

THE
Journal of the American Medical Association.

EDITED UNDER THE DIRECTION OF THE BOARD OF TRUSTEES.

PUBLISHED WEEKLY.

VOL. XV.

CHICAGO, OCTOBER 18, 1890.

No. 16.

ORIGINAL ARTICLES.

A SERIES OF CASES PRESENTING MINOR
LESIONS IN THE MACULA LUTEA.

Read in the Section of Ophthalmology at the Forty-first Annual Meeting of the American Medical Association, held at Nashville, Tenn., May, 1890.

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

OPHTHALMIC SURGEON TO THE CHILDREN'S AND PHILADELPHIA HOSPITALS; OPHTHALMOLOGIST TO THE INFIRMARY FOR NERVOUS DISEASES.

The lesions of the macula lutea which result from myopia, nephritis and diabetes, anæmia and cardiac disease are well known. Haab (Internationaler Ophthalmologen-Congress, Heidelberg, 1888) has classified the remaining diseases of the macula into several groups:

1. Those due to trauma (*a*) by contusion of the globe without rent in the sclera (*commotio retinae*, of Berlin); (*b*) secondary to penetrating foreign bodies; (*c*) secondary to a neighboring rupture of the choroid.

2. Those characterized by the general term senile macular disease.

3. Those seen in people of depressed nutrition—anæmia, diseases of the stomach, etc.—having at the same time an hereditary disposition to macular disease; and finally,

4. Those in which no etiological factor within or without the eye is discoverable.

In the groups just referred to, at least in the majority of them, a marked failure of central vision is a characteristic symptom. In the series of cases to which I beg your attention for a few moments full acuity of vision is present; general disease in most instances is absent; trauma and other local ocular changes are wanting, and with propriety they may be referred to Haab's fourth group in which no etiological factor within or without the eye is discoverable, that is discoverable in the sense that it is not possible to point with certainty to any one determining cause. These small lesions have certain features in common. They vary in size from one to four diameters of a retinal vein. Usually they are somewhat oval or irregularly round in shape, of varying tints, for the most part grayish-white, or buff-colored, sometimes more decidedly yellow, occasionally associated with some granular pig-

ment, or composed of small collections of yellow and black granulations. Their situation is usually either above or to the temporal side of the fovea in the macular region, and if in relation to any vessels they lie beneath them. For the convenience of study these cases may be classified into several groups:

GROUP 1.—*Asymmetrical lesion—situated in the macular region of the eye presenting the greater error of refraction.*

Case 1.—D. N., a young man aged 19; very nervous; hard student; no general disease. Large irregular discs; many lymph reflexes. In the left eye up and in from the fovea a small oval patch of retino-choroiditis composed of yellowish and black granules interspersed, lying upon a buff-colored background. In the right eye no similar change. O. D. + .50s $\frac{2}{0}$. O. S. + 1.5 $\frac{2}{0}$.

Case 2.—Miss M. B., a woman aged 55; blepharitis; unsatisfactory reading power; general health perfect; urine negative. In each eye healthy, oval optic discs. In the left eye a patch 3 by 4 mm. below the fovea characterized by yellow dots and a few pigment granules lying upon a yellowish-white surface. In the right eye no macular changes. O. D. + .75s $\frac{2}{0}$. O. S. + 1.5 $\frac{2}{0}$.

Case 3.—Miss M., a woman aged 35; chronic conjunctivitis; typical asthenopia; bad occipital headaches; suffers much from dyspepsia, and has post-nasal catarrh. Oval discs and hazy retinas. In left macula a small, square, buff-colored spot in the choroid below the fovea. No similar change in the right eye. O. D. + .50s \bigcirc — 2.c axis H. $\frac{2}{0}$. O. S. + .25s \bigcirc — 2.50c axis 5 $\frac{2}{0}$.

Case 4.—Miss C., aged 20; suffers much with trigeminal neuralgia; hair prematurely gray; dreads light; has occipital headache; otherwise health good, although excessively nervous. In the right eye an oval disc; retina slightly hazy, and below the fovea a patch of choroidal change about 3 mm. square containing in its centre a cholesterin crystal. In the left eye a nearly round disc, rather pallid, no macular change. O. D. + .50s \bigcirc + .60c axis V. $\frac{2}{0}$. O. S. + .50c axis V. $\frac{2}{0}$.

Case 5.—N. B., a man aged 46; for three months has had running ears; successive attacks of conjunctivitis; at times occipital headache; giddy spells;

ill-defined history of rheumatism. In the right eye a horizontally oval gray disc; small buff-colored patch below fovea. In the left eye similar disc with absorption of the pigment epithelium of the choroid, but no macular change. O. D. + 1. s \bigcirc .90c axis 165 $\frac{2}{3}$. O. S. + 1.5 \bigcirc + .25c axis H. $\frac{2}{3}$.

Case 6.—Miss P., aged 39; itching and burning eyes; post-ocular pain, worse in right eye; has catarrhal pharyngitis; is deaf in the right ear. In the right eye an oval disc, below the fovea a small buff-colored spot containing a dark centre. In the left eye a normal disc without macular changes. O. D. + .75s \bigcirc + .60c axis V. $\frac{2}{3}$. O. S. + .50s \bigcirc + .50c axis V. $\frac{2}{3}$.

Case 7.—Mrs. M., age 35; frequent attacks of headache through brow and temple, aggravated by eye-work. Family physician sends report of perfect general health. In the right eye an oval disc, its surface too capillary. In the left eye an oval over-capillary disc; full lymph sheaths, and above the fovea an irregularly oval patch, yellowish, and studded with numerous darker tinted dots. O. D. + .50s \bigcirc + .50c axis V. $\frac{2}{3}$. O. S. + .90s \bigcirc + 1.c axis V. $\frac{2}{3}$.

Case 8.—Miss McF., aged 31; burning eyes; blurred print; bad frontal headache; has had rheumatism; no gout; otherwise healthy. In the right eye a large irregular disc; broad scleral ring, and intensely granular macula, and to the outer side of the fovea an irregular buff-colored patch in the choroid. In the left eye a round disc with broad scleral ring. No macular changes. O. D. 2.50s \bigcirc + .50c axis 75 $\frac{2}{3}$. O. S. 2.s \bigcirc + .50c axis V. $\frac{2}{3}$.

Case 9.—Miss S., aged 46; suffers much with eye pain and headache; is in delicate health, and hair prematurely gray. In the right eye an oval disc bounded by a black line, and below the fovea a small oval patch yellowish-white in color. In the left eye a round disc with a shallow central excavation and sharply marked scleral ring. No macular change. O. D. + .75s \bigcirc + .60c axis 120 $\frac{2}{3}$. O. S. + .75s \bigcirc + .25c axis 60 $\frac{2}{3}$.

Case 10.—Mrs. C., aged 58; in perfect general health, and no recent sickness; discs rather gray; veins full, transverse arteries slightly tortuous. In the right eye a small yellowish patch in the macula above and just at the edge of the fovea. In the left eye no similar change. O. D. + .50s \bigcirc + .50c axis 165 $\frac{2}{3}$. O. S. + .75s \bigcirc + .25c axis H. $\frac{2}{3}$.

In this group of ten cases, all with perfect central vision and unaware of any lesions of the eye, general health, with one exception, was good, the well recognized causes of macular disease were absent, a satisfactory reason for the spot of degeneration could not be supplied. It is perhaps suggestive that this occurred upon that side presenting the greater error of refraction. In two the refraction was hypermetropic, and the difference only .50D and .25D respectively; and in the

remaining eight there were seven with compound hypermetropic astigmatism in each eye, and one with mixed astigmatism on both sides, the spot being present in the eye exhibiting the greater anomaly of refraction. If instead of presenting ten cases the number had been one hundred or more, such an association would be more than suggestive; as it stands it may be merely a coincidence. I wish, however, to point it out and learn the experience of my colleagues. When we remember that conus and posterior staphyloma have been ascribed to the influence of astigmatism, that refraction error may cause symptomatic retino-choroidal irritation and even superficial neuritis, it may at least reasonably be suggested that slight macular changes may arise under the influence of anomalous refraction and in asymmetrical cases appear in the more affected eye. Bearing somewhat upon this question is the well known fact, and one that I have often observed in this very series of cases, that under the influence of correction such superficial lesions slowly subside, just as the general irritable condition of the whole eye-ground will disappear through similar treatment.

Still in touch with the present theory of the possible origin of these small lesions under the influence of an error of refraction are those which I have gathered into the second group.

GROUP 2.—*Symmetrical macular changes—symmetrical refraction error.*

Case 1.—Mrs. R., aged 40; much sick headache; very nervous; limbs swell (hysterical); heart and urine normal. In each eye oval discs with hazy edges. In the right eye a small crescent-shaped patch, buff-colored, below and to the temple side of the fovea. In the left eye streaks in the macula and one small buff-colored spot above. O. D. + 1.50c axis 105 $\frac{2}{3}$. O. S. + 1.50c axis 75 $\frac{2}{3}$.

Case 2.—Mrs. B., aged 44; headaches for years; severe hemicrania without prodromes; of feeble muscular strength; urine normal. In the right eye sharply marked scleral ring around an oval disc; several oval, buff-colored patches in the macula somewhat radially placed. In the left eye lower and inner edge of the oval disc hazy. Exactly similar macular changes. O. D. + .50 \bigcirc — 1.c axis 165 $\frac{2}{3}$. O. S. + .50 \bigcirc — 1.c axis 15 $\frac{2}{3}$.

Case 3.—W. D., a man aged 34; complains of blurred feeling when reading, lachrymation and smarting pain in the morning, general health perfectly good; organs and functions normal, although his hair is beginning to turn gray. Large, slightly oval, pallid discs with central lymph sheaths full. In each macula above the fovea a buff-colored crescent more marked upon the left side. O. D. + .50s \bigcirc + .25c axis H. $\frac{2}{3}$. O. S. + .50s \bigcirc + .25c axis H. $\frac{2}{3}$.

Case 4.—Mrs. H., aged 42; recent nervous

prostration; occipital and shoulder pain with strained feeling across forehead; reads better in the dusk. In each eye unduly capillary, oval optic discs with hazy retinas and finely tortuous transverse vessels. In each macula slight dot-like changes, and above each fovea a maroon-colored crescentic area. O. D. —.25c axis 135 $\frac{2}{3}$ °. O. S. —.25c axis 45 $\frac{2}{3}$ °.

I have quoted four cases to illustrate this point: one an example of simple hypermetropic astigmatism; another of compound hypermetropic astigmatism; a third of mixed astigmatism; and a fourth of simple myopic astigmatism. The lesions are in exact accord with those which have already been described. They differ from the last group in being symmetrical; they resemble the others in being present in people of perfectly good health, or at least in people free from organic disease, and in whom no cause either within or without the eye could be discovered to explain their presence. An exception to this, however, may be Case 4, which in all probability is one of changing refraction, and the spots may have appeared under the influence of this phenomenon.¹

To illustrate the imperfection of the theory which has been suggested that these slight macular lesions may possibly arise under the influence of refraction error and appear on the side of the greater anomaly, a third group has been quoted in which precisely the opposite condition obtained.

GROUP 3.—*Asymmetrical lesion—situated in the macular region of the eye presenting the smaller error of refraction.*

Case 1.—Miss P., aged 25; suffers from general headache and smarting eyes at close work; rather delicate, but organs sound, the delicate health probably being due to lack of exercise. In each eye oval discs with rather full veins. In the right macula a small patch of choroiditis about 4 mm. square below the fovea. O. D. + 1.25s \bigcirc .25c axis V. $\frac{2}{3}$ °. O. S. + 1.50s \bigcirc + .25c axis V. $\frac{2}{3}$ °.

Case 2.—Miss S., aged 47; cardiac asthma; has had rheumatism; no renal change, much headache. In each eye oval disc and sharply cut scleral rings. In the right eye a buff-colored patch above in the macula fringing the edge of the fovea. O. D. + .50s \bigcirc + .60c axis 165 $\frac{2}{3}$ °. O. S. + .50 \bigcirc + 1.c axis 15 $\frac{2}{3}$ °.

Case 3.—Mrs. B., aged 61; general health good; blurred vision; urine normal. In each eye small, oval discs, edges clear. In the left eye two small yellowish-white patches bordering the lower edge of the fovea. O. D. + 2.5 \bigcirc + .90c axis 150 $\frac{2}{3}$ °. O. S. + 2.5 \bigcirc + .50c axis 60 $\frac{2}{3}$ °.

Case 4.—Mrs. G., aged 28; brow, vertex, and occipital headache for years, the brow and occip-

ital headache in direct relation to the eyes; general health perfect. In each eye oval discs, rather gray in the outer halves, and in the left eye below the fovea an irregular patch, characterized by numerous yellow dots with some larger buff-colored spots. O. D. + .50s \bigcirc + .50c axis 105 $\frac{2}{3}$ °. O. S. + .50 \bigcirc + .25c axis 75 $\frac{2}{3}$ °.

These four cases, chosen from a number which I have seen, are all examples of compound hypermetropic astigmatism, two with the astigmatism according to the rule and two with the astigmatism contrary to the rule, and in all the macular change in that eye exhibiting the smaller error of refraction. It is not improbable that, if this topic were pursued and large numbers of cases gathered together, it would be found such spots occurred more frequently in eyes exhibiting the smaller degree of refraction error, for the very reason that they may represent eyes that are increasing in refraction and lessening the amount of hypermetropia.

We come now to consider the fourth group of these cases, in which it is possible to point with more exactness to a cause for the changes in the eye-ground, and I will ask your attention for a moment to this group.

GROUP 4.—*Symmetrical macular changes— asymmetrical refraction error; probable influence of constitutional derangement.*

Case 1.—M. G., a man aged 54; aching eyes; intense occipital headache; very gouty, suffering at times with severe exacerbations of acute gout; gouty change in the kidneys. Horizontally oval discs, gray, and in each macula numerous round yellowish dots about the size of the head of a pin. O. D. + 2.s \bigcirc + .50c axis H. $\frac{2}{3}$ °. O. S. + 2.50s \bigcirc + .75c axis 165 $\frac{2}{3}$ °.

Case 2.—D. L., a man aged 42; severe occipital headache; apparently fair general health; years ago had yellow fever. The urine free from albumen and tube casts, but loaded with uric acid. In the right eye an oval disc, the upper and inner edges veiled. Down and in from the disc a small spot of choroidal change and numerous yellow dots in the macula. In the left eye a round disc, edges veiled, and central lymph sheaths full. Similar macular changes. O. D. + .60s $\frac{2}{3}$ °. O. S. + .25s \bigcirc + .50c axis 150 $\frac{2}{3}$ °.

Case 3.—Mrs. A., aged 46; at present in good health, suffering only from headaches attributed to eye-strain and some conjunctival irritation; has had two attacks of puerperal fever, the last with her youngest child, now in his seventh year. In each eye round discs with sharply marked scleral rings, especially below, and in each macular region to the disc side of the fovea several yellowish splotches spotted over with small pigment dots. O. D. + 1.25s \bigcirc + .60c axis 75 $\frac{2}{3}$ °. O. S. + 1.50s \bigcirc + .50c axis 105 $\frac{2}{3}$ °.

Case 4.—Miss M., aged 10; recently has had

¹ Dr. G. M. Gould (Archives of Ophthalmology, Vol. xix, p. 31) reports eight cases to illustrate the hypothesis that central choroiditis is due to ametropia, and suggests the name ametropic choroïdo-retinitis.

sore throat (diphtheria?); has had malaria; feels a film over the eyes; much brow pain. In each eye numerous fine dots the size of the prick of a pin and of yellowish color. The urine contains albumen and tube casts. O. D. 1.50 $\frac{2}{3}$. O. S. 1. $\frac{2}{3}$.

Case 5.—Miss P., aged 24; pain in the eyes, worse when reading; claims to be in good general health, but is readily tired; pain in the back, face pallid and slightly puffy beneath the eyes. Urine of low specific gravity; small hyaline casts. In the right eye the disc is round, the lymph sheaths full, and the macula contains several granular spots. In the left eye the disc is oval, the lymph sheaths full. In the macula granular dots, and one small yellowish patch below the fovea.² O. D. + .25c axis 95 $\frac{2}{3}$. O. S. + .50c axis V $\frac{2}{3}$.

Any influence of refraction error in these cases probably may be eliminated, and this has simply been recorded for the sake of uniformity. In two of the cases the presence of renal disorder renders the explanation of macular change of ready demonstration. They have been referred to chiefly because they represent a large class where very fine lesions in the macula, which do not in any way influence central vision, which can often be found only by the most careful focusing, and yet which direct attention to an examination of the urine, with the results detailed in Cases 4 and 5. I have on a number of occasions had cases of this character referred to me by competent general practitioners, who were not a little amazed when I sent them word back that the headache which they had supposed due to eye-strain, and consequently coming within my province for treatment, was a headache in all probability due to renal inadequacy, and belonging to them. These cases are in no sense albuminuric retinitis, and I have watched them for long periods of time and they apparently do not develop into albuminuric retinitis. They stay simply where they are, and in some minor degree are an index of renal change; moreover, of a renal change which is apparently perfectly compatible with what appears to be good general health. Perhaps investigation would show that such cases are present in the examples of so-called transient albuminuria; perhaps they are only coincidences—but be this as it may, they deserve attention. In two of the other cases (Case 1 and Case 3) renal change was no doubt at the bottom of the lesion; the one a case of chronic gout with gouty kidneys, and the other in a woman who had attacks of puerperal fever. They are interesting only in the fact of the smallness of the lesion and the presence of accompanying perfect central vision. In Case 2 the fact that the patient had yellow fever, and was the subject of uric acid diathesis in a minor degree,

is of interest. I have elsewhere reported not macular changes, but decided general retinal disturbance in association with oxaluria. Perhaps this case is analogous.

In a number of instances exposure to intense light (sunlight, electric light), has resulted in the appearance of a persistent after-image. Corresponding to the central scotoma evidences of retinitis or retino-choroiditis have been found in the macula. It is to this class of cases that the final group belongs, of which I have only one example to quote.

GROUP 5.—*Slight macular changes—the apparent result of exposure to a bright sunlight.*

Case 1.—Miss B., aged 22, complains of a dark spot before the right eye which followed prolonged exposure to the glare of a sunset upon the ocean, the patient having watched this for a long period of time. No headache, no asthenopia. A careful examination by the family physician discovered no constitutional derangement. In the right eye an irregularly oval disc with central excavation, and in the right macula a dark area, and up and in from the fovea a number of fine, faintly marked, yellowish-white dots. In the left eye no similar dark area, but one or two fine dots. No dark spot complained of before the left eye. O. D. + .50s \bigcirc + .25c axis H. $\frac{2}{3}$. O. S. + .75s \bigcirc + .25c axis 120 $\frac{2}{3}$.

The dark area in this case was noted two years ago. It persists still, only the scotoma has grown exceedingly faint, and there has been corresponding fading of the macular changes. That this is really an after-image and is on the retina, is evident from the fact that it obscures but does not hide real objects, moves with the motions of the eye, and is projected when the observer looks upon a dark ground. These are the points which Dr. Tuke, in his article on "Hallucinations and the Subjective Sensations of the Sane," considers characteristic of the after-image of a luminous object. An interesting point in this case is the fact that in the right or affected eye there was a patch darker than the surrounding retina which was the cause of the scotoma, both maculas contained yellowish dots, but evidently independent of the influence of the intense sunlight. The lesion, then, was somewhat analogous to that which has been described under the title of *commotio retinæ*. It is not my purpose to discuss macular disease from intense light, but I have quoted this example as one having all the symptoms of this disorder save only that perfect central acuity of vision was preserved. It may be interesting, however, to note that there was no change in the periphery of the eye-ground, that the field of vision was normal, and that an attempt to map out a positive scotoma on the perimeter was not possible.

In the absence of microscopical examination it

² Cases 4 and 5 have been referred to in a paper before the County Medical Society of Philadelphia, read April 23, 1890.

is idle to discuss the pathology of these small lesions. They appear to arise in the choroid, and to partake of the nature of a spot of degeneration indicating the portion supplied by a single capillary loop, but not of sufficient extent to seriously involve the retinal elements and produce depreciation of central vision. It is not improbable that some of them may be congenital (in those examples in which no other cause was found), or that they have arisen under the possible influence of refraction error, certainly in some instances through constitutional disturbance; and have found their habitat in that portion of the eye-ground which experience has taught is liable, especially in people with a predisposition to macular disorder, to degenerative changes.

DR. RANDALL asked to emphasize Dr. de Schweinitz' note that in many of these cases full normal vision was present, generally without even relative scotoma; and, further, that even where renal trouble has been found by clinical and microscopical tests there has seemed to be no tendency to an increase of the lesion, but, on the contrary, the lesions rather tend to fade. The albuminuria has proven transient, and no albuminuric retinitis has occurred.

DR. T. E. MURRELL, of Little Rock, Ark., said he saw a case of macular spot—a shadow over the macula, caused by viewing the transit of Venus over the sun's disc with the unaided eye.

DR. CHEATHAM said in reference to Dr. de Schweinitz' cases that only last week he saw a case of central retinitis with H. 3.25 D.; this patient had been exposed to very bright light also. V. = $\frac{2}{30}$. He had seen many cases of marked changes at macula, with central blindness, dating back to the total sun eclipse years ago.

DR. ROBERT TILLEY, of Chicago, has seen some of these cases of macular changes, and has been accustomed to regard them as an evidence of specific lesions either primary or hereditary, and remembers one case in point in his recent practice, in which he had supposed that he had obtained advantage over a brother practitioner in seeing the case a little later, when these spots were more readily observed. At any rate, while weak plus glasses were previously given without satisfaction, the exhibition of specific remedies gave relief and the glasses were cast aside.

DR. DE SCHWEINITZ wished to be understood that the cases of macular change which he reported were entirely independent of the syphilitic taint, and were unrecognized by the patient because they gave no inconvenience. The case of macular disease from intense sunlight was peculiar only in the possession of perfect central acuity of vision. Dr. de Schweinitz thought it had been experimentally shown that the direct influence of sunlight was the cause of the retino-choroidal macular change.

MALARIA AND THE CAUSATION OF INTERMITTENT FEVER.

Read in the Section of Practice of Medicine, Materia Medica and Physiology at the Forty-first Annual Meeting of the American Medical Association, at Nashville, Tenn., May, 1890.

BY HENRY B. BAKER, M.D.,
OF LANSING, MICH.

Dr. Tommasi-Crudeli and others have claimed that intermittent fever is caused by a bacillus.

Drs. Laveran, Osler, Council and others have proved, to their own satisfaction at least, that intermittent fever is caused by a microscopic hæmatozoön.

At the meeting of the American Medical Association in Cincinnati, in May, 1888, I presented what I then considered and still consider to be incontrovertible evidence that intermittent fever is caused by exposure to changes of atmospheric temperature,—that, ordinarily, its causation is quantitatively related to, and apparently controlled by the range of atmospheric temperature.¹ It seems to me that both these lines of evidence, which appear to be so divergent, may be true. I feel sure that my own line is. And I have very great confidence in those who have presented the other line of evidence in which they are expert.

Therefore, although those who have held the germ theory of the causation of intermittent fever have not, so far as I know, accepted the evidence which I have collected and published, yet I feel impelled to again ask attention to it. I attempt this the more readily, because the facts and considerations, which it seems to me to make it appear possible that both lines of evidence may be true, were, in the main, held in mind when I read my paper two years ago, but there was not then time to elaborate, and I, therefore, only referred to but did not fully state them.

I suppose that all here are probably familiar with the literature of the subject of the bacillus of malaria, and also that relative to the hæmatozoön of malaria, discovered by Laveran. I may, therefore, devote my time exclusively to that other phase of the subject, on which I have collected evidence, and which is probably little known.

The most important evidence which has been presented by myself is as follows:

1. Statistics of sickness from intermittent fever in Michigan during a long series of years, arranged to show the relation of intermittent fever to changes in atmospheric conditions, and which have proved, to my mind, that the controlling condition is associated with atmospheric temperature, the sickness rising and falling with the temperature. This is shown by Diagram No. 3², which is one of a series prepared to illustrate my previous paper.

¹ "Malaria and the Causation of Periodic Fever," *Journal Amer. Med. Association*, Nov. 10, 1888. ² Page 563.