhasa apso is characterized primarily by increased numbers of small, shrunken, nonperfused (immature) glomeruli. These glomeruli apparently become effete, resulting in the loss of the entire nephron, which ultimately progresses to small sclerotic kidneys and renal failure. Some of the attendees were particularly impressed with the vascular changes, such as thrombosis of large veins and degeneration with mineralization of the walls.

**CONTRIBUTOR.** University of California, Davis.



Slide 51

**HISTORY.** This section of cerebellum is from a 5-month-old male great Dane that had a history of progressive neurologic dysfunction. The early sign was posterior ataxia, which led to paralysis of hind limbs, hypertonus, pectoral limb deficits, and temporal muscular atrophy.

**DIAGNOSIS.** Toxoplasmosis.

**COMMENT.** Conference attendees were cautioned that in cases of toxoplasmosis such as this, every attempt should be made to eliminate concurrent infection by canine distemper. No evidence of such a concurrent infection was observed in the available sections from this case.

**CONTRIBUTOR.** Texas A&M University, College Station.

Slide 52

**HISTORY.** This is a section of the brain from a cat maintained in a small animal research ward. A number of cats in this ward had central nervous system signs of ataxia, incoordination, and convulsions. The convulsions were easily induced and were characterized by ventroflexion of the head.

**DIAGNOSIS.** Thiamine deficiency.

**COMMENT.** Two weeks prior to onset of signs the diet was changed to a commercial canned cat food. Analysis of food and liver from affected cats revealed a deficiency in thiamine. Hemorrhagic lesions were observed in gray matter of the cerebral cortex and in the periventricular gray matter.

**CONTRIBUTOR.** Michigan State University, East Lansing.

Slide 53

**HISTORY.** Tissue is from the spleen of a pheasant that was found dead. Fifteen to 20 other pheasants had also been found dead in a flock of 15,000 birds. Gross lesions consisted of enlarged, mottled spleens with multiple areas of necrosis. These birds also had very dark-red, edematous, and congested lungs. Several birds necropsied had numerous gapeworms in the trachea.

**DIAGNOSIS.** Marble spleen disease.

**CONTRIBUTOR.** Michigan State University, East Lansing.

Slide 54

**HISTORY.** This section is from an inguinal lymph node that was removed from a 2-year-old female German shepherd. The dog was brought to a veterinarian because of a vaginal growth, which was also removed.

**DIAGNOSIS.** Transmissible venereal tumor, metastatic from vagina.

**CONTRIBUTOR.** University of Alabama, Birmingham.

Slide 55

**HISTORY.** This is a section of tissue taken from the metaphysealepiphyseal junction of the distal femur of a 6-month-old female springer spaniel.

**DIAGNOSIS.** Multiple cartilaginous exostotic growths.

**COMMENT.** Similar lesions were found on the ribs, vertebrae, pelvis, radius, ulna, and fibula.

**SUGGESTED READING.** Gee, B.R., and Doigi, C.E.: Multiple cartilaginous exostoses in a litter of dogs. *J. Am. Vet. Med. Assoc.* 156: 53-59, 1970. Pool, R.R., and Carrig, C.B.: Multiple cartilaginous exostoses in a cat. *Vet. Pathol.* 9: 350-359, 1972.

Slide 56

**HISTORY.** Section of urinary bladder is from a rhesus monkey.

**DIAGNOSIS.** Nonspecific eosinophilic cytoplasmic inclusions.

**SUGGESTED READING.** Burek, J.D., et al: Cytoplasmic inclusion in urinary bladder epithelium of the rhesus monkey. *Vet. Pathol.* 9: 212-222, 1972.

**CONTRIBUTOR.** Pfizer, Inc., Groton, Connecticut.

Slide 57

**HISTORY.** Section of lung is from one of two Australorp chicks that were hatched in a feed store in December 1973. They were sold to a Cooperative Extension Service administrator, who has a hobby of raising fancy chickens and rabbits. These two chicks became sick shortly after the new owner moved the brooder. Gross lesions included a yellow solid 8-mm. nodule in the right lung and an abscessed umbilicus that was adherent to the gut.

**DIAGNOSIS.** Pullorum disease.

**COMMENT.** Salmonella pullorum was isolated from the lung lesion.

**CONTRIBUTOR.** University of Arizona, Tucson.

Slide 58

**HISTORY.** Section is from the occipital region of a 9-year-old female dog of mixed breeding. The dog was admitted to the animal hospital with a 2-month history of bumping into familiar objects and lameness of the right rear leg. The results of cerebro-spinal fluid examination, complete blood counts, SMA 12/60 profile, fecal and urinary analysis, and radiographs of the thorax and abdomen were all within normal limits. Radiographs of the skull revealed a nodular soft tissue with stippled-appearing densities throughout the mass and rarefaction of the underlying occipital bone.

**DIAGNOSIS.** Cartilage analogue of fibromatosis (juvenile aponeurotic fibroma).

**COMMENT.** All attendees agreed that this neoplasm is a distinct entity in dogs, but some thought that the adoption of the human nosologic terminology of juvenile aponeurotic fibroma was not justified because of the apparent clinical, histologic, and possibly morphogenic dissimilarities of the respective lesions in the two species. Another term that is sometimes used is chondroma rodens.



SUGGESTED READING. Liu, S.K., and Dorfman, H.D.: The cartilage analogue of fibromatosis (juvenile aponeurotic fibroma) in dogs. *Vet. Pathol.* 11: 60-67, 1974.  
CONTRIBUTOR. Animal Medical Center, New York.

Slide 59

HISTORY. A 1-1/2-year-old male miniature schnauzer had severe dyspnea of 1 month's duration. Radiographs revealed diffuse interstitial pneumonia. The dog did not respond to treatment. All lobes of the lungs were distended and failed to collapse when the thoracic cavity was opened. The pulmonary pleura was thickened, granular, and dark brown. In microscopic sections the parenchyma was diffusely reddened and firm and lacked resiliency.

DIAGNOSIS. Verminous pneumonia caused by Filaroides milksi.

SUGGESTED READING. Corwin, R.M., Legendre, A.M., and Dade, A.W.: Lungworm (Filaroides milksi) infection in a dog. *J. Am. Vet. Med. Assoc.* 165: 180, 1974.  
CONTRIBUTOR. Michigan State University, East Lansing.

Slide 60

HISTORY. A 3-year-old spayed cat with a history of intermittent vomiting of 2 years' duration, albeit with a continuously good appetite, was presented to a practicing veterinarian. The owner became concerned when he noticed that the cat began sneezing blood and gradually losing weight. The animal was treated symptomatically, but was returned approximately 2 weeks later exhibiting signs of subnormal temperature, cyanosis, lethargy, and dehydration. She died the next day.

DIAGNOSIS. Metastatic calcification secondary to chronic renal disease.

COMMENT. On histopathologic examination, deposition of mineral was observed in every organ submitted. The renal changes were interpreted as a diffuse, chronic, active, nonsuppurative nephritis with fibrous proliferation and mineralization. The pathogenesis of the renal lesion, per se, was not determined. With respect to the calcification, the classic definition contends that metastatic calcification is a deposition of calcium salts in normal tissues and is usually a sequella to a hypercalcemia; dystrophic calcification is the deposition of calcium salts in diseased or dead tissues. A more recent investigator, however, with the aid of the electron microscope and more sophisticated biochemical techniques, suggests that even in metastatic calcification the cell injury occurs before the deposition of calcium salts and is not the result of this deposition. Regardless of the concept accepted, the calcification in cases of renal disease is probably due to a combination of both processes in that both a hypercalcemia and a tissue-degenerating uremia are present.

SUGGESTED READING. Scarpelli, M.D.: Experimental nephrocalcinosis. Lab. Invest. 14: 123-141, 1965.

CONTRIBUTOR. Walter Reed Army Institute of Research, Washington, D.C.

Slide 61

HISTORY. A mixed-breed 1-year-old female stray dog with a temperature of 103.20 F. and dehydration was presented to a veterinarian. Fecal examination revealed a heavy whipworm and hookworm infestation. The dog was given dinitrophenol and placed on tetracycline therapy for 6 days. She was returned to the hospital at the end of this period with a temperature of 103.20 F, hepatomegaly, and icterus. She was found dead the next day. Findings from gross necropsy examination were limited to the intestine and liver.

DIAGNOSIS. Histoplasmosis.

COMMENT. Histoplasma capsulatum organisms were seen in hematoxylin and eosin (H & E) sections but were more apparent in periodic acid-Schiff (PAS) - and Gomori's methenamine-silver (GMS)-stained sections.

CONTRIBUTOR. Walter Reed Army Institute of Research, Washington, D.C.

Slide 62

HISTORY. Tissues are from a 3-year-old mixed-breed dog with a history of progressive weight loss and diarrhea unresponsive to treatment.

DIAGNOSIS. Disseminated histoplasmosis.

CONTRIBUTOR. Pennsylvania State University, Hershey Medical Center, Hershey.

Slide 63

HISTORY. Tissue is from a white-cheeked gibbon.

Clinical signs included anorexia, dyspnea, a watery-mucous diarrhea, and lethargy.

DIAGNOSIS. Strongyloidiasis.

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

Slide 64

HISTORY. Subject dog was from a random source and was used in a muscle-flap transplantation procedure. The dog had been anesthetized for approximately 3 hours when he died.

On gross examination for prosector noted several raised yellow areas in the lungs.

DIAGNOSIS. Chronic bronchitis and pneumonia caused by flukes, probably of the genus Paragonimus. Adult parasites were present in other sections.

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

Slide 65

HISTORY. This section of skin is from a 13-year-old male quarter horse that had a nonhealing diffuse irritative dermatitis that had resulted in a very rough-appearing haircoat.

DIAGNOSIS. Onchocerciasis.

CONTRIBUTOR. Texas A&M University, College Station.



Slide 66

**HISTORY.** Incidental finding in a Cebus apella monkey.  
**DIAGNOSIS.** Verminous pneumonia caused by Filaripopsis  
arator.

**CONTRIBUTOR.** National Institutes of Health, Bethesda,  
Maryland.

Slide 67

**HISTORY.** A 14-year-old thoroughbred horse was pregnancy  
checked in the morning, at which time she appeared normal.  
Later the same morning she was down on her knees and 1  
hour later was completely down. This section was taken from  
the spinal cord between C<sub>8</sub> and T<sub>1</sub>. Soft material oozed from  
the cut surface of the cord even after formalin fixation.

**DIAGNOSIS.** Infarct (bland).

**COMMENT.** Thrombotic material was found in the ventral  
spinal artery and in most of its branches in the region of this  
symmetrical lesion. Serial sectioning did not reveal a pri-  
mary lesion. Neither parasitism nor aortic disease was thought  
to have been an inciting cause.

**CONTRIBUTOR.** University of California, Davis.

Slide 68

**HISTORY.** Section is from a 2-year-old male Hereford  
that had died suddenly. At necropsy the lesions were found  
to be confined to the trachea and peritracheal tissues and  
consisted primarily of areas of acute hemorrhage.

**DIAGNOSIS.** Sudden death syndrome.

**COMMENT.** Attendees were cautioned that because of  
the uncertain pathogenesis and lack of pathognomonic gross  
and microscopic changes in sudden death syndrome one should  
carefully eliminate all other possible causes of acute death,  
including anthrax, before rendering a diagnosis.

**CONTRIBUTOR.** Tuskegee Institute, Alabama.

Slide 69

**HISTORY.** This tissue is from one of three pigeons that  
had died over a 48-hour period. They had lost their appetite  
and had then begun gasping. The interval between recog-  
nized illness and death was 5 days. This particular bird was  
a 2-month-old male. No distinct gross lesions could be found.

**DIAGNOSIS.** Inclusion body hepatitis of pigeons.

**SUGGESTED READING.** Cornwell, H.J.C., and Wright,  
N.G.: Herpesvirus infections of pigeons. I. Pathology and  
virus isolation. J. Comp. Pathol. 80: 221-232, 1970.

**CONTRIBUTOR.** University of Arizona, Tucson.

Slide 70

**HISTORY.** A 13-year-old female wirehair fo terrier was admitted with a history of hematuria and increased frequency of urination. The urine had a specific gravity of 1.021, a pH of 8.0, and protein content of 10 mg./100 ml. and was positive for occult blood. It was determined by palpation that the bladder was thickened and enlarged at the neck. Neoplastic cells were not detected. Streptococcus faecalis was cultured from the urine. Urinary infection had been controlled by treatment sulfasoxazole, vitamin C, and tetracycline; but the straining had increased, and a definite mass was palpable in the neck of the bladder.

**DIAGNOSIS.** Chemodectoma of the urinary bladder.

**SUGGESTED READING.** Patnaik, A.K., Lord, P.F., and Liu, S.K.: Chemodectoma of the urinary bladder in a dog. *J. Am. Vet. Med. Assoc.* 164: 797-800, 1974.

**CONTRIBUTOR.** Animal Medical Center, New York.

Slide 71

**HISTORY.** Biopsied tissue was taken from the enlarged tarsal area of a 2-1/2-year-old collie. The enlargement was noticed only 10 days prior to the practitioner's examination, even though the dog had been lame for several weeks. Radiographically, there was radiolucent mottling of the tibia and tarsal and metatarsal bones.

The leg was amputated. Three months later, when it was discovered that the tumor had recurred at the amputation site, the dog was euthanized. On necropsy, metastatic lesions were found in the lungs and kidneys.

**DIAGNOSIS.** Malignant synovium.

**COMMENT.** Attendees were in essential agreement with this diagnosis, but most were of the opinion that sections from within bone should be examined in order to completely eliminate the possibility of a primary bone tumor.

**CONTRIBUTOR.** Colorado State University, Fort Collins.

Slide 72

**HISTORY.** This is a section of lung from a young rat inoculated intraperitoneally with                                 . The animal was put to death 30 days after the inoculation.

**DIAGNOSIS.** Monocrotaline poisoning (dosage: 60 mg./kg.).

**SUGGESTED READING.** Valdivia, E., Lalich, J.J., Hayshi, Y., and Sonnad, J.: Alteration in pulmonary alveoli after a single injection of monocrotaline. *Arch. Pathol.* 84: 64-76, 1967.

**CONTRIBUTOR.** National Animal Disease Laboratory, Ames, Iowa.

Slide 73

**HISTORY.** Section is from a young male hippopotamus (*Hippopotamus amphibius*) that was "cropped" as part of a game-management program employed at Kruger National Park, South Africa.

**DIAGNOSES & COMMENT.** (1) *Schistosomiasis* caused by *Schistosoma hippopotami*. Pathognomonic lesion is the vermiform endophlebitis characterized by a proliferative, chronic, active laminated endophlebitis. (2) *Cysticercosis*. A cross section of the intermediate stage of an unidentified species of *Taenia* is seen on each slide. (3) *Fascioliasis*. Evidence for this is seen in the hyperplasia and/or squamous metaplasia of bile ducts. Bile ducts may reduplicate to the extent that an adenomatous hyperplastic appearance is produced.



SUGGESTED READING. McCully, R.M., Van Niekerk, J.W., and Kruger, S.P.: Observations on the pathology of bilharziasis and other parasitic infestations of Hippopotamus amphibius (Linnaeus, 1758) from the Kruger National Park. Onderstepoort J. Vet. Res. 34: 563-618, 1967.

CONTRIBUTOR. Division of Geographic Pathology, Armed Forces Institute of Pathology.

Slide 74

HISTORY. This section is from a skunk that was part of a group maintained as experimental animals. It was killed because of an outbreak of canine distemper in the colony.

DIAGNOSIS. Lungworm infestation caused by Crenosoma canadensis.

CONTRIBUTOR. Charles Louis Davis, D.V.M. Foundation, Morristown, New Jersey.

Slide 75

HISTORY. This tissue section is from a commercially reared beagle dog used in a study of drug safety.

DIAGNOSIS. Pulmonary granulomas caused by Filaroides hirthi.

COMMENT. Not all of the available sections contained recognizable nematodes.

SUGGESTED READING. Hirth, R.S., and Hottendorf, G.H.: Lesions produced by a new lungworm in beagle colonies. Vet. Pathol. 10: 385-407, 1973.

CONTRIBUTOR. Pfizer, Inc., Groton, Connecticut.

Slide 76

HISTORY. This section of liver and spleen is from a 6-week-old Pekin duck that died 4 days after experimental inoculation.

DIAGNOSIS. Duck plague. The duck was given 10<sup>4</sup> TCID<sub>50</sub> of Lake Andes strain of duck plague virus orally.

SUGGESTED READING. Leibovitz, L.: Gross and histopathologic changes of duck plague (duck virus enteritis). Am. J. Vet. Res. 32: 275-290, 1971.

CONTRIBUTOR. National Animal Disease Laboratory, Ames, Iowa.

Slide 77

HISTORY. Section is from a nude mouse that was experimentally inoculated with a viral agent 18 days prior to death.

DIAGNOSIS. Experimental vaccinia infection.

CONTRIBUTOR. National Institutes of Health, Bethesda, Maryland.

Slide 78

HISTORY. This tissue is from a horse that had clinical signs of severe central nervous system depression. From onset of clinical signs to death was approximately 24 hours.

DIAGNOSIS. Eastern equine encephalomyelitis.

COMMENT. From the clinical signs and the character of inflammatory lesions in the central nervous system, a presumptive diagnosis of eastern equine encephalomyelitis was made. This was subsequently confirmed by serum neutralization and virus isolation from brain tissue of the affected horse.

CONTRIBUTOR. Michigan State University, East Lansing.

Slide 79

**HISTORY.** This tissue is from a golden Syrian hamster. The animal was sacrificed 7 days after receiving a single intraperitoneal dose (300 mg./kg.) of a widely prescribed analgesic.

**DIAGNOSIS.** Chemically induced centrilobular necrosis.

The drug administered was acetaminophen.

**COMMENT.** Acetaminophen causes fulminant hepatic necrosis in human patients who are overdosed and varying degrees of hepatotoxicity in mice, rats, hamsters, guinea pigs, and rabbits.

**CONTRIBUTOR.** Pfizer, Inc., Groton, Connecticut.

Slide 80

**HISTORY.** Tissue is from a 4-1/2-month-old female Mexican hairless dog that was vaccinated at 6, 9, and 12 weeks of age. The dog died acutely.

**DIAGNOSIS.** Necrotizing bronchopneumonia and proliferative bronchiolitis caused by canine distemper virus, adenovirus, and unidentified bacteria.

**COMMENT.** Inclusion bodies morphologically compatible with those of both adenovirus and canine distemper virus were recognized in the bronchiolar epithelium. Attendees were of the opinion that both viruses were probably present, while recognizing the fact that viral cultures would be necessary for a definitive diagnosis in this case.

**CONTRIBUTOR.** Letterman Army Institute of Research, San Francisco, California.

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Slide 81

**HISTORY.** Tissue is from a 4-year-old female pointer that died unexpectedly.

**DIAGNOSIS.** "Hepatic syndrome" caused by Dirofilaria immitis.

**COMMENT.** Autopsy was performed by a practitioner who found approximately 100 adult D. immitis organisms in the right side of the heart and pulmonary arteries. Icterus was also present. The liver lesion consists primarily of periacinar fibrosis with "cavernomatous" venous channels, first described as the hepatic or vena caval syndrome in D. immitis infection. In this case no search of the vena cava was made for worms, but some sections of liver and kidney had small granulomas that contained fragments of nematodes.

**SUGGESTED READING.** Jackson, R.F., von Lichtenberg, F., and Otto, G.F.: Occurrence of adult heartworms in the vena cavae of dogs. J. Am. Vet. Med. Assoc. 141: 117-128, 1962.

**CONTRIBUTOR.** University of Alabama, Birmingham.

Slide 82

**HISTORY.** A mass was removed from the cervical area of a young adult white rat. Six of the 20 rats in the group had similar cervical lesions.

**DIAGNOSIS.** Sialoadenitis, submaxillary salivary gland.

**COMMENT.** The unaffected sublingual gland is present in most of the sets.

**SUGGESTED READING.** Jonas, A.M., Croft, J., Black, C.L., Bhatt, P.N., and Hilding, D.: Sialoadenitis in the rat. Arch. Pathol. 88: 613-622, 1969.

**CONTRIBUTOR.** USA Medical Research Institute of Infectious Diseases, Ft. Detrick, Maryland.

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Slide 83

**HISTORY.** This section is from a mouse with dyspnea.  
**DIAGNOSIS.** Pulmonary adenomas and adenocarcinomas; hyperplastic and inflammatory pulmonary lesions.

**COMMENT.** The neoplasms were induced by a weekly intraperitoneal injection of methylazoxymethanol in corn oil for a period of 13 weeks.

**SUGGESTED READING.** Turusov, V.S., Breslow, N.E., and Tomatis, L.: Frequency and organ distribution of lung tumor metastases in CF-1 mice. *J. Natl. Cancer Inst.* 52: 225-232, 1974.

**CONTRIBUTOR.** National Cancer Institute, Bethesda, Maryland.

Slide 84

**HISTORY.** This section represents an incidental finding in a 12-year-old domestic short-hair castrated male cat.

**DIAGNOSIS.** Bronchiolar-alveolar tumor.

**COMMENT.** A majority of the attendees were of the opinion that the lesion represented a pulmonary adenoma. The opinion of the minority was that the lesion merely represented hyperplasia secondary to inflammation.  
**CONTRIBUTOR.** University of California, Davis.

Slide 85

**HISTORY.** Tissue is from two mice killed during an outbreak of disease in a mouse colony. A few of the mice had skin lesions. At necropsy the liver and spleen contained areas of focal necrosis. This mouse colony had been exposed to mice from Czechoslovakia.

**DIAGNOSIS.** Ectromelia.

**COMMENT.** Inoculation of mice from an adjacent colony with the pooled liver and spleen suspensions from the affected mice produced similar lesions. Mice in the affected colony had rising hemagglutination-inhibition titers to infectious ectromelia and vaccinia.

**CONTRIBUTOR.** University of Wisconsin, Madison.

Slide 86

**HISTORY.** This is tissue from a skunk that was part of a group of such beasts maintained as experimental animals. It was euthanized because of an outbreak of canine distemper in the colony.

**DIAGNOSIS.** Glomerular amyloidosis.

**CONTRIBUTOR.** Charles Louis Davis, D.V.M. Foundation, Morristown, New Jersey.

Slide 87

**HISTORY.** Tissue is from a cat that was first presented because of an abscess that resulted from a bite. The cat was treated and released, but several days later it was returned with pale membranes and anorexia. A blood smear revealed numerous varying-sized platelets. Two subsequent platelet counts revealed approximately 2 million/cmm. of blood. Also noted on the peripheral smear were unclassified blast cells and occasional mitotic figures. Examination of bone marrow aspirates revealed massive numbers of platelets and an increased megakaryocytopoiesis. Many cells had relatively normal granular cytoplasm; the nuclei, however, often appeared immature. There were also increased numbers of primitive cells ranging in size from that of a lymphoblast to that of a normal megakaryoblast.

**DIAGNOSIS.** Myeloproliferative disorder, megakaryocytic leukemia.

**COMMENT.** Gross postmortem findings included icterus, anemia, splenomegaly, and generalized lymphadenopathy. Many tissues examined histologically contained megakaryocytic cells and associated blast cells. They were present in greatest numbers in the femoral bone marrow and lymph nodes but were also seen in the liver and renal cortex.

**CONTRIBUTOR.** Oklahoma State University, Stillwater.

Slide 88

**HISTORY.** Tissue is from the brain of a 9-week-old Yorkshire gilt that was one of a group of 8 pigs. It was normal at birth but had been blind for the previous week. The pig's weight was approximately 40 pounds less than that of its littermates, and it was still blind when submitted to the laboratory. No gross lesions could be found.

**DIAGNOSIS.** Necrotizing vasculitis caused by Escherichia coli endotoxin.

**SUGGESTED READING.** Clugston, R.E., Nielsen, N.O., and Smith, D.L.T.: Experimental edema disease of swine (E. coli enterotoxemia) III. Pathology and pathogenesis. Can. J. Comp. Med. 38: 34-43, 1974. Kurtz, H.J., Bergeland, M.E., and Barnes, D.M.: Pathologic changes in edema disease of swine. Am. J. Vet. Res. 30: 791-806, 1969.

**CONTRIBUTOR.** University of Nebraska, Lincoln.

Slide 89

**HISTORY.** Tissue is from a mature dog that was ataxic.

**DIAGNOSIS.** Inflammatory reticulosis.

**COMMENT.** Most attendees did not disagree with the diagnosis; they were of the opinion, however, that cases such as this one should be carefully examined in order to eliminate the possible presence of an infectious agent.

**CONTRIBUTOR.** C.E. Kord Animal Disease Diagnostic Laboratory, Nashville, Tennessee.



Slides 90, 91, and 92

**HISTORY.** These are sections of lung, liver, and kidney from two pigs from a herd of thirty-three 4-month-old pigs that weighed approximately 100 pounds each. There had been three deaths recently, and five animals were severely ill. The affected pigs were afebrile, and there had been no noticeable response to antibiotic administration. The husbandry practices were standard.

**DIAGNOSIS.** *Crotalaria* toxicity.

**SUGGESTED READING.** Peckham, J.C., Sangster, L.T., and Jones, O.H.: *Crotalaria spectabilis* poisoning in swine. *J. Am. Vet. Med. Assoc.* 165: 633-638, 1974.

**CONTRIBUTOR.** University of Georgia, Athens.

Slides 93 and 94

**HISTORY.** These sections (slide 93, H&E, and slide 94, PAS) are from a cutaneous lesion on a 1-year-old Siamese cat. The animal had multiple encrusted, reddened lesions of the skin of the legs, tail, abdomen, and back.

**DIAGNOSIS.** Sporotrichosis.

**COMMENT.** *Sporotrichum schenckii* organisms were grown in culture and were observable in both H&E and PAS-stained sections.

**SUGGESTED READING.** Anderson, N.W., Ivoghlis, D., Moore, W.E., and Leipold, H.W.: Cutaneous sporotrichosis in a cat. A case report. *J. Am. Anim. Hosp. Assoc.* 9: 526-529, 1973.

**CONTRIBUTOR.** Kansas State University, Manhattan.

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Slides 95 and 96

**HISTORY.** A young male rhesus monkey was euthanized because of progressive CNS signs and debilitation. All previous tests for tuberculosis had been negative.

**DIAGNOSIS.** Tuberculosis, cerebrum.

**COMMENT.** Granulomas containing acid-fast organisms were present in the lung, bronchial lymph nodes, liver, spleen, and brain. Note: Slide 96 is an acid-fast-stained section of the cerebrum. Organisms are very scarce in most of the study sets.

**CONTRIBUTOR.** U.S. Army Medical Research Institute of Infectious Diseases, Ft. Detrick, Maryland.

Slides 97 and 98

**HISTORY.** This tissue is from a 1-month-old foxhound puppy that died shortly after an acute onset of fever and anemia.

**DIAGNOSIS.** Babesiosis.

**Note:** Although the organisms can be seen in the H&E section, slide 97, they are more readily apparent with the Giemsa stain, slide 98.

**CONTRIBUTOR.** Comparative Pathology Section, National Institutes of Health, Bethesda, Maryland.

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Slides 99 and 100

**HISTORY.** These are sections from 1 of 52 cows pasturing on 60 acres of good Bermuda grass bottomland. This was the last of six cows that had an acute death during a period of 3 weeks; three cows had died during the last 24 hours of this period. After the first three deaths, the herd was moved from a pasture containing mostly Johnson grass to the present location because of the possibility of cyanide toxicity in the pasture of Bermuda grass. During the previous month, daytime temperature had ranged from 106° F. to 110° F. No rainfall had occurred. Water sources included a river and an 8-ft.-deep seepage pit (recently dug) near the river. All cows had been vaccinated for blackleg.

**DIAGNOSIS.** Anthrax (confirmed by culture).  
**CONTRIBUTOR.** Oklahoma State University, Stillwater.