Preface
The Dark Side of the Moon

A consistent amount of patients who suffer from stroke, brain injury, or tumors complain of visual problems. Of these, the most evident is the bilateral loss of light sensitivity in the hemifield contralateral to the damaged hemisphere. This defect, called hemianopia, generates reading and orientation problems and may lead to a profound reduction in the quality of life.

The onset of hemianopia, indeed, is a dramatic event: half of the visual world seems to disappear all of a sudden. And the Moon is always crescent or waning. Never full.

Patients are disoriented, scared by what has just happened, and worried about what will become of their lives. Most of them can no longer drive and independence and sociality are at risk. Add the frustration of not having answers, of not finding solutions. The best neurologists and cardiologists cannot but look for risk factors to reduce to a minimum the probability that a new cerebral accident occurs, and the best ophthalmologists cannot but detect or rule out any concurrent ocular and neuro-ophthalmological disease. In fact, there is nothing they can do to return patients to the wonderful sight of a full Moon.

The Dogma is: "In the brain what is lost is lost". And the Dogma cannot be broken: the vanished part of the visual field is lost forever.

Yet, since the past century research has been challenging the Dogma. Investigations first on animals, then on humans reveal that systematic and repetitive stimulation of the blind region of the visual field helps restore, even if partially, the neuronal function. It is well known that man is a highly adaptive being and specific training may improve the capacity to scan into the lost part of the visual world. Moreover, the intact region of vision can make up for the defective area when appropriate optic devices are developed and applied.

It is weird that despite the high prevalence of stroke and in the face of these experimental efforts visual rehabilitation of hemianopia is not receiving the attention it deserves in the clinical setting.

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To stimulate interest and prompt the adoption of avant-garde solutions, in this treatise the pathophysiology of hemianopia, its clinical signs and symptoms, and especially the state-of-the-art rehabilitation are described. It is a long translational journey, that sets out from the pioneering studies on the effects of brain lesions in wounded soldiers, passes through the mechanisms of spontaneous compensation of hemianopia, continues with the laboratory results in the psychophysical, electrophysiological, and neuroimaging fields, and comes to describing and discussing the rehabilitative techniques devised in the last decades. Technical details are provided in a series of tables so to make the training procedures replicable step by step. This way, ophthalmologists, orthoptists, and other health rehabilitation personnel can draw inspiration in their daily practice.

This fascinating journey, with its shadows, stops and go, reverses, confirmations, and denials, has not yet come to an end.

But it is firmly determined to re-illuminate the dark side of the Moon in these unfortunate patients.

And you, dear Reader, are going to be the traveler.

Carlo Aleci, March, 2024.