DIGEST OF THE LITERATURE.

THE UVEAL TRACT.

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(Continued from March issue)

The microscopic examination revealed swollen and edematous corneal plates, with capillary vessels in the middle layers of the corneal stroma, the anterior chamber filled with an albuminous exudate. Completely closing off the anterior chamber posteriorly there was a dense band of fibrous tissue, about two-thirds the thickness of the cornea, and somewhat resembling it in structure. This curtainlike band, which extended from one angle of the anterior chamber almost to the other angle was somewhat adherent to the iris, although sharply differentiated from it in structure. The iris itself was densely infiltrated with small lymphoid cells; and thruout the stroma, but chiefly at its base, were numerous large plasma cells. The ciliary muscle was atrophic and contained large masses of round cells and lymphocytes. In the lens were masses of vesicular cells which appeared to correspond to the "blasenzellen" of Wedl. The band of fibrous tissue described crossing the anterior chamber, corresponded in appearance almost exactly to the one illustrated in Fig. 191 in Parson's *Pathology of the Eye*, Vol. i, Part I, p. 290.

Langdon's patient, a boy, aged thirteen, was seized ten days after pneumonia, with a severe pain in the left knee. Shortly afterward both hips, ankles, and wrists, were involved. He was admitted to the Orthopedic Hospital, with great stiffness of the joints, tenderness, bed-sores on his back, and a temperature varying between 99° to 102° F. Three weeks after admission he had a severe pain in O. D., with some ciliary injection, and a small gray node developed at the upper inner pupillary margin, 1 mm. in diameter. In

forty-eight hours it had tripled in size, and in another twenty-four had begun to send out streamers of soft gray exudate which in two days filled the entire upper inner quadrant of the anterior chamber. The general diagnosis had been thought to be either an aberrant form of tubercular infection or a low-grade purulent organism. The serum from a tapped joint was clear and gave no culture growth. On the third day of the ocular condition, 1/500 mgm. of T. R. was given with no effect, save the temperature then remained between 99° and 100° F. In forty-eight hours an injection of 1/300 mgm. was given and again no change except the temperature stayed between 99° and 99.5° F. Another joint yielded a cloudy fluid with no growth, even on dextrose-ascites-agar anaërobic stabs. Two sets of diplococci were found in a smear. A third T. R. (1/300 mgm.) was given, and after this there was noticeable absorption of the exudate, which in forty-eight hours had disappeared, leaving the node filling in the pupillary area. The iris did not dilate well under large doses of atropin, and the node had taken on a distinctly yellowish tinge, as though purulent, and light perception was lost. It seemed possible that the diplococci found were broken chains of streptococci.

GOUTY IRITIS.—Clarke believed that a point of strain or traumatism was the point for the manifestation of gout when it was in the system. If the metatarsal joint was defective, gout manifested itself there; if eyestrain were present, iritis would probably occur. He always tried correction of the latter before recommending iridectomy. Ormond asked whether rheu-

matic fever produced iritis at all? He also asked for a scientific definition of gout. He did not think it possible that errors of refraction and eyestrain could cause iritis. **Wessely** injected a sterile suspension of crystallin monosodic urat in physiologic salt solution into the cornea, under the conjunctiva, and into the anterior chamber, of rabbits. The monosodic salt was used for maintaining the analogy to human pathology, as not only the gout tophi but also the uric acid circulating in the blood consist of it. Injections into the cornea caused almost no irritation, and the crystals were absorbed or cast off in a few days, leaving a tender scar merely corresponding to the puncture. Injections under the conjunctiva produced violent hyperemia and chemosis for a few days, with gradual absorption of the urat without leaving greater disturbances. Microscopically a dense infiltration with leucocytes remained for a long time in the focus and the surrounding tissues of conjunctiva and sclera, followed later on by necrotic changes. In the majority of experiments the reaction after injections of from 0.5 to 1 cg. into the anterior chamber was comparatively slight. In some cases the aqueous was slightly opaque and the iris swollen, with a few posterior synechiae, which all disappeared after a few days. The opaque swelling of the corneal substance was attributed to the toxic action of sedimented urat at the posterior surface of the cornea. The opacity gradually disappeared under the development of blood vessels from the marginal loops.

Microscopically the deposit of urates is enveloped and permeated by coagula of fibrin, and there is an abundant immigration of leucocytes and numerous eosinophiles. Giant cells are found from 7 to 14 days later. The endothelium of Descemet's membrane at the extreme sinus shows proliferation and participates in the formation of numerous stratified flat cells, almost completely filling the space of Fontana. The parenchyma of the cornea is thickened to twice its size and infiltrated with leucocytes. After four weeks these macroscopic and microscopic

changes disappear almost completely, and a nearly normal condition remains for about a month. Then a gradually waxing opacity of the cornea develops in the area corresponding to the original site of the urates, due to necrotic processes. Descemet's membrane is separated into two lamellae, enclosing a coarse fibrillar new formed tissue. This vascular tissue is best characterized as pannus of the posterior surface of the cornea. In the third and fourth months minute glistening crystals develop in this tissue; which Wessely so far was not able to determine as urates, altho he thinks they are urates.

The interesting and important feature of the experiments lies in this late sedimentation of crystals and the slow necrotic process due to the very gradual and chronic poisonous action. According to Wessely there is scarcely another explanation but that the noxious agent remains during the whole time in some form fixed in the tissue, and it may be supposed to play a constant rôle in the slowly developing changes. He believes that his experiments bring us nearer to the conception that even without local sedimentation of uric crystals merely dissolved monosodic urat circulating in the body may evolve toxic effects on certain tissues of the eye.

GNORRHEAL IRITIS.—According to **Lang**, gonorrhea was not usually considered so potent a cause, but hospital practice would probably show a higher percentage than 12 in his 200 cases of iritis. Now, however, that the infection had been shown to linger in the genito-urinary system for years, relapses could be largely prevented by local treatment applied in that region. **Ormond** says an important point is as to the duration in an active stage of the gonococcus in the tissues; it had been asserted that it remained in the crypts of the prostate for 15 or more years, but that did not coincide with other statements.

CHOROIDITIS.—**Wallace** presented a patient, aged 20, with choroiditis, who noticed interference with vision four years ago. R. V. 7/10. L. V. 20/15. It is not progressing so far as vision is

concerned. Right eye: Temporal field involved from disc outward. Left eye: Superior and superior temporal fields diseased. Extreme superior patch of white very large and looks as if enamelled or like a piece of china. One very interesting thing is the presence of a vitreous string between the disc and fovea, several millimeters long.

Lang says that at one time, syphilis was regarded as the chief cause of iritis and probably hospital figures would show an increase on his 6 per cent; but with the modern antisiphilitic methods he thought it would become the rarest cause, for gummata of iris and ciliary body could be made to melt away without the disorganization of the eye which was formerly seen. In **Wallace's** patient, aged 25, with specific choroiditis, vision began to fail last August. Left eye became worse gradually, until three months ago, when the process increased. L. vision: Fingers at 12 feet. Wassermann plus 4. Fundus: Very extensive changes in all stages of the disease. Temporal field almost wholly involved, far up and far down. Nasal field and superior not so many points. Can see jet black and ivory white spots various sizes. At places pearly, shiny pinhead size spots. Across the superior field a very dim, almost indistinguishable line is seen, looks like a blood vessel but can see no junction with other vessels and lies in front of and at right angles to the arteries and veins. Probably 2 mm. wide and side outline more distinct, of pinkish white color and fades to an indistinguishable outline of other side.

Holloway exhibited a boy, aged thirteen, with disseminated choroiditis first seen March 13, 1916, at which time his eyes showed the following conditions: Vision R. 6/12. L. 6/15. In the right eye a few vitreous opacities, disc was pinkish yellow in tint. Studding the choroid were innumerable lesions, varying in size from a split pea to half the disc diameter. Many of these presented a grayish white, cottonlike appearance, and were surmounted centrally or eccentrically by a ring of pigment having an apparent diameter of about 4 mm., the circumference of the

lesion not being pigmented. In a few instances the pigmentation consisted of a solid clump about the same size as the rings. Some of the lesions were of a yellowish tint, and one near the macula was without pigmentation, whitish in color, and surrounded by a narrow yellowish areola. In a few instances the retinal vessels were partially covered by pigment. In the left eye there were a few vitreous opacities, with a low-grade neuritis, a diffuse superficial retino-choroiditis most perceptible in the macular region; and in the periphery there were a few vague choroidal foci without pigmentation. General examination revealed slight enlargement of the cervical lymph glands, some enlargement of the tonsils, and a suggestion of a rachitic rosary. Wassermann positive. **Holloway** stated that he had never seen a case before quite so striking. He believed the condition presented various stages of an active process depending upon hereditary tues.

UVEAL TUBERCULOSIS.—The tuberculosis cases of *iritis* of **Lang** (11%) were equally divided between the sexes, and the average age of the patients in this form was 25 years, all but two being between 16 and 35 years of age. According to **Koepe** pathologic deposits are found on the posterior surface of the cornea in every case of iritis, whether tuberculous, serous, or in any other form. These deposits look like droplets, fibers, stars, or conglomerates. In the form with droplets the posterior surface of the cornea looks bedewed. It is probable that these droplets are insufficiently coagulated fibrin. They appear also in inflammation of other etiologies. The author has observed them, also, after the complete cure of an iritis. The fibers (filaments of fibrin) may be likened to picked cotton fibers. This is evidently a late stage of the droplets. The star form is very common. The substance is disposed in a manner reminding one of snow flakes. There is the impression that there is an additional moisture capable of crystallization. The amorphous conglomerates have a different aspect. These are like elevations on the

endothelium, often in the form of transparent nodules. After a certain time they are covered with very fine pigment particles like pulverized pepper. Their volume seems to grow by apposition, like the stars, and they reach varying sizes.

These forms show themselves in the course of different varieties and stages of tuberculosis of the iris, and in most cases even side by side. Thanks to the Nernst lamp the diagnosis of iritis can be made by the examination of the posterior surface of the cornea alone, at a period when this would have been impossible with the corneal microscope alone. The conglomerates and the nodules are, moreover, suspicious of tuberculosis.

Deposits are also observed, though less frequently, on the anterior lens capsule. These formations are much thinner than those on Descemet's membrane, often barely visible, or even absent. From a differential diagnostic standpoint they can be used even less than the other. In serous iritis they are always found in the aqueous humor. They are not of any importance from the point of differential diagnosis when searching for the etiology. They are composed of fibrin, cellular elements, pigment particles and sometimes erythrocytes. The visibility of light rays in the anterior chamber is a precious symptom of the existence of an intraocular pathologic modification.

CHOROIDAL TUBERCULOSIS.—**Jackson** presented a young woman who, until nineteen years of age, had vision of 20/20 in her right eye, which suddenly diminished to 5/200. Ophthalmoscopic examination showed a central chorioretinitis, with a large area of edema of the adjoining retina. The ophthalmologists, under whose care she then was, "were unable to determine any cause for the condition," altho careful clinical examination of her general condition was made, which did not, however, include tuberculin tests. She was given pilocarpin sweats, mercurial inunctions, and Donovan's solution. The patch in the macula went on to choroidal atrophy with pigment deposit. She was first

seen by Jackson eight months later. Vision in this eye was 4/45, with slight pallor of the outer quadrant of the optic disc, and choroidal atrophy 2/3 of a disc diameter in the macula, with a small pigment patch at the fovea. The left eye was and has remained normal.

The condition continued practically unchanged for 16 months. Then vision grew worse in the right eye. There was a noticeable extension of the scotoma downwards. Ten days later swelling and gray deposits to the nasal side of the old patch of choroidal atrophy were seen. There was some pain and pericorneal hyperemia, with rise of tension to 4 on the Gradle instrument (presumed pressure 60 mm.). Shortly before this, swelling and soreness had developed in the metatarsophalangeal joint of the great toe. Tuberculin injections gave both general and focal reactions. Under tuberculin treatment the process subsided, the additional patch of choroid undergoing atrophy, the nasal larger portions of the lesion now seen in the macula. Vision reduced to R. 2/60 eccentric. There has been no evidence of fresh disease for more than 4 years. The patient was somewhat out of health when sent to Colorado, but has never given evidence of pulmonary tuberculosis.

UVEAL LESIONS WITH VARIOUS GENERAL DISEASES.—**Demaria** records two interesting cases of general uveitis in subjects affected with *vittiligo*, far enough advanced to render both patients blind. The first case occurred in a boy of 18. Wassermann and v. Pirquet negative. Injection of tuberculin caused marked general reaction as well as focal reaction in eye.

The second case, a woman of 45, in whom the tuberculin reaction was negative, but Wassermann positive. In the first case an iridectomy was performed on each eye without benefit, and the ocular condition did not respond to tuberculin. At present there is bare perception of light. The second case had iridectomy performed previously to coming under Demaria's care, tension is low and the eyes practically blind. Demaria discusses the

cases of ocular affections occurring in patients with vitiligo which have been reported by Erdmann, Gilbert and Komoto.

Masuda observed acute disseminated choroiditis with *scrofuloderma* in a 15-year-old scrofulous patient, who likewise had hemorrhagic nephritis. There was a suppurating lymphatic gland of the neck, which had partly cicatrized and had given rise to typical scrofuloderma in its neighborhood. Chemosis and swelling of the eyelids appeared on each eye, accompanied by dull pain. Ophthalmoscopic examination showed pale yellowish spots, more or less round, a few of which were of the size of the papilla. These spots were not accompanied by pigment and lay under the retinal vessels. They were more frequent in the equatorial zone, leaving the neighborhood of the papilla and macula free. The affection was more pronounced in R. than in L. It was interesting to note that the fundus disease appeared and proceeded with the swelling of the eyelids. The author thinks that this form of choroiditis has not yet been described.

Marquez's patient, a physician, complained of steamininess of vision, first noticed in the morning and persisting during the day. Three days later a sudden pain was felt in the eye. The pain subsequently disappeared but left the eyeball and surrounding parts very sensitive. The cloudiness of vision increased. *Malaria* being suspected, quinin was administered, with rapid disappearance of the symptoms. **Zimmer** describes bilateral metastatic cyclitis following an attack of *bubonic plague* in an Italian taken with sudden fever, a pustule in the right axilla, and loss of vision. Bacteriologic and clinical diagnoses demonstrated the plague. The eyes showed slightly increased tension, mild injection, posterior synechia, exudate in pupil, infiltrated vitreous so the fundus was not visible. Anterior chamber normal, and no visible nodes were seen. The patient was cured of the disease, but the blindness was permanent.

The 3 cases of *meningococcus iridochoroiditis* reported by **Lavergne** emphasize the necessity for watching over the

eyes during cerebrospinal meningitis, to detect ocular complications in their incipency. Lavergne insists that at the least suspicion of iridochoroiditis, ophthalmoscopic examination is imperative. The etiology of iridocyclitis has been discussed by **de Schweinitz**, with special reference to focal infections.

SUBCHRONIC FEBRILE UVEO-PAROTITIS.—A delicate, thin, anemic (hemoglobin about 75%) girl, aged 21, came to **Kuhlefeldt** on August 20, 1915. The father died of tuberculosis, but there were no other cases in the family. Lues could be excluded in both parents and patient. Parotitis epidemica as a child. In adolescence some affection of the fourth metacarpo-phalangeal joint of the right hand. Patient was not aware of having been in contact with anyone sickening from any illness. Since July, swelling and tenderness in each parotid region. Diminution of vision in the right eye August 15; August 18 last joint of left little finger, head and eyes painful. Feels tired. Has not noticed any symptoms of fever or of weakness or disturbances of taste or sensibility. Acute laryngo-bronchitis, but no demonstrable changes suggestive of tuberculosis. Apices alike and clear. Urine free from sugar and albumin. No symptoms of sinusitis.

Preauricular portion of each parotid right retromaxillary portion nearly the size of an infant's hand, the left somewhat tender and uneven, pigeon-egg sized; surrounding parts not swollen. Nothing abnormal in mouth or throat. Sublingual, submaxillary and lacrimal glands neither tender nor swollen. No tenderness in the region of the ovaries.

Right ocular conjunctiva somewhat injected, small deposits on the lower part of Descemet's membrane, iris a little hyperemic. Media clear, papilla and retina over a wide circumpapillary area gray, turbid and swollen; blood vessels invisible at places; veins swollen and tortuous. Numerous large and smaller hemorrhages and gray patches in the inner and lower quadrant of the fundus. V. 5/10.

Left, normal condition. Last joint left little finger swollen and tender.

No demonstrable pareses. August 23. Pupil fairly well dilated by atropin, tho irregularly; iris swollen; exudation in pupil. No details of fundus visible. V. fingers 1.1 meter. Admitted to hospital. Aspirin, sweating, inunction. August 29. L. E. Pericorneal injection, some iris congestion. September 12. Left hospital. September 28. Right parotitis rather increased lately. Iritis gone. Collo-iodid and sweating. October 28. Papilla pale, papillary vessels in the main visible, surrounding retina normal in appearance, in the macular area there remain only the pigment patches, the formerly gray worm-shaped patch is white. V. fingers at 5 meters. Swelling in parotid glands markedly reduced. General conditions rather better. Collo-iodid discontinued and arsenic given.

The temperature has varied in the mornings between 36.2° and 37.3° C., and in the evenings between 36.3° and 37.4° C. There have been four definite rises of short duration, the maximum in the first being 37.7° C., in the second 37.7° C., in the third 37.5° C., and in the fourth 37.9° C. Possibly the first of these was connected with the iritis in the left eye, and the second with an exacerbation of the right-sided parotitis. The case occurred at a time when there were in the patient's neighborhood only isolated cases of epidemic parotitis. (In Helsingfors three in June, four in July, and not a single case in August were notified.) So far as is known, too, the disease was not transmitted to anyone else.

Mackay described a case of uveo-parotitis with *irido-cycloplegia* in a table-maid, aged 30. When first seen, March 10, 1916, she showed slight, diffuse, deep conjunctival and very moderate ciliary injection. The pupils were widely dilated (about 6 mm. in diameter) and immobile to light as well as on convergence, and tho appearing almost circular, a few posterior synechiae were found. Accommodation paralyzed. There were well marked punctate deposits on the back of both corneae, and haziness of the vitreous. Thru this fog the details of the fundus were rendered somewhat obscure, but

no gross changes were to be seen. R. V. 5/60 not improved by any lens. L. V. 6/60.

Two days after admission to hospital she developed bilateral swelling of the preauricular portions of her parotid glands. The cervical part of the parotids were less affected and no other glands in the neck were involved. The enlarged parotids were smooth, firm and only slightly painful on pressure or on yawning. Her temperature, 98.2° F. on admission, remained for the most part rather subnormal, varying from 96.8° F. in the morning to generally a degree more in the evening. The highest temperature was 99.4° F.—two days after a von Pirquet's cuti-reaction. Von Pirquet, Wassermann, and a subsequent injection of Koch's old tuberculin negative; no growth had been obtained from the blood culture; blood showed a leucocytosis; a culture from the conjunctiva showed Gram positive cocci (*staphylococcus albus* and *citreus*).

At the last examination, April 19, 1917, V=6/12 in each eye and Jaeger 1 more easily; pupils equal and almost circular, especially the left, about 5 mm. in width in subdued light, responded very little, if at all, even to brightly focused light, but definitely narrowed to about 3 mm. on convergence with accommodation. Some fine brown spots of deep punctate keratitis on both corneae, vitreous practically free from opacity; optic discs well defined, no visible choroidal changes even in the periphery of the fundus. Nothing abnormal was to be felt about the parotid glands; salivation appeared to be quite natural; the ciliary muscles had practically regained their power. On the whole she seemed in a fair way to make a complete recovery.

Mackay searched thru the *Index Medicus* from Heerfordt's communication of 1909 up to the present time, and found details of only six cases of dilated pupils and paralyzed accommodation recorded in association with parotitis. In three of these, the irido-cycloplegia appeared to be a secondary consequence of optic neuritis or optic atrophy, or as part of a third nerve

paralysis. Of the remaining three cases the first, published by Baas in 1886, had cycloplegia three weeks after mumps. Diphtheria was excluded. The second, reported by Mandonnet in 1903, was a child of 9, with complete paralysis of accommodation and of the soft palate after mumps. The third, recorded by Dopter in 1904, aged 31, two or three weeks after mumps which quickly subsided, developed pyrexia, occipital headache and double orchitis, left facial palsy, paresis of left half of tongue and soft palate, left mydriasis and left cycloplegia. He had definite leucocytosis and made a good recovery. In none of these cases was there iridocyclitis.

Mackay found no record of a case exactly reproducing either the group of symptoms or the order of their occurrence, which characterized the one under his observation. The ciliary body doubtless plays its part in endeavoring to get rid of deleterious substances circulating in the blood stream. It appears not improbable that the obstinate and tedious character which iridocyclitis so often presents is due to the fact that the morbid material passing from the ciliary gland into the aqueous fluid has no chance of being directly evacuated from the body like the saliva, but is necessarily reabsorbed into the circulation and sets out again in a vicious circle. It is commonly believed that in mumps the poison enters the parotid glands thru the buccal orifice. If that be so, it is easy to understand how the parotid gland reaction precedes other signs and symptoms of remote or metastatic inflammation or nerve pareses, which are presumably due to an extension of the poison thru the system, or are set up by toxins produced by the primary infecting agent. When remoter toxic effects precede the parotitis, the poison, whether due to mumps or not, may (or must) have entered by some portal other than Stenson's duct. The possibility of a mixed infection, e. g., with diphtheria, should not be put aside without further careful investigation.

DIAGNOSIS OF UVEITIS.—**Thompson** maintains that iritis is a local mani-

festation of a constitutional condition. In his experience the percentage of cases in which he could find no cause is very small indeed. If history or findings point to any focal infection in the sinuses or teeth, the patient is sent immediately to a roentgenologist for radiographic pictures. Always a Wassermann test is made, regardless of the history. When there is nasal discharge of any kind a specimen is sent to the laboratory for diagnosis; urine is always examined.

A mere cursory examination of the nasal fossae will, as **Wynn** emphasizes, often fail to reveal sinus disease that is causing the most severe focal symptoms. It must be most thoro and painstaking to be of any value, and **Wynn** found great help from the use of Dowling's tampons, which consist of a cotton tampon about 3 inches in length, soaked in argyrol 10 per cent solution, and placed in the middle meatus for about 15 to 30 minutes. If the sinus is affected there will be a free flow of muco-pus and the tampon will be discolored. In the discussion of Irons and Brown's paper, **Rochester** spoke of the great value of the suction apparatus in the diagnosis of these cases.

Levy calls attention to the fact that in all but one of his cases dental infection has been on the same side with the affected eye. He warns the ophthalmologist to satisfy himself that a careful roentgenographic examination has been made of all suspected teeth, before excluding them as a possible etiologic factor in infectious eye conditions.

While the complement fixation test for gonorrhea was formerly very unsatisfactory, giving positive results in only 5% of the cases, **Fredrick** says, the procedure has now been improved by the use of a great number of strains, as many as 150 in some places, so that today we can count on 85% efficiency. He gives the clinical histories of 3 cases from his practice illustrating the great aid the complement fixation test can afford one. **Darier** also attributes great importance to the complement deviation by means of the gonococcic-antigen. The authors mentioned un-

der etiology express the same views with regard to diagnostic methods.

For the differential diagnosis of incipient iritis from simple conjunctivitis, **Darier** recommends instillation of adrenalin, or better cocarenalin, after which the superficial conjunctival hyperemia will disappear if it is a simple conjunctivitis. If it is an iritis, a deep and violet hyperemia will persist around the cornea. **Woods** considers the proper attitude of ophthalmologists to the use of tuberculin for diagnostic purposes: avoidance of focal reaction in ocular lesions; and a positive von Pirquet with elimination of other causes a sufficient diagnostic sign.

TREATMENT OF UVEITIS.—In iritis, accompanied by violent inflammatory phenomena, radiating pains, **Darier** recommends leeches, which **Ormond** also found very useful. Ormond said that great comfort was obtained by the continuous application of the electric coil. From the macroscopic and microscopic findings, in his experiments on the influence of radium emanation on the deposits of urates in the eye and the peritoneum, **Wessely** concludes that radium emanation even in high concentration, exceeding the usual clinical values, has no influence on the effect and the fate of urates deposited in the body. The removal of the septic foci in cases of iritis or focal choroiditis, e. g., in the dental regions, tonsils, etc., as the only rational treatment with brilliant results, was mentioned under etiology.

Not only a method of diagnosis but also the best form of local treatment in chronic affections of the sinus, if they are not operable, is, according to **Wynn**, the use of Dowling's tampons. The benefits obtained are due to the effects of induced capillary attraction, which drains the ethmoidal cells of retained secretions and depletes the turgid soft tissues. The immediate effects produced by the tampons are conjunctival congestion, sneezing and a flow of mucus. **Rochester** thought the suction apparatus was of great aid, when it was necessary to use conservative methods.

Dunn considers vaccines in the earlier stages a valuable adjunct to our list of remedies in the treatment of secondary ocular inflammations. He used Mulford's mixed influenza serobacterins, which contains killed sensitized bacteria: *b. influenza*, *staphylococcus albus* and *aureus*, *streptococcus*, *pneumococcus*. In no case, however, did he fail to supplement their use with such general or local treatment as he thought the case required. In a case of toxic choroiditis secondary to a chronic alveolar abscess, **Rowe** felt that stock vaccines for mixed infections, after the teeth extraction, while they were begun late, were still in a measure responsible for the happy results obtained. **Darier** regards autovaccines in gonorrheism of precious therapeutic value, and **Fredrick** reports most brilliant results in 3 cases from the injection of mixed *Neisser serobacterin*.

To **Lang** the treatment of tuberculous iritis, as for tubercles of the lung, appeared to be good air, graduated exercise, and food rich in fats, as well as such local measures as would subdue inflammation and prevent closure of the pupil. **Woods** avoids tuberculin as a therapeutic measure in acute cases. Under "acute" there should be included duration and advance of the lesion, as indicated by condition of the vitreous, descemetitis, etc. Tuberculin is indicated when the trouble is nonprogressive, but does not get well. A positive von Pirquet, with elimination of other causes, is sufficient basis for the use of tuberculin in therapeutic doses. The present status of vaccin therapy is so uncertain, in the opinion of even those most expert and experienced, that ophthalmologists owe it to their patients to conduct this treatment under the guidance of one trained in "immunologic problems."

Koepe recommends systematic treatment of the portions of iris attacked by tuberculosis with the Nernst lamp. It deserves to be adopted by everybody aside from the specific tuberculin treatment. The best cases for the treatment with the Nernst lamp are all of the nodular forms, and the localized changes in the iris, as, also, the

cases of pure serous iritis without decided changes in the iris tissue. The technic is described and the literature on the subject is given.

Laverne urges that if the diagnosis of irido-choroiditis in cerebro-spinal meningitis is positive, antimeningococcus serum should be injected immediately into the vitreous body. This is the only treatment known to date, he reiterates, that has realized unmistakable benefit. In the three cases here described it came too late to save vision in the affected eye in one child of 11 months; the second child, 13 months old, died, and the third, 5 years old, was left with much impaired vision in the affected eye. **Mann** recommends subconjunctival injections of a 1 to 2,000 solution of cyanid of mercury (20 drops), and is convinced, that in a case of virulent irido-cyclitis, with high tension and occlusion of pupil, of unknown source of infection, without these injections the eye would have been lost.

ATROPHY OF IRIS.—According to **Lane**, primary progressive atrophy of the iris, with almost complete loss of all the iris stroma, is a comparatively rare condition. Atrophy of a portion of the iris due to a specific or tubercular lesion, to an injury or an increased intraocular tension, is not uncommon. After careful search of the literature only twelve cases appear to have been reported. Lane's patient, a well-developed young woman of Bohemian descent, single, aged 20, has been under observation since October, 1915. Her parents, one brother and two sisters, are living and well. A brother died of tuberculosis in infancy, and two sisters have died of the same disease. Five other sisters died in infancy; the patient does not know the cause of death. The patient's general health has been good. She has had a few of the minor diseases of childhood; menstruation regular. When 13 years of age a facial acne vulgaris indurata of a very persistent type developed. The face is deeply scarred, and numerous hard indurated masses are now present. There is no history of injury. The patient is not of a nervous temperament.

Two years ago she noticed the iris of the left eye had a small black hole in the margin of the pupil, which extended downward into the colored part. Shortly afterward another hole appeared which extended toward the temporal side of the eye. At times the eye became inflamed. This would last for several weeks. There was little pain at this time, and never any secretion. Gradually other portions of the iris began to retract and disappear, until the pupil had the appearance of a rectangle. The only iris left was four small bands. The eye became more painful and the vessels injected. About one year ago the patient noticed the eyeball was smaller than the right eye. Vision was poor, at times worse than at other times. During the past months a film had gradually appeared on the cornea. The patient has been nauseated lately and during the past two weeks the pain has interfered with sleep.

A distinct glaucomatous cloudiness of the cornea exists. The ball is considerably smaller than the other one. Ciliary vessels are deeply injected. Vision: R. = 6/30; L. = fingers at six inches. Plus 2.00 cyl. ax. 90° gives 6/7 in R. Tension: R. 22, L. 56. Blood pressure, 115. Slight red reflex, but fundus cannot be made out. Good transillumination of each ball. The iris is almost completely absorbed. A small almost invisible band exists above and to the nasal side; the iris tissue at the temporal and lower quadrants is only slightly more abundant. None of the bands of iris tissue join each other at any point.

The right iris apparently normal. Tuberculin and Wassermann tests negative. The acne seems to be the only condition at all suggestive of a possible focus of infection. Dionin and physostigmin salicylat and treatment for the acne was instituted. In ten days the tension greatly improved, the cloudiness of the cornea was better. Vision: R. = 6/20. L. = 1/60. No pain or nausea.

Late in January, 1916, the tension suddenly rose and the eye became painful. A trephining operation was done. There was considerable difficulty in

dissecting the flap and bleeding was troublesome. A clean disc was removed. No iris appeared in the trephine hole, nor was it possible to draw it up into the opening with forceps. A stab opening was made and the aqueous squirted about four inches above the patient's face, so great was the intra-ocular pressure. The cornea at once became soft. An attempt was made to draw up the iris, but this was only partially successful as the iris was firmly adherent. The eye healed rapidly, the cornea losing its haziness, so the fundus could be indistinctly seen in a week following the operation, when the patient left the hospital. V.=5/60. A large bleb remained over the trephine hole and the filtration was good.

In a month the ball was larger, the cornea was practically clear, no injection of the vessels. Tension 20. November, 1916, the eye was clear, only a pin point haze over the center of the cornea remaining. The bleb was much smaller and the hole not easily made out. However, there was still some filtration. V.=3/60. The fundus could be fairly well made out, some cupping, tension 28. The patient occasionally used eserine or dionin if the eye did not feel good. This always gave relief. Absorption of the iris was still going on; less was visible than on her last visit. In December the eye was still clear, and the difference in the size of the two was not now apparent. Only a trace of iris remained above, and a faint line below and to the temporal side. In February, 1917, the patient reported with the right eye troubling for the previous two weeks. The pupil was partially dilated and somewhat sluggish. Slight conjunctival injection, left eye clear. Vision: R.=6/30, with correction =6/10 minus. L.=3/60. Patient is dizzy, nauseated, and has severe headache. No cupping of disc. The media are not perfectly clear. Tension 30. Physostigmin gave prompt relief, improvement in vision and in symptoms being rapid. The acne has not responded to treatment. Vaccines have been used. At times it is better. Various tests have not re-

vealed anything to show the cause of the disappearance of the iris.

In the reports of de Schweinitz, Harms, Wood, Zentmayer, and in this patient, increased tension has been found. No one yet has been able to show a definite primary cause for essential primary atrophy of the iris. Men and women are each subject to the condition. The period of twenty to forty has furnished the most of the cases. Previous history of injury was found in at least four of the cases, but undoubtedly could not be called a possible causal factor of great importance. Nervous tissue degeneration may be a factor, as in Dupuy-Dutemps' report of atrophy of the iris in *tabes dorsalis*. Latent tuberculosis was undoubtedly present in several of the patients of those reporting atrophy of the iris.

Autotoxemia could be a factor. The acne which this patient has had for years is probably of this origin, as diet and eliminative treatment seem to produce a slight improvement.

Lane hopes that some one may see this condition when it is beginning and make an exhaustive study. Many cases of partial atrophy of the iris, or arrested condition of loss of iris tissue, have been reported. But only a few go on to complete absorption of all the iris stroma and loss of vision. All the cases reported show more or less loss of vision. The question arises, will the other eye become involved in a similar process? As yet no report has shown this to have happened. Increased tension has been present in nearly all the patients reported. It appears that there may be some disturbance of the bodily metabolism which exerts marked action on the eye tissue, causing the increase of tension.

ATROPHY OF CHOROID.—Chance exhibited a case of extensive atrophy of the *choroid* in a man of about 70, who has been in good health. Wassermann negative. There has been nothing in his business that would give rise to such atrophy. Here and there, large surfaces of the sclera are seen. There is but little secondary pigmentation. The macular region is intact. V.=6/30.

The appearances in **Jackson's** case supported the view of Stock and others that a large part of cases of choroidal atrophy are due to tuberculosis.

OSSIFICATION OF THE CHOROID.—**Monbron** reports a series of 5 cases with histoanatomic examination of the

specimens, and a general review of the subject with a bibliography. He concludes contrary to the opinion generally received that only the choroid and more exactly the choriocapillaris is the starting point for intraocular ossification.

SYMPATHETIC DISEASES

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SAN FRANCISCO.

A review of the literature relating to sympathetic diseases of the eye appearing during 1917 and to February 1st, 1918. Allied topics are reviewed in the section on the Uveal Tract, or will be taken up in the section on Injuries.

OCULAR ANAPHYLAXIS.—**Woods** refers to the mycotic theory, as to the pathogenesis of sympathetic ophthalmia, advocated by Roemer and Fuchs, to the cytotoxic theory of Golowin; and to the theory of Elschnig, who assumed sympathetic ophthalmia to be an anaphylactic uveitis. In order to determine the fundamental points of the anaphylactic theory, the author endeavored to test the following: 1. The antigenic properties of homologous uvea-organ specificity. 2. The ability of one eye to react to perfusion in animals previously sensitized by intraocular injection of the other eye. 3. What constituent of the uveal tract is responsible for such antigenic properties as are possessed by homologous uvea.

The technic of his experiments is given, and a summary of his results. He concludes as follows: 1. Homologous uvea has the power of acting as antigen, and producing an ocular hyper-sensitiveness. 2. Homologous uvea possesses a strong specificity. 3. Intraocular injection of a small amount of either homologous or heterologous uveal emulsion can produce a hyper-sensitiveness in the second eye. 4. From the evidence at hand, it seems probable that the peculiar antigen properties of uveal emulsion are due to the pigment epithelium. A bibliography is added.

The anaphylactic theory of sympathetic ophthalmia has also been fully

discussed by **Schieck**, who questions whether the theory propounded by Elschnig is at all clinically applicable, or meets with important objections, so that it must be repudiated. Elschnig advanced the hypothesis, that sympathetic ophthalmia is an expression of local anaphylaxis, utilizing Bail's theory. Bail's theory says that by antigenous resorption of injured uveal tissue an over-sensitiveness is produced in the organism, especially the homologous organ, viz., the second eye.

As in von Pirquet's experiments inflammations occur in consequence of increased capability of reaction through introduction of the anaphylactogen from outside, in our case an inflammation would have to arise, with the serious sequelae due to the vulnerability of the organ, by the least disturbance in the over-sensitive eye, by the disintegration of even one uveal cell or pigment epithelium.

Schieck points out, that for applying this assumption to the clinical facts it must be proven: 1. That the uvea contains an organ-specific, anaphylactogenous albumin, which is absorbed as antigen; 2, whether an organism produces antibodies against its own, although serum-heterogenous, albumin, and whether it can be sensitized against its own products, in other words, whether an autoanaphylaxis exists; 3, how a spontaneous disintegration of uveal cells occurs in the second eye and