ANGIOID STREAKS IN THE RETINA.

BY G. E. DESCHWEINITZ, M.D.,

PHILADELPHIA, PENN.

Four years ago Plange * called attention to certain pigment striæ with secondary changes in the retina after hemorrhage. His communication was followed by a paper by Dr. Knapp,† who gave the name "angioid streaks" to this affection. A similar condition is described by Sydney Stephenson, ‡ characacterized "by the presence of dark, reddish-brown anastomosing bands lying beneath the retinal vessels, and extending over a large area of the fundus." Ward Holden § contributes an article on the probable hemorrhagic origin of the striated affections of the retina, and concludes that "it would seem warrantable to assume as a hypothesis, to be verified by future observation, that the affection called retinitis striata, like that called angioid streaks, arises through the elements of peripheric hemorrhages being diffused in a linear manner in the deep layers of the retina, and undergoing various sorts of metamorphoses." Recently, B. Walser, ‖ in Vienna, has contributed three similar examples to the literature of the subject.

To this series of cases I desire to add another, at present under my observation.

Josiah Deily, aged 47, born in Pennsylvania, married, carpenter, consulted me May 16, 1895, with the hope of obtaining relief for failing vision.

History.— With the exception of small-pox in 1885, and the usual fevers of childhood, the patient has been a healthy man. He denies venereal disease of any type; he has not smoked for many years, but chews one ounce of tobacco per diem; he is not accustomed to drink liquor; his parents are alive and well; he has seven healthy children, and his wife has had no miscarriages.

---

* "Archives of Ophthalmology," 1892, XXI, p. 282.

† Ibid., p. 289.

‡ "Trans. Ophth. Soc., U. K.," 1892, Vol. XII, p. 140.

§ "Archives of Ophthalmology," 1895, XXIV, p. 147.

‖ "Archiv. f. Augenheilkunde."

In April, 1894, the vision of the left eye began to fail, and one month later the right eye suddenly lost its sight. These visual disturbances were unassociated with ocular pains, but at times he has suffered from starting pains in the head.

Examination.— The patient is a medium-sized, apparently healthy man, with slightly pallid countenance and typically amaurotic expression. The pulse is rather soft, 72 to the minute, and regular in rhythm; the area of cardiac dullness is normal, and there is no murmur. The specific gravity of the urine is 1012; it contains neither albumin nor sugar.

Eyes.— V. of R. E. equals counting fingers at 1.5 metres; of L. E., counting fingers at 1 metre. Each visual field (form and colors) is normal. The pupils are semi-dilated (6 mm.), and the iris movements to light and accommodation are preserved, but are somewhat sluggish.

One year ago the lesions in the background of the eyes were as follows: *R. E.* — The optic disc was somewhat discolored, and there was greenish broadening of the scleral ring on the temporal side. Directly in the macular region was a patch of whitish exudation, and below it and between it and the disc were large, sheet-like hemorrhages, while above it was a patch of pigment equal in size to the surface of the papilla. Several smaller hemorrhages were visible in the lower and inner quadrant of the retina. Covering a large area of the fundus, especially on the nasal side, were numerous branching and anastomosing lines, or streaks, of somewhat granular appearance, lying beneath the retinal vessels, partly brownish-black and partly reddish in color. They resembled a system of obliterated vessels, were slightly elevated, and might be compared to diminutive ridges, not unlike those made by a mole when he burrows beneath the surface of the ground. Some of them terminated near the margin of the disc, while others reached entirely to the edge of the papilla. *L. E.*—The appearances were almost exactly similar to those just described, except that the macular degeneration was more extensive, and the streaks broader and more pigmented. (Figure 1.)

More than one year has elapsed since this description was written, and as the patient has been under continual observa-

tion in the meantime, it is now interesting to compare these two water colors which I exhibit — the first one having been prepared by Miss Margaretta Washington in June, 1895, and the second one in June, 1896.

Examination of the second sketch shows practically the same arrangement of the angioid streaks on the nasal and upper side of the retina, although their hemorrhagic nature is now less marked, owing to the admixture of finely granular pigment.

A study of the temporal side of the eyeground is most instructive. The large dark mass which lay beneath the upper temporal vessels has almost entirely disappeared, while the diffuse hemorrhagic extravasation between the disc and the macula has nearly subsided, and in its place have developed a number of short, dark ridges, or streaks, which are evidently the outcome of its metamorphosis. (Figure 2.) In connection with the large hemorrhage which was situated below the macula region, there has developed a broad, somewhat pigmented streak — also, unquestionably, a part of the process of transformation.

The interesting point in connection with these two sketches is that they demonstrate, from the ophthalmoscopic standpoint, at least, the undoubted hemorrhagic nature of the lesions, which may be traced from their origin in the hemorrhagic metamorphosis, through the stage in which the formed striæ, still partly hemorrhagic in nature, are disposed in characteristic and branching lines, to their later development into true pigment streaks and ridges.

In the cases thus far observed there has been some difference in the description of the striæ. Thus, in the right eye of Plange's patient the striæ were of a dull brown color, and were included in broader light stripes, probably a later development of the affection. In Knapp's case the streaks were dark brown or black, radiating from the neighborhood of the optic disc in every direction. There was no direct connection with hemorrhage, although in a few places the dark streaks had red portions. Stephenson's description, as well as his plate, shows that the anastomosing bands were of a dark reddish

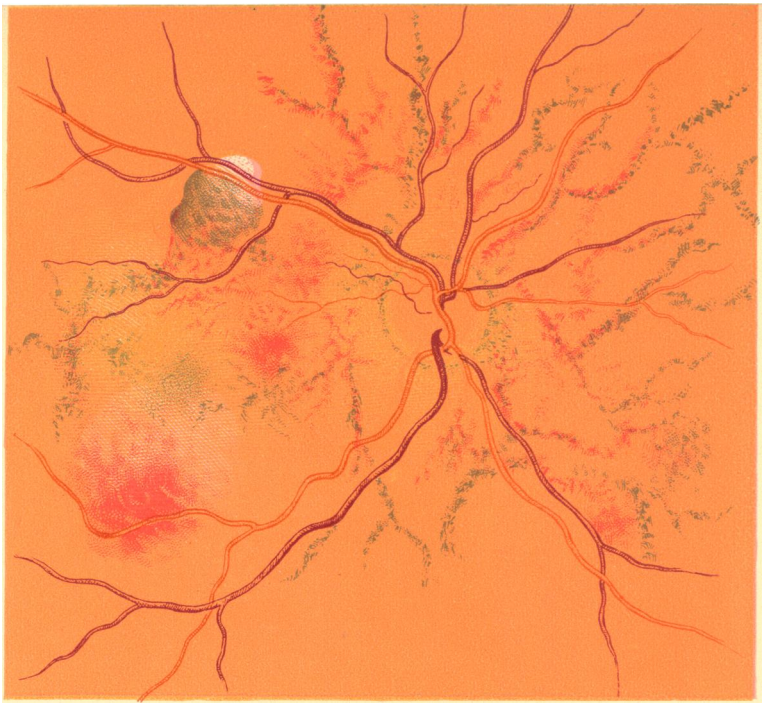
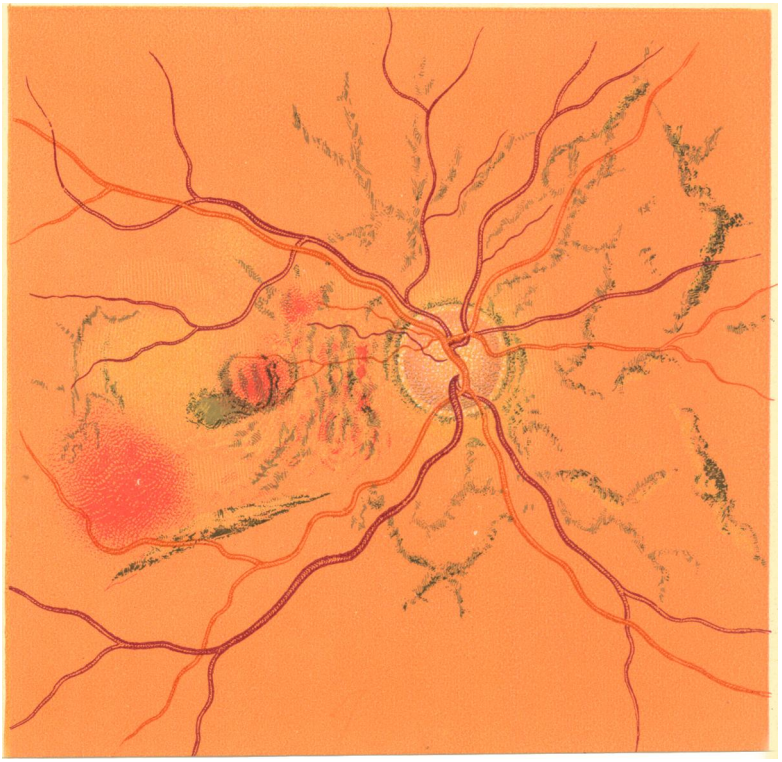


FIGURE II



brown color, and were occasionally bordered by cicatricial-looking lines of a glistening gray aspect. In Ward Holden's case, studied in the practice of Dr. Knapp, the angioid streaks closely resembled those of previous cases. He also was able to notice their direct connection with a hemorrhage — in fact, he practically observed the gradual development of the streaks while the hemorrhage was undergoing absorption. In my own case it will be noted that in the first drawing there is no bordering of white tissue, as has been described, the streaks being composed of a stippling of brown or reddish tissue. In the later stages, however, as represented in the drawing made one year after the original observation, in addition to the increase in the brown pigment and the decrease in the reddish color, an irregular whitish border begins to appear, especially along those streaks which probably are oldest in point of origin. In the reports of some of the cases it has been stated that the streaks lose themselves gradually near the papilla, or stop short in the neighborhood of its margin. Certainly in the case which I present today many of the striæ pass entirely to the margin of the disc — in fact, they become united with the pigment disturbance in its immediate environment. The mechanism of the development of these striæ has already been discussed by Plange, by Holden, and by Knapp, and need not be referred to in further detail.

It would be a matter of interest to determine the reason of the retinal hemorrhages in this case, and one naturally turns to an examination of the blood to furnish etiological clues, inasmuch as the urine is normal, and there is no history of bodily-dyscrasia which would satisfactorily explain those ophthalmoscopic extravasations. To this end, I have secured a very careful examination of the patient's blood, and am indebted to Dr. Alonzo E. Taylor of the Pepper Laboratory of Clinical Research for the following study of the blood:

Haemoglobin, . . .	80 per cent.
Red corpuscles, . . .	4,750,000.
Leucocytes, ...	4,200.

The red cells are in all respects normal. A differential count of the leucocytes gives the following result:

Neutrophilic polynuclear leucocytes,	68	per cent.
Oxyphilic polynuclear leucocytes,	4	per cent.
Mononuclear and transitional forms, not granulated,	13.6	per cent.
Lymphocytes,	14.4	per cent.

The percentage of mononuclear cells is higher than usual, but, morphologically, the cells are normal. The amount of fibrin is approximately normal. The resistance of the red cells is also approximately normal. It is, therefore, almost absolutely certain (assuming that his blood has been in the same condition that it now is) that the retinal hemorrhages are not the result of any general blood dyscrasia.

HISTOLOGICAL EXAMINATION OF THE EYES FROM A CASE OF PERNICIOUS ANÆMIA.

BY G. E. DE SCHWEINITZ, M.D.,

PHILADELPHIA, PENN.

The following case of pernicious anæmia occurred in the wards of the Philadelphia Hospital in the service of Dr. F. P. Henry, to whose courtesy I am indebted for the privilege of examining the eyes.

Dr. Charles W. Burr* has reported the case, so far as the lesions of the spinal cord are concerned, and from his paper I abstract the following history:

James Mullaney, male, 64 years of age, a laborer, was admitted to the Philadelphia Hospital, April 26, 1894. He had been slowly growing weaker for several years and complained of slight dyspnœa upon exertion. During his entire stay in the hospital his only complaint was a progressive weakness.

There was a soft systolic murmur at the apex and a more distinct systolic murmur at the aortic cartilage, transmitted to the vessels of the neck.

At the first examination of the blood made by Dr. Henry

* University Medical Magazine, April, 1895.