

closed, but apparently relaxed, the eyes are not rolled upwards, as I have convinced myself in an examination of numerous cases. The eyes are in a position almost directly forward, sometimes slightly downward or upward, but a marked rolling upward is never present. If the lids are clumsily lifted, naturally a reflex results, followed by an upward rolling of the eye. If the lids are carefully lifted, however, so that the subject is not disturbed, the eyes will never be found in an intense upward position.

IV. Deviation of the Eyes When Eyelids Are Closed.—Whether a deviation of the eyes takes place in the normal subject when eyelids are closed I do not know. I have never yet seen a case in a definitely normal subject. I have, however, determined the deviation of the eyes with closed lids in three diseased conditions, namely (1) Destruction of the labyrinth, (2) Hemiplegia, (3) Epilepsy.

(1) But few observations have been made as yet by me and Nasiell concerning deviation of the eyes with closed lids in labyrinth destruction. I have reported this observation, January 29, 1921, at the Otological Section in Stockholm. From theoretical considerations I arrived at the conclusion that in labyrinth destruction such a deviation of the eyes to the affected side must take place, and my observations have been corroborated. Frequently as early as the second or third day following labyrinth destruction the deviation of the eyes with lids closed takes place. In a large group of cases I have found this deviation present long after the spontaneous nystagmus had disappeared. This deviation is not always present. It is, therefore, not a constant symptom of latent labyrinth destruction, but is found in the majority of such cases. This deviation is analogous to the head-twisting of pigeons and the head and eye distortion in rabbits. It apparently occurs as the result of a contraction of the muscles following the vestibular permanent impulse. Evidently the nystagmus results from two innervations: the slow in one direction, and the rapid in the other. During sleep, however, the rapid component is eliminated, while the slow innervation continues. Presumably this deviation is developed during sleep. I have not yet had opportunity to observe whether this deviation actually occurs "over night."

(2) In 1913, I first described latent deviation of the eyes in hemiplegia to the affected side.⁴ In referring to this publication I wish to remark that Prezzolini,⁵ in Bologna, has also independently made this observation. He even presented this observation before I did, but published his data later. This deviation occurs simultaneously with the disappearance of the cortical or subcortical conjugate ocu-

lar paralysis to the side of the paralyzed muscles and proves that one-sided subcortical or cortical ocular paralyses are never found in long-standing cases. This is my explanation for the apparent "cure" of conjugate ocular paralysis that also occurs in *ad exitum* cases and not the existence of completely hypothetic centers for the movement toward the same side in the healthy hemisphere.

(3) In epilepsy also I have frequently found deviation of the eyes with closed lids. It is my opinion that this is a sign of a cerebral focus. Possibly we are dealing with a focus in the frontal oculomotor center, which produces a conjugate ocular paralysis and consequent deviation of the eyes to the opposite side simultaneous with "cure" of the conjugate ocular paralysis.

V. Rocking Vestibular Eye Movement Synchronous With the Pulse; Peripheral (Ausgelöster); Labyrinth Tonus.—In 1906⁹ I first described the observation that in a patient with labyrinth fistula and otherwise intact labyrinth a constant, slow rocking, horizontal-rotary movement of the eye was noticed. I and others⁷ have repeatedly observed this phenomena and that mostly in cases of labyrinth fistula with intact labyrinth. In November, 1916, I found it in a case of lues withluetice disease of the right internal ear. This case was also observed by my former assistant, Dr. Martha Pson Hening. She promptly expressed the opinion that this movement might be synchronous with the pulse. An examination of the pulse corroborated the accuracy of this opinion. Since then I have seen innumerable cases and always found this synchronicity of the slow eye movement with the pulse; on the other hand, I have never found synchronicity of the nystagmus component with the pulse.

The synchronicity of this slow eye movement with the pulse results from the fact that the first slow ocular movement occurs simultaneous with the pulse wave and that the second, opposing ocular movement, occurs distinctly after the pulse wave has passed. Neither Dr. Hening nor I have published this observation of the simultaneous occurrence of the slow ocular movement with the pulse. In March, 1918, S. H. Mygind published an article in the *Zeitschrift für Ohrenheilkunde*, Vol. 77, page 70, under the caption, "A New Labyrinth Fistula Symptom," wherein he reports two cases of labyrinth fistula in which he determines the synchronicity of the slow ocular movement with that of the pulse. Mygind naturally developed his observations entirely independent of ours and the priority of publication is due him, yet Dr. Hening is entitled to the priority of observation. Her observations followed my written report, November 27, 1916. Mygind made his observations in December, 1916.