ternally or internally. In the latter case there is great danger of infiltration of urine and deep perineal abscess.

Treatment.—The treatment is that of periurethral inflammation and abscess.

LYMPHANGITIS.

In severe cases of gonorrhœa more or less lymphangitis is common. In its simplest and mildest form there are no subjective sensations, but one or more lymphatics, usually on the dorsum of the penis, can be felt beneath the skin as small indurated cords. Occasionally such a cord may be traced to the groin. If the inflammation runs a little higher, perilymphangitis results and is manifested by reddish streaks along the course of the lymphatics, which may be knotted and tender. There may be a more diffuse redness of the skin, which is then œdematous, swollen, hot, and sensitive. The inguinal glands may become swollen, tense, and painful.

Treatment.—Rest, elevation of the penis, and boric-acid fomentations are usually all the treatment necessary. As a rule, the inflammation terminates in resolution. If pus forms, it should be evacuated early to prevent burrowing in the loose tissues, as a considerable portion, or even all, of the skin and the subcutaneous tissue of the penis could be thus destroyed.

ADENITIS.

During a severe case of gonorrhœa it is not uncommon for one or more of the inguinal glands to become slightly swollen and tender; but suppuration is quite unusual, and when it does occur the abscess heals kindly after discharging the pus, which is not autoinoculable.

Treatment for the adenitis, aside from that given for the gonorrhœa, is usually unnecessary. When the gland first begins to swell and become sensitive, it may be well to paint the overlying skin with tincture of iodine or to apply a 2 per cent. oleate of mercury. If pain and swelling become pronounced, rest, hygiene, and boric-acid fomentations give relief. If pus forms, the abscess should be opened and treated on surgical principles. Scraping is rarely necessary, since the cavity usually heals kindly and rapidly under daily cleansing and packing with iodoform gauze.

GONORRHŒAL RHEUMATISM.

In certain individuals gonorrhœal infection is always attended by a complication known as "gonorrhœal rheumatism." These individuals are not, as a rule, subject to other forms of rheumatism.

Etiology.—Various theories are offered to explain the cause of this disease and its relation to gonorrhœal infection, but none of them have yet been proven. In some cases there seems to be no doubt that the gonococci are carried through the blood to the joints, for, although these micro-organisms have not been discovered in the blood, they have been found in the fluids in the affected joints, and their identity has been fairly well established through their behavior with stains and through culture-experiments. Successful inoculations from these cultures are, however, wanting. In other cases the joint disease seems to be essentially pyæmic, and to be due to infection with the pus coccus, which gains admittance to the circulation through the urethral or other epithelium that has been damaged or destroyed

by the gonococci. It is believed that some cases are due to ptomaïne-poisoning.

The disease does not occur with non-infectious urethritis, but it has resulted from gonorrhœal infection of the conjunctiva or vagina, and therefore cannot be due simply to urethral irritation. It occurs in about 2 per cent. of all cases of gonorrhœa, and it is much more frequent in men than in women. A rheumatic diathesis and the usual causes of the commoner articular rheumatism have no apparent influence in the production of gonorrhœal rheumatism; while an individual who has once had this complication of gonorrhœa rarely escapes in future infections, even when every precaution is taken to prevent its occurrence.

Symptoms.—The period at which the disease appears varies, but in about three-fourths of all cases it occurs during the third or fourth week of gonorrhœa. It may be much later, and has been reported as early as the fifth day. It does not have the effect—as do most of the complications of gonorrhœa—of diminishing the urethral discharge; on the contrary, changes in the degree and intensity of the urethral inflammation are usually promptly followed by similar changes in the rheumatic symptoms.

In about 40 per cent. of all cases the disease is limited to a single joint, and when polyarticular it is usually confined to two or three joints, which it attacks in succession, and not simultaneously. Finger collected statistics showing the joints affected in 376 cases as follows: Knee, 136; tibio-tarsal, 59; wrist, 43; finger, 35; elbow, 25; shoulder, 24; hip, 18; maxillary, 14; metatarsus, 7; sacro-iliac, 4; sterno-clavicular, 4; chondro-costal, 2; intervertebral, 2; crico-arytenoid, 2; peroneo-tibial, 1. Besides the joints, synovial bursæ and the synovial sheaths of tendons and muscles may be involved.

All attempts to classify the widely varying symptoms of gonorrhœal rheumatism in distinct types have proven unsatisfactory. The classification here followed is substantially that given by Finger:

1. *Acute Monarticular Gonorrhœal Rheumatism.*—This is the most frequent form of the disease, and usually appears in one of the large joints, most commonly the knee. The local disorder may be preceded by slight constitutional disturbance and by tenderness of several articulations, or the first symptoms may be pain and swelling of the affected joint. The tumefaction usually increases rapidly, with sufficient exudation to produce considerable tension. Pain is usually moderate, but may be mild or violent. Fluctuation is always distinct. Fever—which may be as high as 103° F.—and other systemic disturbances are present for a few days, but they rapidly subside. The swelling and the exudate remain and interfere with motion of the joint.

The exudate may be wholly absorbed in the course of a few weeks, complete recovery following, or there may be a relapse of the acute symptoms—usually following exacerbations of the urethritis—which greatly increases the natural tendency of the disease to become chronic and to terminate in hydrarthrosis. In rare instances the disease terminates in suppuration, which is announced by its usual symptoms—namely, chills and fever, an increase of the local swelling, pain which becomes throbbing in character, and an intense redness of the skin covering the parts. The pus bursts through the capsule and burrows between the tendons and mus-

cles to the surface. The usual result of this process is pyæmia and death. Recovery with ankylosis is possible.

2. *Acute Polyarticular Gonorrhœal Rheumatism.*—The symptoms are those of the preceding variety, except that the disease involves two or more joints and that the constitutional disturbances are usually more pronounced. The latter may be acute and severe for a few days, but they do not last long. They may, however, recur a number of times as new joints are affected or following exacerbations of the urethritis. The fever does not often go above 103° F. The pericardium and the endocardium are rarely implicated. The mild character and the brief duration of all the general symptoms, as compared with the severity of the local disorder, form a striking feature of the disease.

The affection may be limited to two—often symmetrical—joints, or it may pass in succession to three or four: the implication of a larger number of joints is exceptional. Simultaneous invasion of two or more joints is unusual, and the disease does not travel rapidly from one joint to another, nor does the involvement of a second joint hasten recovery in the first. Absorption of the effusion is slow, and, as in the monarticular variety, the disease may terminate in recovery, in chronic hydrarthrosis, or in pyæmia.

This variety of the disorder resembles more than do the others simple inflammatory rheumatism.

3. *Subacute Polyarticular Gonorrhœal Rheumatism.*—This form of the malady is identical with the preceding, except that the fever is never higher than 101° F. and that the subjective symptoms are very slight. It is evident that a sharp dividing-line cannot be drawn

between the two forms. Finger considers this variety of the disease second in order of frequency.

4. *Chronic Gonorrhœal Rheumatism; Hydrarthrosis.*—This is a common form of the disease, is usually monarticular, and is commonly found in the knee, the ankle, or the elbow. It may follow the acute or the subacute form, or it may appear independently. In the latter case it often develops insidiously, and it may not be noticed by the patient until the effusion is sufficient to interfere with motion; or the effusion may take place rapidly, and may be accompanied by some pain which is increased on walking or on other movements of the joint. Fluctuation may be the sole evidence of the disease. If the effusion be considerable, motion in the joint is more or less limited; if the exudate be excessive, there may be abnormal mobility of the joint, due, undoubtedly, to loosening of the ligaments. Absorption is occasionally rapid, but usually it is very slow and the fluid may be many months in disappearing. Adhesions and other deformities may leave an impaired joint.

Fournier's classification recognizes a form of gonorrhœal rheumatism in which neither structural nor functional evidences of disease are observed, and which may present no symptoms other than vague, wandering or persistent pains in some of the larger joints. These pains are very similar to those sometimes found in the early stages of syphilis, and they are often very rebellious to treatment.

The synovial sheaths of tendons connected with the affected joints may be involved, and, occasionally they are affected independently of the joints. There is redness of the skin, with a doughy, painful swelling that may extend some distance along the tendon. Motion of

the muscle is prevented by the pain, which may persist after the swelling disappears. The bursa in front of the tendo Achillis and that beneath the inferior tuberosity of the os calcis are frequently involved. Other bursæ are occasionally implicated. Rheumatic symptoms are sometimes present in the muscles, more especially in those connected with the affected joints.

Ophthalmic symptoms are not infrequently present. They are most common in connection with the poly-articular form of rheumatism. In rare instances they appear without rheumatic symptoms in other parts of the body. The parts of the eye that may be affected are the iris, the membrane of Descemet, and the conjunctiva. The iritis presents symptoms similar to those occurring when the affection results from other causes: the conjunctiva is reddened; the subconjunctival capillaries are injected, and can be seen radiating outward from the margin of the cornea; the iris is clouded and discolored, and its movements are sluggish; vision is somewhat impaired; posterior synechiæ may form; pain may be severe or absent, but there is usually photophobia and lachrymation.

In inflammation of the membrane of Descemet (aquo-capsulitis, serous iritis) the symptoms are less acute. The fluid in the anterior chamber is clouded by the presence of a plastic exudate and epithelial cells from the iris; vision is thus impaired. Flocculi may be deposited on the membrane of Descemet, giving this part of the cornea a punctate appearance. The iris may be slow in its movements, and exceptionally synechiæ may form, but other symptoms of iritis are wanting. This is the commonest form of ophthalmia associated with gonorrhœal rheumatism.

The conjunctival form of *gonorrhœal rheumatic ophthalmia*, described by Fournier, is very rare, and is simply a mild form of conjunctivitis having a scanty, muco-purulent discharge. The prognosis is entirely favorable. This form of conjunctivitis must not be confused with the infectious gonorrhœal form (see table of diagnosis in *Gonorrhœal Ophthalmia*).

These forms of ophthalmia usually follow the course of the gonorrhœa on which they are dependent. As a rule, they affect both eyes, but not at the same time. The prognosis is favorable, and the only results to be feared are the adhesions which may follow iritis, or, rarely, inflammation of the membrane of Descemet.

Among the occasional and unusual complications of gonorrhœal rheumatism are pericarditis and endocarditis. Neuralgia of the sciatic and other nerves has been reported, as well as indefinite spinal symptoms consisting of disturbances of sensory and motor functions of the nerves. Purpura, erythema multiforme, and other eruptions on the skin may occur in connection with the disease, but in most cases the eruption is probably due to some drug given to relieve the rheumatism.

Pathology.—Regarding the pathology of the disease little is known. Post-mortem examinations have been made on a few fatal pyæmic cases. In some of these cases there were erosions of the cartilages and bones, and even complete destruction of the cartilages, with dissection of the periosteum from several inches of the femur. Gonococci were found in some instances. In more favorable cases puncture or incision of the joint has disclosed a serous, sero-fibrinous, or sero-purulent fluid, which in the majority of cases contained cocci that were apparently identical with gonococci.

Diagnosis.—When the disease complicates successive gonorrhœal infections, or when it is limited to a single joint, the diagnosis is usually made without difficulty. The following is a table of differential diagnosis as given by Fournier, with some modifications:

Gonorrhœal Rheumatism.	*Simple Rheumatism.*
Cause.—Gonorrhœal infection. Cold and rheumatic diathesis without influence.	No relation to gonorrhœa. Habitual causes are cold, inheritance, rheumatic diathesis, etc.
Rare in women.	Common in the female, though less frequent than in the male.
Fever and systemic symptoms usually mild and often absent. Acute symptoms, when present, are of brief duration.	Fever and other systemic symptoms are almost always present and are much more severe and more prolonged.
Often limited to one joint, never involves many.	Rarely limited to less than two or three joints; may involve nearly all.
When polyarticular, the joints are affected consecutively, and not simultaneously.	Simultaneous involvement of several joints is the rule.
Moves from one joint to another less quickly. No delitescence; no real jumping from one joint to another.	Movable, ambulatory fluxions; rapid delitescence, jumping from one joint to another.
Local pain less intense and shorter in duration. More relief from rest and position. Pain often slight or even absent.	Pains are usually intense, sometimes excessive, last much longer, and are but partially relieved by rest and position.
Secondary hydrarthrosis common.	Secondary hydrarthrosis rare.
No sweating.	Abundant sweats, usually acid, are characteristic.
Urine not modified.	Urine specially modified.
Blood does not furnish marked buffy-coat.	Blood forms a firm, concave clot with buffy-coat.
Cardiac complications very exceptional.	Cardiac complications frequent.
Frequently complicated by a special ophthalmia, synovitis of tendon-sheaths, bursæ, etc. The latter localities may be exclusively implicated.	Eye not affected; the bursæ escape, as do usually the sheaths of the tendons.
Relapses are frequent, and are usually dependent on exacerbation of urethritis. Recurs almost invariably with succeeding gonorrhœal infections.	Relapses frequent, but independent of state of urethra. Can often be traced to exposure to cold, weather-changes, etc.

Treatment.—No satisfactory treatment of gonorrhœal rheumatism has yet been found. In the acute and subacute stages salicylate of sodium, salol, and occasionally phenacetin, are of some value. Taylor recommends oil of gaultheria in capsules each of from 10 to 20 minims three or four times a day. Rest, a light diet, tonics, and hygienic measures are always indicated. The urine should be kept unirritating by the use of bland drinks and, when necessary, alkalies. Copaiba, sandalwood, and cubebs are of decided benefit when they lessen the urethral inflammation, since changes for the better or the worse in the rheumatic symptoms usually closely follow similar changes in the urethritis. For this reason local treatment of the urethra and all possible sources of urethral irritation should carefully be avoided.

The most satisfactory results usually come from local treatment of the joint. During the acute stages absolute rest, with the constant application of fomentations or poultices as hot as can be tolerated, will usually give prompt relief. In unusual cases, when the pain is excessive, tobacco or opium and belladonna may be added to the fomentations. Blistering of the surface and frequent applications of the Paquelin cautery are excellent

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