

Historical Perspectives in Ophthalmic Photography

Light Toxicity Circa 1869

Patrick J. Same, M.Ed., C.R.A.

In a modern fundus camera, the instantaneous electronic flash imprints the retina's image onto film. The steady output of the tungsten viewing light facilitates focusing. Concern about the intraocular safety of these light sources recently prompted a symposium on light toxicity.¹

Retinal light exposure during photography has raised questions in the ophthalmic community as early as the 1869 paper excerpted below. At the time, the wet plate was the dominant photographic medium.² It needed two to three seconds exposure for a normal scene in direct sunlight.³ The ophthalmologist's retinal exam took place with "Jäger's strong mirror and full sunlight."⁴ In 1869 the success and physiological consequences of retinal photography were uncertain:

At Dr. Algernon Coolidge's request I lately saw, in consultation at the Massachusetts General Hospital in Boston, a lad some fifteen years of age who had been kicked by a horse over the right frontal region, breaking in the outer table and involving the frontal nerve. The boy was totally blind of this, the right, eye. As atropine had been put in I could not say whether the pupil acted with the other eye, which was quite normal. I made an ophthalmoscopic examination by Jäger's strong mirror and full sunlight. The patient had no perception of light whatever, although the reflex was too strong for me to look at long. The sunlight, partly obscured by a thin white cloud, gave me the most beautiful view of the fundus oculi I ever remembered to have obtained. This was with the upright image. The same with the reversed. The fundus looked *perfectly normal*, except a grayish tinge to about two thirds of the papilla; as the same, however, existed in the other apparently normal eye, I could not regard it as indicative of any pathological change. A few weeks afterward both Dr. Coolidge and myself thought this grayish portion was less or encroached upon by the encircling white outer ring of the papilla. My prognosis was that vision might return, in whole or in part, which time (some three months) has confirmed....

But that which is of special interest, and my reason for reporting this case, is, that we here had a perfectly normal fundus oculi entirely destitute of sensation to light, and with transparent media in front of it. From not being able to communicate in time with Dr. Noyes, of New York, who possesses the necessary skill and apparatus, an opportunity was lost to achieve a scientific triumph, namely, the photographing the interior of the normal human eye, which, I believe has not yet been done. A question then arose as to whether the retina might be damaged by throwing on it an amount of light sufficient to obtain a photographic picture from its reflection, for I

felt that vision might again return in this eye, and therefore any risk of injury to the retina was unjustifiable. The only direct answer to this was some experiments I had read in the Vienna Academy Reports for 1867, by Dr. Vincenz Czerny, on the objective change in the eye, especially the retina, from the effect of light. Werneck reported in Ammon's Zeitschrift für Ophthalmologie, 1834, have broken down by concentrated sunlight cataract in animals, and seen it gradually absorb. He proposed doing the same in man. Cases have now and then been reported, by E. Jäger, Arlt, Coccius, and Schirmer, of injury of the eyes from exposure to sunlight, for instance, during an eclipse. As Dr. Czerny says, it is rather curious that physiologists should not have sought for objective change in the retina from the effect of intense illumination, especially as it is practically important to know what degree of intensity we may safely use in ophthalmoscopic examination.⁴

REFERENCES

1. "Light Toxicity and Its Meaning to Ophthalmic Photographers," a symposium presented at the Seventeenth Annual Meeting of the Ophthalmic Photographers' Society, 10 November 1986, New Orleans.
2. Gilbert, G. 1976. *Collecting Photographica*, New York: Hawthorn Books, Inc., pg. 8.
3. Pollack, P. 1958. *The Picture History of Photography*, New York: Harry N. Abrams, Inc., pg. 103.
4. Jeffries B. J. 1869. A question in reference to photographing the interior of the human eye, *Trans. Amer. Ophthal. Soc.* 6: 67-71.

Author's current address: Patrick J. Same, C.R.A., c/o Davis Duehr Eye Associates, 1025 Regent St., Madison, WI 53715.

Key words: light toxicity

Submitted for publication: May 26, 1987
Modified: July 28, 1987

Historical Perspectives in Ophthalmic Photography
counterpoints significant advances in the field with a short historical comment. Suggestions are most welcome.