History of Comparative Ophthalmic Pathology

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Comparative Ocular Pathology Society
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2100 BC
Meat inspection regulations in Babylonian Empire of Hammurabi.

350 BC
Alexander the Great’s research grant to Aristotle on “the nature of animals.”
Folklore and Myth
Early Contributors to Veterinary Medicine

• Giordano Ruffo (1239-1257)

• Theodoric Borgognoni (1205-1298)
Cabinets of Wonder
Beginning in the 16th Century
The Polymath

Leonardo da Vinci
(1452-1519)

Johann Wolfgang von Goethe
(1749-1832)
Emergence of Veterinary Medicine

• The first veterinary school is established in Lyon in 1761.

• Until about 1815, physicians played a major role in the management of animal diseases.
James Wardrop (1782-1869)

- Student of John Hunter, who helped establish the London Veterinary College in 1791.
- Founder of Ophthalmic Pathology in 1808.
ESSAYS
ON
THE MORBID ANATOMY
OF THE
HUMAN EYE.

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ILLUSTRATED BY PLATES.

EDINBURGH:
Printed by George Ramsay and Company,
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AND JOHN MURRAY, 15 LEAD STREET,
LONDON.
1808.

Figure 8.1

Title page from Wardrop’s Essays on the Morbid Anatomy of the Human Eye (1808).
Major Figures in the Establishment of Veterinary Medicine and Contributors to Early Studies in Comparative Ocular Pathology

- Andrew Snape, the younger, English (b.1644)
- Claude Bourgelat, French (1712-1779)
- James Carver, English/American (1773-1822)
- Alexis Casmir Dupny, French (1775-1849)
- Urbaine Leblanc, French (1797-1871)
- Heinrich Mőller, (German (1820-1864)
- Henry Gray, English (1825-1861)
Major Figures in the Establishment of Veterinary Medicine and Contributors to Early Studies in Comparative Ocular Pathology (cont.)

• Rudolf Berlin, German (1833-1897)
• Joseph Bayer, Austrian (1847-1925)
• Andrea Vachetta, Italian (Fl. 1870-1910)
• Oscar Everbusch, German (1853-1912)
• Bela Plósz, Hungarian (1863-1945)
• Eugéne Nicholas, French (1867-1929)
• Otto Őberreiter, Austrian (1898-1967)
Accomplishments of Major Figures

• Established veterinary schools.

• Taught as faculty members.

• Wrote text books.

• Carried out research and contributed articles.
Continuing Contribution of Physicians to Comparative Veterinary Pathology in the 19th Century

- **Edward Jenner**—determined greasy heel lesion in horses was a vaccinia-like disease related to cowpox.
- **Guillaume Dupuytren**—demonstrated cause of roaring in horses by cutting vagus nerve.
- **Rudolf Virchow**—studied tuberculosis, actinomycosis and parasitic infections in cows and pigs.
Establishment of Pathology and Ophthalmology as Medical Specialties

- 1805 Eye pathology begins.
- 1812 First professorship in ophthalmology in Vienna.
- 1850 Helmholtz discovers the ophthalmoscope.
- 1875 Ophthalmology becomes obligatory in the veterinary schools of Europe.
Late 19th Century Eye Pathologists Intensely Interested in Diseases in Animal Eyes

**Sir William Gowers**—CNS lesions in canine distemper.

**Edward Nettleship**—albinism in human and animal eyes.

**George Coats**—compared congenital anomalies in human and animal eyes.

**George E. de Schweinitz**—multiple studies in comparative ocular pathology.
Joseph J. Woodward and the AFIP Section of Comparative Pathology

- First pathologist at the Army Medical Museum.
- Founded the Registry of Comparative Pathology (closed 2010).
- Major role in developing photomicroscopy.
- Mentor to William Thompson and William F. Norris, noted ophthalmologists.
- “Father of Veterinary Pathology” in the U.S.
A Sampling of Animal Models with Diseases of Interest to Ophthalmologists

- **Cats**—Klinefelter’s syndrome; Waardenburg’s syndrome; $G_{M1}$ gangliosidosis.

- **Chimpanzees**—Down’s syndrome.

- **Dogs**—globoid cell leukodystrophy; Lafora’s disease; lupus erythematosus; $G_{M2}$ gangliosidosis.

- **Mice**—amyloidosis.

- **Mink**—kuru; Creutzfeldt-Jacob disease.

- **Monkeys**—acute toxoplasmosis; malignant lymphoma.

- **Rats**—rheumatoid arthritis; hereditary fructose intolerance.

- **Swine**—rheumatoid arthritis; malignant lymphoma.

- **Cattle, Sheep, Horses**—malignant lymphoma.
Induced Experimental Animal Models

• Far outnumber spontaneously occurring and naturally occurring models.

• Focus of on-going research with strong NIH support.

• Extremely important gene therapy.
Leber’s Congenital Amaurosis (LCA): A Case in Point Concerning Gene Therapy

• This therapy gave vision to 60 dogs, including world-famous Lancelot, born blind from LCA. These studies provide great promise for eradicating LCA caused by RPE65, and eventually, LCA caused by other genetic variations.

• Clinical trials of gene replacement therapy for LCA caused by mutations in the RPE65 are now underway at Children’s Hospital of Philadelphia, Universities of Pennsylvania and Florida, and Moorfields Eye Hospital at the University College of London. Children and young adults who were nearly blind have had dramatic improvements in their vision after treatment.
“Classical” Comparative Ophthalmic Pathology in the 20th Century

• 1905—Theodor Kitt published the first textbook of veterinary pathology with in-depth coverage of ophthalmic disease ("Lehrbuch Der Pathologischen Anatomie Der Hausthiere") 5th and final edition in 1927.

• 1908—Eugene Nicolas published a text on veterinary and comparative pathology ("Ophtalmologie Vétérinaire Et Comparée.") English edition by Henry Gray used in U.S. and Britain into the 1950s.

• 30 year hiatus until “Veterinary Pathology” was published in 1957 with a chapter on pathology of organs of special sense.
1950’s and 60’s Bring Renewed Interest in Veterinary Ocular Pathology

- Thomas C. Jones publishes articles on uveitis in horses and other aspects of ocular pathology.
- Leon Z. Saunders and Charles Barron publish on intraocular tumors in dogs; Saunders reports on blindness in dogs in Journal of Comparative Pathology.
- Stuart Young at Colorado State University begins involvement in veterinary ocular pathology.
- In 1964 William G. Magrane opens first exclusive veterinary ophthalmology practice.
- At 1968 ACVP meeting, main topic is ocular pathology with L.E. Zimmerman as featured guest.
American College of Veterinary Ophthalmology (ASVO) Granted Specialty Status
March 21, 1970

Charter Members:
- Gustavo D. Aguirre
- Roy W. Bellhorn
- Stephen I. Bistner
- James D. Carter
- Robert M. Cello
- Richard H. Donovan
- Leonard Krawitz
- Andre M. Lavignette
- William G. Magrane
- Charles L. Martin
- Charles J. Parshall, Jr.
- Seymour R. Roberts
- Lloyd C. Helper
- Glenn A. Severin
- Harlan E. Jensen
- Samuel J. Vainisi
- Kirk N. Gelatt
- Ralph C. Vierheller
- Milton Wyman
- Seth A. Koch
- Earl Catcott
- Waldo F. Keller
- Lionel F. Rubin
- Craig A. Fischer
Sampling of Other Notable Events 1970-2000

• William Carlton at Purdue offers a graduate course on ophthalmic pathology and routinely examines enucleated eyes on diagnostic service.

• C.L. Davis Foundation symposia (December 2007) at U of P and (September 2008) in Dubrovnik, Croatia, on ophthalmic pathology.

• Robert Peiffer, Jr., and Robert Trucksa organize 1980 symposia at Chapel Hill on comparative ocular pathology, followed in 1983 by the textbook: “Comparative Ocular Pathology.”
Sampling of Other Notable Events 1970-2000 (cont.)

- A 1980 symposium gives rise to the ophthalmic pathology short course “The Histologic Basis of Ocular Disease,” and then the larger Basic Science Course sponsored by ACVO.
- In the 1990’s, T.C. Jones, U. Mohr, and Y. Konishi organized course offered in their 3 countries sponsored by International Life Sciences Institute. A book (with R. D. Hunt) on the pathology of eye and ear in lab animals followed.
- In the 1990’s, ACVP and ACVO met jointly to foster interactions.
Sampling of Publications in New Millennium


• R. Dubielzig, et. al. Veterinary Ocular Pathology: A Comparative Review. 2010
“Philosophical” Considerations

• Mission and vision of COPS.

• Closer relationships with physicians and researchers.

• Introduction of fellowships and undergraduate and graduate courses with an eye toward the future.
References


