

ACUTE RHEUMATISM.

Definition.—*Acute rheumatism* is a constitutional disease characterized by fever, inflammation of the joints occurring in succession, and by a tendency to attack the peri- and endocardium. It is frequently called *articular rheumatism*, *rheumatic fever*, *polyarthritis rheumatica*, etc.

Causes.—The vice of constitution belonging to rheumatism may be inherited, but it is not possible to indicate its character.* There are three types of bodily conformation in which rheumatism occurs: the pale, thin, and anæmic subject; the robust and vigorous individual with an inherited tendency; and the obese, often given to the consumption of malt-liquors and having a form of acid indigestion (lactic?). Acute rheumatism is most frequent in youth and early manhood, rarely occurring before seven and after fifty. It is more frequent in men than in women, not because of a greater susceptibility to the disease, but because men are more exposed to the influences producing it. The liability to the disease is increased by having attacks, and a longer interval usually separates the first and second seizures than the second and third. On the other hand, the susceptibility to rheumatism lessens with increase of years. Certain diseases dispose to attacks of acute rheumatism: thus during the stage of desquamation of scarlet fever, and in the puerperal state, attacks in all respects the same as ordinary rheumatic fever may occur. The seasons of greatest prevalence are winter and spring, and the occupations most favorable are those in which there is the most frequent exposure to inclement weather. Protracted stay in damp apartments, lying between damp sheets all night, exposure of the body to cold and wet when in a heated and perspiring state, are fruitful causes of attacks, the predisposition already existing. The frequency with which rheumatic attacks follow exposure to cold, to chilling the superficies of the body, is a very striking fact. Senator† ingeniously supposes that the irritation of the peripheral fibers of the centripetal nerves excites the vaso-motor and trophic centers into abnormal activity. Various facts go to prove that a condition of the joints not unlike rheumatism is brought about by certain diseases of the spinal cord and injuries of nerves.‡ As, during muscular exercise, lactic acid and the acid potassium phosphate are produced, and as an excess of acid is a fact in rheumatism, and, further, as sudden chilling of the body stops the elimination of those acid products, which therefore accumulate, there would seem

* Notwithstanding the agency of a damp climate in causing acute rheumatism, in New Mexico, a remarkably dry climate, this disease prevails largely. Indeed, the author saw, in 1860, what might be regarded as an epidemic.

† Ziemssen's "Cyclopædia," vol. xvi.

‡ "Injuries of Nerves and their Consequences," S. Weir Mitchell, *op. cit.*

to be a necessary connection between these states. The agency of lactic acid in producing rheumatism seems further strengthened by the fact, first observed by Richardson, that the injection of lactic acid is followed by endocarditis, and its medicinal administration in diabetes has in various instances apparently caused a rheumatic inflammation of the joints. This chemical theory, originally proposed by Prout and supported by Richardson's experiments, has received a severe blow in the denial by Reyher* that the injection of lactic acid is followed by endocarditis, as affirmed by Richardson, or that an accumulation of the acid in the blood is a cause of rheumatism, as suggested by Prout.

Pathological Anatomy.—The changes in the joints are slight as compared with the apparent extent of the mischief. The synovial membrane is injected more or less deeply, and the fringes are highly vascular. The membrane has lost its pearly transparency and its smoothness, and is cloudy and granular. The synovial fluid is increased in amount and is changed in character. Instead of being a transparent, homogeneous, viscid fluid, it is thin, watery, reddish from extravasated blood, turbid from the presence of fibrin, and some pus-corpuscles. There is never any considerable amount of blood present in the fluid, except in the case of the hæmorrhagic diathesis, and the quantity of pus is slight unless the rheumatic inflammation is complicated by some other malady. A half-century ago much importance was ascribed to the excess of fibrin in the blood, to the buffy-coat and to the cupped appearance of the clot; but these features of the blood composition are not now considered to have any special significance, besides the excess in fibrin. Garrod states that the quantity of fibrin reaches from four to six parts per thousand. The serum is alkaline, and is free from uric acid and lactic acid. The usual complication of acute rheumatism is inflammation of the peri- and endocardium. The nature of the pathological changes in these cardiac affections is set forth in the articles on these topics.

Symptoms.—For several days previous to the attack of acute rheumatism, the patient complains of muscular soreness, often of neuralgic pains localized in some important nerve; in other cases the patient experiences a good deal of pain, stiffness and soreness of certain joints, and with these joint- and muscle-pains and soreness are associated an impaired appetite, coated, pasty tongue, constipation, etc. The disease may begin abruptly without the prodromic symptoms just described, by a chill, followed by fever, or by a succession of slight chills with fever, the temperature rising to 102°, 103°, or 104° Fahr. There occur also, thirst, a coated tongue, anorexia, and constipation; headache and wakefulness are experienced; and the ankles become painful and can not support the body. Examination of the painful joints discloses the

* "Zur Frage von der Erzeugung von Endocarditis durch Milchsäure-injection," etc., by Dr. Gustav Reyher, Virchow's "Archiv," vol. xxi, p. 85.

fact that they are tender, hot, swollen, and red, and every attempted movement produces exquisite suffering. On the same day, or certainly the next day, other joints are affected, and those first attacked get a little easier and the swelling slowly subsides. In the first attack the larger joints are affected almost entirely, but in succeeding attacks the smaller joints, especially of the hands, suffer severely. The joints first attacked and getting well may be seized upon again, and in turn most of the joints of the body are affected. By the end of the first week, a number of joints, six, ten, even twelve, may be inflamed. The joints most frequently visited are the ankle and knee; next, the shoulder, elbow, and wrist; then the hip and fingers, and finally the spine, the toes, and the lower jaw. Even the crico-arytenoid articulation may be attacked (Senator). The disease seems to pursue a certain order in its visits to the articulations—first touching at the right ankle-joint, then flying over to the left, then the right knee is reached, afterward the left (Garrod). The suffering imposed by a rheumatic seizure is very great in any case, but is the greater the larger and the more numerous the joints inflamed. When the spine is attacked the pain and inconvenience are at the maximum, for no movement of the body can be attempted, and even breathing is painful. The position assumed by the patient is the easiest which his disability will permit; the limbs are half flexed, the foot turned in a little, and the hand extended, the fingers separated more or less widely. So exquisitely tender are the joints, in many cases, that the patients manifest uneasiness when any one approaches the bed; the weight of the bedclothes becomes intolerable; and even the jar of one walking heavily over the floor awakens pain. The joints are red and swollen, and sometimes the tendons and connective tissue about the joints are infiltrated and œdematous. On the other hand, the joint may have a natural appearance and yet be very painful. Even when quite a good deal swollen, the inflammation may subside in a few hours, and attack other joints in a corresponding way.

This tendency to migrate from one joint to another is the most characteristic feature of acute rheumatism. As the effusion into and about the joint is serous, and as, besides this, only a condition of hyperæmia is present, it is not surprising that such sudden transitions take place. In the mildest cases, with few joints affected, and without complications, the fever is slight, consisting of an exacerbation developing toward evening, and entire freedom from any increased body-heat the rest of the time. In the decided cases, however, there is fever of a somewhat remittent type, the exacerbation coming on in the afternoon. The maximum rarely exceeds 104° Fahr., and the usual temperature is 100° to 101° in the morning and from a half to one degree higher in the afternoon. The range of febrile heat is not uniform; besides the daily variations, remissions and even intermissions take

place during the course of the disease. If there should occur a complete intermission, usually there is an exacerbation of all the symptoms with the rise of fever. The termination of the febrile movement is gradual and not by crisis. Now and then a case of remarkable severity is encountered. Violent delirium occurs and a state of hyperpyrexia comes on, the temperature rising to 108°, 109°, and even 111° Fahr., has been noted,* and the rise continues subsequent to death, for a short time. Dr. Ringer observed that this condition came on suddenly in three cases who were doing well. Either delirium followed by stupor or stupor without delirium appeared without any warning, the temperature rose to 111° in one case, and to 109° and 110° in the others, and death ensued in all in a few hours. Quinke, Wilson Fox, and others have reported similar cases, but they are fortunately rare. Delirium, coma vigil, excitement with very high temperature, phenomena not unlike one variety of heat-stroke, occur in the case of spirit-drinkers or the cachectic attacked by acute rheumatism. The rate of pulse is not usually conformable to the temperature curve, because it is accelerated by other causes—chiefly by the pain. There is in acute rheumatism not a hot skin, because of the sweating. This free action of the skin is a part of the morbid process; it occurs with the joint affection, and subsides somewhat before the latter, and returns with a relapse. The sweat is acid in reaction, and the linen and person of the patient have a strong acid odor. The sweat also contains urea, and formerly was supposed to owe its acidity to lactic acid—a statement which has not been confirmed. As in other diseases characterized by profuse sweating, sudamina appear on the skin. Other eruptions are also sometimes present—urticaria, purpura, herpes, etc. The severe loss by the skin necessarily lessens the quantity of urinary water. The urine is concentrated, strongly acid in reaction, of a deep-red color, and deposits a great quantity of urates and uric acid. The chlorides of the urine are diminished, the sulphates are increased (Parkes), and the urea is also greater than normal in its relative proportion. Albumen is present in the urine in small amount.

Course, Duration, and Termination.—The course of acute rheumatism is much influenced by complications. The most important complication is the rheumatic inflammation of the peri- and endocardium, and of the cardiac muscle. This sometimes is the first symptom, the joint affection appearing subsequently. The author saw in New Mexico cases of rheumatism pursuing this course. The relative proportion of heart cases to those having joint lesions only is stated differently by different authorities, Bouillaud standing at one extreme with fifty per cent., and Chambers at the other with five to seven per

* Ringer, Dr. Sydney, "On some Fatal Cases of Rheumatic Fever, accompanied by a Very High Temperature of the Body," "Medical Times and Gazette," October 5, 1867.

cent.* There can be no doubt that great differences exist, and hence no numbers can state the true proportion. The inmates of hospitals have a greater tendency to heart complication than those sick under favorable conditions at home. The existence, then, of the various diatheses and cachexiæ must exert an unfavorable influence over the course of acute rheumatism. Again, youth is a predisposing cause of cardiac complication, a fact which Senator formularizes as follows: "The younger the patient, the greater the risk of his heart becoming affected." Treatment, according to the exhibit of Dr. Dickinson, exercises no little influence over the tendency to cardiac complications, if rightly directed. Comparatively rare complications are bronchitis and pneumonia—the former occurring the more frequently. Pleurisy is still more common because induced by contiguity of tissue, and hence of the left side chiefly, although it may be double. These complicating diseases differ in no material way from the same idiopathic affections. Meningitis has rarely occurred, and doubtless, of the cases reported, most of them were examples of cerebro-spinal meningitis. The natural history of acute rheumatism has been determined thoroughly. The mint-water treatment of Sir William Gull and Dr. Sutton, and the expectant methods of Garrod and of Flint, have demonstrated the course pursued by rheumatism when not interfered with by remedies. The disease manifests a tendency to spontaneous cure about the thirteenth to the fifteenth day, and still more decidedly from the fifteenth to the twenty-first day. The average stay of rheumatic patients in Guy's Hospital, when subjected to the "mint-water treatment," was for males 27.6 days, and for females 26.8 days.† The conclusions arrived at by the advocates of non-intervention have been severely contested by Dr. Fuller and others. In almost the last paper written by the late Dr. Fuller,‡ he has demonstrated the fallacy underlying the observations of the Guy's Hospital clinicians, and has proved the immense superiority of the so-called alkaline treatment. Notwithstanding the disease may be classed with the self-limited, its course is materially abbreviated not only by the alkaline, but by other methods of treatment. The acute stage of a rheumatic seizure, if the first one, is not often terminated in an earlier period than two weeks, and is more frequently prolonged to three or even four weeks. After the first, the subsequent attacks are usually less severe, and the acute symptoms terminate in one to two weeks, and may be prolonged to three. The duration is, however, materially affected, not only by the complications

* But Dr. Fuller, in his "Treatise on Rheumatism," puts the proportion of heart complications at one third, after examination of many statistics (third edition, pp. 258-284).

† "Guy's Hospital Reports" for 1865, "Cases of Rheumatic Fever, treated for the most part with Mint-Water," collected from Dr. Gull's case-books by Dr. Sutton.

‡ "The Practitioner," vol. ii, p. 129.

mentioned above and by the treatment, but by the number of joints visited. If more than six joints are visited, the duration of the acute symptoms will not be less than two to three weeks; and, if a dozen joints are one after another brought within the diseased circuit, the duration will be scarcely less than the traditional six weeks. So many factors, therefore, are concerned, that results must be very uncertain which are arrived at without estimating the value of all. Rheumatism is by no means a serious disease if judged from the standpoint of its immediate effects, but it becomes more formidable when the cardiac and other complications arise. The mortality from rheumatism alone does not exceed three per cent.; but the after-consequences of the cardiac lesions are responsible for a great many more deaths. When death occurs during the seizure, it is determined by the condition of hyperpyrexia with delirium most frequently, and alcoholic excess is probably the real cause of this accident in most cases. Now and then a fatal result may be due to meningitis, but more frequently to peri- and endocarditis, with myocarditis. In a very small proportion of cases joints may be permanently damaged by thickenings and deposits, and slow chronic synovitis.

Diagnosis.—A well-developed acute rheumatism can hardly be mistaken for any other disease, but there may be difficulty in differentiating it from pyæmia, rheumatoid arthritis, acute general gout, urethral rheumatism, and hysterical joint. Pyæmia differs from acute rheumatism in the type of fever, the periodical sweats, the jaundice, the prostration, and the suppuration and disorganization of joints. Acute rheumatoid arthritis is stationary, and is free from constitutional disturbance, from sweats, and from cardiac lesions. From acute general gout it is distinguished by the fever, the sweats, and the cardiac mischief. Urethral rheumatism attacks one joint, the ankle or wrist, most usually, does not migrate, is slower to recover, is unaccompanied by fever, and is coincident with a urethral discharge. Hysterical joint is without swelling or change of temperature, is exquisitely sensitive when the attention is fixed on it, and can be handled even roughly when the attention is directed to other objects, and is accompanied with other hysterical manifestations.

Treatment.—Opinions are still greatly divided as to the best treatment of acute rheumatism. As controversial discussions do not enter into the scope of this work, the author confines himself to the expression of his convictions. The alkaline treatment has been a real and important advance, but the general conception of what is meant by it is singularly cloudy. Senator gravely proposes the use of the soda-salts because of the supposed toxic effects of the potash-salts on the heart. "By the alkaline treatment," says Dr. Fuller, "I mean a plan of treatment in which alkalies play an important part, but which consists not only in the administration of alkalies, but in the careful regu-

lation of the secretions, the strictest attention to diet, and the administration of tonics, such as quinine and bark, as soon as the patient can bear them." In the treatment by alkalies, the object to be accomplished is, to effect the alkalization of the secretions, and any result less than this will prove a failure. Fuller gives not less than an ounce and a half of the alkaline carbonates, either alone or in combination with a vegetable acid, during the first twenty-four hours of the treatment. Two drachms of bicarbonate of potassium are given in a state of effervescence by means of an ounce of lemon-juice, or a half-drachm of citric acid, in four ounces of water, every three or four hours. If the bowels are torpid, as is usual, two compound cathartic pills are administered. If the urine no longer exhibits an acid reaction after twenty-four to thirty-six hours, the quantity of alkali is diminished one half. If the urine continues alkaline at the end of another twenty-four hours, three drachms of alkali only are given for the next twenty-four hours; and on the fourth day, if the alkalinity of the urine persists, the form of the medicine is changed, and a tonic is added to the alkali, giving three grains of quinine with a half-drachm of potassium bicarbonate three times a day. Aperients are given as required, and opium as little as possible, and only when there is excessive irritability. The diet is restricted to milk, beef-tea, or broths, barley-water, etc., and under no circumstances solid food until the tongue is clean and convalescence established. The patient is kept between sheets rather cool, and the heaping up of extra blankets on the bed is not permitted. We have been thus full and minute in describing Dr. Fuller's method, from a conviction of its great value in appropriate cases. It relieves the pain quite speedily, shortens the duration and lessens the violence of the disease and prevents heart complications. The average duration of the cases thus treated is put by Dr. Fuller at *eleven days*. Of 439 cases subjected to this plan there was not a fatal case; only a little over two per cent. suffered with a cardiac complication. Dr. Dickinson's statistics are not less striking. Of 161 cases, 113 were subjected to some other than alkaline treatment, and in thirty-five, or 30.8 per cent., the heart became involved; while only one of forty-eight cases treated with alkalies so suffered.* In the pale, feeble, and anæmic young subjects attacked with acute rheumatism, alkalies are as a rule too depressing, and are followed by a tedious and protracted convalescence. In this class of cases we possess a valuable resource in the tinctura ferri chloridi, first proposed by Dr. Russell Reynolds. This remedy must be given in full doses well diluted with water (3 ss. of the tincture to six ounces of water taken through a glass tube every four hours). It has a most favorable influence over the progress of these cases, and, as Dr. Anstie pointed out, is very effective as a pro-

* London "Lancet," January 23 and 30, and February 6, 1879.

phylactic against the disease when an attack is impending. For the acute rheumatism succeeding to scarlet fever, to puerperal fever, etc., it is especially desirable and successful. At the present time no remedy is so universally employed in the treatment of rheumatism as salicylic acid in various forms. The success which attends its use is on the whole remarkable. Now that the enthusiasm which first followed its use in rheumatism has subsided somewhat, a fair estimate of its powers can be made. As it causes very great depression of the heart, and excites irritation of the stomach, its utility is much more limited than was at first supposed. Furthermore, although its action is very prompt, relieving the principal symptoms of the disease in two or three days, the tendency to relapses is very great. In a recent paper by Dr. Greenhow,* we find a most able exposition of the effects and real utility of the salicylates. He finds with others that great immediate relief follows the administration of these remedies, that the temperature declines and with it the pain, but serious toxic phenomena often ensue, and relapses occur. Moreover, the drug in considerable doses depresses the heart, obliterates the first sound, and causes vomiting, tinnitus, hallucinations, etc. Salicin, salicylate of soda, and salicylic acid, to be effective, must be given in sufficient quantity to lower the temperature—a half-drachm of salicylate of sodium every four hours, until the pulse and temperature decline, may be taken as the standard. When the pain and fever subside, the dose may be reduced to a scruple. In the discussion which followed the reading of Dr. Greenhow's paper, the speakers insisted on the persistent use of the remedy to prevent relapses. As the effects of salicylic acid and its congeners are decidedly spoliative, the patient is left in a weak and anæmic state. It is good practice, according to the author's experience, to give the muriated tincture of iron as soon as the reduction of heat and pain is effected, while smaller doses of the salicylates are continued. Dr. Greenhow finds that the blister-treatment is quite as successful as the treatment by salicylates, and open to less objection. The blister-treatment as revived by Dr. Davies, of the London Hospital, consists in the application of armlets, wristlets, and fingerlets of blistering-plaster about the inflamed joint, but not on it, as carried out by Dr. Dechilly. The author has ascertained that an investment of the joint by small blisters, leaving space between them all around the joint for succeeding applications, is a good method. Blisters relieve the pain remarkably, change the reaction of the urine from acid to neutral or alkaline, and prevent complications. With blisters may be combined the excellences of the other plans of treatment. The alkaline treatment is particularly applicable to "the obese, florid, but flabby drinkers of malt-liquors"; the iron-treatment to the pale, delicate, and anæmic young

* The London "Lancet," May 29, 1880, "Cases of Rheumatic Fever treated with Salicylate of Soda," "Transactions of the Clinical Society."

subject; and the salicylic treatment to the vigorous, able-bodied subjects of the inherited tendency or rheumatic diathesis, while blisters may be, with proper precautions, utilized in all forms of the disease and combined with any plan. The complications of acute rheumatism are to be treated according to their character. The most important, because so rapidly fatal, is the condition of hyperpyrexia with coma. Since the remarkable efficiency of the cold bath has been ascertained, better results are had from the treatment of this condition than ever before. Quiet and rest are of great importance. Solid food must not be given the patient until the tongue is clean and the digestion active. Milk, above all things, is the most suitable article of diet.

CHRONIC RHEUMATISM.

Definition.—By *chronic rheumatism* is meant an affection of the articulations, characterized by pain and stiffness, with some swelling, occurring chiefly after middle life, and influenced by atmospheric changes.

Causes and Pathogeny.—The chronic may succeed to the acute form of rheumatism. In all cases of the acute disease the joints remain sore and stiff for a short period after the acute symptoms have ceased; but in a few, owing to the constitutional state, to improper management, too early use of the joints, etc., the articulations remain swollen, more or less tender, and disabled. The case may be chronic from the first. If the predisposition exist, exposure to cold and dampness, working in the water, etc., will develop the disease slowly, and those joints undergo alterations first which are most exposed to injury, and to cold and dampness in the performance of their functions. The changes of structure are not well defined in many instances, because of the fugitive attacks; in others, however, there are plain evidences of mischief done. The synovial membrane becomes cloudy, thickened, and rough, and the cartilages also undergo proliferation of their corpuscles and subsequent thickening. Very little effusion of fluid occurs into the synovial sac. Fatty degeneration of the articular cartilages, erosions of the same, slow changes in the bone, leading to induration and thickening, resulting in a limited extent of motion of the articulation, are also results of the morbid process.

Symptoms.—The trouble is limited to the articulations affected and to the neighborhood. The joint is swollen more or less, and its movements are constrained; it is not red and hot unless some recent inflammatory mischief has been lighted up; pain is felt in the joint spontaneously, and soreness whenever the joint is moved, and acute pain is experienced when there occur changes of temperature and the barometer is falling. Patients soon learn the indications, afforded by their pains, when storms are imminent, or other atmospheric perturbations

The joints are stiff, their movements slow and jerking. As the sheaths of the tendons are thickened by deposits, movements cause more or less creaking, like rusty machinery, which may be audible. In the morning, on rising, movements are particularly slow, rigid, jerking, so that dressing is accomplished with difficulty; use renders them limber and supple. Various joints are affected, as a rule, but the disease does not migrate from one joint to another; they may be affected simultaneously or in turn. The muscular pains, which usually accompany the joint affection, are due to the extension of the disease to the sheaths of the tendons in the neighborhood of the articulations. Myalgia is a frequent coincident affection, and hence it is confounded with the rheumatism.

Course, Duration, and Termination.—Chronic rheumatism is a very chronic disease. There occur but few changes from month to month. Exposure to cold, and especially to cold and dampness combined, increases the pains and the joint changes; and warmth—especially removing to a warm climate—lessens them. Fatigue, manual labor, especially in cold and damp situations, and clothing insufficiently warm, promote the disease. In forming conclusions as to the future course of the malady, these elements must be taken into consideration. A perfect recovery must be regarded as possible only in those cases treated at the outset under favorable hygienic and personal conditions. When deposits have taken place, and the cartilages and synovial membrane are changed in structure, a cure can not be effected. In old cases tendinous ankylosis may result, and, the muscles wasting, the limb will appear much deformed. Chronic rheumatism never causes death, nor does it indirectly abridge life except by depriving the patient of rest and sleep.

Treatment.—The remedies intended to assail chronic rheumatism, from the constitutional side, are numerous, but they accomplish little. Colchicum, guaiacum, conium, etc., formerly so much employed, have no longer any repute as remedies in this disorder. There are, however, a few remedies of real value—cod-liver oil, iodide of potassium, muriate of ammonia, and the lithium salts, notably the bromide. Cod-liver oil should be given with a little ether to assist its digestion, and in the dose of a teaspoonful three times a day after meals. To be of real service, the administration of the oil should continue for many months. If there is anæmia, chalybeates should be given. A course of iodide of potassium, if the general health of the patient is fairly good, often renders important service. It is necessary to give it many months, however. Deposits about joints may sometimes be absorbed during the administration of muriate of ammonia, but, to accomplish anything, prolonged use is necessary. In several cases the author has had excellent results from the bromide of lithium. Under its use the pains ceased, the swelling subsided, and the suppleness of