AN EYE FOR OPHTHALMOLOGY

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CLAUDIA BUSSE details the history of veterinary ocular advancements, educational progress and invites readers to attend the biggest veterinary ophthalmology meeting in Europe.

THINK I always wanted to be a vet, but still remember the day when I decided to become an ophthalmologist.

I was a teenager and had just convinced my parents my recently prescribed glasses were so not fashionable and I urgently needed contact lenses. So there we were at the newly opened ophthalmology practice, not too far from my rural home town. The practice was a beautiful converted mansion and a young, attractive ophthalmologist examined my eyes.

There were fancy instruments, such as a slit lamp and ophthalmoscope (not that I knew these names at the time), and all the incredible little lenses used to correct the visual deficit of my eyes. To my great relief, at the end of the session I could see perfectly well without wearing my glasses again. I went out of the consulting room with my new contact lenses and said: “Dad, I think I want to be an ophthalmologist.”

This apparently straight line of career choice did actually get diverted slightly, mainly by a book about human ophthalmology that initially scared me away. In my vague memory persists pictures of a child with a pencil stuck in its orbit and eyes severely distorted by neoplasia. Nevertheless, eyes continued to fascinate me.

In veterinary school we had the great luck of being taught by a very inspiring veterinary ophthalmologist. In contrast to most of our professors and lecturers, his lectures were interactive all...
the way through, keeping us awake and even fascinated by the topic. Then there were the hundreds of beautiful eye pictures that got me hooked forever.

Clever and communicative

So, why ophthalmology you may ask? Aren’t eyes scarily slippery or frighteningly fragile, so it is intimidating to work with them? Well, I think they are by far the most beautiful and clever part of the body.

Eyes are evolution’s video camera and are surprisingly resilient. Eyes “talk” to you when you examine them straight away, rather than hiding important information from you as much as possible, as most organ systems do. Most eye diseases can be diagnosed purely by properly examining the eye. Not only that, sometimes eyes will also tell you about problems in other parts of the body.

The eye is the only part of the body where you can directly look at capillaries and even a nerve – the optic nerve. The eye contains the only two transparent structures of the body – the cornea and lens. Think about it – natural tissue made from cells and collagen fibres that is completely transparent. How amazing is that?

Looking back

Ancient Egypt showed some passion for veterinary ophthalmology as long as 4,000 years ago. “Moon blindness” in horses was first described between 450AD and 500AD in *Vegetii Renati Artis Veterinariae Sive Mulomedicinae Libri Quatuor* by Publius Vegetius Renatus – a book that can now be found in the historical collection of the RCVS.

Even Leonardo da Vinci was fascinated by eyes and spent a lot of time dissecting them, studying them more thoroughly than anyone before him and long after him. The eye examination technique advanced dramatically in the early 19th century when the fundus reflex was first discovered and eventually led to the invention of the ophthalmoscope.

Optical advancement

The first advances in modern veterinary ophthalmology occurred in Europe. Ophthalmology became obligatory in the curriculum of all veterinary schools in 1875, but was mostly taught by human ophthalmologists. But modern ophthalmology did not start until about 80 years ago.

Before 1940 pretty much any eye disease was treated with boric acid two per cent. Antiseptics at the time included silver nitrate, mercuric chloride and biniodide of mercury. Cocaine and atropine were used to dilate pupils and cocaine hydrochlorate was one of the topical anaesthetics of choice.
at the time.

Different powders including salt, sugar or boric acid were blown or dusted into the eyes to try to help with different conditions, obviously with questionable success. Castor oil and cod liver oil acted as soothing protectants, and leeches were applied to the conjunctival or cutaneous surface with the aim to remove subconjunctival or even intraocular haemorrhages.

Surgical instruments were also rather crude at the time. While lid surgeries and enucleations were most commonly performed, the odd cataract or glaucoma surgery also took place. “False eye” implants were used in horses as early as the 19th century.

We have come a long way since. As already mentioned, it was really only in the past 80 years that antibiotics, antivirals, corticosteroids and other modern drugs dramatically improved the treatment options for ophthalmic patients, including both humans and animals.

Also, who would have thought the Second World War would significantly contribute to the advances of cataract surgery in people? Harold Ridley placed the first intraocular lens into a human eye in London in 1949. He had noticed RAF pilots that got pieces of shattered aircraft canopies into their eyes showed very little, if any, reaction to it. So it was the same acrylic resin that was used to produce the first artificial intraocular lens.

**Separate focus**

Soon, veterinary ophthalmology became its own speciality. The American, and the International, Society of Veterinary Ophthalmology were founded in 1957 and 1977, respectively, with the aim to promote the exchange of information and further scientific progress in veterinary ophthalmology, in all species, on a national and international basis.

Subsequently, the American, and later the European, College of Veterinary Ophthalmologists (ACVO and ECVO) were founded to establish postgraduate training programmes in ophthalmology, and to examine and certify veterinarians that have undergone the training programme as specialists.

The ECVO, which was founded in 1992, now has 90 members and is steadily growing. Just last year it celebrated its 20th birthday. The UK is the country with the highest number of diplomates (DipECVO) and residency training programmes – currently five in Europe. There are also several holders of the RCVS Diploma in Ophthalmology (DVOphthal).

More and more ophthalmology internships are also offered by a number of specialist practices, and allow veterinarians to increase their experience in ophthalmology without committing to a three-year residency training programme.
Veterinarians with an interest in ophthalmology can also join the British Association of Veterinary Ophthalmologists (BrAVO) – a vibrant group of people crazy about eyes who meet twice a year to learn more about their favourite subject.

**Modern day ophthalmics**

Where we used to remove eyes, we now repair deep and even perforated corneal ulcers, perform cataract surgery close to human standards, correct the eyelid position in brachycephalic dogs or put slow release drug implants in the wall horse eyes with recurrent uveitis.

Cataract surgery has in fact been performed in many different species, including rabbits, pinnipeds and birds such as owls, ducks, kites, penguins and condors.

We use instruments comparable to our colleagues in human ophthalmology, and are constantly improving our diagnostic approaches using advanced imaging techniques like MRI, high resolution ultrasound and even optical coherence tomography (OCT) – an incredible technique that provides histology-like in vivo images of the retina and optic nerve, as well as the anterior segment of the eye. Our knowledge in veterinary ophthalmology is increasing constantly, and there is even a dedicated journal called *Veterinary Ophthalmology*.

**Evolution’s rôle**

So, are eyes just eyes, no matter what the species? Well, they are in a way. The basic anatomy of the eye is universal in vertebrates all over the world. Evolution, however, has brought on a fascinating number of variations between species that keeps the world of a veterinary ophthalmologist exciting.

There is the tapetum lucidum – a reflective structure behind the retina that increases the exposure of the retina to light and improves night vision. There are the striate muscles in the bird’s iris that gives them conscious control over their pupil size and, staying with the birds, there is the beauty of the pecten oculi – a vascular fan in the posterior segment of the bird’s eye that provides nutrition to the surrounding structures.

Do you enjoy watching television? Did you know your dog can actually distinguish the individual pictures, a bit like when you and I are watching really old movies or cartoons, or that they see the neon light bulbs flicker where we see a constant light?

Have you ever been asked by clients what colours their pets see? Well, there is not one answer, but very many, depending on the species you are looking at. Dogs, cats and horses can distinguish colours in the range of yellow and blue, with two different photoreceptors for colour vision. We have three, so can distinguish many more colours than they can, but birds, for example, beat us with not three, but four photoreceptors – one allowing them to see ultraviolet (UV) light, which is a feature
we understand better when looking at birds under UV light. Suddenly, plain birds have a rich and colourful plumage we can’t see without help, given our lack of UV vision. It is fascinating, isn’t it? Just like that I, and most ophthalmologists, can just go on and on.

**BrAVO Spring Congress/ECVO Congress London**

This year you have the rare opportunity to find out what it is all about. In late spring BrAVO and the ECVO will join their annual meetings and invite everyone to the biggest veterinary ophthalmology meeting in Europe to date. Between May 14-18, 2014 veterinary ophthalmologists from all over the world will come to the centre of London to present and discuss the most recent findings and developments in veterinary ophthalmology. This year’s theme is ophthalmic surgery.

On May 14, BrAVO is devoting a whole day to phacoemulsification in dogs, the technique used to remove cataracts in our patients. This is probably the procedure in which we are closest to the standards found in human ophthalmology. Yet human cataract surgery is not the same as cataract surgery in dogs.

On this CPD day you can learn to understand how cataracts are operated in dogs and in people (something most of us will experience too when we get older) and what the most worrying complications of the surgery are and how to deal with them.

For the new or experienced cataract surgeon this day will be all about reviewing one’s surgical technique, brushing up to the best possible standard and improving the ability to avoid, recognise and deal with complications.

From Thursday the ECVO meeting starts with a continuing education day. This will also be very useful for the budding ophthalmologist, as well as the more experienced ophthalmic surgeon. Topics discussed include eyelid, third eyelid as well as orbital surgery.

The following two days will be filled with short abstracts presented by ophthalmologists from all over the world and covering a wide range of topics. This is always a great opportunity to learn new things and see the directions ophthalmology may be heading to in the future.

The Saturday will be further enhanced by a highly-anticipated state-of-the-art lecture on limbal stem cell transplants by the well-know human ophthalmologist Harminder Dua. He and his colleagues will also lead the masterclass on May 18 when delegates can learn all about corneal surgery and will also have the opportunity to practice their surgical skills under the operating microscope in an ophthalmic wet lab. Veterinary ophthalmology is an ever-growing discipline and 2014 may just be the year to start having eyes for eyes.

Visit [www.ecvo](http://www.ecvo) or [www.bravo.org.uk](http://www.bravo.org.uk) for more information about the conferences. Early bird rates for the ECVO conference are available until the end of March. Hopefully I will meet you all in
London this May.

**Further reading**

Deep corneal ulcers can now be repaired in a number of ways. This pug’s ulcer was treated with a corneoconjunctival transposition where neighbouring healthy tissue is moved into the defect. Suture material used can be as small as 9/0 or even 10/0, making the use of an operating microscope indispensable.
This pug also had a deep corneal ulcer that was repaired with a corneocconjunctival transposition. Note the transposed cornea is regaining some transparency.
Veterinary ophthalmology is one of the few disciplines that covers all animal species (the ones with eyes, that is). This is a tortoise with conjunctivitis due to suboptimal husbandry.
A patient following cataract surgery. Note the slightly wrinkled anterior lens capsule, into which an opening (capsulorhexis) was created to remove the cataract and the intraocular lens that allows the dog to have normal vision, rather than being severely long-sighted.
The fundus picture of a diabetic dog following cataract surgery. The eye examination tells us the patient is hyperlipidaemic, which causes the rather pinkish appearance of the blood, which can be seen in the retinal vessels.
This patient presented with a dermoid on its cornea. A dermoid is a patch of often hair-bearing skin growing in the wrong location. An operating microscope allows precise removal of this structure.