

A man with short dark hair, wearing a light-colored button-down shirt with dark sleeves and dark trousers, stands in front of a large, multi-tiered artificial waterfall. The waterfall is constructed from large, stacked, reddish-brown rocks. Water is cascading down the rocks. In the background, there is a wooden structure, possibly a walkway or part of a building, and some greenery in pots. The overall scene is outdoors.

# **P.M Poultry Diseases 4<sup>th</sup> year series**

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# INFECTIOUS ENCEPHALOMYELITIS

248. The infectious encephalomyelitis (IEM) is characterized by signs of ataxia, progressing to paralysis, prostration and marked tremor of the head and the neck, and because of that, is also called epidemic tremor. The chickens with prostration are usually in lateral recumbency.



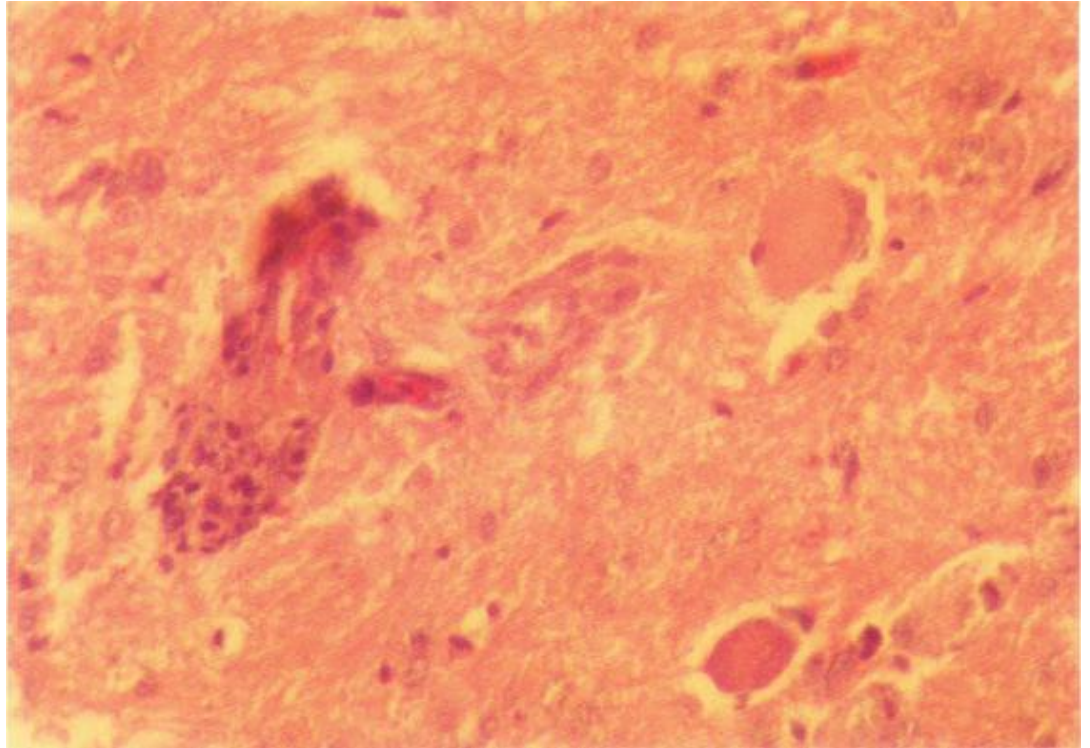
# INFECTIOUS ENCEPHALOMYELITIS

249. The tremor could be unapparent, but is often perceptible when the chicken is held gently with the hand and carefully looked at. The expression of the eyes is dull. IEM outbreaks are generally observed in chickens at the age between 8 - 9 and 20 days. The morbidity rate could reach 40 - 60%. The average death rate is about 25%, but could be more than 50%. Gross lesions are not present.



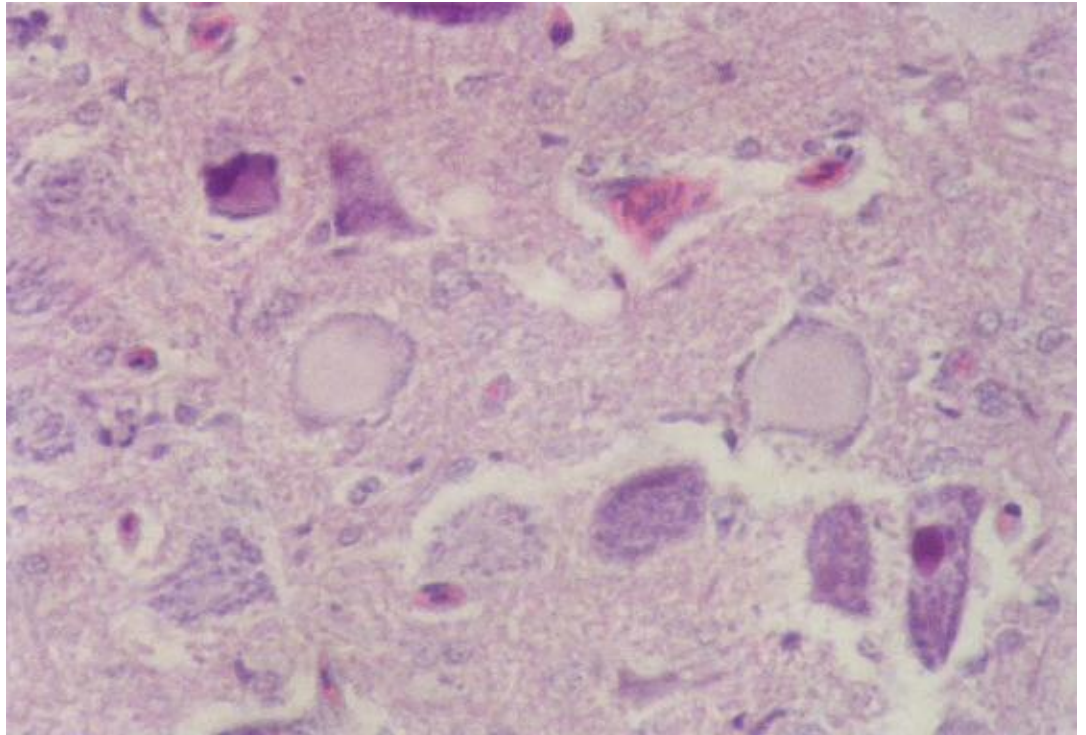
# INFECTIOUS ENCEPHALOMYELITIS

250. The histological lesions are specific and with a diagnostic value. A nonpurulent encephalomyelitis with marked perivascular clusters is present. The IEM virus is from the Picornaviridae family. The previous studies placed the virus in the Enterovirus genus, but based on the most recent studies, it is provisionally referred to the Hepatovirus genus. The virus is found in faeces of infected chickens and could survive there for at least 4 weeks. It is relatively highly resistant to environmental conditions.



# INFECTIOUS ENCEPHALOMYELITIS

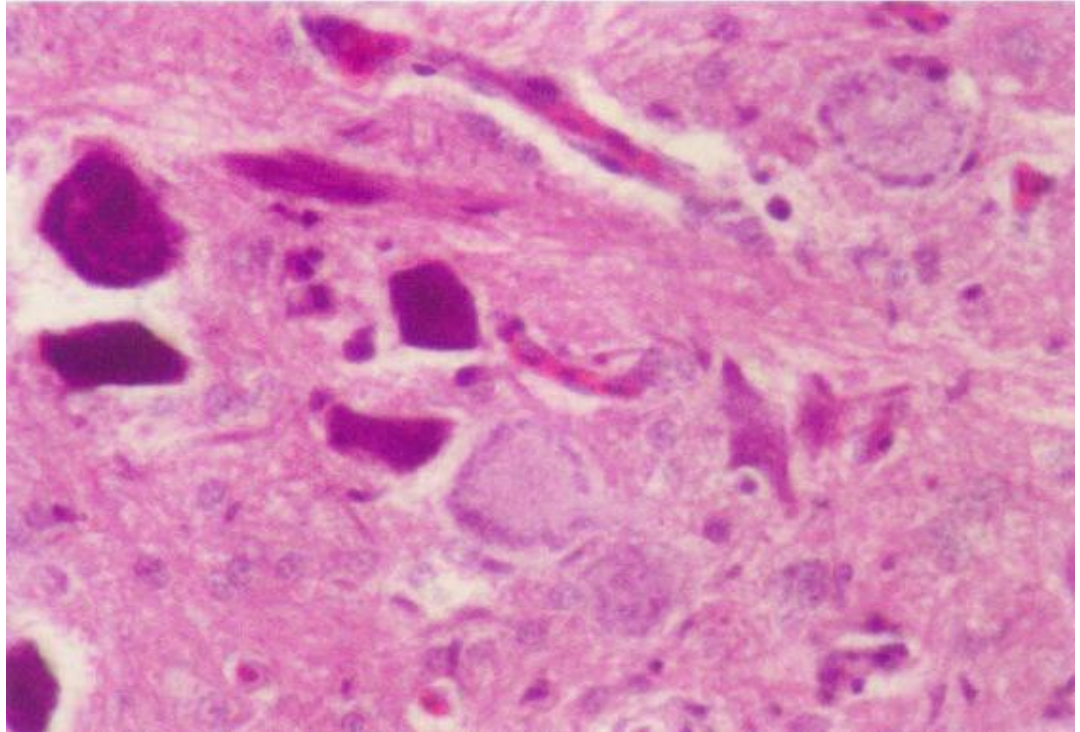
251, 252. A particularly valuable finding is the central chromatolysis (251) of neurons in segments from the lumbosacral widening of the spinal cord and more rarely, chromatopyknosis (252). The infection occurs in non-vaccinated broiler breeder flocks and its course is subclinical. A vertical transmission of the infection to susceptible birds is realized by the eggs laid during this period.





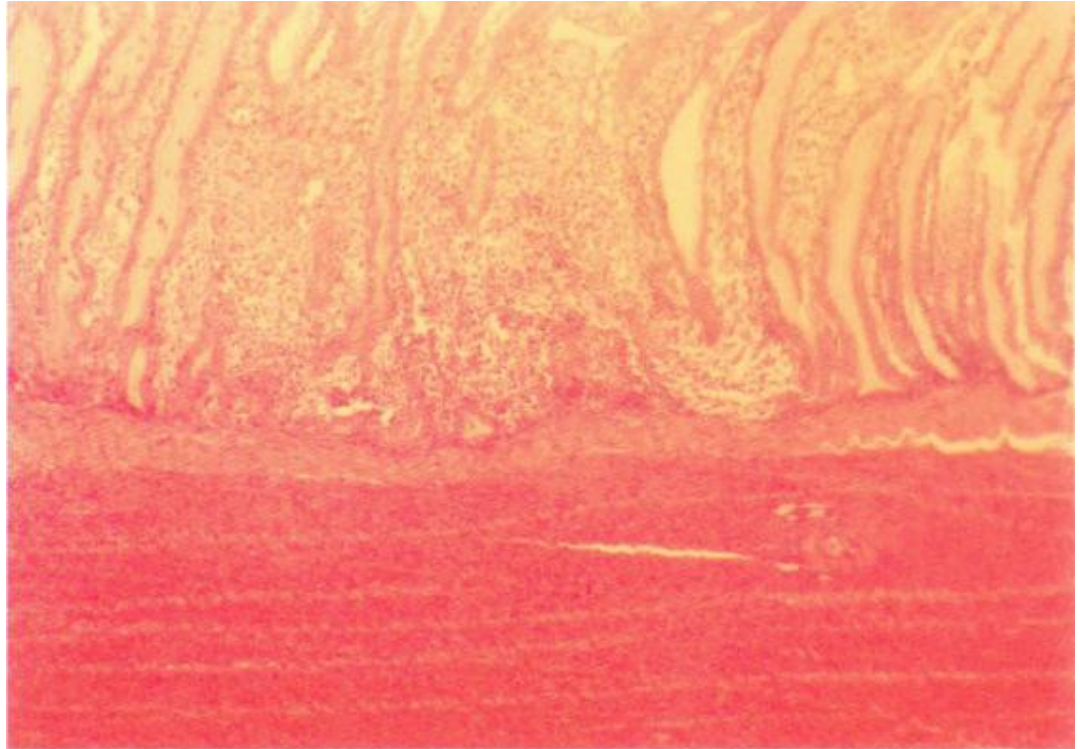
# INFECTIOUS ENCEPHALOMYELITIS

At the same time, parents acquire immunity and transmit it to the next generations thus protecting them from IEM. So, clinical manifestation of IEM is observed in chickens, hatched from the eggs during the 2- or 3 week period after breeder flock's infection. The next generations are immune.



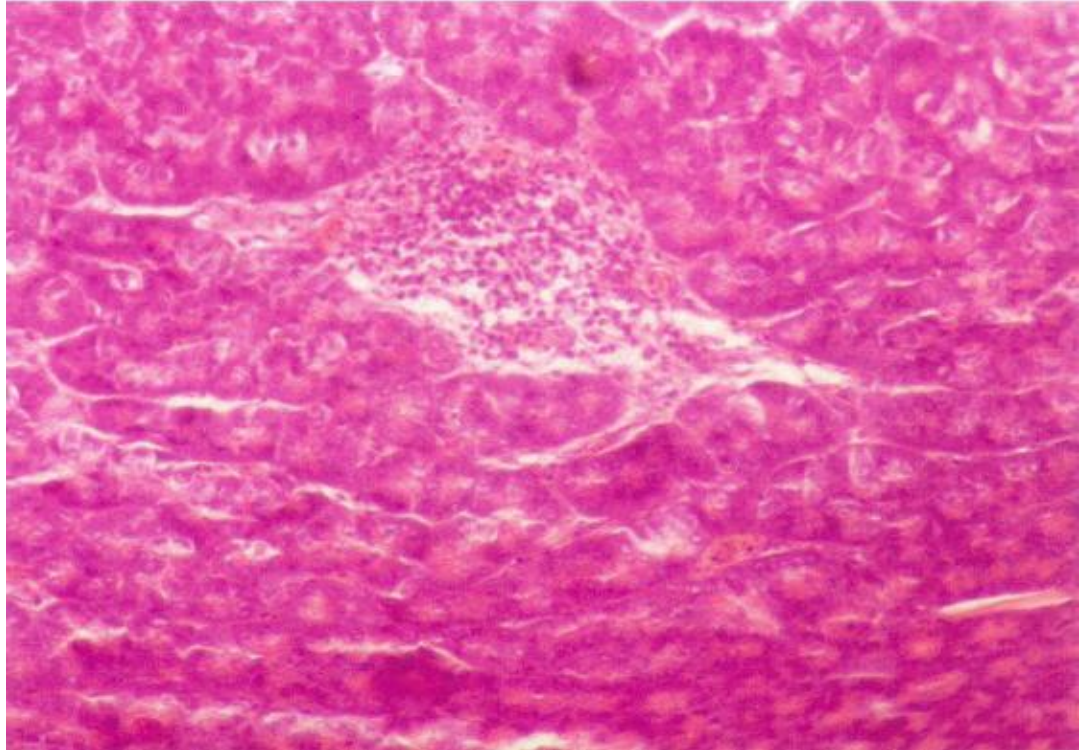
# INFECTIOUS ENCEPHALOMYELITIS

253, 254. Valuable diagnostic findings are the dense lymphoid clusters in the muscles of the proventriculus and the gizzard (253) and in the pancreatic interstitium (254). The history of the disease, the age of onset and the typical nervous signs, especially the head tremor are indicative for the diagnosis that could be finally confirmed by histology. I EM should be differentiated from other diseases with nervous symptoms as encephalomalacia, mycotic encephalites, toxicoses (salt, pesticides). Prevention - vaccination of breeder flocks with regard to ensuring maximum protection of their offspring. The chickens from



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# **INFECTIOUS ENCEPHALOMYELITIS**

# Avian Encephalomyelitis



AVIAN ENCEPHALOMYELITIS



# Avian Encephalomyelitis

- Clinical Description
- In the early stages of avian encephalomyelitis, chicks are often depressed and have a dull expression. Neurological signs may begin with hock-sitting behavior, as observed here. AE virus naturally infects quail (shown), chickens, turkeys, and pheasants.



# Avian Encephalomyelitis

- Clinical Description
- **Birds infected with avian encephalomyelitis, through vertical transmission within the egg, may develop neurologic signs 1-2 weeks after hatch. Signs may include progressive ataxia, incoordination, paralysis, and prostration (seen here). Young birds are more susceptible to this disease than older birds. Humoral immunity, or antibody response, constitutes the basis of this age resistance. Birds exposed after 2-3 weeks of age may not develop neurological signs and adults may only experience a slight drop in egg production.**





# Avian Encephalomyelitis

- Clinical Description
- **Young chicks showing signs of avian encephalomyelitis including paralysis and prostration. Morbidity in chicks may be as high as 60%, while average mortality is approximately 25%.**
- انبطاح



# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Brain: Extensive malacia**
- Pathologic Description
- **The heads of two chicks have been bisected. The brain of the chick on the left is normal. The brain of the chick on the right has lost architectural detail, is soft, and pale yellow.**





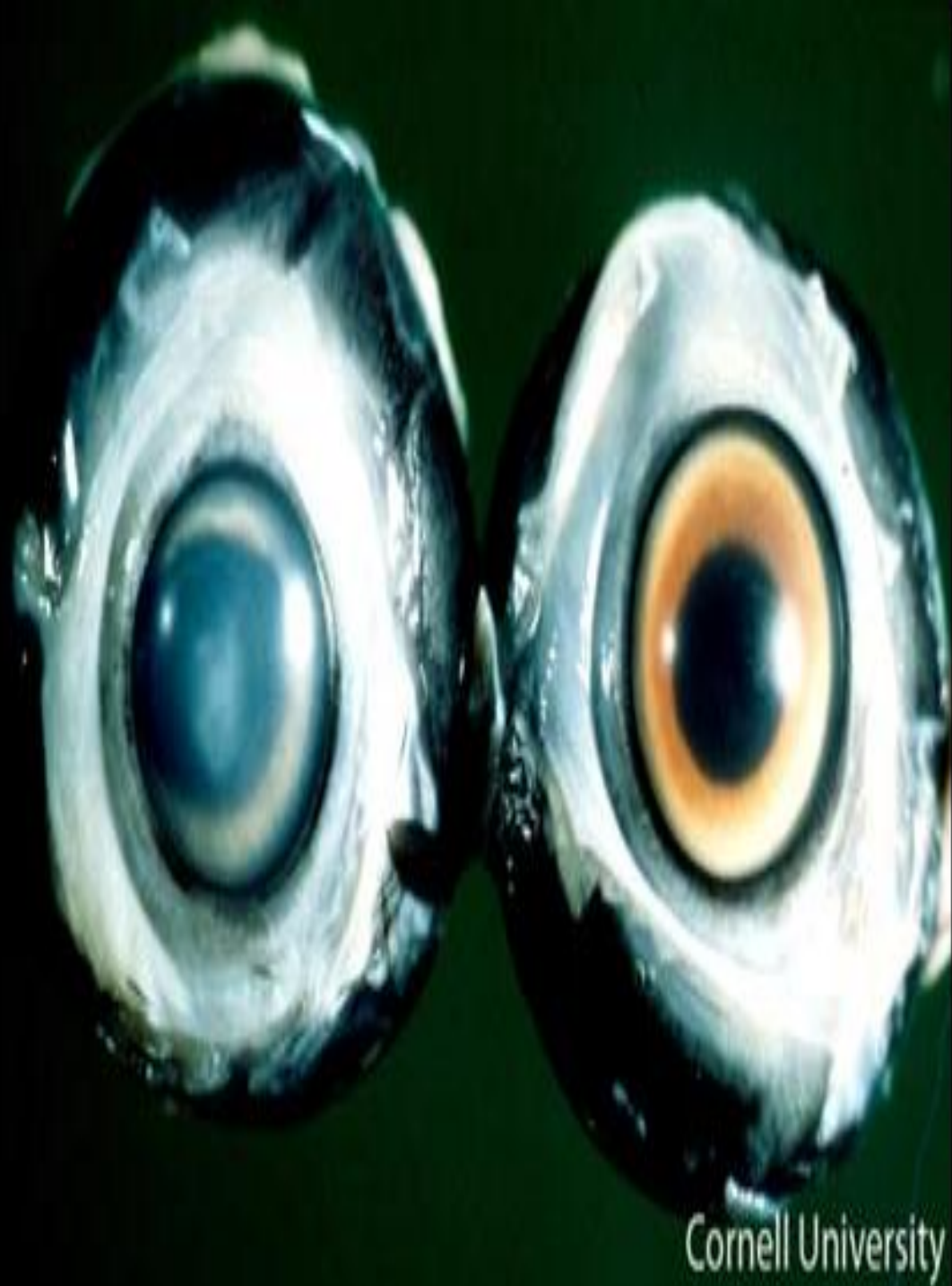
# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Lens: Locally extensive cataract**
- Clinical Description
- **Avian encephalomyelitis affects chickens, quail, pheasant, and turkey. Birds that survive the acute infection, may develop cataracts. Here, a lens opacity, caused by a cataract, can be seen in a pheasant.**
- Pathologic Description
- **The lens of this bird's eye contains a large, roughly circular, well-demarcated pale blue area of opacity.**



# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Lens: extensive cataract**
- Clinical Description
- **Cataract formation in the affected eye on the left, taken from a chicken that survived an earlier infection with avian encephalomyelitis virus.**
- Pathologic Description
- **These are the eyes from two birds. The eye on the right is a normal. The lens within the left eye is completely opaque and pale blue. The opacity is most pronounced in the center of the lens.**





# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Lens: Focal cataract**
- Clinical Description
- **Birds that survive an acute infection of avian encephalomyelitis may develop a blue opacity of the lens, as shown here.**
- Pathologic Description
- **The eye of this bird contains an irregularly shaped, pale blue focus within the lens.**





# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Lens: focal cataract**
- Clinical Description
- **Birds that survive acute AE infection may develop lens opacities caused by cataracts. These cataracts can be associated with a blue discoloration of the eyes, as seen in the upper eye in this photo.**
- Pathologic Description
- **The head of the bird on the bottom of the image is normal. Within the center of the eye of the bird at the top of the image, there is a pale blue opacity within the lens.**



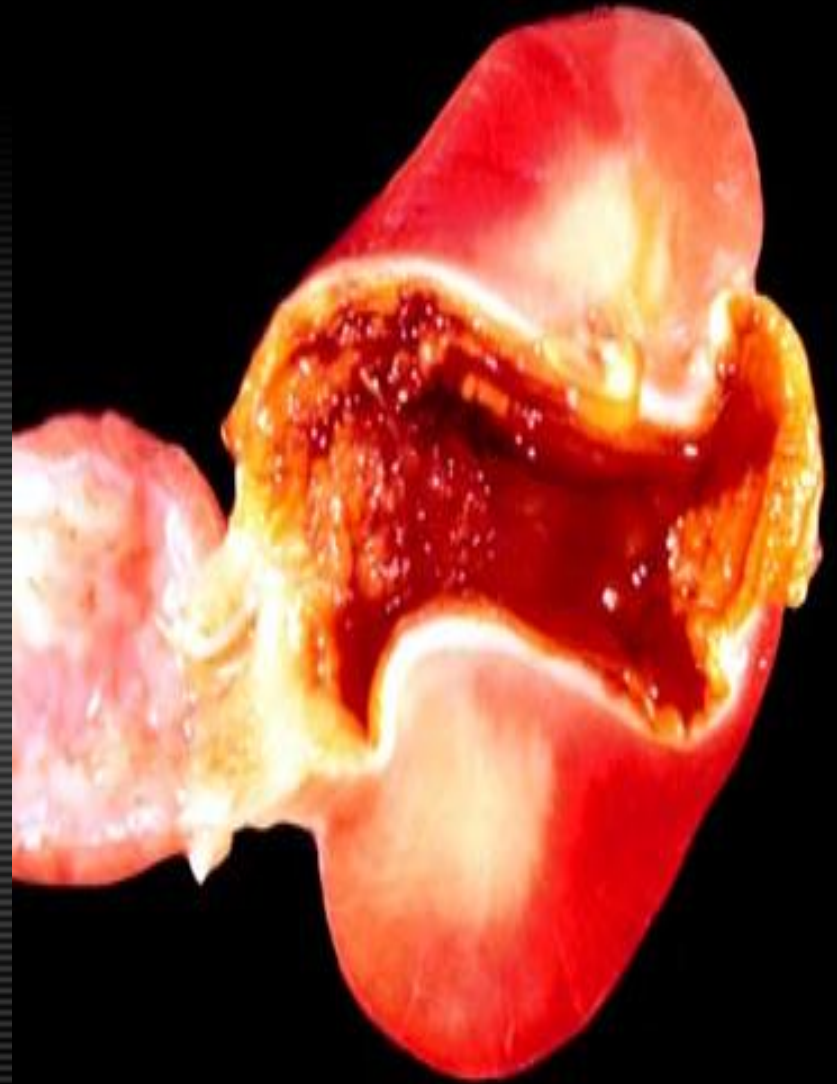
# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Lens: Locally extensive cataract**
- Clinical Description
- **Cataract formation in the affected eye on the left of a chicken that survived an earlier infection with avian encephalomyelitis virus.**
- Pathologic Description
- **This picture shows the eyes of two birds. The eye from the bird on the right is normal. The lens, within the eye on the left, contains a central irregularly-shaped, poorly-demarcated, area of light blue opacity.**



# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Ventriculus (gizzard): Severe locally extensive ventriculitis**
- Clinical Description
- **On post-mortem examination, there are few gross lesions associated with avian encephalomyelitis. Here, a cross section of the gizzard muscle wall shows a pale white area associated with lymphocytic infiltration.**
- Pathologic Description
- **The muscular wall of the ventriculus contains two well-demarcated pale tan foci. The edges of these lesions merge smoothly and extend slightly into the surrounding, more normal muscle. Histologically, these areas would correspond to infiltration by lymphocytes.**





# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Ventriculus (gizzard): Moderate locally extensive ventriculitis**
- Clinical Description
- **On post-mortem examination, there are few gross lesions associated with avian encephalomyelitis. Here, the gizzard on the right shows pale white areas in the muscle associated with lymphocytic infiltration.**
- Pathologic Description
- **This picture shows sections of the ventricular wall in two birds. The tissue on the left is normal. The muscular tissue on the right contains a large, poorly-demarcated, pale tan area. Histologically, this area would correspond to infiltration by large numbers of lymphocytes.**



# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Embryo: Cerebellar herniation with edema**
- Clinical Description
- **Avian encephalomyelitis virus primarily affects the central nervous system. However, chicks exhibiting neurologic signs, typically do not have gross lesions visible on necropsy.**
- Pathologic Description
- **The normal embryo is at the bottom of the image, with the abnormal embryo at the top. The cerebellum of the abnormal embryo has herniated out of the Foramen Magnum and is extensively swollen, glistening, and wet.**



# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Embryo: Stunting with limb malformation (muscular dystrophy)**
- Clinical Description
- **One diagnostic method for avian encephalomyelitis is the yolk sac inoculation of 5-7 day old chicken embryos. In positive cases, typical lesions may include muscular dystrophy and rigid legs.**
- Pathologic Description
- **The embryo on the left is a normal control embryo and the embryo on the right is abnormal. The abnormal chick is stunted and the limbs and the toes are rigidly extended. These changes are due to viral-induced muscular dystrophy.**





# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Embryos: Stunting with limb abnormalities (muscular dystrophy)**
- Clinical Description
- **This photo shows stunting of chicken embryos resulting from muscular dystrophy (top) following inoculation of susceptible (antibody-free) embryos with encephalomyelitis virus. The affected embryos are paralyzed and their legs are held in a rigidly extended position rather than the normal position seen in the embryos on the bottom of the photo.**
- Pathologic Description
- **The embryos at the top of this image are abnormal and the normal controls are at the bottom of the image. The three upper chicks are markedly stunted and their legs are malformed and rigidly extended.**



# Avian Encephalomyelitis

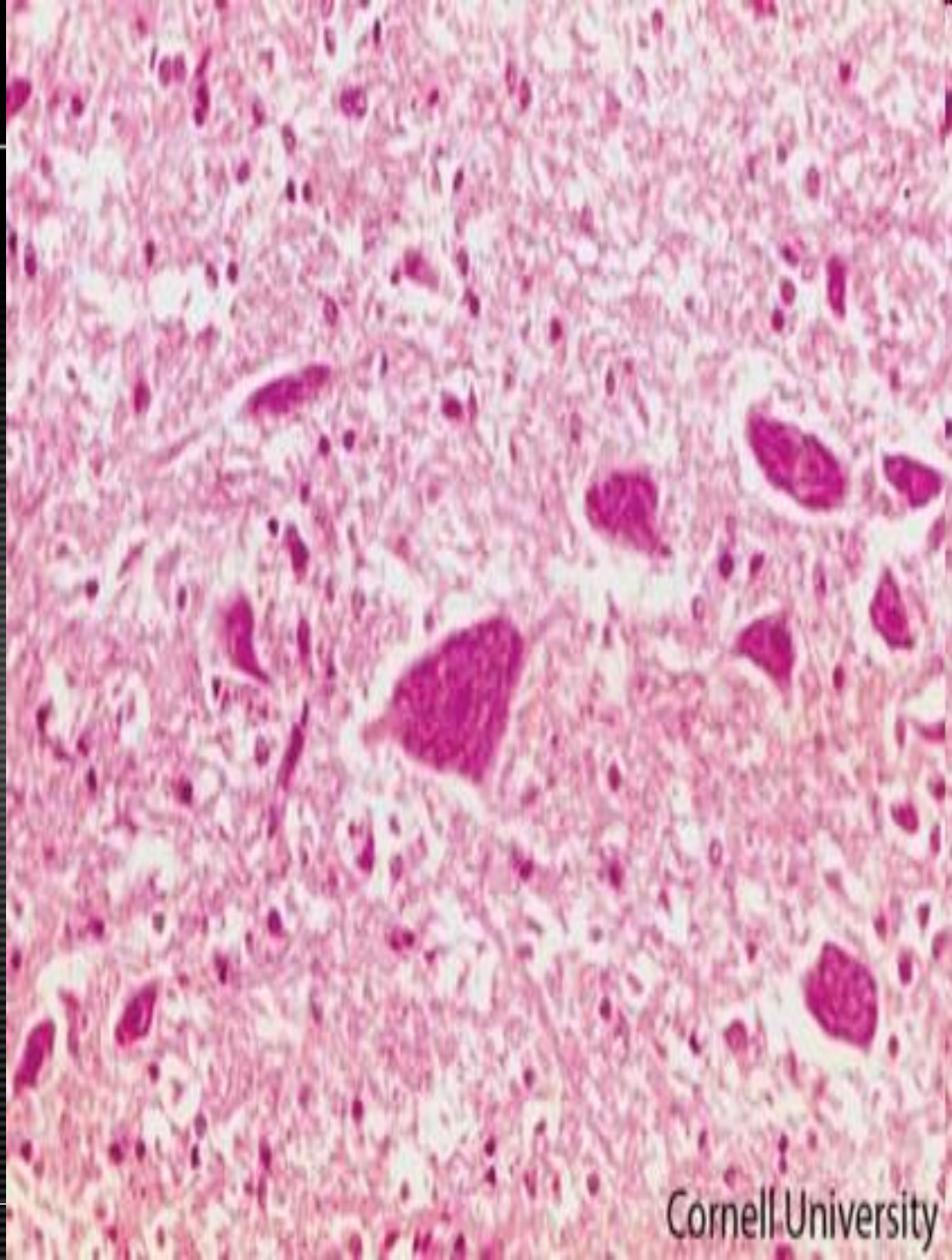
- Morphologic Diagnosis
- **Embryo: Stunting with muscular dystrophy**
- Clinical Description
- **In this comparative photo, the embryo on the left lacks the normal leg muscle development seen in the normal embryo on the right.**
- Pathologic Description
- **The normal embryo is on the right of this image and the abnormal embryo is on the left. The abnormal embryo is stunted and lacks muscular development.**





# Avian Encephalomyelitis

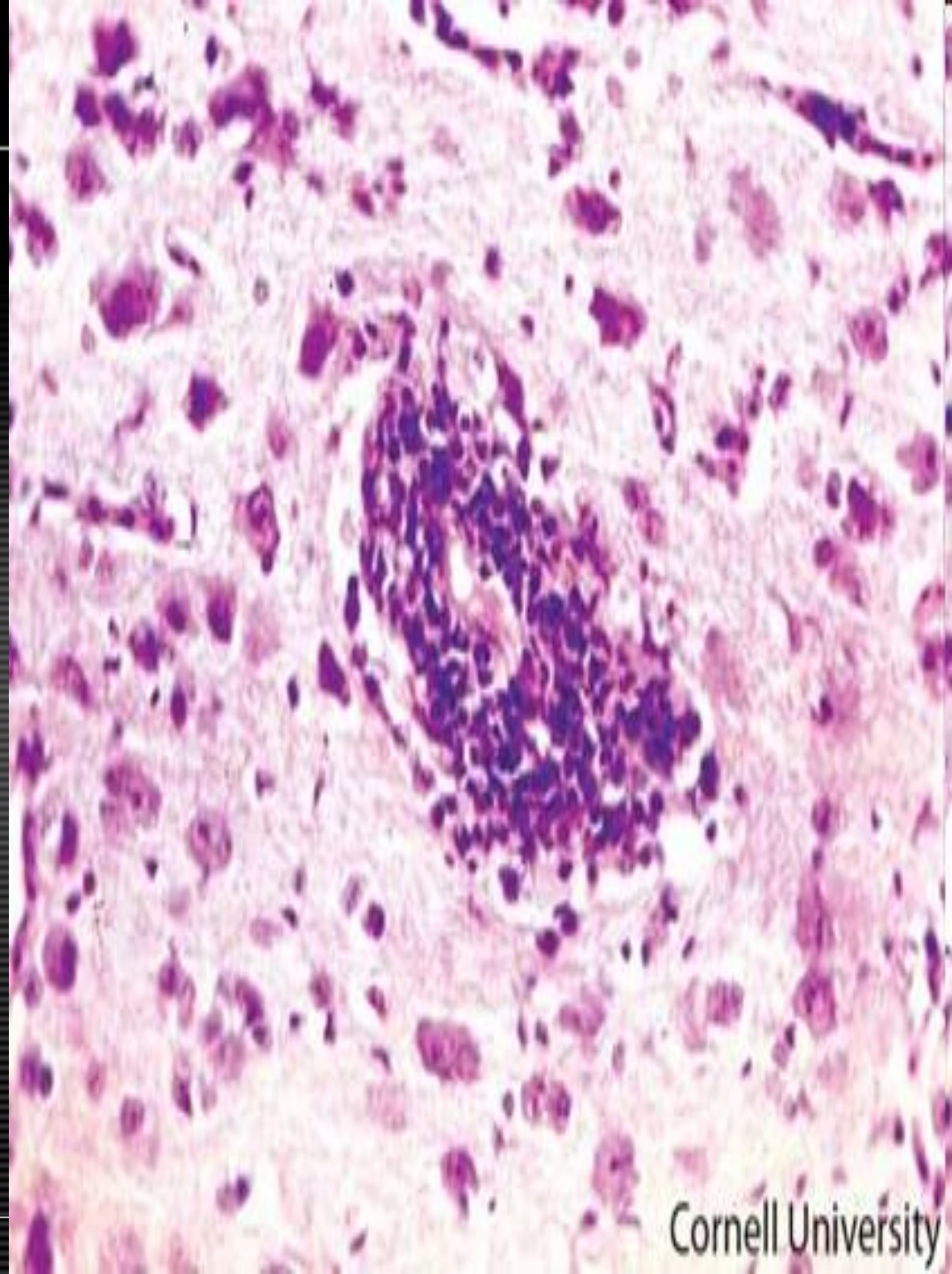
- Morphologic Diagnosis
- **Brain: within normal limits**
- Clinical Description
- **A normal section of brain is shown here for comparison.**
- Pathologic Description
- **This section of brain is within normal limits.**





# Avian Encephalomyelitis

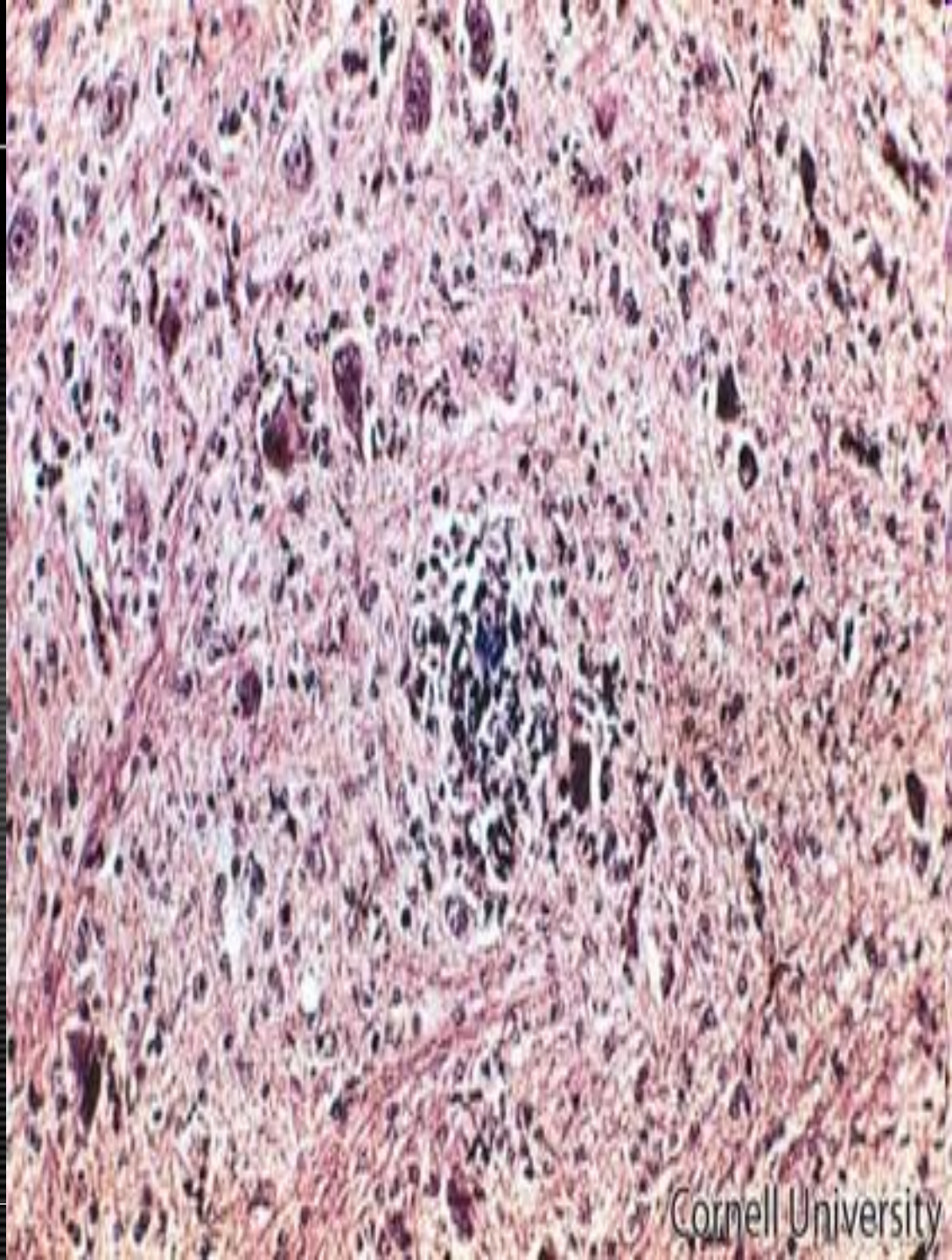
- Morphologic Diagnosis
- **Brain: Focal lymphoplasmacytic perivascular cuff**
- Pathologic Description
- **A blood vessel in the section of brain is surrounded, and partially obscured by, a thick layer of lymphocytes and plasma cells (perivascular cuff.)**





# Avian Encephalomyelitis

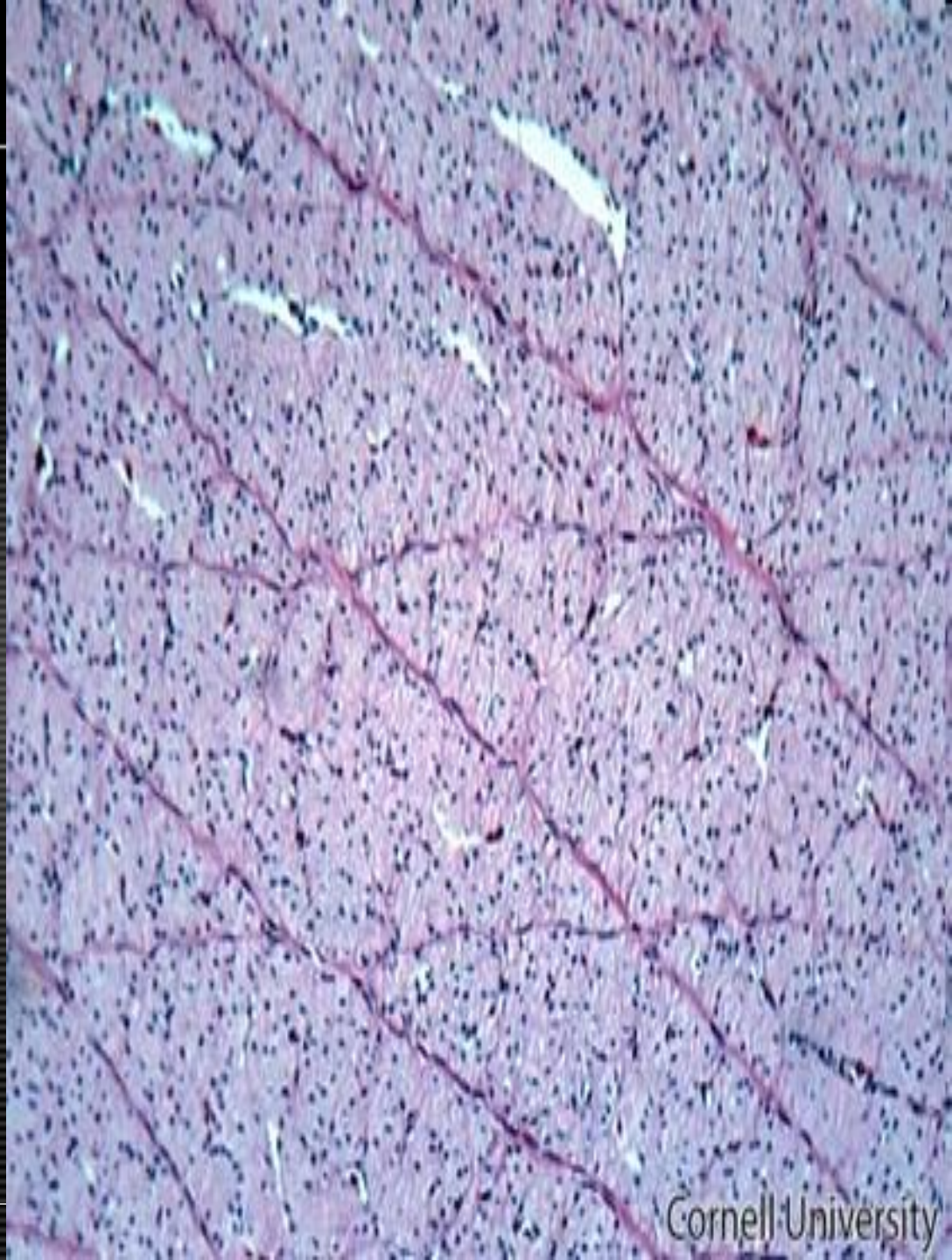
- Morphologic Diagnosis
- **Brain, white matter: Glial nodule and diffuse gliosis**
- Pathologic Description
- **Within the neuropil there is a single poorly-demarcated and roughly circular aggregate of glial cells. The surrounding nervous tissue is slightly and diffusely hypercellular. This hypercellularity is due to increased numbers of small hyper chromatic glial cells.**





# Avian Encephalomyelitis

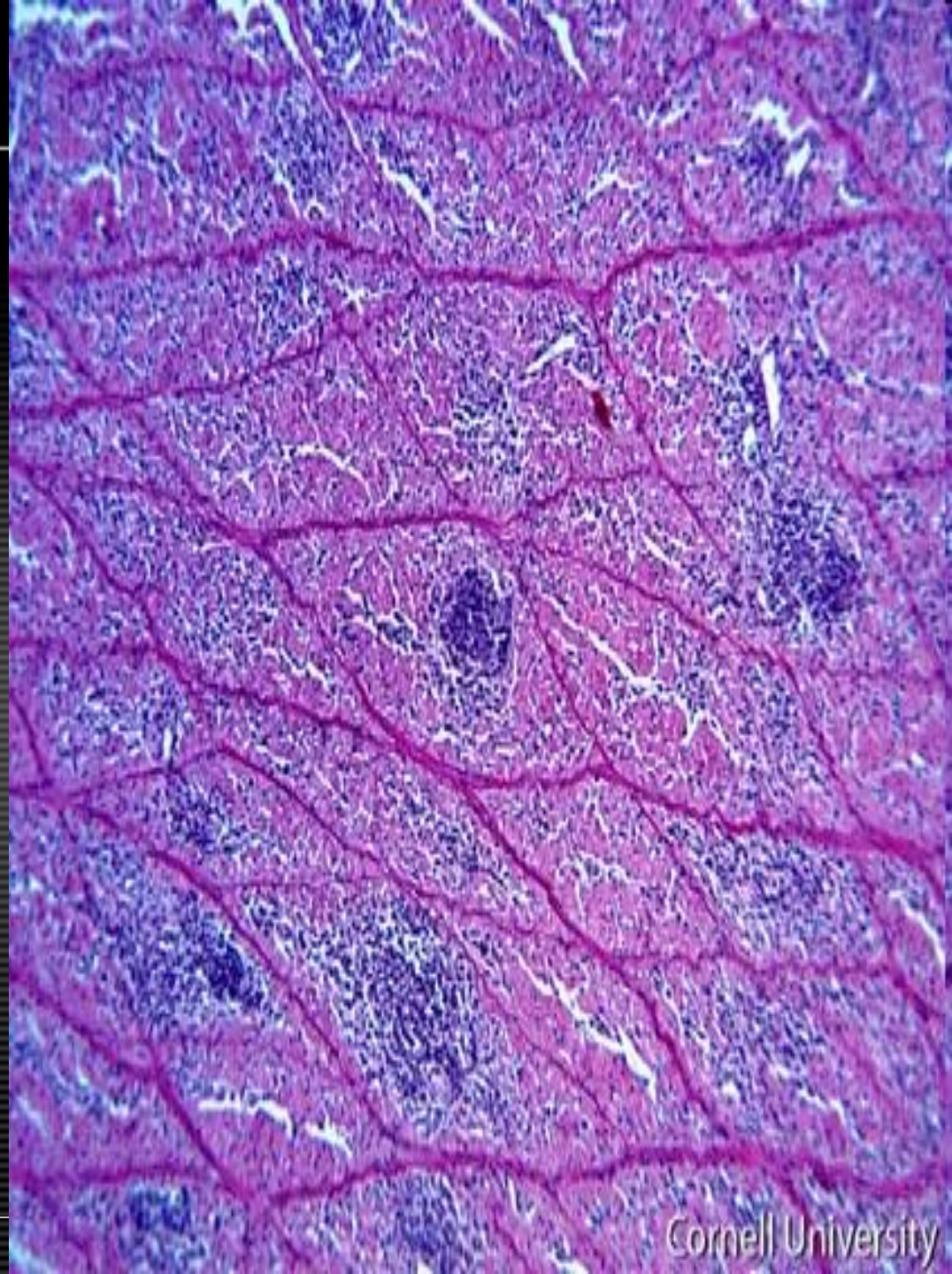
- Morphologic Diagnosis
- **Muscle: Within Normal Limits**
- Clinical Description
- **Normal gizzard muscle (control)**
- Pathologic Description
- **This is a histologic section of normal muscle.**





# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Muscle: Moderate subacute multifocal lymphocytic myositis**
- Pathologic Description
- **This is a histologic view of a section of the ventricular muscle. Within the centers of several muscle bundles, normal muscular architecture has been replaced by an irregularly shaped, poorly defined infiltrate of lymphocytes.**





# Avian Encephalomyelitis

- Morphologic Diagnosis
- **Cerebellum: Marked focal and diffuse mild gliosis**
- Pathologic Description
- **Within a section of cerebellum, there is a poorly-demarcated area of hypercellularity. Additionally, there is a diffuse mild increase in the number of cells in the tissue. This hypercellularity is due to the presence of increased numbers of small hyperchromatic glial cells.**

