

already been detailed, with a drawing of the microscopical appearances, under the subject of Episcleritis, and need not be dwelt on further in this place. The diagnosis of these troubles is oftentimes somewhat speculative, as, from the position of the ciliary body, these affections do not lie open to either direct inspection or that of the ophthalmoscope. Virchow¹ was, however, fortunate enough to see a gummy tumor of the ciliary body, which, ophthalmoscopically and by oblique light, was seen and taken by others for a sarcoma. That syphilis was the cause of the tumor was demonstrated by the fact that it disappeared under specific treatment.

CHOROIDITIS.

Choroidal affections, like those of the iris, have been divided into three principal classes.

- (1) *Plastic* (exudativa, disseminata) *choroiditis*.
- (2) *Serous choroiditis*.
- (3) *Parenchymatous* (suppurative) *choroiditis*.

It must be admitted that the distinctions between these various forms cannot be drawn, either pathologically or clinically, so closely as those of iritis; still, as they are based on anatomical research, however meagre, they are preferable to any classification of a merely arbitrary character, and will, therefore, be retained here. Inasmuch as they may all be the product of syphilitic infection, a short description of each will be given.

Plastic Choroiditis, or more properly speaking choroiditis exudativa, is characterized by the production of an exudation upon the surface, or in the substance, of the choroid. This exudation manifests itself, when seen by the ophthalmoscope, by the presence at the bottom of the eye of certain circumscribed spots or patches, varying greatly as to number, shape, and size. When freshly deposited they are of a yellowish-white or pale straw color, and give the appearance of having been flecked on to the membrane, the pigment epithelium preserving, as a general rule, a perfectly normal aspect. These spots entirely conceal from view the subjacent choroid, so that the epithelial layer, together with the deeper-lying vascular tunics, are completely hidden from sight; while, on the contrary, the retinal vessels, which, as a rule, run over the patches unimpeded in their course, are brought strongly in view through contrast, and clearly prove the trouble to be in the deeper-seated membrane.

These spots of exudation may be entirely absorbed, and leave but little or no trace of their former existence, but usually they pass to a secondary or atrophic stage, in which, although the exudation itself disappears, the underlying and surrounding tissue becomes implicated. On this account the substance of the choroid itself undergoes atrophic changes, permitting the sclera, on account of the former becoming thinned, to show through; thus giving to what were formerly

¹ Jahresbericht der Ophth., 1872, p. 307.

straw-colored spots a glistening white appearance. These atrophic spots may be further distinguished from those due to simple exudation by the fact that single choroidal vessels or their remains may be detected on their surface, while their border, instead of being sharply defined and surrounded by normal-looking tissue, is irregular, and marked by collections of dark pigment cells, which, from proliferation, may combine together so as to form a black zone, which then surrounds in part or in whole the denuded spots; or the pigment may lie irregularly scattered over its surface. This latter takes place, especially in the early stage of the disease, when the trouble is confined to the internal and pigmentary layers, producing a condition known as "maceration of the pigment of the choroid," in which the coloring matter is distributed irregularly, thinned in some places and aggregated in others, thus giving to the fundus of the eye a mottled or watery appearance, as if sprinkled with ink.

Serous Choroiditis.—This is characterized by the exudation from the choroidal membrane being of a serous instead of a plastic nature, and presents externally oftentimes the same appearance, both as to the dilatation of the pupil and spots upon the inner surface of the cornea, as serous iritis.

The ophthalmoscopic appearances are not well marked, and are sometimes entirely wanting. When present, however, they are such as are produced by increased intraocular pressure, and are chiefly confined to the pigment epithelium, the whole surface of which may be affected, exhibiting the changes peculiar to the condition of "maceration." Sometimes this form is also accompanied by extensive changes in the fundus, similar to those just detailed under the plastic form. This variety is exceedingly prone to fall into a glaucomatous condition, and is then accompanied by excavation of the optic nerve and the other ophthalmoscopic signs common to that disease.

Parenchymatous Choroiditis.—This is a deep-seated inflammation with a marked tendency towards an increase in the cellular tissue elements, especially in the neighborhood of the larger choroidal vessels. This hypertrophy of the cellular tissue, as in this form of iritis, sometimes forms masses which are elevated considerably above the surrounding level of the choroid, and may attain the size and appearance of a veritable tumor, most probably of gummy origin, and as such project into the vitreous humor, its surface being covered by the retina, which ordinarily undergoes fatty degeneration.

It is this variety of the affection which has been described by various authors as "choroiditis circumscripta," and attributed by them particularly to a syphilitic origin.

The fact is, however, that the predominant cause of all choroidal affections is the specific virus, and the particular form under which it shows itself most frequently is certainly the plastic form (choroiditis exudativa). There are, however, even in this latter form certain peculiarities, which have been thought by some of the lead-

ing authorities (Graefe, Liebreich, Schweigger, and others) to be characteristic of the specific origin of the disease. The chief of these are:

(1) The spots of exudation and atrophy are, as a rule, situated at the posterior pole of the eye, and in the neighborhood of the macula, instead of, as in the idiopathic variety, at the periphery. They also have a tendency to arrange themselves in groups, and are less apt to coalesce with each other, while at the same time they penetrate deeper.

(2) The retina and optic nerve are more apt to be involved, and sometimes to such a degree as to undergo subsequently partial or complete atrophy.

(3) The choroidal affection is very liable to be complicated with a characteristic disturbance of the vitreous, which often appears and disappears with great rapidity. Oftentimes this opacity is so delicate as to give the idea of a slight want of transparency of the retina.

I must, however, guard the reader against placing too much dependence on the above statements as to the specific origin of the disease, especially in regard to the situation and general contour of the patches, as these are often situated, even in undoubted cases of specific infection, at the very periphery, instead of the posterior pole, of the eye, and may assume, whatever their seat, any and all shapes. So, too, disturbance of the vitreous humor is one of the commonest complications of all choroidal affections.

It would be out of place in a work of this kind to give a detailed description of all the ophthalmoscopic appearances which this protean disease may assume. I would, therefore, since the use of the ophthalmoscope has now become so prevalent, and opportunities for its study so attainable, strongly advise the student of venereal diseases to make himself acquainted at least with the general outlines of ophthalmoscopy.

It is only in this way that he can get at all an adequate idea of a large class of diseases which are intimately connected with syphilis, and in this connection I would refer the reader to the magnificent plates of Jaeger,¹ Liebreich,² and Stellwag von Carion.³

If the connection between the iris and choroid, anatomically speaking, is an intimate one, clinically speaking it is even more so, and the diseases of the one may be considered as the analogue of the other; for this reason the indications for treatment and the remedies to be employed are, as a rule, precisely the same as those laid down under iritis, only greater care and attention are, if possible, required of the physician, as the part concerned is hidden from ordinary inspection.

¹ Jaeger, Ophthalmoskopischer Handatlas, 1868. Choroiditis Exudativa, Tafel XXII., figs. 99, 100; Taf. XXIII., figs. 101, 102, 104; Taf. XXIV., XXVIII., XXIX.

² Lieberich, Atlas d'Ophthalmologie. Choroiditis Syphilitica. Table IV., fig. 2. (See also Soelberg Wells, for copy of the same.)

³ Stellwag von Carion. American edition.

Choroiditis syphilitica, as a rule, belongs to the later stages of life, in which the disposition to all choroidal troubles is particularly marked. Out of fifty-five cases, forty were above thirty years, and of these forty, fourteen were over fifty years of age. The appearance of the disease usually coincides with the late secondary and the early tertiary symptoms.¹

Sufficient has been said under iritis of the necessity for, and the efficacy of, the operations of iridectomy and paracentesis, and of those for the removal of the eye when the other is threatened by what is known as sympathetic ophthalmia (a contingency which should never be lost sight of), but I must refer the reader to the various text-books on ophthalmic surgery for their minute description.

The complications which are to be feared in choroiditis are extension of the inflammatory action to the neighboring tissues, to the iris (producing irido-choroiditis), to the retina and optic nerve. There is danger also of exudation from the choroidal vessels, producing subretinal effusion with subsequent separation of a part or the whole of the membrane.

RETINITIS.

The natural effect of inflammation upon this transparent membrane is to give it increased vascularity, and cause effusion into its substance and render it opaque. Hence one of the earliest signs of retinitis is increased redness of the optic nerve entrance, imparting to it a pinkish hue, or the trouble may show itself simply by a slight œdema, which obscures the contour of the nerve, or the vessels which emerge from the optic disk to be distributed to the retina may be abnormally enlarged, injected, and tortuous, and at certain points of their course lost to view, owing to the opacity of the retinal tissue which covers them. Their rupture may also give rise to small patches of ecchymosis. Again, effusion into the substance of the retina first impairs its transparency, and produces the appearance of a fog or haze in the fundus of the eye, and finally entirely conceals the entrance of the optic nerve, the site of which can only be determined by the convergence of the dilated veins. The obscurity of the deeper structures may also be increased by transudation into the vitreous humor. Deposits of lymph in the retina may also give rise to light-colored patches, similar to those produced in the choroid; but the former may be recognized from the fact that they conceal the choroidal and retinal vessels, which in the latter may be seen to cross the patch.

Although the ophthalmoscopic appearances of specific retinitis do not differ, as a whole, from the non-specific form, still there are certain peculiarities attending it which are supposed to be characteristic of its syphilitic origin.

Thus, it has been observed that the inflammatory changes do not,

¹ Förster, Handbuch der gesammten Augenheilkunde, 1876, vol. vii., part 1st, p. 191.

as a rule, either in the vascular system or in the substance of the retina reach the same intensity as in the idiopathic form. Sometimes, indeed, these are so slight as only to give the idea of a normal retina seen through a delicate gauze, which, however, has been proved by the microscope to be due, not to any disturbance in the vitreous, but to changes in the retina itself. The alteration in the tissue does not, as a rule, extend equally in all directions from the optic nerve, but is usually more developed on one side than the other, and the border of the disturbance is more sharply defined than in the simple form, while the exudations into the substance of the retina have a tendency to extend along the vessels.¹ Schweigger,² Von Graefe,³ Classen,⁴ and others, have also described some peculiar forms of syphilitic retinitis, which, with their fine-drawn distinctions, are, however, of interest rather to the ophthalmologist than to the general physician, and I would, therefore, refer the reader who is curious about these matters to the articles themselves.

Retinitis is by no means as frequent a symptom of secondary syphilis as iritis; it is, in fact, rather a rare occurrence, and when it does take place, it is usually with the later series of symptoms; thus, in one instance, which came under my observation, the patient suffered from this disease fifteen months after an attack of iritis, and at a time when no other syphilitic symptoms were present.

It is certainly an interesting fact in this connection that Mooren⁵ says that he has never seen specific retinitis accompanied at the same time by any other syphilitic symptoms. The same author mentions that he has often observed that the subjective phenomena of light are more marked in syphilitic than in the simple form of retinitis, and that these are often accompanied by zone-like limitations in the field of vision, or hemeralopia. These latter may also occur in that form of specific choroiditis which is attended with infiltration of pigment into the retina. When both the choroid and retina are affected, we have a combination of the symptoms of both under the name of choroïdo-retinitis.

Moreover, it must be borne in mind that the subjective symptoms of both retinitis and choroiditis are often so slightly marked at their commencement as to attract but little attention from the patient, and irreparable mischief may be done before their gravity is fully appreciated. I have repeatedly met with cases of syphilis in which some slight complaint from the patient has led to an ophthalmoscopic examination of the eye, disclosing the existence of a disease which threatened the loss of sight, but which was subsequently arrested by appropriate treatment. Consequently, any impairment of vision in syphilitic subjects, although unattended by symptoms of external in-

¹ For more minute distinctions, see *Lehrbuch der Ophthalmoscopie*, Mauthner, Abth. II., p. 368. For ophthalmoscopic plates of syphilitic retinitis, see Liebreich's *Atlas*, Tab. X., Figs. 1 and 2.

² *Augenspiegel*, p. 110.

⁴ *Archiv*, x., 2, p. 157.

³ *Archiv für Ophth.*, vii., 2, p. 211.

⁵ *Ophthalmologische Beobachtungen*, p. 287.

flammation, should at once put the surgeon upon his guard, and lead him to resort to specific remedies. Indeed, the latter are usually the only resource, as operative interference is very rarely, if ever, called for.

The prognosis is generally favorable, when appropriate treatment is employed at an early stage of the disease, and, in this respect, syphilitic choroiditis and retinitis resemble syphilitic iritis.

AFFECTIONS OF THE OPTIC NERVE.

Inflammation of the optic nerve or neuritis, which is not an extension of the process from the retina or choroid, is an extremely rare result of the syphilitic infection; so rare, indeed, that it has been doubted by competent authorities whether the optic nerve was ever primarily affected. Thus, Hughlings Jackson says, "optic neuritis from syphilis is not syphilitic optic neuritis. The optic neuritis produced by a syphilitic tumor is just like that produced by a glioma or by any other adventitious product in the cerebrum or cerebellum."¹

Förster, on the other hand, is of the opinion that choked disk, dependent on syphilis, may occur, not as a symptom of an intracranial trouble, but as the result of gummy infiltration of tissue between the sheaths of the nerve, rather than of the nerve-stem itself. He also calls attention to the fact that by far the greater quantity of cases or neuritis with syphilis are unaccompanied by any brain symptom whatever, and moreover that it is only when the trouble is due to syphilis that the most pronounced cases of choked disk run their course within a few weeks, with rapid return to the normal condition under the employment of specific remedies. There have been, moreover, a few cases reported of gummy infiltration of the optic nerve itself by Graefe, Hulke, and Barber.²

Westphal has also reported, as an example of gummy infiltration of an individual cranial nerve, a case in which the oculomotorius had been changed into a gummy mass.³

I think, therefore, there is no doubt that the optic nerve may be affected primarily by the syphilitic taint, which may produce the symptoms of both kinds of neuritis: that is, the simple form already described in connection with retinitis, and the form known as choked disk, in which the predominant features are venous stasis with enlarged and tortuous vessels, protrusion of the papilla, œdema, and hæmorrhage. That these affections, especially the latter, are more commonly the result of an intracranial trouble, such as diffused meningitis, or concrete masses (gummata), is of course incontestable; but that they may be purely intraocular I have from my own experience no reason to doubt.

There is nothing distinctive between the ophthalmoscopic appearances of syphilitic and non-syphilitic neuritis. The origin, progress,

¹ *Ophthalmic Hospital Reports*, vol. viii., pt. ii., p. 322.

² *Inaug. Diss.*, Zurich, 1873.

³ *Jahresbericht Ophthal.*, 1873, p. 436.

and retrogression are also the same, with the exception that the course of the disease is shorter, and the prognosis is, as a rule, more favorable in the specific than in the non-specific form.

It should be constantly kept in mind that the amount of sight and the field of vision may be, and often is, perfectly normal in the most pronounced cases of choked disk, and that for this reason the practitioner must be doubly on his guard, so as to detect the trouble at the outset. Any complaint whatever in regard to the eye should at once demand a careful examination into all its parts and functions.

AFFECTIONS OF THE VITREOUS.

It has already been pointed out in the section on choroiditis that turbidity of the vitreous is a common accompaniment of inflammation of the choroid, but whether the vitreous is ever, under any circumstances, the seat of a primary inflammation is still a matter of discussion among ophthalmologists, and one which is hardly suitable to the character of the present work. I will say, however, that I have occasionally noticed in young adults and those in middle life who have had syphilis, a tendency towards troubles in the vitreous apparently unconnected, so far as the ophthalmoscope showed, with any trouble in the uveal tract. That such existed, but of too low a grade to be detected, is of course possible, and the disease in these cases would then be, as it is in the vast majority, a secondary, and not a primary, affection.

PARALYSIS OF THE NERVES OF THE EYE.

A large proportion of the cases of paralysis of these nerves is due to syphilis. Graefe¹ attributes fifty in a hundred of all the cases met with to this cause, while others have placed it as high as sixty or sixty-five per cent. And it is this predominating frequency, and especially the marked and very curious predilection which the virus would appear to have in regard to certain particular nerves of the ocular group, which must be looked upon as the essential character of the disease. Thus, in most instances it is the third pair, or motor oculi, that is affected; next in order comes the sixth pair,² or abducens; and finally the fourth pair, or patheticus.

My limited space compels me to refer the reader to special treatises upon diseases of the eye for a detailed description of the symptoms, and for the methods employed by ophthalmologists in the diagnosis of these affections.³ These are much too technical and intricate for the present work, still the general practitioner should be aware of the most prominent symptoms, as disturbances in vision, due to a want

¹ Syphilitic Affections of the Eye, Deutsch Klinik, 1858, No. 21.

² Dr. Beyram has related three interesting cases of paralysis of the sixth pair due to syphilis. L'Union Médicale, February 23, 1860.

³ See an able article by Dr. Wells, giving an account of Graefe's researches upon paralytic affections of the eye. Ophthalmic Hospital Reports, vol. ii., p. 44. Also, Diseases of the Eye, same author.

of coördination of the eyes, are often the initial, if not the sole, symptoms of commencing cerebral syphilis—a warning which, if neglected, often leads to a disastrous result, but which, if seized upon at the moment, allows the application of remedies with the most beneficial effect.

The principal symptoms of all these affections are loss of power in a muscle or muscles, and consequent limitation in the motion of the eye, shown by double images and strabismus. The individual characteristics are as follows:

3d pair. Falling of the lid, or ptosis; deviation outwards of the eye, with loss of power upwards, inwards, or downwards. Dilatation of the pupil, with loss or limitation of the accommodation.

6th pair. Deviation inwards, with loss of power outwards, and double vision on the temporal side of the median line of the affected eye.

4th pair. Double vision when looking at objects below the horizontal plane, and a peculiar inclination of the ground or floor, with an opposing inclination of the head of the patient to counterbalance the disturbance.

The paralysis, instead of being complete, may be limited to single muscles, from which it would appear that different branches of the nerve only were affected, or, instead of being an actual paralysis, it may be only a paresis. This "incompleteness" has been looked upon by some as characteristic of syphilitic paralysis, and it is this condition which has led to the supposition that there was a "syphilitic vertigo." There is, however, nothing *sui generis* in this vertigo, which may occur from any cause, as it is usually only the expression of a want of coördination of the muscles. The latter may be so slight as not to produce any deviation of the axes, but be just sufficient to interrupt transiently the perfect coördination of the muscles and produce a dizzy sensation, but it may on some occasions produce for a moment actual double vision, especially when the gaze is turned in a particular direction. Still, it must be borne in mind that this want of coördination is not, as asserted by some, the only cause of vertigo in syphilitic patients, as it may exist and be exceedingly annoying, even when the ocular muscles are not affected in the slightest degree. It must then be referred to an intracranial cause not connected with the organs of vision, but probably due to a morbid influence upon the semicircular canals. Among these limited paralyzes, one of the most striking is that of monocular mydriasis, which may occur even without any implication of the accommodation of the same eye. It has sometimes been looked upon as a precursor of severe brain trouble, but that it is often not so, is proved by a number of syphilitic cases, in which it has appeared and then disappeared with no intracranial symptom.

Besides these simple paralyzes affecting a single nerve or some of its branches, there may be a coincident paralysis of the other nerves; thus the third and sixth pair, or the sixth and fourth pair, and so