

Okno – prvi astronomski inštrument

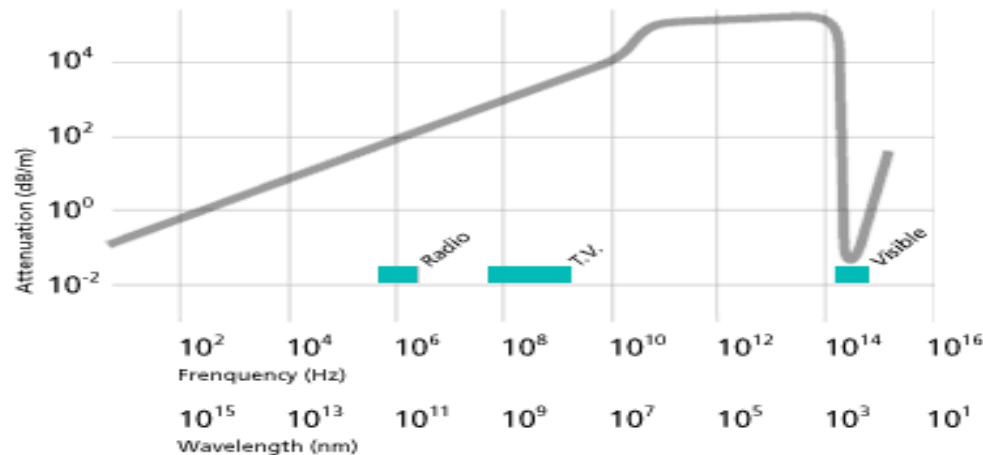
Rok Vidmar

Oko – prvi astronomski inštrument

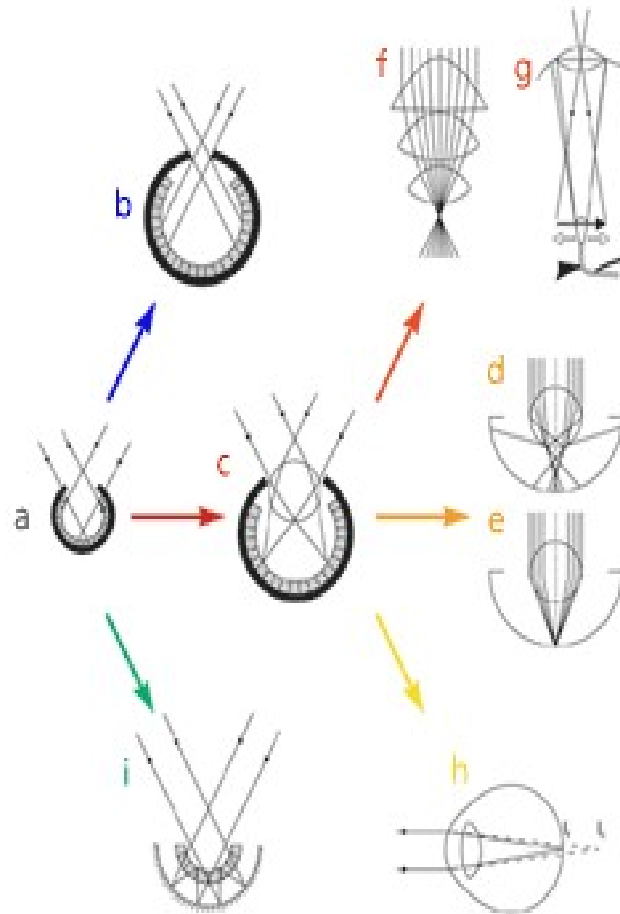
- Evolucija.
- Zgradba.
- Občutljivost in ločljivost.
- Napake.
- Kako poskrbeti za oči pred opazovanjem?

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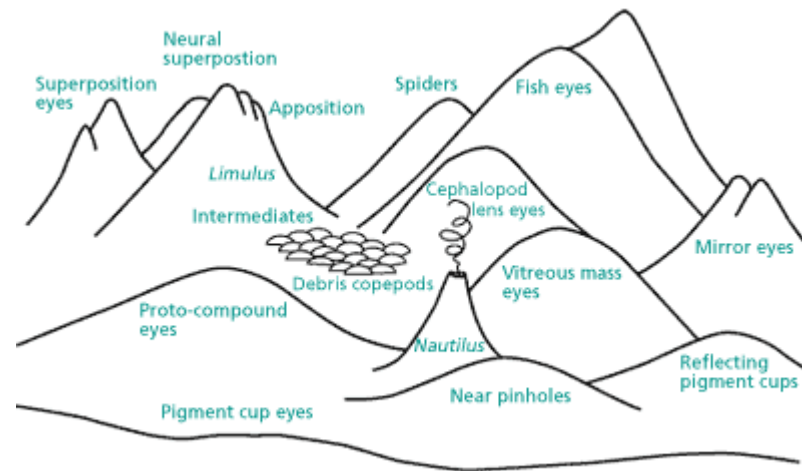
- Evolucija oči.
 - Oko se je razvilo v vodi.
 - Biokemični mehanizmi so se od takrat le malo spremenili.
 - Razvoj oči se je razcvetel v kambriju.



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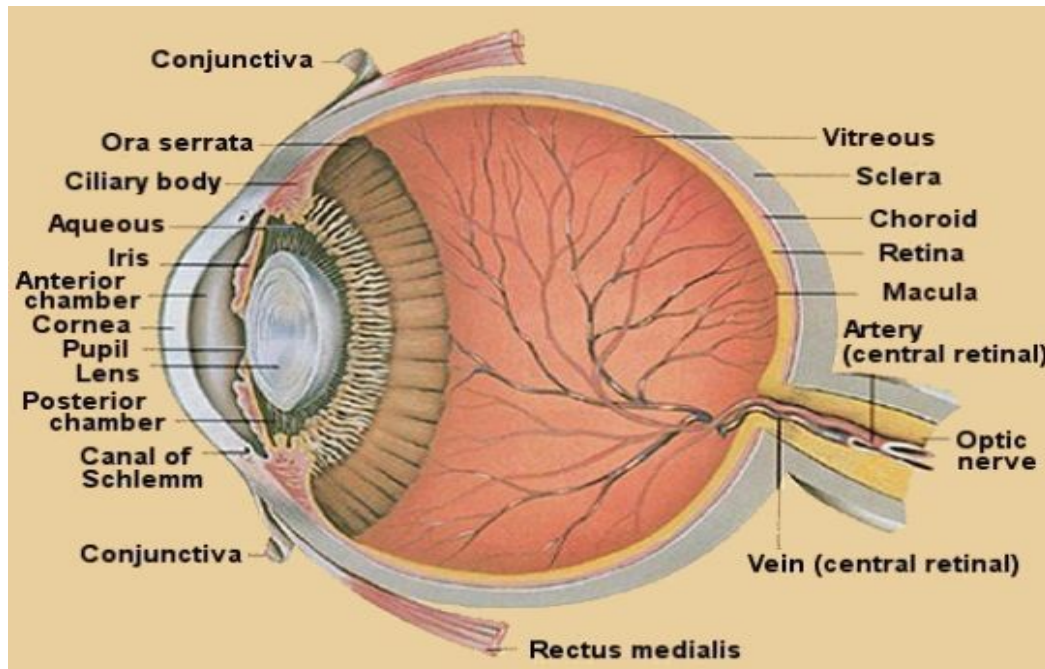
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- Najpopolnejše oko je tipa kamere.
 - Za tako oko je potrebna velika glava.

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- Zgradba očesa



www.discoveryfund.com/anatomyoftheeye.html

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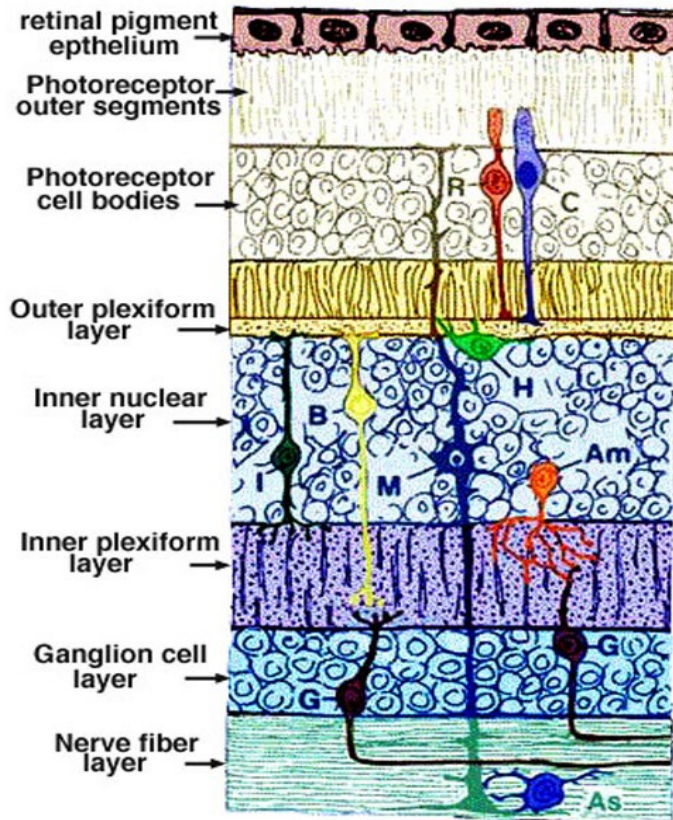


Fig. 5. Scheme of the layers of the developing retina around 5 months' gestation (Modified from Odgen, 1989).

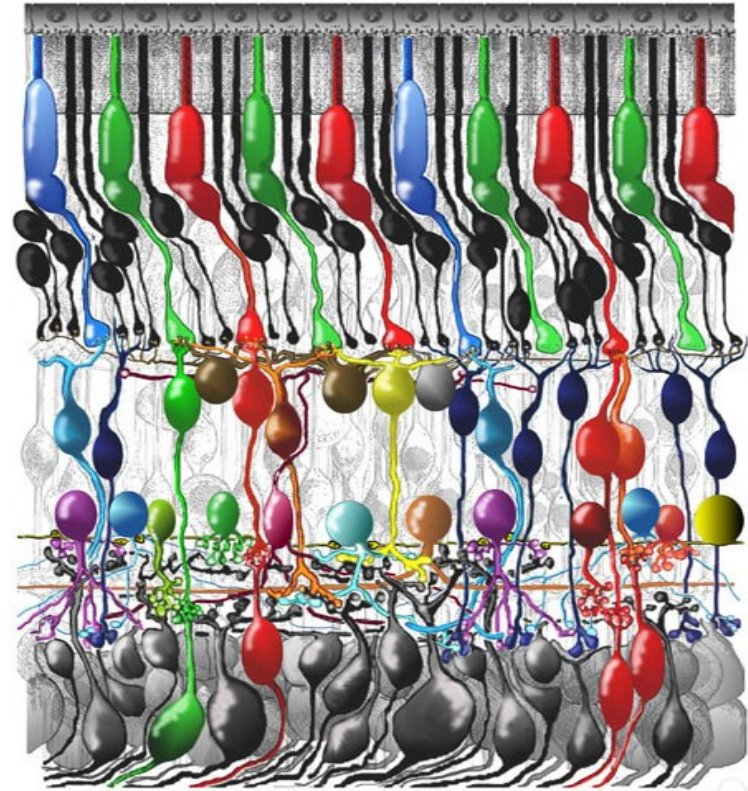


Fig. 5. Drawing of a vertical section through the human retina to show the organization of the different neurons and glial cells constituting it.

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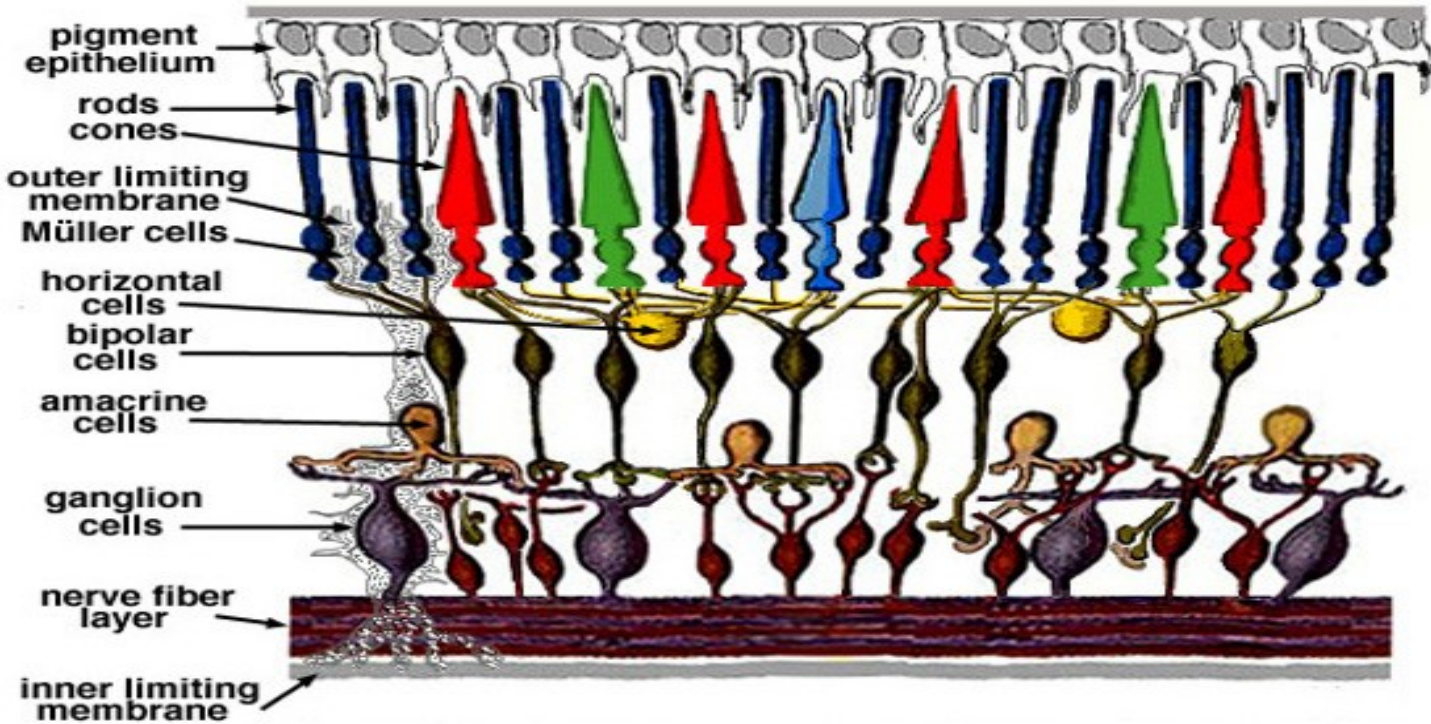
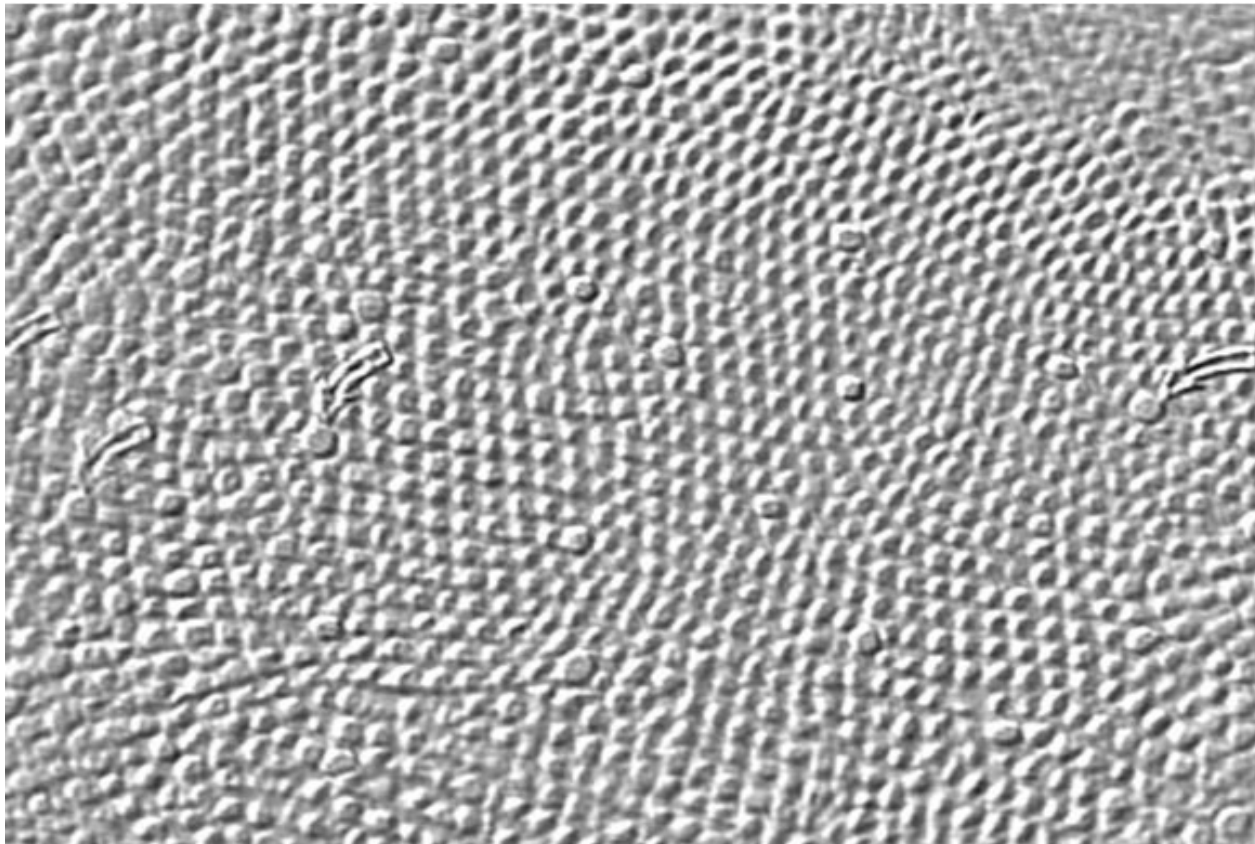


Fig. 2. Simple diagram of the organization of the retina.

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***Fig. 13. Tangential section through the human fovea.
Larger cones (arrows) are blue cones.***

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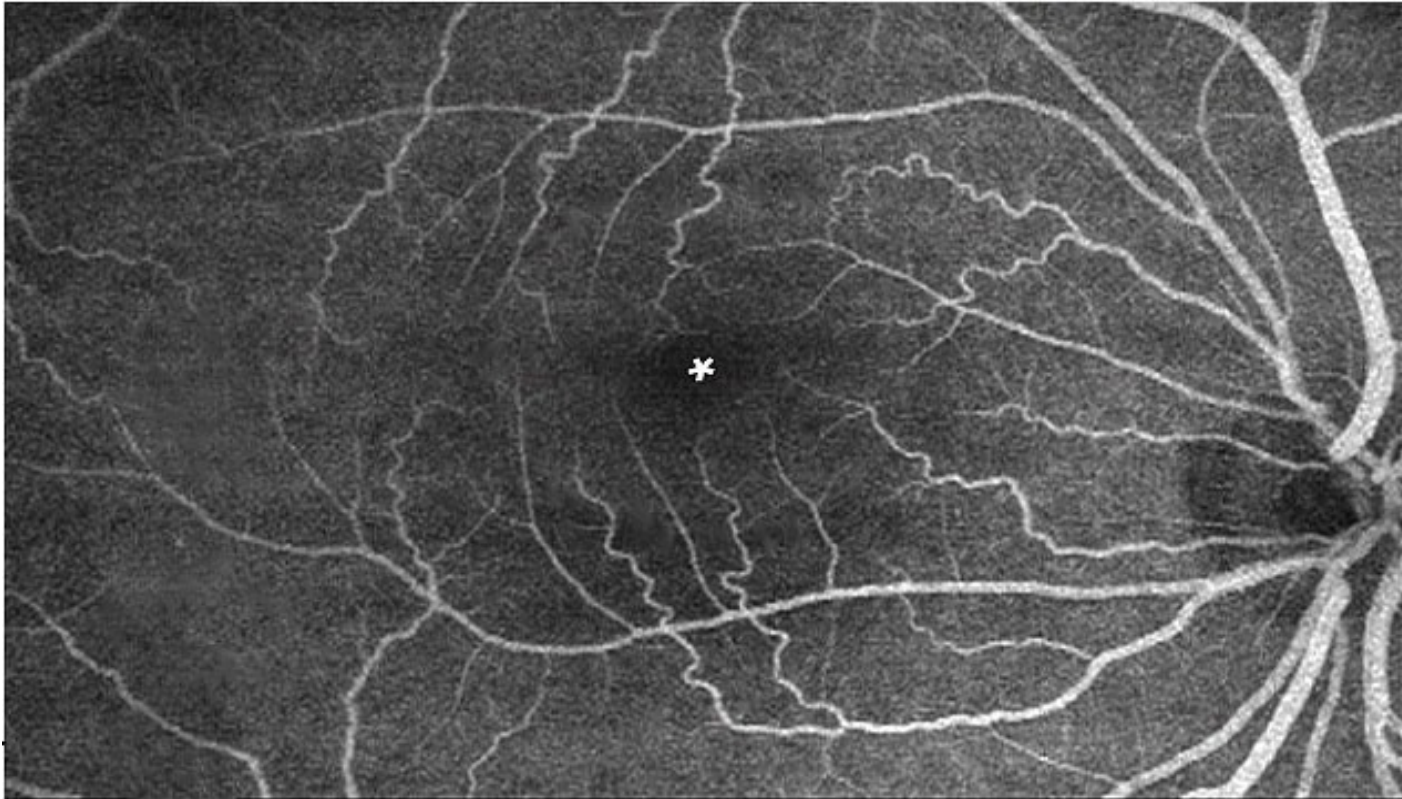


Fig. 17. Fundus photograph showing fluorescein imaging of the major arteries and veins in a normal human right eye retina. The vessels emerge from the optic nerve head and run in a radial fashion curving towards and around the fovea (asterisk in photograph). (Image courtesy of Isabel Pinilla, Spain).

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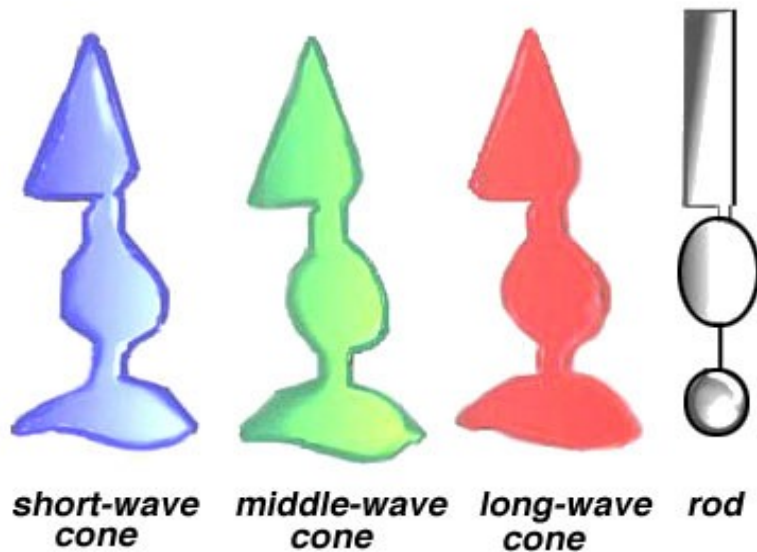


Fig. 13. There are four photoreceptor types in the human retina. Short-wavelength cones (blue), medium wavelength cones (green), long wavelength cones (red) and rods.

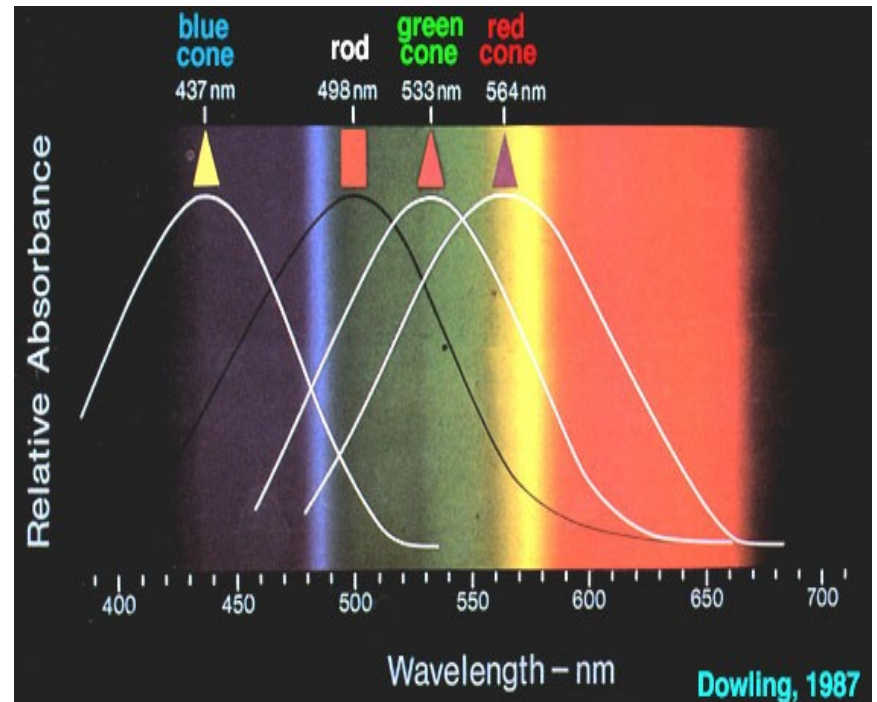


Fig. 14. The peak spectral sensitivities of the the 3 cone types and the the rods in the primate retina (Brown and Wald, 1963). From Dowling's book (1987).

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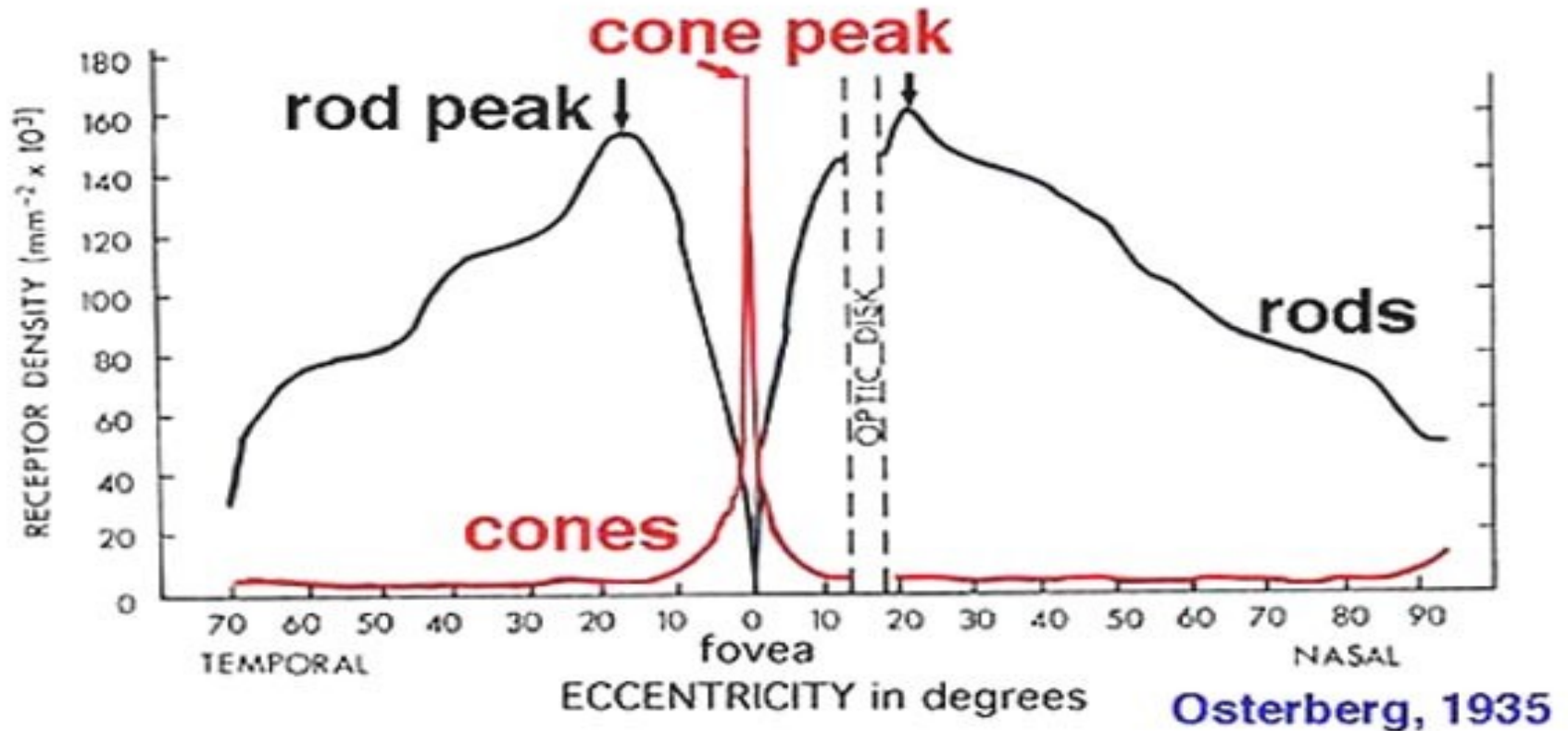


Fig. 20. Graph to show rod and cone densities along the horizontal meridian.

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- Občutljivost in ločljivost
 - Okoli 600 megapikslov
 - Osvetlitev traja približno 1/10 sekunde
 - Palčice zaznajo že nekaj fotonov
 - Občutljivost je približno ISO 800
 - Občutljivost čepkov je približno ISO 1
 - Kotna ločljivost okoli 40"
 - Ločljivost v nivojih: 10.000, absolutna vsaj 15 m
 - $F = 22\text{mm}$, $f/3,2$ – $f/22$

Oko – prvi astronomski inštrument

- Napake oči (ki zanimajo predvsem nas)
 - Kratkovidnost
 - popravimo z izostritvijo
 - Daljnovidnost
 - popravimo z izostritvijo
 - Astigmatizem
 - popravimo z očali ali lečo, ki jo dodamo za okular

Oko – prvi astronomski inštrument

- Kako poskrbeti za oči pred opazovanjem?
 - Prehranjuj se pravilno (korenje, borovnice 😊)
 - Ne kadi, ne pij alkohola
 - Čez dan se izogni močni svetlobi
 - Ponoči si pomagaj
 - z gusarsko obvezo
 - s krpo čez glavo
 - Pred opazovanjem za nekaj minut zapri oči
 - Ostani miren in sproščen
 - **Ne uporablaj atropina!**

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- Vprašanja?