CRANIAL NERVES VII - XII

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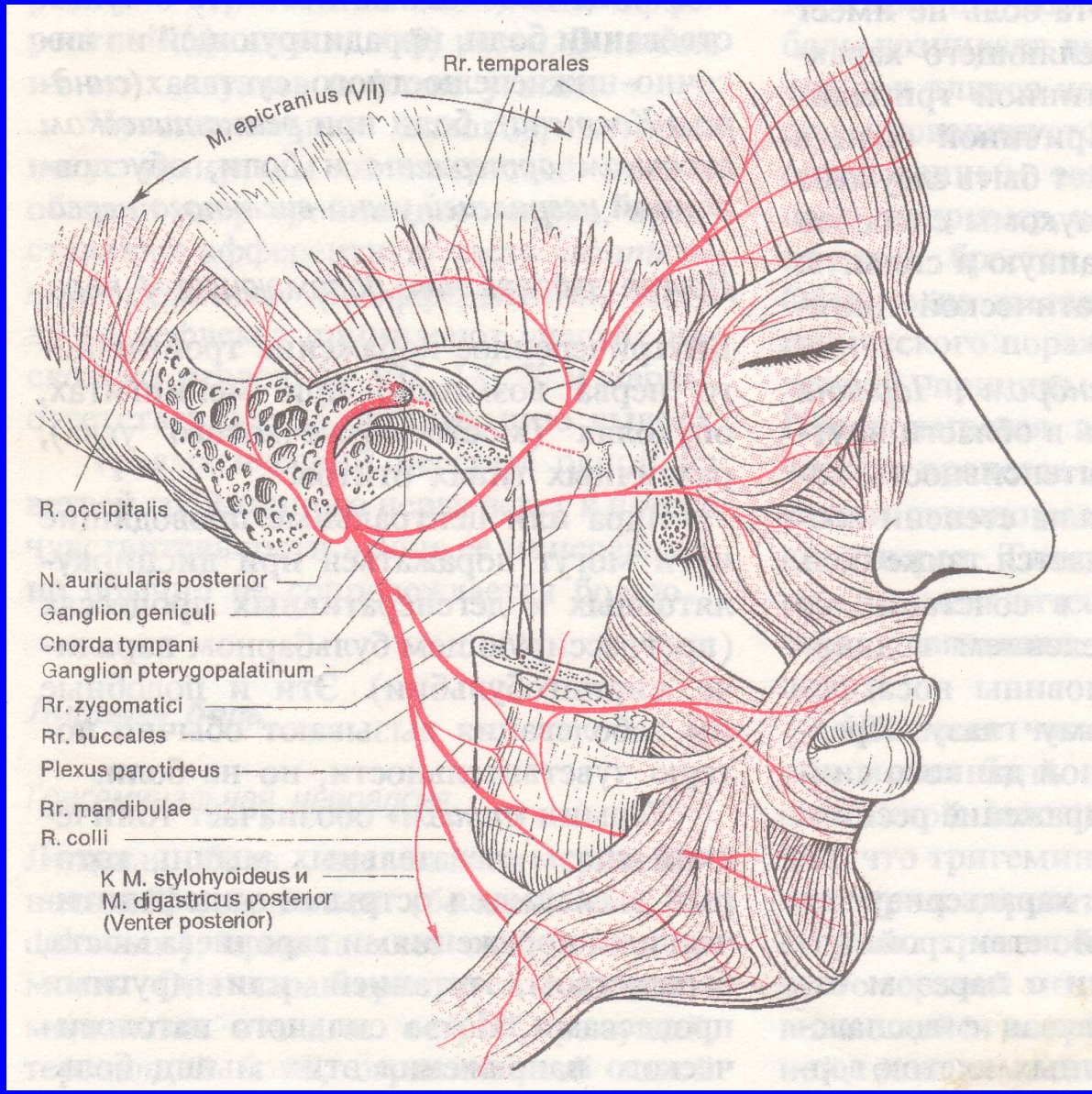
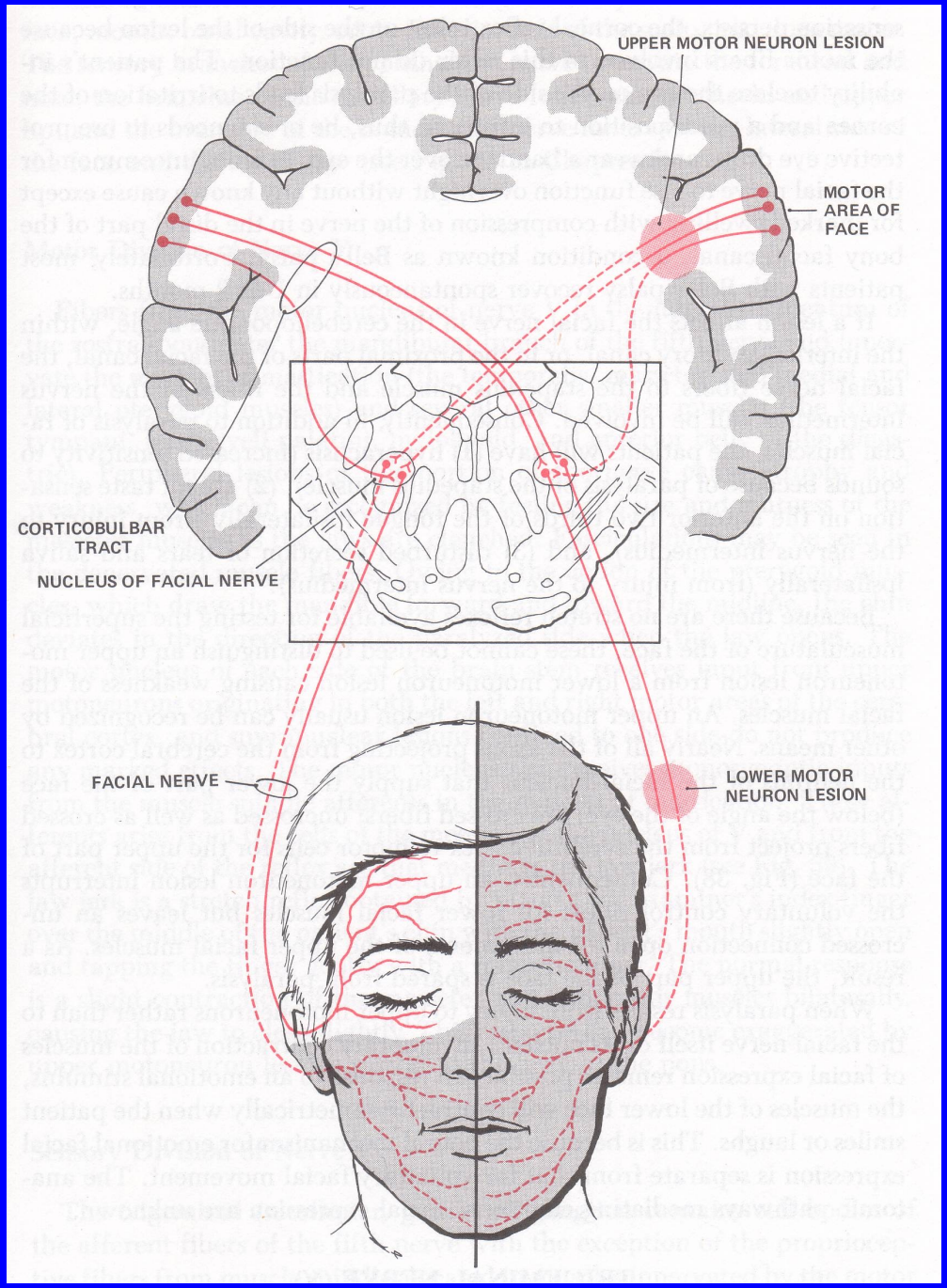
FACIAL NERVE (VII)

The seventh cranial nerve is mainly a motor nerve supplying all the muscles concerned with facial expression on one side. The sensory component is small (the nervus intermedius of Wrisberg); it conveys taste sensation from the anterior two-thirds of the tongue and probably cutaneous sensation from the anterior wall of the external auditory canal.



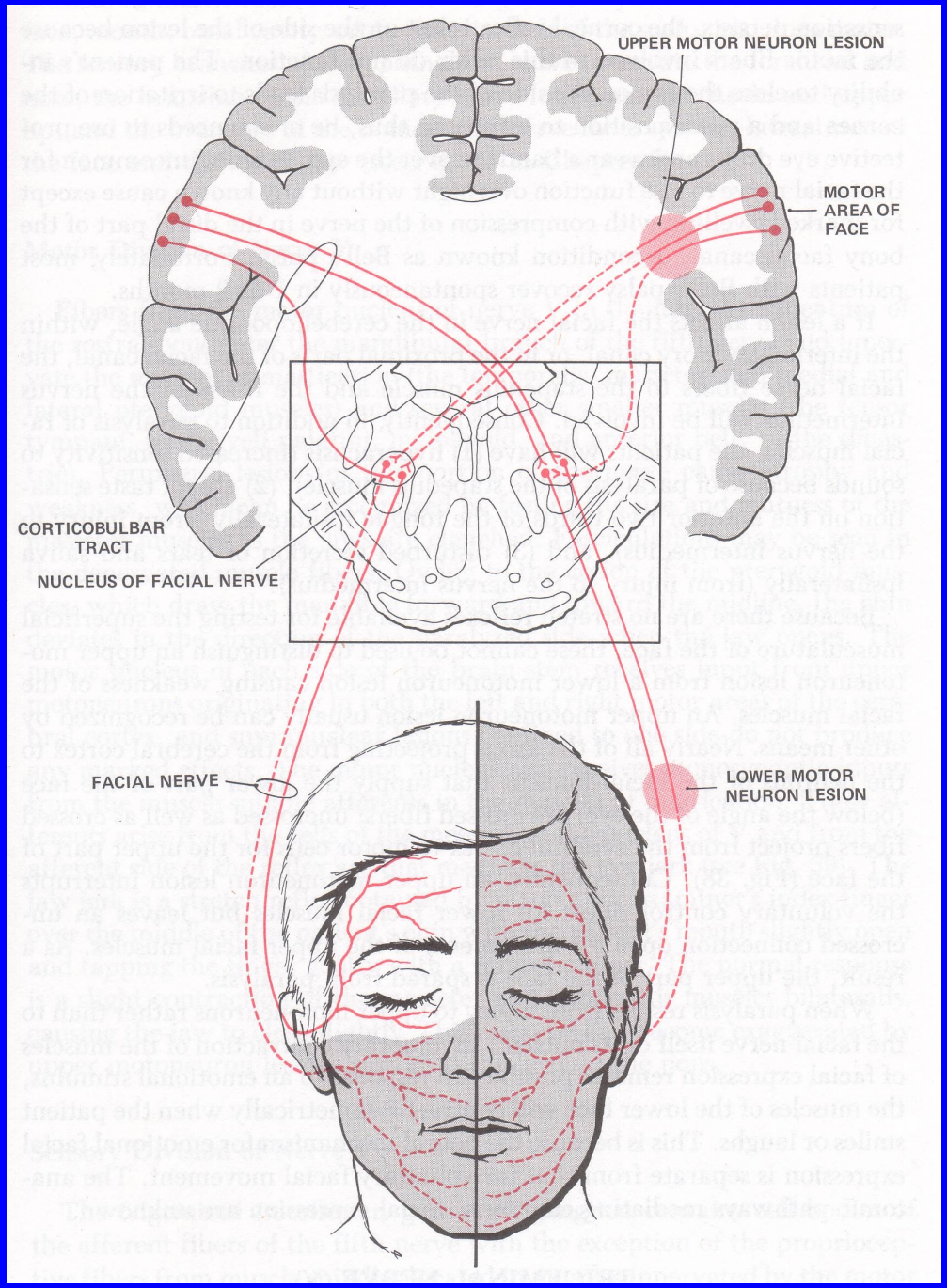
FACIAL NERVE (VII)

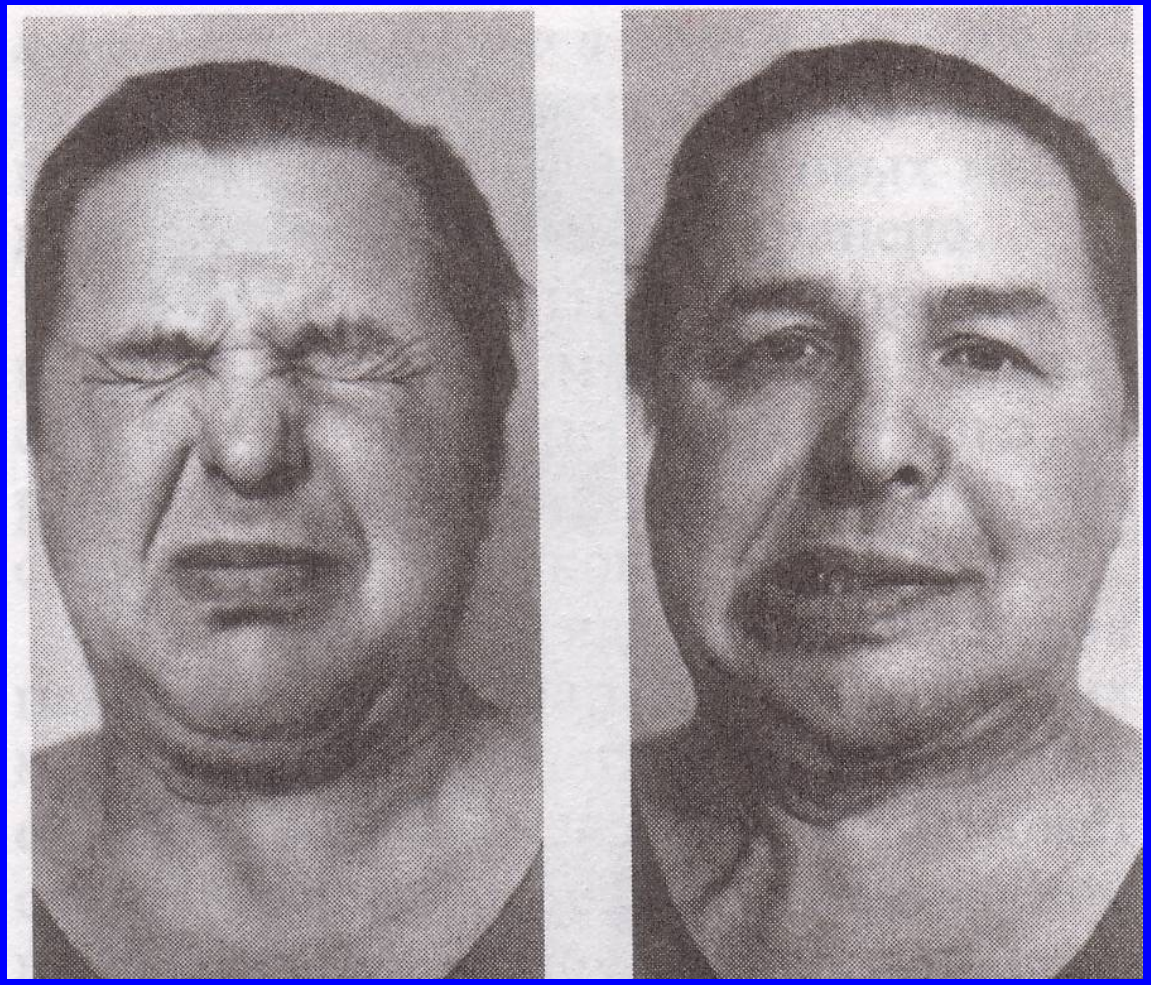
Nearly all of the axons projecting from the cerebral cortex to the neurons of the facial nucleus of the pontine tegmentum that supply the lower part of the face (below the angle of the eye) are crossed fibers; uncrossed as well as crossed fibers project from the cerebral cortex to motor cells for the upper part of the face.



FACIAL NERVE (VII)

When paralysis results from injury to upper motoneurons rather than to the facial nerve itself or its nucleus, involuntary contraction of the muscles of facial expression remains possible. In response to an emotional stimulus, the muscles of the lower face will contract symmetrically when the patient smiles or laughs. This is because the neural mechanism for emotional facial expression is separate from that voluntary facial movement.



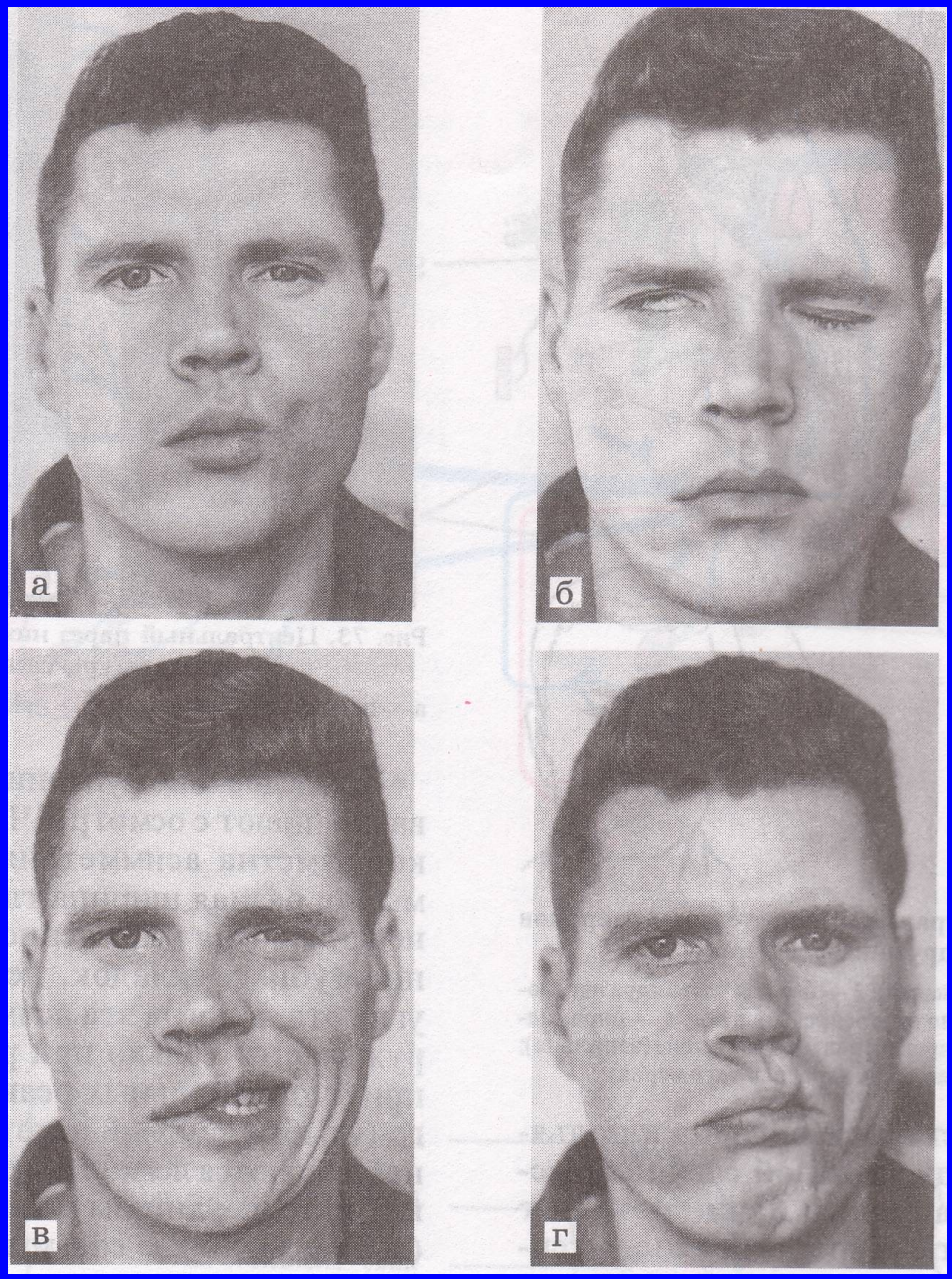


Central paralysis of mymetic muscles on the left face. . The symptom of “racket”. The shaft of the racket indicates the wounded side.

FACIAL NERVE (VII)

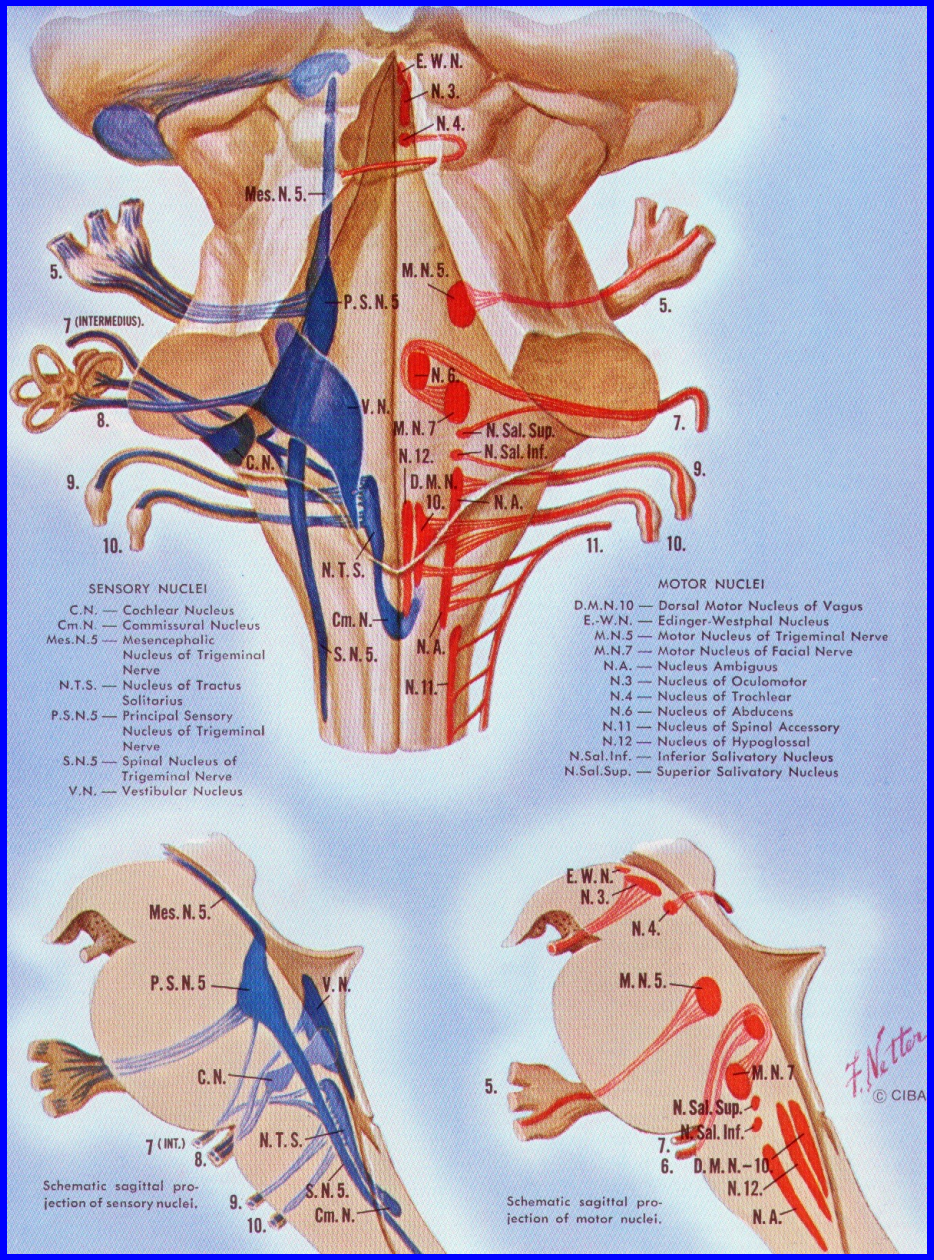
Peripheral paralysis of mymetic muscles:

The corner of the mouth droops, the creases and skin folds are effaced, the forehead is unfurrowed, the palpebral fissure is widened, and the eyelids will not close. Upon attempted closure of the lids, both eyes roll upward (Bell's phenomenon), but the one on the paralyzed side remains visible. The lower lid sags also, and the punctum falls away from the conjunctiva, permitting tears to spill over the cheek



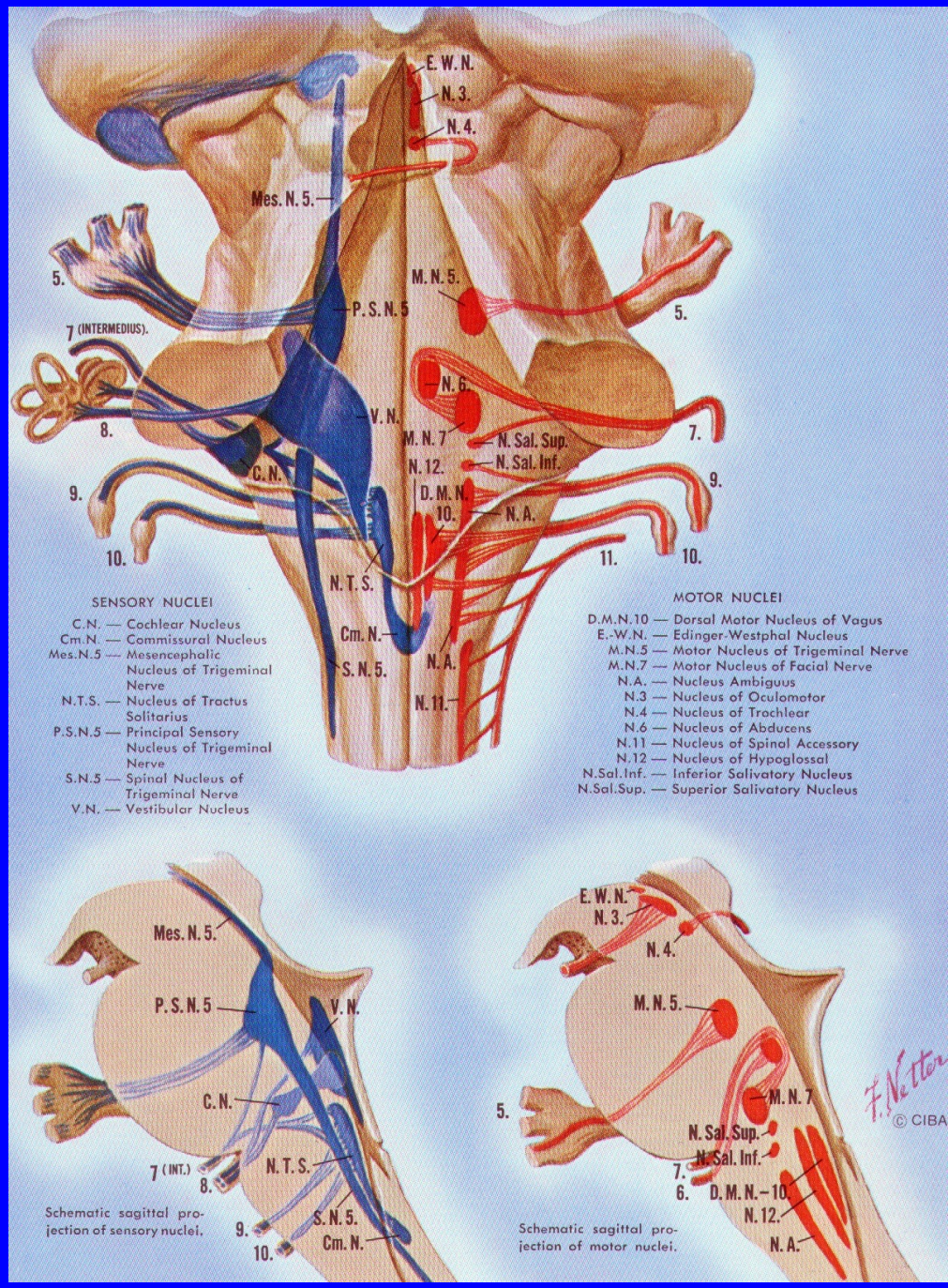
FACIAL NERVE (VII)

The fibers emerging from the facial nucleus of the pontine tegmentum pass dorsally, encicrcling the nucleus of the abducens nerve, and emerge at the lateral aspect of the caudal border of the pons in the angle formed by the junction of the cerebellum and the pons (the cerebellopontine angle).



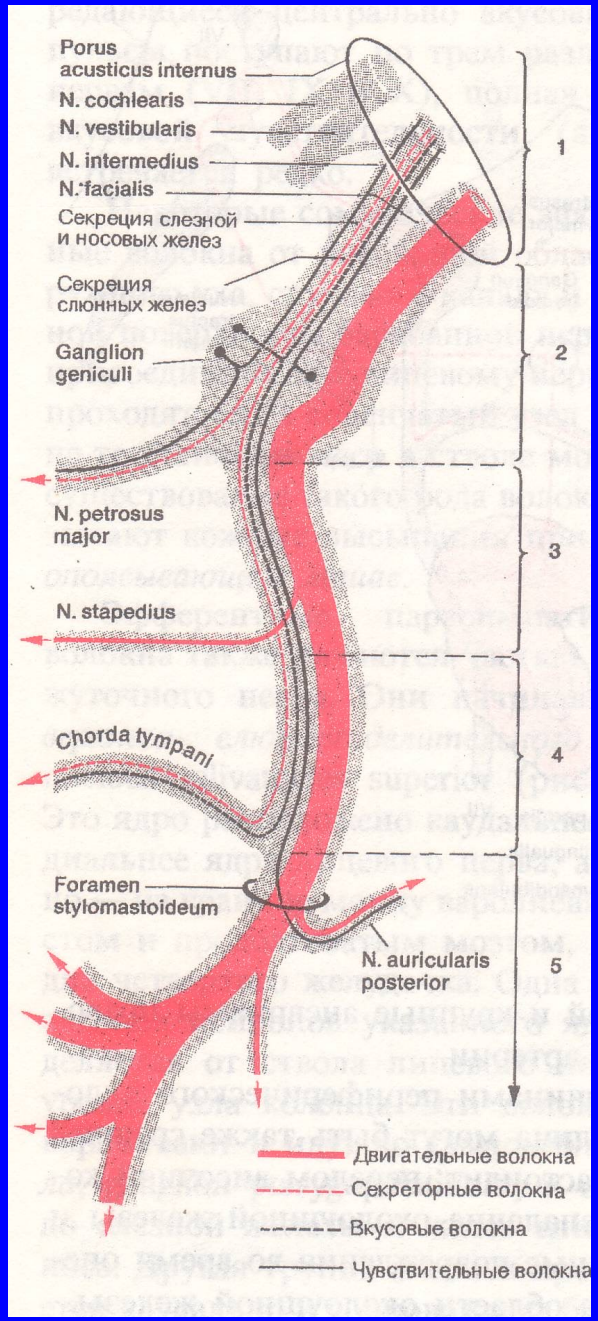
FACIAL NERVE (VII)

The nerve enters the internal auditory canal, then the facial canal, and, leaves the skull via stylomastoid foramen. The nervus intermedius of Wrisberg courses together with the facial nerves from the brain stem to the internal auditory meatus and then into the facial canal.



FACIAL NERVE (VII)

The fibers of the nervus intermedius of Wrisberg leave the facial nerve during its course in the facial canal.



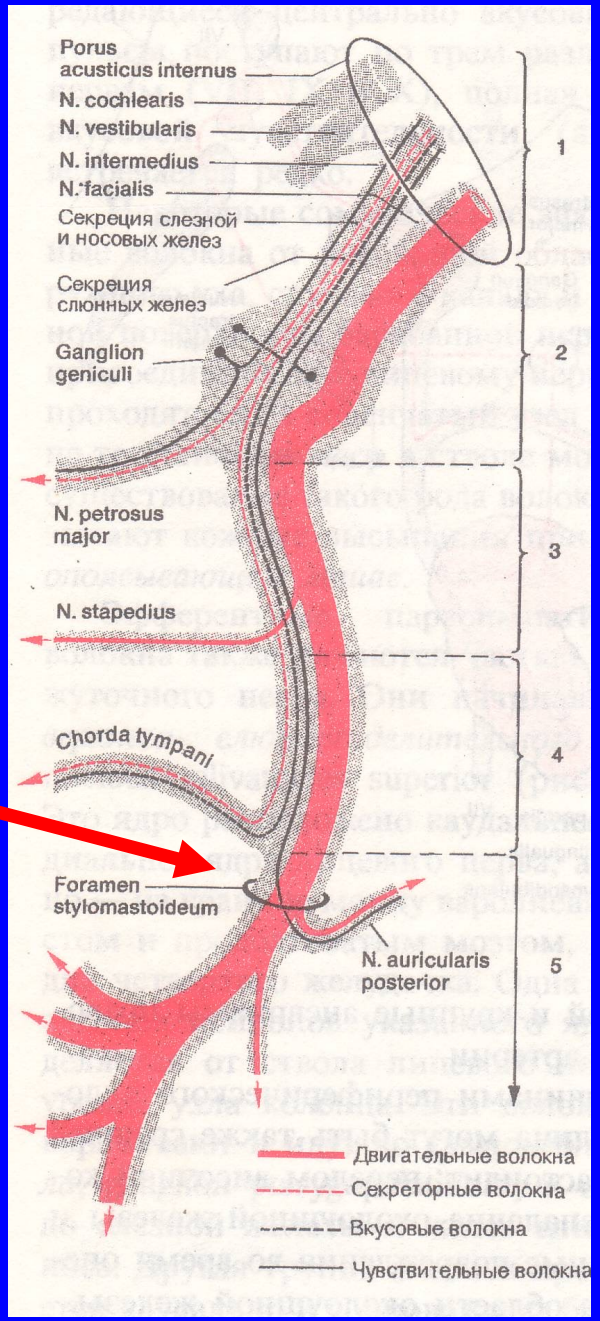
FACIAL NERVE (VII)

Loss of the function of the facial nerve at the different levels

Level I.

Stylomastoid foramen:

- Total paralysis of the mimetic muscles + Hyperlacrimatia



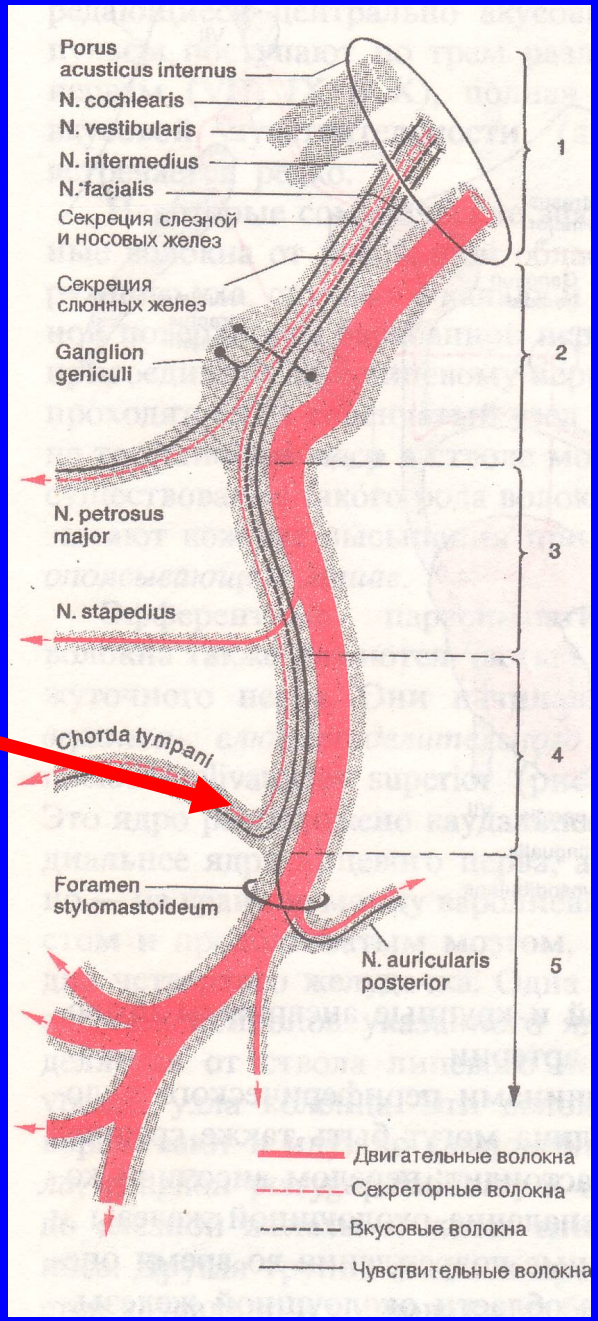
FACIAL NERVE (VII)

Loss of the function of the facial nerve at the different levels

Level II.

Chorda tympani:

- Total paralysis of the mimetic muscles + Hyperlacrimation + Hypogeuzia



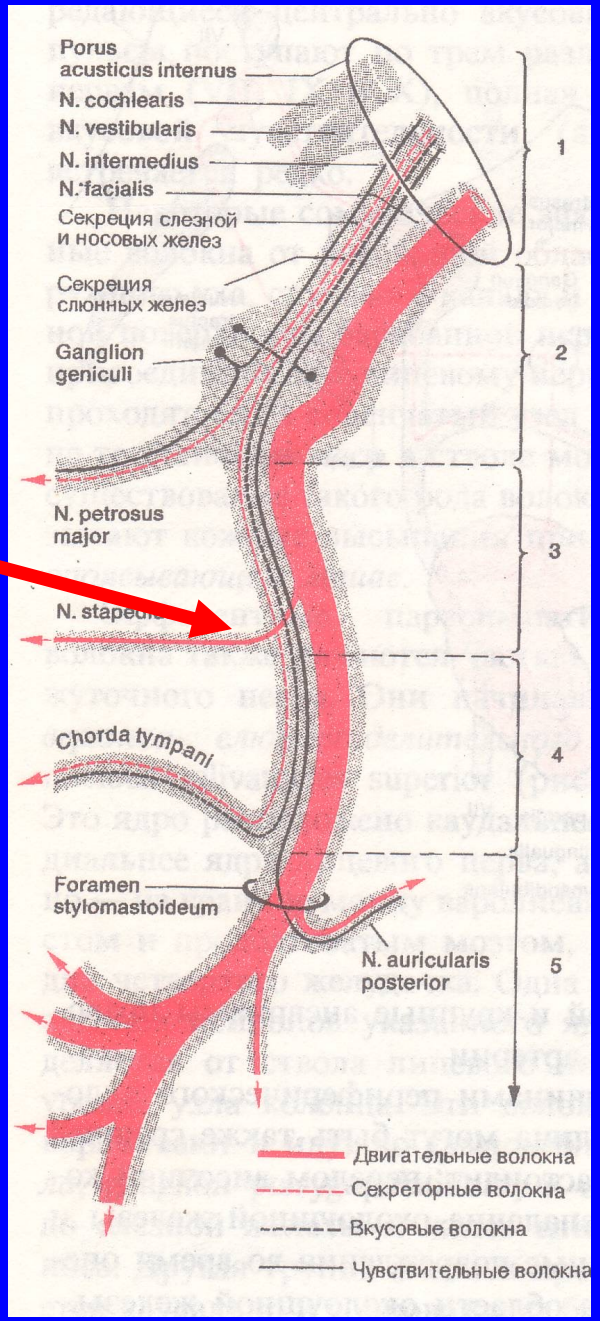
FACIAL NERVE (VII)

Loss of the function of the facial nerve at the different levels

Level III.

Nervus stapedius:

- Total paralysis of the mimetic muscles +
  Hyperlacrimation +
  Hypogeuzia +
  Hyperacuzia



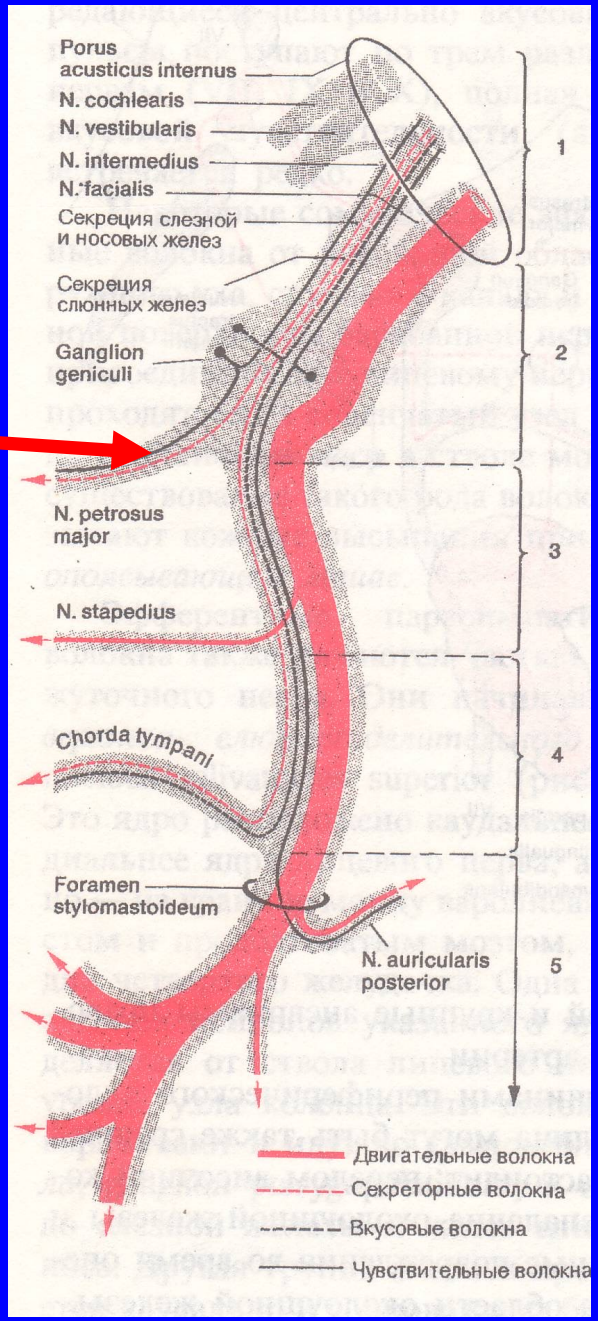
FACIAL NERVE (VII)

Loss of the function of the facial nerve at the different levels

Level IV.

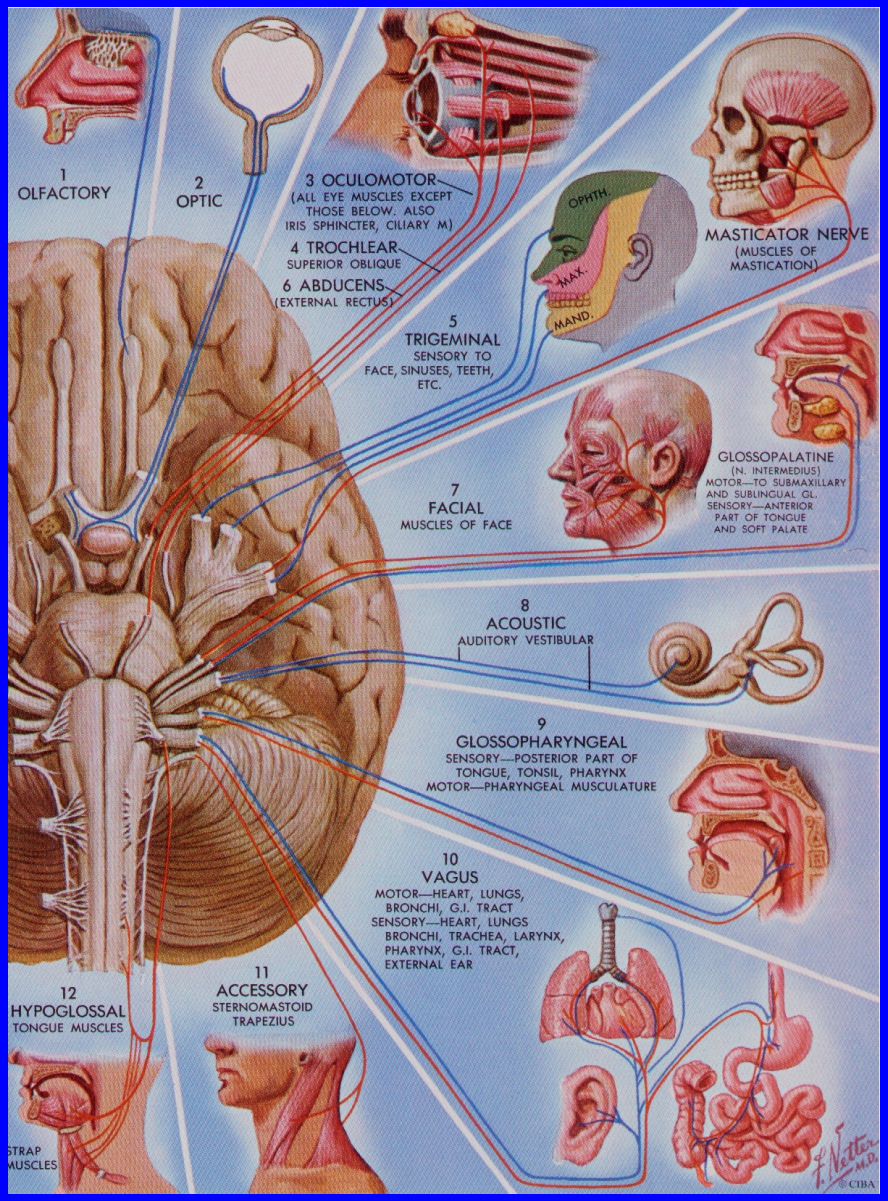
Nervus petrosus superficialis major:

- Total paralysis of the mimetic muscles +
  Xeroftalmia +
  Hypogeuzia +
  Hyperacuzia

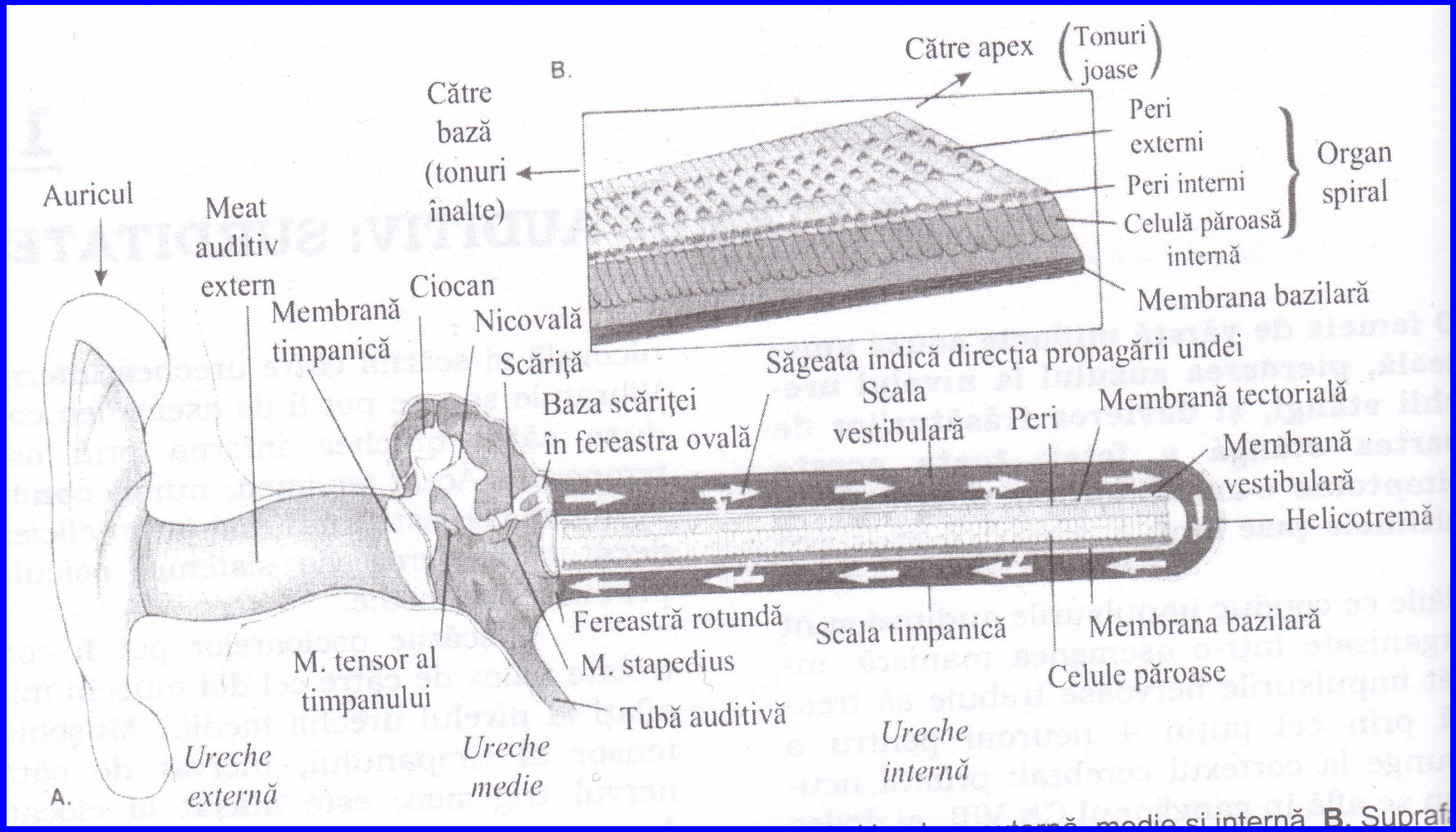


VESTIBULOCOCHLEAR NERVE (VIII)

The vestibulocochlear or eighth cranial nerve has two components: the cochlear nerve, which subserves hearing, or acoustic function, and the vestibular nerve, which is concerned with equilibrium, or balance, and orientation of the body to the surrounding world

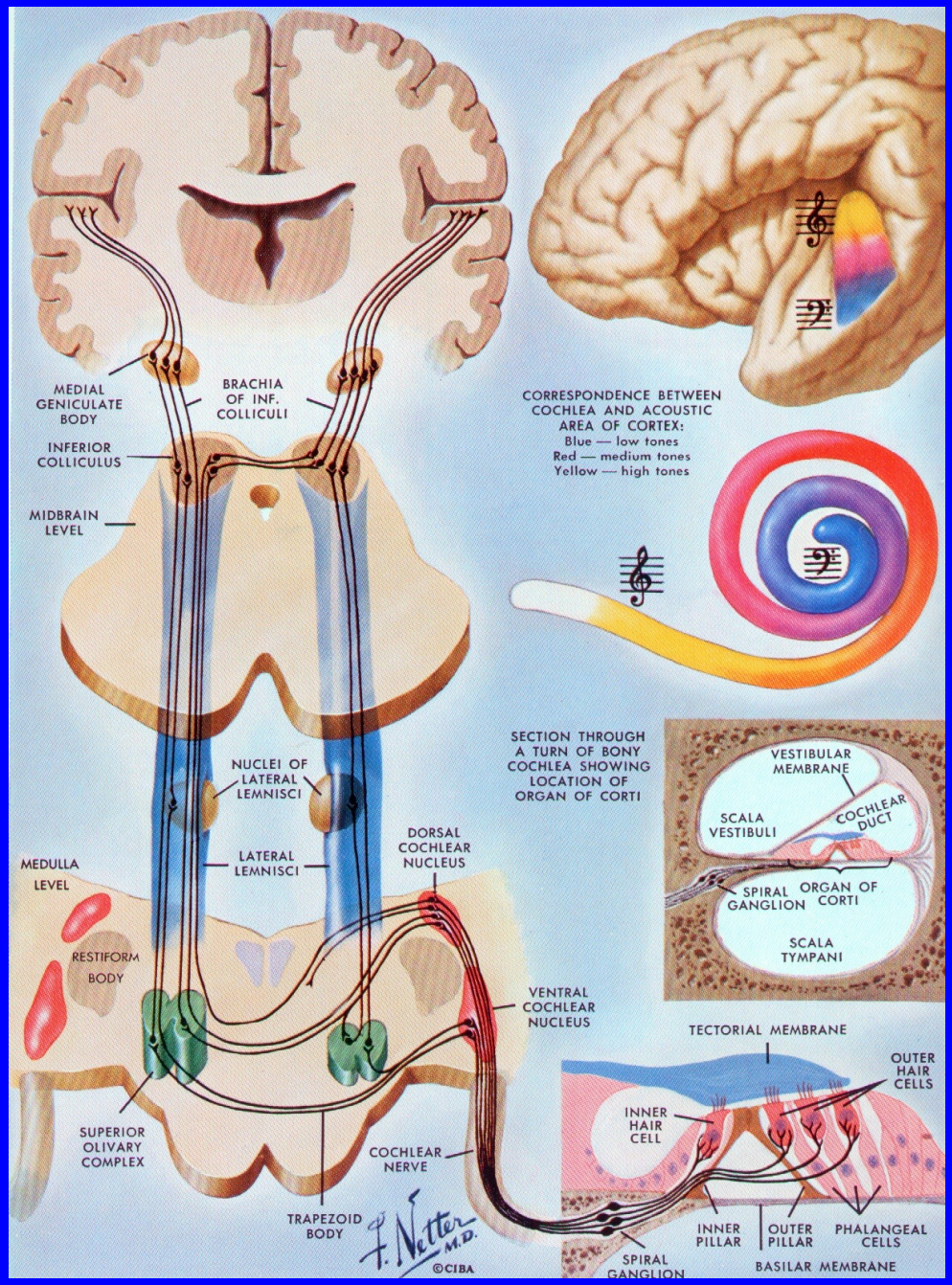


AUDITORY SYSTEM



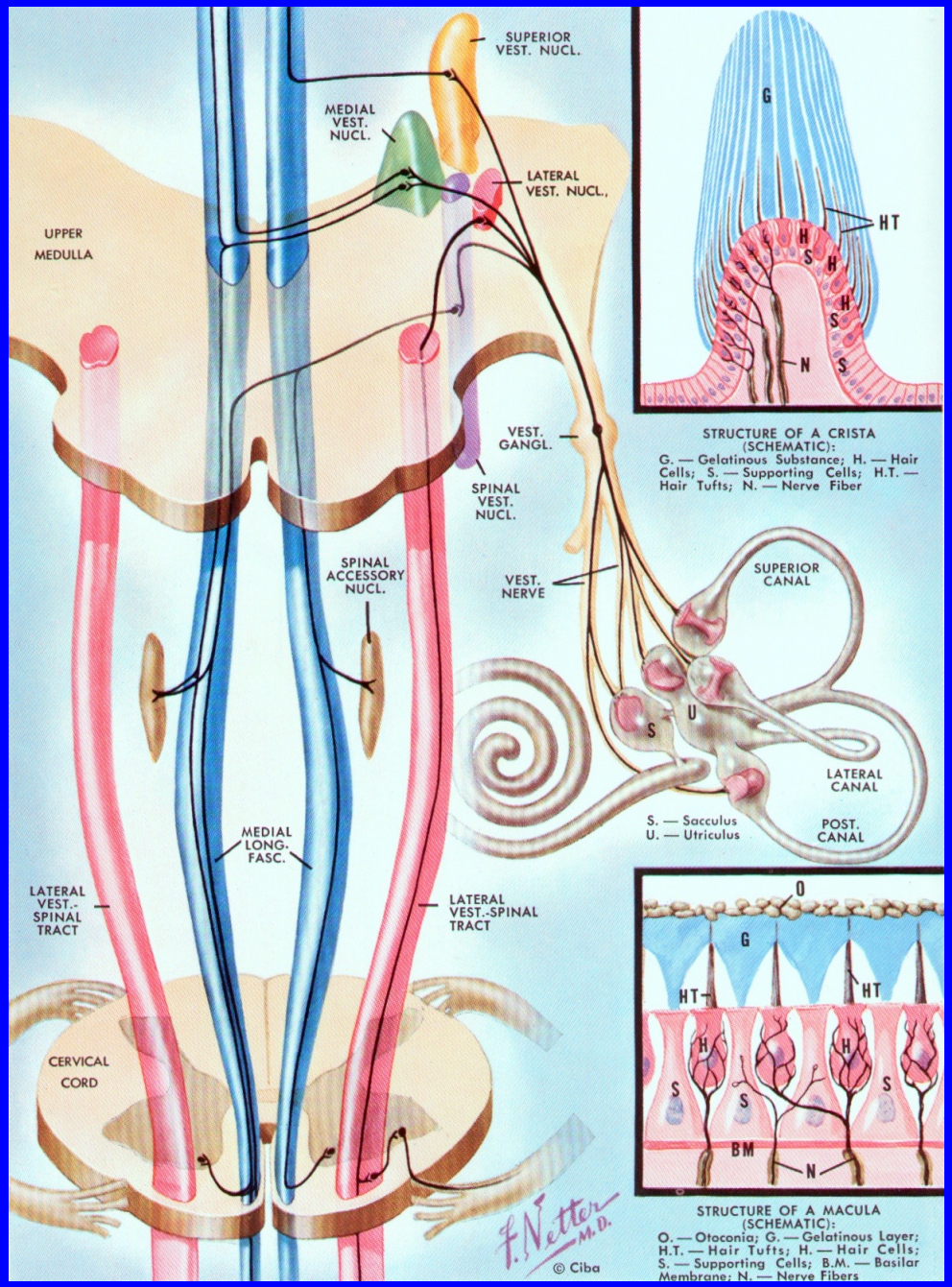
AUDITORY SYSTEM

The acoustic division has its cell bodies in the spiral ganglion of the cochlea. This ganglion is composed of bipolar cells, the peripheral processes of which convey auditory impulses from the specialized neuroepithelium of the inner ear, the spiral organ of Corti. This is the end organ of hearing, wherein sound is transduced into nerve impulses.



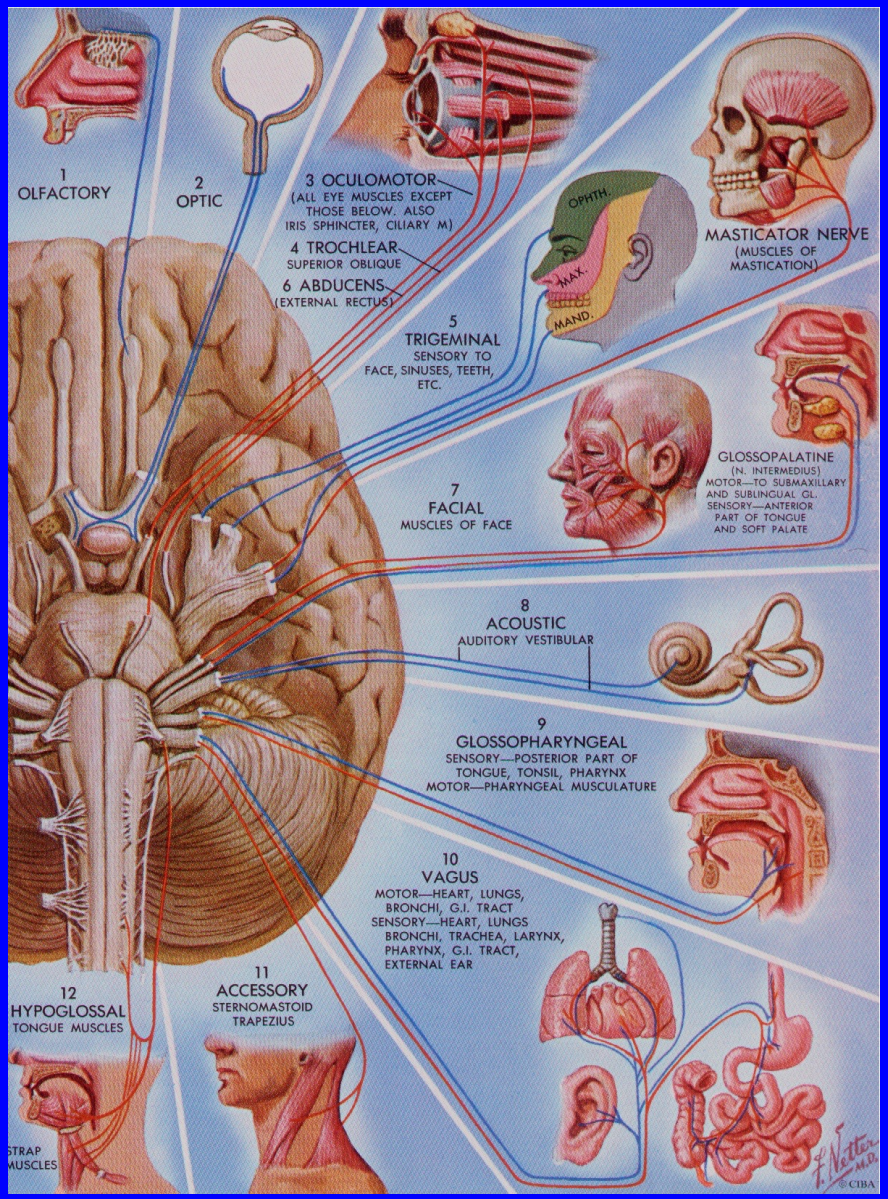
VESTIBULAR DIVISION

The vestibular division arises from cells in the vestibular, or Scarpa's, ganglion, which is situated in the internal auditory meatus. This ganglion is also composed of bipolar cells, the peripheral processes of which terminate in hair cells of the specialized sensory epithelium of the labyrinth (semicircular canals, saccule, and utricle).



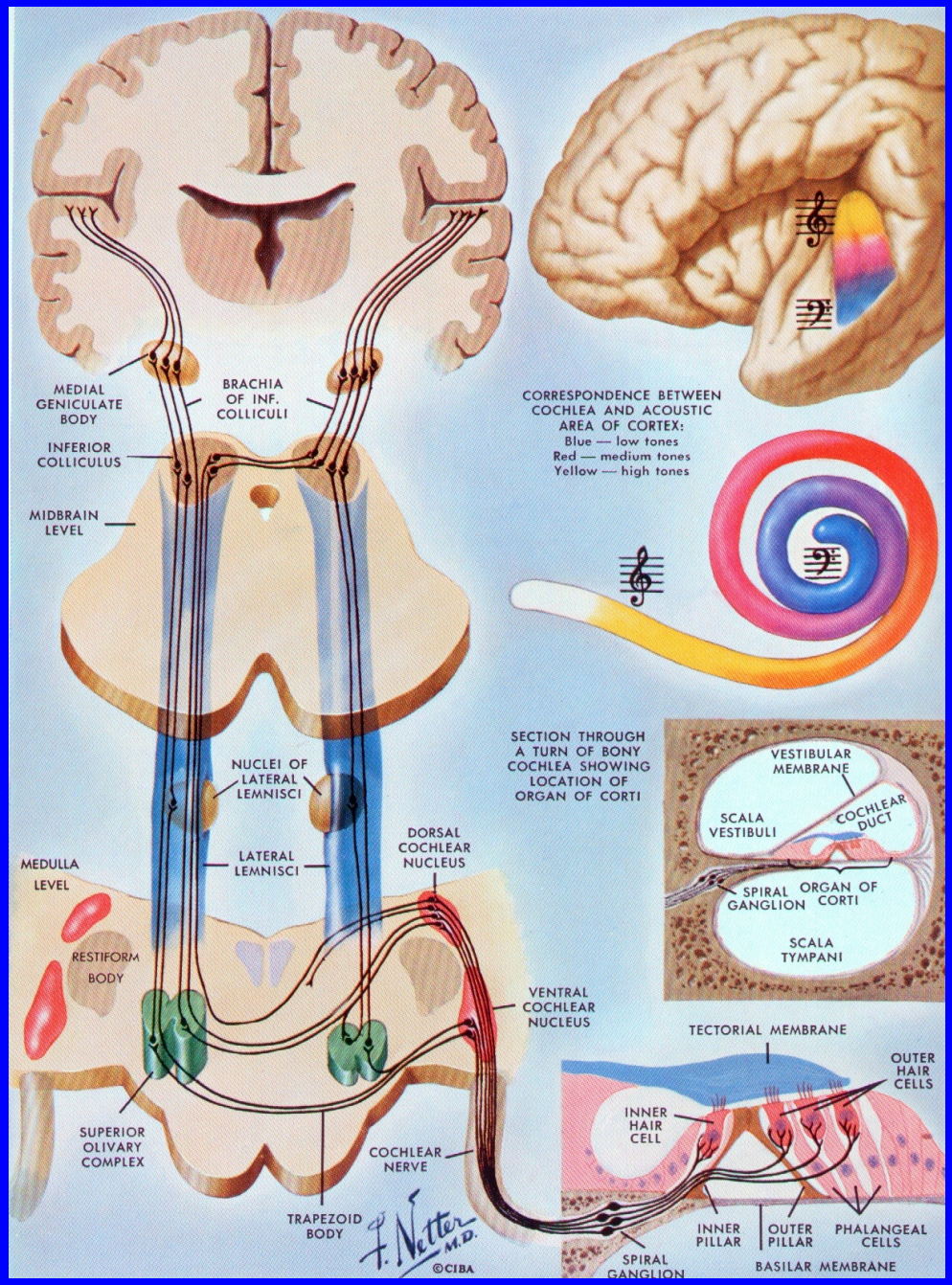
VESTIBULOCOCHLEAR NERVE (VIII)

The central fibers from the cells of the spiral and vestibular ganglia are united in a common trunk, which enters the cranial cavity through the internal auditory meatus (accompanied by the facial and intermediate nerves), traverses the cerebellopontine angle, and enters the brainstem at the junction of the pons and medulla. Here the cochlear and vestibular fibers become



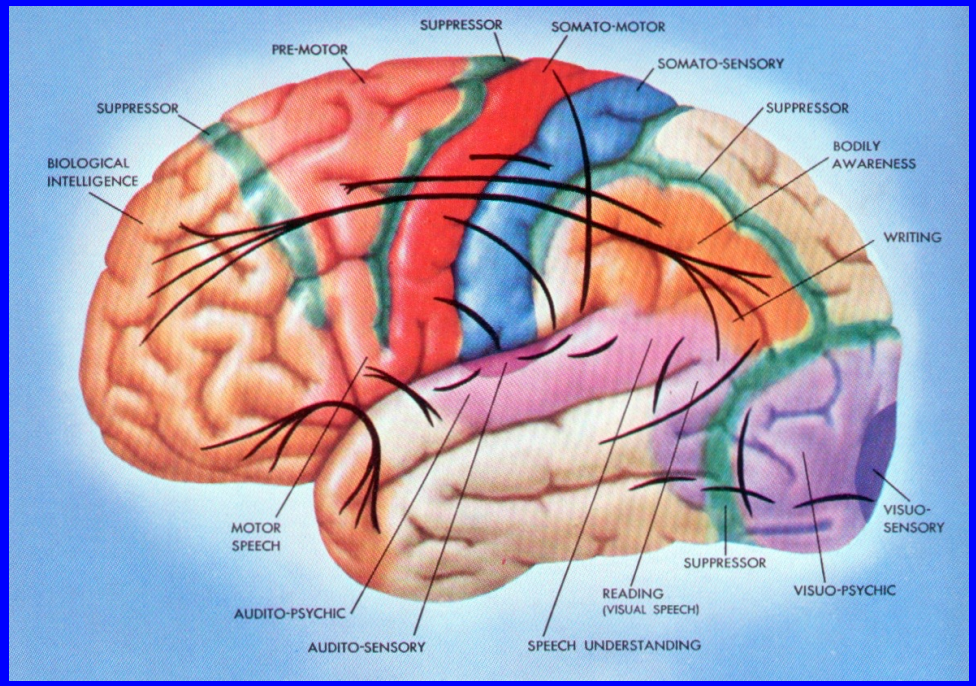
AUDITORY SYSTEM

The cochlear fibers bifurcate and terminate almost at once in the dorsal and ventral cochlear nuclei. The fibers from one cochlear nucleus are transmitted to both inferior colliculi (mainly to the opposite side) via the lateral lemnisci. Secondary acoustic fibers project via the trapezoid body and lateral lemniscus to the medial geniculate bodies



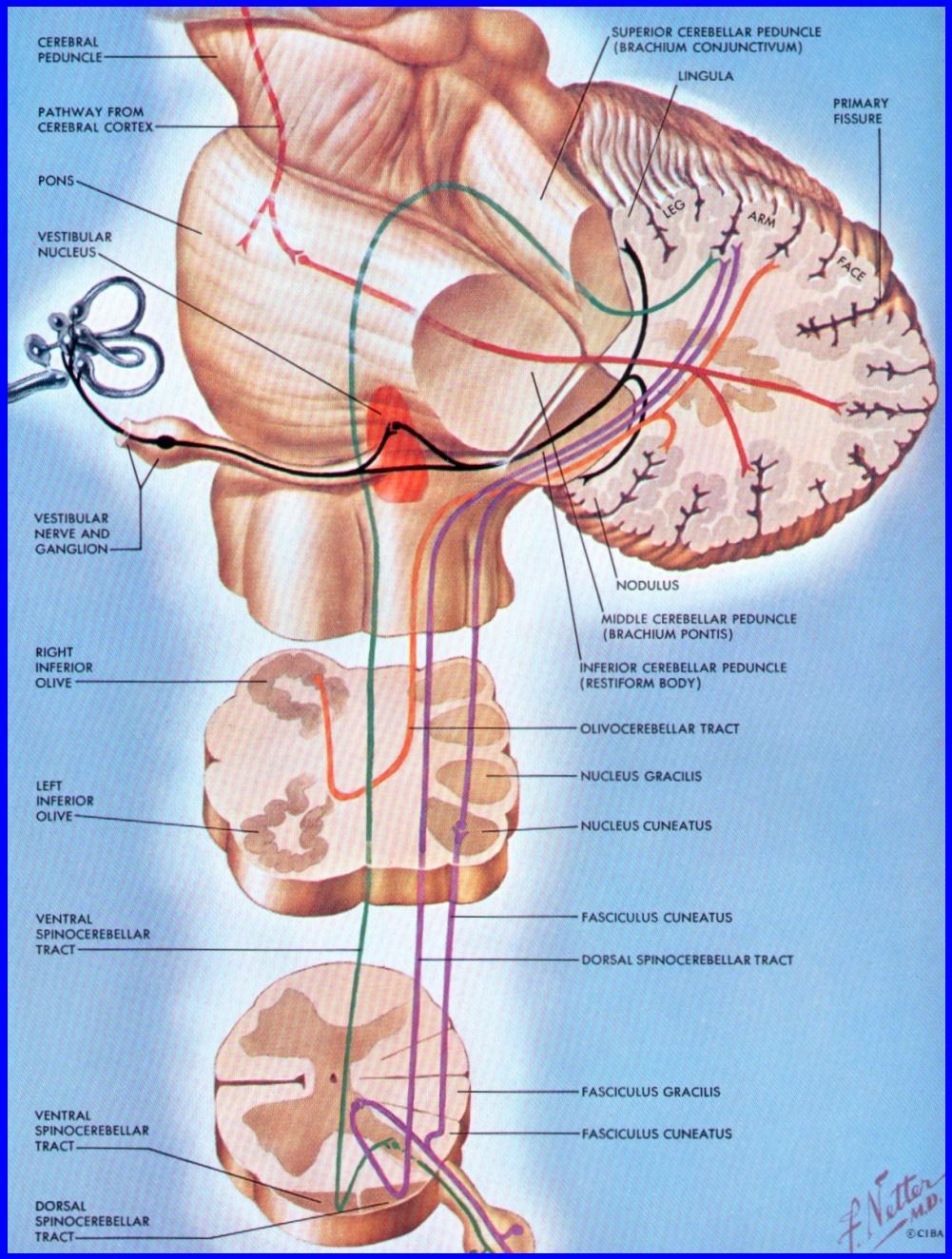
AUDITORY SYSTEM

From the medial geniculate bodies fibers project to the cortex via the auditory radiations¾relatively compact bundles that course ventrolaterally to the posterior parts of the putamens before dispersing and ending in the transverse gyri of Heschl and other auditory cortical areas (Tanaka et al). The cortical field comprises the superior temporal gyrus and the upper bank of the sylvian fissure (area 41), or primary auditory cortex, and the surrounding secondary and tertiary cortices in the adjacent temporal lobe.



VESTIBULAR DIVISION

The vestibular fibers of the eighth nerve terminate in the four vestibular nuclei: superior (Bechterew), lateral (Deiters), medial (triangular, or Schwalbe), and inferior (spinal, or descending). In addition, some of the fibers from the semicircular canals project directly to the cerebellum via the juxtarestiform body and terminate in the flocculonodular lobe and adjacent vermian cortex



AUDITORY SYSTEM

DISORDERS OF AUDITORY PERCEPTION

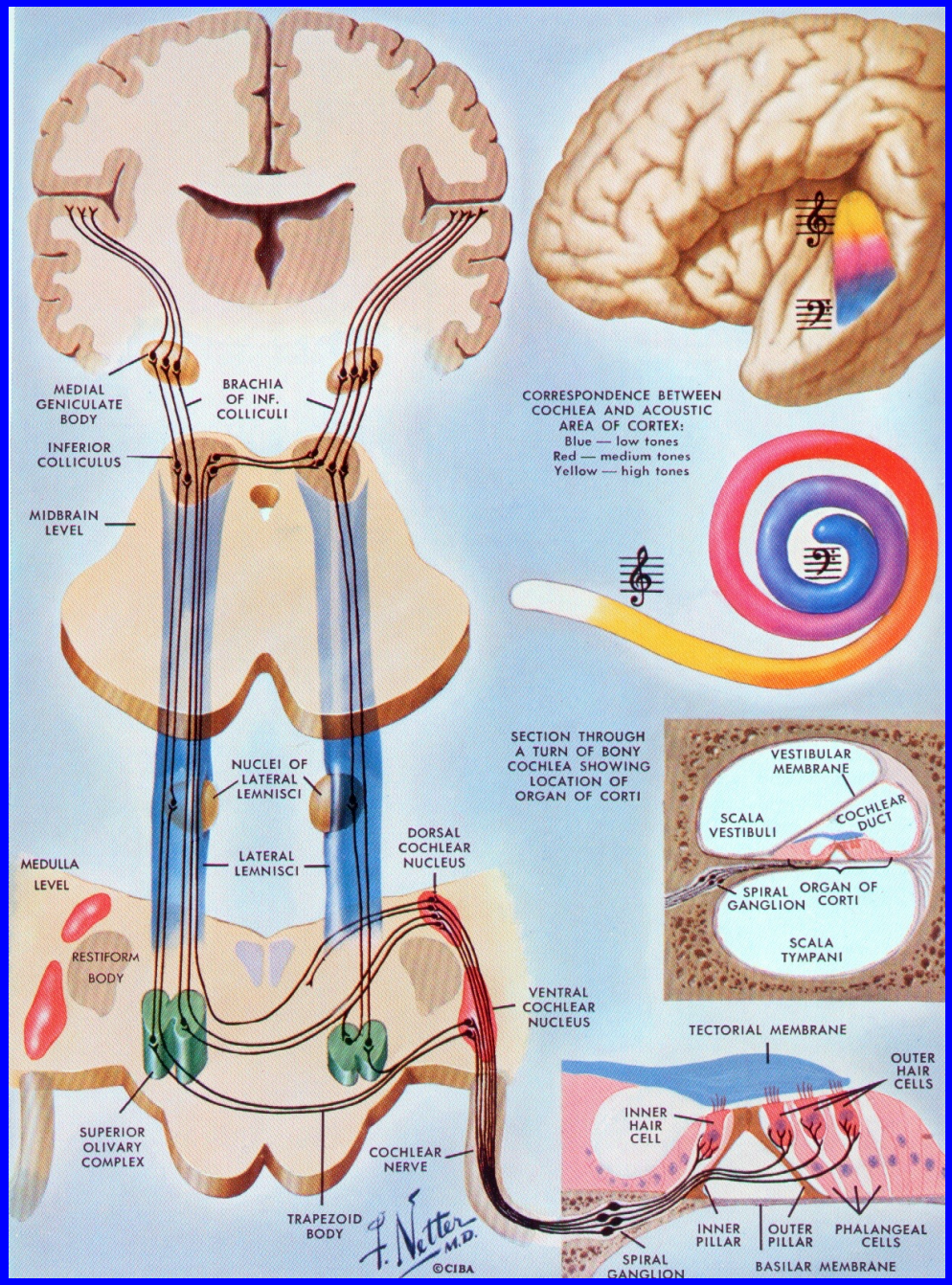
Deafness:

- Conductive
- Sensorineural

-Central

Tinnitus: "ringing of the ears" (Latin *tinnire*, "to ring or jingle").

Acoustic hallucinations

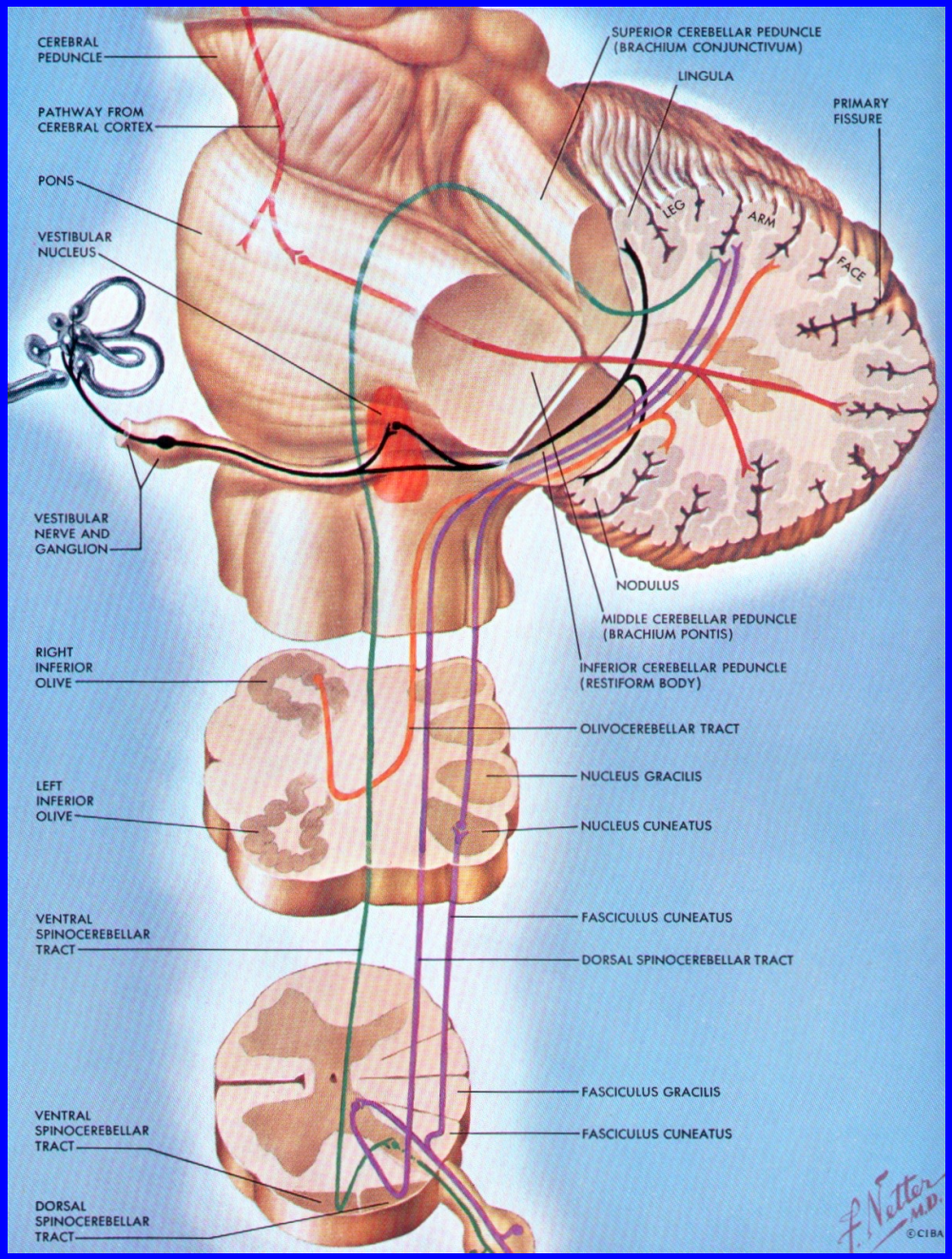


VESTIBULAR DIVISION

DISORDERS OF VESTIBULAR FUNCTION

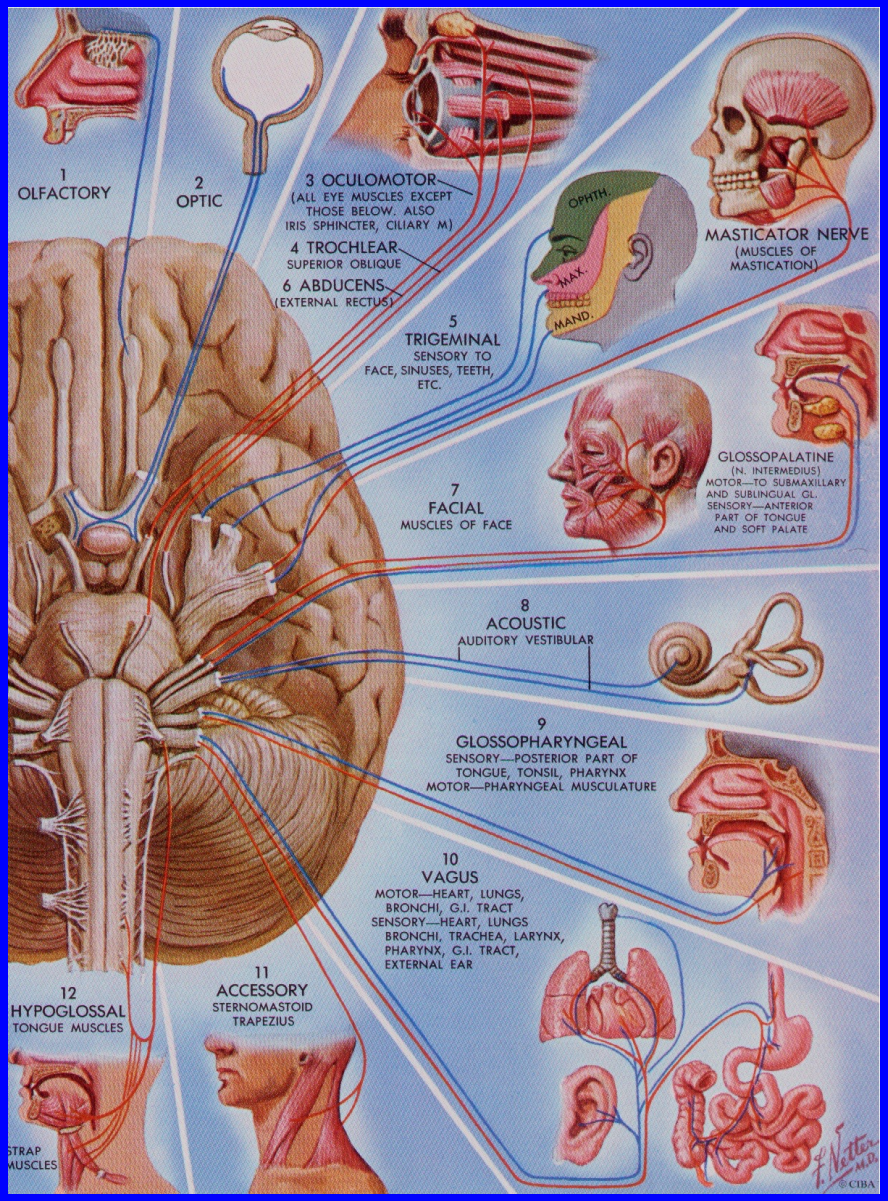
DIZZINESS AND VERTIGO:

The term is applied by the patient to a number of different sensory experiences - a feeling of rotation or whirling as well as nonrotatory swaying, weakness, faintness, light-headedness, or unsteadiness.



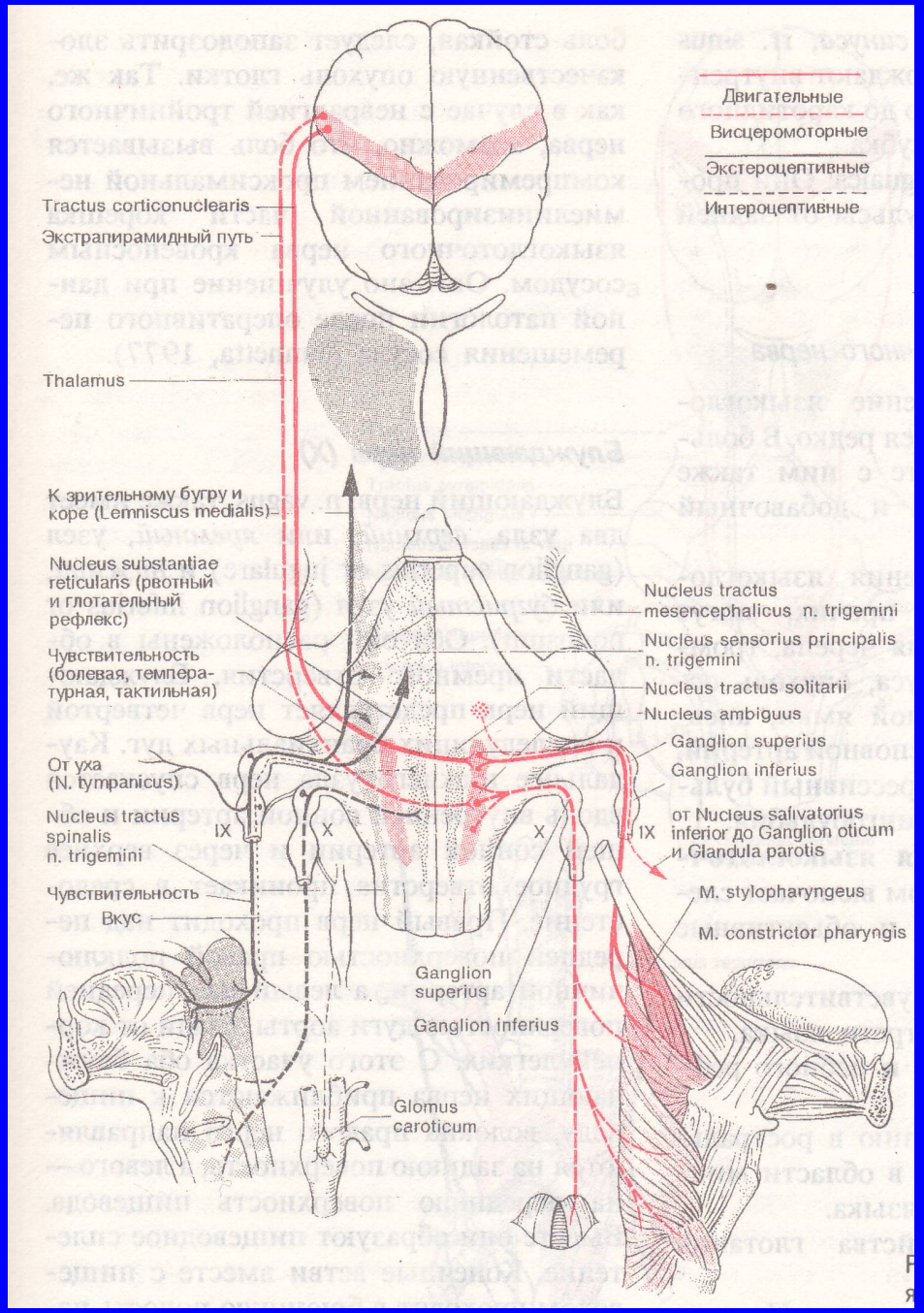
GLOSSOPHARINGEAL NERVE (IX)

This nerve arises from the lateral surface of the medulla by a series of small roots that lie just rostral to those of the vagus nerve. The glossopharyngeal, vagus, and accessory nerves leave the skull together through the jugular foramen and are then distributed peripherally.



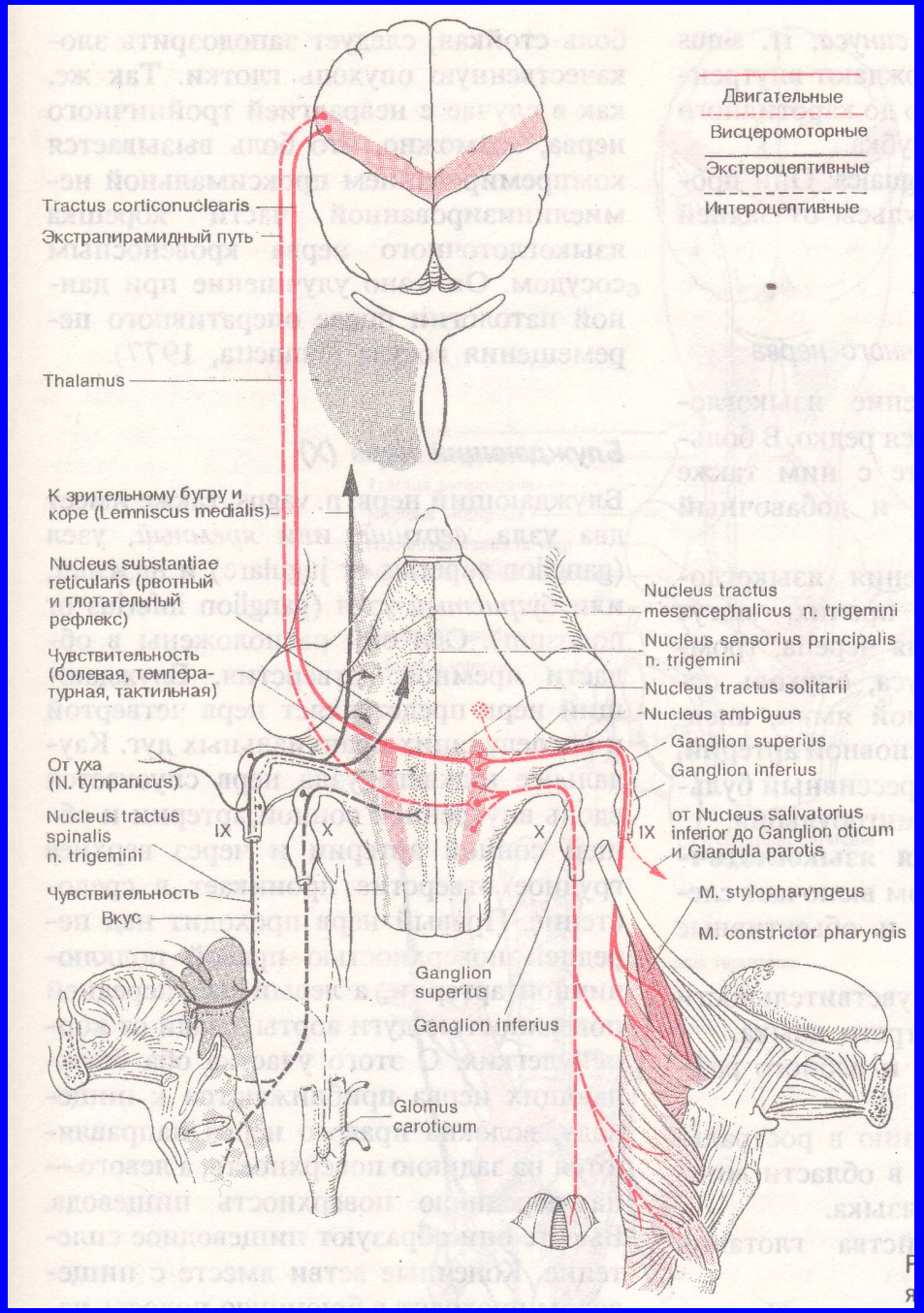
GLOSSOPHARINGEAL NERVE (IX)

The *ninth nerve* is mainly sensory, with cell bodies in the inferior, or petrosal, ganglion (the central processes of which end in the nucleus solitarius) and the small superior ganglion (the central fibers of which enter the spinal trigeminal tract and nucleus). Within the nerve are afferent fibers from baroreceptors in the wall of the carotid sinus and from chemoreceptors in the



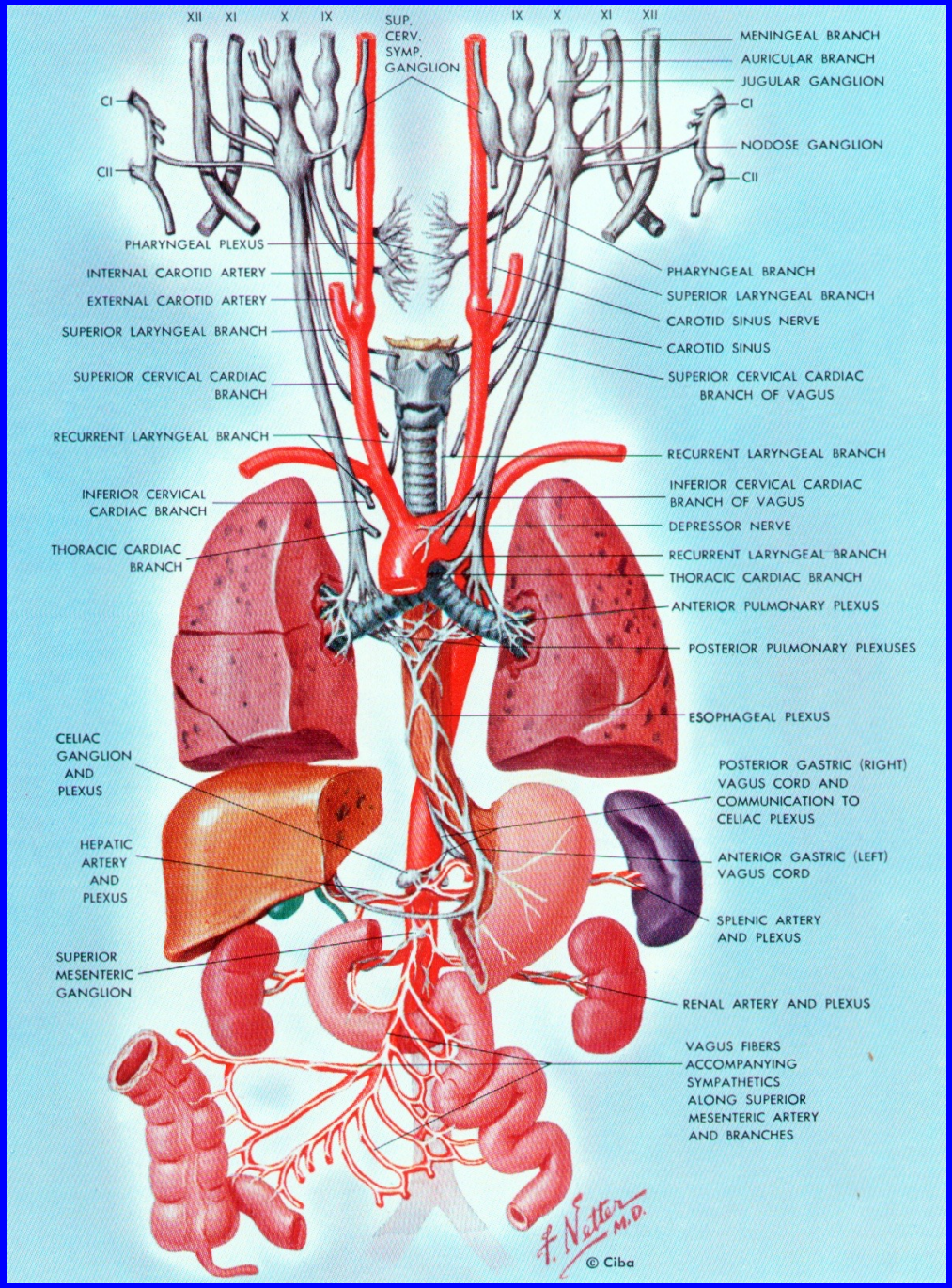
GLOSSOPHARINGEAL NERVE (IX)

The somatic efferent fibers of the ninth nerve are derived from the nucleus ambiguus, and the visceral efferent (secretory) fibers, from the inferior salivatory nucleus. These fibers contribute in a limited way to the motor innervation of the striated musculature of the pharynx (mainly of the stylopharyngeus, which elevates the pharynx), the parotid gland, and the glands in the pharyngeal mucosa.



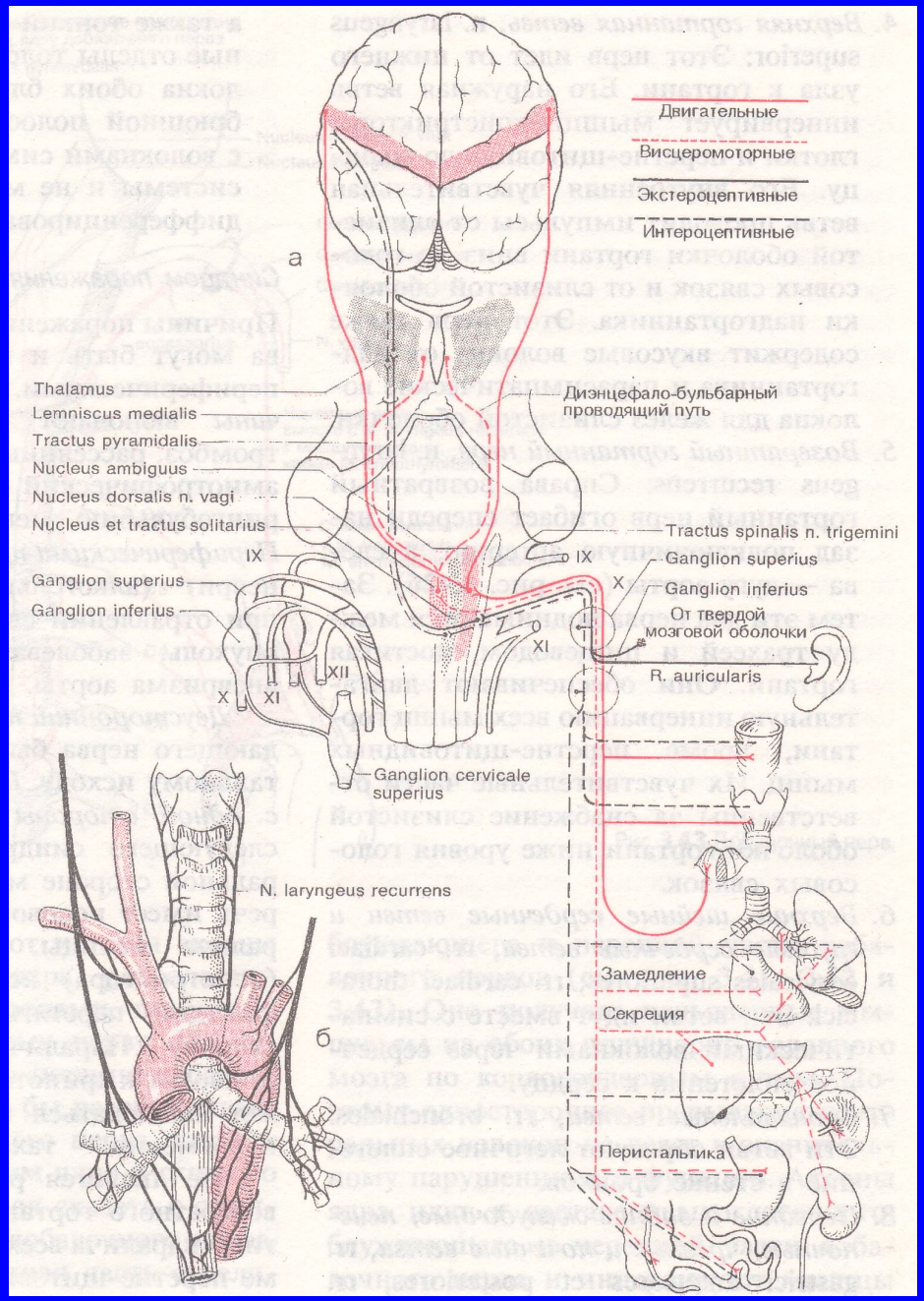
VAGUS NERVE (X)

This nerve has an extensive sensory and motor distribution. It has two ganglia: the *jugular*, which contains the cell bodies of the somatic sensory nerves (innervating the skin in the concha of the ear), and the *nodose*, which contains the cell bodies of the afferent fibers from the pharynx, larynx, trachea, esophagus, and the thoracic and abdominal viscera.



VAGUS NERVE (X)

The central processes of these two ganglia terminate in relation to the nucleus of the spinal trigeminal tract and the tractus solitarius, respectively. The motor fibers of the vagus are derived from two nuclei in the medulla - the nucleus ambiguus and the dorsal motor nucleus.



DISORDERS OF GLOSOPHARINGEAL AND VAGAL FUNCTION

Characteristic paralysis:

The soft palate droops on the ipsilateral side and does not rise in phonation.

The uvula deviates to the normal side on phonation.

There is loss of the gag reflex on the affected side and of the *curtain movement* of the lateral wall of the pharynx.

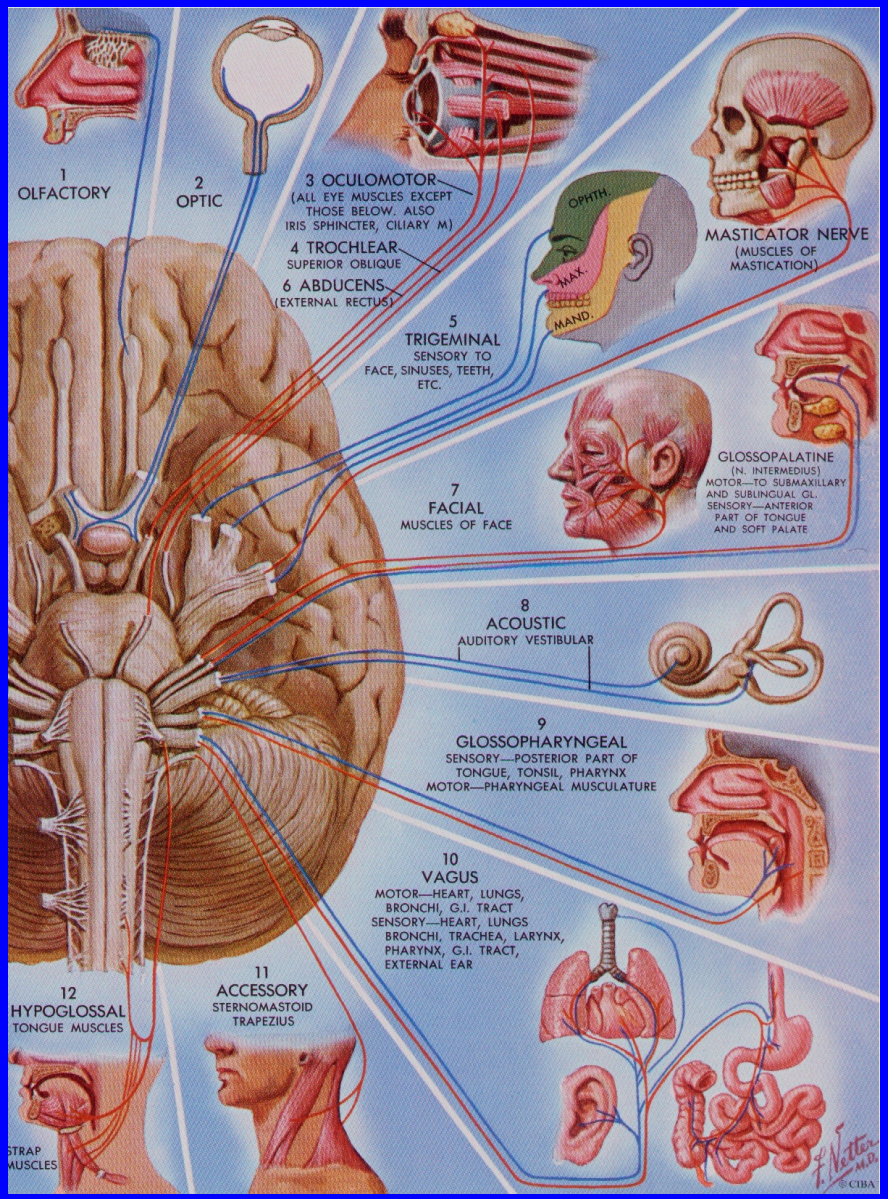
The voice is hoarse, often nasal.

Usually no change in visceral function can be demonstrated.

Regurgitation of liquids through the nose occurs during the act of swallowing.

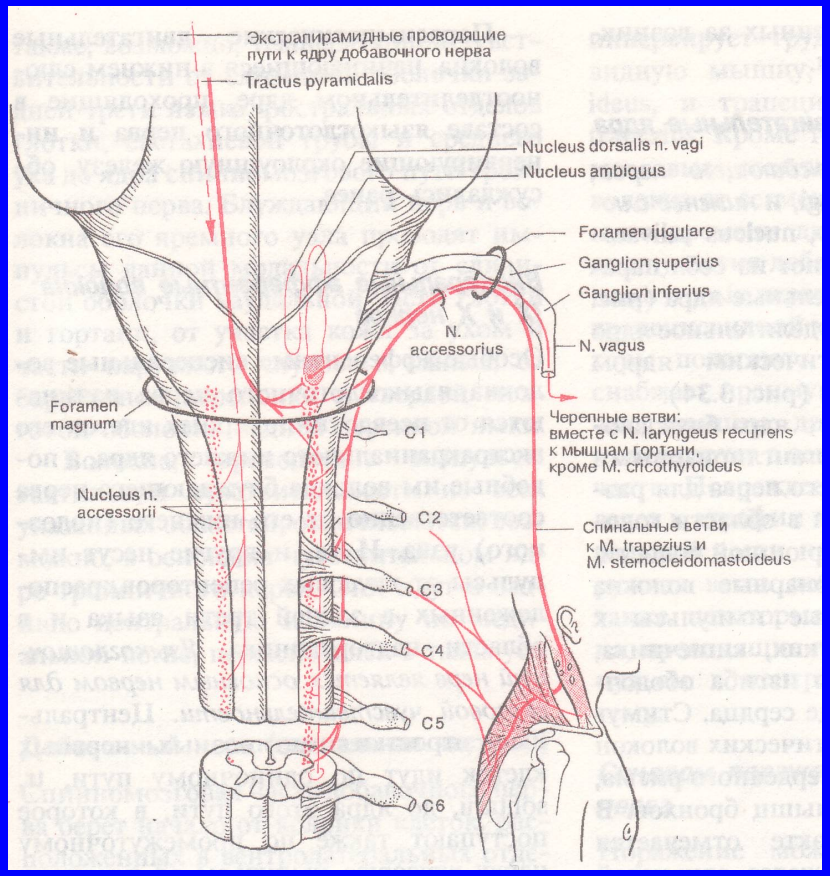
ACCESSORY NERVE (XI)

This is a purely motor nerve. Its fibers arise from the anterior horn cells of the upper four or five cervical cord segments and enter the skull through the foramen magnum. Intracranially, the accessory nerve travels for a short distance with the part of the tenth nerve that is derived from the caudalmost cells of the nucleus ambiguus; together, the two roots are referred to as the *vagal-accessory nerve* or *cranial root of the accessory nerve*.



ACCESSORY NERVE (XI)

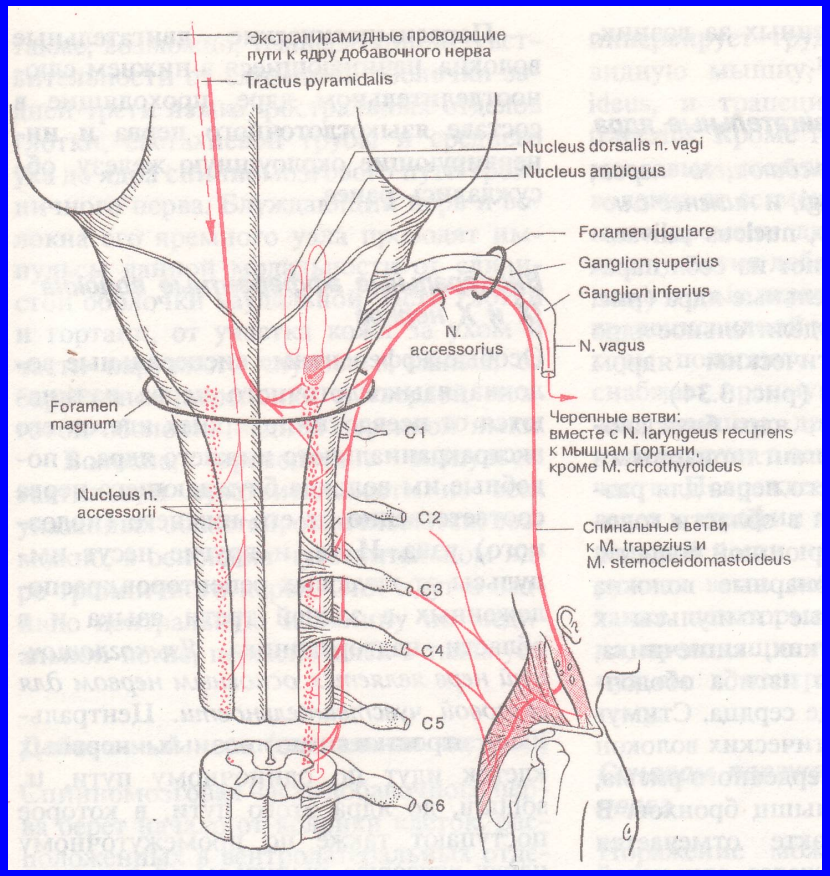
The accessory nerve has two distinct parts, both which are special visceral efferents to branchiomeric muscles. The spinal root, which arises from anterior horn cell of cervical cord segments (spinal accessory nucleus) C-2 through C-5, exits the spinal cord through the lateral funiculus as a series of rootlets, ascend through the foramen magnum, and courses along the side of the medulla. Here it joints the cranial root from the medulla. The spinal portion passes through the jugular foramen and descendes in the neck to end in the sternomastoid and trapezius muscles.



ACCESSORY NERVE (XI)

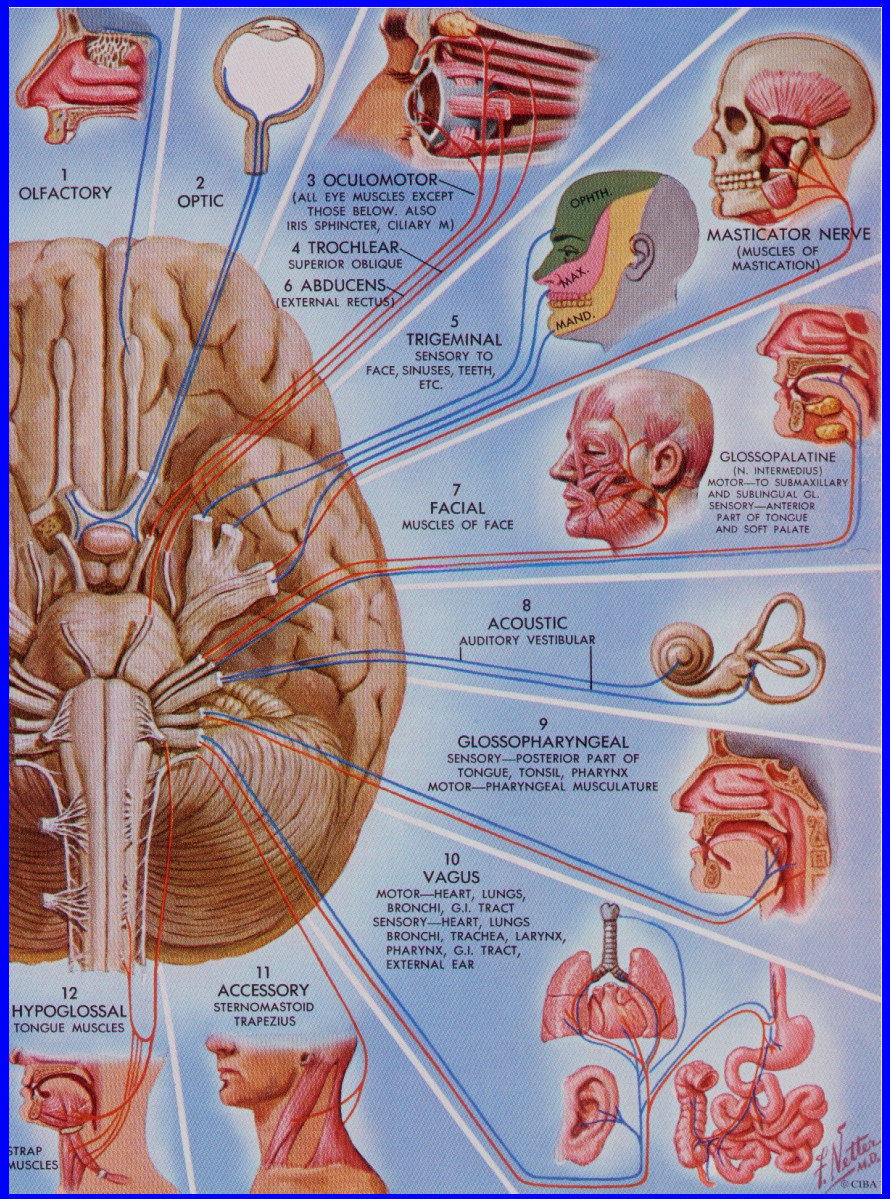
LESION:

A complete lesion of the accessory nerve results in weakness of the sternocleidomastoid muscle and upper part of the trapezius (the lower part of the trapezius is innervated by the third and fourth cervical roots through the cervical plexus). This can be demonstrated by asking the patient to shrug his shoulders; the affected trapezius will be found to be weaker, and there will often be evident atrophy of its upper part.



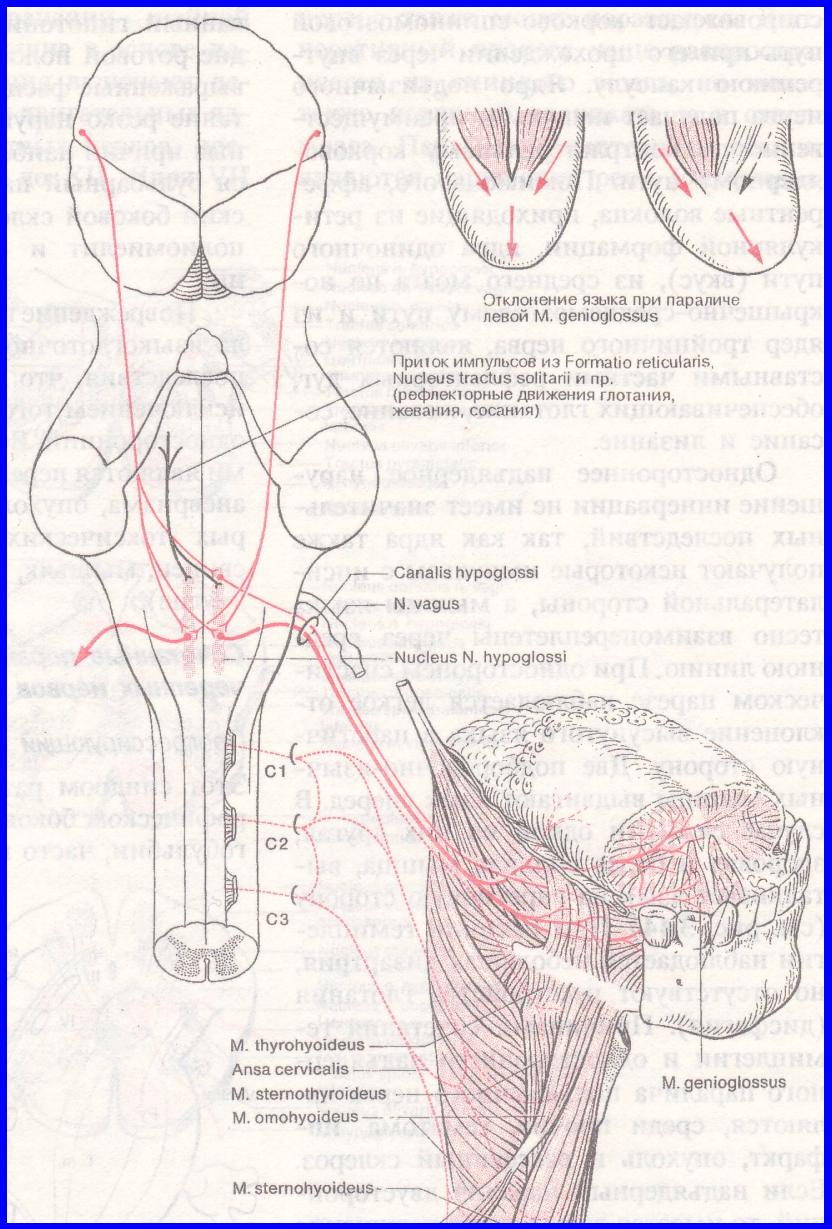
HYPOGLOSSAL NERVE (XII)

This is also a pure motor nerve, which supplies the somatic musculature of the tongue. It arises as a series of rootlets that issue from the medulla between the pyramid and inferior olivary complex. The nerve leaves the skull through the hypoglossal foramen and innervates the genioglossus muscle, which acts to protrude the tongue; the styloglossus, which retracts and elevates its root; and the hypoglossus, which causes the upper surface to become convex.

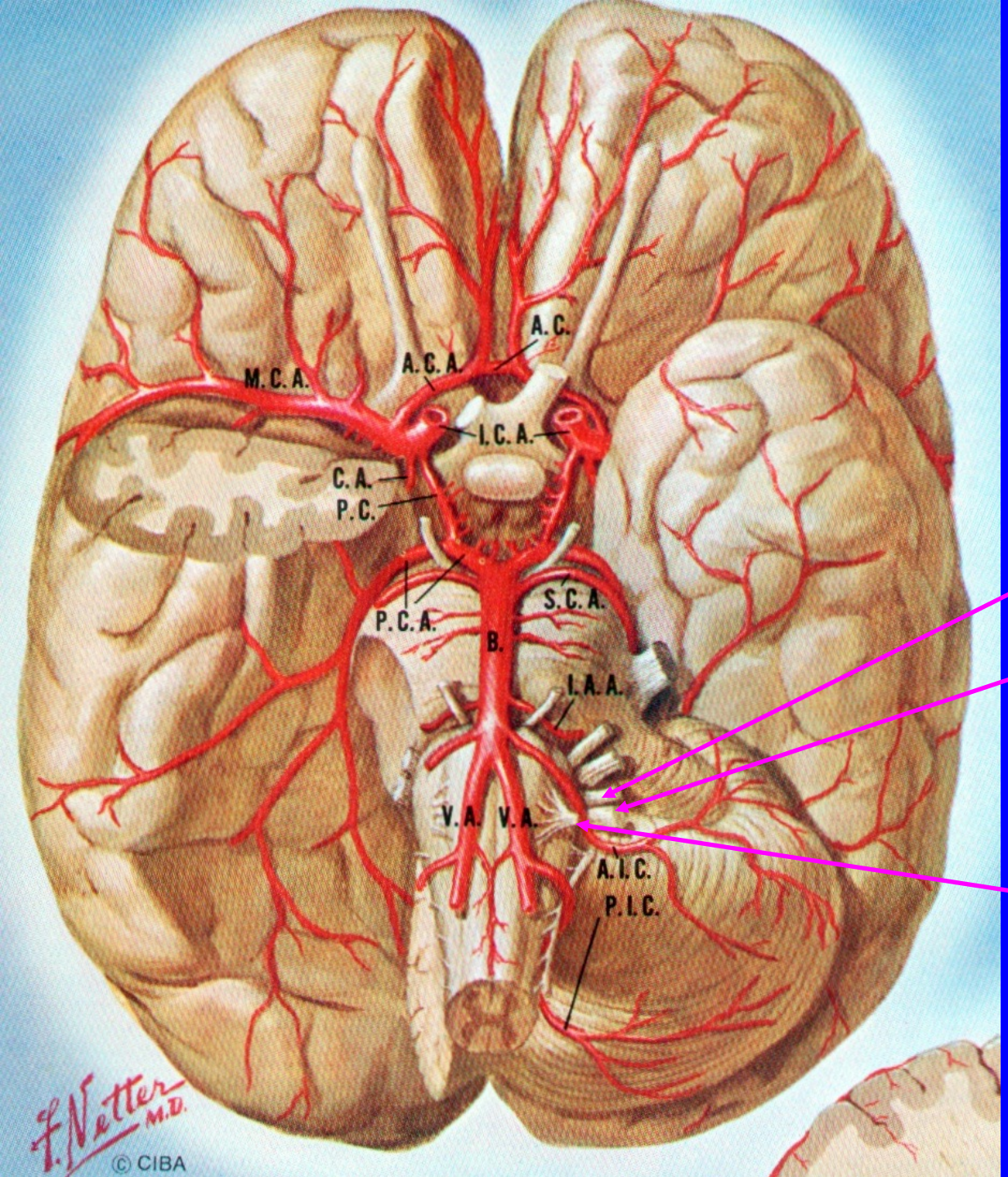


HYPOGLOSSAL NERVE (XII)

Complete interruption of the nerve results in paralysis of one side of the tongue. The tongue curves slightly to the healthy side as it lies in the mouth, but on protrusion it deviates to the affected side, owing to the unopposed contraction of the healthy genioglossus muscle. The tongue cannot be moved with natural facility. The denervated side becomes wrinkled and atrophied, and fasciculations and fibrillations can be seen.



BULBAR and PSEUDOBULBAR SYNDROME



IX. N. glosofaringian

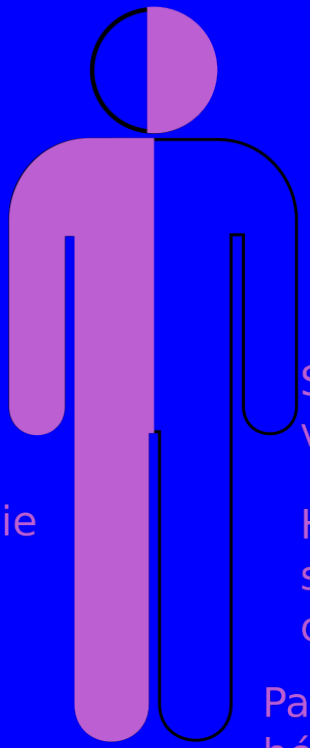
X. N. vag

XII. N. hipoglos

Crossed sydromes

Syndrome de Wallenberg

CÔTÉ DE LA LÉSION



Anesthésie thermo-algique.

Claude Bernard-Horner

Syndrome vestibulaire

Anesthésie thermo-algique.

Hemi-syndrome cérébelleux

Paralysie hémi-voile, corde vocale,

THE END

QUESTIONS ???