

specific cause of scarlet fever is not known⁷ and that the streptococcus is a concomitant or secondary invader for the growth and activity of which the conditions in this disease are peculiarly favorable, seems to me to harmonize better with the facts now at hand. This view receives strong support from the fact that smallpox when fatal is practically always associated with streptococcus invasion,⁸ so that the suggestion has been made that smallpox, too, is a streptococcus disease.⁹ Perkins and Pay¹⁰ dispose of this claim, however, by causing smallpox in the monkey with materials entirely free from streptococci, which by themselves, as expected, have no such effect.¹¹ It has been said that smallpox would be a relatively harmless disease were it not for the streptococcus invasion, and there are certainly good reasons to look on scarlet fever in the same light.

From the fact that there is no evidence in scarlet fever of increased activity on the part of pneumococci and certain related cocci that normally inhabit the throat, we may infer that the conditions in the scarlatinal throat are peculiarly favorable to *Streptococcus pyogenes*. Indeed, in view of the paramount importance of streptococci in the course and outcome of scarlet fever the chief significance of the pure scarlatinal virus would seem to lie in its power to open the door, so to speak, to streptococci. From this point of view the need for potent antistreptococcus remedies is as urgent and their eventual specific effects as logically explainable as would be the case were scarlet fever considered a streptococcus disease pure and simple.

One point remains. In view of the fact that streptococci grow in virulence in the susceptible animal organism it becomes our duty to guard carefully by adequate isolation against the transfer of especially virulent strains from patient to patient. We can understand from what we know of the dissemination of throat and mouth bacteria in coughing and other ways the great chance for such transfer when patients lie side by side in the same room. Perhaps the sad instances of several deaths from scarlet fever of children of the same family, sometimes spoken of as examples of family susceptibility to scarlatina, often result from the passage from child to child of especially virulent streptococci.

SOME SYPHILITIC DISEASES OF THE EYE.

RANDOLPH BRUNSON, M.D.

HOT SPRINGS, ARK.

Of all diseases of the eye probably syphilis is responsible for a greater number of ocular affections than any one disease known, so I can not, in a paper of this character, go into an exhaustive study of diagnosis, prognosis and treatment, but will confine my remarks to giving the essentials of diagnosis, and take up each subject as seen from the anterior aspect of the eye.

7. Whether the protozoan-like bodies described by Mallory (Jour. Med. Research, 1904, x, 483), in the skin of scarlet fever, the parasitic nature of which is corroborated by Duval (Virchow's Archiv, 1905, 179, 485), but questioned by Field (Jour. Exp. Med., 1905, vii, 343), have any etiologic significance is of course a question for the future.

8. Ewing: Trans. Assoc. Am. Phys., 1902, xviii, 208.

9. De Waele and Sugg: Arch. intern. Pharmacodynamie et Therapie, 1903, xii, 205; Münch. med. Wochschr., 1905; Centrbl. f. Bakt., I, 1905, xxxix, 324.

10. Jour. Med. Research, 1903, x, 195.

11. On account of incommunicability of scarlet fever to animals the investigator is without ready means to determine whether scarlatinal materials or microbes he may isolate therefrom have specific pathogenic powers.

EYELIDS.

Secondary syphilitic ulcers may occur in the eyelids from the breaking down of a gumma originating in the skin or in the subcutaneous tissue and cartilage. The most frequent location of the lesion is in the skin, near the lid margin or below the inner canthus, though it may occur on the conjunctival surface of the lid. It manifests itself usually at a late stage of the disease and should be classified as a tertiary lesion. The fact that this lesion may occur after all other symptoms of syphilis have subsided necessarily makes a diagnosis rather difficult, especially if it is situated over the lachrymal sac; in this event dacryocystitis is apt to be confounded with it. It is at times difficult to differentiate between this lesion and epithelioma, as the latter occurs more frequently on the eyelids than elsewhere.

CONJUNCTIVA.

The conjunctiva is very rarely affected primarily, but inflammation usually occurs when the iris and ciliary body are involved, the edema seen in these cases being caused by an obstruction to the return flow of the circulation. It has been my good fortune to see one case of gumma of the conjunctiva; this in a man 36 years old, who had been infected six years previously. The patient had received treatment for about three months after the initial lesion, and in the following year also he had taken more or less treatment, but, as all symptoms of syphilis had long since disappeared, he did not appreciate the necessity of further treatment, and the gumma of the conjunctiva was a result four years later. When I first saw him there was a round, hard mass, the size of a pea, glazed in appearance and almost white, situated at the sclerocorneal junction on the outer side of the right eye. Though he gave me a history of syphilis, a diagnosis was not made at the time, as I was uncertain as to the character of the trouble, and I requested him to return later in the week. On his return he told me that he had spent a very uncomfortable night with his eye. Examination disclosed a true broken-down gumma, ulcerated, and the whole surrounding tissue deeply injected. A salve of iodoform was prescribed to be used locally, and subcutaneous injections of the albuminate of mercury were begun at once, with iodid of sodium internally. After twelve injections, one given daily, and taking iodid up to 225 minims per day, the gumma completely disappeared, except for a slight contraction of the tissue.

For the past five years I have made a practice of examining the conjunctiva of each syphilitic coming into my office; my object in doing this was to find a mucous patch, but so far my efforts have been in vain. However, I expect some day to find one, as there does not seem to be any reason why they should not be found on the conjunctiva as they are elsewhere.

LACHRYMAL SAC AND DUCT.

The lachrymal sac and duct is frequently invaded by syphilis through the nose. In all the cases of stricture of the lachrymal canal in syphilis which have come under my observation I have always been able to find the cause in the nose. Syphilitic rhinitis, both acute and chronic, is very common, and when we have great destruction of the nasal bones and membranes dacryocystitis usually occurs with varying severity.

THE CORNEA.

Interstitial keratitis has its origin in syphilis in perhaps 60 per cent. or more of all cases, and the true form

is always hereditary. I have never seen a case caused by acquired syphilis, and believe the cases reported as such have simply been produced by iridochoroiditis, which has involved the deep layer of the cornea. Antonelli directs attention to the ophthalmoscopic appearance in congenital syphilis, namely: "A certain degree of pallor, sclerosis of the papilla, a massing of the pigment on the papillary border, a certain narrowing of the retinal arteries and a granular state of the retinal pigment." The symptoms of this variety of keratitis are a grayish discoloration at the periphery or some other part of the cornea. This color soon spreads over the whole of the membrane, which is infiltrated and its surface dull. At first the infiltration is translucent, it then becomes thickened and of a grayish tint, becoming darker until the iris is quite obscured. There is ciliary injection without congestion of the conjunctiva, lachrymation, photophobia and ciliary pain are also present, the latter due to an iritis which is nearly always present in these cases. The deep punctate keratitis of syphilis is situated in the deeper planes of the cornea; the iris, ciliary body and choroid are nearly always invaded. We have numerous small, deep infiltrations appearing in front of Descemet's membrane and in the center of the cornea. These infiltrations may become ulcerated in a few cases and leave very dense and permanent opacities.

A word in regard to the treatment of these forms of keratitis: I have never seen a case, no matter how ill nourished and cachectic the patient may have been, that small doses of mercury did not act in a most satisfactory manner from the very start. It seems to exert a tonic influence.

IRIS AND CILIARY BODY.

The iris and ciliary body are perhaps more often invaded by syphilis than any other part of the globe, and syphilis is the common predisposing cause of iritis. About 70 per cent. of all cases of iritis are caused by this disease, and I have found in examining the histories of 1,500 cases of syphilis, reported in a previous paper,¹ that iritis occurred in over 3 per cent. of all cases. There are a certain number of cases in which the clinical aspect will not give any indication of the constitutional cause of the inflammation; so we are more or less dependent on the history of the case and other data to confirm our diagnosis. In syphilis there are a certain number of characteristic signs in a given number of cases which will allow us at once to recognize the etiology of the disease. The most palpable of these are the papules—small raised masses imbedded in the iris, usually not exceeding three in number and generally located in the pupillary zone, but they may be seen at the periphery of the anterior chamber, or elsewhere. They begin as small points, increasing in size, until finally, in a few cases, they may attain such size as to touch the posterior surface of the cornea. During this time their color changes from a reddish brown to a lighter shade, and on closer inspection we shall find numerous small vessels surrounding them. They may disappear completely, or leave small arch-shaped synechiæ. A white line is not infrequently seen at the bottom of the anterior chamber, due to the accumulated debris of broken down condylomata. At the pupillary edge of the iris, a rusty hue is sometimes observed, and is probably due to condylomatous masses, diffused throughout the tissues in that position. The posterior synechiæ in this form of iritis are suggestive of the etiology of the trouble, as they are

broad and dark in color, thus differing in a marked degree from those of rheumatism, for instance, which are thin and light in color. This then, is the iritis of secondary syphilis, which is nearly always of a plastic type and has little tendency to recur. In nearly all cases attachment between the iris and the lens capsule takes place, unless the case is seen early.

Hereditary syphilitic iritis appears in the first few years of life, and also at a much later period. According to Hutchinson, the average age at which infantile iritis begins is five months, it affects females more often than males, attacks one or both eyes, and, though generally associated with a free exudation of lymph, is not much marked by redness of the eye. The cornea remains clear and the ailment is attended by few of the more severe symptoms met with in adults. Most of the cases show one or more of the signs of hereditary taint—as cachexia, psoriasis-like cutaneous eruptions, aphthæ or sores about the mouth, condylomata about the anus, or "snuffles." When iritis attacks other subjects, it may occur alone or with interstitial keratitis. If alone, the inflammation usually appears in the ciliary body, and spreads to the iris at a later stage, so we have an irido-cyclitis. It is very hard at times to recognize, as patients may show no signs of hereditary syphilis elsewhere. In other cases we may find associated with it, disseminated choroiditis, which is characteristic of syphilis. The iris reacts to light very sluggishly and ciliary congestion, purplish in color and patchy in distribution, is present. Sometimes a pupil may get blocked by a grayish layer of debris which seems to cling to the edge of the iris, and punctate deposits constantly appear in the cornea. Secondary glaucoma is a frequent sequel. In hereditary syphilis, iritis assumes the form of a serous irido-cyclitis and may appear alone or with interstitial keratitis.

Syphilitic cyclitis may be plastic, serous or gummatous, and is almost invariably associated with iritis; the symptoms are pain, diminished vision due to deposits upon the posterior surface of the cornea, precipitates in the vitreous, exudations between the iris and lens capsule, and ciliary injection. Galezowski, in studying symptoms of syphilis in the ciliary body, says:

1. Whenever syphilitic iritis is accompanied by punctate keratitis, either chronic or recent, areas of atrophic choroiditis will be found in the ora serrata.

2. In parenchymatous interstitial keratitis, when due to hereditary syphilis, disseminated plaques, which sometimes reach the posterior segment, are seen in the ora serrata; more often, however, they are confined to the ciliary region.

3. Diffuse syphilitic choroiditis, with disease of the vitreous, always presents atrophic alterations of the ora serrata, and the opacities of that humor are due to the latter lesion.

4. In ataxic atrophy of the discs, atrophic and pigment changes occur in the ora serrata.

5. In syphilitic inflammation of the cerebral or cerebro-spinal nerves, characteristic signs of the disease appear in the ora serrata.

Gallenga reports two cases of syphilitic gumma of the ciliary body, but I have never seen a case.

Before leaving the subject of irido-cyclitis, I wish to make a few remarks upon the pathogenesis of primary iritis of syphilis. Brailey says:

Almost all ailments capable of giving rise to inflammation of the iris are intimately associated with, if not actually caused by, micro-organisms. As regards syphilis, gonorrhea, tubercle, leprosy, influenza and relapsing fever, this fact will be disputed by none. Organisms have been described in many fevers—typhoid, smallpox and pneumonia—during recovery from which, inflammatory infections of the iris and ciliary body may occur. From all the facts brought to bear on the

1. Relative frequency of Iritis in Syphilis and Rheumatism, observed in 3,000 cases. *Ophthalmic Record*, November, 1899.

subject, it would indicate that syphilitic iritis is due to the presence of microbes.

Alexander believes that specific iritis is produced by vascular alterations, and points to the fact that Fuchs and Friedal have shown that the walls of the vessels of the iris are the seat of a gummatous degeneration. Brailey states that the ordinary form of the disease appears as an early secondary symptom during the time when the specific virus is diffusing itself, by means of the blood, throughout the entire economy. Nodular growths or condylomata are present in every case and are strongly suggestive of local irritation, such as might well be set up by bacilli deposited from the aqueous humor. Bronner has given particulars of three cases in which concussion of the eyeball was followed speedily by local syphilitic disease.

In many cases of irido-cyclitis, the patient tells us that the disease was set up by some slight injury to the eyes. A case in question came under my care some months ago.

History.———, aged 38 years, was walking along the street, carnival week, and a woman threw "confetti" into his face, some of which got into his left eye, producing at the time more or less irritation. Two days later, he came into my office with a typical case of specific irido-cyclitis. A history of syphilis was obtained, but he had never had iritis before, so it would seem that the bacilli deposited by the aqueous humor were there and only required some slight irritation to start them working industriously.

RETINA.

That syphilitic retinitis, pure and simple, does exist, seems to be beyond question, as such careful and painstaking observers at Leibreich, Mooren Mauthner have reported cases, while Ole Bull reports its occurrence in half of all the syphilitic cases seen by him.

We have observed in cases of severe iritis, more or less irritation of the retina. During the past twelve years I have had exceptional opportunities for observing syphilitic diseases of the eye, and in this time I have seen at least three positive cases of syphilitic retinitis without the choroid or iris being involved. The three cases were all due to the acquired form of syphilis, and appeared from four months to seven months after infection. In one case the retinitis was preceded by iritis, but the latter trouble had entirely subsided without injury to the eye. The most remarkable incident, outside the rarity of such cases, was that none of these patients had been fully under the influence of mercury, though each had been using inunctions for several weeks previous to the discovery of retinitis. I will not go into the details of these three cases here, as I expect soon to make a further and more elaborate report. In two cases there were dust-like particles in the posterior part of the vitreous, producing a cloudy appearance in front of the papilla. In the other case this condition was absent. In all there was a grayish opacity of the retina, and particularly along the course of the blood vessels; small, white foci were seen towards the periphery of the retina, developing along the course of the blood vessels, berry-like in appearance and covering the vessels in places. The arteries seemed somewhat thinner, and the veins were much larger than normal.

Syphilitic hemorrhagic retinitis not infrequently occurs in the course of syphilis and usually in the tertiary period of the disease. Of course, the predominating clinical symptom is a great number of hemorrhagic spots of different sizes and shapes; dust-like opacities are seen in the vitreous, the retina appears opaque, the

arteries are small and the veins are dark and large. Persistent headache is a constant factor in this disease until the patient is thoroughly under the influence of mercury and iodids.

Relapsing syphilitic central retinitis is a very rare affection; personally, I have seen only 1 case in about 2,000 cases of syphilis which have been under my observation. There is a sudden disturbance of vision, which disappears after a few days, to reappear. These recurrent attacks may keep up indefinitely. During the attacks the vision is much impaired. At first the vision is very good between the attacks, but later it is reduced. There is seen a slight shadow on the macula, but the papilla and surrounding field remain perfectly clear. Fine white points appear in groups around a grayish macula and during the intervals of attacks this cloudiness disappears entirely. In my case the trouble was cured after three months of heroic anti-syphilitic treatment. Three years have passed since the case was first seen and there has not been any recurrent attack.

Transitory recurrent bitemporal hemianopsia may be caused by syphilitic tumors affecting the chiasm. Oppenheimer regards this form of hemianopsia as a sign of basal syphilitic lesion.

Swanzy directs attention to the fact, that symptoms caused by syphilitic gummata at the base of the brain are frequently inconstant, that is to say, a nerve which is paralyzed to-day, may be found to perform its functions well to-morrow, while the paralysis of some other nerve may continue. In nearly all cases of hemianopsia and blindness brought about by gumma situated somewhere in the optic tract and chiasm, if the blindness is recent, we can, with a great degree of certainty, hope for useful vision, if not for entire relief. This, of course, can only be brought about through heroic anti-syphilitic treatment. Diseases of the blood vessels of the retina and iris caused by syphilis, while not very common, yet occur with sufficient frequency to attract attention.

Syphilis not only induces inflammatory changes in the retina as elsewhere, but frequently produces changes in the blood vessels similar to those seen in senile or albuminuric sclerosis. Blood extravasations, opacities of the vessels and sometimes retinal opacities are seen.

In syphilis, Haab attaches considerable importance as a diagnostic sign to decrease of the retinal vessels when the opacities of the walls appear as fine disseminated scales upon the arteries. He states further that other similar vessel-degenerations rarely show this appearance. New vessel formation is quite frequent in syphilis and takes place after hemorrhages of syphilitic origin.

CHOROID.

Disseminated choroiditis is caused by syphilis in perhaps 80 per cent. of all cases. In acquired syphilis the disease makes its appearance in from six to eighteen months or possibly longer, after infection. In hereditary syphilis the disease comes on in the first three or four years of life, or probably at a later date. In the early stages, in the acquired form, we see perfectly round white spots of a pinkish hue. The retinal vessels are clearly seen as they pass over the spots. The next change takes place in the center of the spot which becomes very white; at the same time the pigment ring begins to show itself and gradually becomes darker. The pigment ring and other details now sharpen up and the enclosed surface appears as a dull, yellowish-white plaque. Sometimes little shreds of lymph are seen during this stage attached by one edge to the choroidal plaque and undu-

lating in the vitreous. Patches of complete atrophy appear, bounded by a ring of black pigment; the entire surface in this ring is white or bluish-white and glistening, and we cannot see any trace of the choroidal vessels or pigment, yet the retinal vessels go across without interruption. The appearance of the fundus, between the choroidal spots, is usually normal. When the inner layers of the retina become affected the case is always more or less serious and a loss of sight may take place either from atrophy of the disc or from detachment of the retina.

Iritis, interstitial keratitis and scleritis may make their appearance during the course of the disease. Liquefaction of the vitreous may take place with partial or complete dislocation of the lens. The occurrence of a group of yellowish-white flecks near the macula and of dust-like opacities of the vitreous, with change in the walls of the choroidal and retinal vessels, is nearly always characteristic of syphilis.

Syphilitic chorio-retinitis is always characterized at first by fine dust-like vitreous opacities and increased redness of the disc, which latter is surrounded by a halo of grayish discoloration. There is an absence of the patchy condition characteristic of choroidal inflammation alone. This form is frequently preceded by iritis. Night blindness is usually a marked feature. The field of vision rarely shows any marked diminution. In the early stages the diagnosis is quite difficult; there is a smoky appearance of the details of the fundus, however, which is characteristic. The vitreous opacities, increased redness of the disc and opacities of the surrounding retina, are frequently the only diagnostic signs.

Later, as the disease progresses, there is often found overfullness of the retinal veins, with a contraction of the calibers of the arteries and paleness of the disc.

POLYCYTHEMIA.

J. F. ALDRICH, M.D. AND LE ROY CRUMMER, M.D.

SHENANDOAH, IOWA.

OMAHA.

The recent exhaustive articles¹ on this subject have changed our plans in considering the condition in detail and referring to the previous work which has been done on this subject, but cases are still so rare that we think it expedient to report this one in considerable detail. This case seems of especial interest in that while it has the entire triad of symptoms completely developed, it differs in some important essentials from the cases previously reported.

Patient.—Mrs. J. M. D., aged 53, first seen by Dr. Aldrich Jan. 11, 1906, complained of considerable dyspnea on exertion. She had also noticed that she had an immense growth in the left abdomen.

Family History.—This was negative. The father was living at the age of 86, and was in reasonably good health. The mother died at 50, from a "lingering consumption." The patient had waited on her mother constantly for three months prior to her death, but developed no symptoms following this exposure. She has two brothers living, aged 50 and 55 years respectively, and both in good health. Four sisters died in early infancy, the causes of their deaths being unknown to the patient. One brother died of a wound received in the Civil War when but 20 years old.

Personal History.—When a child the patient had eczema on the scalp and along the shins, and at about the same time, had a severe attack of ringworm. She also had measles, scarlet fever, chickenpox and mumps during childhood. She never had any of the other diseases, nor has she ever been seriously sick

at any time since puberty. There was no history of typhoid or malaria, and she has never had symptoms which would indicate a tuberculous infection. Menstruation began at 14 and terminated in a normal climacteric at the age of 50. Before marriage she had dysmenorrhea, but was much better after marriage, and has considered herself normal in that respect ever since. She has borne six children, the latest eleven years ago.

History of Present Condition.—For eight years she noticed a redness of the face so striking at times that even the school children noticed it and would run past her house exclaiming: "Look out for the red Indian woman." During this entire period she had a feeling of fullness of the head and dizziness at times. This still continues, but occurs only at comparatively long intervals. Three years ago she first noticed a tumor in the abdomen, which enlarged rapidly, and at the end of the first year was as large as a coconut. This tumor grew slowly, but continuously, and she did not notice at any time a decrease in size. She never had any form of hemorrhage.

Symptoms.—The patient complained of extreme fatigue, a feeling of weight and dragging in the abdomen, and pressure over the bladder. She suffered somewhat from nausea, a slight distress after eating, and occasional attacks of diarrhea. She never had fever, but perspired easily. There had never been much loss of weight.

Present Condition.—Jan. 11, 1906. Patient was in fair flesh, had no difficulty in walking, and showed no trace of fatigue after rather a hard trip. The color of the face and hands was striking. The exposed skin had a dusky red color, and on closer examination, enlarged veins were seen in fine network throughout the skin. The conjunctiva presented the same appearance. The teeth and gums were normal; there was no tonsillar enlargement. The cervical glands, as well as those in other regions, were normal. The lungs were normal, save for a slight emphysema. The heart was normal in size and sounds, and there was no dulness of the mediastinum. Examination of the abdomen showed no ascites, no enlarged veins, and the liver not perceptibly enlarged. The entire left half of the abdomen was filled with a heavy tumor, which came out from under the costal border at the seventh cartilage, extending down to one inch to the right of the umbilicus. One inch below the umbilicus it turned and ran almost horizontally across to the antero superior spine of the ilium, and thence behind the crest of the ilium. There were three typical notches of the median edge, which, however, were very blunt. Careful palpation gave an impression that this tumor was thicker in the anteroposterior diameter than is usual with splenic enlargements. The length of the anteroposterior diameter from the costal border to the lowest point in the abdomen was seven and one-half inches. The tumor was seven inches from the extreme right edge to the point where it disappeared behind the crest of the ilium. The skin was everywhere mottled, but there were no enlarged veins except on the face and hands. There was no edema, but some tenderness on percussion over the sternum, tibia and other long bones. Urinary examination gave normal findings.

Blood Examination (Crummer).—

Red blood cells (Thoma Zeiss).....	7,700,000
White blood cells.....	4,700
Hemoglobin (F. M.).....	120 per cent.
Index.....	approx. 4/3

Smears stained by the Ehrlich's nitrophenol and eosin-methylene blue method showed considerable variation in the size and contour of the red blood cells. There were many microcytes and a few pale-staining macrocytes. A few cells show slight poikilocytosis, and in almost every field polychromatosis could be recognized. Nucleated red cells were found in considerable numbers. While counting 200 white cells, 24 nucleated red blood cells were seen, which equals 6,600 nucleated red blood cells per c.c.m. Five or six were typical normoblasts, while the others showed many characteristics of the megaloblastic type of cell.

The differential white cell count showed:

Polymorphonuclears	72.5 per cent.
Eosinophiles	4.0 per cent.
Large lymphocytes.....	8.0 per cent.
Small lymphocytes.....	11.0 per cent.
Myelocytes	4.5 per cent.

1. Englebach and Brown: THE JOUR. A. M. A., Oct. 20, 1906. This article contains a complete biography.