Syphilis of the Eye and Ocular Appendages.

The lachrymal gland is rarely involved either in a primary gummatous infiltration or secondarily as a result of implication of other organs in the orbit. The same is true of the *lachrymal caruncle*, which may become tumid, engorged, dense, and eventually the site of ulceration in the rare cases in which it has been found diseased. The *canaliculi*, the *puncta*, the *sac*, and the *nasal duct* may be involved in any one of the early or late manifestations of syphilis when the eye is involved, usually as the result of some lesions in the vicinity, as, for example, chancres, papules, tubercles, ulcers of the edges of the lids, iritis with its frequent accompaniment of conjunctivitis, and the panophthalmias seen in filthy and destitute charity patients in dispensary practice. Again, many of the syphilitic lesions of the nasal passages lead indirectly to catarrhal and purulent inflammatory affections of the sac. Periostitis of the bones forming the nasal cavity is a frequent source of these purulent catarrhs. Stricture and eventual obliteration of the duct may result either from gummatous deposits in the mucous or submucous tissue or from osteo-periosteal changes in the channel. The external symptoms of these affections are epiphora, a swelling of the part, and tenderness with a sense of fulness. There is commonly evacuation of a sero-purulent fluid when pressure is exerted over the tumor. Eventually there may be abscess and ulceration at the point of bursting. The osteoplastic metamorphosis of the bony walls of the canal, described heretofore as eburnation (one of the varieties of formative osteitis), occasionally occludes the duct by the formation of a growth which chokes its calibre; but more often

the bony changes here are in the line of caries and necrosis, relieved by spontaneous or artificial removal of segments of bone.

Syphilis of the eyelids may be exhibited in chancres or in the syphilodermata of systemic disease, such lesions being located either on the edge, on the conjunctival surface, or on the cutaneous covering of the lid. In the case of chancre the diagnosis is readily made when consideration is had of the induration of the lesion and its bubo, the enlarged gland being usually the pre-auricular of the involved side. Eyelid-chancre has the usual characteristics of chancres seen elsewhere and previously described, the chief peculiarities of the site being an enormous tumefaction of the lid that occasionally (not invariably) results, and the consequent epiphora and photophobia. When the initial sclerosis ulcerates, the excavation is shallow and oval, with elevated edges, densely sclerosed base, and a floor secreting rather more freely than chancres in other situations, on account of the irritation to which it is subjected.

Syphilodermata are more frequently found on the cutaneous surface of the eyelid; rarely an isolated lesion or several lesions may be discovered on the conjunctival surface; but in our experience these accidents result most commonly from special causes inciting the mucous membrane to morbid activity (traumatism, iodism, foreign bodies beneath the lid). Gummata, when present, form nearer the free border of the lids than elsewhere; they may be single or multiple in this region, and their ulcers, when they degenerate, are characteristic. When the tarsus is infiltrated with a gummatous deposit, a firm tumor results, implicating the entire lid (usually the upper) or but a portion of it, with

and without involvement of the cutaneous surface. Here, as in syphilis of the testis and the liver, after complete absorption of the neoplasm has been effected the tarsus may lose its original texture and elasticity.

The conjunctiva may be the seat of any one of the processes previously described in connection with syphilis of the mucous membrane, save that the limitations of the area involved and the large portion of it that is protected by apposition of contiguous surfaces save it from many of the sources of disease to which the lining membrane of the mouth and of the nares is especially subject. Chancres of the conjunctiva have been reported without implication of the lid, but they are exceedingly rare. Papules, tubercles, pustules, and ulcers occur upon the conjunctiva as elsewhere, and are readily recognized by the symptoms heretofore described. Ulceration of the conjunctiva, whether from breaking down of a gumma or as the result of pustulation of the surface, produces one or many points where superficial losses of tissue occur, circumscribed, with uneven base, covered usually with a more or less adherent yellowish-white film, beneath which the surface is eroded. On the free edge of the lid the ulceration often assumes a linear shape and spreads along the entire edge, excavating its thickness. Cases are recorded in which gummata of the ocular conjunctiva produced an annular infiltration surrounding the cornea, which, after degeneration of the former, has undergone necrosis.

Syphilis of the cornea occurs either in the form of an interstitial keratitis, with points of opacity usually at first centrally situated, spreading thence outward and involving the deeper layers, which may become vascularized, or the opacity spreads from the periphery to the centre,

and eventually produces the characteristic "ground-glass" appearance of the cornea. In another form there are definite points of opacity, the puncta being pin-point to pin-head in size, usually not numerous though multiple, the transparency of the unaffected portions of the cornea being unaltered. Gummatous deposits in the cornea, of the type of the gumma of other regions, have occasionally been observed.

Syphilis of the sclerotic is betrayed in superficial and parenchymatous forms of scleritis, some authors describing a gummatous form as distinct from the latter, the difference in all being, however, one chiefly of external appearance of the lesion. In the milder cases dark-tinted, even empurpled patches occur, of congestive aspect, with thickening of the tissues and obvious involvement of the overlying conjunctiva. These maculæ may be single or multiple; they are rarely very numerous, and are said never to form a pericorneal zone, though extreme cases occur where the deep congestion involves a large part of the exposed sclera. There is usually some pain, although at times none is experienced. Iritis is rarely present. In the parenchymatous form all the symptoms above described are exaggerated and complications are more common. The disorder is really a diffuse gummatous change, as distinguished from the circumscribed forms of gummatous deposit, in which elevated or flattened nodules, usually developing on the temporal side of the globe, exhibit telangiectases overlying the conjunctiva.

Syphilis of the iris is the most common of all luetic affections of the eye. Iritis, acute, subacute, or chronic, occurs both early and late after infection, much more often seen after the involution of the chancre. Usually

but one eye is affected, rarely both. Recurrences are apt to be limited to the organ originally involved. In our experience there is usually an exciting cause even when syphilis is present, determining the onset of the affection and even its selection of a weak eye. For example, there are few experts in the cities of the North who have not noted an increase in the number of cases of iritis in a group of syphilitic patients treated after the streets have suddenly been covered with snow. Forms of plastic, serous, and gummatous iritis are described by authors, the three forms being distinguished merely by a preponderance of one or more symptoms present in any given case. The chief symptoms regularly noted on the part of the patient are photophobia, lachrymation, deep-seated pain, and imperfect vision; while the physician recognizes tumefaction and a change of color in the affected iris; irregularity of the pupillary opening, due, as a rule, to posterior synechiæ, giving an oval, at times even a jagged, outline to the pupil; marked sluggishness of the iris when light is suddenly admitted to it; and deep ciliary injection, distinguished by radii of straight pinkish vessels forming a halo about the cornea and contrasting vividly with the longer, more tortuous, and brick-colored vessels set superficially, deeply engorged, and belonging to the conjunctiva. In the forms of serous iritis of authors the aqueous humor is turbid, the tension of the eyeball is increased, and the field of the pupil, especially near the margin of the iris and the posterior face of the cornea and of the iris, becomes the seat of exudative deposits. The term "gummatous iritis" is by some authors limited to the distinct formation of nodes, papules, or reddish-yellow tubercles on the surface of the iris; but it is probable that all syphilitic

forms of iritis are due chiefly to gummatous deposits even when no circumscribed nodules appear on the anterior face of the curtain.

The prognosis of all forms of iritis is good. The chief danger arises from adhesion of the iris to the capsule of the lens as a consequence of posterior synechia—a complication which may usually be set aside by the production of extreme mydriasis. Glaucoma results in a very small proportion of cases.

Syphilis of the Ciliary Body.—Serous, plastic, and gummatous forms of cyclitis are recognized, the chief difference between them being the mode of gummatous infiltration, all being due to deposit of gummatous material either in diffuse or in circumscribed form. When the ciliary body is implicated the symptoms are the following: visual disturbance in various grades; usually, not invariably, diminished tension; ciliary injection; and an exudation varying in amount and character within the posterior chamber, and at times also involving the vitreous. Often the symptoms of iritis and of choroiditis are present, and the disease is then properly described as "irido-choroiditis." In well-marked cases the attached portions of the iris are pushed forward by the *vis à tergo* of the exudate, blocking up the pupil and distending the posterior chamber, while its free border is more or less fixed by posterior synechiæ. Glaucoma or softening of the globe may result, and the issue is, in general, grave. The gummatous material, whether deposited in points on the membrane of Descemet or spreading to the ciliary body from nodules on the face of the iris, undergoes changes, either by resolution or by disintegration, not different from those recognized in other portions of the globe.

Syphilis of the choroid is more common than any luetic affection of the eye save iritis; in point of seriousness, while not so grave in the majority of cases as cyclitis, the affection may result in irreparable damage. The symptoms are, in general, clouding of the vitreous humor by reason of exudates forming fixed or floating specks, fibrils, threads, membranes, or even, in extreme cases, semi-solid masses of irregular form occupying either the anterior or the posterior half of the choroid, and accompanied or not by retinitis and disturbance of vision in various degrees. Iritis is a complication when the anterior portion of the choroid is chiefly involved, retinitis when the posterior segment is affected. There occur rapid diminution of ocular tension, deep-seated pain, and amaurosis in various degrees of severity. The remote results of these serious changes are the formation of staphyloma, cataract, detachment of the vitreous, and ultimate atrophy and shrinkage of all the constituent coats of the eye. By the aid of the ophthalmoscope in well-marked choroiditis whitish-yellow or reddish-yellow patches, fairly well circumscribed, can be recognized about the posterior pole of the ocular axis, often with a distinctly pigmented halo and with a tendency to atrophy of the tissue in which they have developed.

The crystalline lens and the vitreous humor, when attacked in syphilis, always exhibit nutritional changes secondary to morbid processes in the uveal tract.

Syphilis of the retina furnishes a list of grave disorders as respects vision. Chorio-retinitis is practically a complication of choroiditis, as already described. When the retina is distinctly involved, a membranous film appears to be stretched between it and the observer. There is also scotoma and deficient central vision. The

forms of pure retinitis where the choroid is not involved are rare. By the aid of the ophthalmoscope it can be seen that the fundus of the eye is misty, the papilla is obscured, and the disk, which may be engorged, is encircled by a grayish retina. The symptoms are hemeralopia, lachrymation, photophobia, diminution of central vision, and the appearance to the patient of bright circles or patches which revolve about the point on which the eye is fixed. When a distinct exudation occurs the inner layers of the retina are involved and indistinctly circumscribed elevations occur chiefly about the posterior pole of the eye. When, as a result of these or of the other changes in syphilitic disease of the retina, hemorrhages occur, the symptoms and appearance are those of similar complications in non-specific disease. The "central recurrent retinitis" of Von Graefe is exhibited in opacities about the macula, which disappear at the time of the improvement of the vision, but which may return with the production of characteristic streaks radiating from the disk along the lines of the vessels.

The optic nerve may be affected by syphilis either within the cerebral tissue, within the orbit, or between the orbit and the brain, and as a result either of morbid changes in the adjacent tissues (bones of the orbit or foramen) or of primary involvement of the nerve-tissue.

Papillitis (inflammation of the intraocular extremity of the nerve) is betrayed by tumefaction of the disk (with its outline obscured by surrounding œdema), venous stasis, and arterial stenosis. When both eyes are thus affected, and they exhibit signs of choked disk, the diagnosis is of an intracranial lesion (gumma of bone, vessel, meninges). When but a single eye is involved, the source of the trouble may be wholly within the orbit.

There may be amblyopia, hemianopsia, or more or less complete amaurosis. Preservation of fairly good visual power with symptoms of choked disk is supposed to be due to the integrity of the layer of cones and rods in the retina.

In neuritis descendens of one side the lesion obviously has existed between the chiasm and the orbit; when both sides are involved, the lesion is situated posterior to the chiasm. In these cases the change occurs primarily in the tissues outside the nerve-sheath, the latter being secondarily involved, as are also the nervous fibrillæ within the sheath. The most common causes are arteritis, mesarteritis, endarteritis, meningitis, and gummata of the encephalic nervous tissue.

Atrophy of the optic nerve may result from any of the changes described above, or from encephalic or spinal disease. The differences between the inflammatory, cerebral, and spinal forms, as distinguished by the ophthalmoscope, are chiefly color-changes in the optic disk from a grayish-blue to a bluish-green shade, and the various degrees of reduction in size of the arteries and the veins, the picture being more or less hidden by an obscuring mist. In some cases, however, no ophthalmoscopic changes can be recognized, and the location of the site of the effective lesion must be inferred from other symptoms. In hemiopia fugax (flittering scotoma) and true hemianopsia the lesion, without visible ophthalmoscopic changes, is probably seated in one optic tract.

Syphilis of the ocular muscles has already been described in connection with the subject of nervous lesions. It is merely needful to repeat here that the great majority of all cases of disturbance of function of these muscles is due not to a specific myositis, but to

intracranial lesions (pachymeningitis, obliterating arterial disease, etc.).

Syphilis of the bony walls of the orbit is exhibited in osseous changes of the types already described in connection with bone-syphilis, periostitis, osteo-periostitis, hyperostosis, exostosis, caries, and necrosis, these conditions representing a series of changes due to the evolution of a gummatous product, its absorption or degradation, and the formative processes (by fibrosis, eburnation, etc.) already studied. As a consequence of these changes in the orbital bones, exophthalmos (protrusion of the eyeball outward, along its axis, or, as is not uncommon, to one side) may result, with secondary consequences due to stretching and traumatism of the optic nerve. In other cases the nerve is injured by pressure, and atrocious neuralgias may follow. In yet other cases abscesses form and burst externally, at times with resulting exfoliation of osseous sequestra, at others with the formation of fistulous tracts leading to carious bone. When exostosis occurs from the walls of the orbit, the tumor usually forms on the inner wall and projects toward the central axis; but it may also develop near the apex and produce exophthalmos or grave pressure-effects. These growths as a result of syphilis are extremely rare.

Syphilis of the Ear.

The auricle may be the seat of chancre or of any of the cutaneous lesions of systemic syphilis—macules, papules, pustules, tubercles, gummata, ulcers, etc.

The meatus may also be found affected with any of the lesions occurring upon the auricle. Exceedingly intractable ulcerations occasionally progress just within

the meatus, at the junction of cartilage and bone. These ulcers greatly resemble the ill-conditioned ulcers often visible at the same time and in the same patient just within the nares. Condylomata are not rare within the meatus, where they may often be recognized as circumscribed, scaling elevations of the surface, furnishing an admixture of pus and cerumen, in extreme cases eventually inducing by their presence a typical otitis externa. Blocking of the canal may ensue, and in severe cases ulceration with scarring. Rarely there results permanent contraction of the meatus.

The *membrana tympani* is rarely the seat of syphilitic lesions. Luetic changes have, however, been recognized in this situation, and ulceration has at times resulted from degeneration of minute gummata situated upon the drum.

The diseases of the tympanum due to syphilis are obscured by reason of the difficulty experienced in precisely locating any lesions capable of producing the symptoms exhibited in any given case, and by the further fact that the symptoms presented are so nearly alike in the victims of both syphilitic and non-syphilitic aural disease.

Catarrhal inflammatory affections of the middle ear occur, resulting in hypersecretion, pus-formation, or the formation of plastic products, the distinction between these affections being established by symptoms rather than by any recognized lesions. Most of these troubles are associated with or spring directly from disorders of the naso-pharynx, which is so frequently involved in systemic syphilis; others arise from changes in the osseous walls of the Eustachian tube or from periostitis of the tympanum. The symptoms of these diseases of

the middle ear are chiefly deafness in varying degrees, pain, serous or purulent discharges, tumefaction to the point of obstruction of the Eustachian tube, and râles on its insufflation.

The changes in the *labyrinth* due to syphilis are as yet little understood. The ossicles may be ankylosed, and all the tissues composing the labyrinth may be thickened either primarily or as a result of extension of disease from the tympanum. The symptoms are found in a series of widely differing subjective sensations of a morbid character, associated with imperfect audition, diminution of bone-conduction, and vertigo often resembling that occurring *ab aure læso.*

HEREDITARY SYPHILIS.

Syphilis may be transmitted from progenitor to offspring as a strictly inherited disease. The term "congenital" has been somewhat loosely applied by different writers either to inherited syphilis or to syphilis acquired at birth of an infant and due to infection from recently developed chancres of the maternal passages. In these pages the term "hereditary syphilis" is employed to designate exclusively the disease acquired by inheritance. The term "congenital," as liable to beget confusion, should be dropped from the nomenclature.

A vast amount of discussion has been elicited by questions concerning the etiology of inherited syphilis. It is sufficient here merely to state that, for most cases, the fact of a syphilitic child points to inheritance from the mother. When the father is without question syphilitic, and children are born syphilitic, the mother, free from all evidences of the disease, has probably been infected. She betrays no evidences of this infection