Rowe Referrals

The eye clinic

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01454 521000

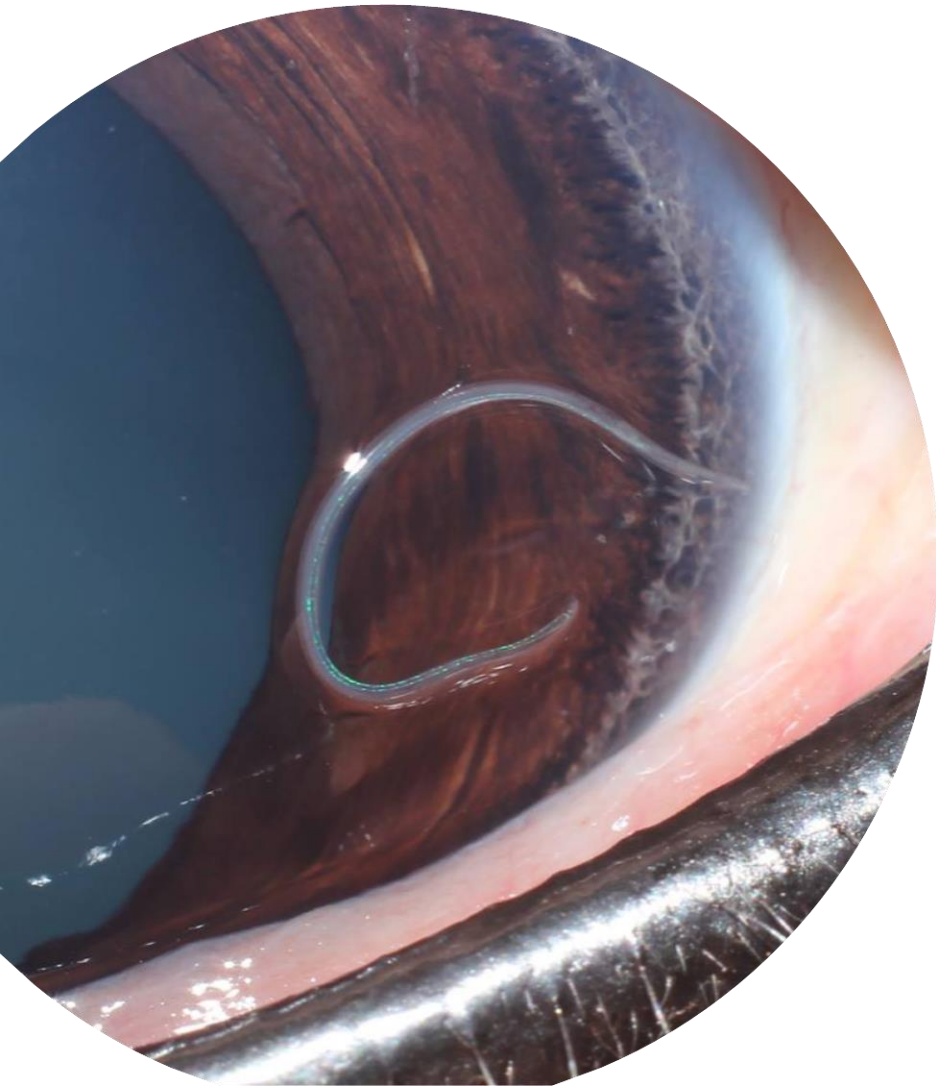
Rowe Referrals

A systematic approach to the examination of the eye

What’s number 1?

EQUIPMENT “MUST HAVES”


Canon
EOS
760D
BRISTOL
MAID



But first a competition…

#1 most important diagnostic tool


Number 1

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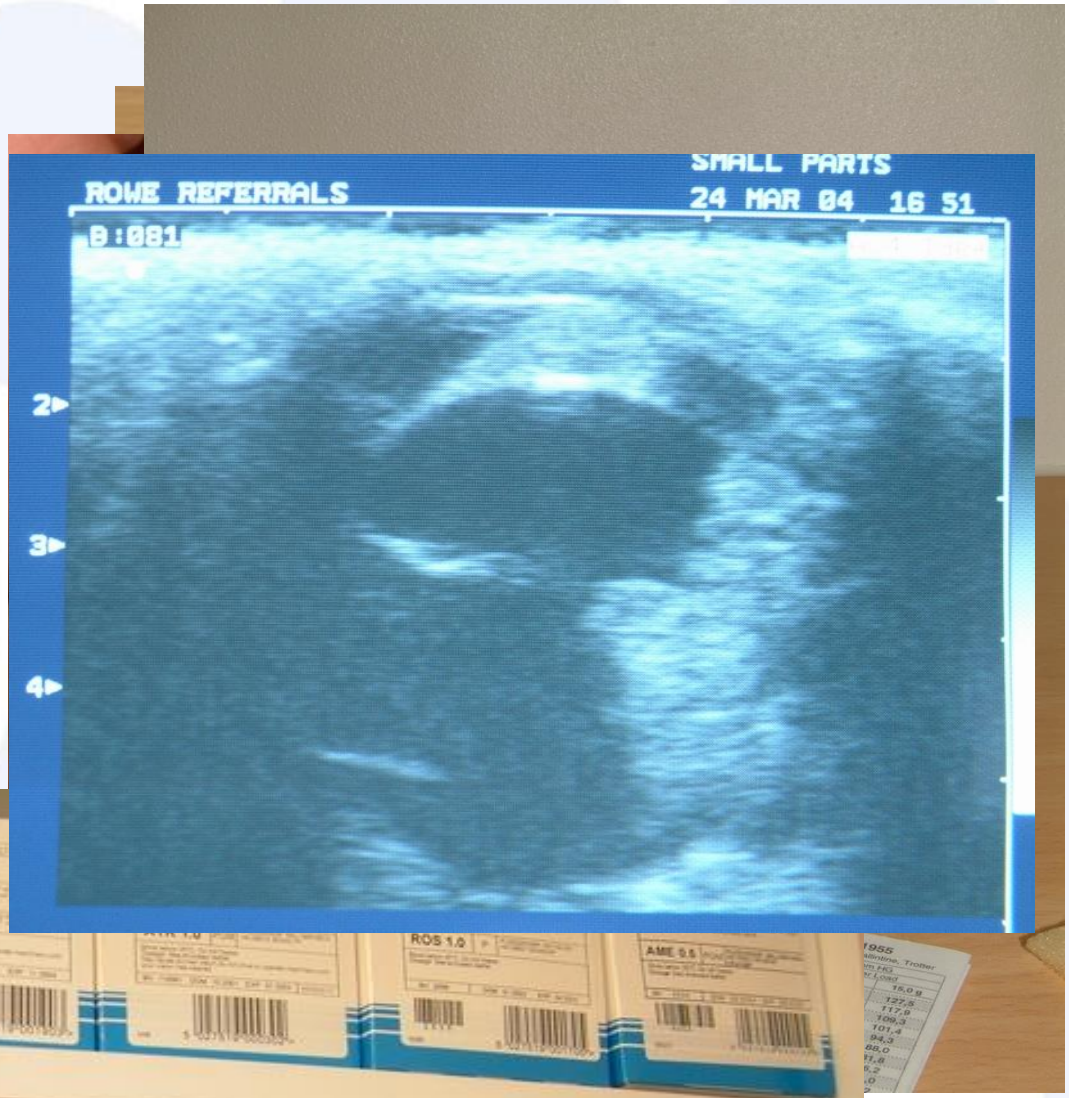
Tools of the trade

- Focal light source
- Dark Room
- Lens
- Diagnostic consumables
- Tonometry
- Direct Ophthalmoscope
- (Slit lamp biomicroscopy)
- Ultrasound



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10 stage exam

1. Signalment
2. Distant exam
3. History
4. Hands on
5. CN
6. STT
7. Light & mag
8. Distant direct
9. Indirect
10. Close direct

Function

Adnexa

Anterior to pupil (lit)

Posterior to pupil (dark)

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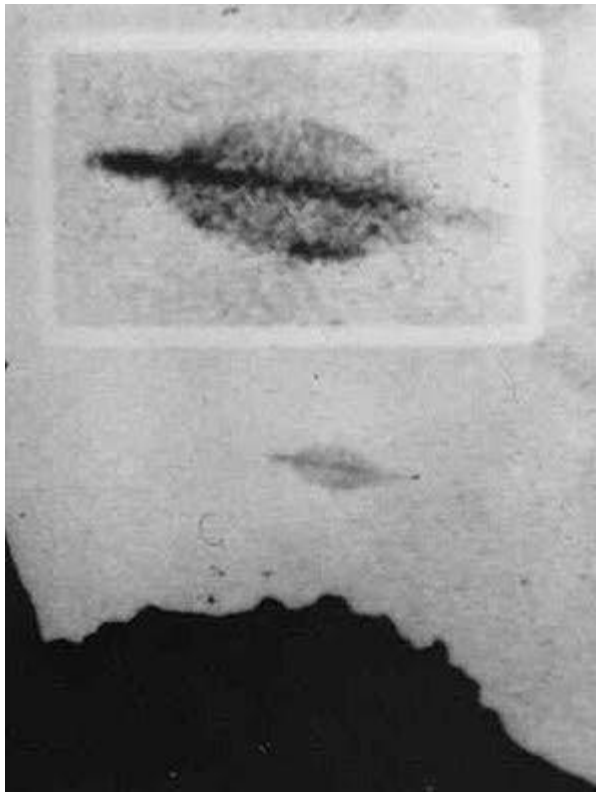

1: Signalment

Breed	• Cat – infectious & trauma, brachycephalic ocular syndrome • Dog – trauma, KCS & heritance • Rabbit – dental disease & infectious
Heritance	• Brachycephalics – corneal disease • Abbysinians - GPRA
Temperament	• Pups – cats • Fighter – corneal trauma, FIV, FeLV • Hunters – toxoplasmosis, mycobacteriosis
Age	• <2weeks – ophthalmia neonatorum • Kittens – chlamyd, FHV, congenital dz • >12years - hypertension

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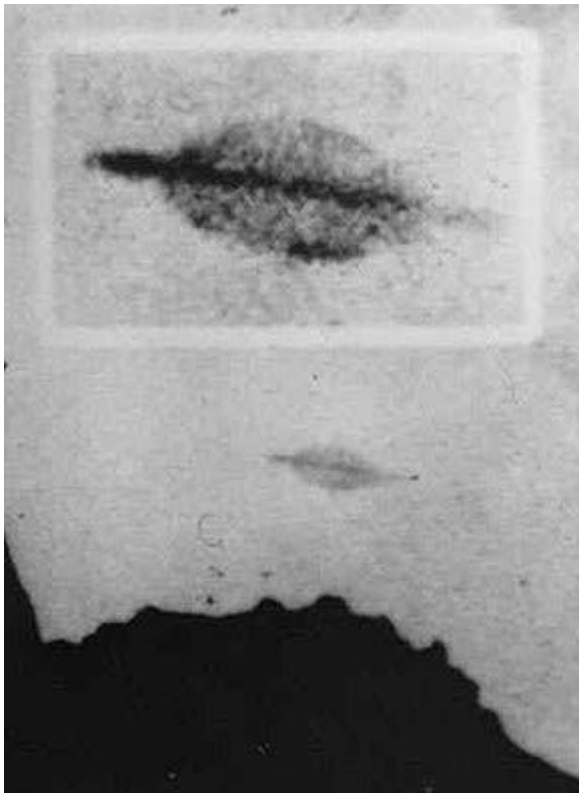
Breeds and Conditions Certified (on Schedule A) under the BVA/KC/ISDS Eye Scheme - January 2006

BREED	CONDITION(S) CERTIFIED
Alaskan Malamute	HC
Australian Cattle Dog	GPRA
Basenji	PPM
Basset Hound	G
Bedlington Terrier	TRD
Belgian Shepherd (all varieties)	HC
Border Collie	CEA, CPRA, PLL
Boston Terrier	HC (two forms)
Briard	CPRA
Bull Terrier (Miniature)	PLL
Cavalier King Charles Spaniel	MRD, HC
Collie (Rough)	CEA, GPRA, CPRA
Collie (Smooth)	CEA, CPRA
Dachshund (Miniature Long-Haired)	GPRA
Dobermann	PHPV
Finnish Lapphund	GPRA
Fox Terrier (Smooth)	PLL
Fox Terrier (Wire)	PLL
German Shepherd Dog (Alsatian)	HC
Giant Schnauzer	HC
Glen of Imaal Terrier	GPRA
Hungarian Puli	MRD
Irish Red and White Setter	HC
Irish Setter	GPRA (DNA test available)
Irish Wolfhound	GPRA
Lancashire Heeler	CEA, PLL
Large Munsterlander	HC
Leonberger	HC
Lhasa Apso	GPRA
Miniature Schnauzer	CHC, GPRA, HC
Norwegian Buhund	HC
Norwegian Elkhound	GPRA
Old English Sheepdog	HC
Parson Russell Terrier	PLL
Poodle (Miniature)	GPRA
Poodle (Standard)	HC
Poodle (Toy)	GPRA
Retriever (Chesapeake Bay)	GPRA, HC
Retriever (Flat Coated)	G
Retriever (Golden)	CPRA, HC, GPRA, MRD
Retriever (Labrador)	TRD, GPRA, CPRA, HC, MRD
Retriever (Nova Scotia Duck Tolling)	PRA
Rottweiler	MRD
Sealyham Terrier	PLL, TRD
Shetland Sheepdog	CEA, CPRA
Siberian Husky	HC, G
Spaniel (American Cocker)	MRD, GPRA, HC, G
Spaniel (Cocker)	GPRA, CPRA, G
Spaniel (English Springer)	GPRA, CPRA, MRD
Spaniel (Welsh Springer)	HC, G
Staffordshire Bull Terrier	PHPV, HC
Tibetan Spaniel	GPRA
Tibetan Terrier	GPRA, PLL
Welsh Corgi (Cardigan)	GPRA (DNA test available), CPRA

KEY: CEA Collie eye anomaly, CHC Congenital hereditary cataract, CPRA Central progressive retinal atrophy, G Goniodysgenesis/primary glaucoma, GPRA generalised progressive retinal atrophy, HC Hereditary cataract, MRD Multifocal retinal dysplasia, PHPV Persistent hyperplastic primary vitreous, PLL Primary lens luxation, PPM Persistent pupillary membrane, TRD Total retinal dysplasia

Bizarre Skull Found In Tishomin sissippi



-
- Brian Vike - Director
HBCC UFO Research
3-12-6

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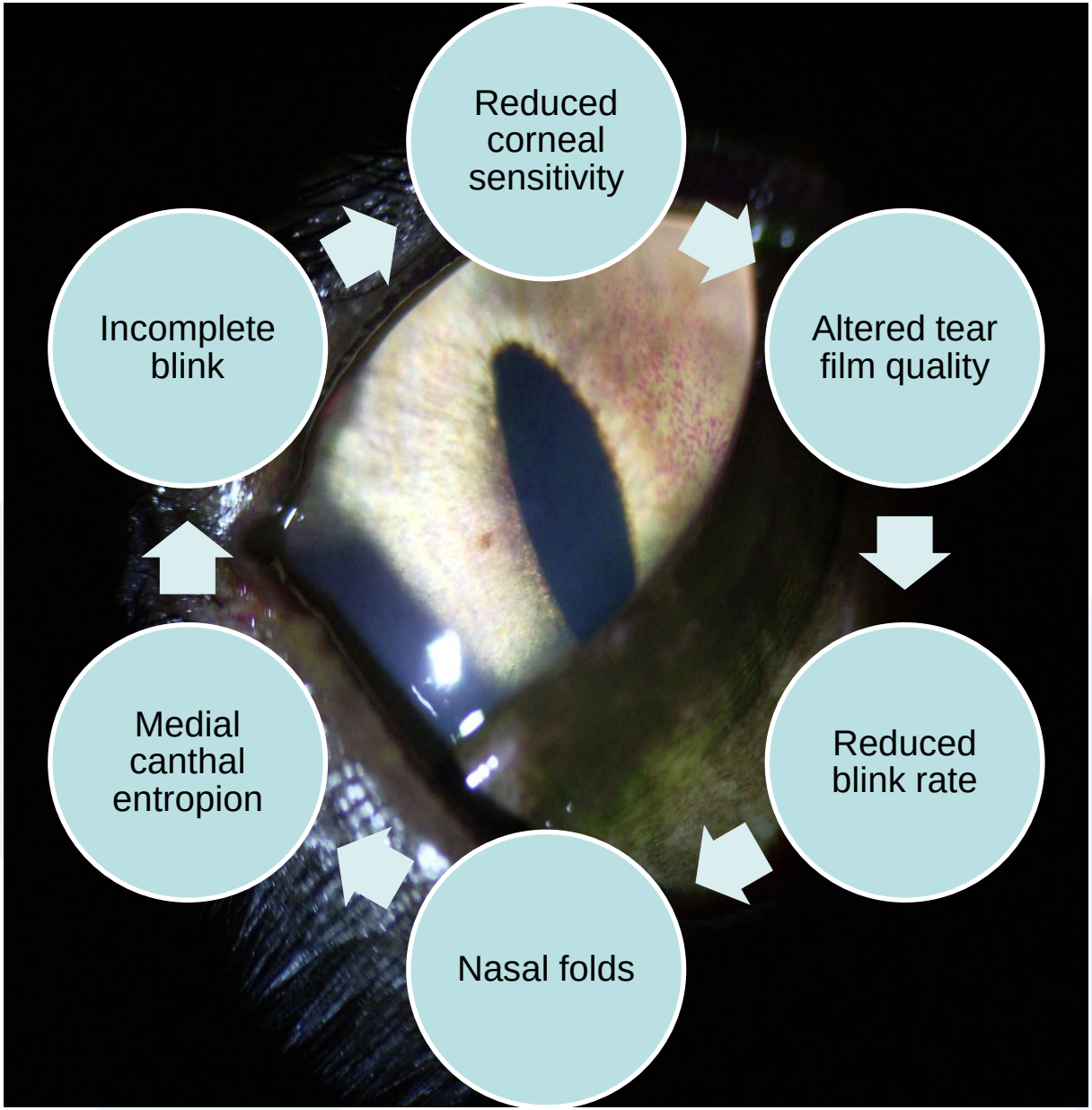
Brachycephalic ocular syndrome



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2: Distant examination: 5 Q's

Vision

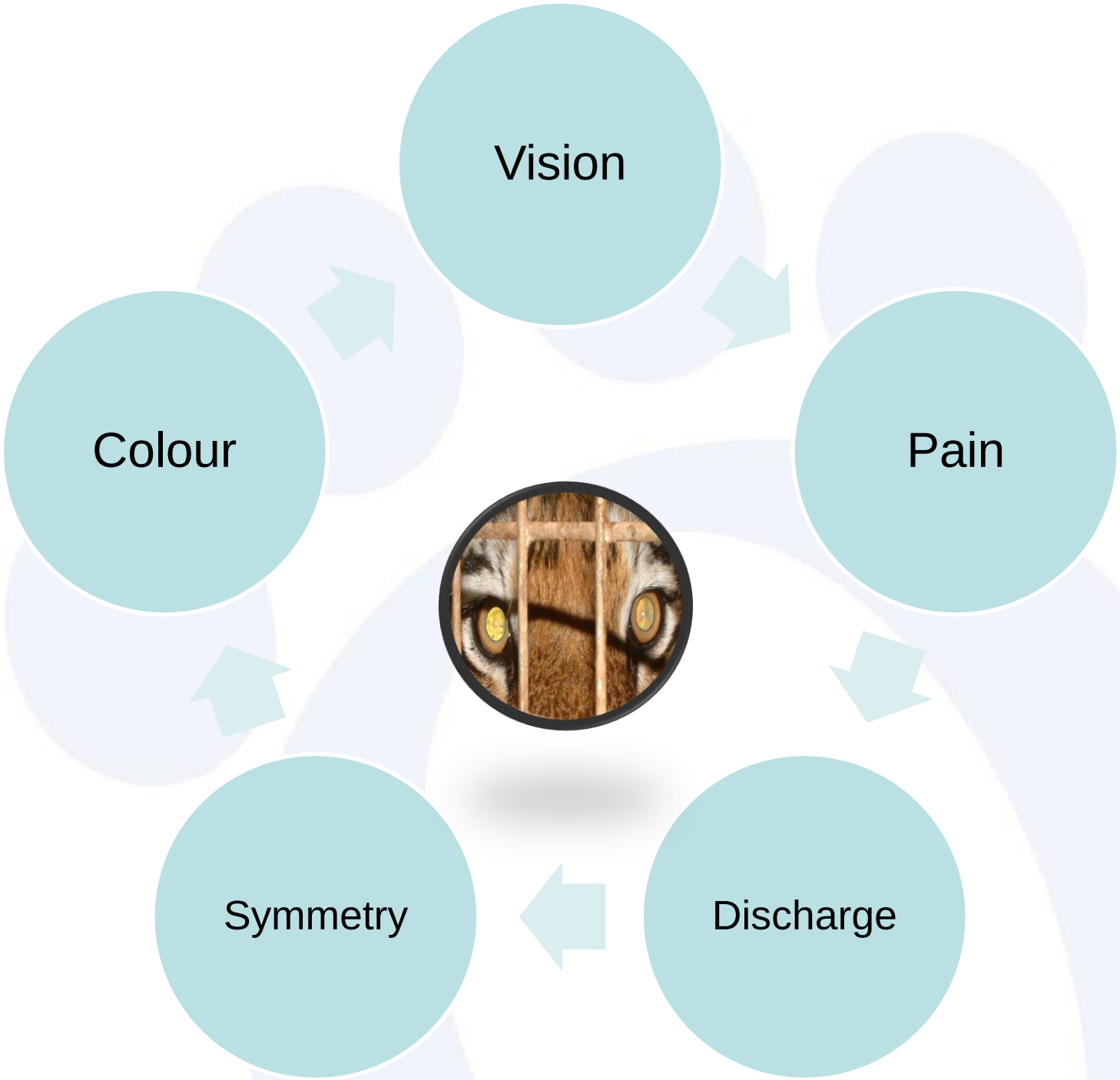
Pain

Discharge

Symmetry

Colour

(Photography)



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Vision

Head carriage

Gait

- Jumping? High stepping gait?

Response

- owner
- vet
- other animals

Tracking

- Voluntary – Light (cats) food (dogs) threat (prey spp)
- Involuntary - Falling objects

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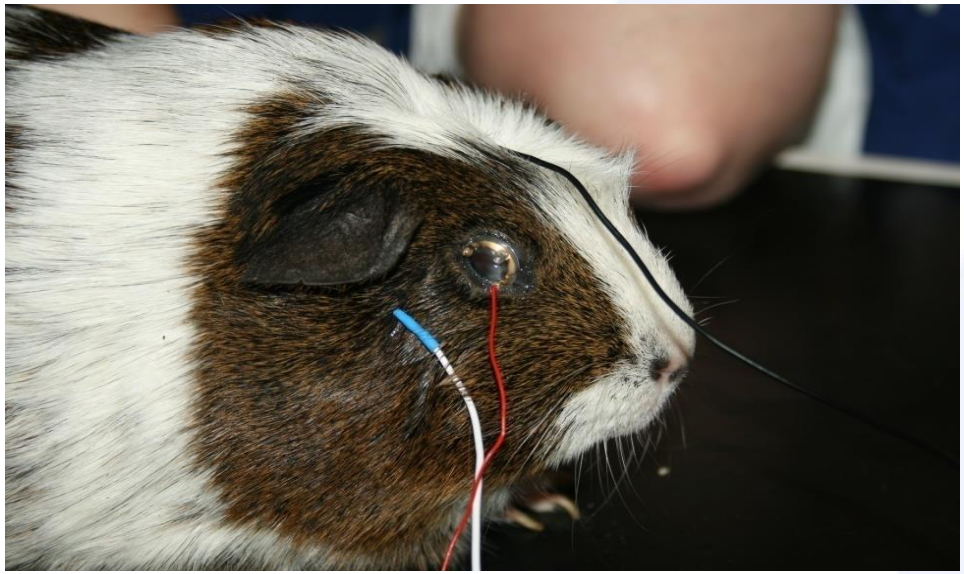
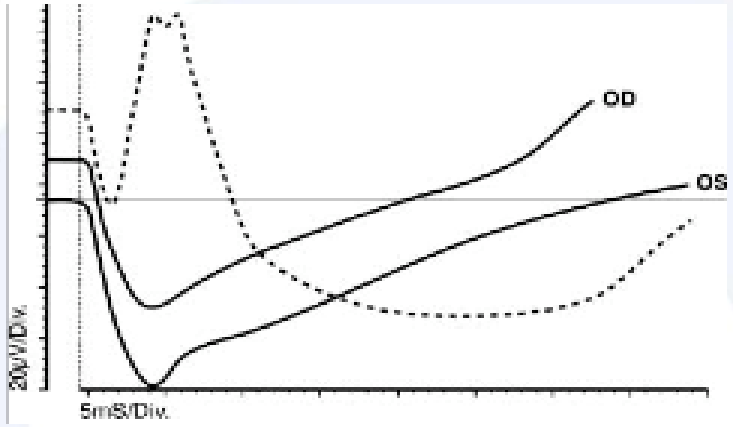
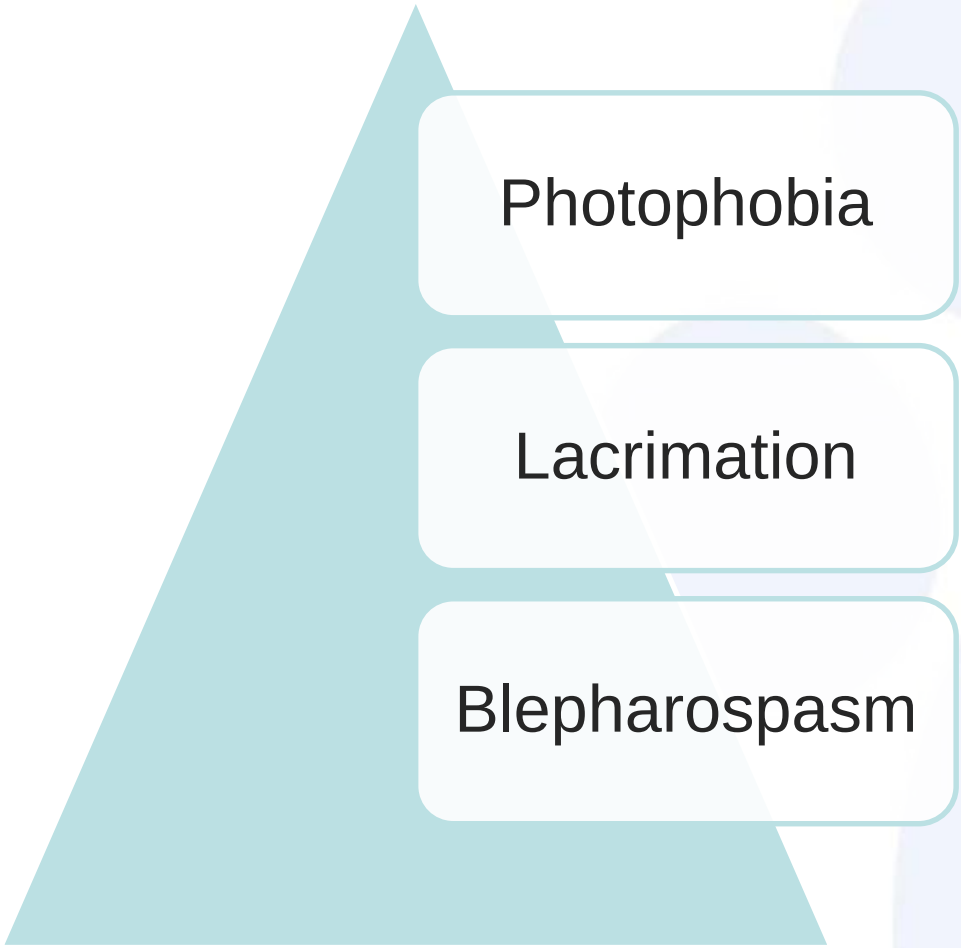
Quantifying Retinal function

Electroretinography





Pain – “triad of ocular pain”



+

behavioural changes

- Sleep
- Temperament
- Rubbing

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Ocular pain

Persistent scratching at the eyes may be pruritus rather than eye pain

John Mould

Discharge

Classify ~ Quantify ~ Localise

Serous

- Increase tear production.
- Decreased tear drainage.
- Both.

Mucoid

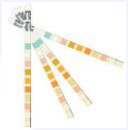
- Mucus membrane inflammation
  - i.e. conjunctivitis (think mucochezia)
- Tear film abnormalities

Mucopurulent

- Bacterial infection
- Always secondary & reflects environment
- dogs/cats = skin = gram + cocci

Sanguinous

- Blood = trauma (dipstick to id occult blood)
- Acute trauma – sharp>blunt
- Chronic trauma (Foreign body, SCC)



Sticky brown stuff

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Symmetry

- Gait
- Head
- Ears
- Muzzle
- Globe size & position
- Squint
- Pupils
- Vision

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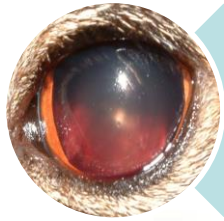
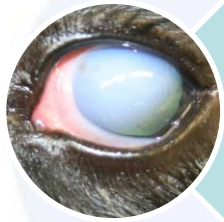
Colour



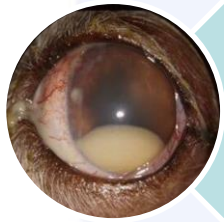
Red



Blue

Black

White



Yellow

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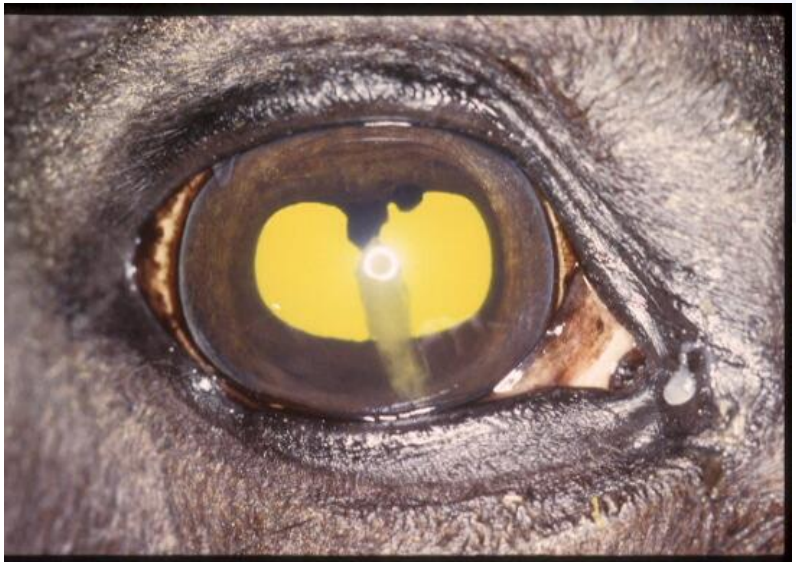
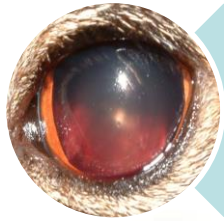
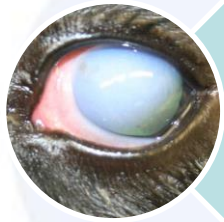
Colour

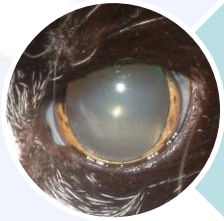




Red

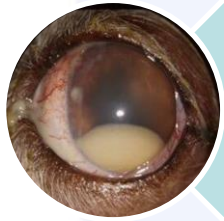


Blue



Black

White



Yellow

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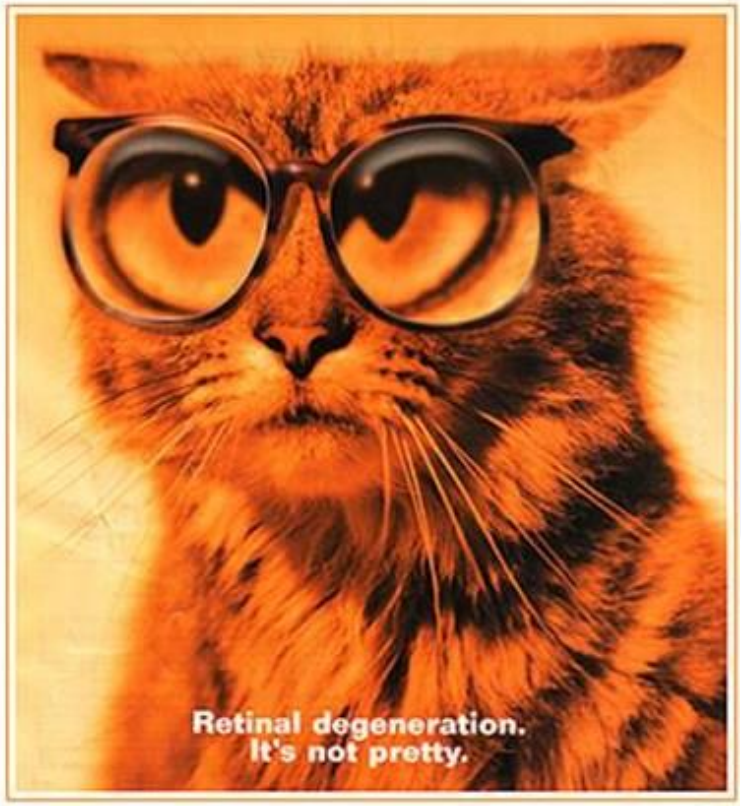
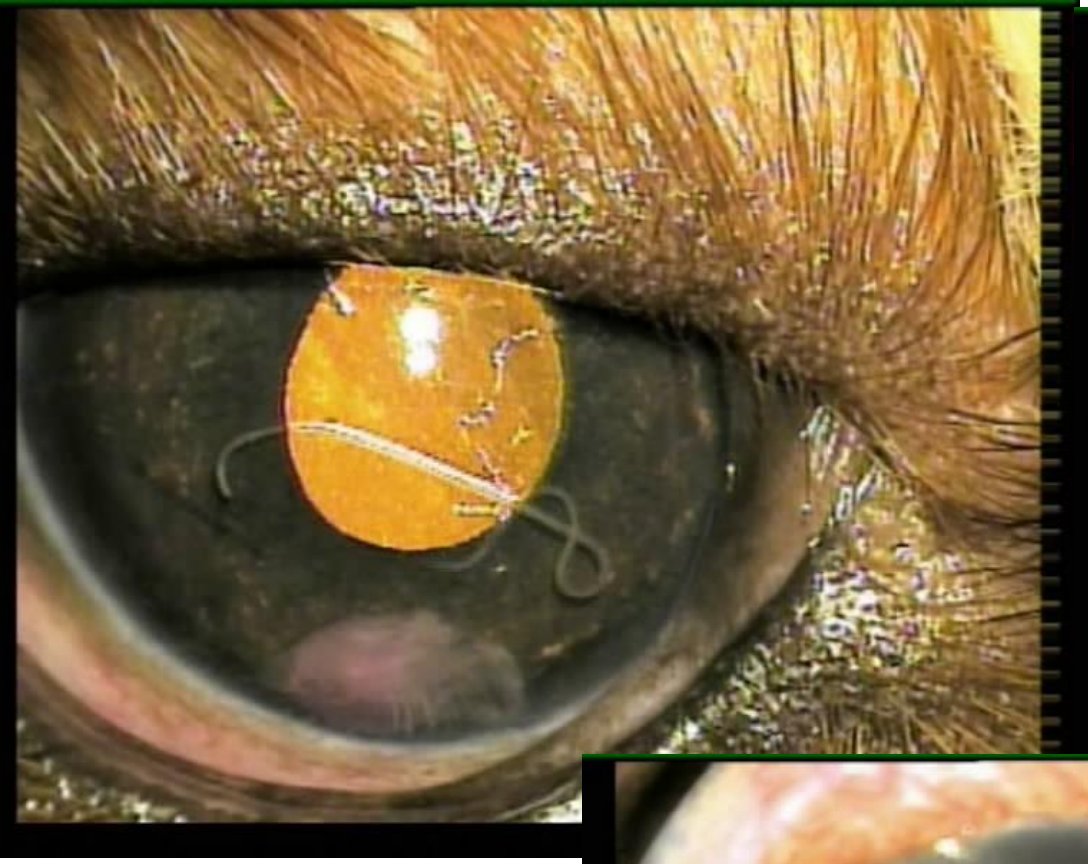
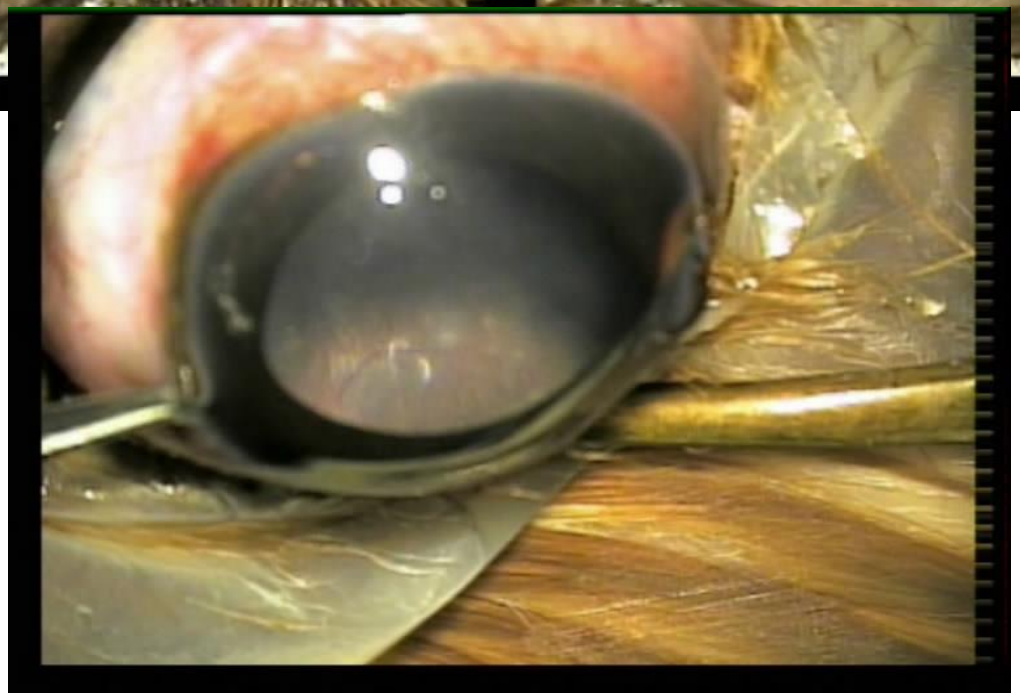
3: History



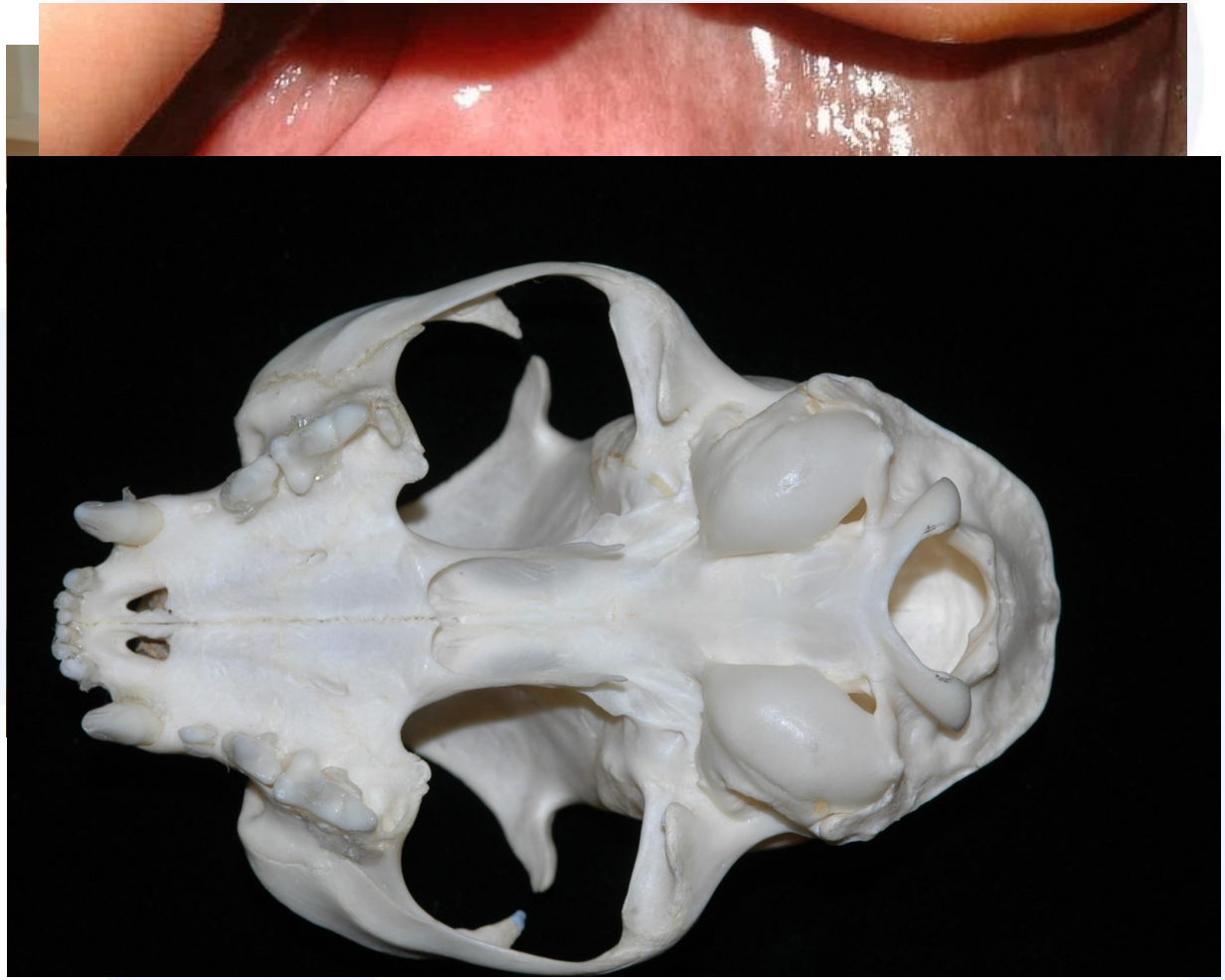
- Breed, breeder and relatives.
- Travel
  - Angiostrongylus
  - Leishmaniasis
- Access to drugs
  - Ivermectins, fluroquinilones, SNM's
- Parasite control & access
  - Ticks
  - fleas
- PMPs?
  - Lumps
  - Teeth
  - Endocrine
  - Season?
- PEPs?
  - Vision? Nyctalopia?
  - Appearence? Pain?
  - Discharge?
- This problem.....





4: Hands on - Palpation

- Temporal muscles
- Orbital rim
- Maxilla
- Globe
  - IOP
  - Retropulsion (NM)
- Open mouth



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5: CN exam

- Can they see, smell & hear?
- Can they eat normally?
- Can they feel?
- Do they blink?
- Do their eyes move normally?
- Pupils?

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Vision assessment – Optic Nerve

- Behaviour
- History
- Tracking
  - Conscious
  - Unconscious
- Placing reflex
- Maze testing
- Menace
- Dazzle
- (consensual)

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Sensation – Trigeminal N

- Ear
- Nose
- Medial canthus
- Lateral canthus
- (Cornea)

Eye lids – Facial & Oculomotor

- Eye lid position
  - Ptosis
  - Blinks

Ear?

Muzzle?

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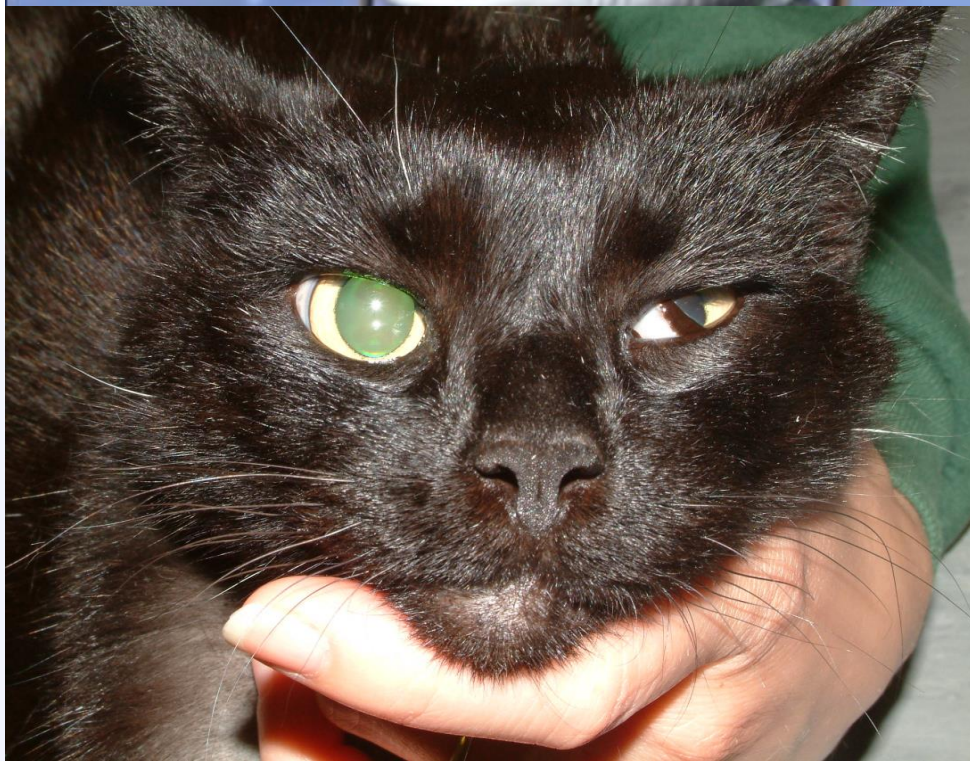
Eye position – Oculomotor, abducens & vestibulocochlear

- Eye movements
  - Squint?
  - Tracking?
  - VOR
  - Nystagmus
- NB Trochlear

Pupil control – a balancing act

- Anisocoria
  - CN3 constricts (PSN)
  - Sympathetic dilates
- Dyscoria
  - Neurological (Reverse D pupil – cats)
  - Synechiae
  - Iris atrophy
- Resting pupil diameter?
- PLR
  - Direct & Consensual



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Direct & consensual PLR

- Cover / un-cover
- Swinging flash light
- PLR
- Distant direct

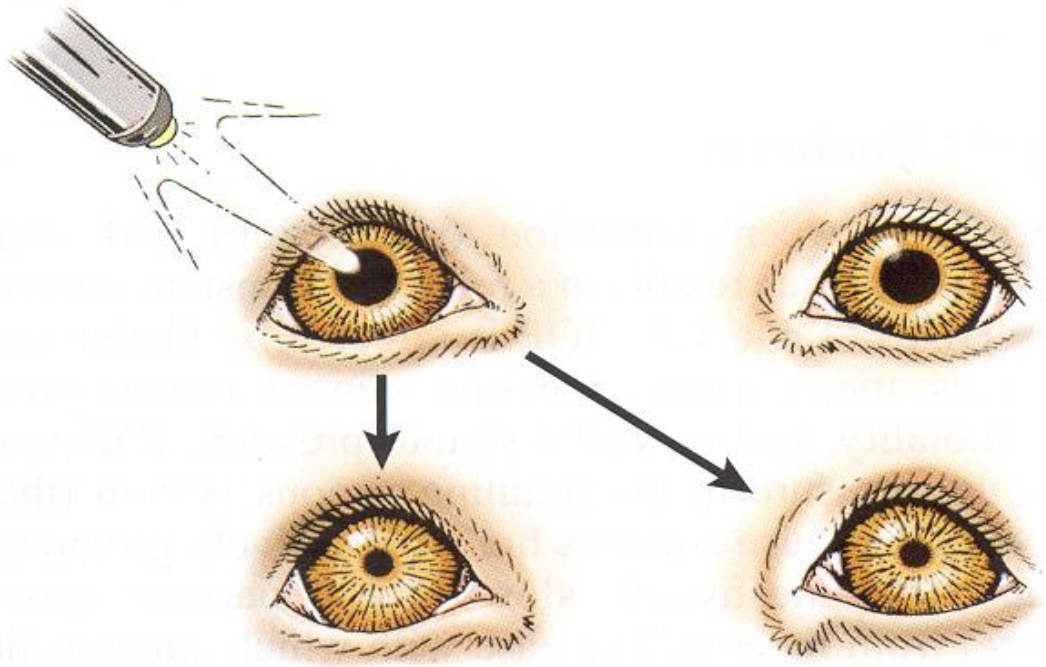

Figure 1-27. The pupillary light reflex. The direct pupillary light reflex is the response shown by the eye being illuminated. The consensual pupillary light reflex is the response shown by the contralateral eye, which is not being illuminated.

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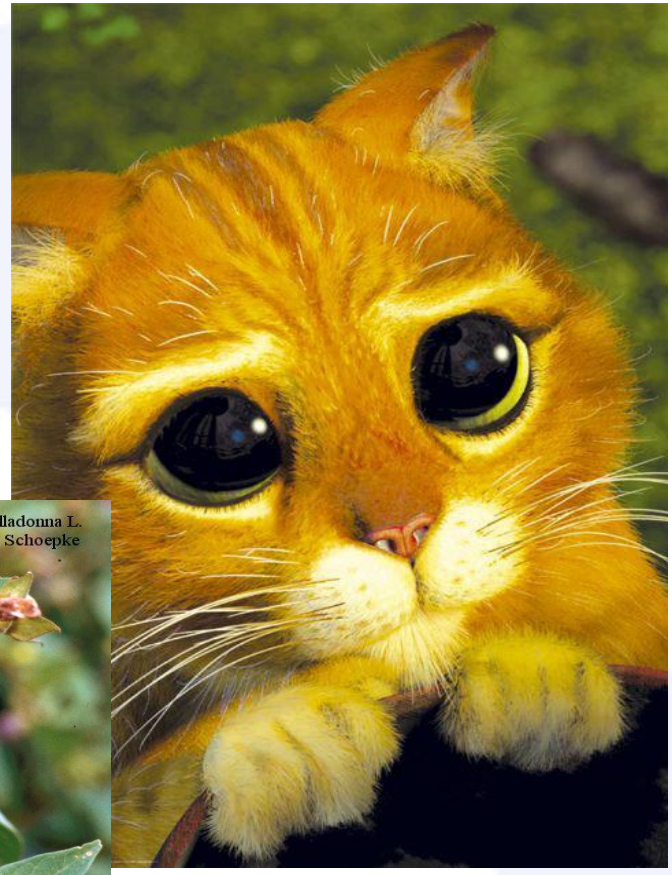
Dilation



- Sympathetic
  - adrenergic
  - Fight, flight
- Arousal, Fear
- Iris muscle atrophy
- Loss vision -> relative dilation
- Loss constrictor tone or innervation

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Constriction

- Parasympathetic
  - CN3
- “Reflex” miosis
  - CN5 stimulation
- Uveitis
- Loss of sympathetic tone

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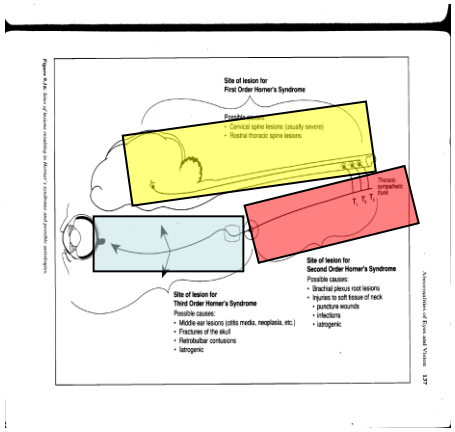
Horner's syndrome



1. Ptosis
2. Third eye lid protrusion
3. MIOSIS (small pupil)

3 neurone pathway

1. Brain to thoracic spine
2. T Spine – mediastinum – ventral neck – bulla
3. Bulla – eye

Phenylephrine can be used to "localise" lesion

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Practical session 1:

Distant direct ophthalmoscopy: the pupillometer

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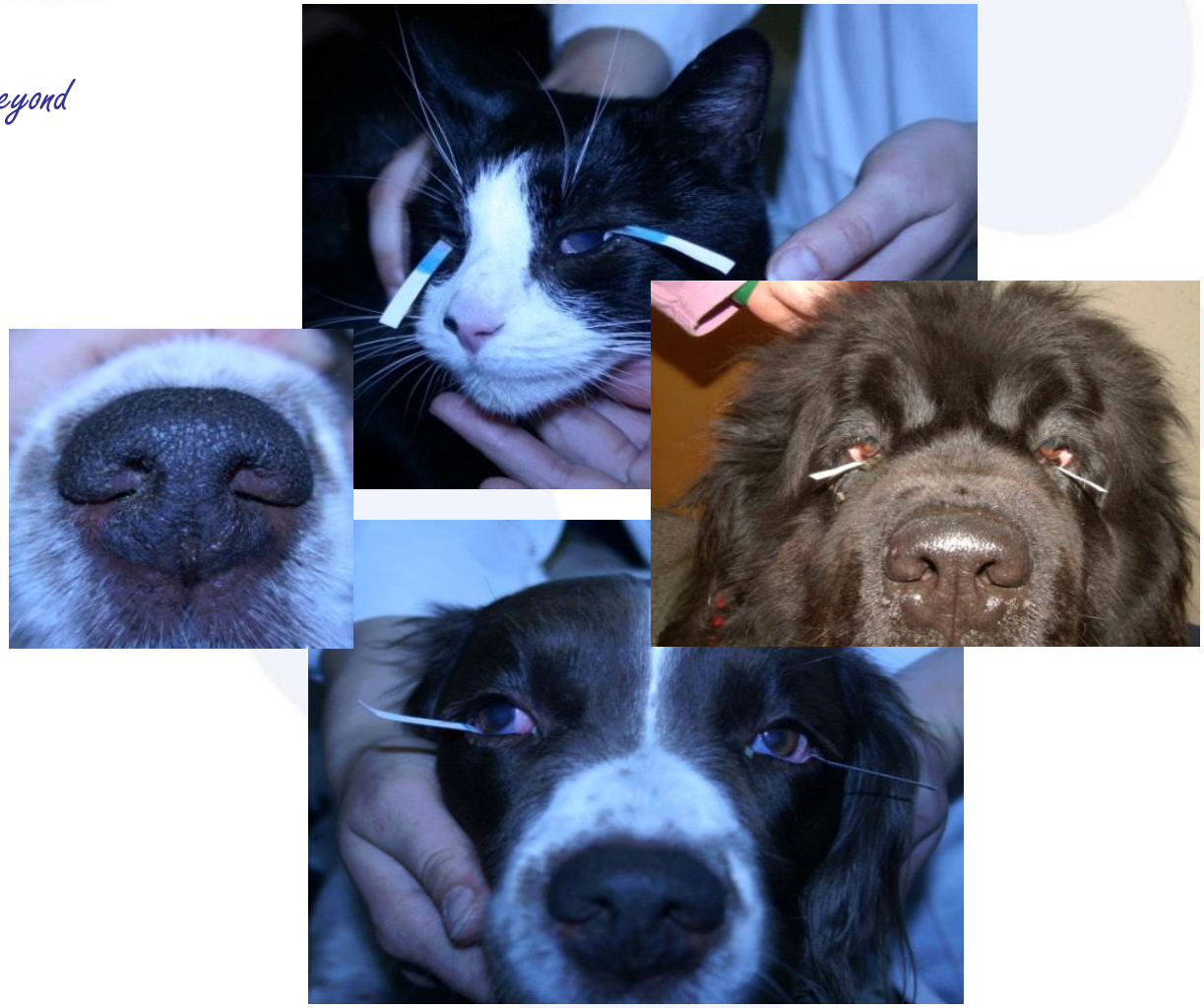
6: STT



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7: Exam with light & magnification

- Adnexa
- Conjunctival surfaces
  - X5
- Cornea
- Ant chamber
- Iris
- Pupil

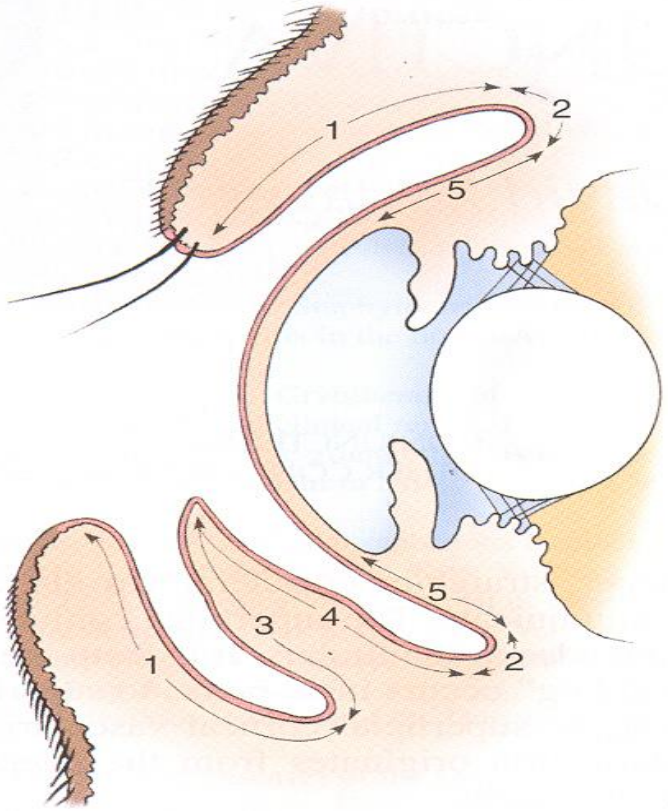

Figure 7-1. Areas of conjunctiva: *1*, palpebral; *2*, fornix; *3*, anterior third eyelid; *4*, posterior third eyelid; *5*, bulbar.

Close exam: focal light & magnification

- Otoscope head
- Magnifying glass
- Direct Ophthalmoscope set at 20
- Monocular slit lamp
- Binocular slit lamp

- Lids
- Lid margin
- Puncta
- Meibomian glands
- Conjunctiva
- Third lid
- Cornea and anterior chamber
- Pupil
- Anterior lens

Close exam: focal light & magnification

- Otoscope head
- Magnifying glass

- Lids
- Lid margin
- Puncta
- Meibomian glands
- Conjunctiva
- Third lid
- Cornea and anterior chamber
- Pupil
- Anterior lens



	Iris nevi (freckles)	FDIM	Chronic uveitis
IOP	Normal	+/- Increased IOP	Decreased IOP but may become raised due to 2nd glaucoma
Colour	Golden brown to light brown. Occasional darker areas.	Highly pigmented lesions – dark brown to black	Whole of iris may become darkened with focal areas of hyperpigmentation
Distribution	Often associated with iridal vessels.	pigment clumps, may not be associated with iris vessels	Diffuse hyperpigmentation the norm
Iris structure	Iris architecture unchanged	"carpet"/"velvet" appearance may obscurse underlying iris architecture	Iris architecture may become obscured.
Pupil shape	None	+/- Dyscoria	Synechiae and iris atrophy may both contribute to dyscoria
Ectropion uvei	None	+/- Ectropion uvei	+/- Ectropion uvei as formation of PIFM's* causes contraction of anterior iris epithelium.
Shape	Flat	+/- Raised lesions (slit lamp exam)	Flat

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Lights off

Come on Joey, lights off:
It's a school day tomorrow...

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7: Exam with light & magnification... again

- Adnexa
- Conjunctival surfaces
  - X5
- Cornea
- Ant chamber
- Iris
- Pupil

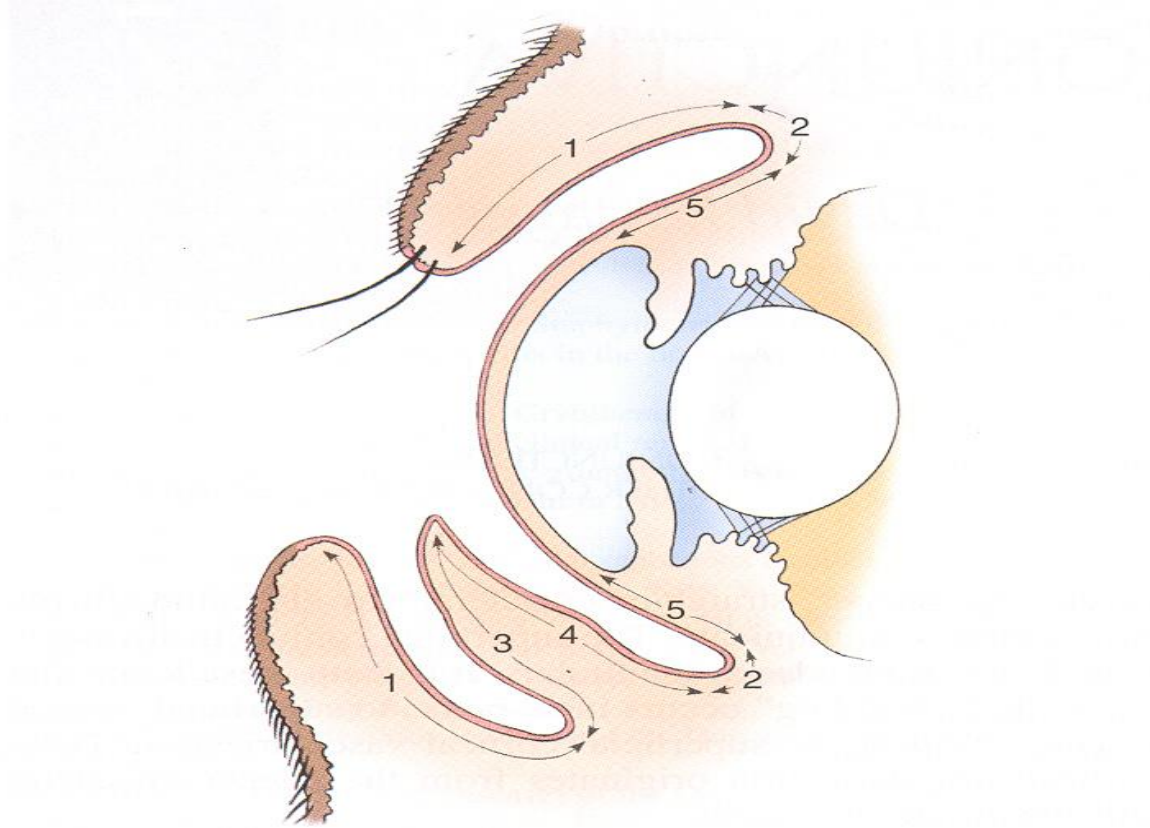

Figure 7-1. Areas of conjunctiva: *1,* palpebral; *2,* fornix; *3,* anterior third eyelid; *4,* posterior third eyelid; *5,* bulbar.

The search light technique..

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Practical session 2:

Smart phone anterior segment macrophotography

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Going past the pupil.....

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Ophthalmoscopy

Through the Looking Glass

I had sent my heroine straight down a rabbit-hole ... without the least idea what was to happen afterwards. -- Lewis Carroll

Where's the ophthalmoscope?

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Concepts to help us

Visual axis

How the eye bends light – the refractive system of the eye

+ lenses focus images closer to us

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Alternatives...

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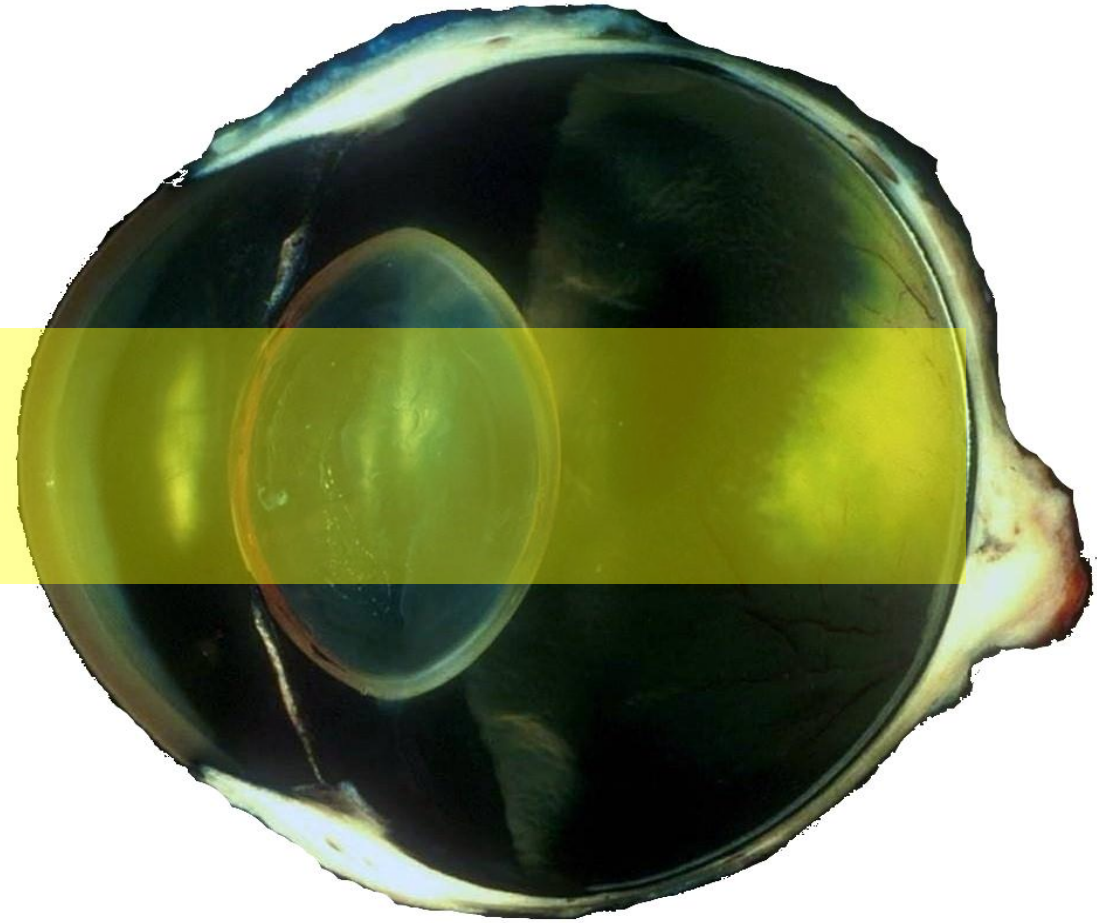
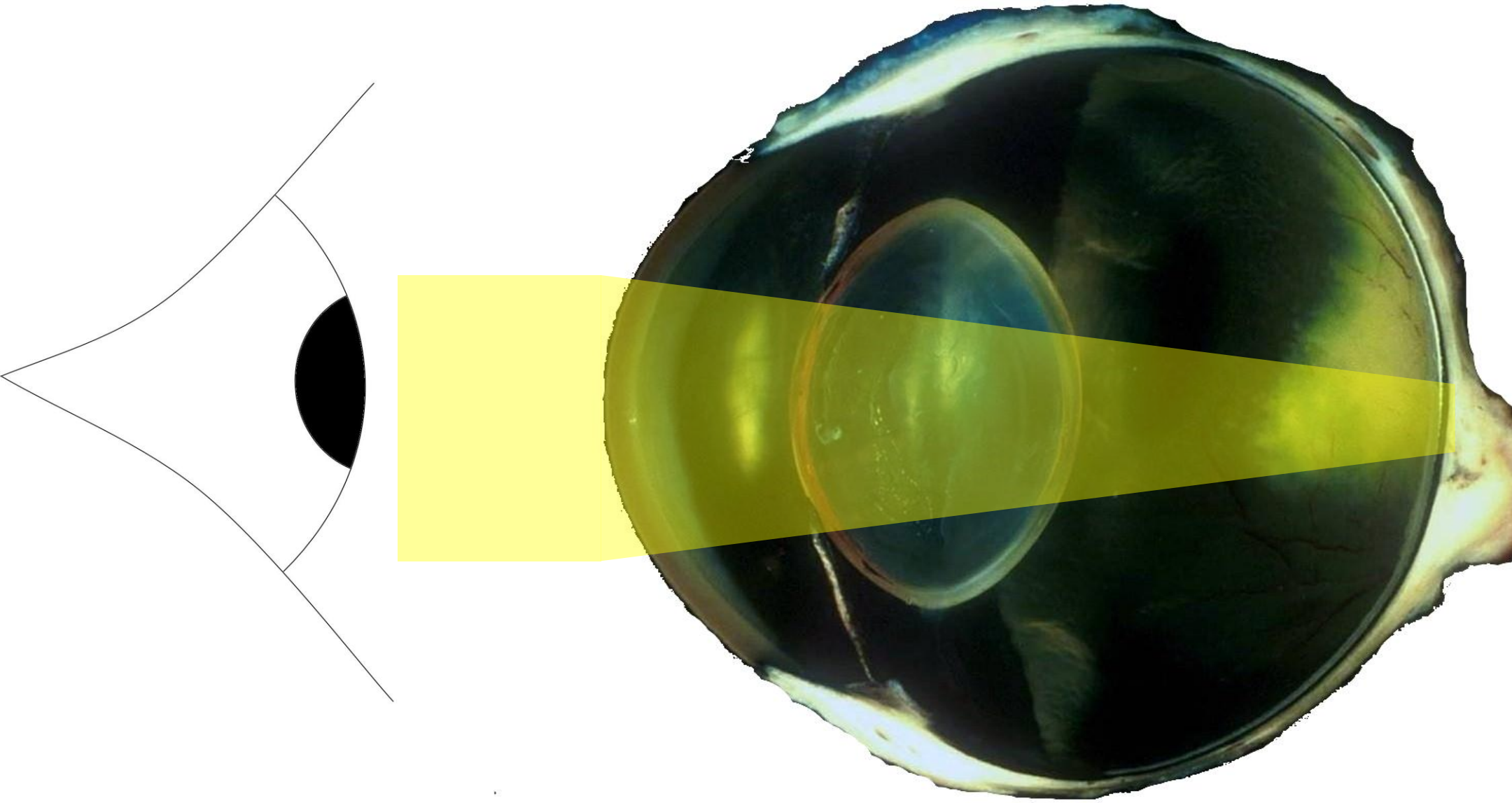
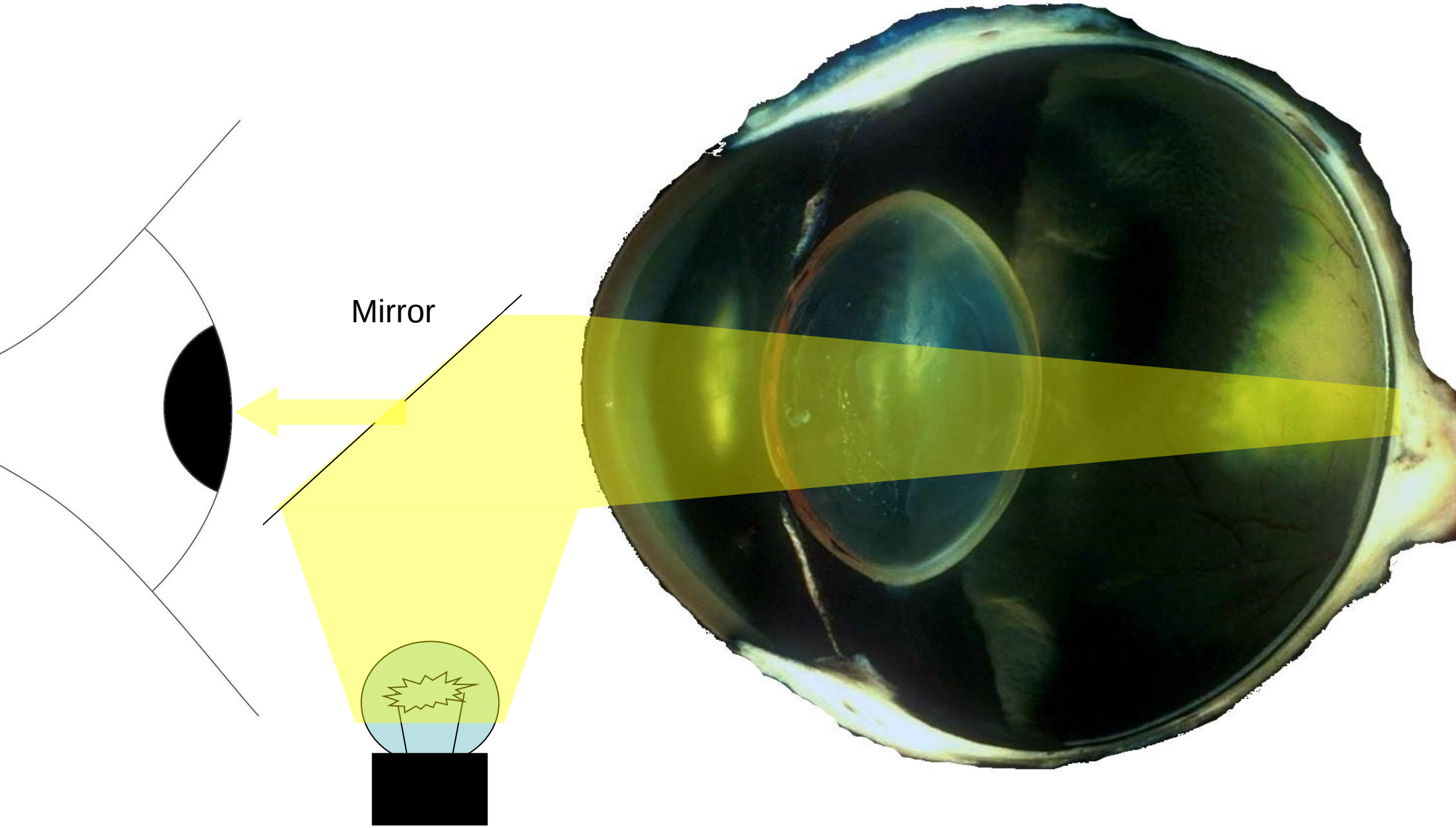
Visual axis

- Cornea
- Aqueous
- Pupil
- Lens
- Vitreous
- Retina

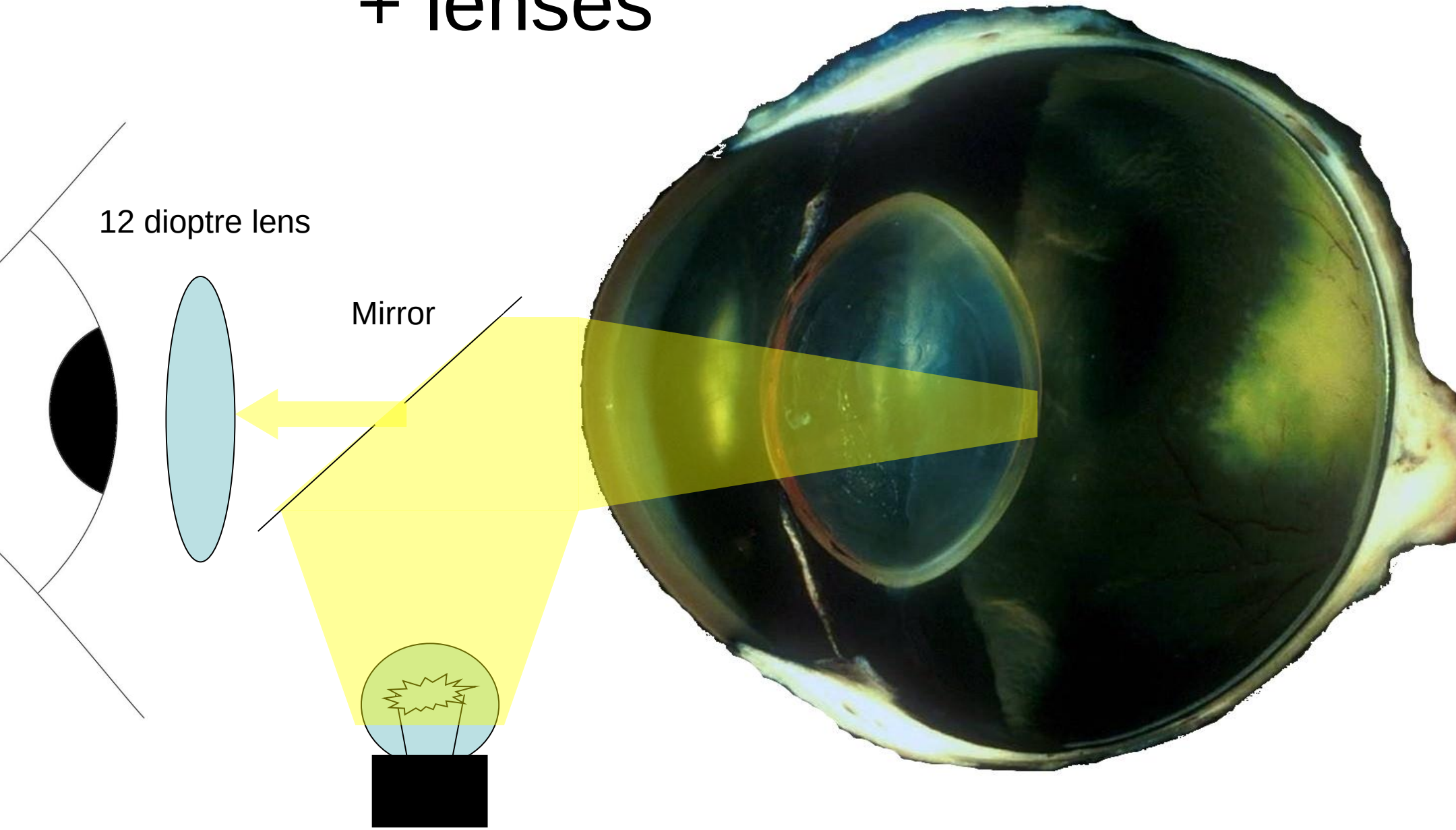


Normal refraction



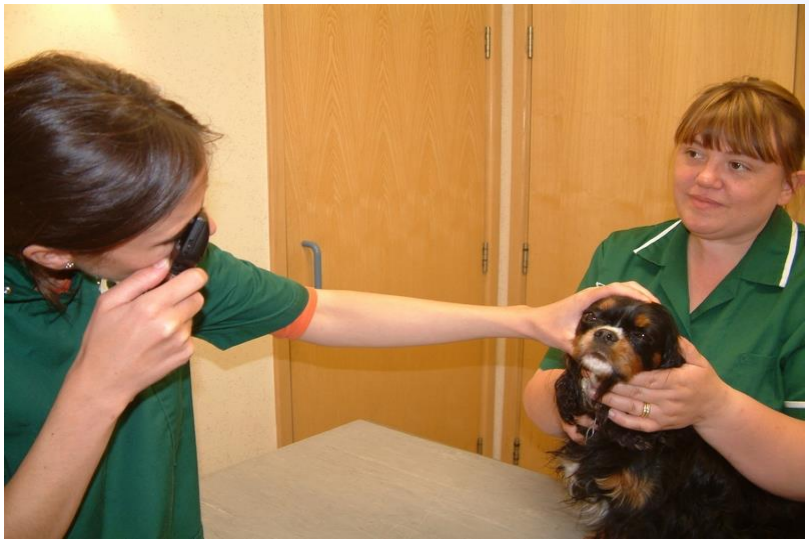

Mirror

+ lenses



8: Distant direct Ophthalmoscopy

- Ophthalmoscope on zero
  - or
- Light source as close to visual axis as possible



Use as a “pupilometer” : assess pupil size, symmetry, shape and response to light.

Assess tapetal reflectivity & symmetry.

Assess opacities in the visual axis

Assess opacities outside the visual axis

Localisation of opacities using parallax

Localisation of opacities using oblique illumination “the search light technique”.

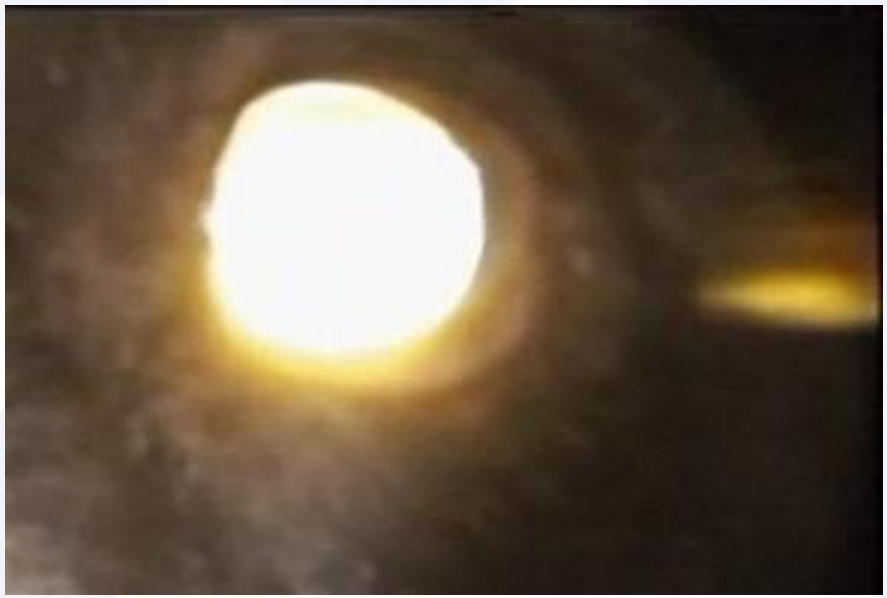
8a: Pupilometer

8b: Compare tapetal reflection

8b: Compare tapetal reflection

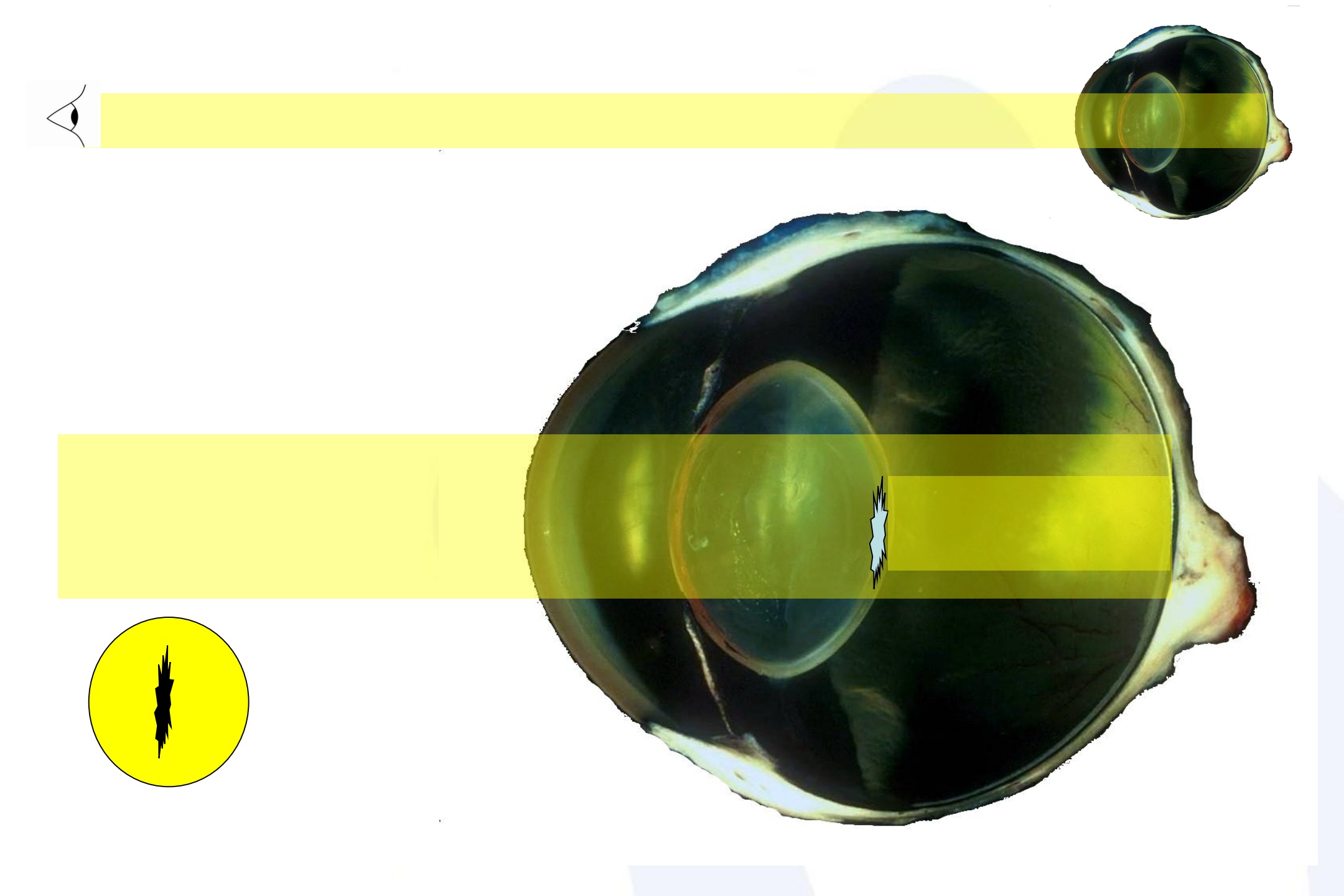
Normal cat tapetal reflection

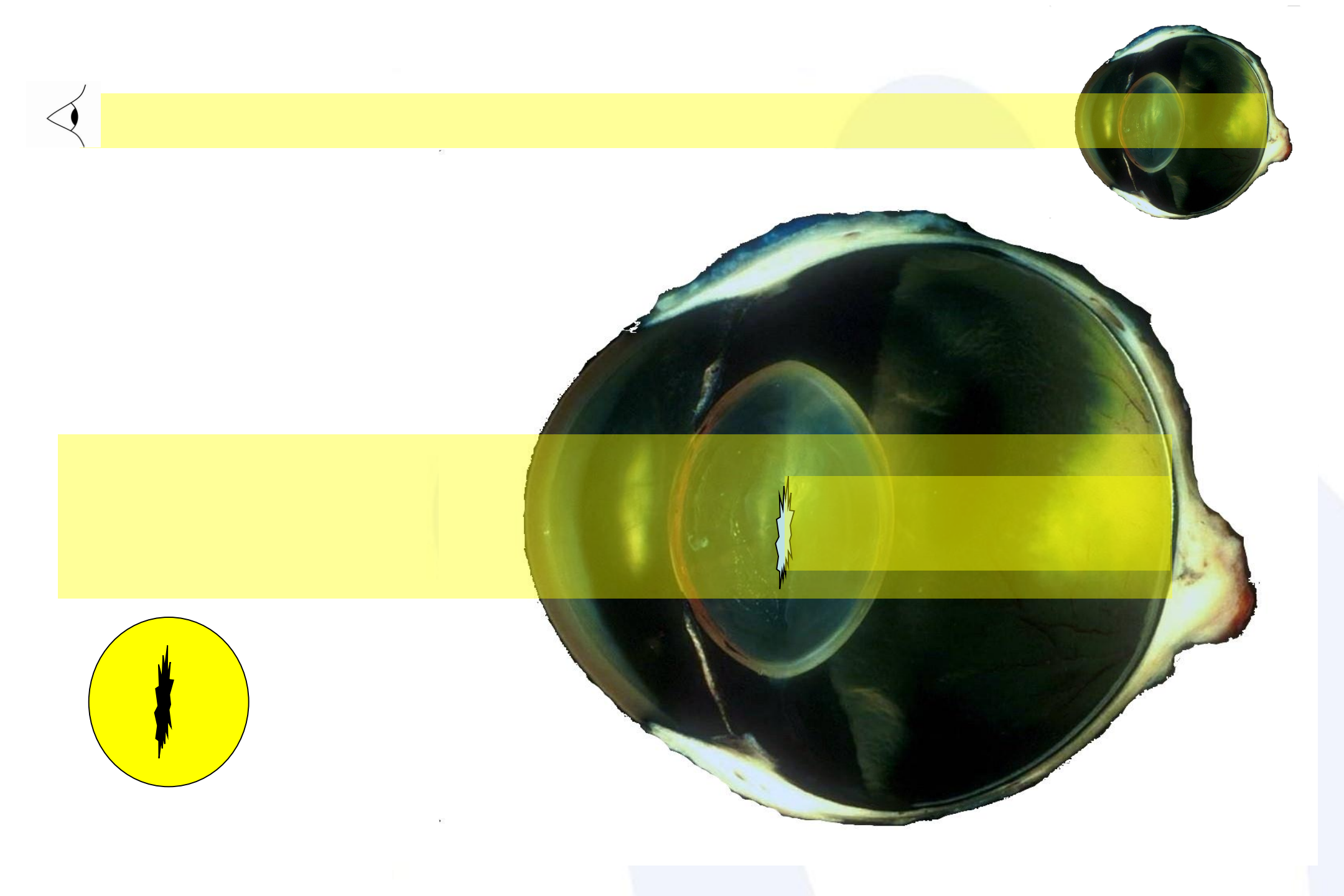
Hyperreflective dog tapetal reflection

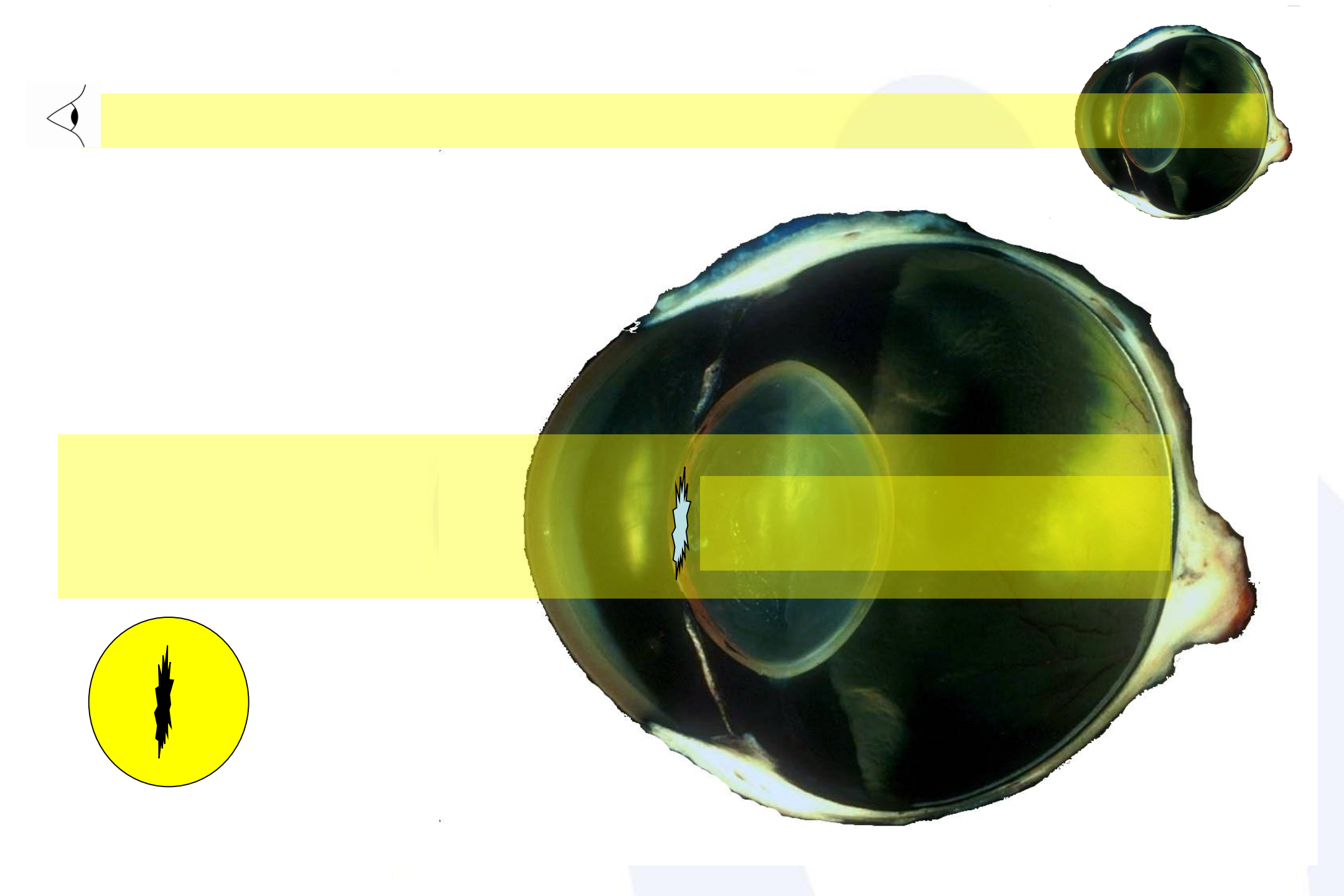


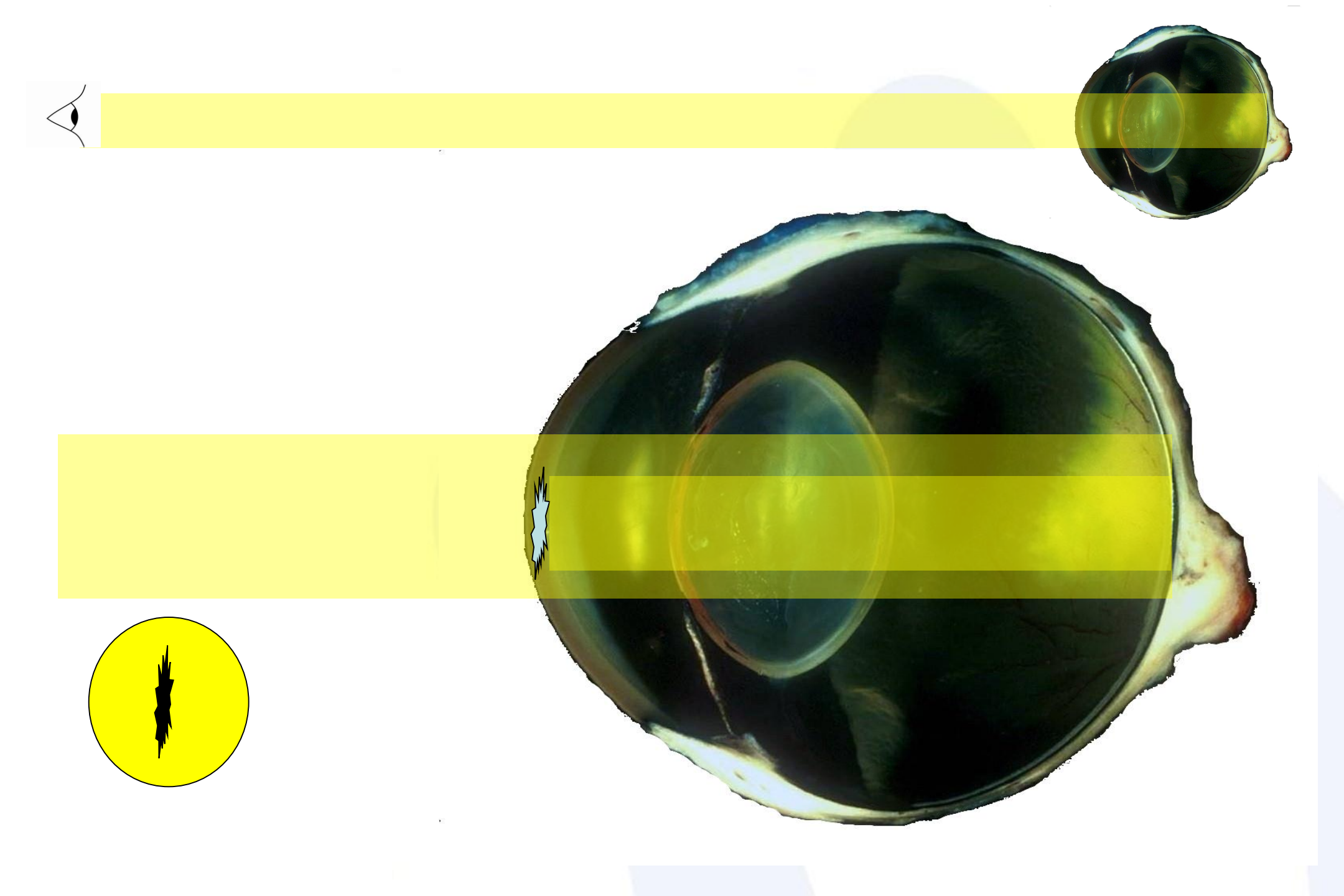
8b: Compare tapetal reflection

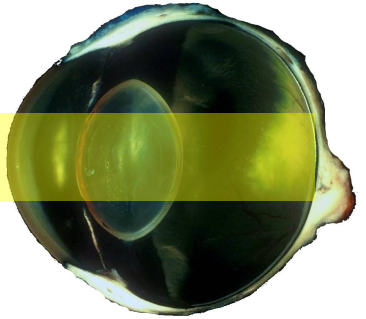
8c: Opacities in the visual axis?

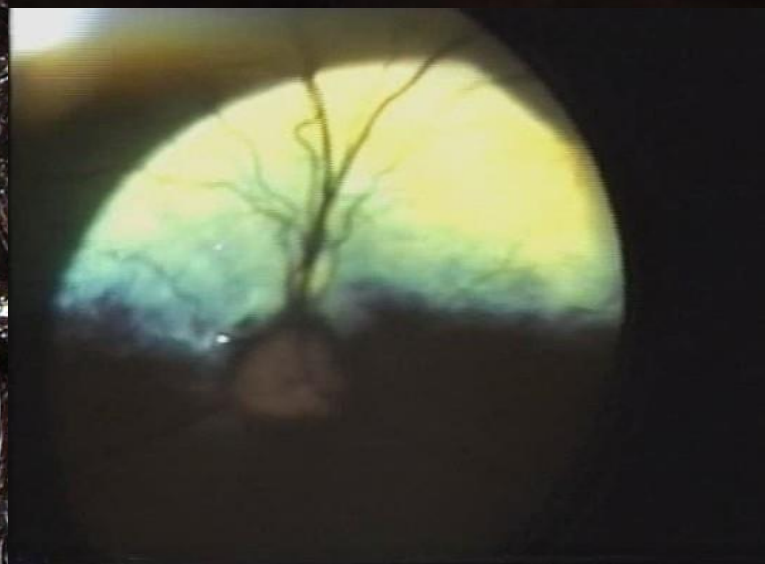


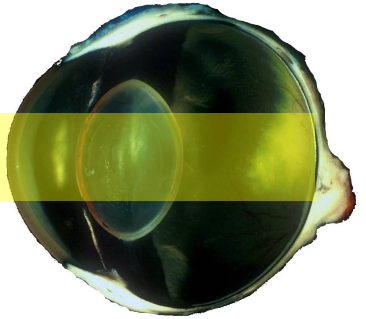


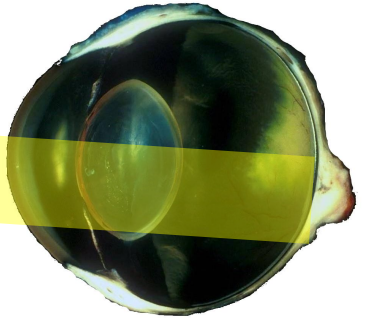


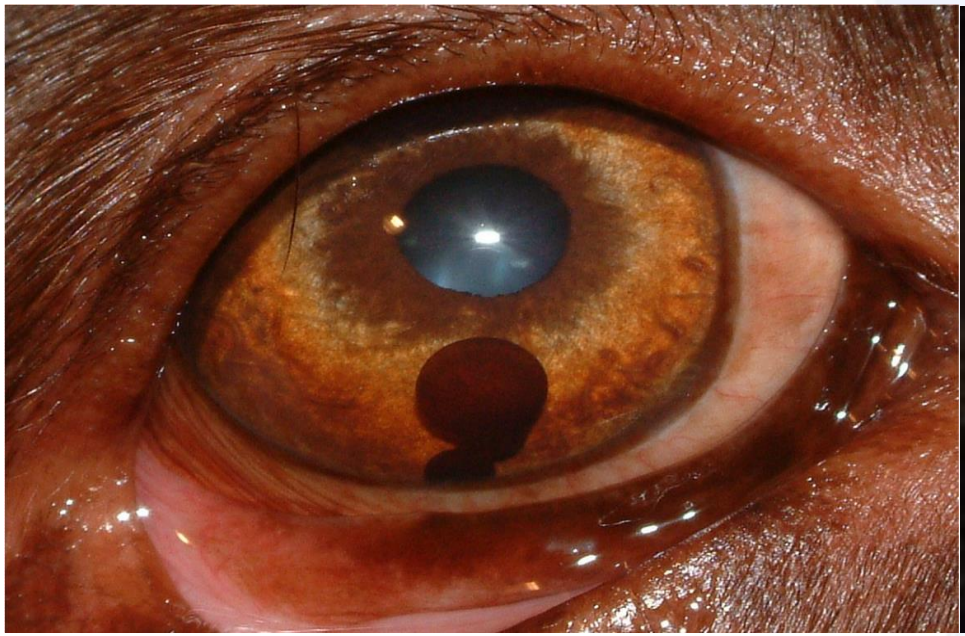


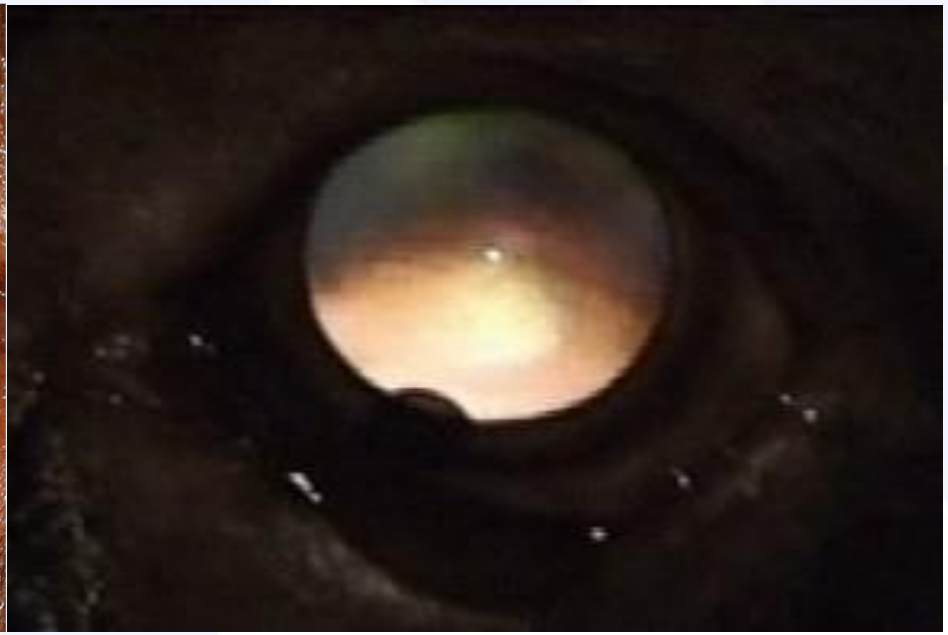








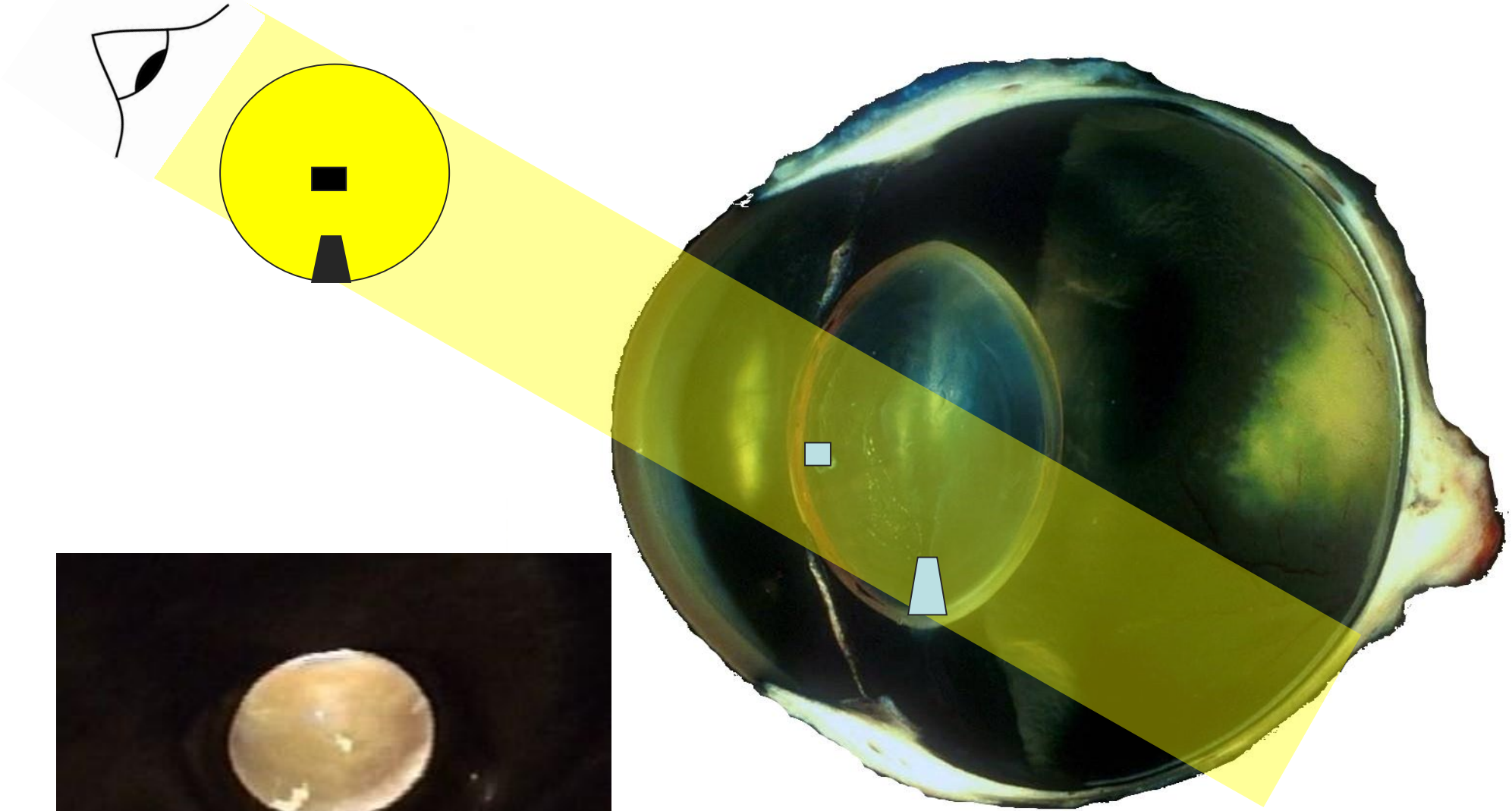




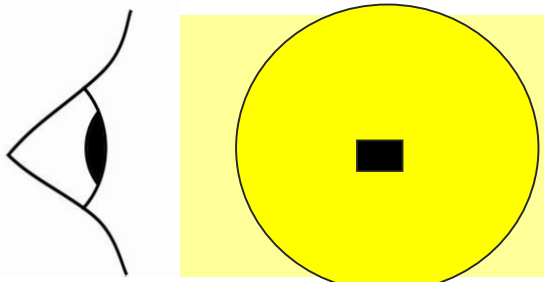
8d: Opacities outside the visual axis

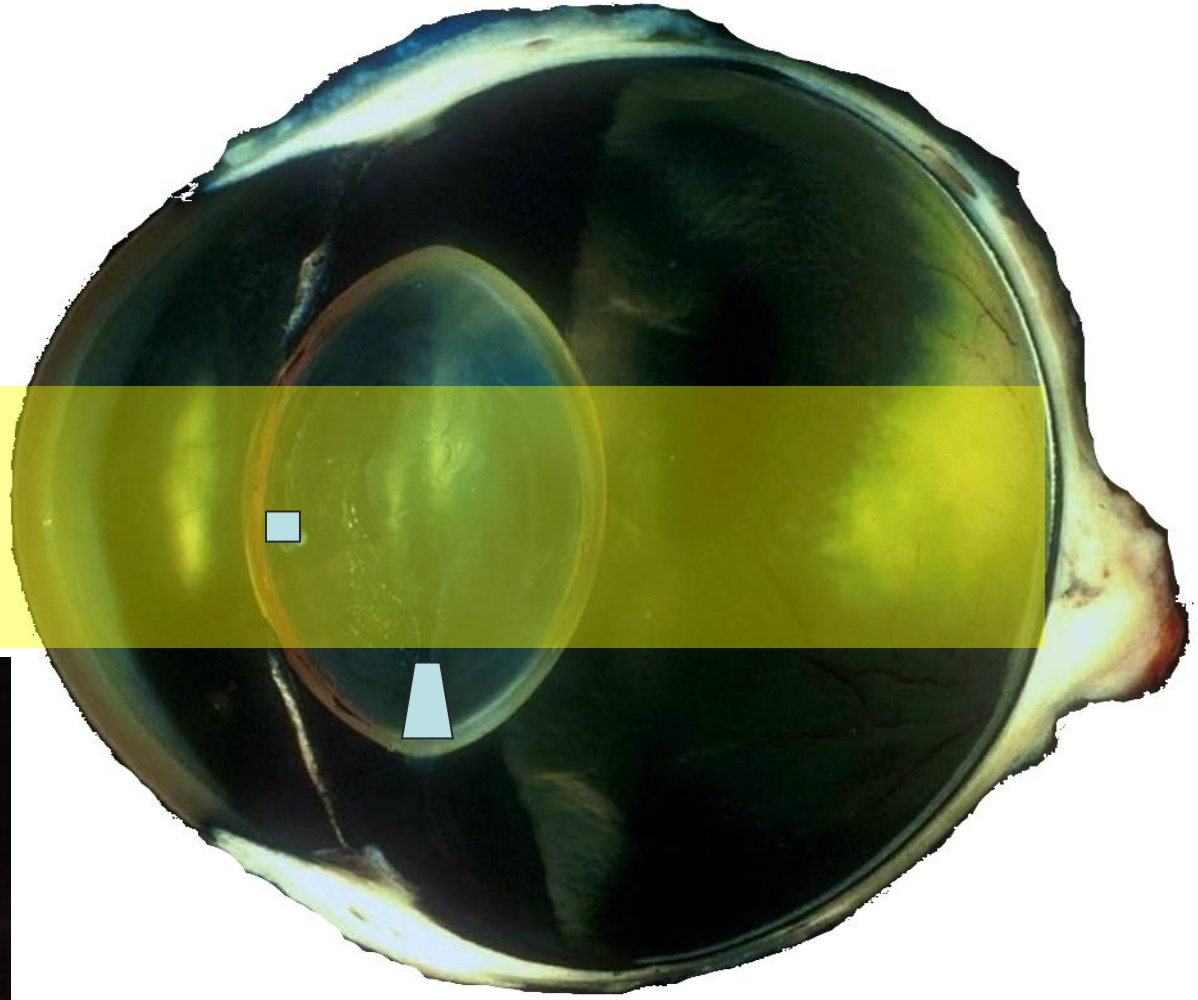
- Aim to **visualise** opacities in :
  - Peripheral lens
  - Peripheral lens capsule
  - Cilary body
  - Anterior peripheral vitreous

- Then aim to **localise** opacities using paralax

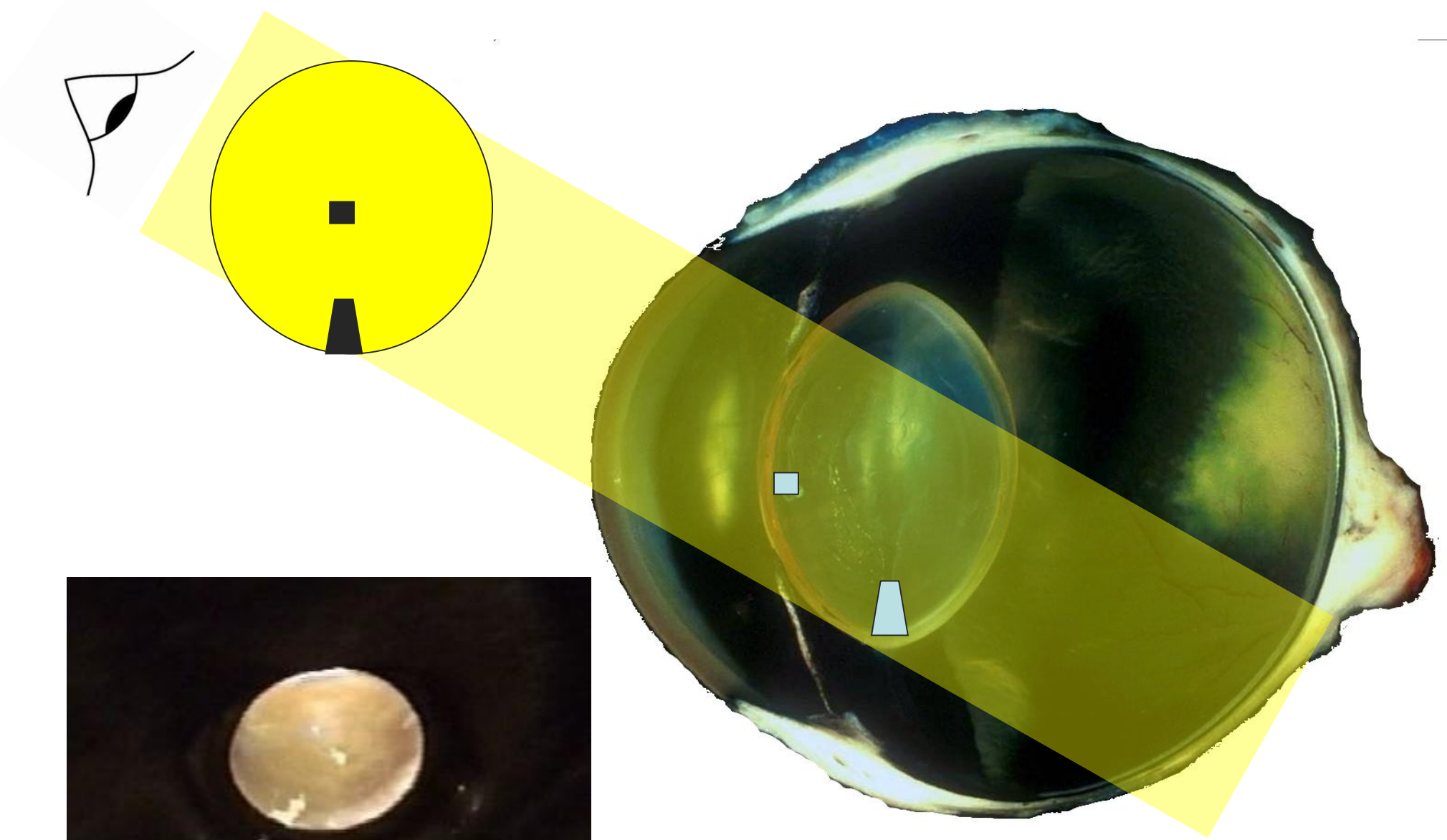


8e: Localise lesions using parallax

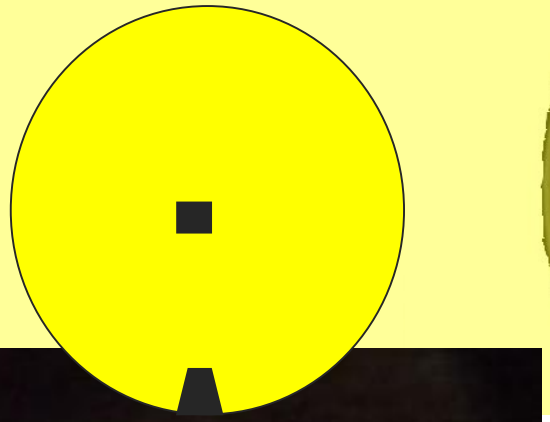


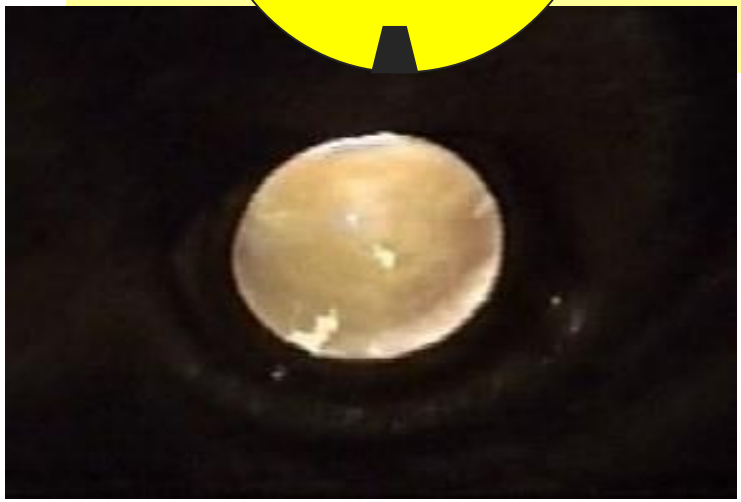


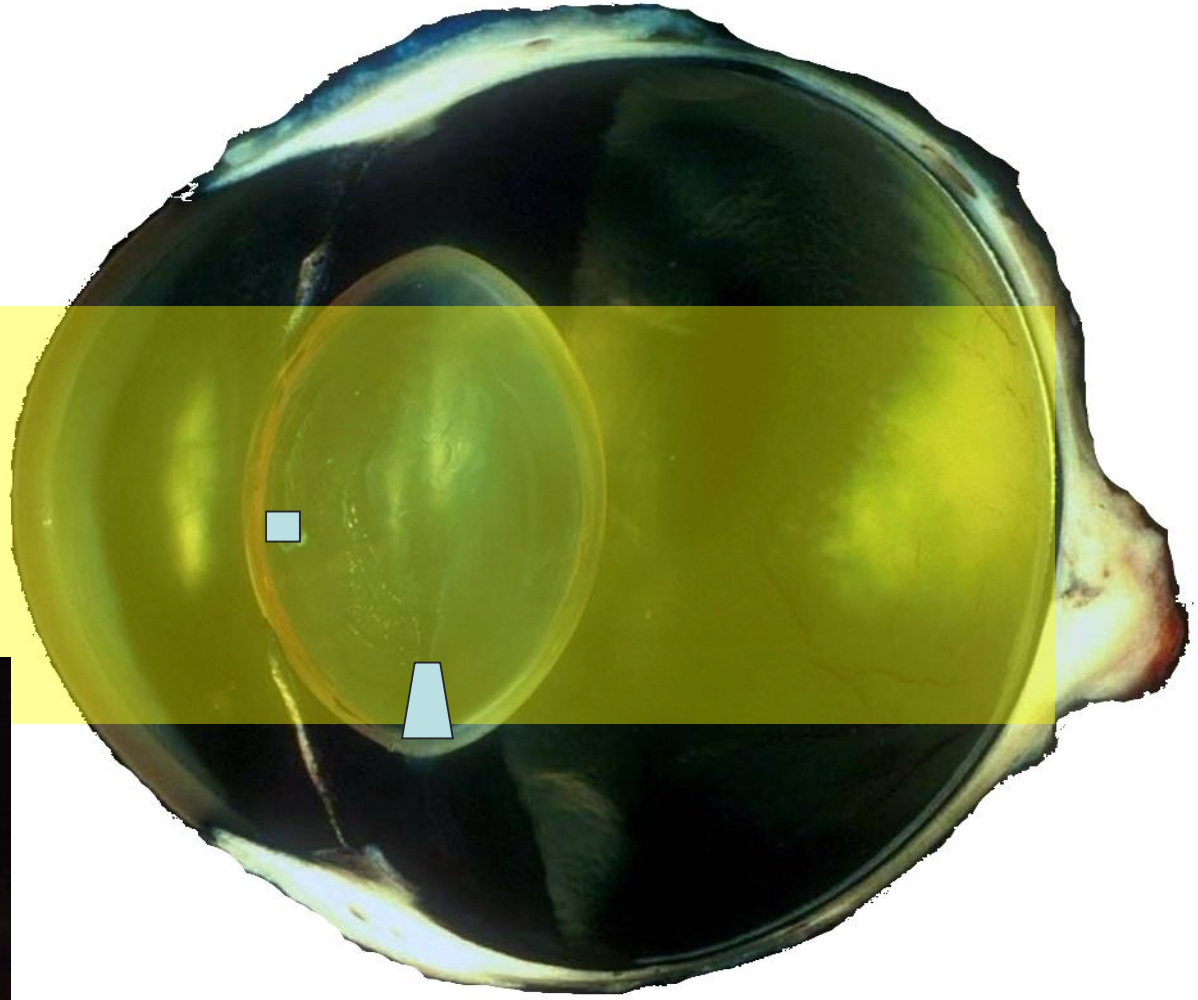
8e: Localise lesions using parallax



8e: Localise lesions using parallax







8e: Localise lesions using parallax

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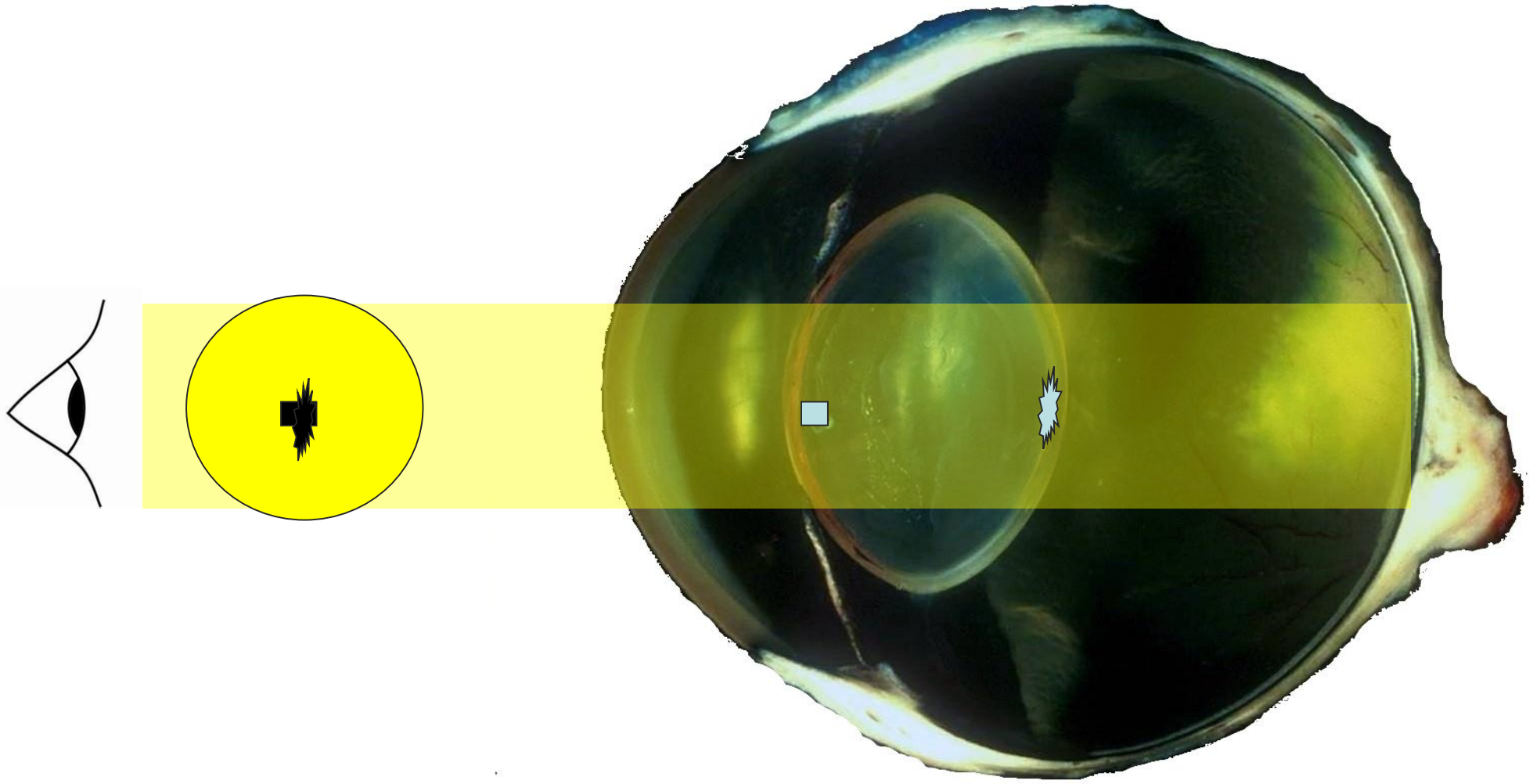
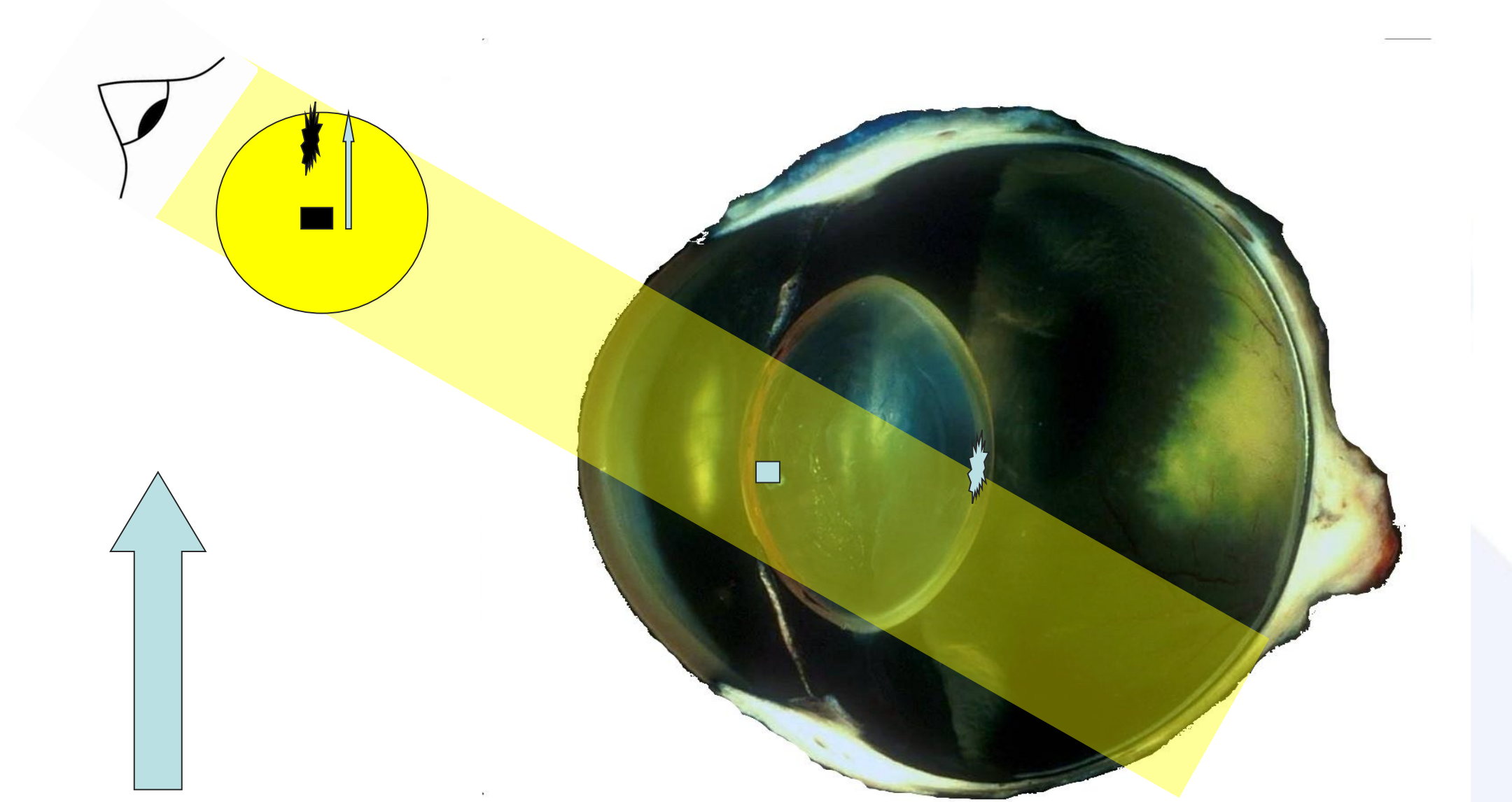
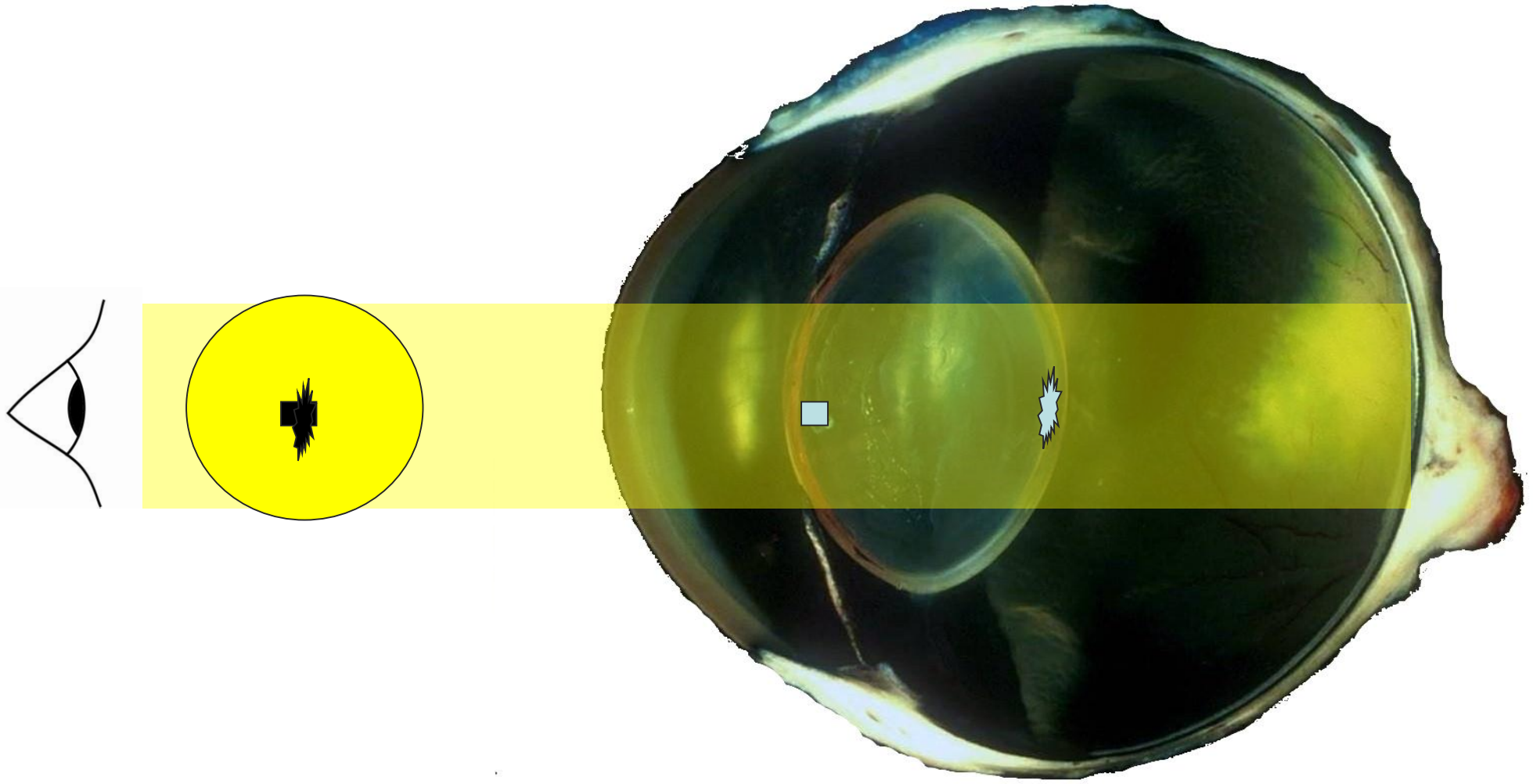


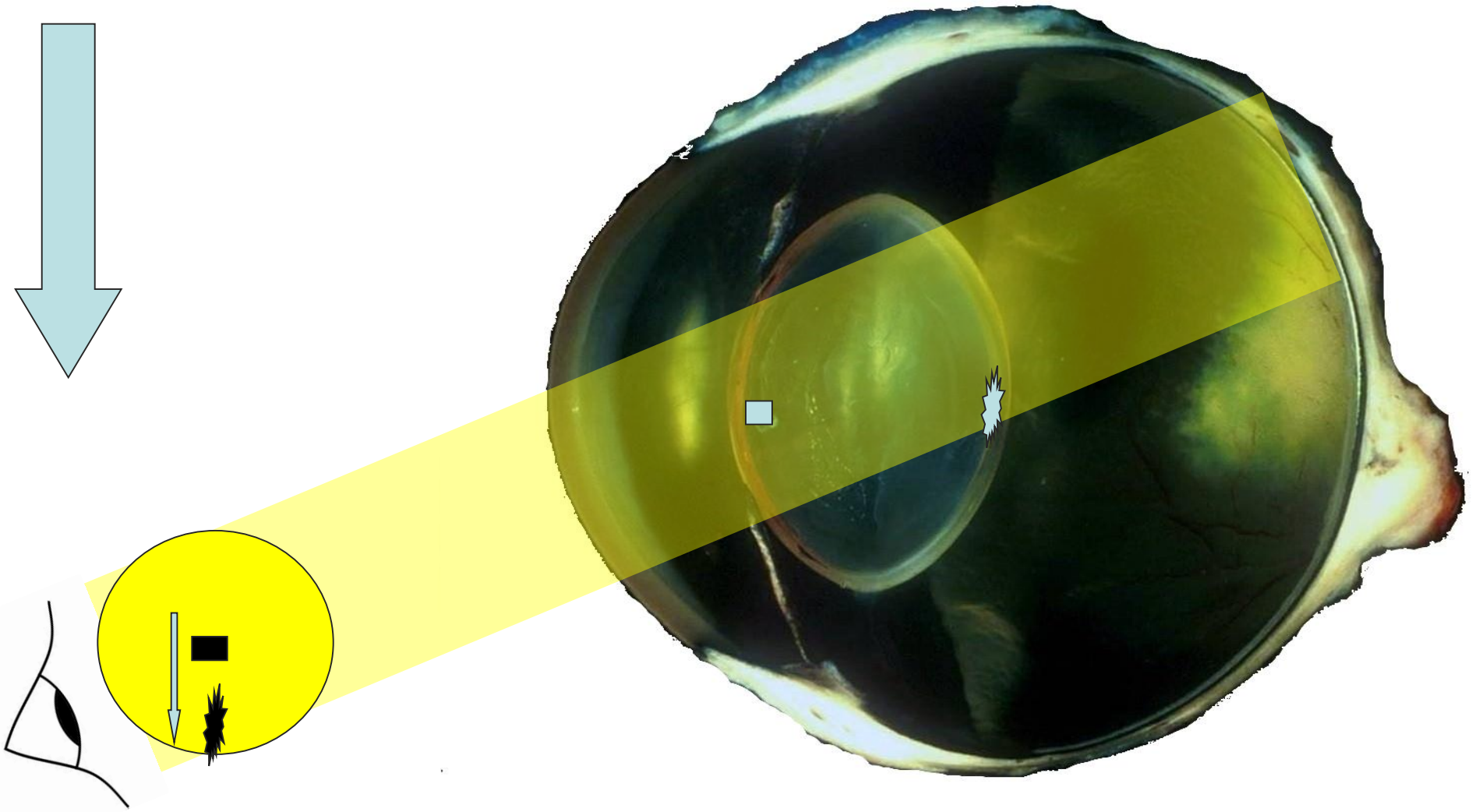
8e: Localise lesions using parallax



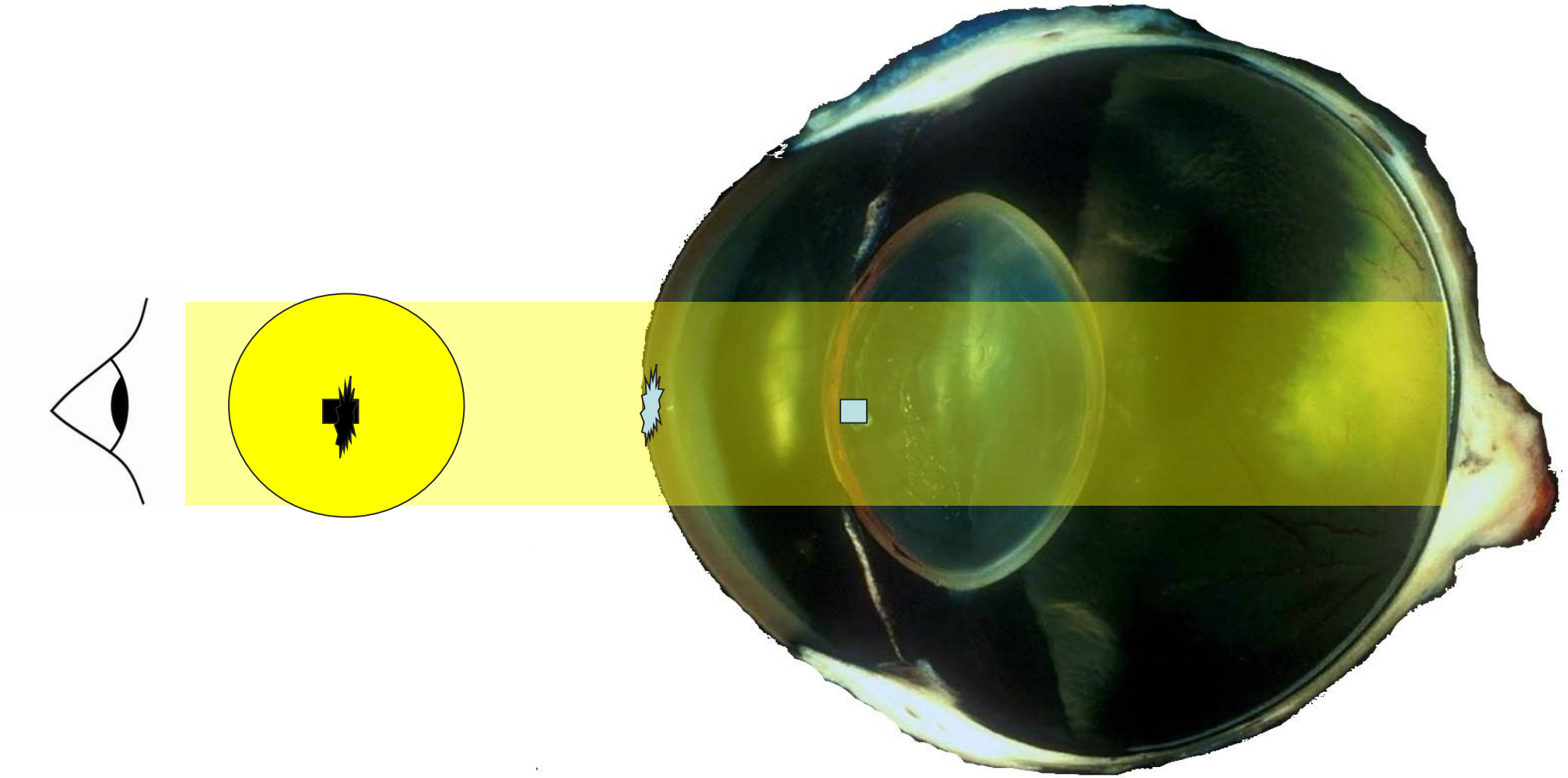
8e: Localise lesions using parallax



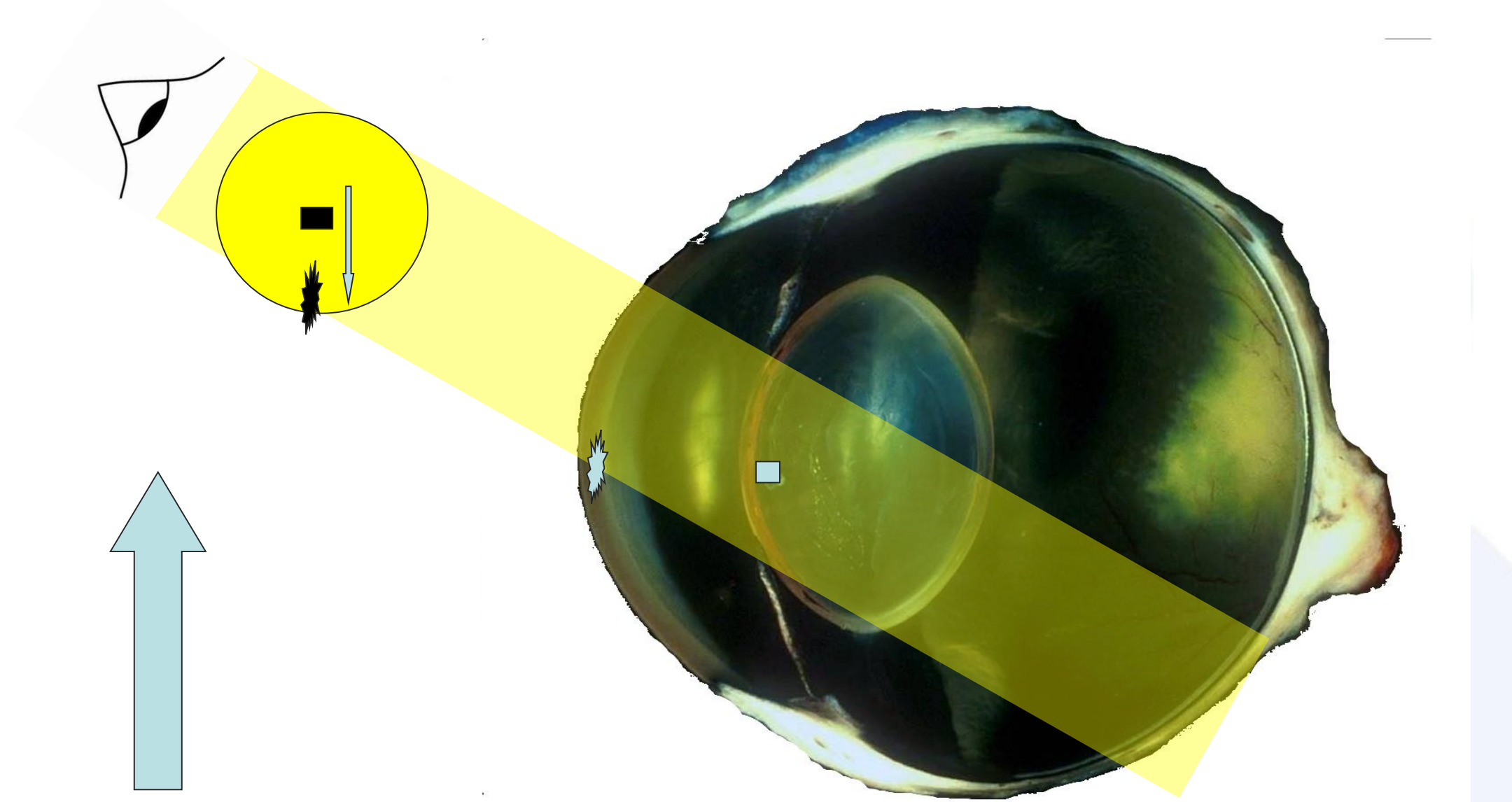
8e: Localise lesions using parallax



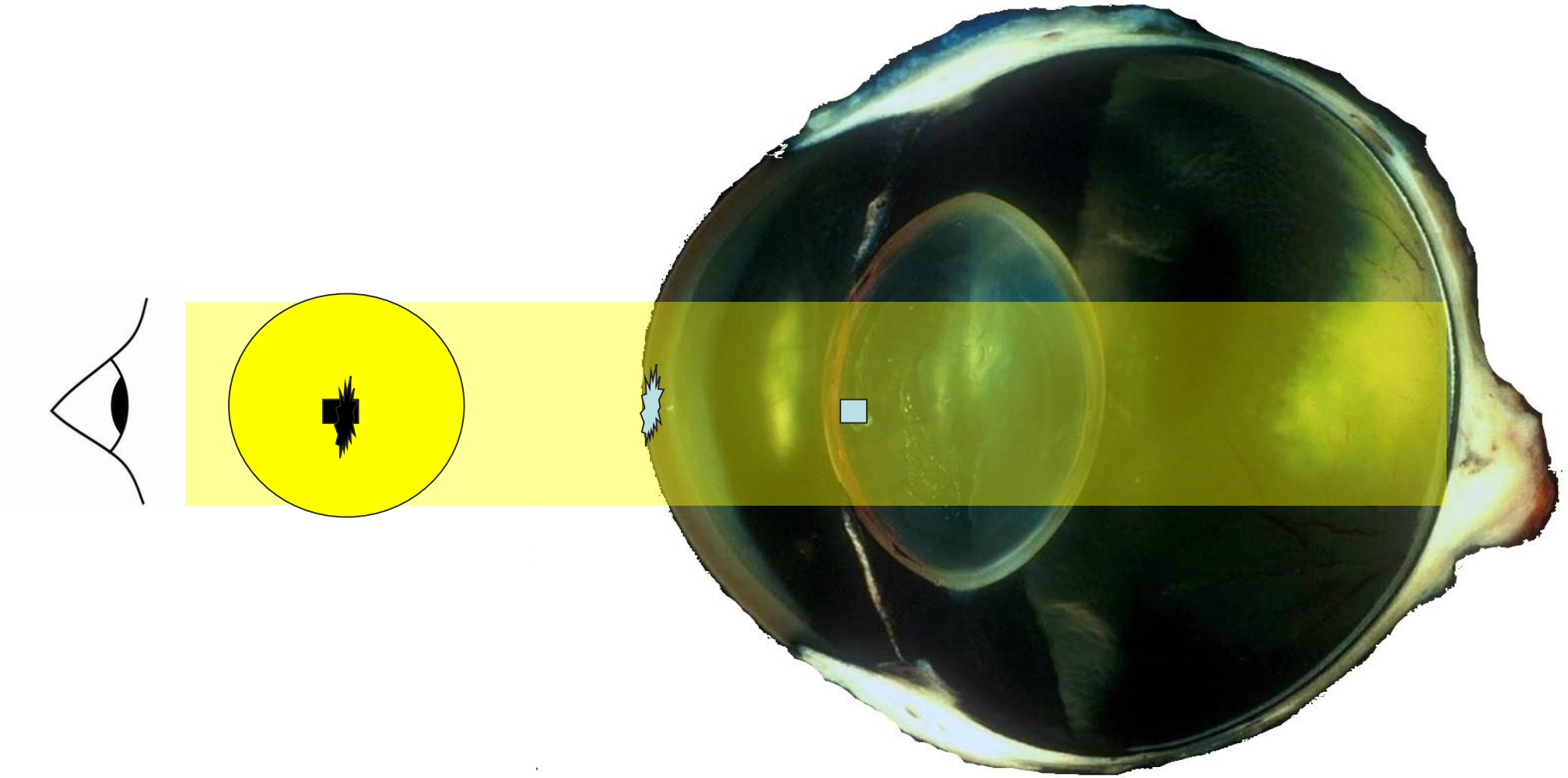
8e: Localise lesions using parallax



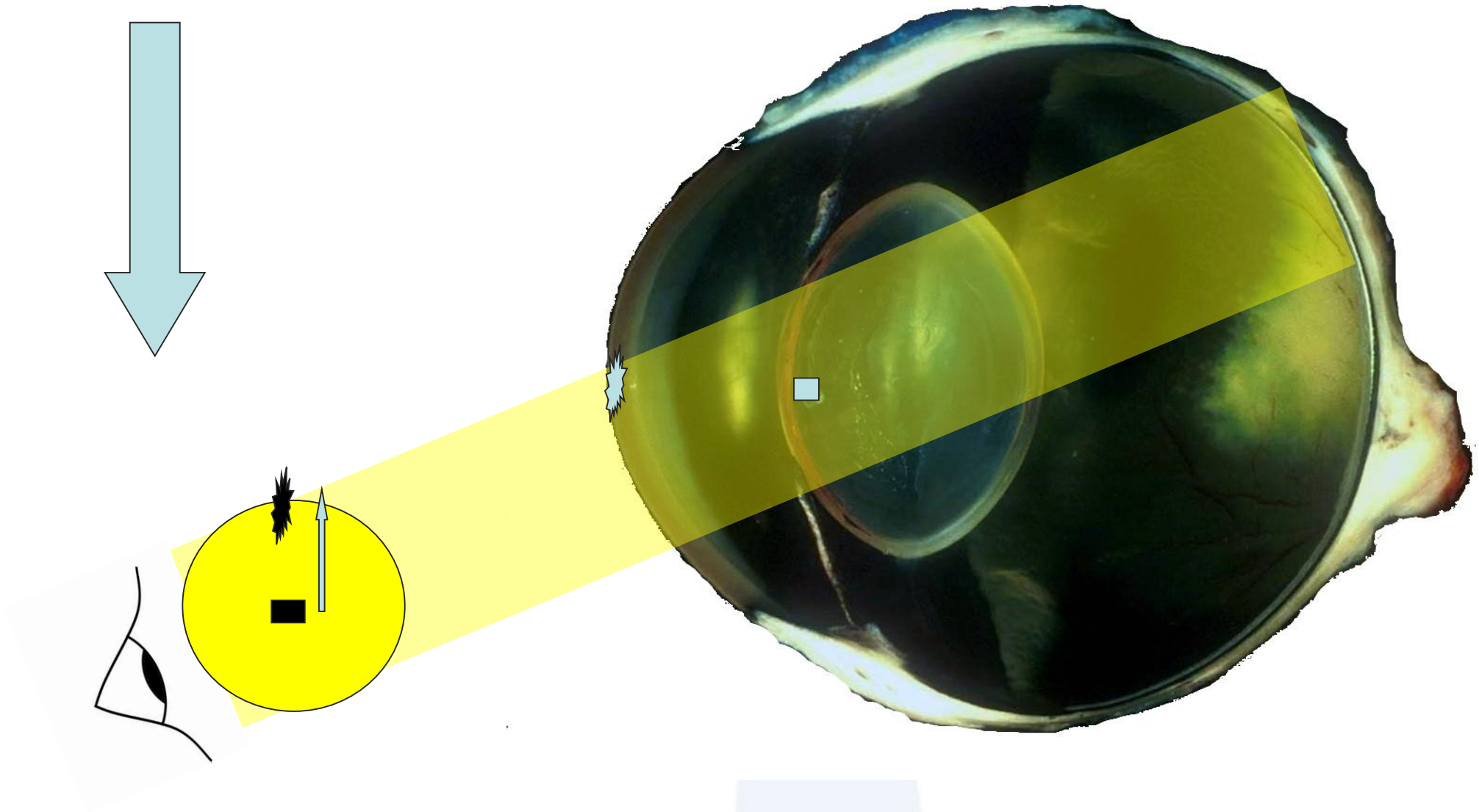
8e: Localise lesions using parallax



8e: Localise lesions using parallax

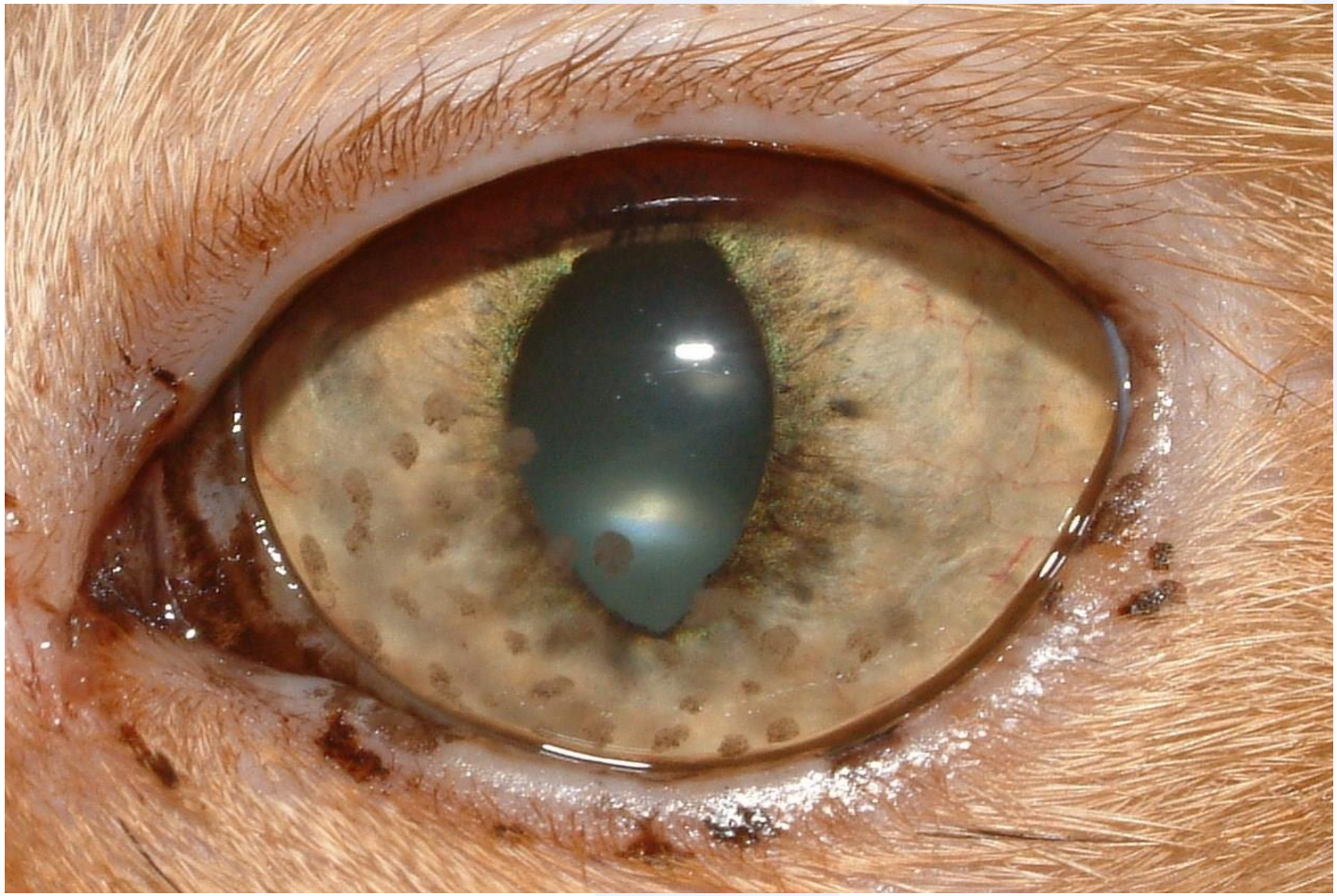


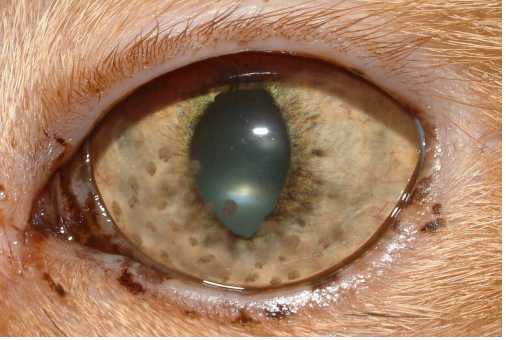
8e: Localise lesions using parallax

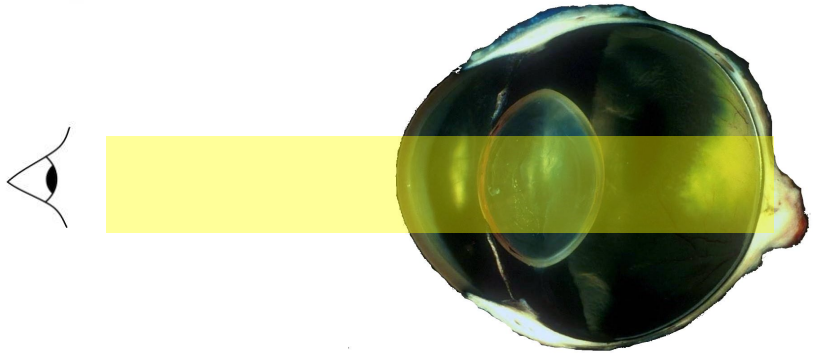


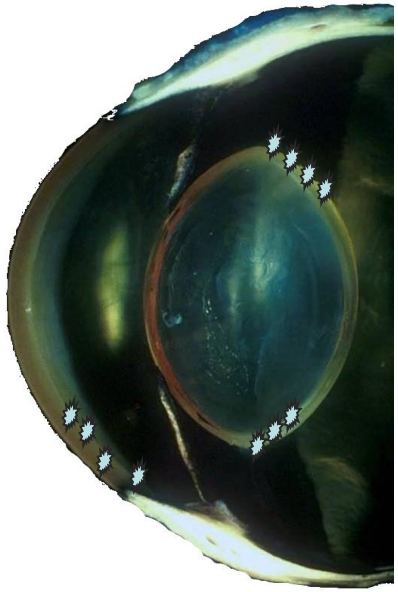
8e: Localise lesions using parallax

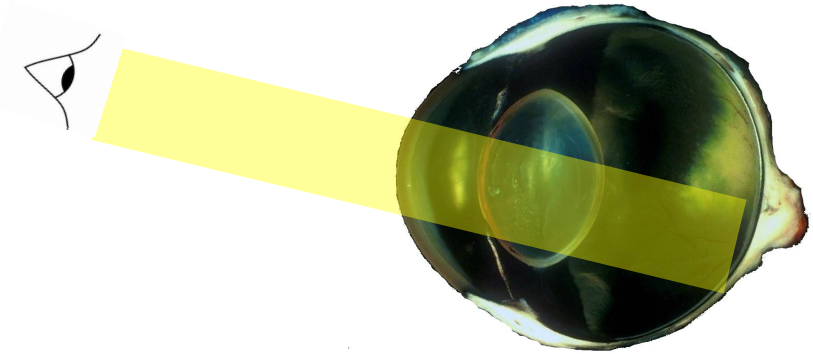
8e: Localise lesions using parallax

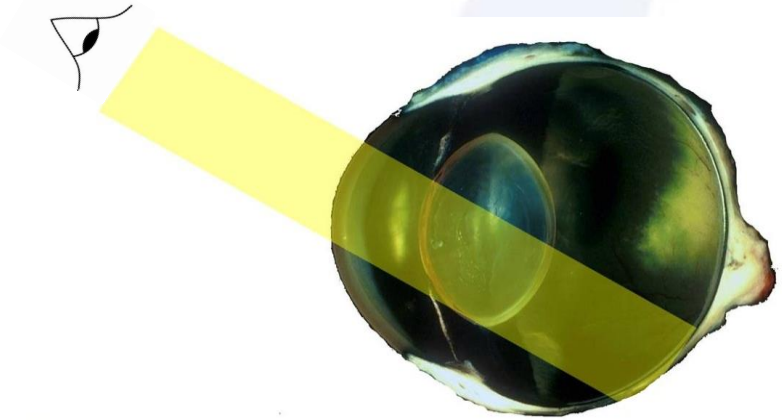












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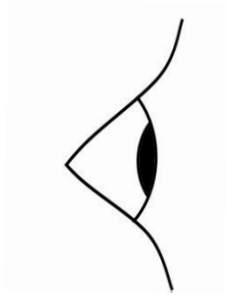
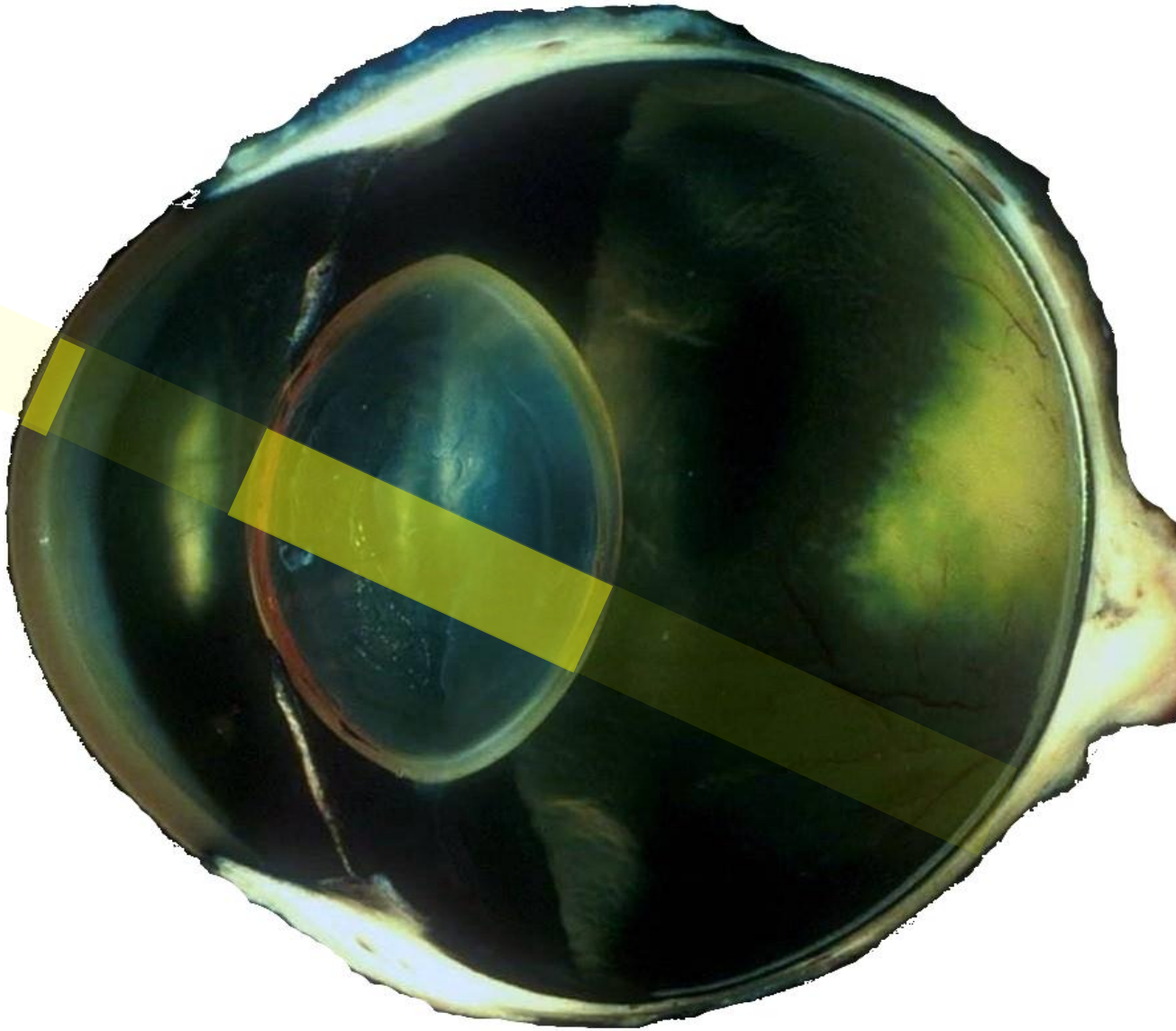
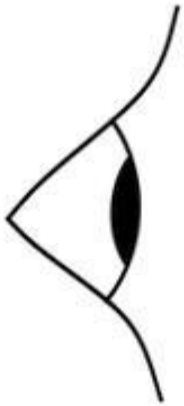
Practical session 3:

Distant direct ophthalmoscopy: localising opacities

8f: The “search light technique”







A Cornea

B Anterior chamber

C Anterior lens capsule

D Posterior lens capsule

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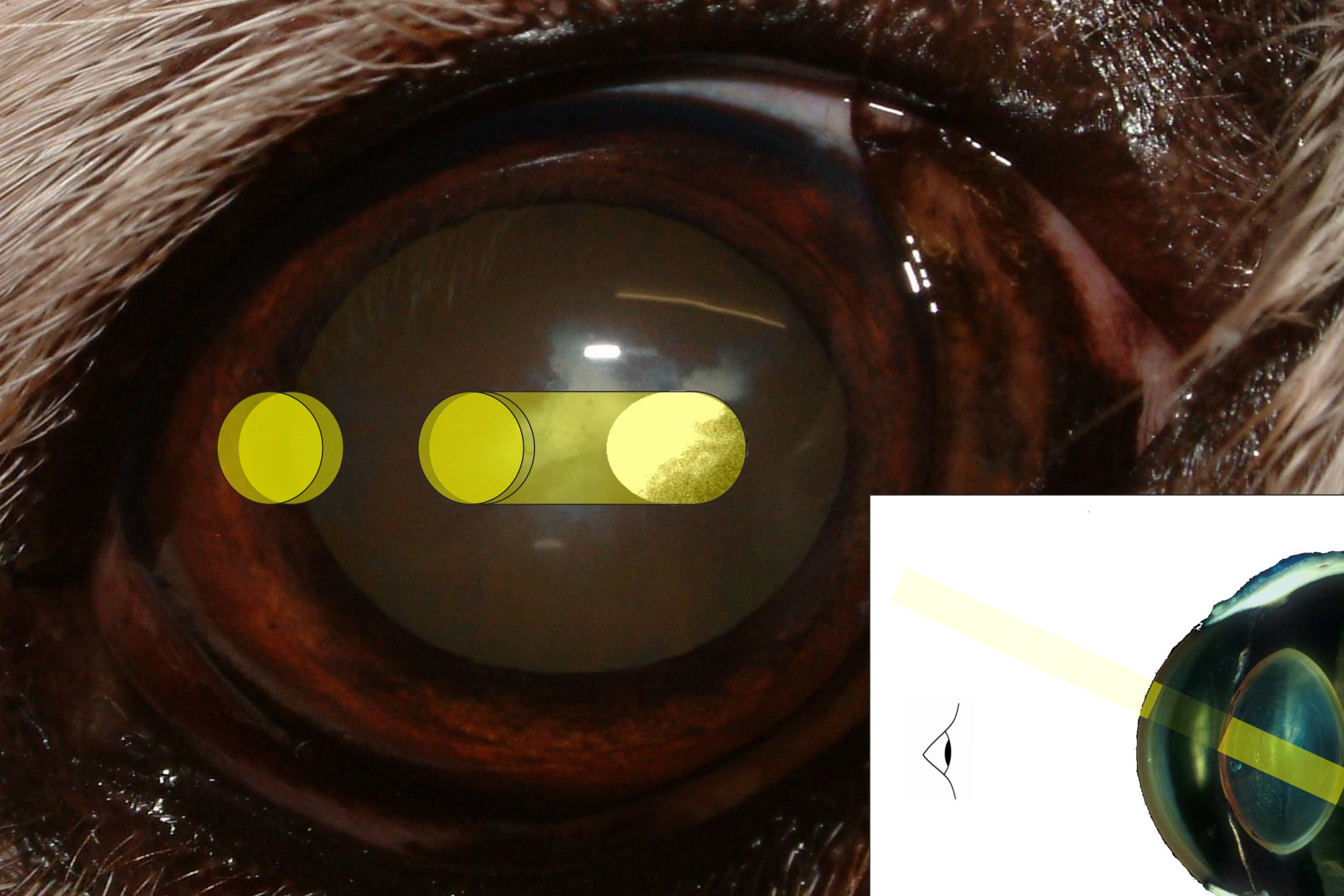
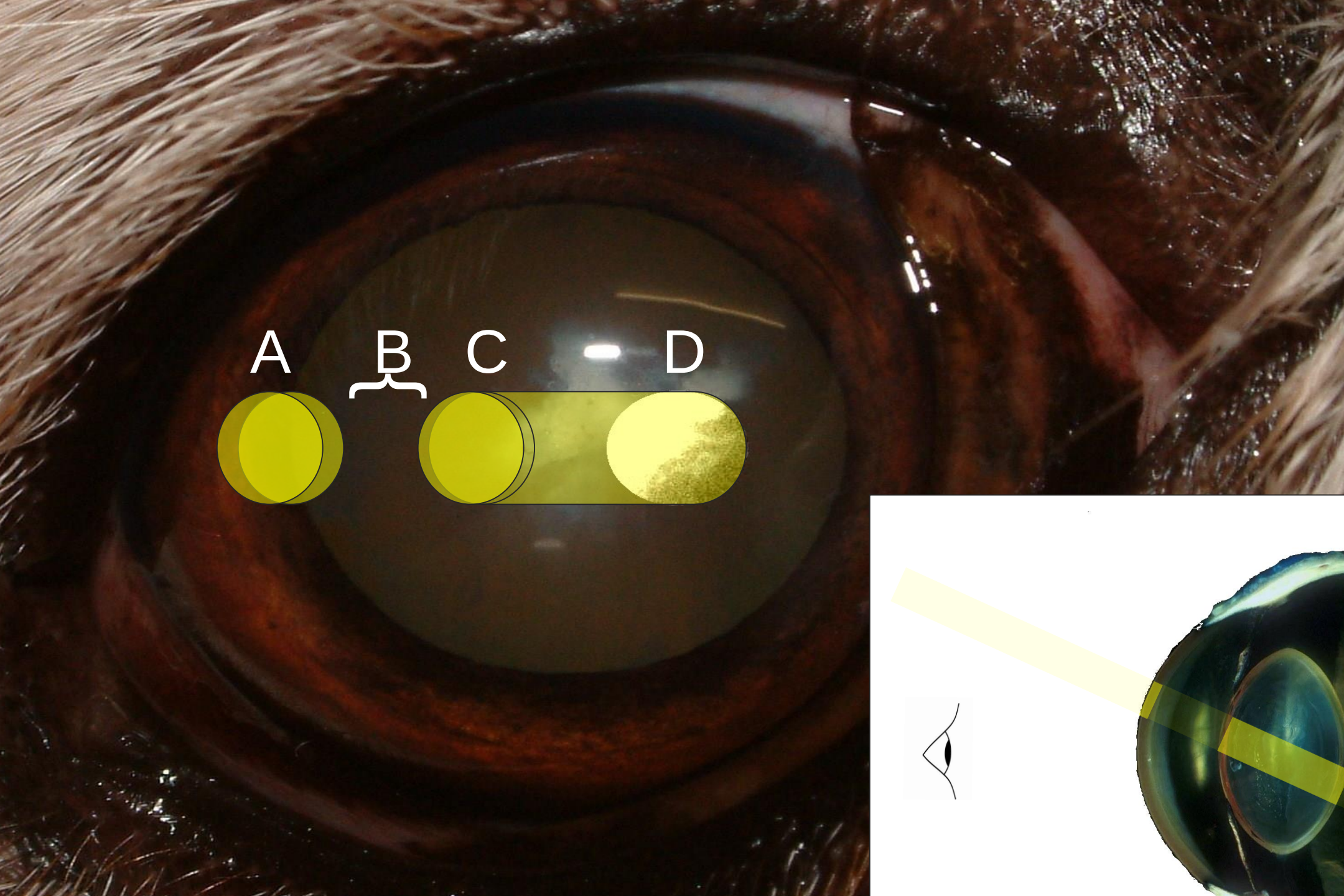
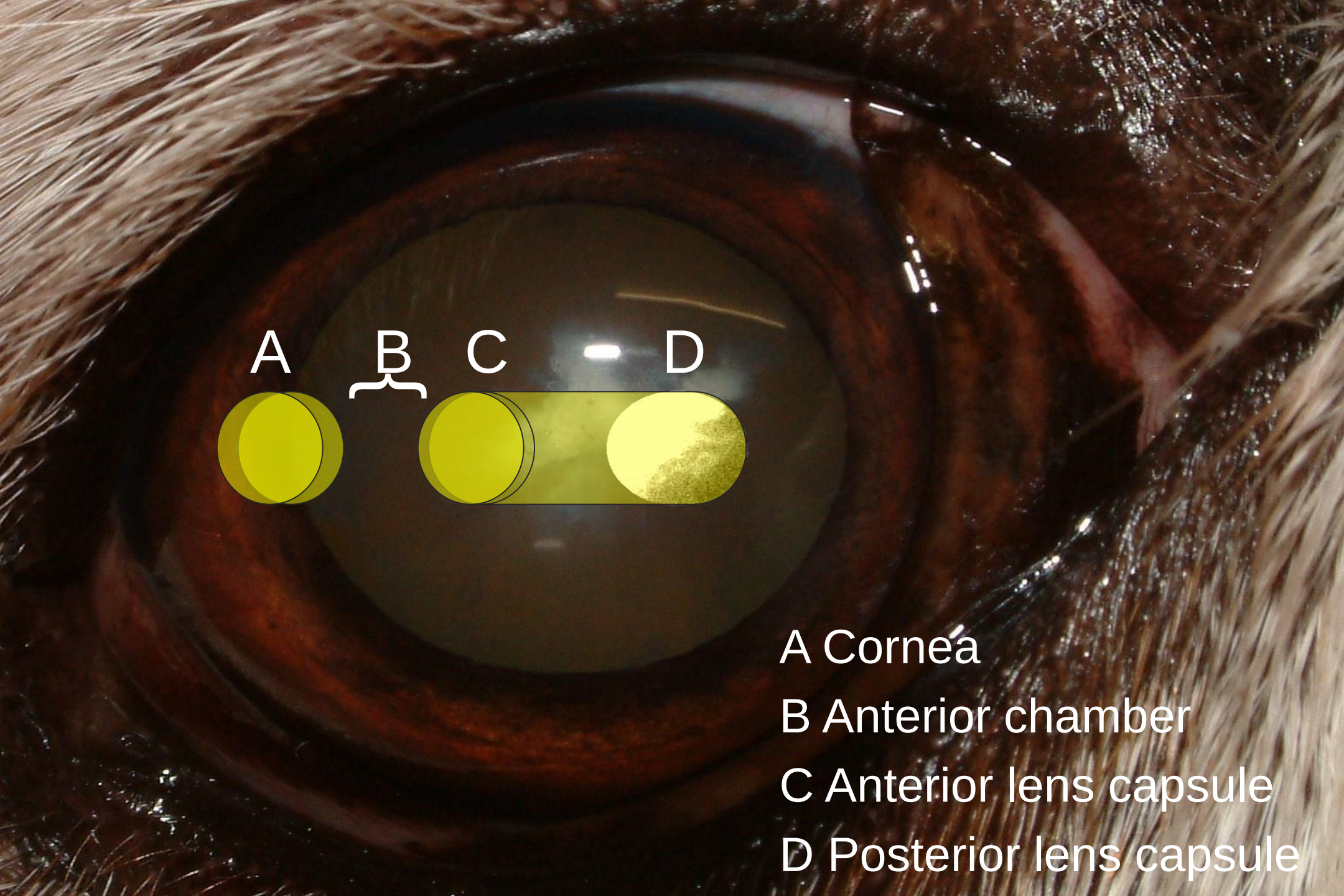



A
B
C
D


A
B
C
D
A Cornea
B Anterior chamber
C Anterior lens capsule
D Posterior lens capsule

Practical session 4:

Direct ophthalmoscopic examination of lens lesions and the search light technique

Rowe Referrals

Serving the South West & beyond

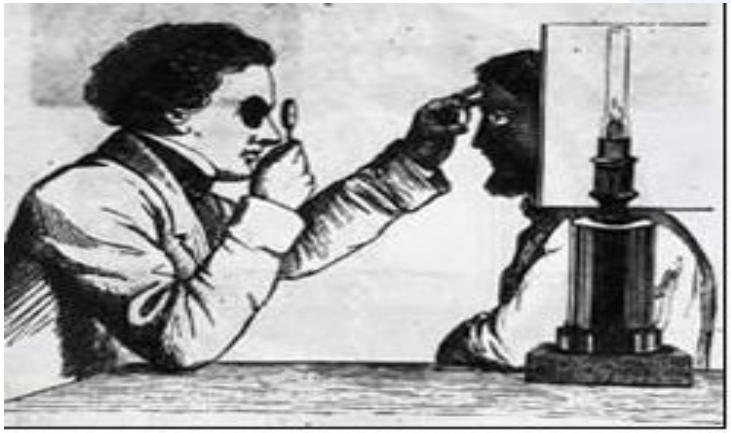
Fundoscopy

Fundoscopy – seeing the retina

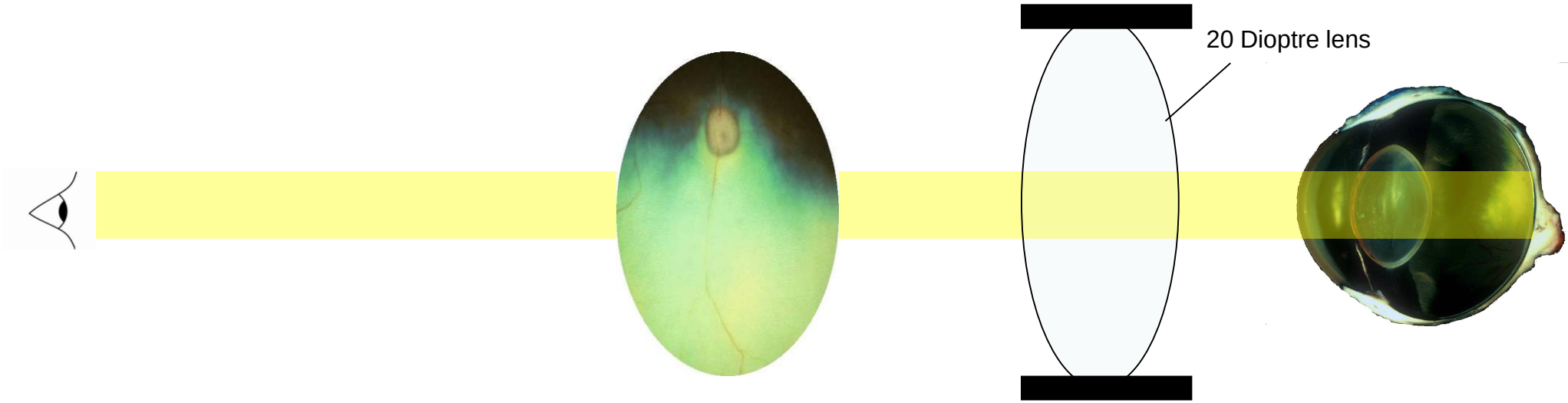
- The Earliest Fundus Visualization of Living Eyes
- On November 12, 1704, the medical doctor Jean Méry presented to the French Royal Academy of Sciences, Paris, his observation that if a cat is immersed in water its retinal vessels became visible. On March 20, 1709, Philippe de La Hire pointed out that this was due to the abolition of the corneal refraction. Méry's experiment of eye immersion for fundus visualization was repeated and supplemented later in humans: in 1845 by Adolf Kussmaul, in 1851 by Johann Nepomuk Czermak for the construction of the orthoscope, and in 1891 by Oswald Gerloff, for the earliest successful fundus photography.

9: Indirect- The diagnostic lens

- Monocular indirect ophthalmoscopy



Early Ophthalmoscope
Edouard Meyer 1873
(From NLM History of Medicine Collection)



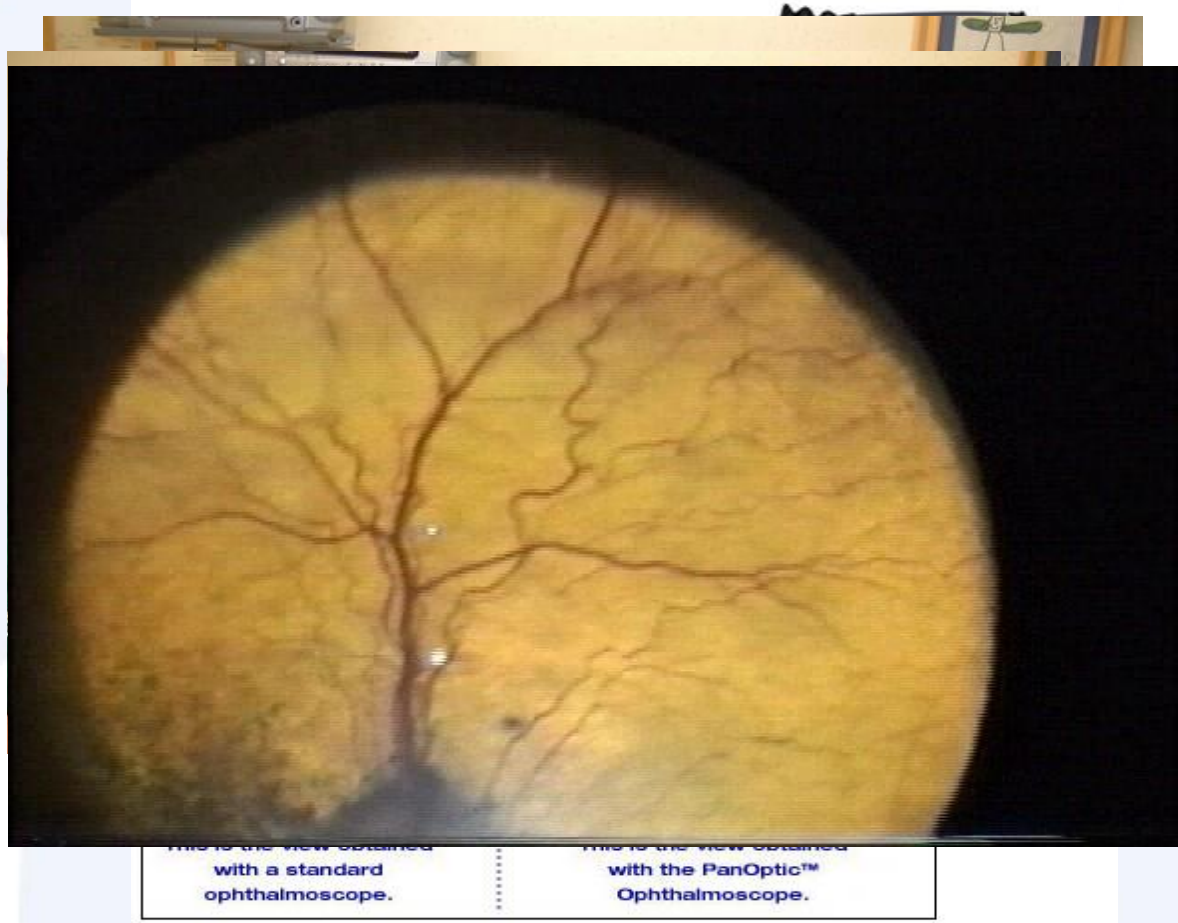
Virtual, **inverted**, image formed in front of lens

Large field of view

Whole fundus

Indirect Ophthalmoscopy

- Image formed in front of patient. Inverted.
- 2.5-3.2x Mag
- 45-56degree field view
- Monocular
  - lens & light (pen torch, direct, Finhof).
  - Panoptic (not inverted).
- Binocular
  - hands free
  - stereopsis



Fundus photography

- Dilated pupil
- Patience
- Pen torch and a rubber band.

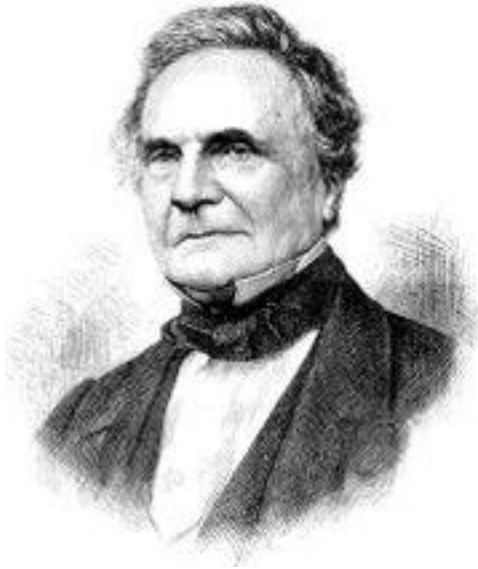
- DSLR:
- Pen torch strapped to lens
- Compact:
- Light over shoulder or Head torch
- Flash on

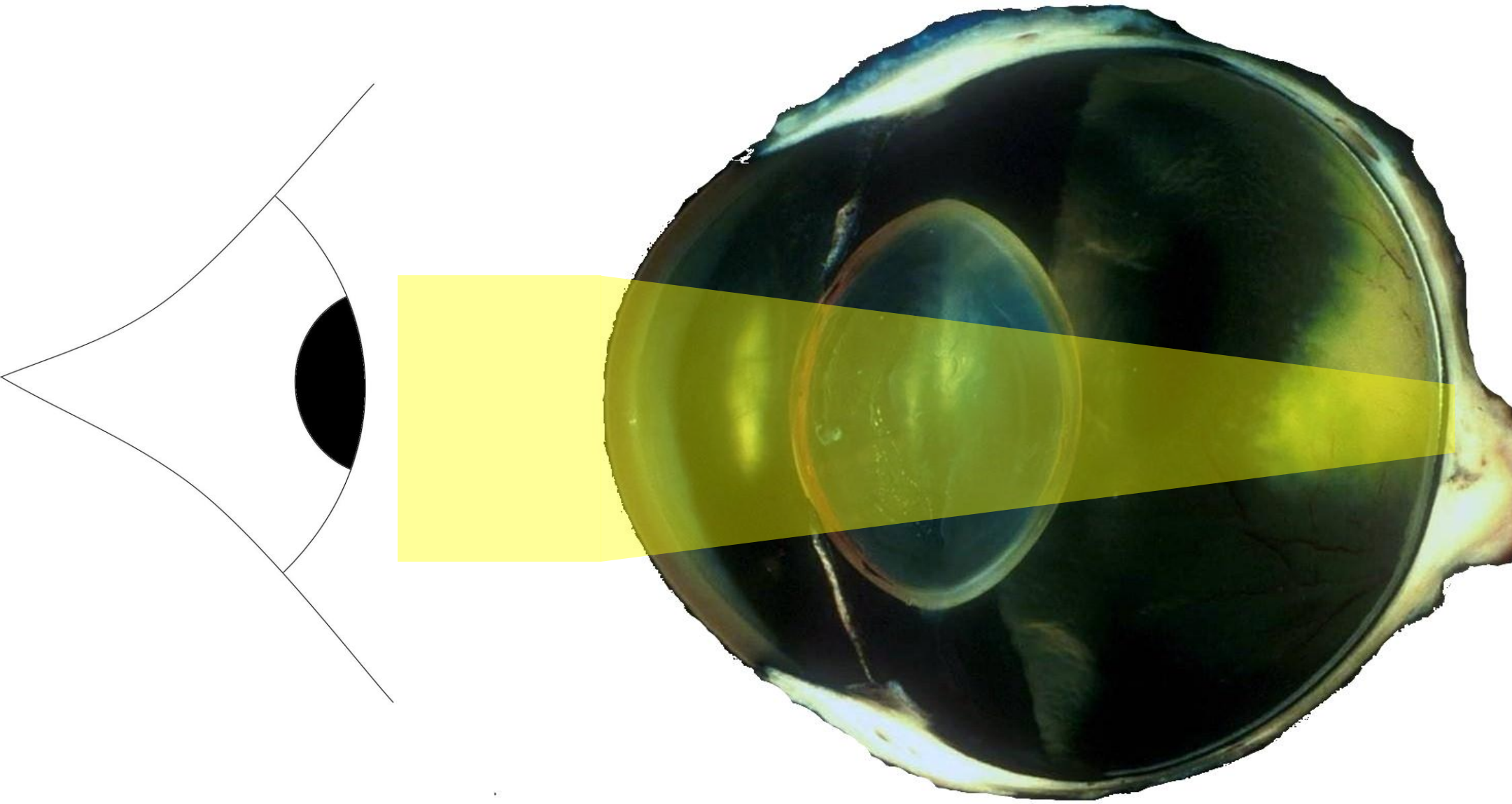
💣 Image formed 50mm in front of lens thus focus on hand at this approx distance before returning to lens

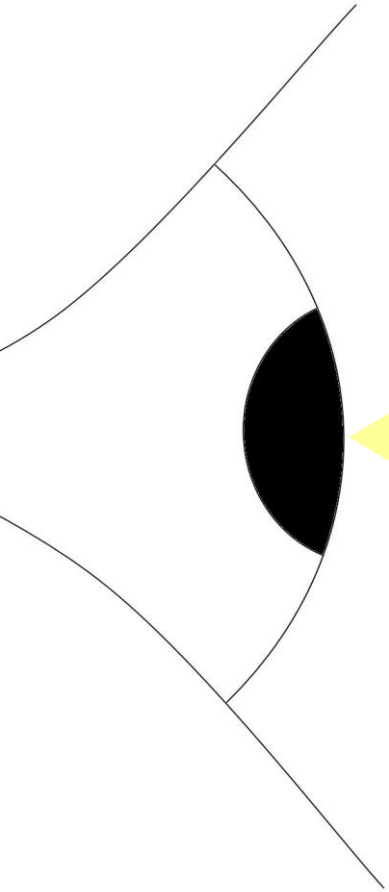
Practical session 5:

distant direct ophthalmoscopy

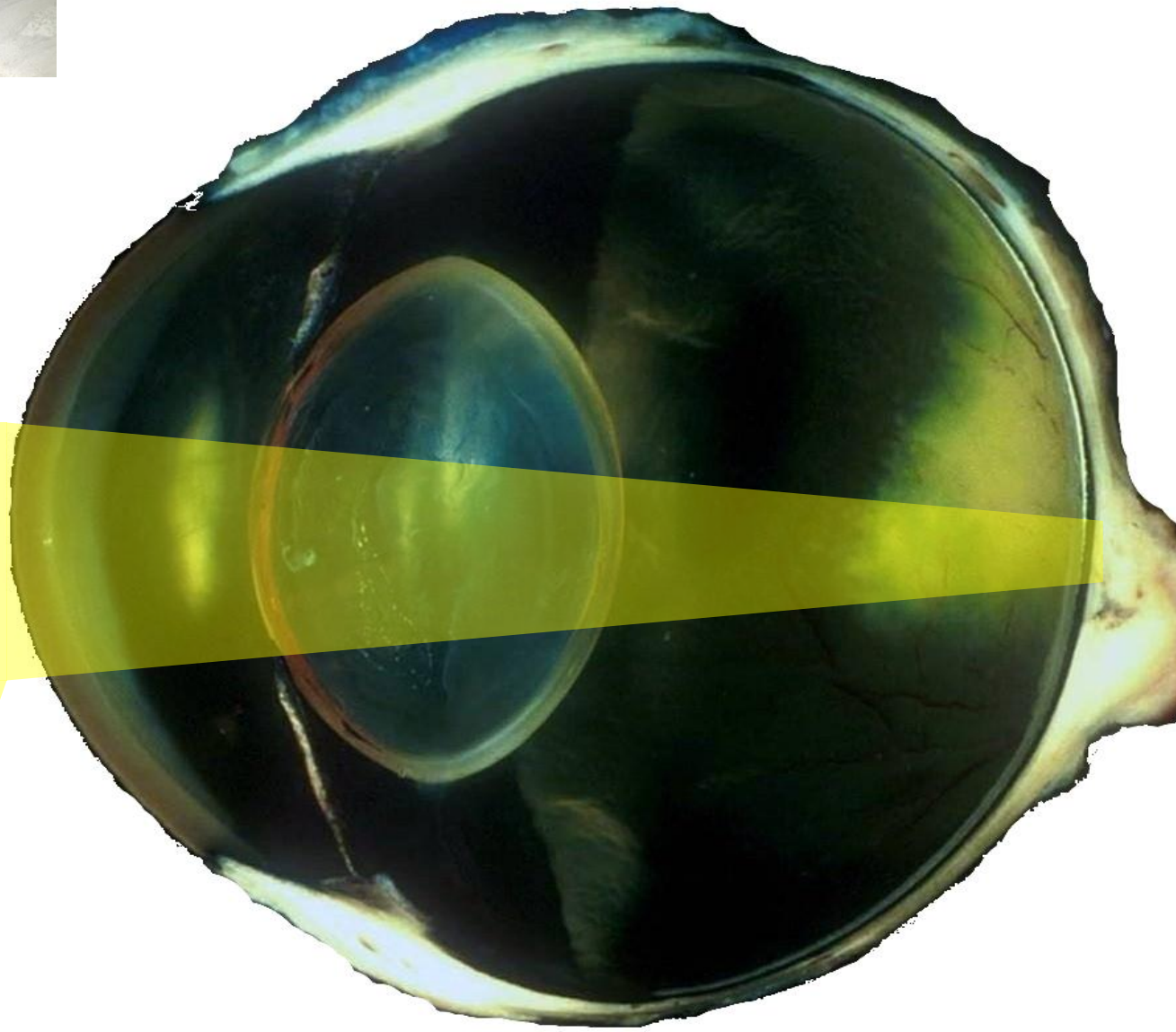
10: Close direct

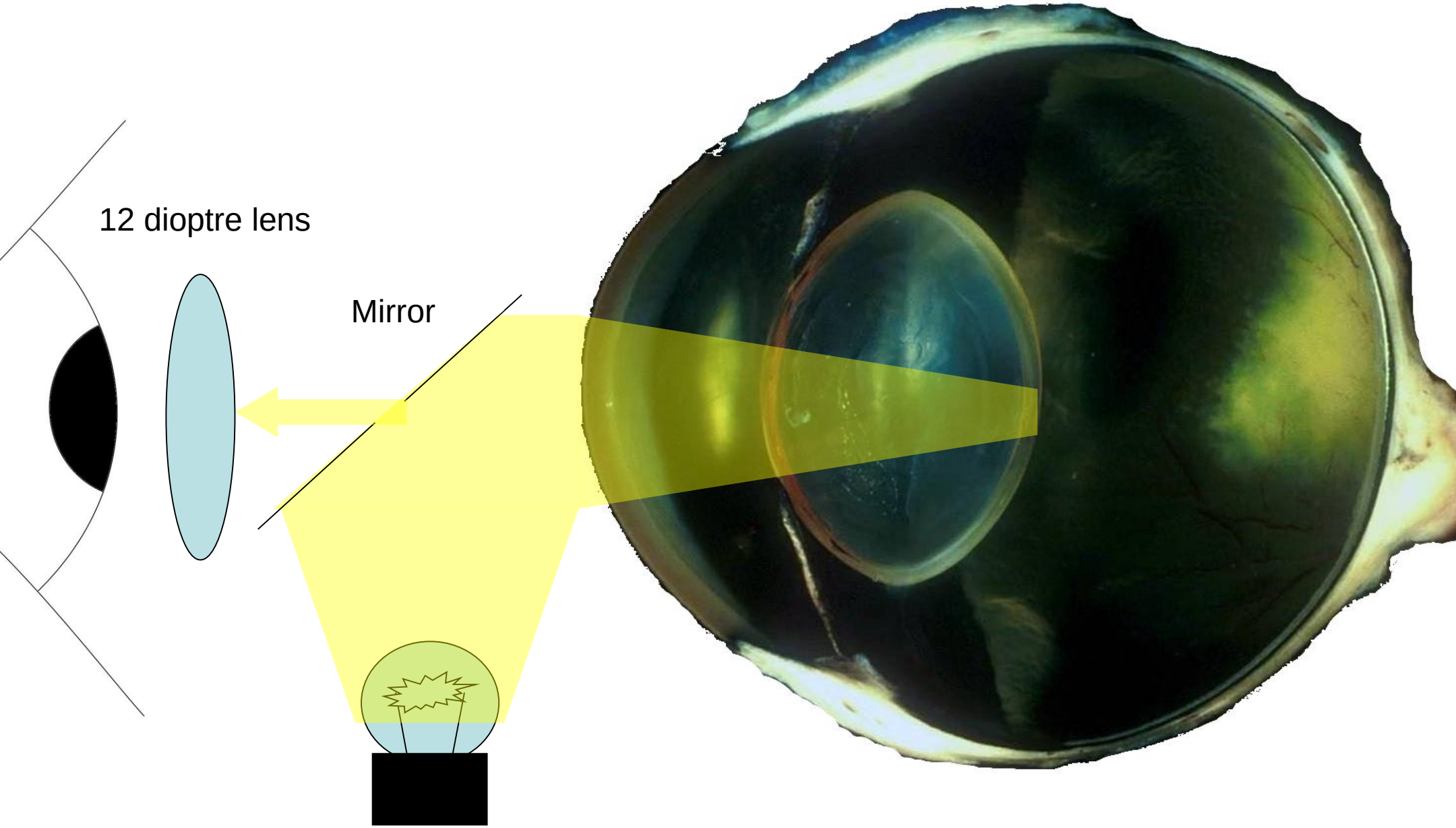


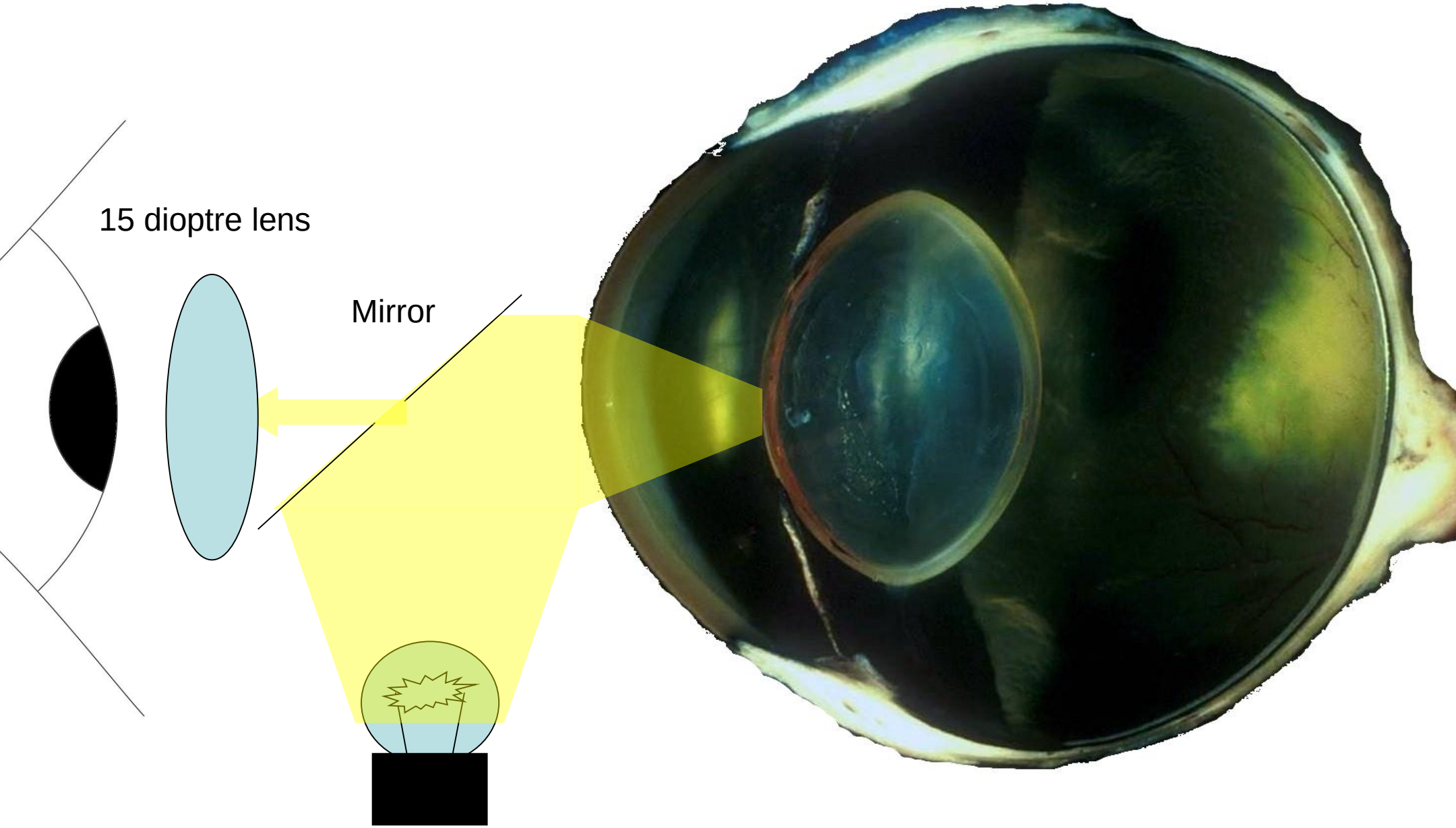


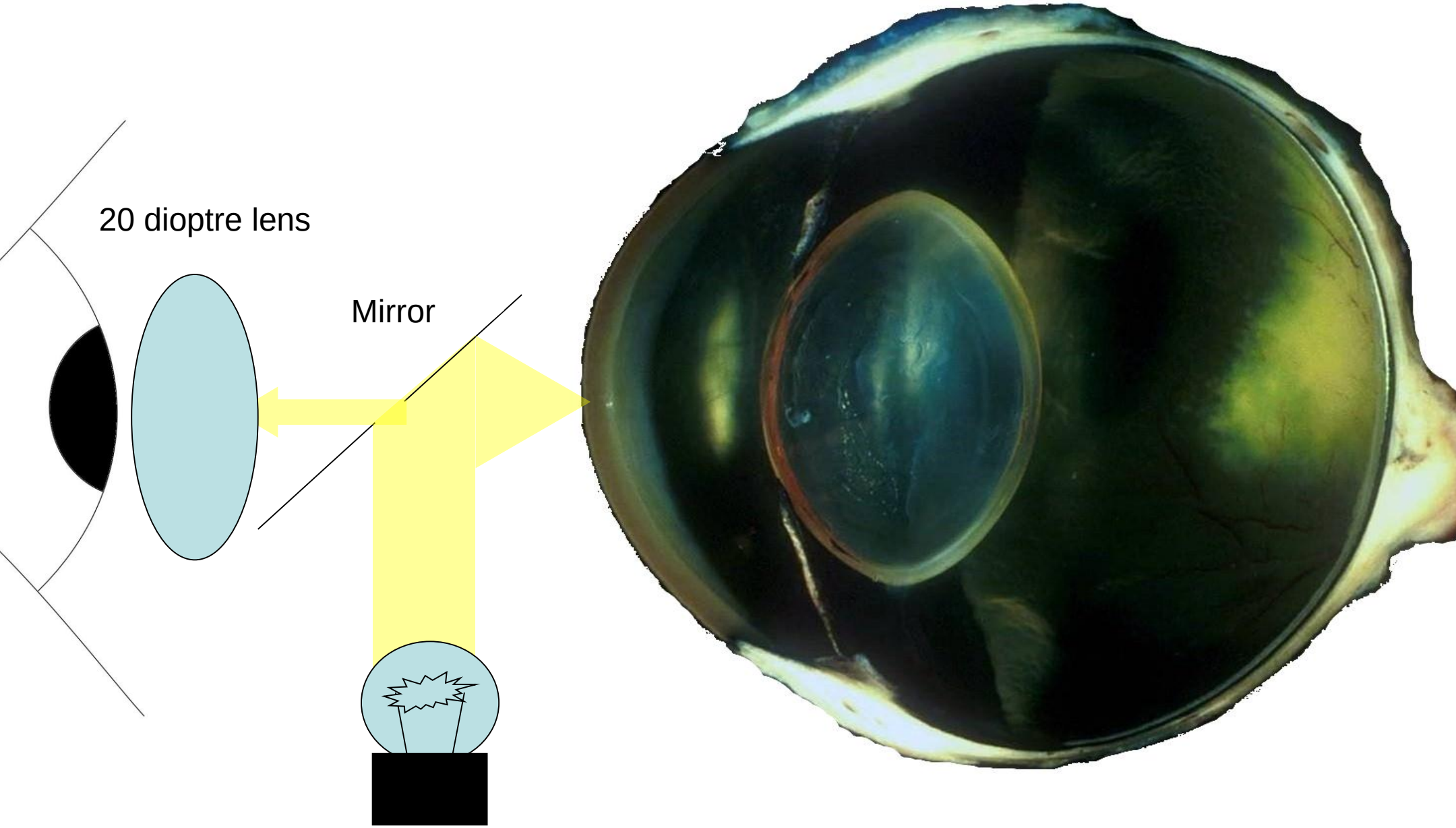


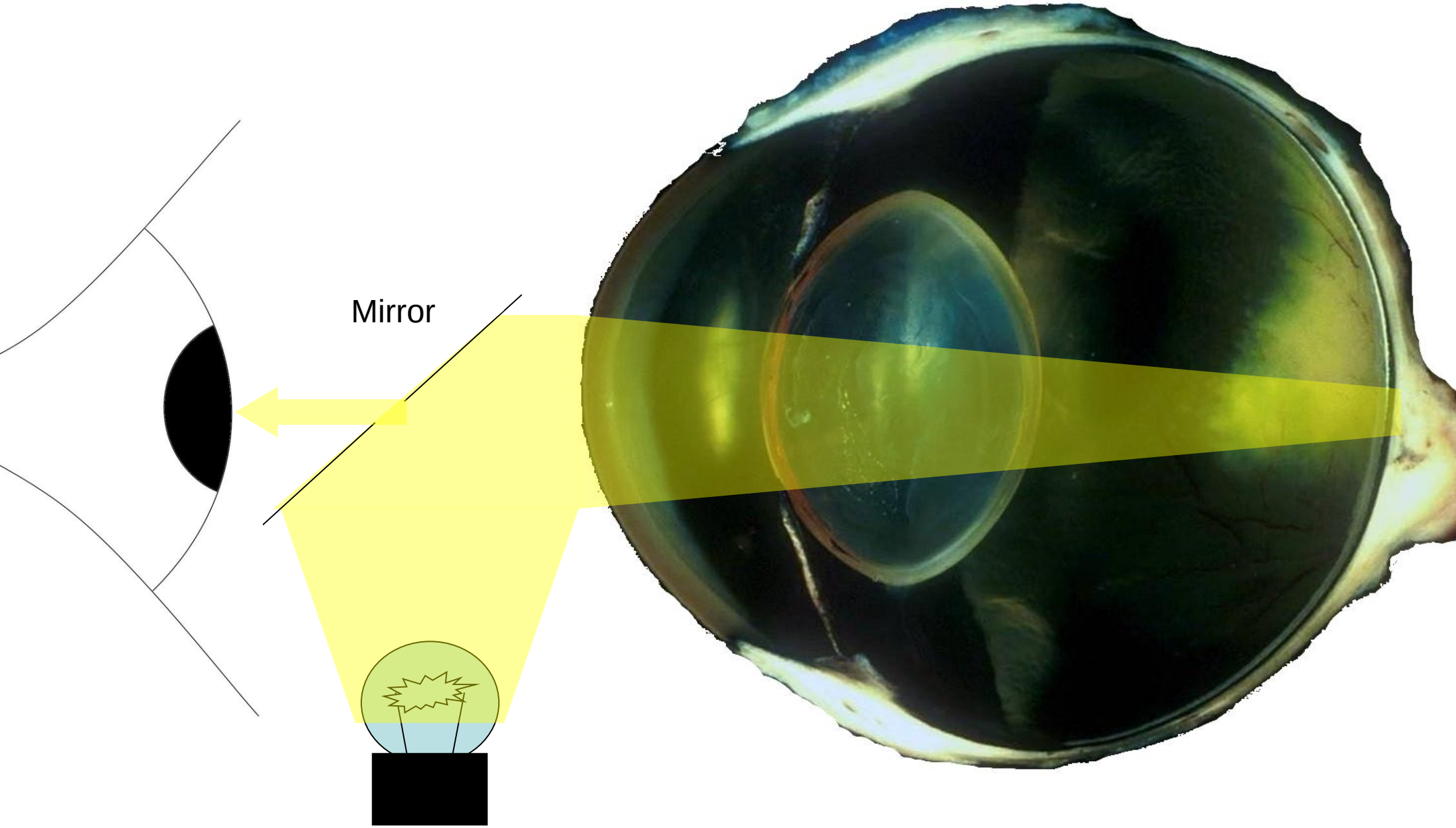
Mirror

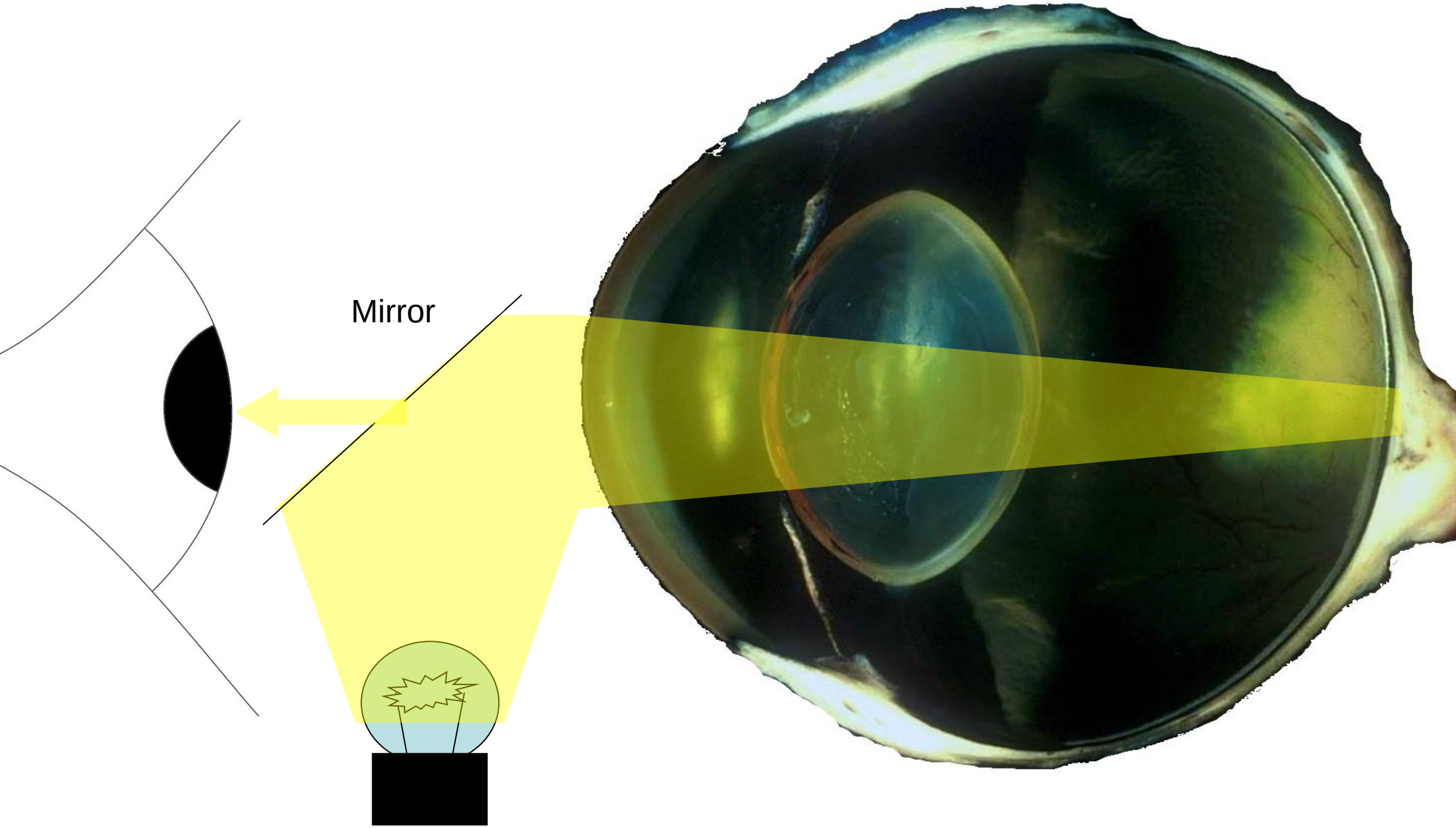



12 dioptre lens
Mirror


15 dioptre lens
Mirror


20 dioptre lens
Mirror


Mirror


Mirror

Rowe Referrals

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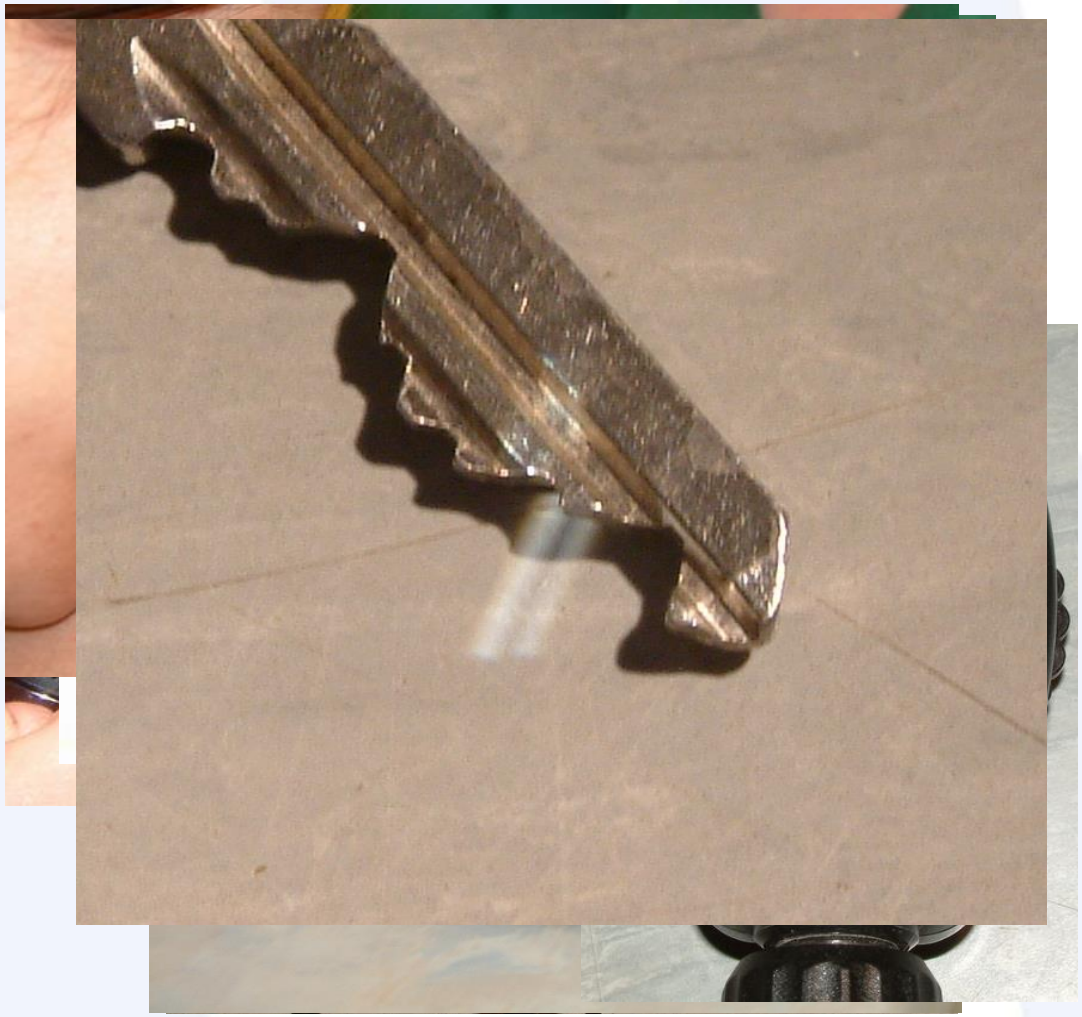
Close direct

- New batteries and clean lens.
- CLOSER to patient increases field view.
- CLOSE to you
- Use Rheostat
- Back to Front:
  - 20 = cornea (2x)
  - 15 = ant lens capsule
  - 8 = post lens capsule
  - 0 = retina (15x)
  - 1D = 0.3-0.4mm



Rowe Referrals

Serving the South West & beyond

Practical session 6:

Close direct ophthalmoscopy

Rowe Referrals

Serving the South West & beyond

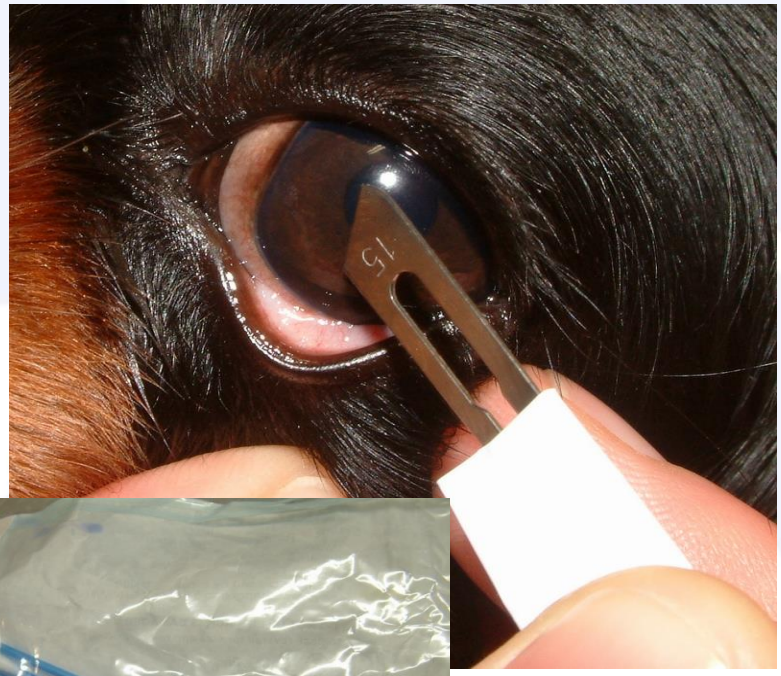
ADDITIONAL TESTS

Rowe Referrals

Serving the South West & beyond

Sampling

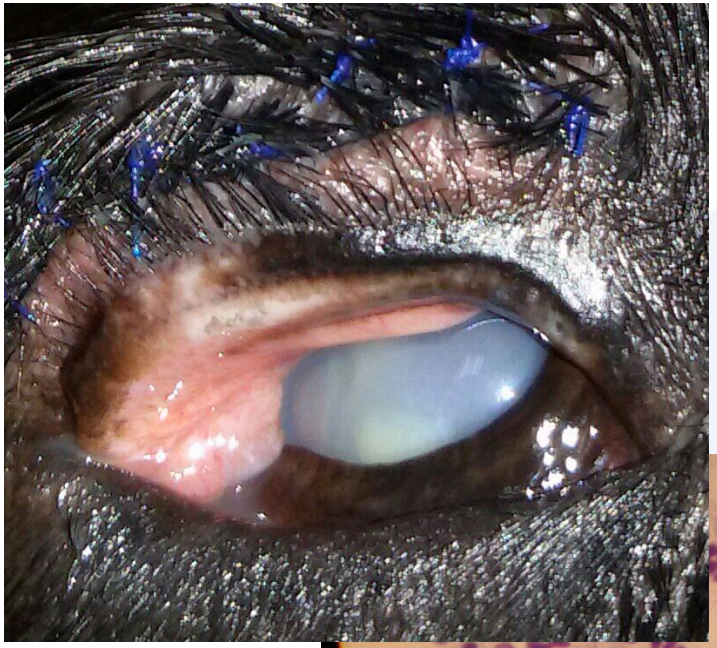
- BEFORE TOPICALS!
- PCR: dry swab
- Isolation: VCTM
- Cats
  - FHV PCR, FAT, isolation
  - FCV isolation
  - Chlamydophila PCR & isolation
  - Cytology
- Dogs
  - Cytology (Bacteriology)

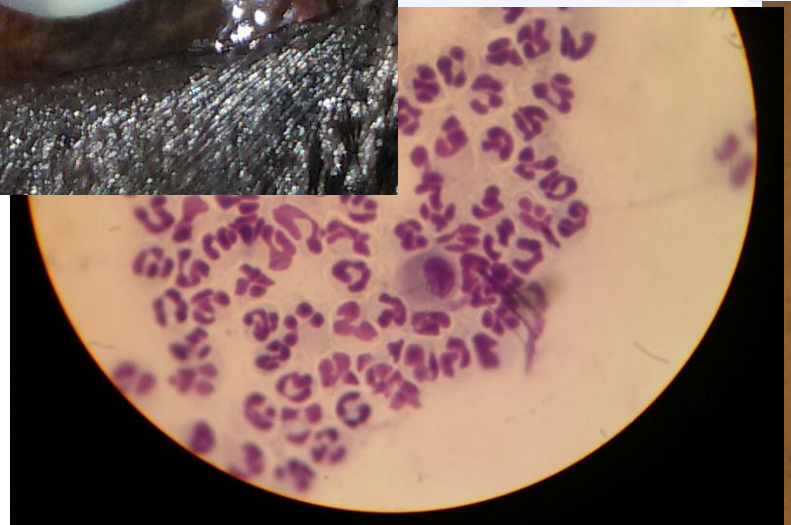


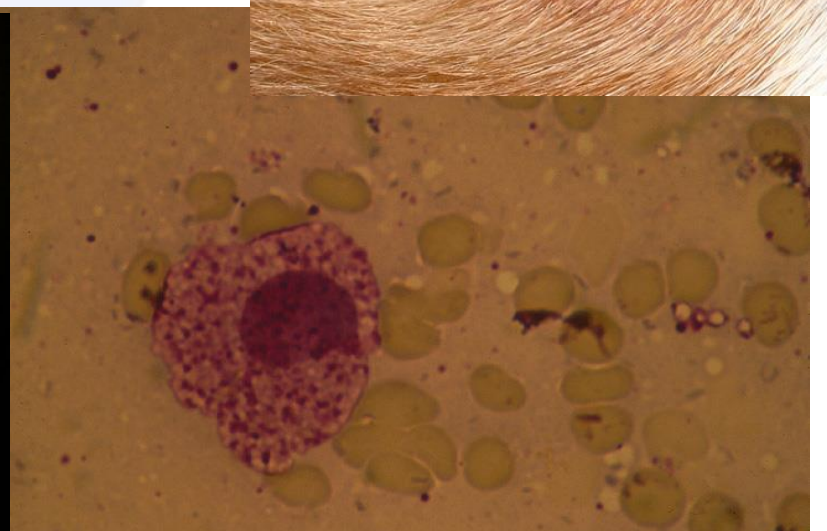
Rowe Referrals

Serving the South West & beyond

Cytology





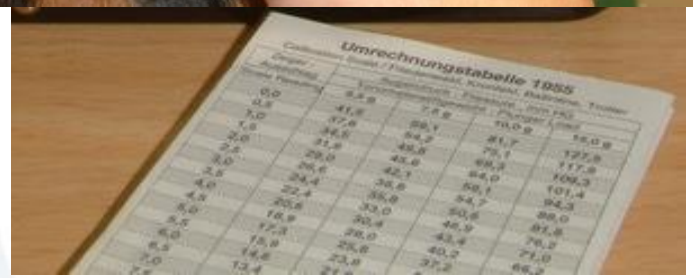


Rowe Referrals

Serving the South West & beyond

Tonometry

- Indentation
  - Shiotz
  - £30-100
  - Accurate with experience
  - Need co-operative patient
  - Care when deep ulcers
  - Only use Vertical
- Rebound
  - Tonovet
- Applanation
  - Tonopen



Rowe Referrals

Serving the South West & beyond

Tonometry

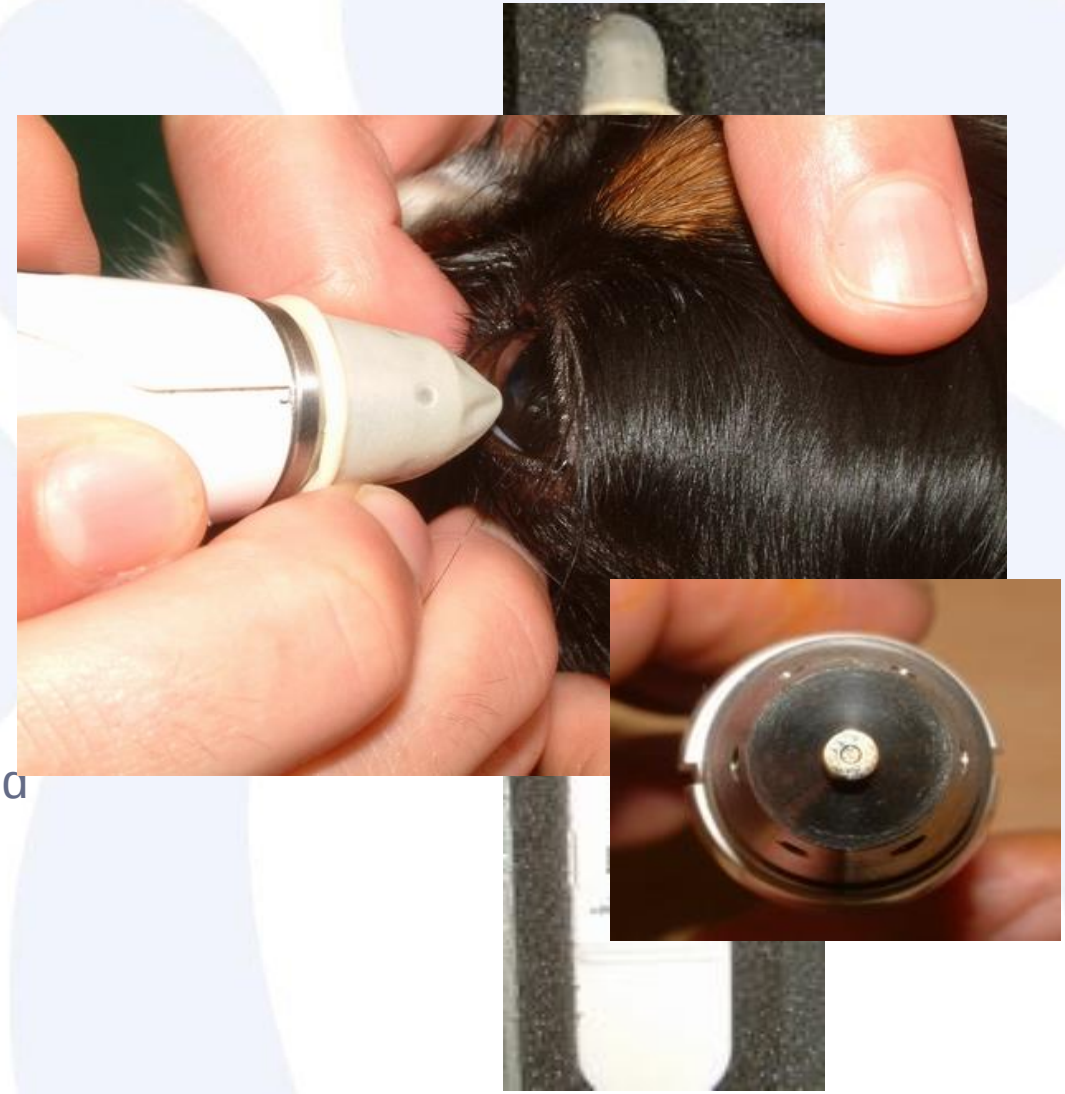
- Rebound
  - Tonovet
  - £1800-2000
  - Accurate
  - Only Horizontal
  - Equine & small animal
  - No Local
  - Sterile probes
  - Quick, simple to use

Rowe Referrals

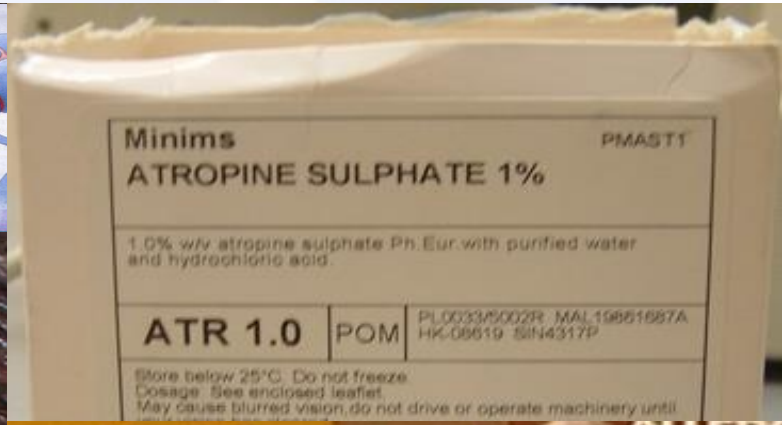
Serving the South West & beyond

Tonometry

- Applanation
  - Tonopen.
  - £1900-2100.
  - Accurate.
  - Use at any angle.
  - Must be perpendicular to cornea.
  - All species.
  - Easy to use.
  - Must be used properly to avoid damaging probe tip.



Mydriatics.


Minims
PMAST1
ATROPINE SULPHATE 1%
1.0% w/v atropine sulphate Ph.Eur with purified water and hydrochloric acid.
ATR 1.0
POM
Store below 25°C. Do not freeze.
Dosage: See enclosed leaflet.
May cause blurred vision,do not drive or operate machinery until


Timolol
Eye Drops BP
EXOCIN
(ofloxacin 0.3%)
TOPICAL
OPHTHALMIC
SOLUTION
STERILE
0.3%
5ml
0.5%w
Alcon
HYDRIACYL® 1%

Mydriatics

Tropicamide

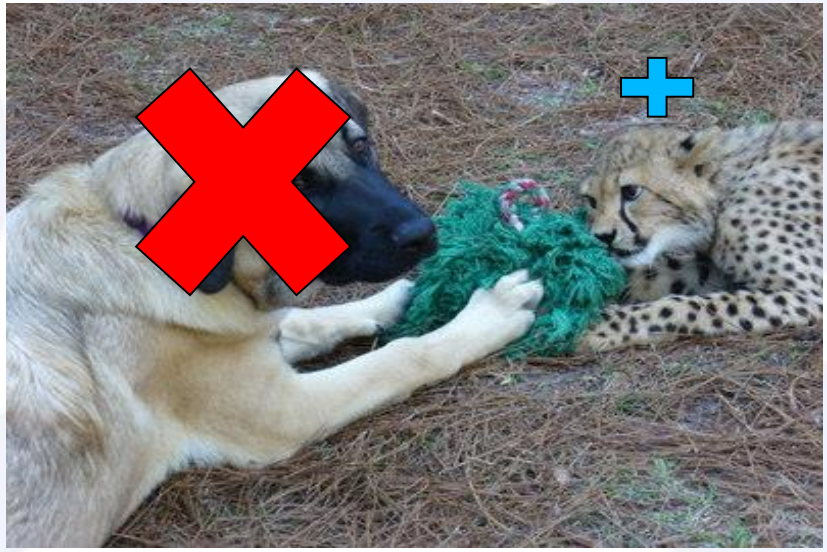
- Ach like
- Diagnostic

Atropine

- Ach like
- Therapeutic

Phenyelphrine

- Adrenaline like



Constrictor	**Dilator**
Acetyl Choline	**Adrenaline**
Stronger	**Weaker**