methods in both acute and subacute cases. To promote absorption in subacute and chronic cases, the surface over the joint may be painted with iodine or rubbed with oleate of mercury in lanolin (2 to 10 per cent.); or massage, friction, and electricity may be found of benefit. All forms of local treatment should be supplemented by firm, even pressure secured by a properly applied roller or elastic bandage or by an elastic cap or splint made to fit the joint. In chronic and persistent cases it may be necessary to immobilize the joint in a plaster cast. Aspiration of the joint followed by irrigation with a 2 per cent. solution of carbolic acid may prove effective when other measures fail. In the rare cases in which suppuration occurs the treatment is entirely surgical.

The ophthalmic symptoms call for little special treatment. In iritis a solution of atropine (gr. ij to ʒj) should be used to keep the pupil dilated and to prevent adhesions. All other treatment is chiefly symptomatic. A light diet, rest, correct hygiene, and proper treatment of the urethritis are always in order.

Prognosis.—With thorough and persistent treatment most cases recover. Fatal cases are few, but the disease has a decided tendency to continue as a chronic hydrarthrosis. The prognosis should therefore be guarded.

GONORRHŒAL CONJUNCTIVITIS.

Synonyms.—Gonorrhœal ophthalmia; Blennorrhagic ophthalmia; Purulent ophthalmia; Blennorrhagic conjunctivitis; Purulent conjunctivitis.

In the adult gonorrhœal conjunctivitis is fortunately rare, but when it does occur it is an exceedingly grave disease, since it usually results in impairment or destruction of vision in the affected eye.

Etiology.—Direct infection of the conjunctival membrane with pus containing gonococci is apparently the sole cause. The smallest particle, however, of such pus, even after it has been dried for some days, is sufficient to cause infection. Successful inoculation of the urethra has been accomplished with gonorrhœal pus diluted to one part in a thousand. These statements apply only to gonorrhœal conjunctivitis, and not to other, usually milder, forms of purulent conjunctivitis. In most cases the disease of the conjunctiva is found in individuals suffering from gonorrhœa, and who have conveyed some of the discharge from the genitals to the eye; but pus from any form of gonorrhœal inflammation may be carried by means of fingers, handkerchiefs, towels, etc., and produce the disease in any eye with which they come in contact. In this way the eyes of the physician, nurse, or companion are occasionally infected.

Symptoms.—The period of incubation, or the time which elapses between the infection and the first apparent symptoms, varies from a few hours to two or three days. Usually the duration of this period cannot be determined, since the infection is rarely recognized at the time of its occurrence.

The symptoms begin as a mild conjunctivitis, with lachrymation and itching, burning, or irritation of the conjunctiva, which is more or less reddened and injected. These symptoms, however, rapidly increase in severity; the discharge often becomes purulent in a few hours, and the inflammation reaches its greatest intensity on the second or third day. The lids are then œdematous and swollen, usually hard and tense, with a dusky-red, glistening surface, and to the touch are hot and painful. The upper lid often overhangs the lower, and the patient is

usually unable to open the eye. The discharge is thin, creamy, and abundant, and escapes between the edges of the lids, flowing over the cheek, where it may dry in crusts and excoriate the skin; later it is thicker and less abundant.

On carefully separating the lids a quantity of the retained discharge will escape, and the conjunctiva is seen to be intensely red, swollen, rough and spongy, and often dotted with hemorrhagic points. As the lids are opened the pent-up secretion sometimes escapes in quite a jet, and the examiner should be very careful to keep his own eyes at a safe distance. The swollen and congested ocular conjunctiva is lifted up from the globe by the exudate, overlaps the margin of the cornea, and forms a circular wall around it. The cornea thus forms the bottom of a depression filled with pus, and cannot be seen until the latter is removed. A plastic exudate may cover portions of the conjunctiva, the removal of which exudate is followed by hemorrhage.

Pain in the eye and in the orbital region is often intense. The local temperature is increased, but general fever is mild or absent. Systemic disturbances are usually limited to those caused by the pain, anxiety, and mental distress.

The great danger lies in extension of the inflammation to the cornea—a process that is encouraged by the irritating effects of the pus retained in contact with the surface of the cornea, and by the interference in the corneal circulation resulting from the pressure produced by the chemosis and the tensely swollen, heavy lids. Cloudiness of the cornea may be present; this cloudiness may disappear under treatment, leaving no permanent defects. Ulceration of the cornea, however, is to be

dreaded; it begins as superficial losses of tissue, usually near the margin, but it may first appear at the centre. Such ulceration may progress rapidly and destroy large portions or all of the cornea, resulting in staphyloma, prolapse of the iris, escape of the entire contents of the eye, or even purulent panophthalmitis. In less severe cases the ulceration may be arrested by prompt treatment, and the vision may be but partially lost. The duration of the disease is from four to twelve weeks. In favorable cases, with no involvement of the cornea, complete recovery occurs in five or six weeks, or there is left a chronic conjunctivitis which disappears under appropriate treatment.

Pathology.—There is inflammation of the conjunctiva and of the subconjunctival tissues. The point of special interest is the presence and location in the tissues of the gonococci: they rapidly penetrate to the upper layers of the subepithelial tissues, where their presence is soon followed by the phenomena of inflammation. Just where they chiefly proliferate is an undecided question, but they are most numerous in the epithelium and in the secretion.

Diagnosis.—The symptoms are usually so pronounced that the diagnosis is not difficult. Purulent conjunctivitis from other causes presents symptoms of the same type, but less severe, and the secretion does not contain gonococci. Treatment is the same. To avoid confusing the two distinct types of ophthalmic disease that may complicate gonorrhœa, the following table of Fournier's is given:

Gonorrhœal Conjunctivitis.	*Gonorrhœal (Rheumatic) Ophthalmia.*
Essential cause is inoculation of the conjunctiva with gonorrhœal pus.	Not contagious; develops under the influence of an internal cause, the nature of which is unknown.
A rare affection.	An infrequent complication of gonorrhœa. More common than gonorrhœal conjunctivitis—14 : 1.
May affect subjects not suffering from gonorrhœa.	Only attacks patients already suffering from gonorrhœa.
Usually but one eye involved.	Commonly both eyes.
The symptoms are those of the gravest forms of purulent conjunctivitis; they affect the conjunctiva primarily.	Symptoms are those of inflammation of the membrane of Descemet, of an iritis, or of a mild conjunctivitis.
Symptoms fixed, not going from one eye to the other.	Symptoms may be mobile, passing from one eye to the other.
No tendency to relapse in subsequent gonorrhœas.	Frequent relapses in the course of subsequent gonorrhœas.
No coincidence with rheumatic manifestations.	Occurs with gonorrhœal rheumatism, rarely without.
Prognosis excessively grave; often loss of eye.	Prognosis without gravity.
Eye is saved only by most energetic treatment.	Expectation, or the simplest treatment, sufficient for a cure.
Gonococci in the discharge.	No gonococci.

Treatment.—The treatment must be prompt and thorough. A few hours' delay may cause the loss of the eye. The patient should go to bed in a darkened room, and should have a trained nurse in constant attendance, to keep the surfaces cleansed and properly dressed and to protect the sound eye from infection. In some cases it is best to protect the sound eye by sealing it hermetically with a layer of light rubber tissue covered with a thin layer of cotton or gauze, which, with the rubber, is fastened by means of collodion to the skin surrounding the orbit. An opening for ventilation may

be left at the outer side. Rubber plaster may be used instead of collodion, while for those who can obtain it promptly Buller's shield is the best device.

In the beginning, if the patient be strong and robust, several ounces of blood may be abstracted from the temple by means of leeches or cups, and a brisk cathartic may be administered. This treatment may be followed for several days by laxatives and a light diet. In a less vigorous patient these measures would be too severe, since it is very important that the general strength and the recuperative powers be maintained fully. In cachectic or debilitated subjects or in those with poor hygienic surroundings the task of trying to save the cornea is exceedingly difficult.

The objects of local treatment are (1) to keep the surfaces clean and to prevent the accumulation of secretion beneath the lids; (2) to reduce congestion by the constant application of cold; (3) to relieve pressure; and (4) in all but mild cases to combat the process with applications of astringent or caustic solutions. The accumulation of pus about the edges of the lids and under them should be wiped away gently with lint or with bits of cotton wrapped on the ends of toothpicks. Such lint, cotton, and toothpicks should promptly be burned. No dressing of any description should be used a second time. Safety for the patient's sound eye and for the eyes of the physician and the attendants demands that every piece of cloth or other dressing that has once come in contact with the smallest particle of the discharge should immediately be destroyed by burning.

After the first cleansing further accumulation of pus beneath the lids should be prevented by frequent washing with a 3 per cent. solution of boric acid in distilled or

boiled water. A solution of bichloride of mercury (1 : 20,000) may be used instead. The lids are gently separated, and the liquid is allowed to flow over the surfaces until all secretion is removed. The solution is best applied by sqeezing it out of pieces of cotton or sponge; a bulb-syringe may be used, but the ordinary irrigating syringe is liable to spatter and to endanger the other eye. The patient's head should be turned slightly to the side of the affected eye, to prevent any possibility of the solution reaching the opposite side, and a pus-basin or wads of cotton should be held in position to catch the discharge. This irrigation of the inflamed surfaces should be repeated every five, ten, or fifteen minutes, both day and night, during the acute stage, and less frequently as the discharge becomes less abundant. The object is to keep the surfaces, and especially the cornea, free from pus.

During the intervals between the washings cold is applied by means of pieces of soft linen, large enough to cover the eye, taken out of ice-water or from the surface of a block of ice. These pieces of linen are removed and burned, and are replaced by fresh ones every minute or two. This constant dressing and handling of the eye must be done with the utmost care and gentleness, and should be made to interfere as little as possible with that physiological rest which is so greatly to be desired in any acute inflammation. The fingers should not come in contact with the globe, or, if possible to avoid it, with the edges of the lids. Pressure (of heavy dressings, etc.) should be prevented. If the upper lid is thick and tense and difficult to evert, thus preventing proper cleansing of the eye and producing pressure upon the cornea, canthoplasty should be performed freely. The fingers or a

wire speculum hold the lids apart and thoroughly stretch the skin over the outer canthus; one blade of a pair of sharp, strong scissors is passed under the lid, and the point is carried to the bottom of the cul-de-sac; a single sharp cut, which should be exactly horizontal, divides the tissues to the margin of the orbit. Pressure is thus relieved and free irrigation of the eye is made possible. If the parts heal too rapidly, it may be necessary to repeat the operation.

In mild cases frequent cleansing and the constant application of cold may be all the local treatment necessary. In most cases, however, when the conjunctiva becomes greatly swollen and the discharge profuse and purulent, a 1 or 2 per cent. solution of nitrate of silver should be used. If the cornea is clear, 2 or 3 drops of such a solution may be dropped between the lids; but a better method is to evert the lids and apply a 2 (occasionally a 3 or 4) per cent. solution to the conjunctiva by means of a bit of cotton twisted on the end of a tooth-pick. After a few seconds the surfaces may be gently wiped dry or washed with a common salt-solution. By allowing the nitrate solution to remain on the conjunctiva a longer or shorter time the duration and extent of the caustic action, indicated by the whitening of the surfaces, can be controlled, and danger of irritating the cornea by contact with the fluid is avoided. In ulceration of the cornea the avoidance of such irritation is a matter of special importance.

Following such an application the discharge is greatly lessened, though the swelling continues, and pain is temporarily increased. If the iced cloths do not relieve the pain, solutions of atropine or of cocaine may be used. After a few hours the discharge reappears and contains

fine shreds of the eschar resulting from the caustic. Frequent washings and another application of the silver-solution are then in order. In the early stages of the affection solutions of the nitrate should be used but once in twenty-four hours; later they may be used every six, eight, twelve, or twenty-four hours, depending upon the rapidity with which the conjunctiva recovers from the application. Dr. Joseph A. Andrews has well emphasized the fact that the caustic solution should not be used until the eschar produced by the previous application has disappeared entirely. The use of the nitrate of silver solution should always be preceded by a thorough washing of the surfaces, and may be followed at intervals of an hour or two by the free use in the eye of a pure vaseline.

The cornea should be watched carefully. If it becomes cloudy or ulcerates centrally, a solution of atropine (gr. ij to ℥j) should be dropped in the eye often enough to keep the pupil well dilated. If ulceration begins at the margin, sulphate of eserine (gr. j to ℥j) should be used instead of atropine, and with sufficient frequency to keep the pupil tightly contracted, thus lessening the danger of prolapse of the iris in case of perforation. In exceptional cases, with pus in the anterior chamber and with bulging of the cornea, puncture (paracentesis) is advisable; and occasionally it is necessary to relieve the pressure upon the cornea by free incisions into the chemotic conjunctiva. Such incisions should be made after, never before, application of the caustic solution.

As the inflammatory symptoms subside and the disease progresses toward recovery the treatment is less active, but careful watch of the eye must be maintained for fear of a relapse. In the declining stage, if the cornea

is clouded, absorption may be hastened by the use, for ten or fifteen minutes several times a day, of hot fomentations or irrigations; in the intervals the use of cold cloths is continued. When the discharge has become slight the cold cloths may be given up and the surfaces may be brushed lightly every day or two with a 1 per cent. solution of nitrate of silver or of sulphate of zinc.

Prognosis.—The prognosis is always grave, but it is least favorable in the cachectic or the feeble and in those who have had previous disease of the eyes. Noyes gives the result in 40 cases as follows: In 10 the cornea escaped injury and recovery was complete; of the other 30 with involvement of the cornea, 5 retained useful vision, 9 retained some vision, and 16 lost all vision, in the affected eye. The chronic (granular) conjunctivitis which often results usually yields to appropriate treatment.

OPHTHALMIA NEONATORUM (BLENNORRHŒA NEONATORUM).

The term "ophthalmia neonatorum" is applied to purulent conjunctivitis appearing in children a day or two, or occasionally a few weeks, after birth. It is much more common than gonorrhœal conjunctivitis in the adult, and is therefore of greater importance, but it is of interest chiefly to the obstetrician and the ophthalmologist. The condition is the result of direct or indirect infection of the child's eyes with secretions from the mother's vagina. This infection may occur during birth, but in most cases it probably occurs during the first washing of the child, or from accidental contact with sponges, napkins, handkerchiefs, etc. used by the mother. Indirect infection by some means is undoubtedly the cause of the disease when it appears after a few days. The source of infection is

not necessarily gonorrhœal; other pus or irritating secretions may produce in the child a conjunctivitis differing but slightly, if at all, from that produced by gonorrhœa.

Symptoms.— The symptoms are essentially those of gonorrhœal conjunctivitis in the adult; but the disease may be even more acute in its course, and loss of sight is possibly more frequent.

Prophylaxis.—In case the mother have a suspicious vaginal discharge, her vagina should be cleansed with an antiseptic solution before the child is delivered. Immediately after birth the child's eyes should be washed thoroughly with a 3 per cent. solution of boric acid, and a drop of a 2 per cent. solution of nitrate of silver should be dropped in each eye (Credé's method). If the resulting inflammation be too severe, it may be limited by the application of cold. Every precaution should be taken lest the child's eyes be infected later, through the careless use of handkerchiefs, towels, etc.

Treatment.—The treatment is practically that of the disease in the adult, except that the nitrate of silver should be used with greater caution and in weaker solution (one-half per cent.), and be limited in its application to such cases as fail to improve under the use of frequent washing and iced cloths. It is even more important than in the adult that caustic solutions should be kept from the cornea. Canthoplasty is rarely required in the infant. Cachexia, debility, and lack of development (premature birth) predispose to unfavorable results.

Many children for a few days after birth have a mild form of conjunctivitis which gives the lids a red and sticky appearance. These cases call simply for occasional bathing in simple borax-water or alum-water, and should not be confounded with the purulent form of the disease.

GONORRHŒAL INFLAMMATION OF THE RECTUM AND THE MOUTH.

A few well-authenticated cases are reported in which the mucous membrane of the anus, of the rectum, or of the mouth has been involved in a gonorrhœal inflammation. Such cases are, however, so rare that they may be classed among the curiosities of medical and surgical practice. The gonococcus does not readily invade these membranes, but when the disease does occur in these localities, it is undoubtedly due to local infection with gonorrhœal pus, and not, as has been suggested, to metastasis. Infection may be the result of accident or uncleanliness in those suffering from gonorrhœa, or it may be due to unnatural coitus.

Occurring in the anus and the rectum, the disease begins with itching and burning sensations which rapidly increase in intensity until, in a few days, pain is constant and greatly increased on defecation. The membranes become intensely red, hot, congested, and swollen, and secrete at first a thin, creamy discharge, which soon becomes thicker, darker, and profuse.. The inflammation is usually limited to the anus or to the membrane below the internal sphincter. The diagnosis between gonorrhœal and other forms of proctitis will rest chiefly upon the discovery of gonococci in the discharge and upon the history. In women the cause may be found in a gonorrhœa of the vagina or the urethra, the discharge from which has been allowed to run down over the anus and infect the membrane. When the disease occurs in one who has practised sodomy for some time, the sphincters are relaxed, the anal folds are wanting, and the anus may be more or less funnel-shaped.

If limited to the anus, the disease should be treated simply with cleansing and astringent lotions and powders, and the surfaces should be separated with soft dressings, the principles and details of treatment being essentially those recommended for balanitis. Excoriations, fissures, and superficial fistulæ may be touched with solutions (or the solid stick) of nitrate of silver. If the disease extends into the rectum, care should be taken to secure a regular daily evacuation from the bowel, and the rectum should be irrigated thoroughly once or twice daily with a warm saturated solution of boric acid. For this purpose the rectal irrigator devised by Dr. James P. Tuttle is desirable. It may be necessary to dilate the sphincters and to apply a solution of nitrate of silver to excoriations and superficial ulcers that may be present.

Gonorrhœal inflammation of the mucous membrane of the mouth has been reported in very few instances, the largest number of cases being in new-born infants undoubtedly infected during birth by vaginal discharges. The symptoms are those of a severe stomatitis. The diagnosis is made from the history and by the finding of gonococci in the discharge. In new-born children the disease appears much earlier than do other forms of stomatitis. The treatment consists in frequent washing of the mouth with warm saturated solutions of boric acid (the addition of slippery elm or of flaxseed to the solution is sometimes very grateful), and in the application to the surface of astringent solutions. Nitrate of silver in strength varied to meet the indications of each case is the best preparation.

Gonorrhœal inflammation of the nose has been mentioned by several writers, but an unquestionable case has not been reported.

CHRONIC URETHRITIS.

Synonyms.—Chronic gonorrhœa; Gleet.

Before terminating in complete recovery every case of acute urethritis passes through a subacute stage with a muco-purulent and finally a mucous discharge. Following a first attack of gonorrhœa, in a healthy man under favorable hygienic surroundings, this muco-purulent stage tends to recovery without local treatment; but when following repeated infections, or an infection in an unhealthy individual or in one subjected to improper treatment or other injurious influences, this subacute stage may be prolonged indefinitely, and is known as "chronic urethritis" or "gleet."

Etiology.—In the cachectic, chronic urethritis may occur independently of an acute attack; but almost all cases originate in gonorrhœa.

The influences which interfere with the proper recovery of gonorrhœa and which tend to prolong the disease in chronic form are numerous and vary widely in different individuals. The general health of the patient is an important factor. In gouty, rheumatic, strumous, syphilitic, tubercular, anæmic, or debilitated persons it is not unusual for gonorrhœa to be followed by chronic urethritis. It occurs frequently as a result of repeated infections, or after a first infection in which there have been a series of relapses.