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CLINICAL FEATURES OF VISUAL AND OCULAR MOTOR DISORDERS

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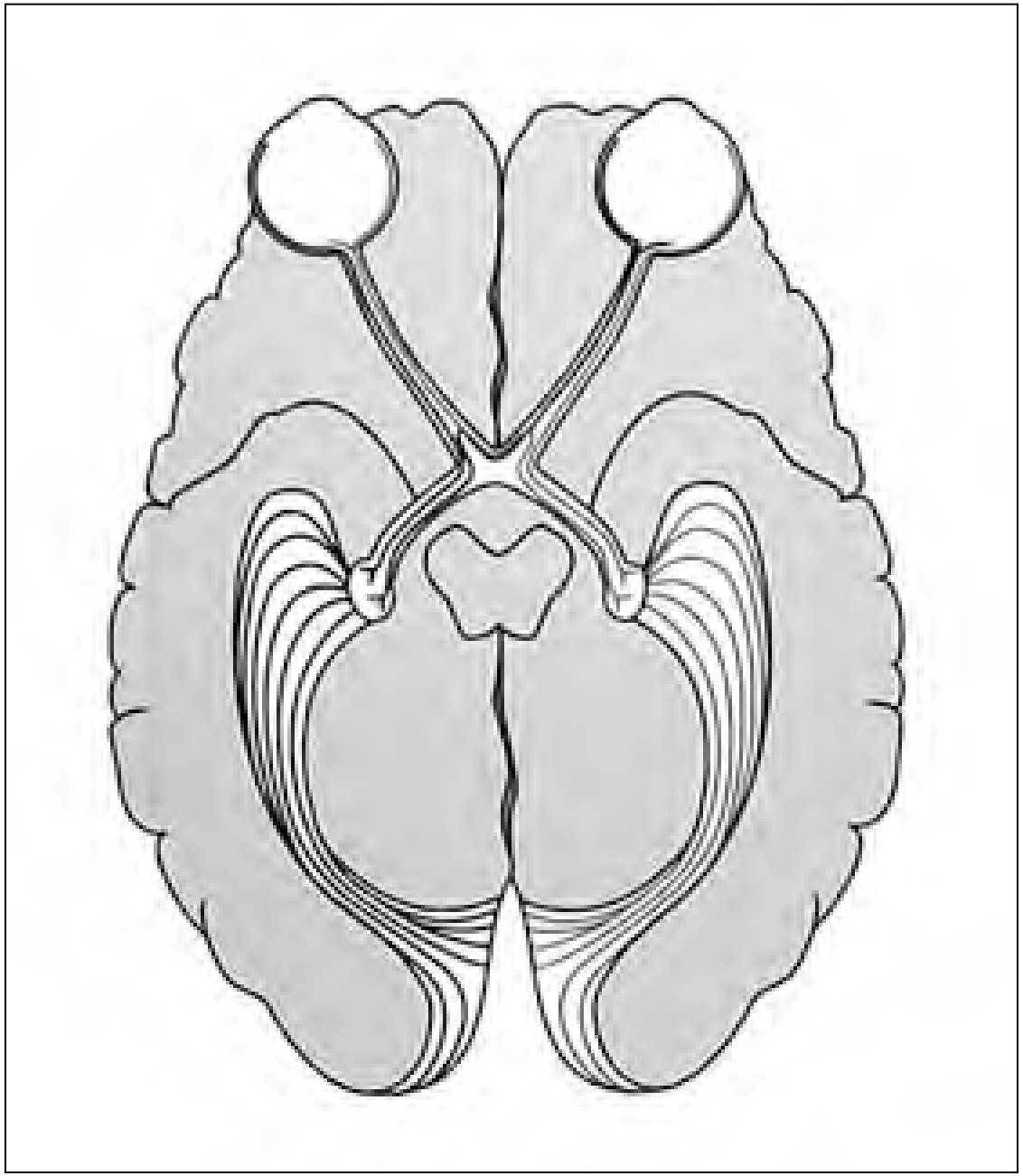
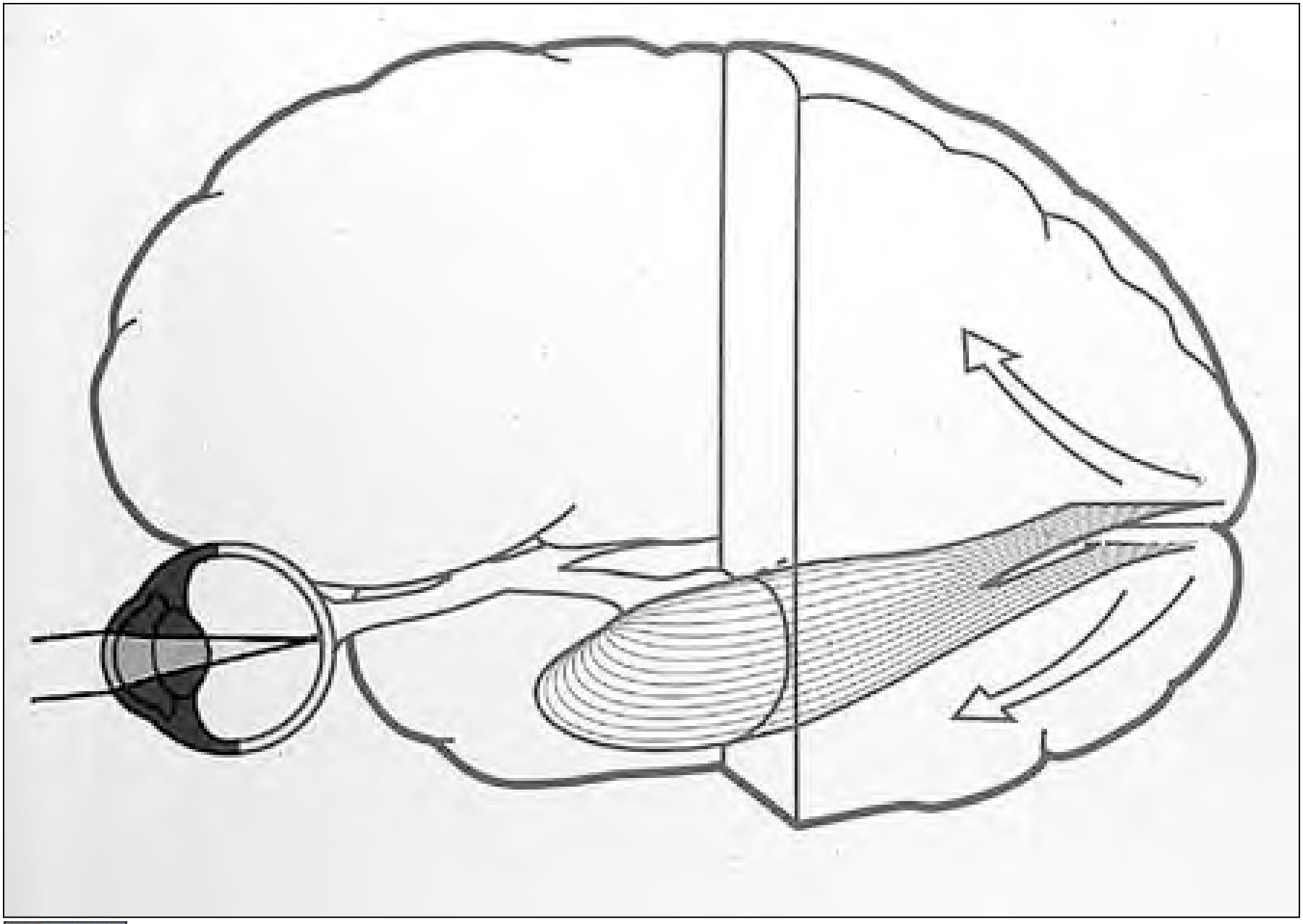
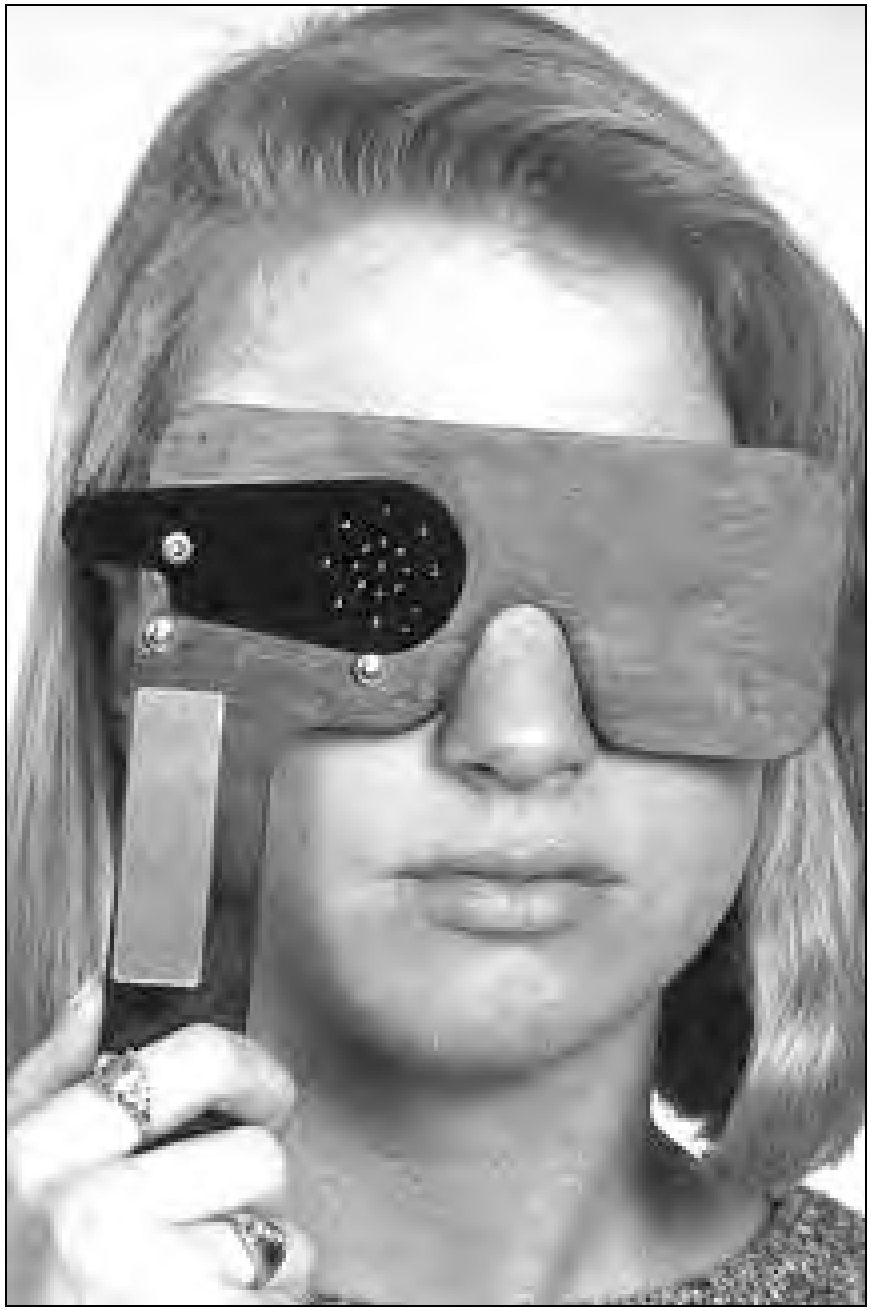
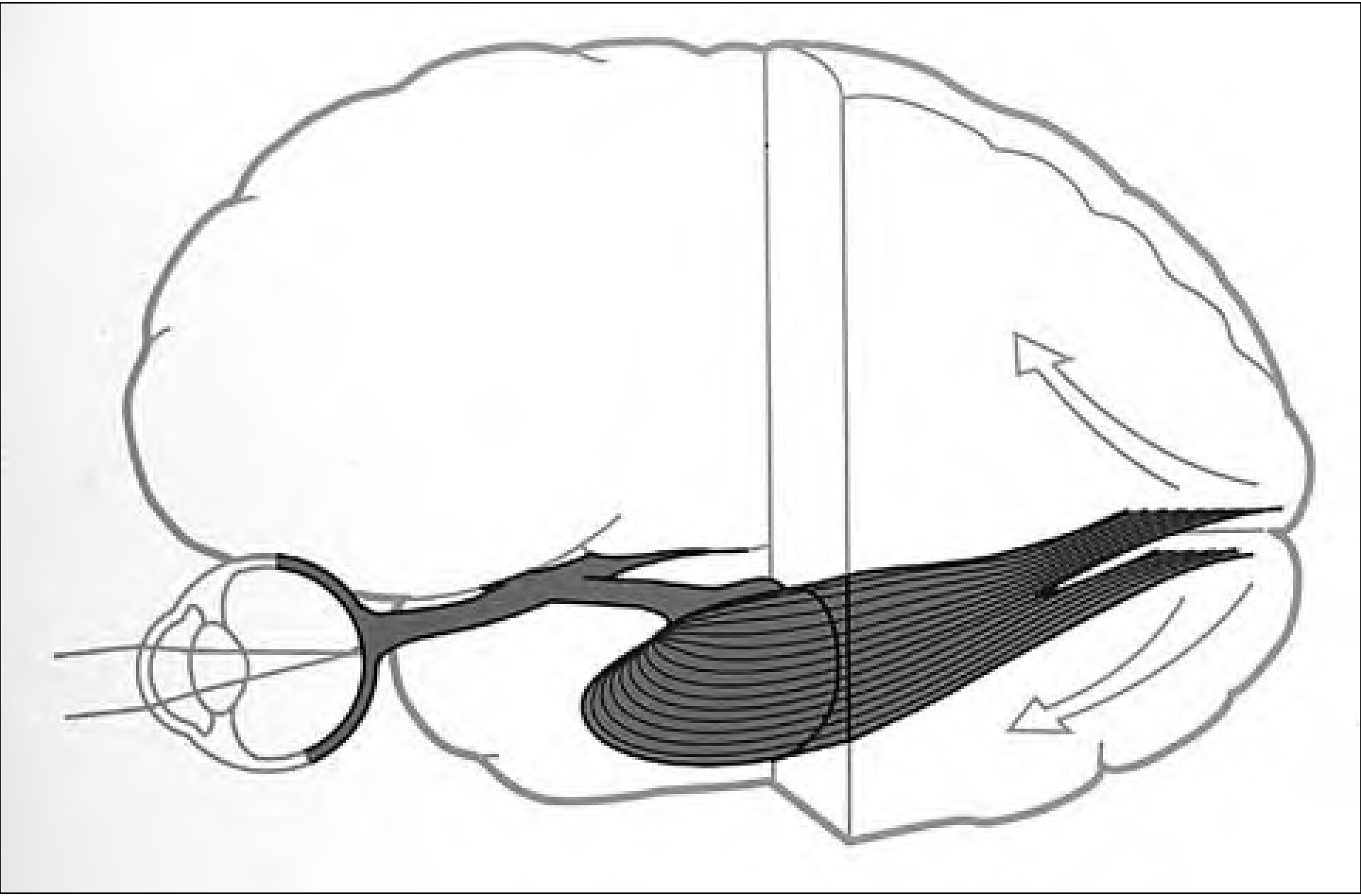
University of Michigan Medical School

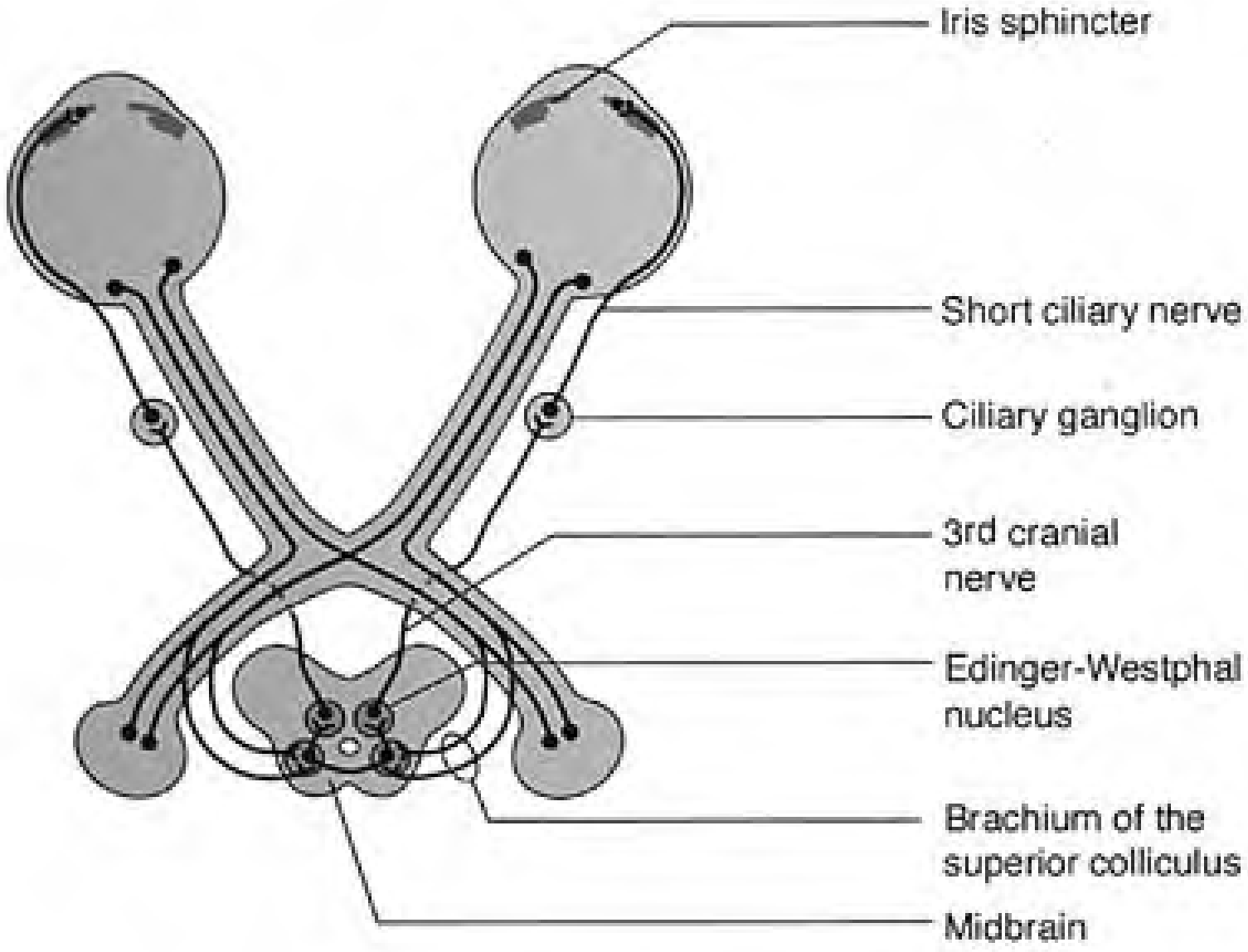
Fall, 2008

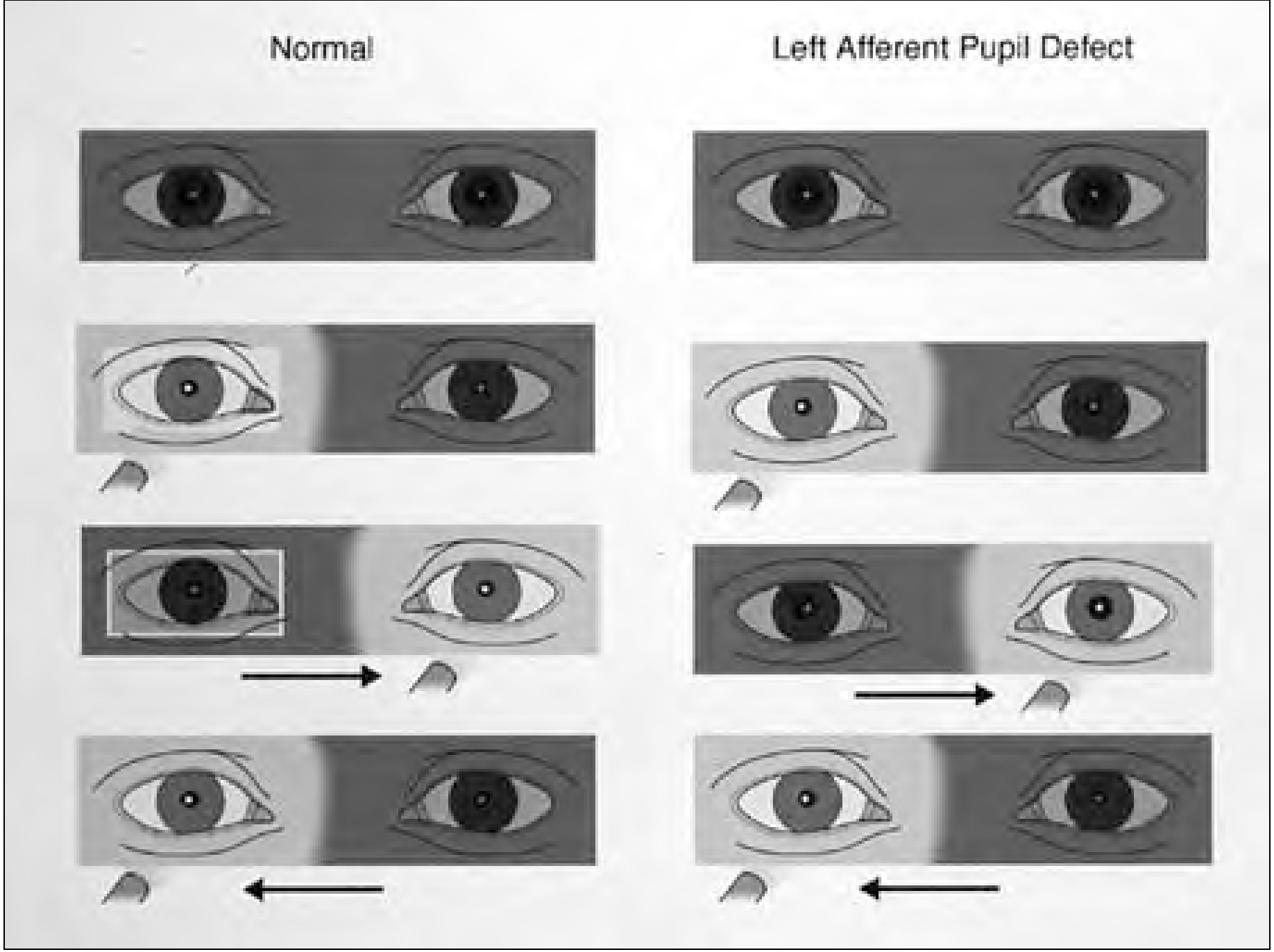












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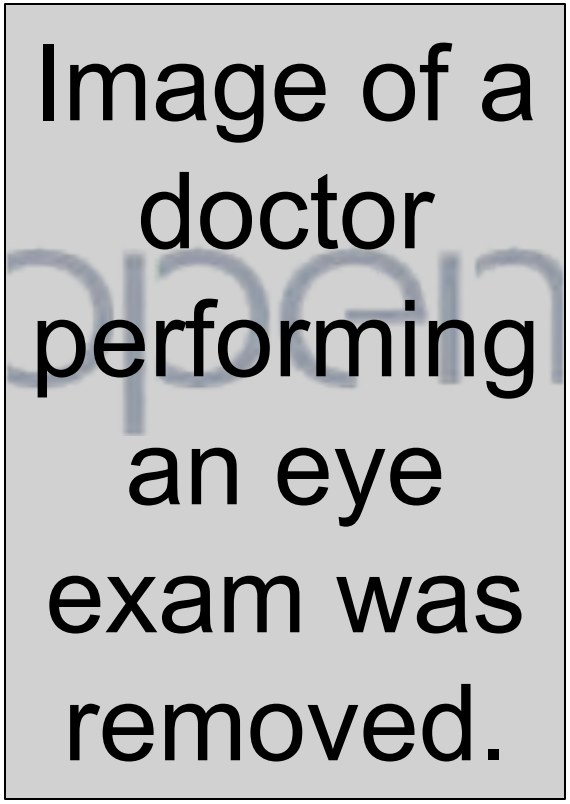
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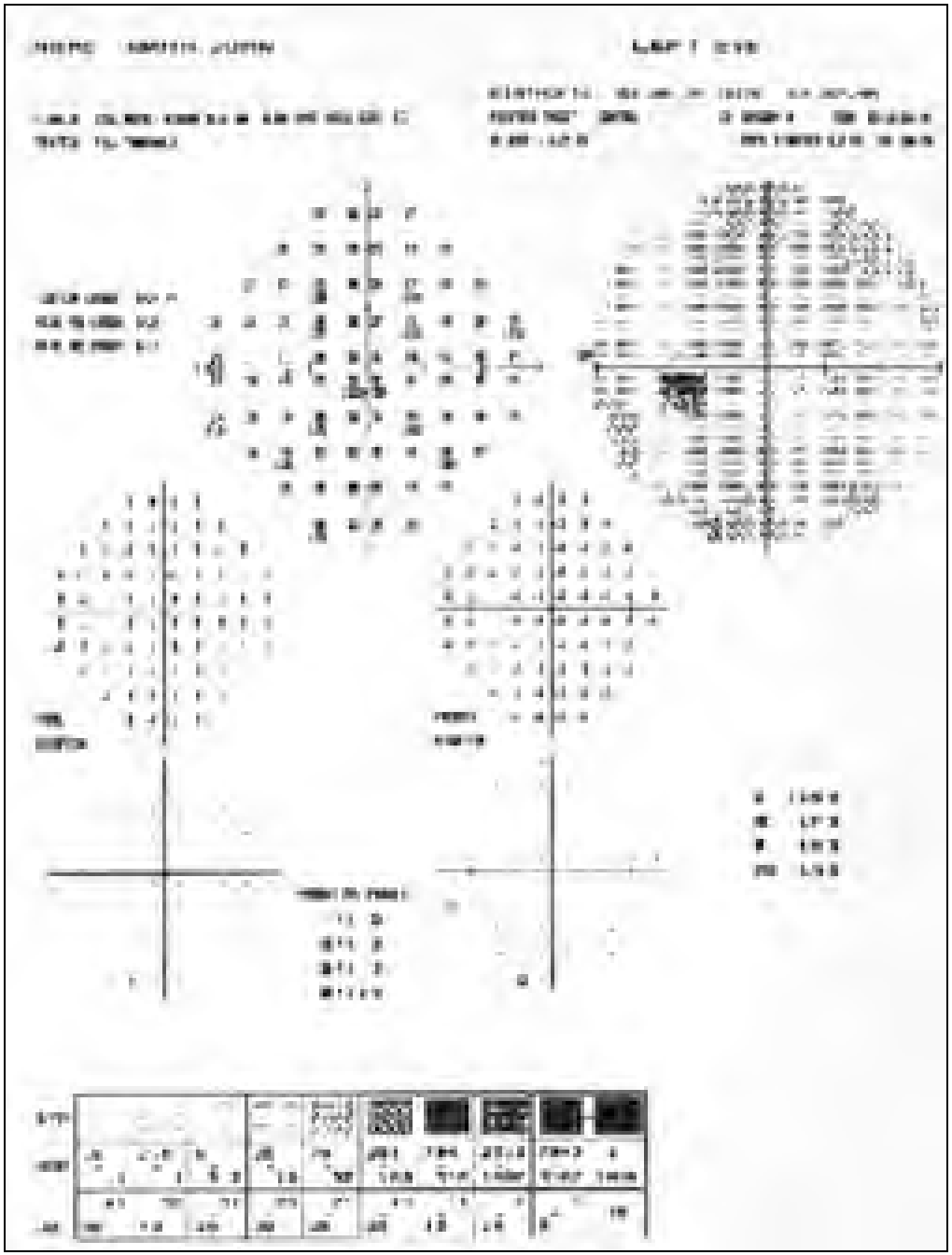
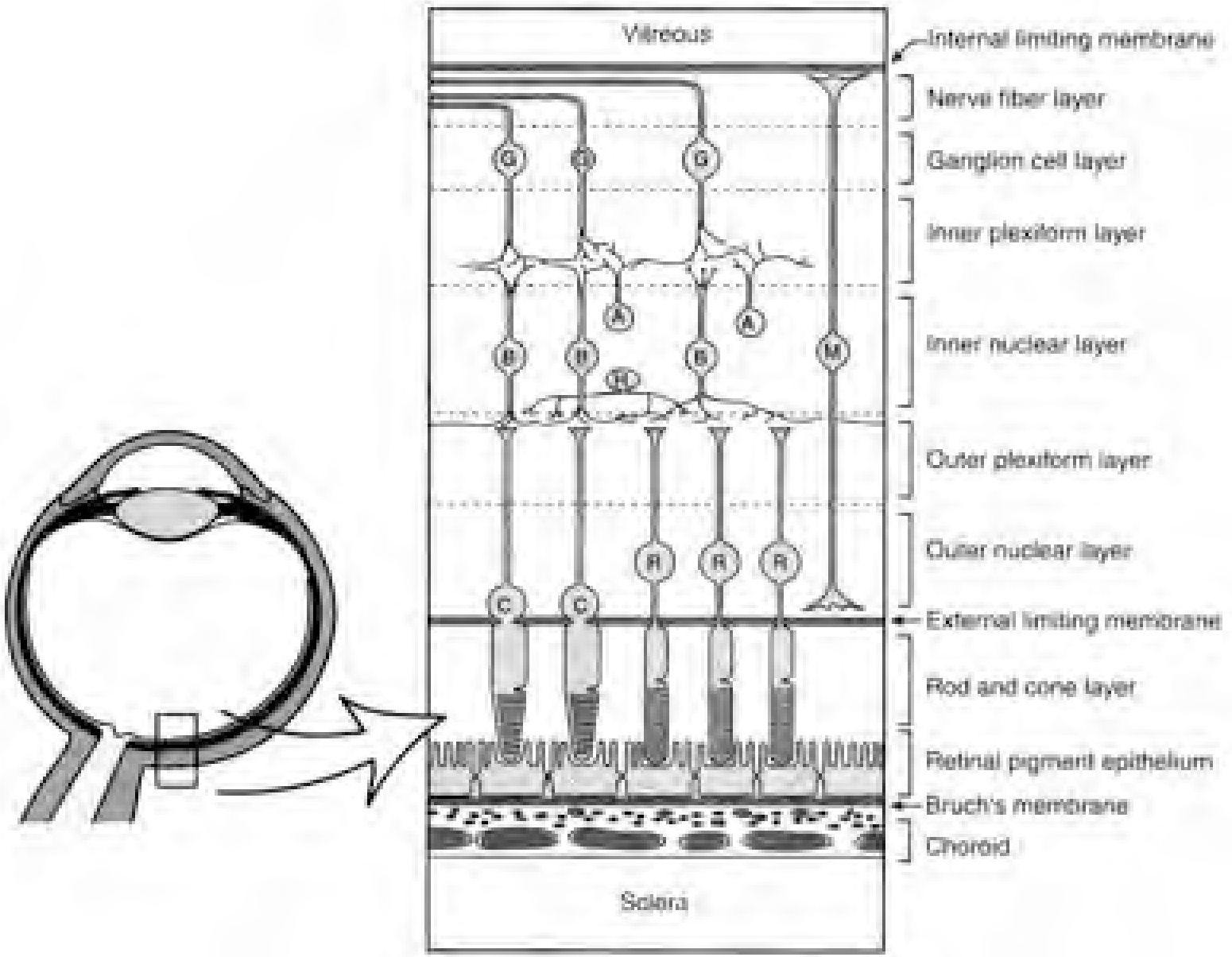
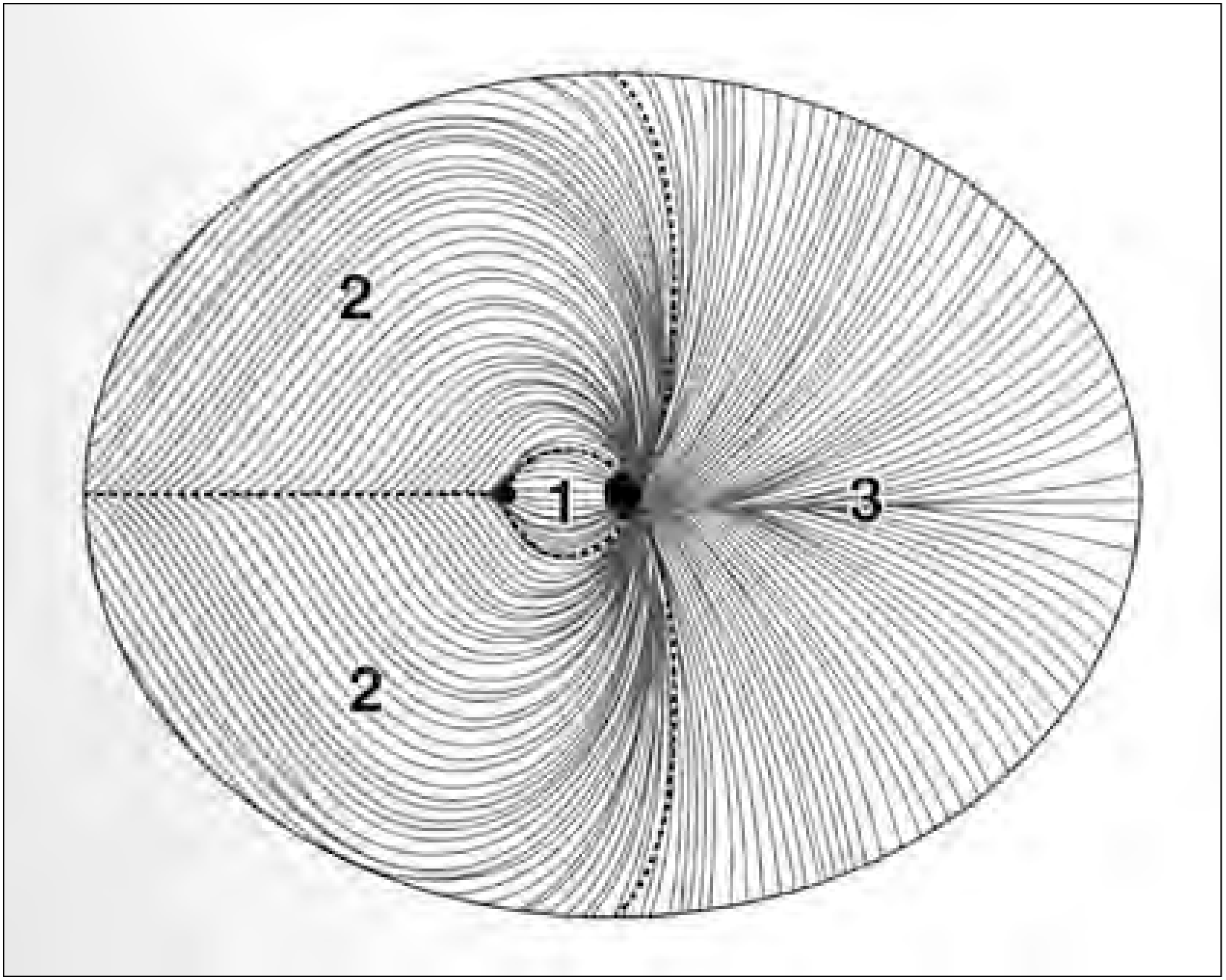
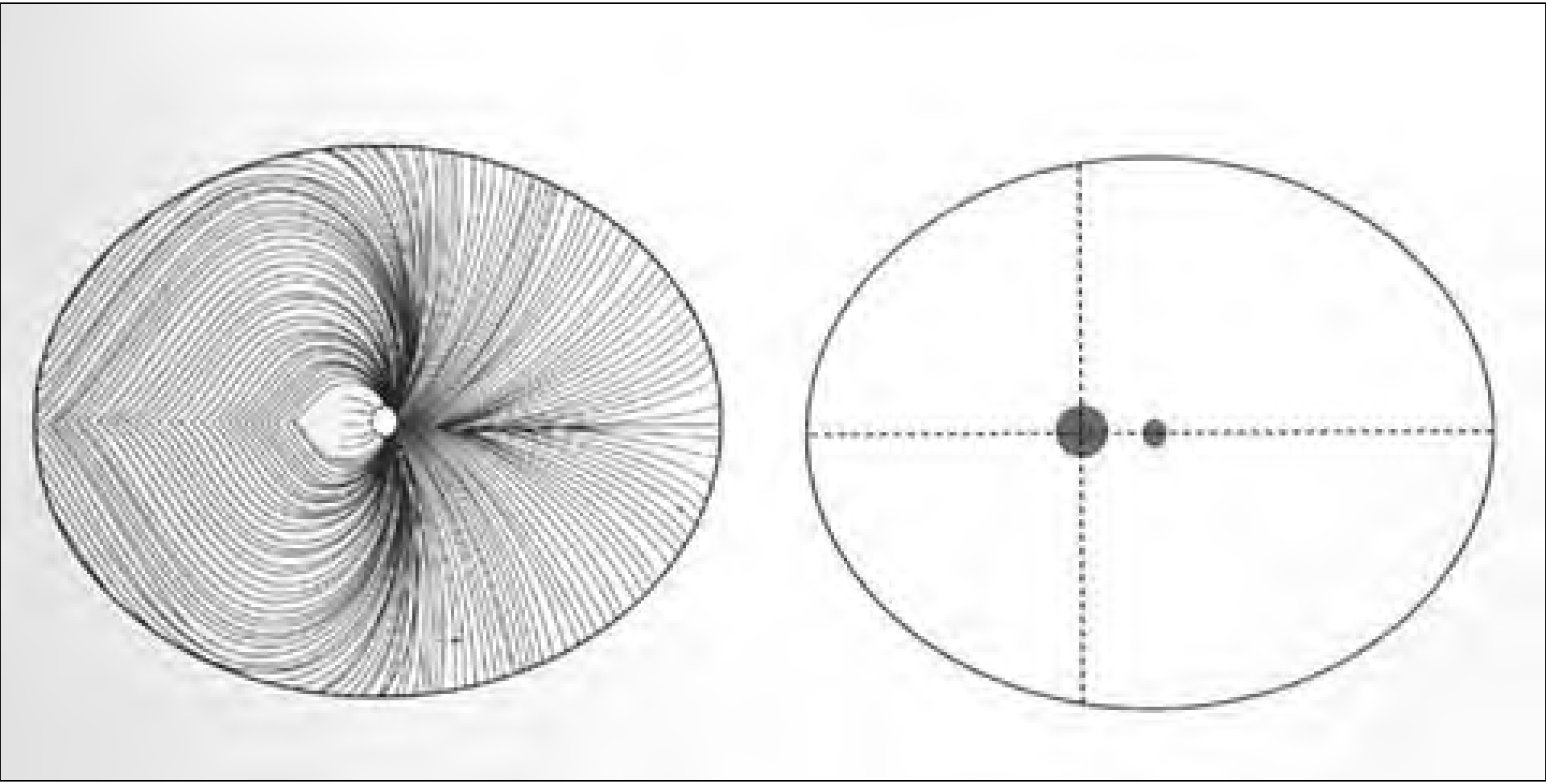
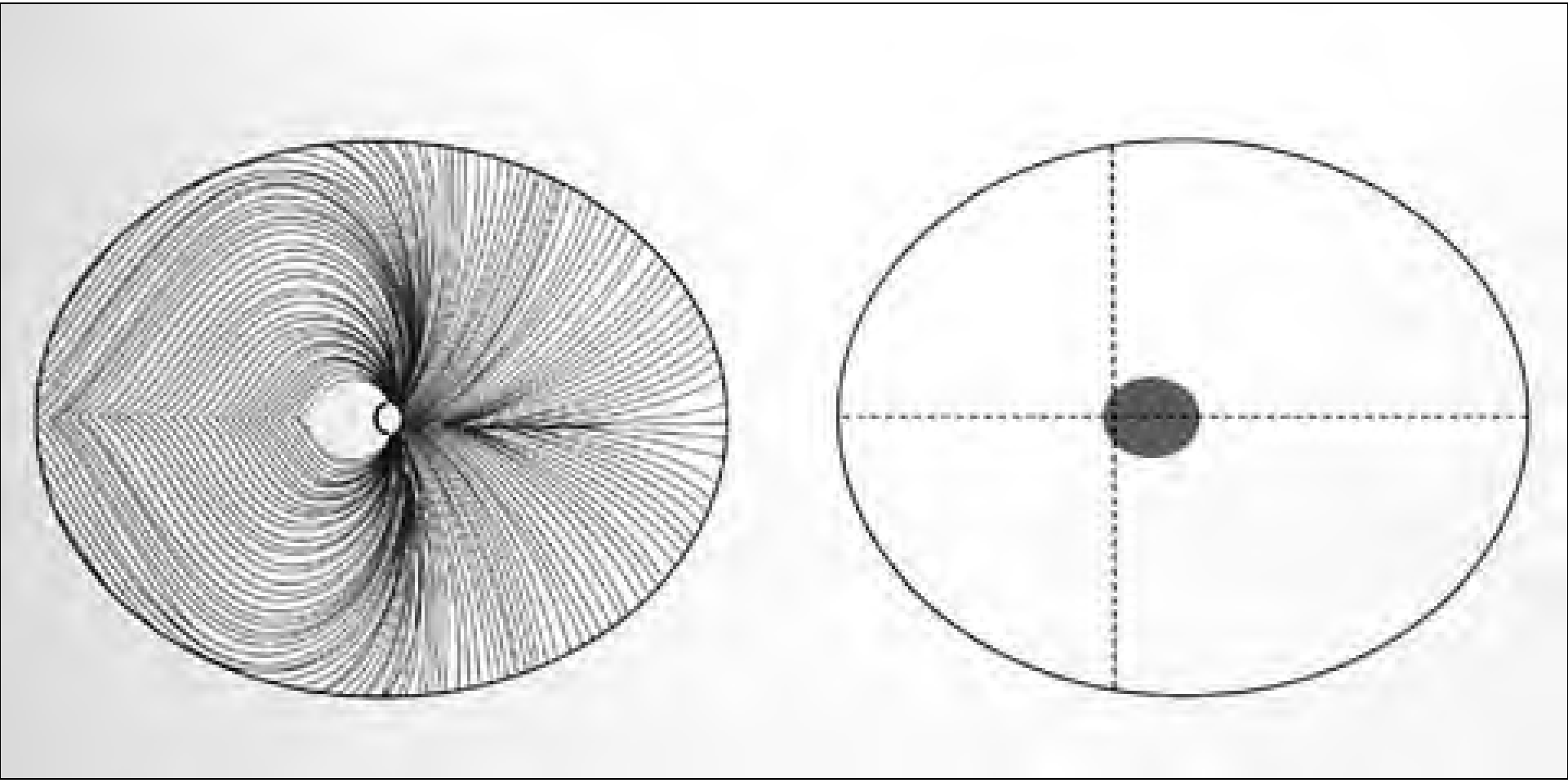
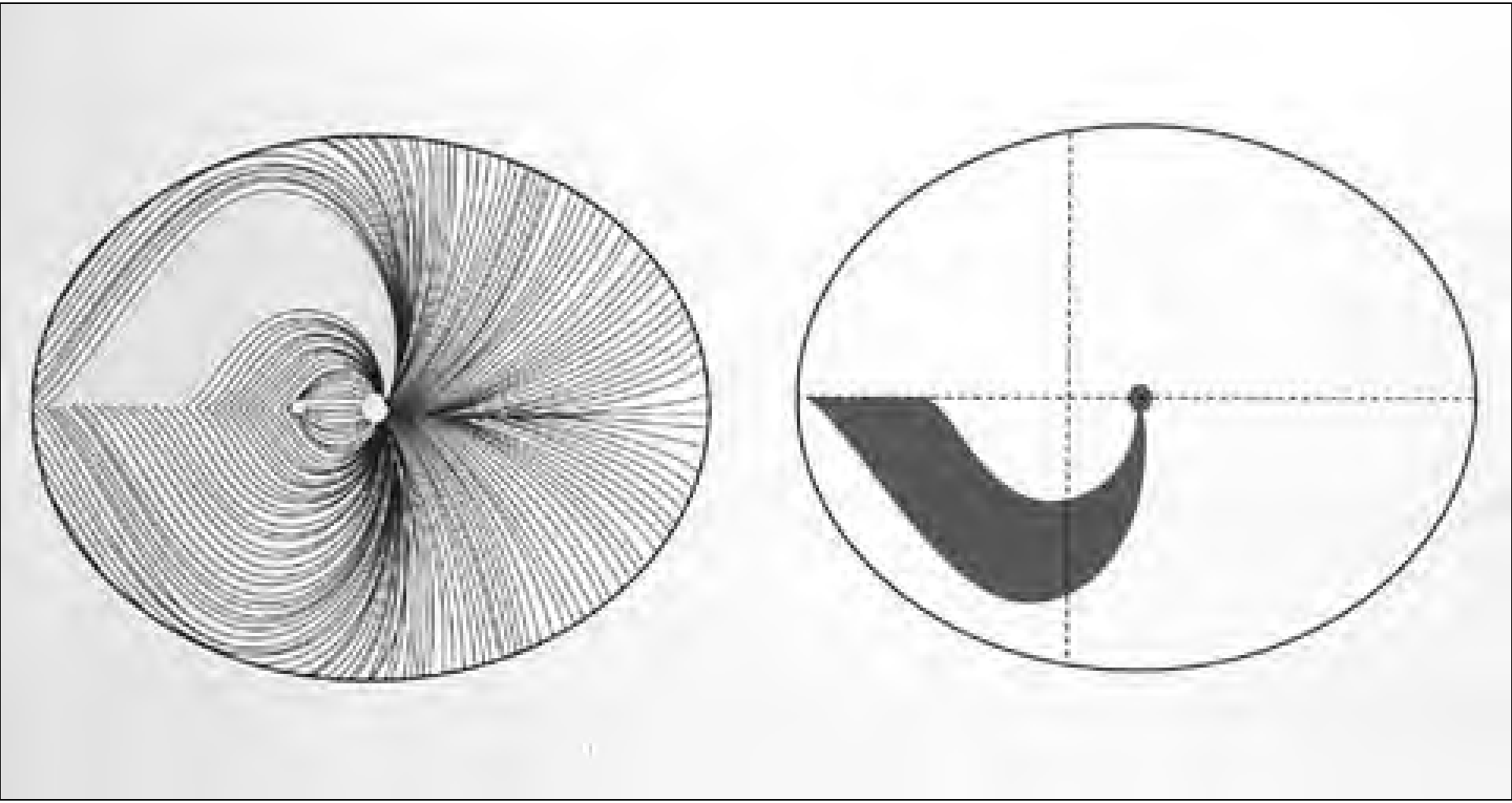


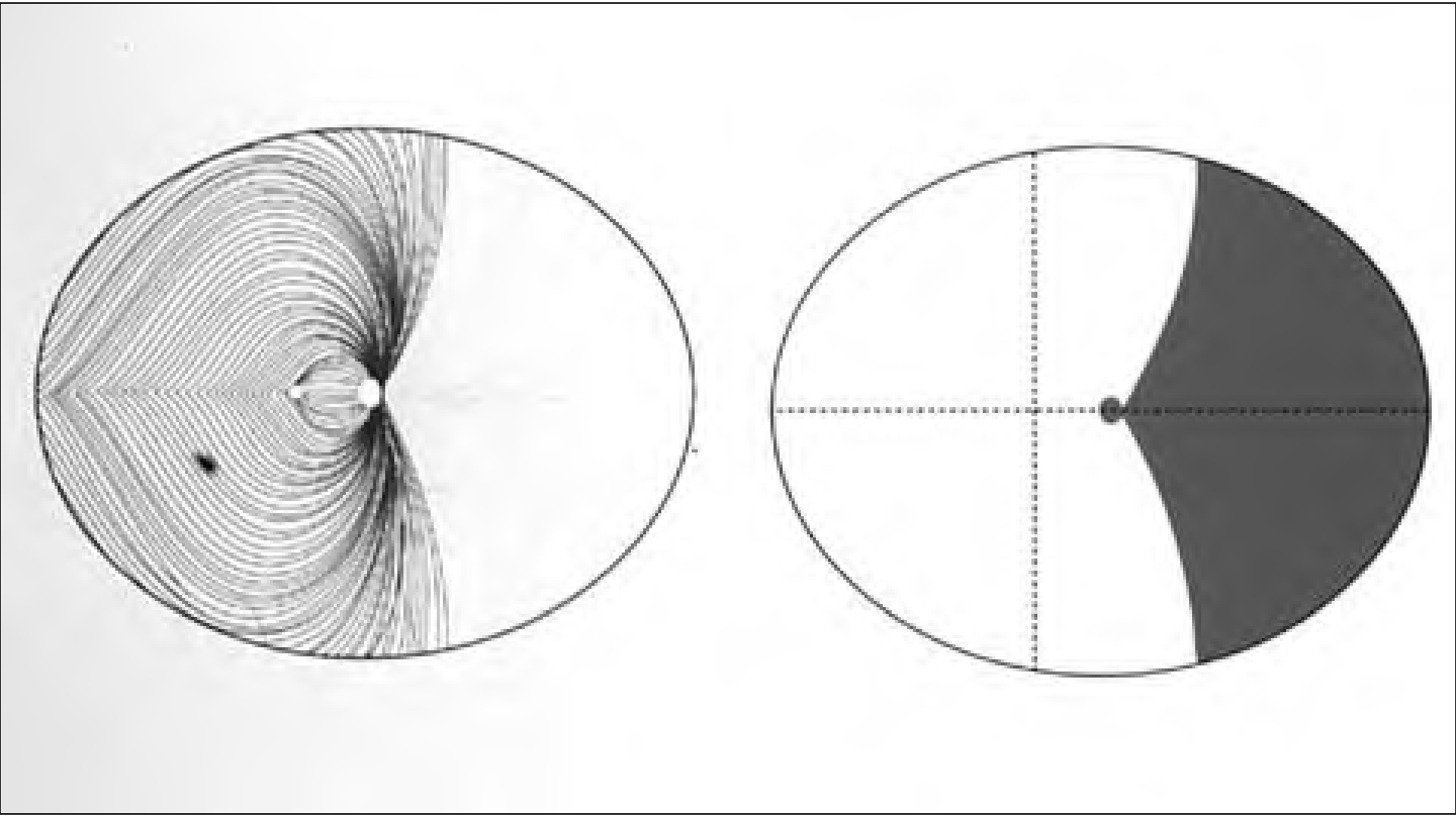


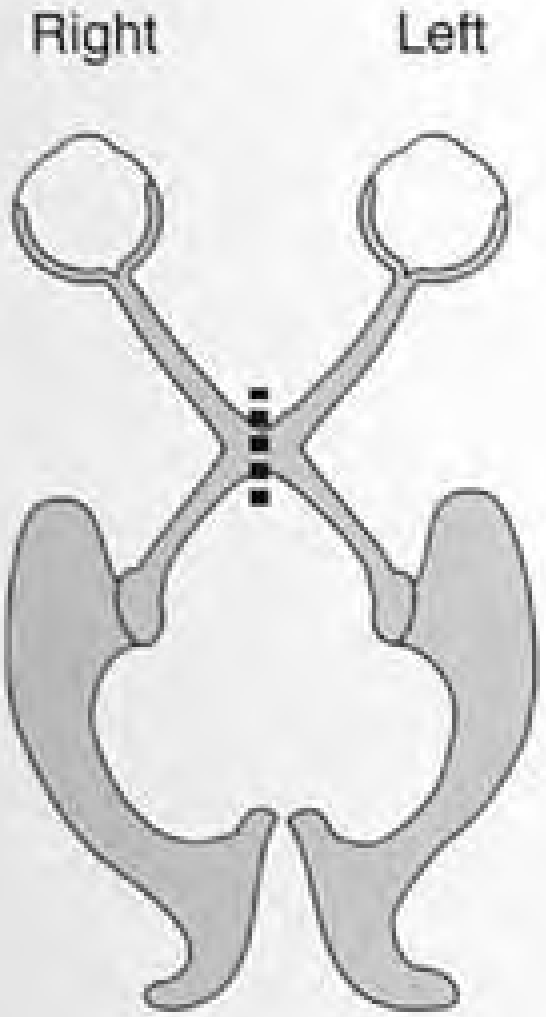


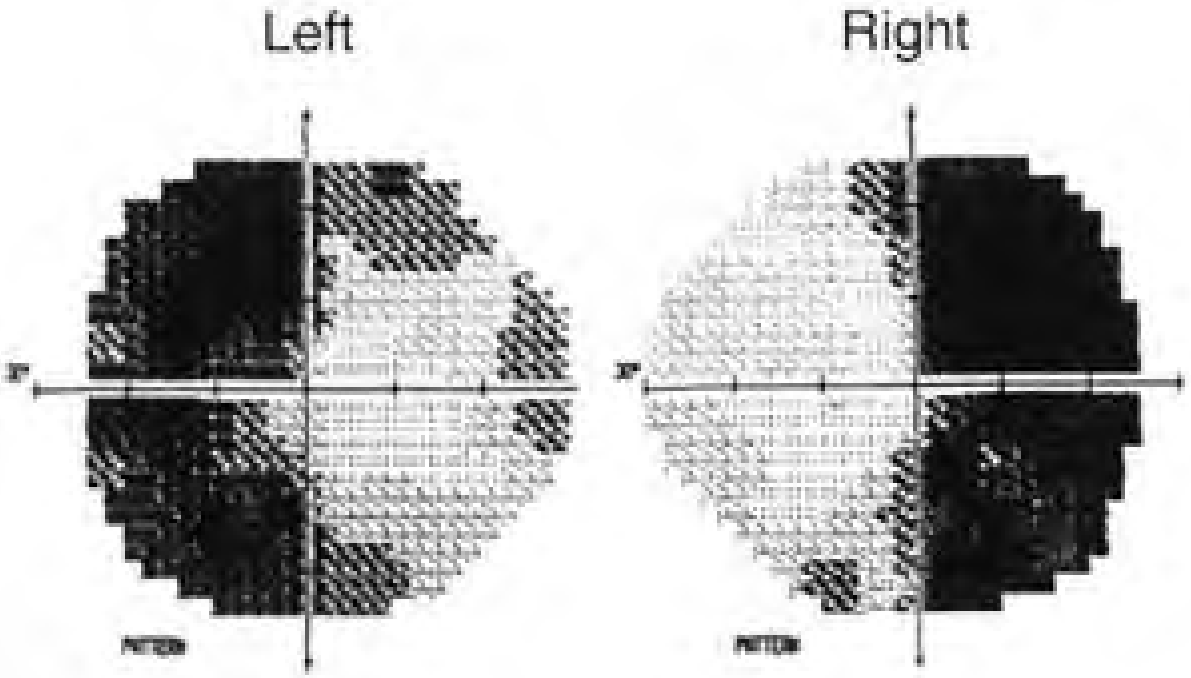




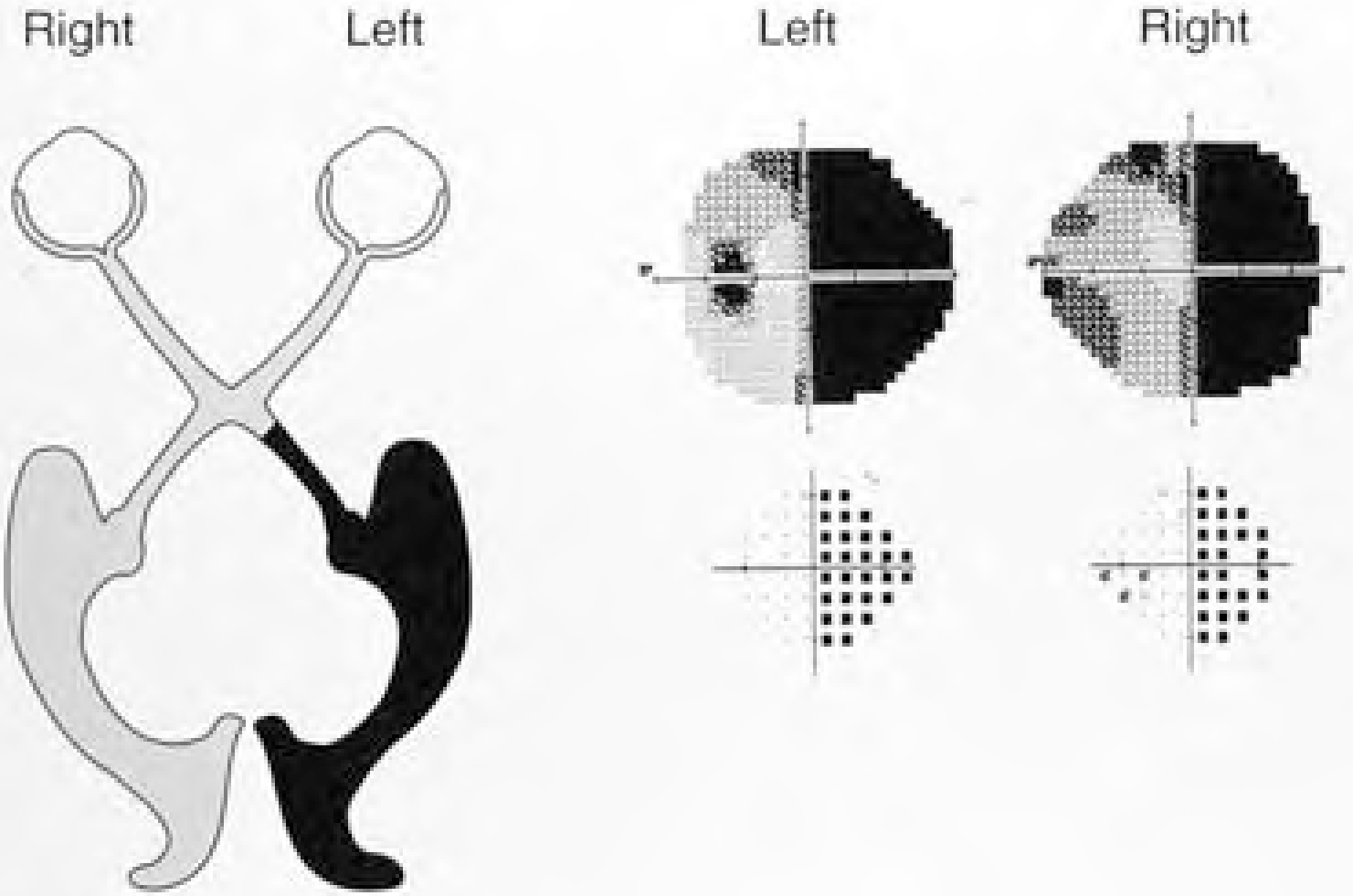


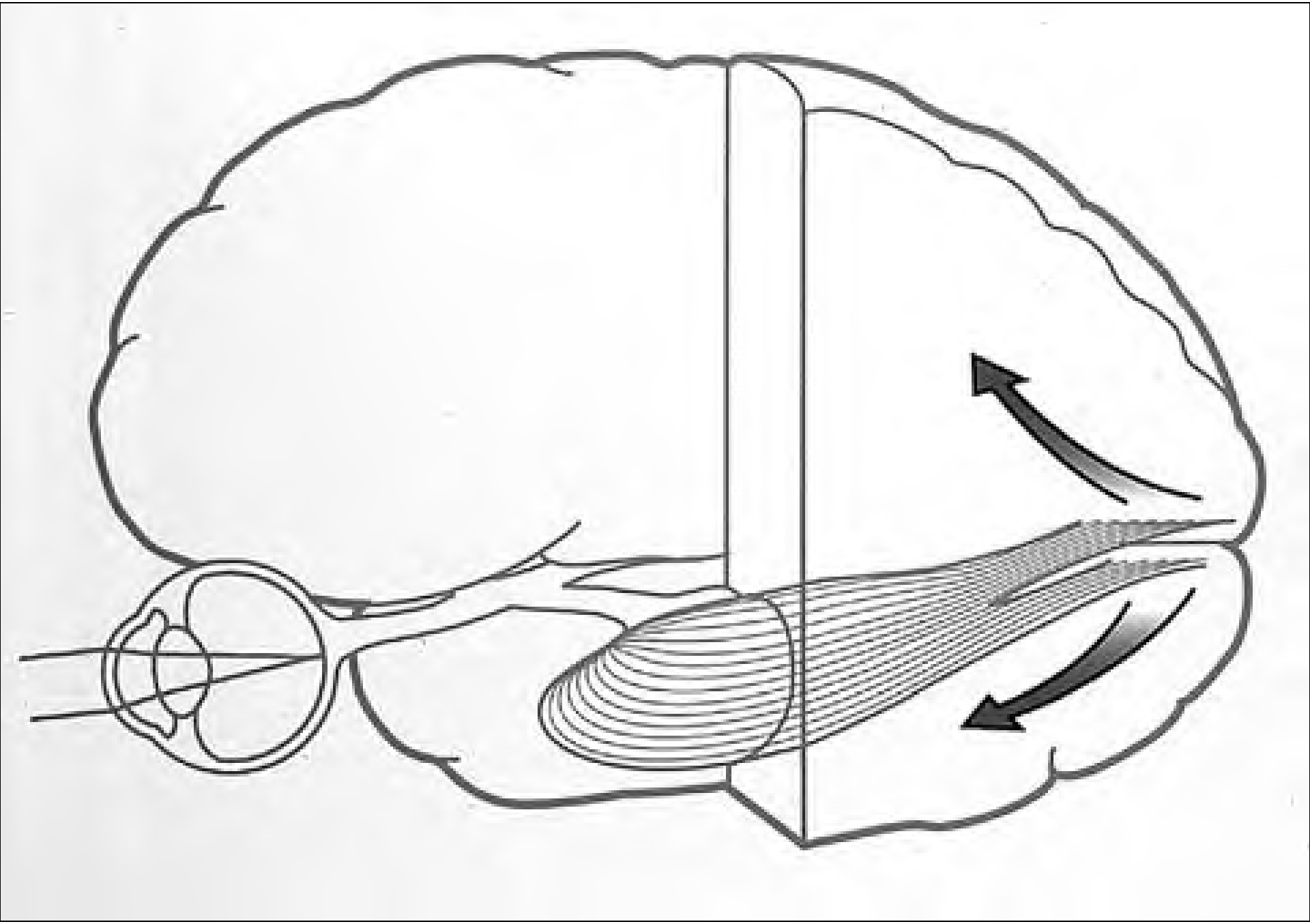


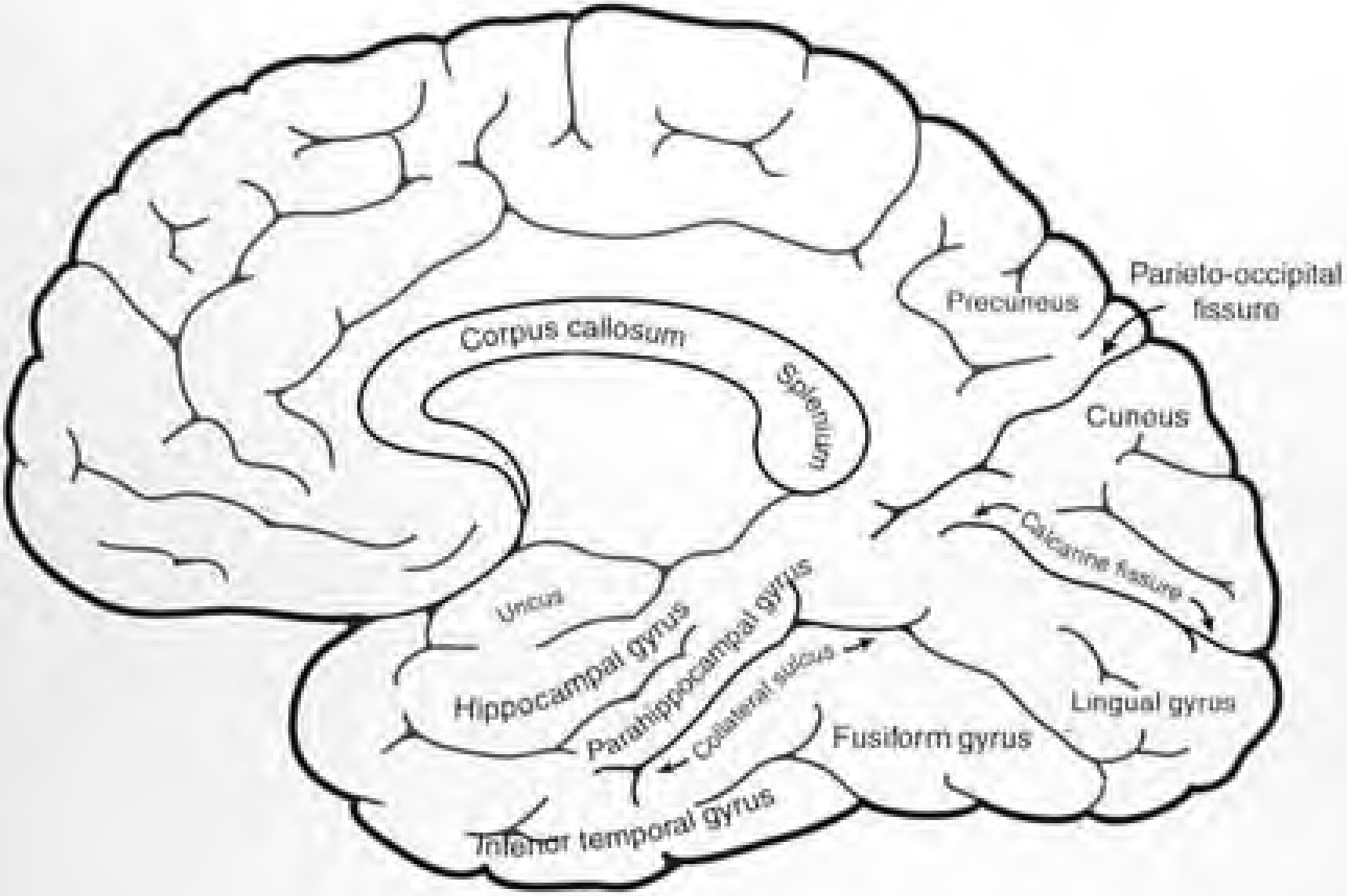


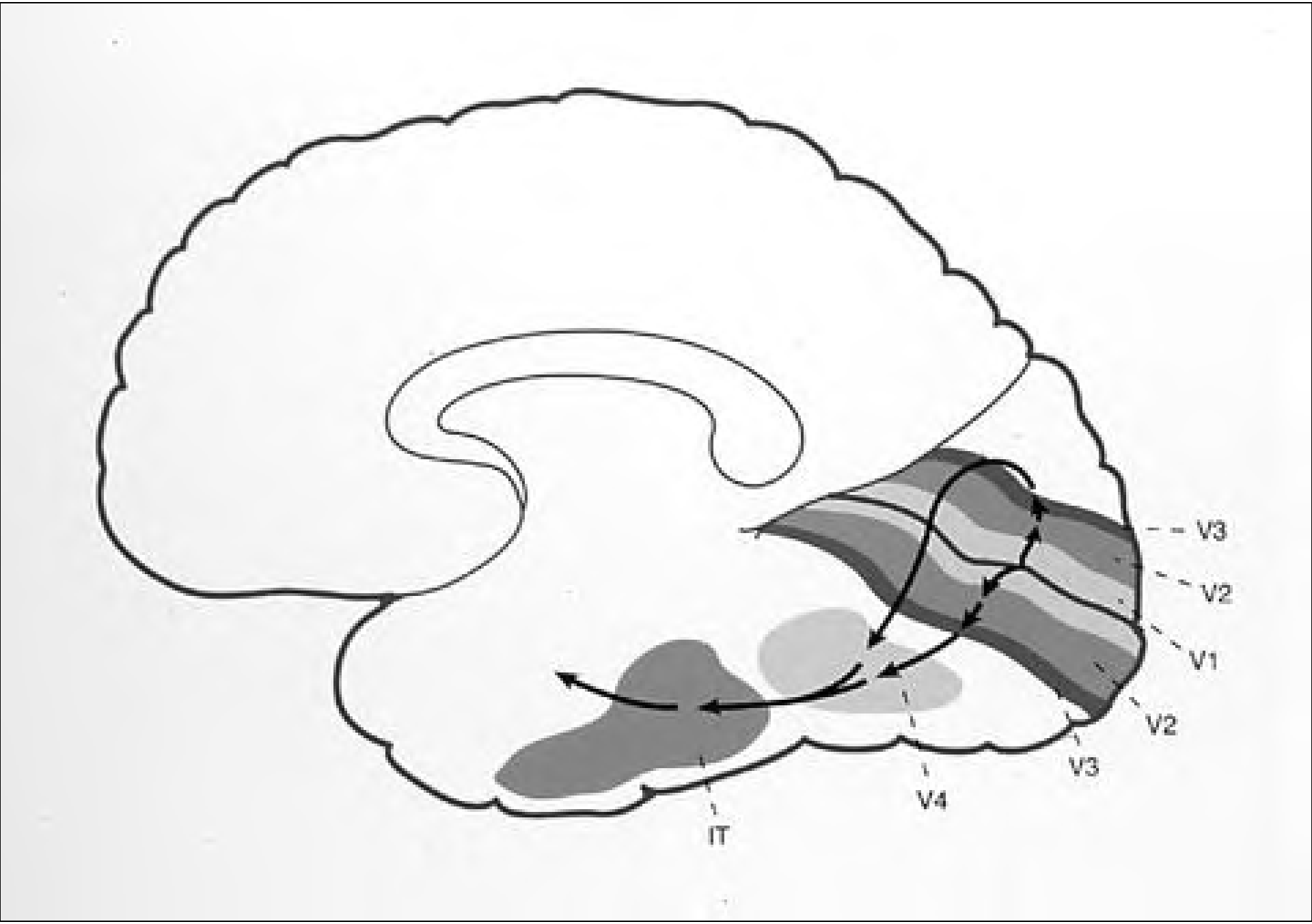


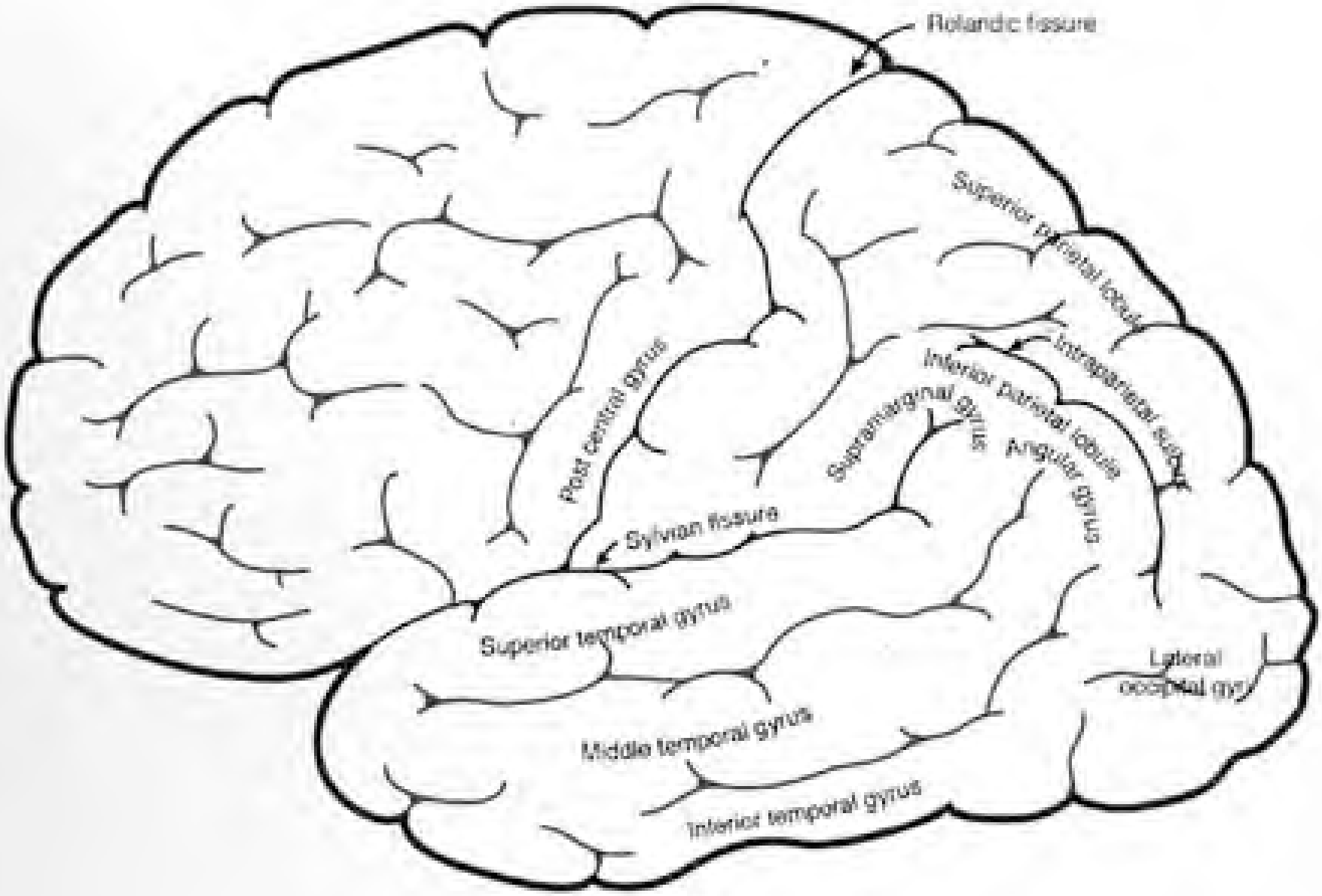
Right Complete Homonymous Hemianopia

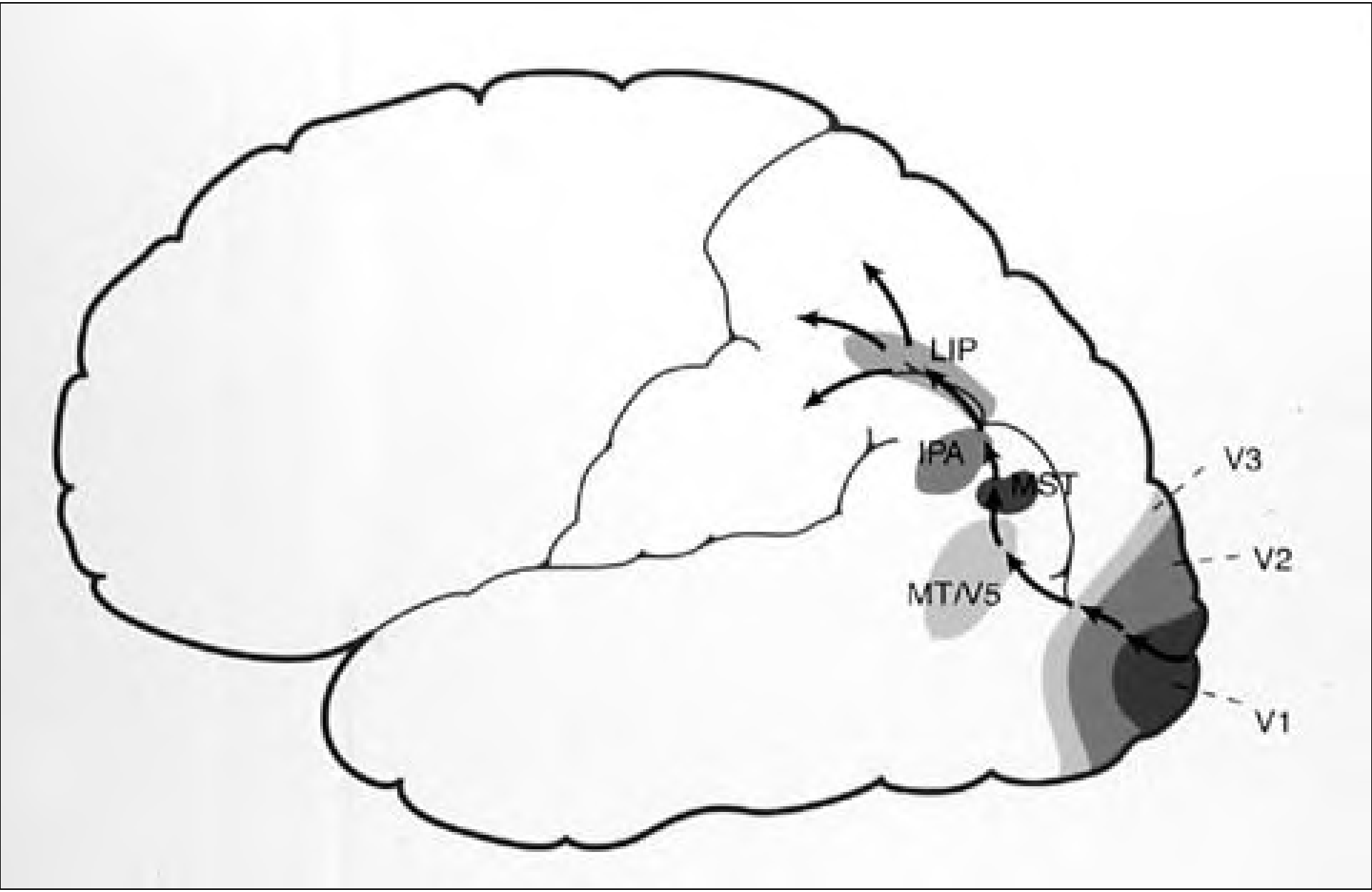












Ocular Motor System

1. Move the Eyes from One Equidistant Target to Another (“Saccades”)
2. Move the Eyes from Distant to Near Target or Vice Versa (“Vergence”)
3. Keep the Eyes on Target When the Target Moves (“Pursuit”)
4. Keep the Eyes on Target When the Head Moves (“Vestibulo-ocular”)

Saccades

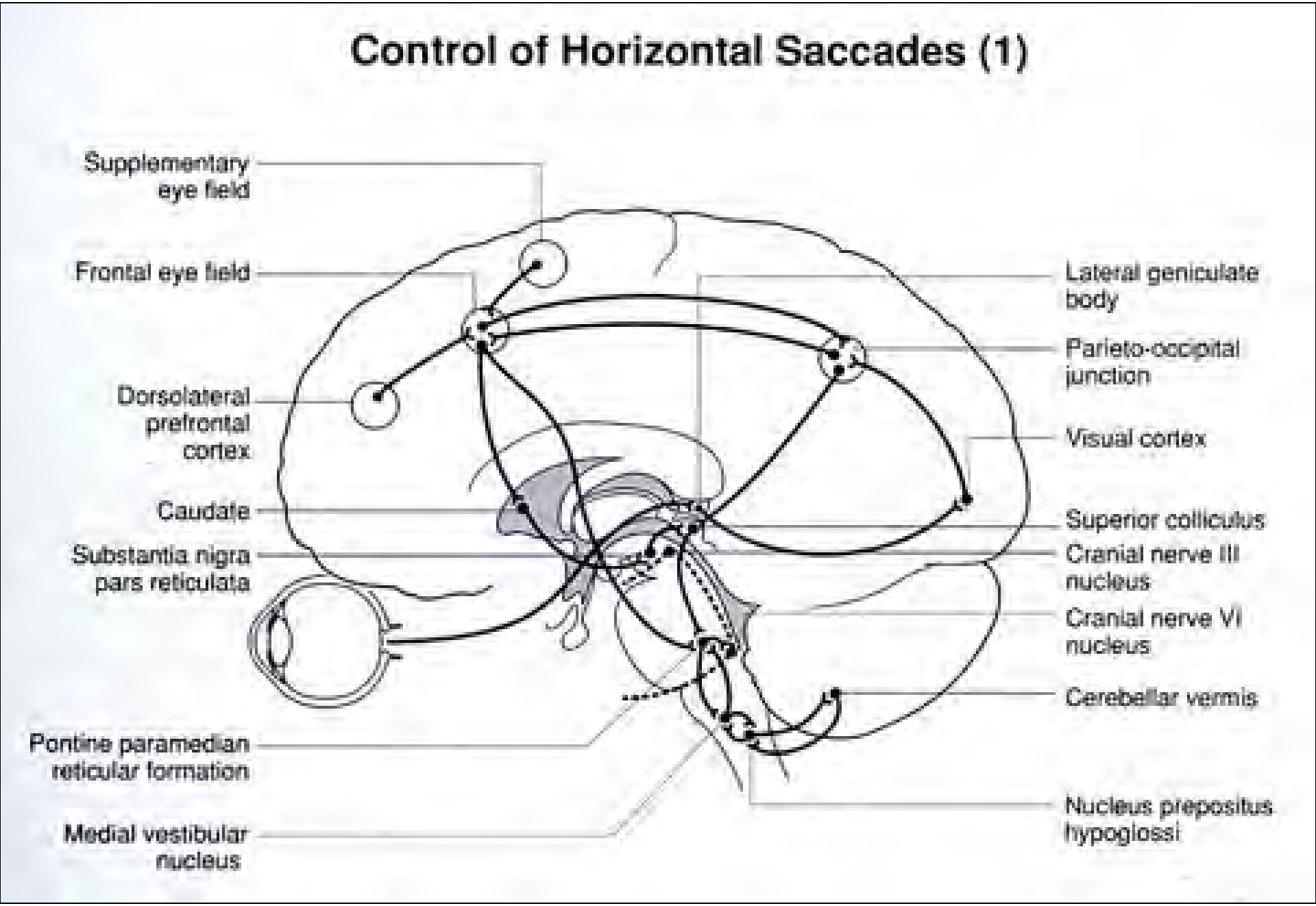
1. Voluntary
    a. Move eyes to target seen in peripheral field (“visually guided”)
    b. Move eyes to unseen target (“non visually guided”)
2. Involuntary
    a. Rapid eye movements of sleep
    b. Fast phases of nystagmus
    c. Random

Saccades

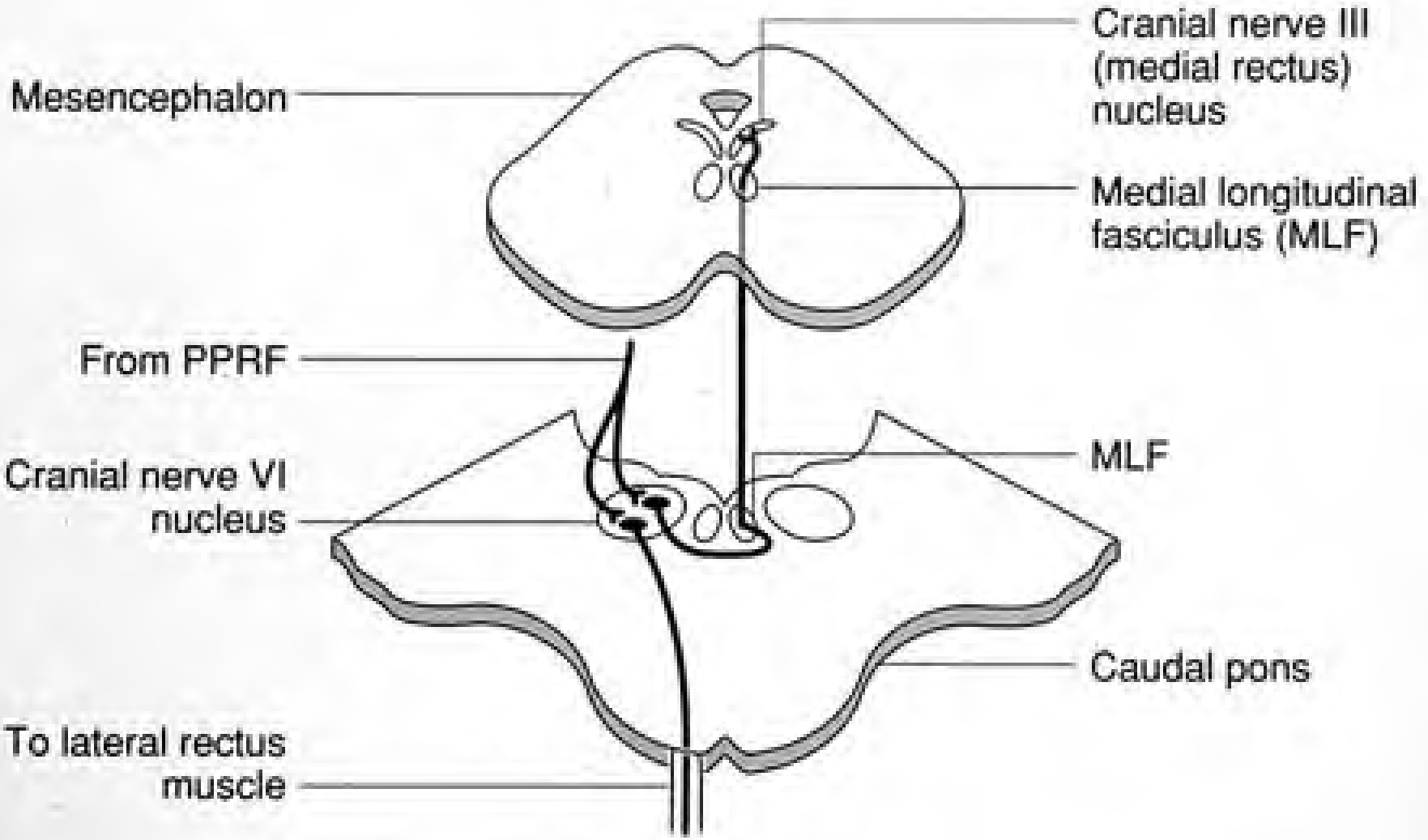
Test by having patient fixate a stationary target and then look from one target to another

Note whether eyes are still during fixation, and note speed, amplitude, accuracy of refixations, and if oscillations are present

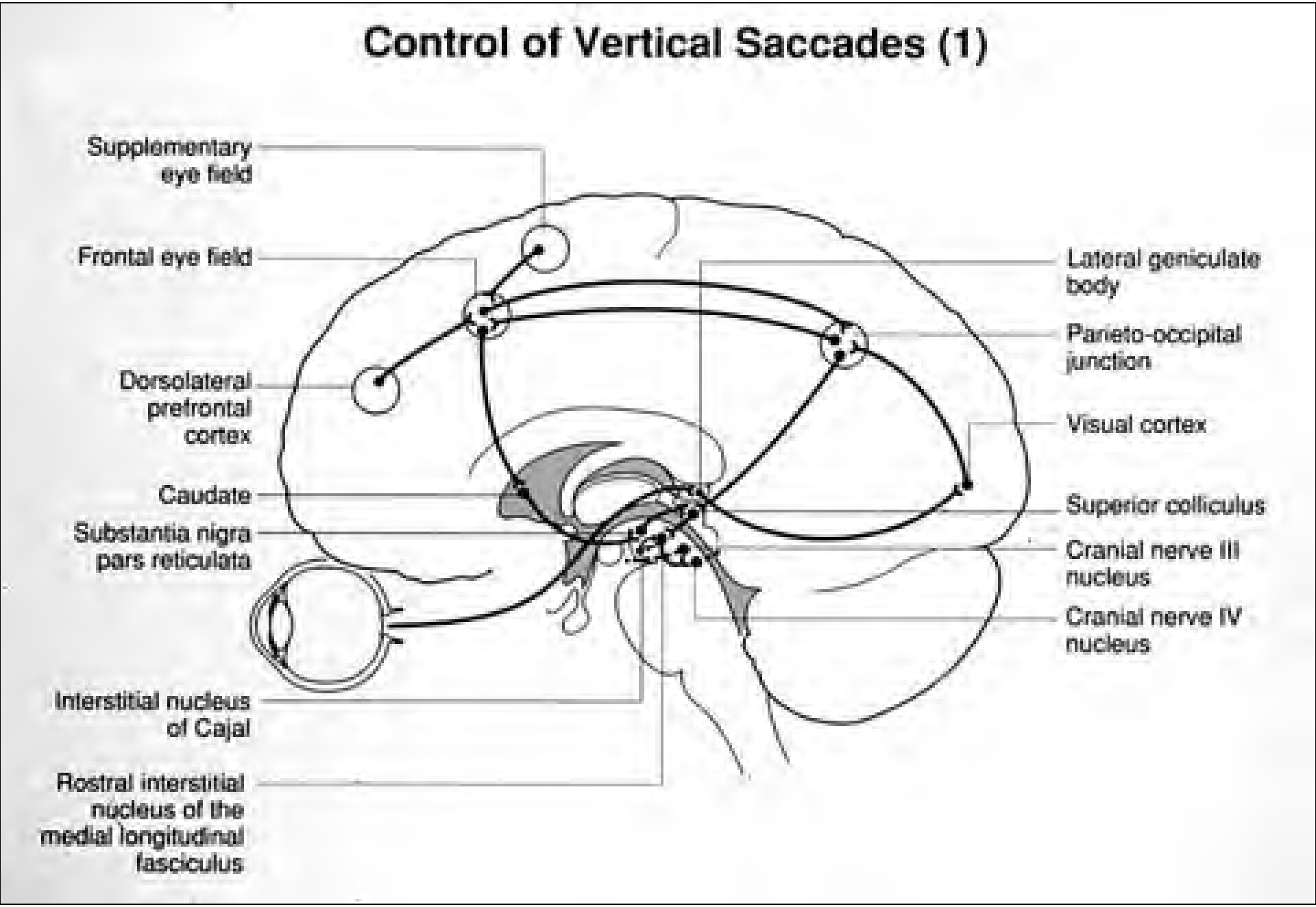
Control of Horizontal Saccades (1)



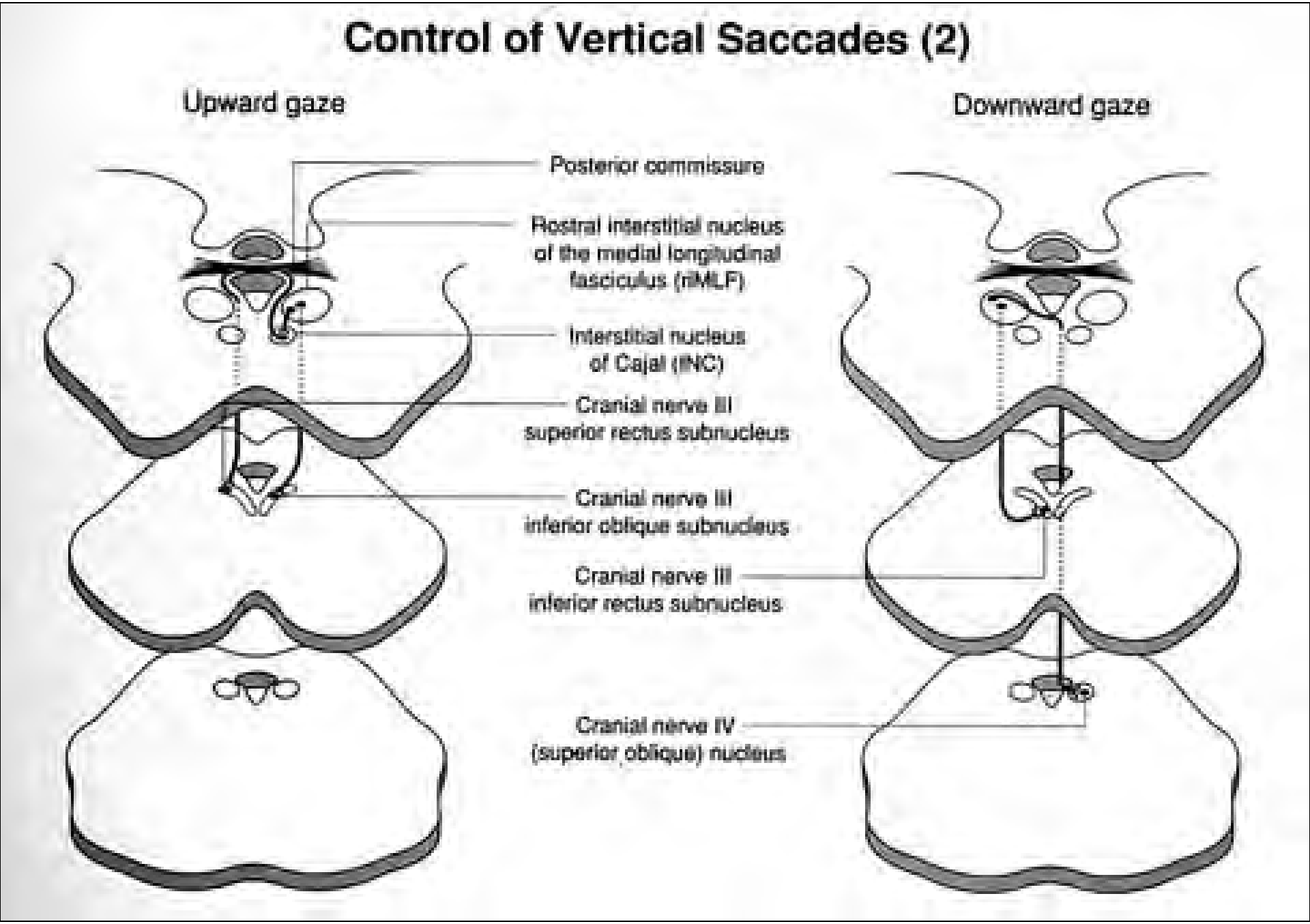
Control of Horizontal Saccades (2)



Control of Vertical Saccades (1)



Control of Vertical Saccades (2)



Saccadic Disorders

1. Absent (gaze palsy)
2. Reduced amplitude (“hypometric”)
3. Slow
4. Inaccurate (“dysmetric”)
5. Intrusive

Vergence

1. Move eyes closer to one another ("convergence")

2. Move eyes farther apart from one another ("divergence")

Vergence

Test by measuring ocular alignment
when eyes are focusing
on a distant and on a near target

Vergence Pathway

1. Generated in both parieto-occipital regions
2. Travels to midbrain
3. Exact pathway not known

Vergence Disorders

- Excessive convergence
- Insufficient convergence
- Excessive divergence
- Insufficient divergence

Vergence Disorders

1. Excessive convergence
    a. Congenital defect
    b. Too much accommodation
    c. Loss of vision
    d. Nonspecific brain insult
2. Insufficient convergence
    a. Idiopathic
    b. Nonspecific brain insult

Vergence Disorders

1. Excessive Divergence
    a. Congenital defect
    b. Loss of vision

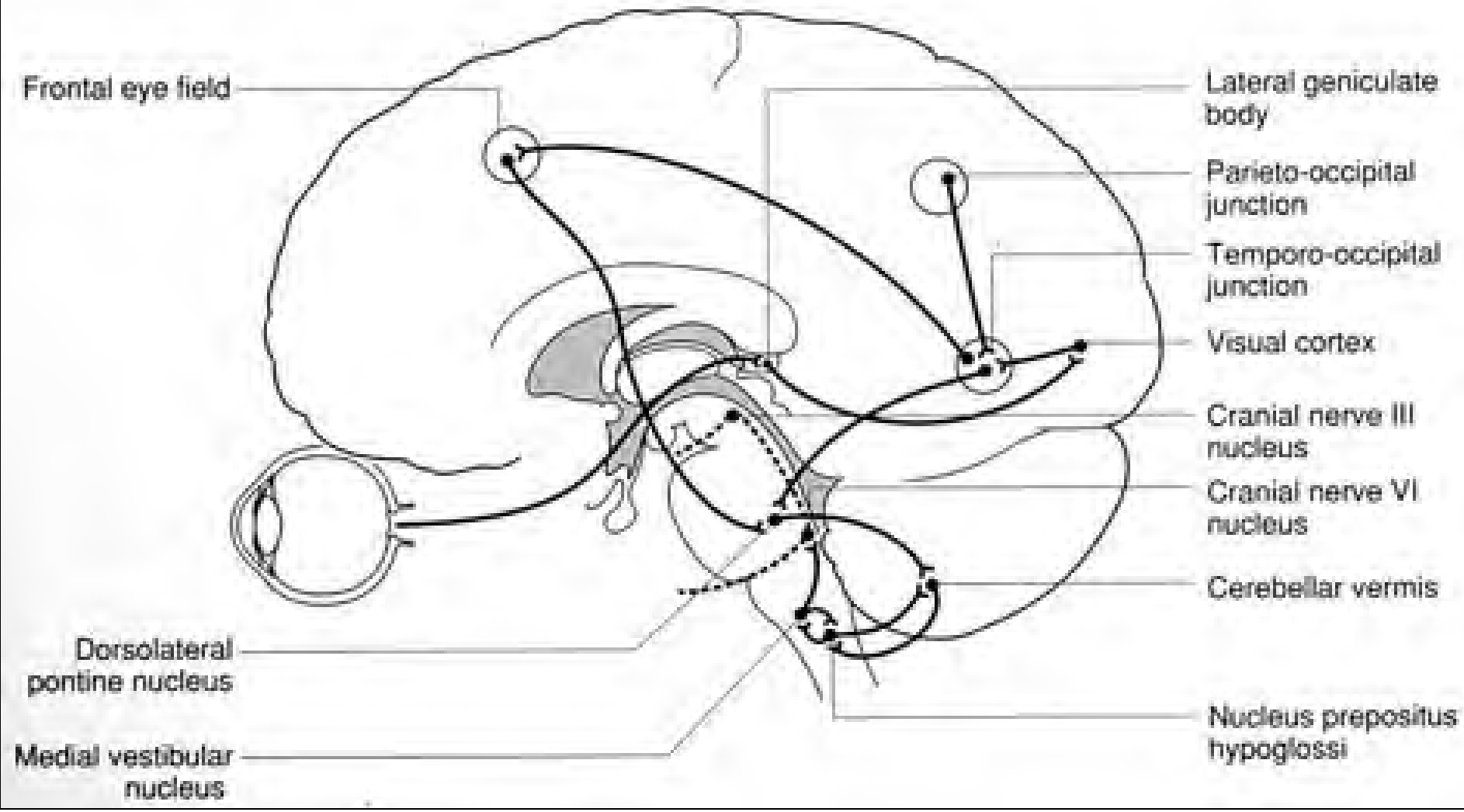
2. Insufficient Divergence
    a. Nonspecific brain insult

Pursuit

Test by having patient follow
a moving light or finger at about 30 degrees/ second

Note smoothness of motion, amplitude of excursion, presence of oscillations

Control of Horizontal Pursuit



Pursuit Disorders

1. Cogwheel (“saccadic”)
2. Absent

Vestibulo-ocular

In awake patients with intact voluntary eye movements, can test only with special techniques

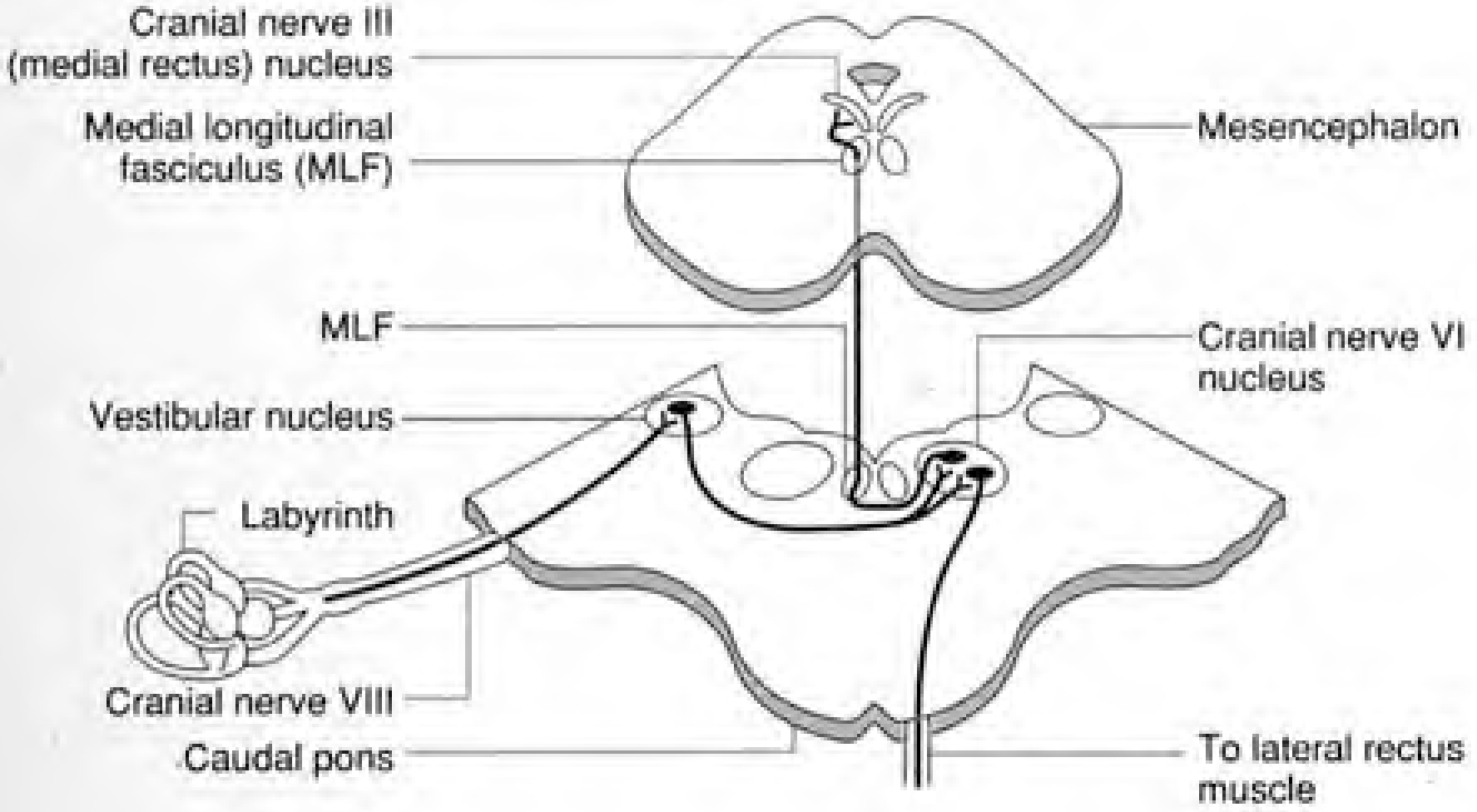
Vestibulo-ocular

In comatose patients and in awake patients with poor voluntary eye movements, two tests:

1. Doll's Head Maneuver. Move head rapidly and look for slow contraversive conjugate eye movements

2. Cold Water Calorics. Look for ipsiversive slow conjugate eye movements and perhaps contraversive involuntary saccades ("nystagmus")

Control of Horizontal Vestibulo-ocular Movements



Vestibulo-ocular Disorders

- General hypofunction (creates oscillopsia)
- Imbalance (creates nystagmus)

Supranuclear Gaze Palsy

- Absent voluntary gaze (saccades and pursuit)
- Intact reflex gaze (vestibulo-ocular), elicited by Doll's Head Maneuver or Cold Water Calorics
- Means that brain stem gaze pathways are intact but cerebral gaze pathways are not intact

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