erythroextrin which give a red colour with iodine (instead of the well-known blue given by starch), and later of bodies such as achroodextrin and maltose, which give no reaction with iodine. The soluble starch may be assumed as having a formula $(C_{12}H_{20}O_{10})_{10}$, and when this is acted upon by the ferment the reaction may be represented thus:

Subsequently the erythroextrin formed by the above reaction may be supposed to break down, under the influence of water, into a simpler achroodextrin and maltose, the process of hydration and decomposition proceeds until in the final stages in the reaction are an achroodextrin which is rebellious to further ferment action, maltose, and a little grape sugar.

The bodies into which starch is converted, unlike itself, have the property of diffusing through or permeating animal membranes, and so can enter the lymph spaces and blood-vessels, and become available for the varied requirements of the organism.

REMARKS ON

ACUTE ARTICULAR RHEUMATISM.

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PROBABLY there is nothing more remarkable in the history of practical medicine than the variety of opinions which has existed, and which still exists, in the treatment of acute articular rheumatism, unless, indeed, it be the variety of opinions which has been, and which is still, held as to its nature and pathology; and yet the symptoms and phases of the developed affection are marvellously uniform. The limitary and binding influence of a fixed nomenclature of disease is chargeable with much of this unhappy contrariety of opinions. The determining fact, of course, in the establishment of the name of the disease is its manifestation upon the joints of the body. The diseased action, however, is the same when it attacks the cardiac textures as when it attacks the synovial membranes; and both manifestations of disease have an antecedent fever which is essential to their very existence, and which, nevertheless, only develops the localised rheumatic quality when it operates upon subjects of suitable idiosyncrasy.

The most common and the most efficient (perhaps the only) exciting cause of acute articular rheumatism is the application of cold to the surface of the body; but in order that chilling of—the hurtful withdrawal of heat from—the surface shall be competent to the development of the affection, it must be operative upon a body already prepared for it by certain predisposing conditions. The tendency to rheumatic disease is sometimes palpably hereditary, and may in such cases be regarded as diathetic. But, again, in a large proportion of cases sufferers from this affection have no such diathesis nor hereditary predisposition to it. Acquired habit of body and mode of life are much more distinctly predisponents; the disturbed innervation which results from grief and vexation and bodily fatigue; the alternating excitement and depression which the injudicious use of alcoholic drinks so constantly produces in body and in mind; the languor and bodily disorder of luxurious living and hot rooms; the exhaustion of bad food and bad hygiene generally; rapid transition of temperature and hygrometric conditions; the age of the individual; the constitutional effect of former disease,—these must be regarded as the most efficient agents in the work of fitting the body for the onset of acute articular rheumatism.

The first recognisable effect of the exciting cause is an aching of the body and a decided feeling of malaise. These conditions are followed by rise of bodily temperature, and by increased force and frequency of the cardiac contractions. Then is commonly felt exalted sensibility of mind and of nervous system generally; speedily followed usually by pain and swelling of the larger joints of the body. Occasionally, however, the joints are affected after invasion by disease of the endocardium or pericardium or pleura. Still more frequently perhaps the cardiac and the arthritic affections are coeval. Sometimes before any marked affection of

the joints or of the heart the constitutional fever is associated with—accompanied by—profuse sweating. And contemporary with or antecedent to this sweating the renal secretion and the blood itself have become palpably altered. Herein is displayed within the body a power which tends to the formation of acids and acid salts; notably superphosphate of potass and urea, and perhaps lactic acid, in the blood and urine, and in the blood itself of fibrine, in abnormal quantities and proportions. The sweat and urine are abnormally acid; and the synovia of the affected joints is often remarkably acid also. Neither the affection of the joints, then, however much they may suffer, nor the condition of the heart, however extensively it may be affected, can be regarded as the first incident in the development of acute rheumatism. And however competent the localised affection may be when it is present to produce great constitutional disturbance, it must be admitted that the constitutional fever, which essentially belongs to the disease, is independent of, and antecedent to, the manifestation of local injury; while the malaise which generally precedes the outburst of constitutional fever and of local suffering probably bears precise relationship with the amount of derangement which has taken place in the nutrition and functions of the central nervous system by the agency of the exciting cause.

That the cardiac affections of acute rheumatism are commonly of an inflammatory character there cannot be a doubt; and the similarity of structure between the membranes lining the pericardium and the walls of the cardiac cavities, or of the thorax or cranium, on the one hand, and those lining the joints on the other (the first manifestation of the arthritic disease is always upon the synovial membranes) indicate the real fitness of the parts themselves severally for the operation of the rheumatic disease, and also that interdependence is not so much between arthritic and cardiac or other local affections as between the constitutional disease and the intrathoracic or intracranial, as the case may be. However, it is reasonable to assume that the more exposed positions and the more extensive structures of the joints afford sufficient explanation, if no other is recognisable, of the greater frequency of the onset of the disease upon the synovial membranes than upon textures more deeply seated. It is manifest also that the attack upon intrathoracic or intracranial structures by rheumatic inflammation is not of the character of a metastasis from the joints, as is commonly supposed, because the general rule certainly is that no one of the localised affections becomes increased or diminished by increase or diminution of another. The profuse diaphoresis of acute rheumatism is characteristic of the affection; but it is significant of no crisis in its history, neither is it alleviative of its constitutional fever, nor of any form of its localised disease. It is, doubtless, the outcome of an abnormal condition of the blood, and bears striking analogy to forms of septicæmia which show themselves in the course of other diseases; so remarkably so, indeed, that in the latter the symptoms are often distinguished with difficulty from those of acute rheumatism. At the outset of acute rheumatic disease the incidence of the morbid agency—the shock of injury produced by the chill—is inevitably upon the central nervous system, through the agency of the peripheral nerves. Derangement of the nutrition and functional life of these organs immediately follows, and contemporaneously with this derangement constitutional fever is evolved, and an abnormal condition of the circulating blood. The functions of the central organs are thence further interfered with and disturbed by the direct agency of diseased blood. These conditions evidently react upon each other during the whole period of the acute disease.

The result of this brief recital of facts appears to be the establishment of the conclusion that the articular disease is almost, if not quite, invariably a secondary matter only in the history of the development and course of acute rheumatism; that the localised inflammation is not necessarily, or even commonly, an element in the production of its constitutional fever; that in this way the affection of the joints bears close analogy with the affection of other internal structures; and that both the latter hold subsidiary places, chronologically, in the pathology of acute rheumatism.

The treatment of acute articular rheumatism has been, and still is, dishonourable to the practice of scientific medicine. Here is a disease which is marvellously uniform in its symptoms and in its progress, as we have seen, but in which, nevertheless, the united wisdom of ages has been over and over again expressed by the prescription of camphor water as

its remedy; and by the statement, often repeated, that the curative agent for the disease is time—six weeks. With very many eminent and able practitioners the abstraction of blood has been accepted as the great curative means in the treatment of the disease, in the belief that it is capable of subduing the fever, relieving the nervous disquietude, and removing the articular pain and swelling. “I have seen,” says Dr. Latham, “people enormously bled in acute rheumatism, and their entire disease swept away at once and health restored rapidly.” And, again, “I have seen people enormously bled in acute rheumatism, and no single pain has been mitigated; but the disease has continued for an unusually long time.” Dr. Latham’s statement that venesection has been effective occasionally in the treatment of this disease may be safely accepted; but it is not to be forgotten that there is a remarkable tendency in acute rheumatism in the direction of anæmia, and that the agency of this remedy is in the direction of that tendency; and that, although it may be useful sometimes, it is often terribly pernicious. A remedy which has been regarded as the “sheet anchor” in this disease is mercury, either alone or in combination with purgatives, or with bloodletting, or with opium. Now, however useful mercury may be in the after-treatment of the disease—i.e., of its complications or of its sequelæ—it is submitted that the cachexia which it often induces cannot fail from time to time to contribute, even largely, to the development of cardiac disease, or to the production of the dangerous anæmia which is apt to set in after subsidence of the acute affection. Like bloodletting, its employment demands extreme caution. Then the nervous disturbance and the local pain have been considered by many thoughtful men as representative of the entire disease, and opium, or some of its preparations, has been regarded by quite an age of physicians as its remedy. The tolerance of opium in this affection is remarkable, and somewhat likens the tolerance of antimony in pneumonia; and, doubtless, under judicious management, it has often contributed very largely to the relief of the sufferer from acute articular rheumatism. It does not appear, however, to have any specific action in the disease. The sedative action of quinine is of a higher and more appreciable quality in the relief of the pain of this disease than opium, and its curative power is more absolute. Quinine supports while it soothes, in fitting subjects, and tends to prevent the extension of the disease by subduing constitutional fever. It is often materially aided in its action by opium, and occasionally by purgatives. The salutary agency of quinine, guaranteed by extensive experience, is fairly indicated by the pathological conditions herein set forth, and it is in harmony with the same general laws that salicine acts genially in the disease. Salicine is an agent of great power in the reduction of the high temperature which is an essential feature of the disease, and when judiciously administered it is at the same time a supporter of the vital powers of the patient. It possesses extraordinary value also as an antiseptic. The great danger and the great injury which impend in acute rheumatism are referable to its effects upon the cardiac membranes; and the only means yet known which are competent to the reduction of the tendency to injury of this locality are those which subdue the constitutional fever—the sustained high temperature of the body. Quinine, with or without opium, is an important agent in this direction. Salicine, with or without opium, is a still better remedy. But the most perfect, and most generally efficient, remedial agent in this formidable disease, either from its tonic or sedative action on the central nervous system, reducing the bodily temperature in a very remarkable manner, or from its antiseptic or other power over the blood, is salicylic acid. Salicylic acid is a remedy which is indicated in the first moments of the diseased action, and is especially valuable when it is so employed. The constitutional fever of acute rheumatism has an average duration of, it may be, ten days, but has extreme limits from a day or two up to more than twenty days. It is during this period of exalted temperature that the initial injury to the cardiac structures is presumably affected; and it is during this period that the action of salicylic acid as a prophylactic and as a curative agent is obtained in the highest degree. Doubtless it has often failed, and probably will often fail; the constitutional peculiarities of patients seem to assure this; but if individual experience could establish its transcendent value, it might be truthfully affirmed that the introduction of salicylic acid into the armamentarium of the modern physician constitutes an era in the history of thera-

peutics, in its application to the treatment of the disease and to the prevention of cardiac complications. The experience of physicians, however, has not been equally satisfactory, and it may be difficult to explain the cause of the difference of results obtained; but its power as a febrifuge, either alone or in combination with soda or potass, is absolutely unquestionable. The treatment of acute rheumatism by eliminatives—purgatives, diuretics, &c.—is founded on the assumption that the essential peculiarity of the disease is the presence in the blood of a peculiar *materies morbi*, and that these evacuations are capable of eliminating from the blood the morbid particles which have been imported into, or generated by, it. In the hands of the late Dr. Todd and others this mode of treatment appears to have been useful. But it does not seem to have lessened the tendency of the diseased action in the direction of cardiac complications greatly; and it is, perhaps, more seductive in name than valuable in fact. The treatment by alkalies appears to have had, and, indeed, still to have, a large measure of acceptance. It is at once suggested by the presence of the highly acid secretions of acute rheumatism, and is a fulfilment of the law of “*contraria contrariis curantur*,” but not by any means an admirable one. Still some good results appear to have followed its employment. There is, however, a miserably mechanical quality about it which is offensive, and it has not been shown that it exercises much power in correcting the acid secretions (if they are really objectionable), nor that it possesses preventive power against cardiac disease. On the other hand, it must be urged that large doses of alkalies long continued inevitably induce depression of vital power, and that the tendency to such depression is a salient feature of the malady under consideration. How strange it is that the treatment by lemon-juice and by lactic acid has been equally lauded. If the principle of “*contraria contrariis*” is applicable to the alkaline treatment, the doctrine of “*similia similibus curantur*” is fairly applicable here. But the vital actions are often inscrutable, and it may be, at some future time, that these doctrines, which are now being almost affectionately interred, will be rehabilitated “to point a moral and adorn a tale” of the blindness of the generations of which we form a part. It may, however, be remarked that camphor water has been employed since the time of the eliminatives, and the alkalies and the lemon-juice or lactic acid, and that some of our authorities have recognised the do-nothing treatment as quite as valuable. It may be safely predicted, however, that in the absence of some great therapeutic discovery no one really judicious in its employment will ever completely reject the treatment by salicylic acid in our generation, and that just as it shows power (within poisonous doses) to subdue the constitutional fever which precedes and accompanies acute articular rheumatism, and to modify the morbid qualities of the blood, so it will be found efficacious in the dispersion of the articular disease, and in the prevention of cardiac involvements.

From the standpoint here assumed it cannot be admitted that any local treatment can cure the disease, although it may, and very often does, effect local relief. And again, the constitutional fever having for the most part passed away, the affection of the joints which remains, and which very often is exceedingly painful, may be dealt with as a distinct affection, and herein local treatment is truly valuable and highly commendable. Among the best remedies for such affections are the local abstraction of blood, warmth, with or without moisture, the application of blisters, the subcutaneous injections of morphia, &c. Nevertheless, it should be understood that these local affections may be severe and long continued, without any consequent morbid changes taking place in the textures of the heart, and without any constitutional effects other than those which result from local suffering.

THE NORTH-WESTERN ASSOCIATION OF MEDICAL OFFICERS OF HEALTH.—The monthly meeting of this Society was held on the 8th inst. at the office of the secretary, Mr. Fred Scott, King-street, Manchester, Dr. W. H. Hughes (Ashton-under-Lyne), President, in the chair. A paper was read by Mr. Vacner on “The Transmission of Disease by Food,” in which he stated that food might spread disease in three ways. First, it might be in a pathological condition; second, it might serve as a medium in which diseased germs were nourished and multiplied; and, third, it might serve simply as a nidus in which such germs rest.