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The eye is the mirror of the soul, or it is rather a mirror of the brain, a window to the brain, at least for neurologists. In neurology, the examination of the optic nerve and eye movements are part of the physical examination. Fundoscopy is vital in emergency neurology. Visual field testing is performed both during neurological and ophthalmological examinations, but its most accurate assessment is best performed with ophthalmological devices. Eye movement and pupil reaction tests are also carried out by both specialties; however, the criteria for these evaluations might be the most different in these tests.

The interdependence of neurology and ophthalmology is justified by the complexity of the visual system. The eyes are ultimately part of the brain, the retina develops from the diencephalon,

and the layers of the eyeball are related to the meninges. The retina and the brain are supplied by a common artery. The orbits and the intracranial structures feature strong anatomical connections. The visual system has some contact with all regions of the brain from the retina to the occipital cortex. The anatomy and the vestibular connections of oculomotor regulation constitute some of the most difficult topics both in medical and specialty training. Structures related to vision can be found almost everywhere in the nervous system (one-third of supratentorial structures plays a role in vision); thus, they can be affected by nearly all neurological diseases; the description of the disorder can help to identify the trigger factor (Newman et al. 2003).

As a result, it is easy to understand why ophthalmologists and neurologists often point at each other when faced with several diseases of the visual and oculomotor system. In our everyday practice, most of us have seen patients with anterior ischemic optic neuropathy pushed to and fro by neurological and ophthalmological wards and outpatient clinics. Neuro-ophthalmology is a field where the specialist has to be an ophthalmologist and a neurologist at the same time, which is, of course, not achievable. As a result of the system of education, everybody qualifies as an ophthalmologist or a neurologist first, which means that we are going to have neurologists who are good at ophthalmology and ophthalmologists who are good at neurology; a

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situation which has both advantages and disadvantages. The most significant consequences of this separation are apparent in the case of rare diseases. In 1992, a child was admitted to the Department of Neurology in Boston, USA (Engle 2007) with bilateral ptosis and downward gaze. Investigations for myasthenia, mitochondrial disease, and congenital myopathy yielded no results. The result of ophthalmological consultation was somewhat surprising for the neurologists as the ophthalmologists diagnosed the case as congenital fibrosis of the extraocular muscles. This disease entity was unknown for the neurologists in spite of the fact that it had been first described in ophthalmology in the 1800s, as belonging to the group of ocular fibroses, the most well-known manifestation of which is Duane syndrome. In ophthalmological literature, the cause of this group of diseases was thought to be the primary

fibrosis of the extraocular muscles. Nowadays the group has extensive neurological literature as well, as the cause of oculomotor disorders has proved to be a developmental disorder of cranial nerve motor neurons (congenital cranial dysinnervation disorders) rather than fibrosis. There are many other ‘surprising’ diseases like this; therefore, this book might serve to decrease the number of such surprises for both ophthalmologists and neurologists.

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## References

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