

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, creating a misty spray at the bottom. 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 and appears to be a park or a recreational area.

P.M Poultry Diseases 4th year series

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FOWL POX

265, 266.

Fowl pox (FP) is a viral disease in hens, turkeys and many other birds, characterized by cutaneous lesions on the featherless skin and/or diphtheritic lesions of mucous coats of the upper alimentary and respiratory tract. FP is encountered in either cutaneous or diphtheritic form or in both. In most outbreaks, the cutaneous form is prevailing. The lesions vary according to the stage of development: papules, vesicles, pustules or crusts. The lesions are usually in the region of the head.



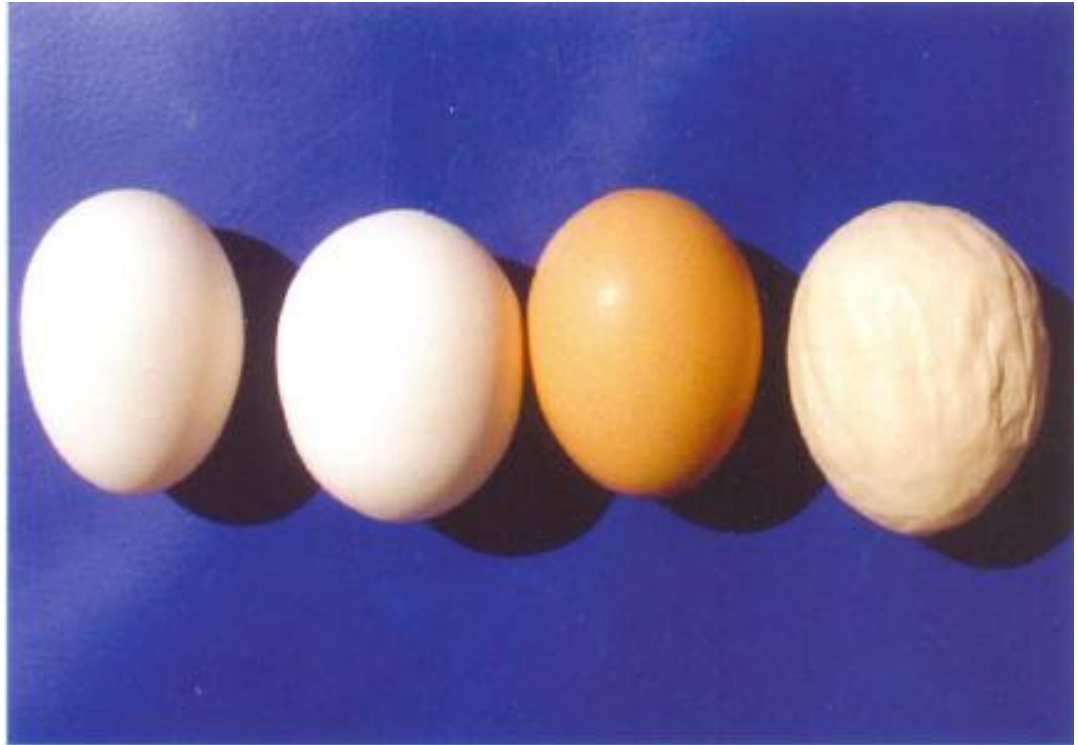
INFECTIOUS BRONCHITIS

227, 228. In layer hens infected with the IB virus, oophorites and dystrophic necrobiotic lesions affecting primarily the middle and the last thirds of oviduct's mucous coat are observed. The consequences are drop in egg production, appearance and increase in the number of deformed and pigmentless eggs or eggs with soft shells and watery egg white.



INFECTIOUS BRONCHITIS

The oviduct is atrophied, cystic, with deposits of yolks or completely formed eggs in the abdominal cavity (the so-called internal layer). IB is caused by a coronavirus. It is characterized by a rich antigenic diversity and that is why many serotypes (Massachusetts, Arkansas 99, Connecticut, 072 etc.) are identified. Often, the infection's course is complicated with the involvement of *E. coli*, *M. gallisepticum*, the laryngotracheitis virus etc.



INFECTIOUS BRONCHITIS

229, 230, 231.

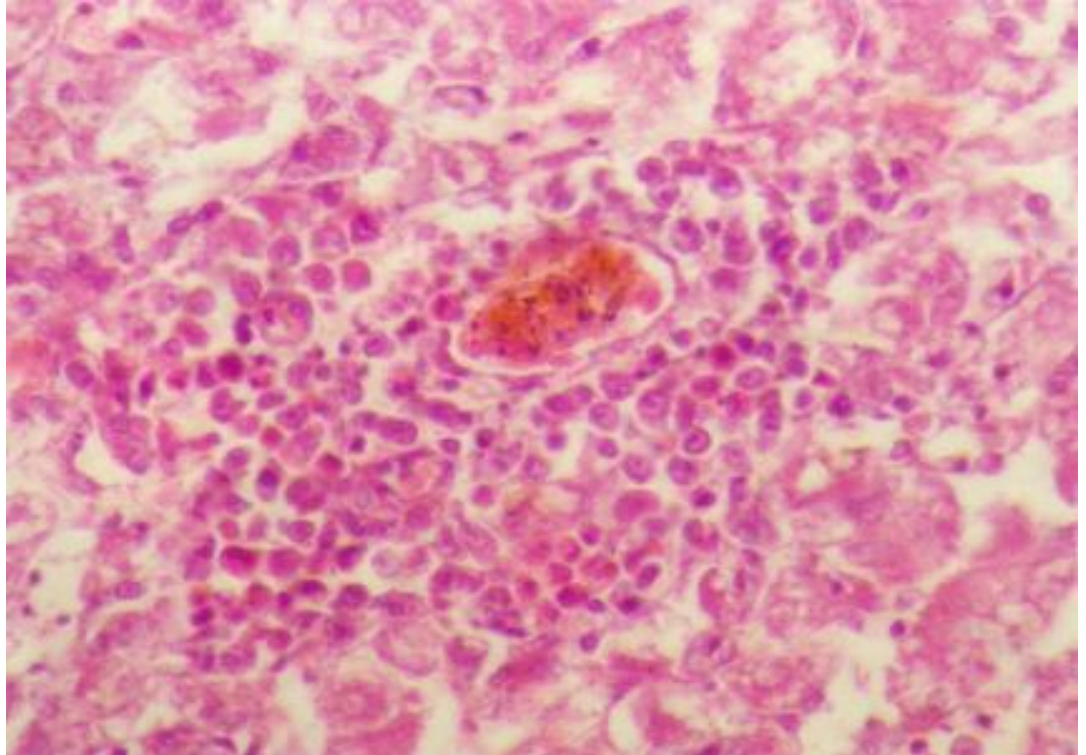
The nephrotropic strains of the IB virus cause severe inflammatory and dystrophic necrobiotic damages of kidneys: urolithiasis (229), interstitial nephritis (230), haemorrhages (231) that considerably increase the death rate. Under natural conditions, only hens are infected. Non-immune birds of all ages are susceptible. The disease is even seen in vaccinated flocks. The serological methods (VN, ELISA etc.) are widely used in the diagnostics. At present, peR is used for rapid identification of IB virus serotypes. IB should be distinguished from other acute respiratory disease as ND, laryngotracheitis and infectious coryza. The vaccination with live or killed vaccines is effective only if they contain the respective serotype of the virus for the given region.



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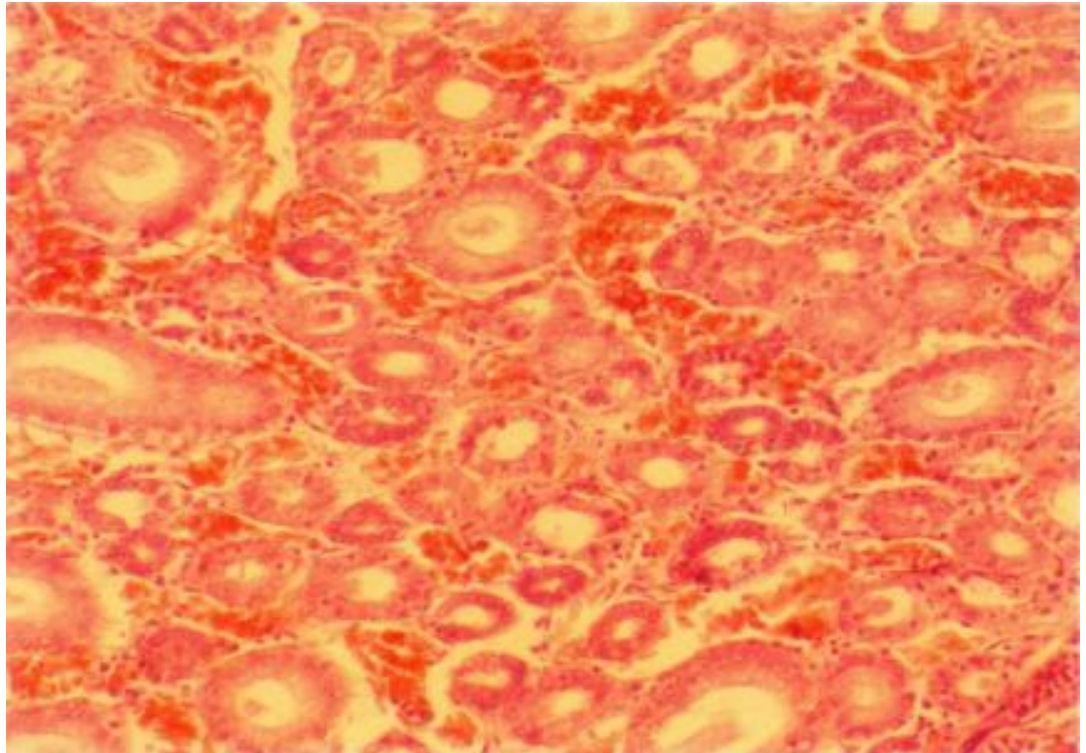
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INFECTIOUS BRONCHITIS

Infectious Bronchitis

usually complicated with mycoplasma

Air sacs : lymphocytic infiltration

Trachea : caseous necrosis

Bronchi : caseous necrosis

Kidneys : nephrosis (swollen, pale)
gout

Oviduct : localized hypoplasia, cyst formation

Eggs : thin, irregular shells

No epithelial hyperplasia, hypertrophy or inclusion bodies
in the trachea

in contrast to infectious laryngotracheitis

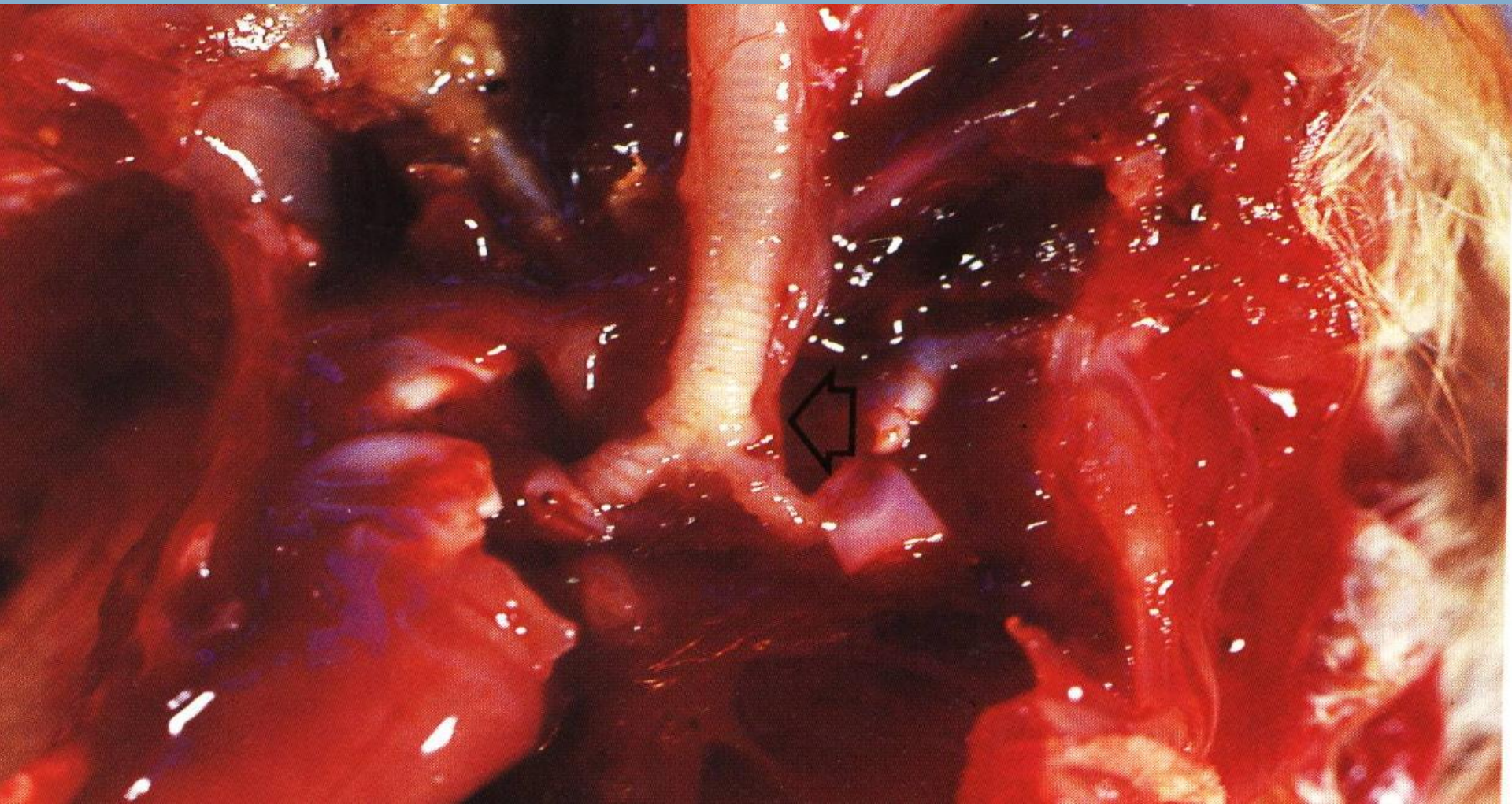


Infectious bronchitis : caseous plug
in the loer trachea and bronchi

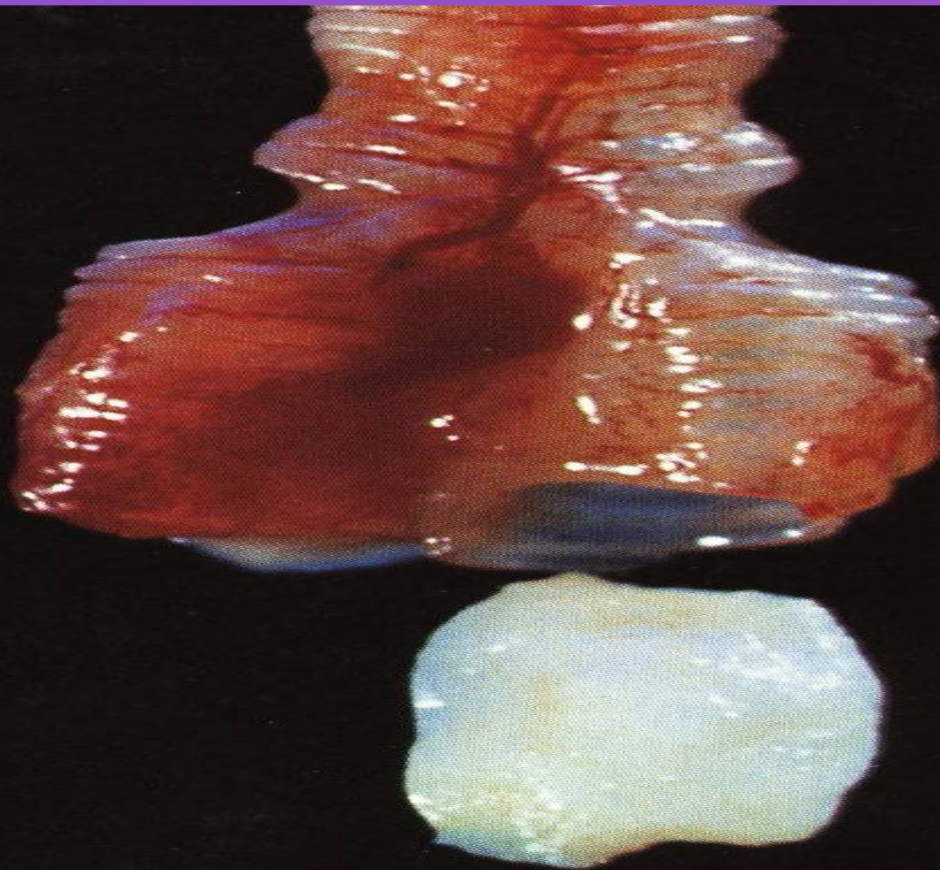
ORGAN : Chest cavity

LESIONS : Caseous plugs in the syrinx

SUSP.DIS. : IB



ORGAN : Trachea
LESIONS : Caseous Plugs
SUSP.DIS. : IB

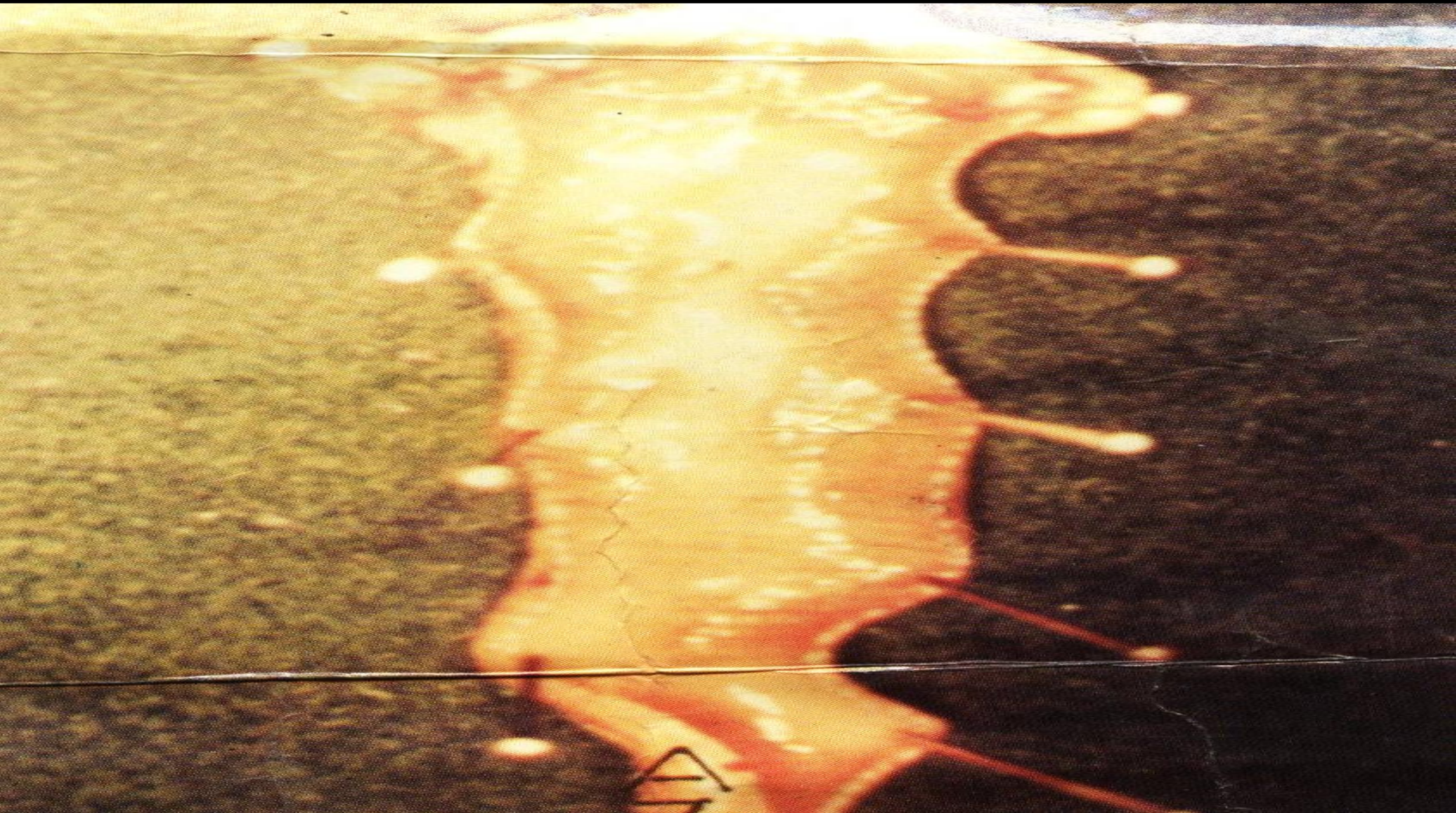




Infectious bronchitis

Kidneys showing acute nephritis

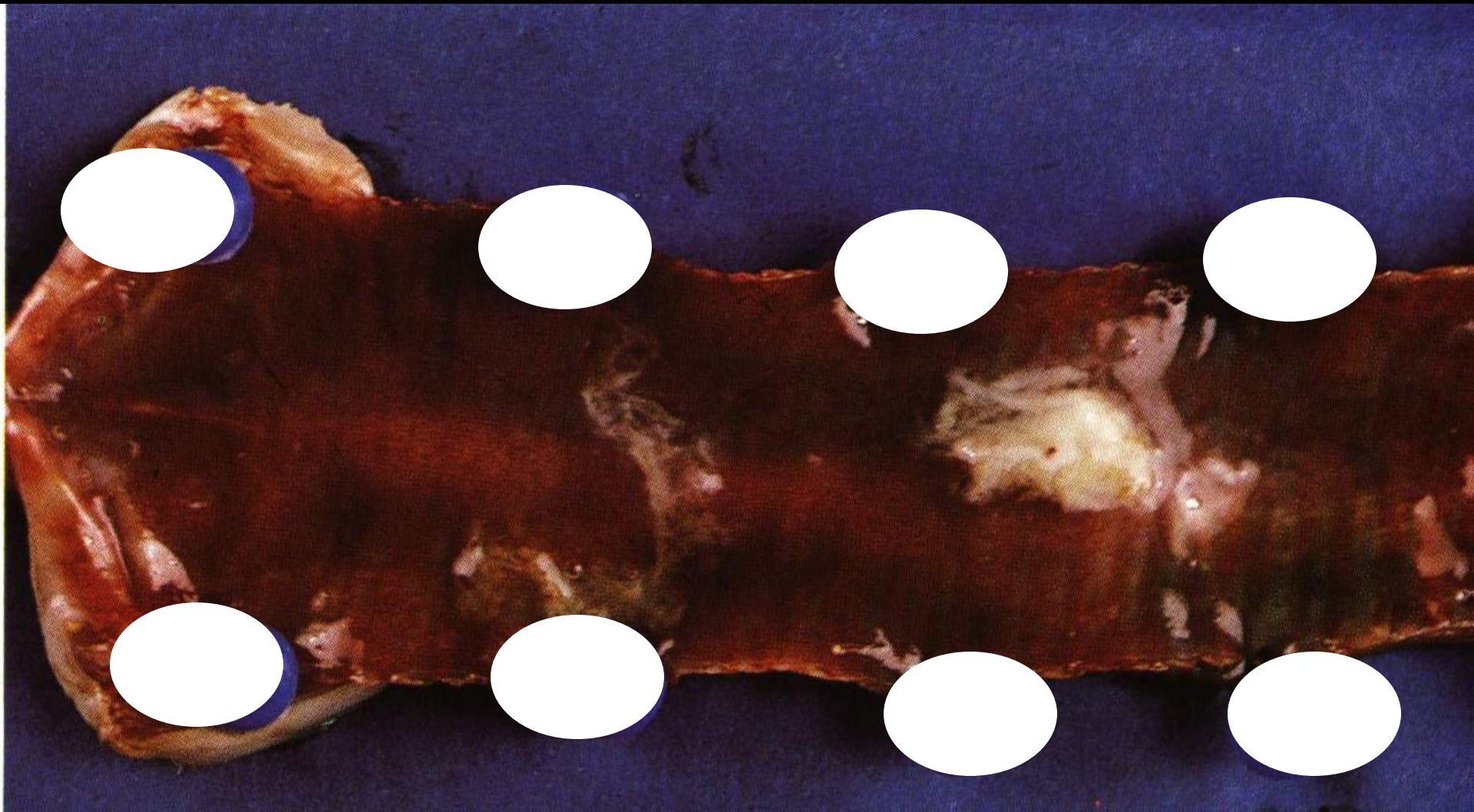
ORGAN : Trachea
LESIONS : Caseated material
SUSP.DIS.: IB, ILT& ND



ORGAN : Trachea

LESIONS : Acute tracheitis

SUSP.DIS. : ILT , IB



ORGAN : Egg

LESIONS : Rough-shell egg

SUSP.DIS. : IB



ORGAN :

Eggs

LESIONS :

Abnormal shell quality

SUSP.DIS.:

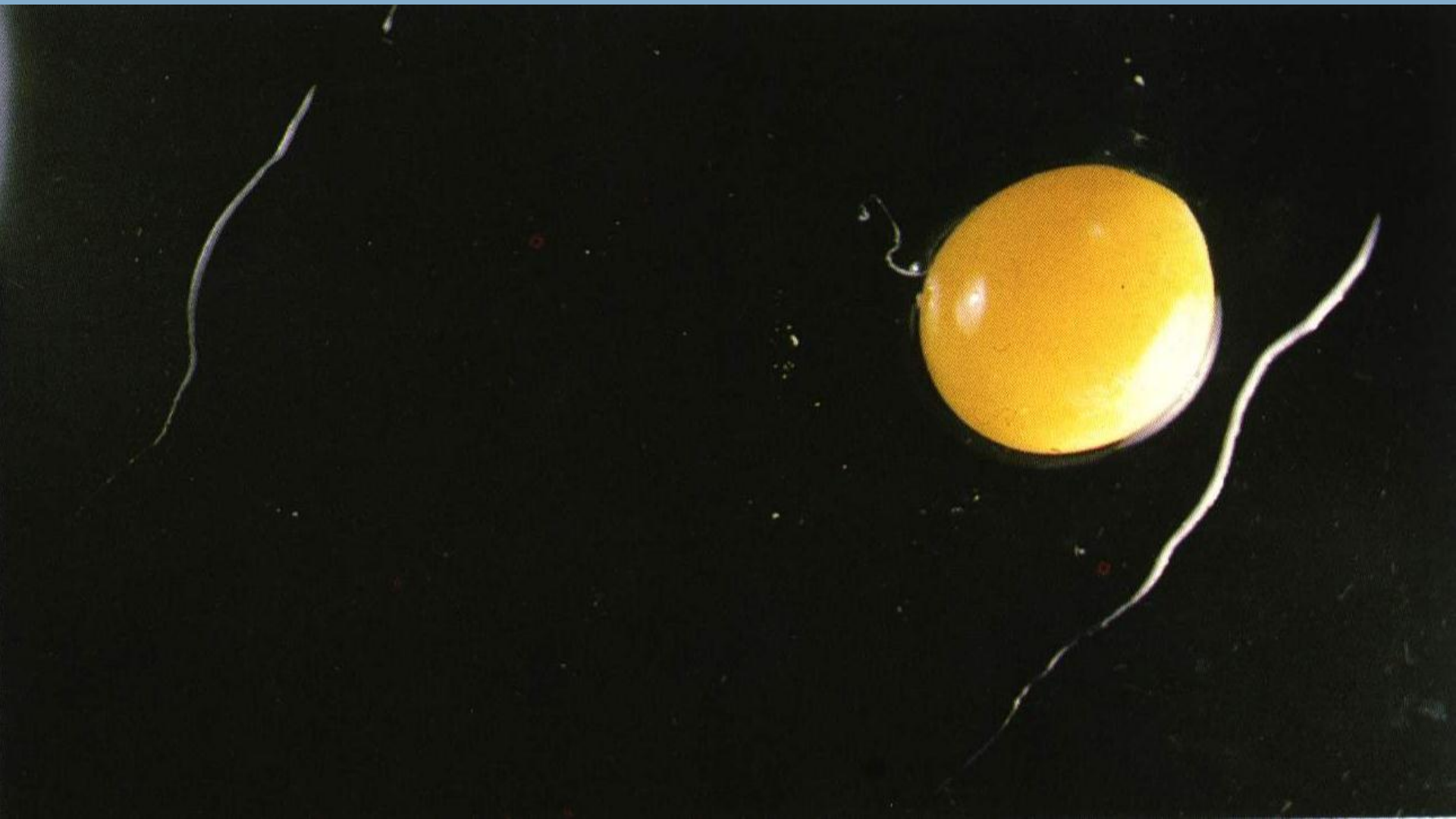
IB, EDS or ND



ORGAN : Egg content

LESIONS : Watery albumin

SUSP.DIS. : IB



Comparison of pale shelled and normally pigmented eggs

SUSP.DIS. : EDS & ND



infectious bronchitis

- Clinical Description
- **Within 24 hours post-infection, chickens infected with infectious bronchitis virus may begin to show signs of respiratory disease. This flock of layers is exhibiting a mixture of respiratory signs including coughing, sneezing, and rales. In flocks of birds older than 6 weeks of age, these signs may be subtle and may only be observable at night when the birds are normally quiet.**



infectious bronchitis

- Clinical Description
- A mature chicken exhibiting

depression

associated with infectious bronchitis virus.



infectious bronchitis

- Clinical Description
- In this mature chicken with infectious bronchitis virus, there is mucopurulent ocular discharge associated with the conjunctivitis. Ocular involvement is most commonly observed in young chicks and may include epiphora (tearing) and conjunctivitis. There is also nasal discharge present at the nares. Nasal discharge is more commonly observed in infected chicks however, clinical signs of IBV will vary according to the pathogenicity of the strain, the host's immune status, environmental factors, and the presence of concurrent infections which may complicate the disease.



infectious bronchitis

- Clinical Description
- In young birds infected with infectious bronchitis virus (IBV), some of the earliest signs of the disease include **depression and ruffled feathers**, as exhibited by some of the birds seen here. Birds may also huddle near heat sources. These signs typically appear within 24 hours post-infection. Young birds are more susceptible to IBV than older birds.



infectious bronchitis

- Clinical Description
 - Baby chick showing signs of **gasping and respiratory distress.** Other signs in young chicks often include coughing, sneezing, rales and oculo-nasal discharge. In most strains, mortality is usually negligible unless complicated by secondary bacterial infections. However, chicks less than 2 weeks old that have a natural IB infection or a severe reaction to IB vaccine, may suffer permanent damage to the oviduct, resulting in poor to no egg production capacity later in life.



infectious bronchitis

- Clinical Description
- **Dyspnea (seen here) and tracheal rales** may occur in some chickens. These respiratory signs may be caused by the accumulation of exudate in the upper respiratory tract as well as pneumonia in the lungs.



infectious bronchitis

- Clinical Description
 - In severe cases, birds may experience **severe dyspnea and gasp for air.**



infectious bronchitis

- Clinical Description
- The IB virus is shed in the nasal excretions and feces of infected birds. In production facilities such as this one, the virus typically spreads quickly from bird to bird, **via direct contact with contaminated feed, water, equipment, and infected birds.** In some birds, internal organs become persistently infected, resulting in intermittent shedding of the virus. These persistent carriers increase the possibility of flock-to-flock spread of the virus via unknowingly contaminated personnel.



infectious bronchitis

- Clinical Description
- **Chronic epiphora (tearing)**
associated with infectious bronchitis virus can lead to **secondary periocular feather loss, as seen here.**



infectious bronchitis

- Clinical Description
- When infectious bronchitis virus replicates in the reproductive tract of layers, normal calcium deposition in the egg shells may be disrupted, resulting in soft misshapen eggs.



infectious bronchitis

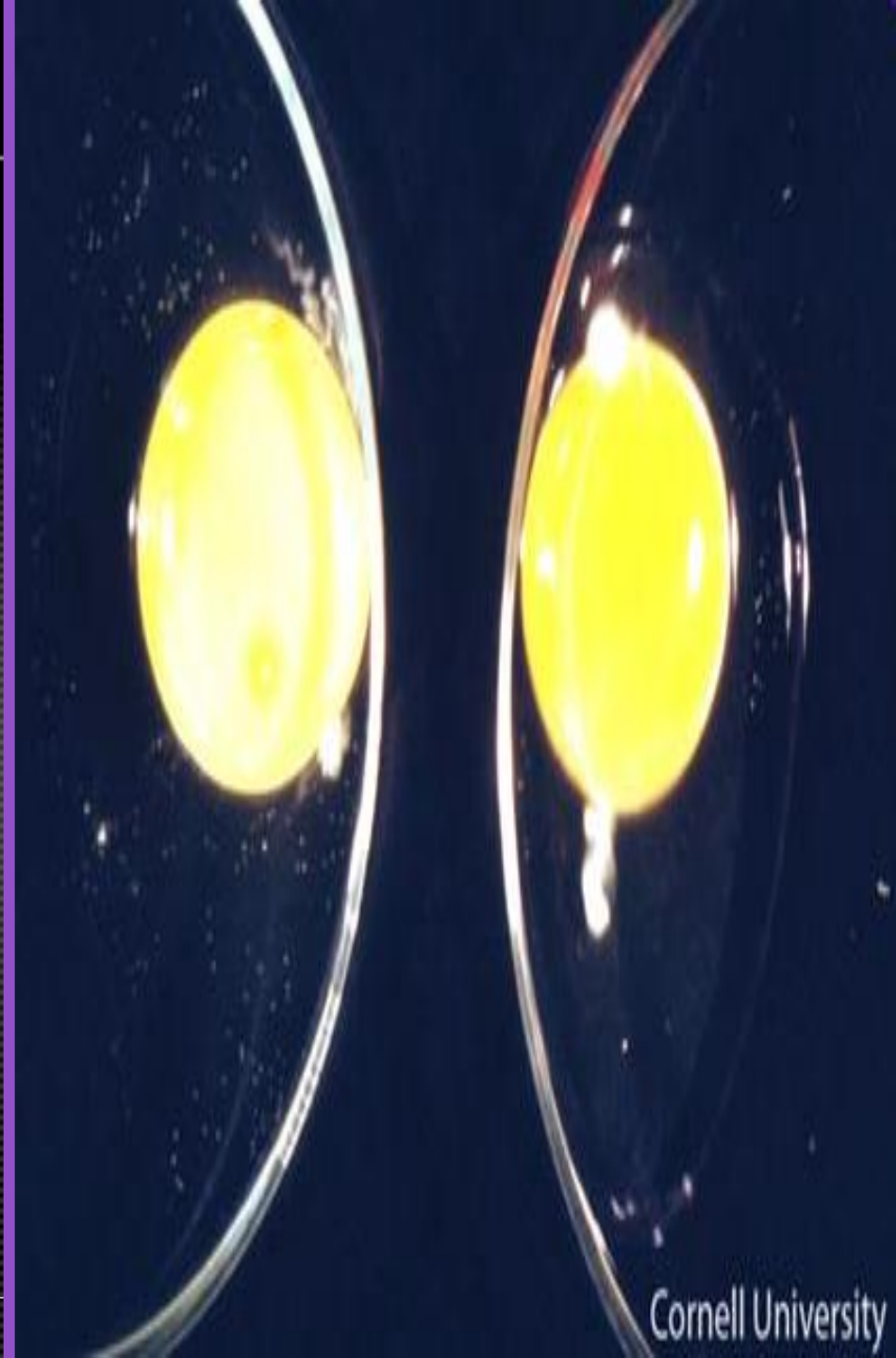
- Clinical Description
- Egg color and texture may also be affected.

Here, the egg shell is roughened and areas of discoloration are evident.



infectious bronchitis

- Clinical Description
- When the egg is opened, the quality of the egg is often found to be inferior. **As seen in the egg on the left, the albumen may be thin and watery and the separation between the thick and thin albumen may be absent. A normal egg is shown on the right for comparison.**



infectious bronchitis

- Clinical Description
- In layers, egg production may drop by up to 50% and **eggs may be soft-shelled (fragile) and misshapen, as seen here.**



infectious bronchitis

- Clinical Description
- On post-mortem examination, infectious bronchitis virus is typically associated with tracheal lesions. Here, the proximal trachea shows edema and congestion. In more advanced cases, the trachea may have accumulations of serous, catarrhal, or caseous exudate.



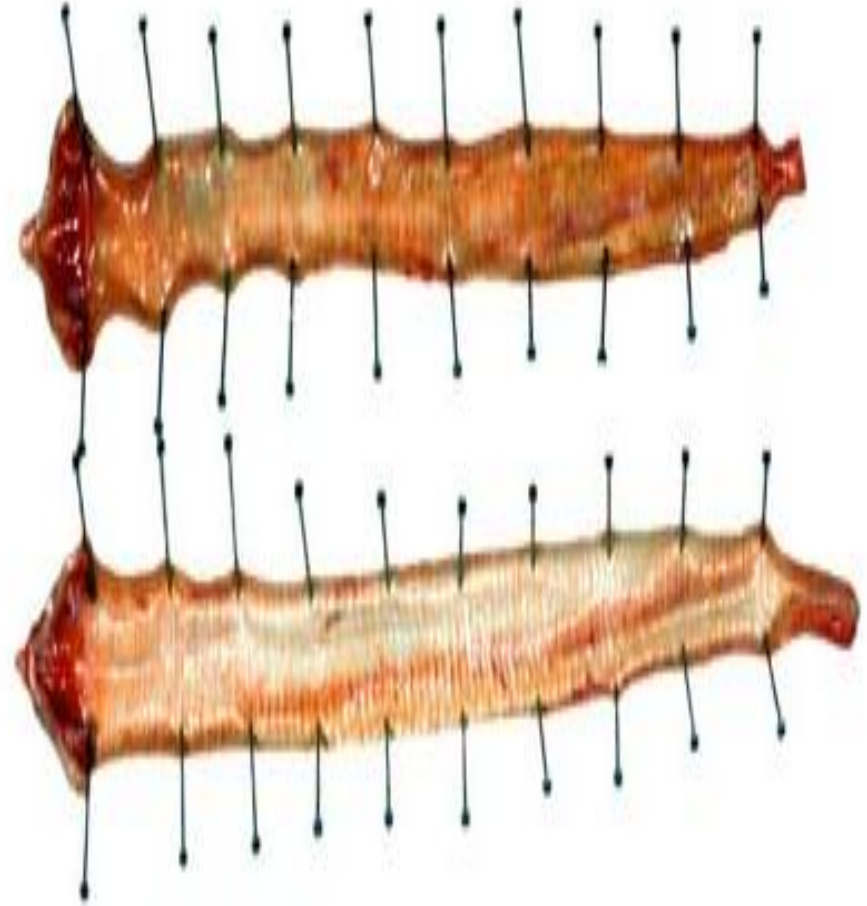
infectious bronchitis

- Clinical Description
- **There is mild catarrhal exudate in the lumen of this trachea.**



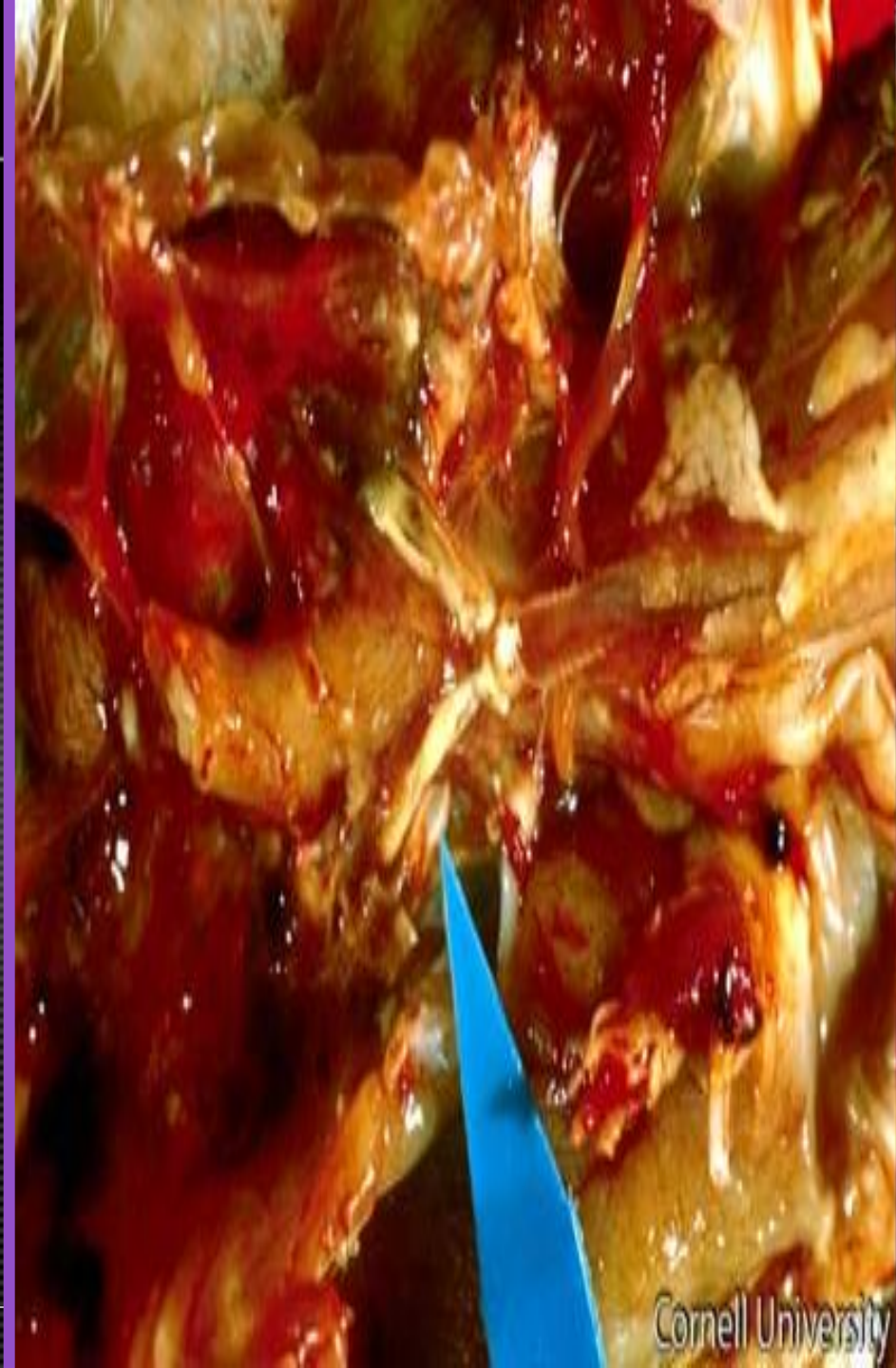
infectious bronchitis

- Clinical Description
- In infectious bronchitis virus infection, tracheal lesions may be quite severe and include congestion and hemorrhages, as seen here in the proximal trachea and oropharynx of 2 infected chickens.



infectious bronchitis

- Clinical Description
- Here, mild to moderate inflammation of the trachea and bronchi can be seen. **There is also an accumulation of white caseous exudate in the syrinx and primary bronchi.**



infectious bronchitis

- Clinical Description
- On post-mortem examination, the reproductive tract may be affected. **The ovarian follicles may be undergoing involution and may appear flaccid**, as seen here. These lesions are non-specific for infectious bronchitis, as many other acute diseases can be associated with this finding.



infectious bronchitis

- Clinical Description
- In the nephropathogenic strain of infectious

bronchitis virus, **the kidneys may become swollen and pale, as seen here.**



infectious bronchitis

- Clinical Description
- **Swollen kidneys with severe accumulation of white urates.**



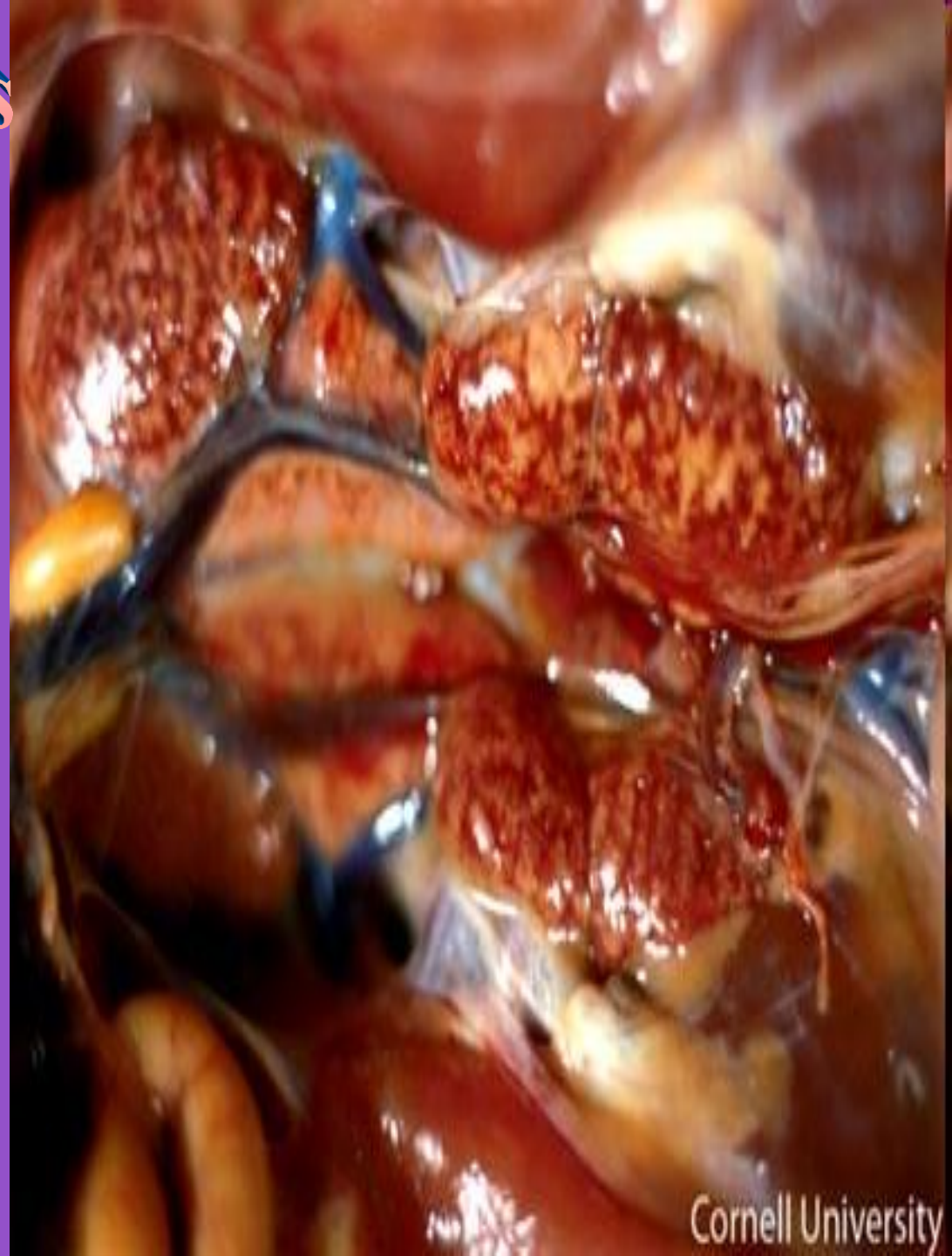
infectious bronchitis

- Clinical Description
- These kidneys are swollen and there is urolithiasis of the ureters. **The ureters are very distended with white urates.**



infectious bronchitis

- Clinical Description
- **The collecting tubules of these kidneys are also distended with white urates.**



infectious bronchitis

- Clinical Description
- Here, urate accumulations have lead to **visceral gout**, a deposition of urates on the **surfaces of the liver and heart.**



infectious bronchitis

- Clinical Description
- A comparison embryos inoculated with infectious bronchitis. The embryo on the right is a normal (negative control). The embryo in the middle was inoculated 4 days prior to the photo. The embryo on the left was inoculated 9 days prior to the photo. Embryos infected with infectious bronchitis virus show **stunting and curling**.



infectious bronchitis

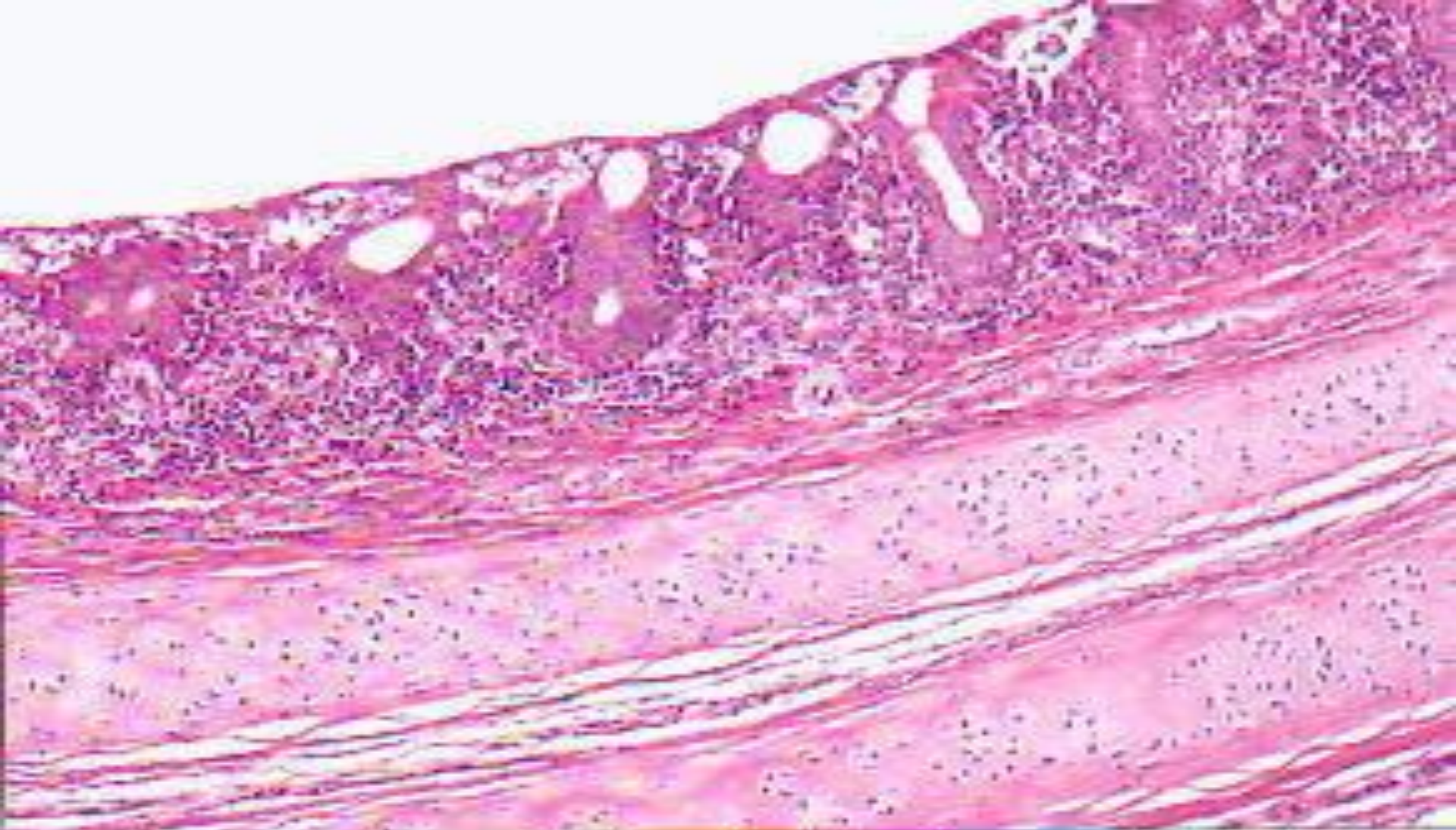
- Clinical Description
- The embryo of the left shows **stunting and dwarfing**, resulting from the inoculation of a susceptible (antibody free) embryo with infectious bronchitis virus. The amnion and allantois are usually thickened and closely invest the embryo (as seen on the right side of the embryo on the left). A normal embryo is shown on the right for comparison.



infectious bronchitis

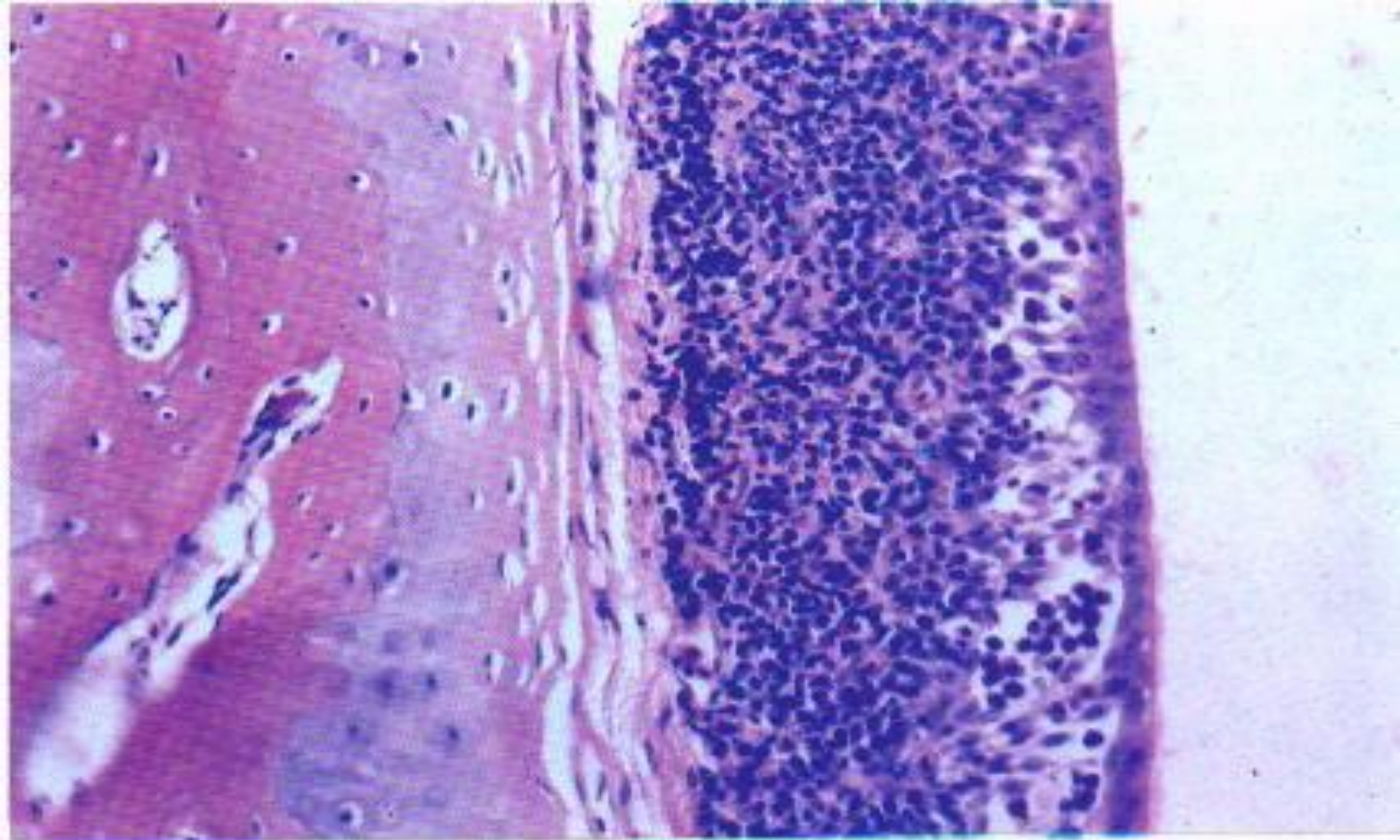
- Clinical Description
- **Stunting and dwarfing of a chicken embryo (right)**, resulting from the inoculation of susceptible (antibody free) embryos with infectious bronchitis virus. The amnion and allantois are thickened and closely invest the embryo (left side of the embryo) and the affected embryo also has an **unabsorbed yolk sac**. A normal embryo is shown on the right for comparison





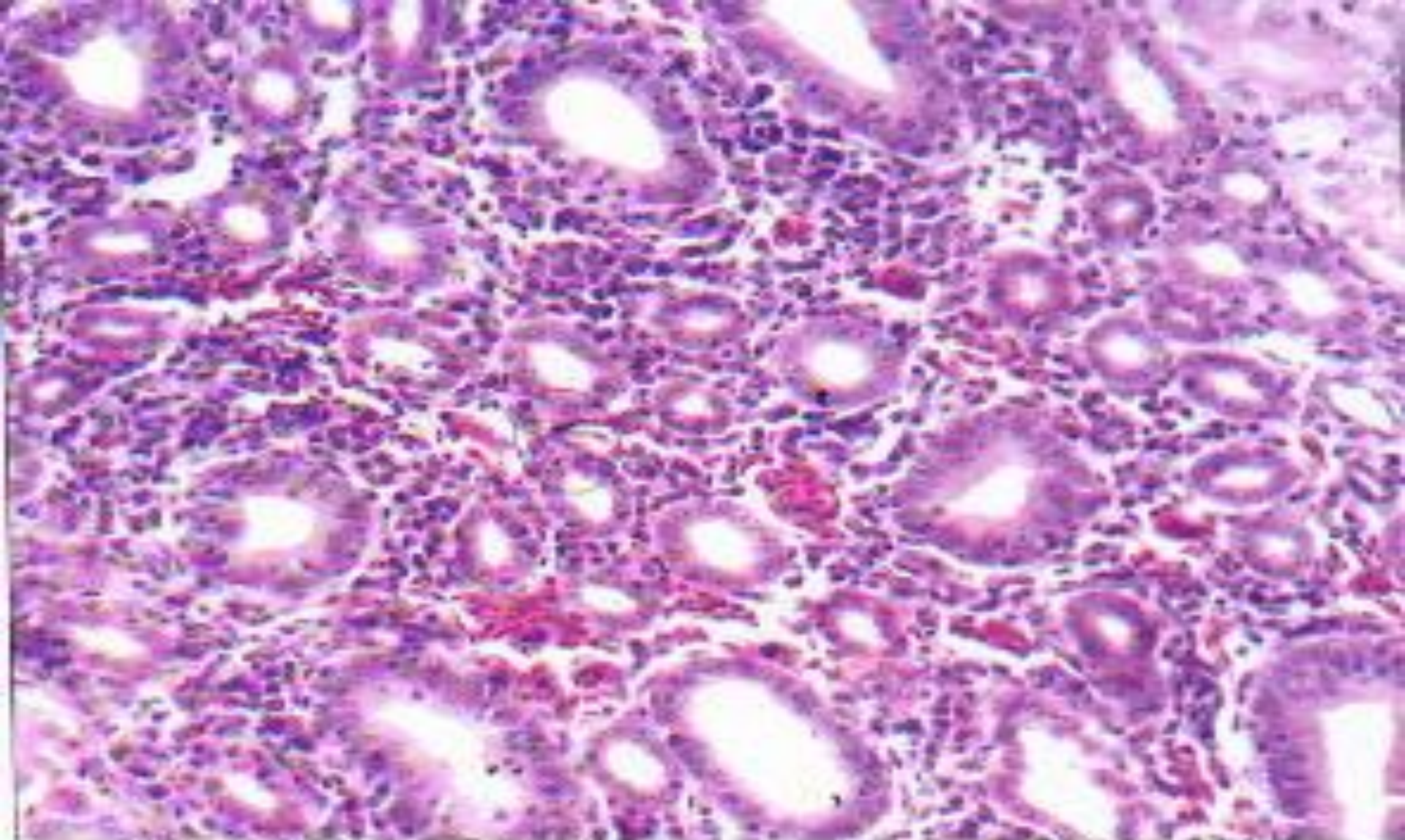
Tracheitis (Infectious bronchitis)

**dense lymphocytic infiltration in the lamina
and hypertrophy of the mucus glands**

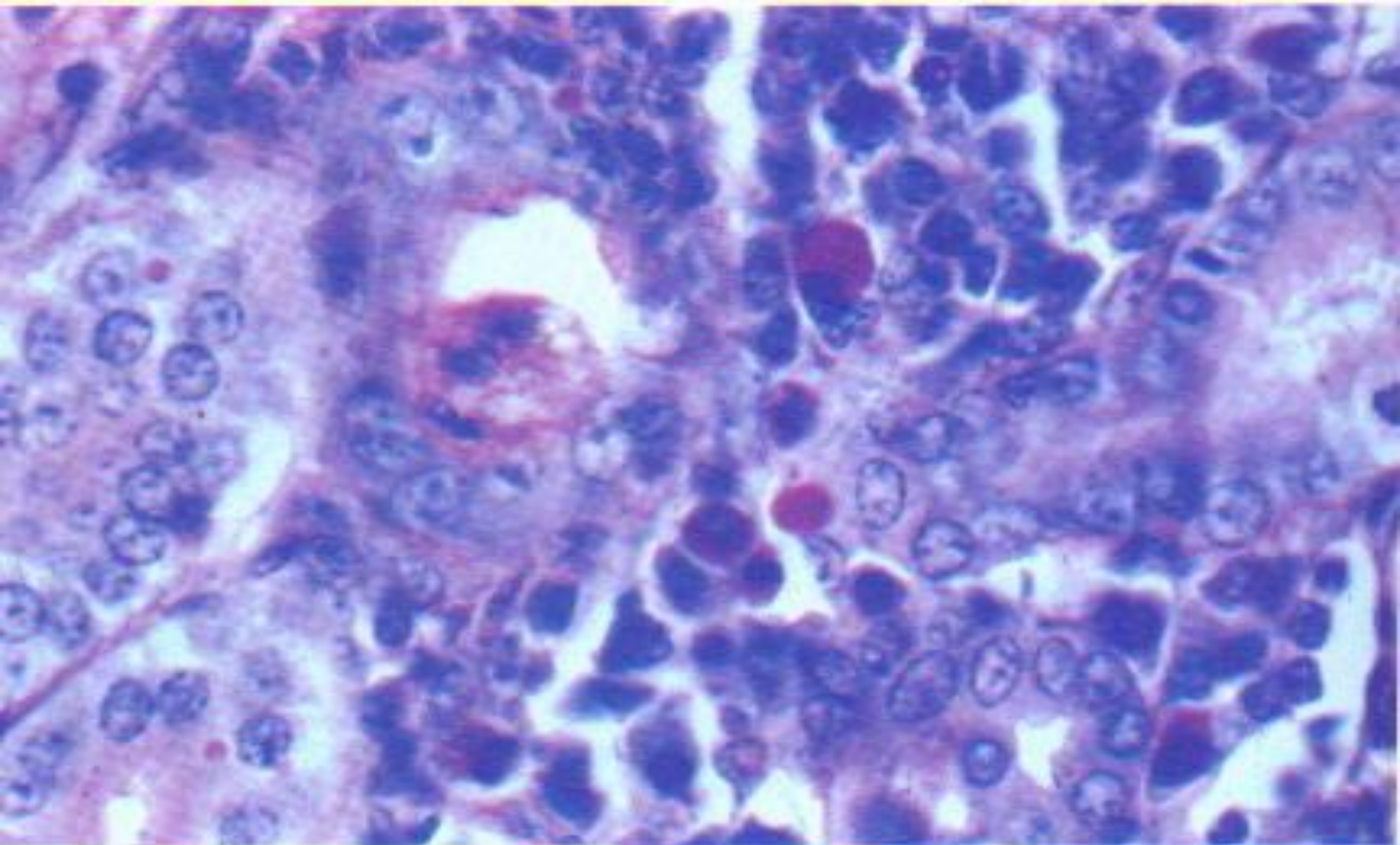


Infectious bronchitis

Trachea: dense lymphocytic infiltration in the mucosa



**Nephritis (Infectious bronchitis)
focal lymphocytic interstitial nephritis**



Infectious bronchitis

interstitial nephritis in an experimentally infected fowl showing lymphocytic and plasma cell infiltration