

Dissertation

on

Rheumatic Fever.

Above the average of theses, giving a very creditable account of the pathology, symptoms &c of the disease. ~~1111~~

George Hill

In the tissues of the living organism, constant change takes place. The living body has been compared to an engine, in which combustion is continually going on, and the effete matters, - the excreta are compared to the ashes. When matter has gone through the changes necessary for the forces of life, it can be of no farther use in the economy, and must therefore be eliminated and removed; and to the proper maintenance of health, the elimination must be constantly going on. And so we find that Nature has provided means for its removal; and, for the most part, provided also a receptacle into which the excreta are received, as the intestinal canal and bladder, so that whenever a sufficient quantity is accumulated, it is discharged from the body. The skin and lungs, however, form exceptions to this; in them the elimination is constant, and the effete matter is discharged as soon as formed. - And by a law of nature, when an organ, from disease or other cause, is unable duly to perform its function, it

Watson's Practice of Physic. vol. ii. p. 654

Ibid. vol. ii. p. 817

it is assisted or relieved by some other organ. Familiar examples of this are the mutual connection between the functions of the skin and kidney; and the discharge from almost any excreting surface in the body of the menstrual molemen, when the uterus fails to perform its functions in the ordinary way. —

The extent to which this process of elimination goes on in the organism is comparatively unknown. The functions of some of the excreting organs have not been thoroughly investigated; and many organs which are not considered excretory may probably, after farther research, be found to be so. Thus, the tonsils are much affected in some forms of fever, perhaps engaged in eliminating the poison. The remarkable discovery of Claude Bernharde regarding the secretion of sugar by the liver, and its passing into the blood, suggests the probability that the ductless glands may have some analogous function. In Hydrophobia, the poison is eliminated by the salivary glands in the dog, and attacks similar organs in man. — D. Carpenter considers it probable that the function of the gland-ule acuminata is the elimination of noxious matters from the blood; and Williams ascribes the ulcera-
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-tion of these glands in typhoid fever to the constant passing off of the poison from the blood by these channels.-

Again, Cullen, in his description of Scarlet fever, speaks of *cynanche maligna*, and *scarlatina*; the former differing from the latter in the severe throat affection. Is it not probable that this is due to the poison seeking egress principally by the throat, just as the *glandulae agminatae* are affected in typhoid fever?

Now, it is manifest that if this process of elimination be suspended or imperfect, the system cannot maintain its healthy standard; it is deranged by the retention of the effete matter, acting as a poison. Thus, when urea, which should be eliminated from the blood as soon as formed, is retained, it is decomposed, (carbonate of ammonia being formed, according to Frerichs) and its poisonous action is soon manifested by the disturbance which it causes in the cerebral functions. And so it is with other excrementitious matters, such as carbonic acid, which, if not immediately extricated from the lungs, will soon extinguish life.-

And

And there is a certain class of individuals, in whom the elimination of certain excreta is more imperfectly performed than in others, those, namely, of the Arthritic diathesis. In them, derangement may result, either from a too abundant formation of certain materials, or from a too imperfect elimination of them, when formed.

With this brief introduction, we proceed to the consideration of a disease, intimately connected with the process of elimination, and, as we have reason to believe, dependent on the formation of a certain *materia morbi* in the system.

Now what are the characteristics of this disease, Rheumatism? That the disease is inflammation, there can be little doubt; the character of the pulse and tongue, the urine loaded with lithates, and the inflammatory characters which draw blood presents, afford good proof of this.

And it is inflammation of a peculiar kind, predisposed to attack a certain class of tissues - the fibrous. But the liability to its attack is not confined to the joints, where that tissue is most largely developed: on the contrary, we find it in all those tissues which are histologically connected with that of the joints. And it is to this that

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The danger of the malady is due, for a case of uncomplicated articular rheumatism will run its course with very little risk to the life of the patient.

In the fibrous tissue, then, the disease originates. But it does not limit itself to that tissue. It may spread by contiguity, and that from a part in which its presence is attended with little danger to one which may endanger life, as from the epimeral aponeurosis to the membranes of the brain.

It is characterized, moreover, by the peculiar tendency to metastasis. It may leave one joint for a time, appear in another, and again reappear in the former; or it may pass from one to another till every joint in the body has been affected. Again, the inflammation is specific, as it differs essentially from the progress of ordinary inflammation, suppuration rarely occurring; and when it does occur, it is generally in the tissues affected by contiguity.

There are two varieties of Acute Rheumatism, designated from the tissues which they are most prone to affect. These are 1st the Fibrous or Muscular, in which the ligamentous and muscular tissues are preeminently affected; and 2nd the Bursal

Wardrop on Diseases of the Heart. p. 531.

Bursal, in which the bursa mucosa are principally affected. These two may attack concurrently. They are so much blended, however, that we will not discuss them separately, but describe the course of a case of Rheumatic fever, and afterwards point out the leading features by which these two varieties are recognised.

They sh^d be, & he does a little at p 10

Rheumatic fever, then, has a premonitory stage like other fevers. The patient has wandering pains in the muscles and joints; is languid and chilly, and complains of headache; loss of appetite, and often biliary derangement, giving an icteric tint to the conjunctiva, and change in the complexion generally. Then there is a smart inflammatory fever; a full bounding pulse, with a peculiar vibratory feeling, and quick, rising to 110 or 120: the saliva is acid; the urine is scanty, loaded, of a deep red colour, and also acid, containing a mucous cloud; and there are profuse acid perspirations, which weaken the patient, but bring no sensible relief to his sufferings. Dr. Wardrop describes the condition of the tongue, as being increased in bulk, of a milk-white colour, and the central portion coated with a brown fur.

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In from twelve to thirty-six hours, the pain in the joints becomes more intense, and the characters of inflammation in the adjoining parts distinct: pain, heat, redness and swelling. The slightest movement causes great suffering to the patient, so that he sometimes lies on his back, unable to move from that position; even the weight of the bedclothes is sometimes unendurable. Sometimes a miliaary eruption appears; usually, however, the skin is free from any eruption, and the head perfectly clear; at least in uncomplicated rheumatic fever. Towards evening, the fever undergoes an exacerbation, and in the morning, remission. In about fourteen days, the fever abates, and the convalescent stage occupies two or three weeks; so that the whole disease usually lasts for five or six weeks. After subsidence of the fever the parts are left tender and weak, and prone to a subsequent attack. Those which have been previously injured are more prone to take on inflammatory action than others. And in proportion as the inflammation is extensive in the joints, so is the intensity of the fever.

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Fouilland, quoted in *Medico-Chirurgical Review*, July 1838.

But the fever may run its course without any muscular or articular affection. And this is perhaps the most dangerous form, for the disease may be making rapid progress without the patient being aware of the danger he is in. This form may be considered analogous to what happens sometimes among the Exanthemata, when the disease runs its course without any eruption manifesting its presence; e.g. the variola sine variolis of De Haen & others. Or perhaps still more analogous is the scarlatina latens, described by Dr. Copland, in which there is no outward manifestation of the disease, but the well-known sequela of scarlet fever betray its inward existence. In these cases, great skill, & perhaps, knowledge of the patient's previous are necessary. —

Bovilland states, that, "in general; ceteris paribus, the fixedness & persistence of acute articular Rheumatism are inversely proportionate to the number of articulations affected". He is of opinion that the statements regarding the rapidity with which rheumatism shifts from joint to joint are exaggerated. He says, "the pain may, it is true, readily disappear with or without the establishment of pain in any other joint,"

but it is not always so with the effusion, which, however, constitutes the essential element of the disease. The pain is indeed but a kind of neuralgia, symptomatic of the ^{articular} affection, as the stitch in the side is of pleurisy; and in both cases it is contingent rather than essential, for the pleurisy may exist without pain, as may also rheumatism of the joints, which is, in fact, nothing else than a pleurisy of the synovial membranes."

Let us now look at the distinguishing characters of the two forms; viz. the fibrous and the bursal. In the former, then, the seat of the disease is in the ligaments for the most part, serous and sero-fibrous tissues, and the aponeuroses of the muscles. The skin of the joints may also be inflamed, but if so, it is by contiguity, not by direct action. The kind of swelling also differs from that of the bursal form, it is caused mostly by turgescence of the vessels, or effusion into the adjoining areolar tissue. In this form, metastatic inflammation is often observed, and it is apt to be to the heart and arteries.

In the Bursal form, the disease is mostly
confined

confined to the bursa mucosa, and corresponding textures,
 among the sheaths of the tissues. The contiguous
 connective tissue of the skin, or the sudoriferous
 glands may be affected. In this form, the swelling
 is pathognomonic; it is principally due to the
 effusion of fluid into the cavity of the joint,
 so that fluctuation may sometimes be felt, and
 the seat of the swelling gives rise to protrusion
 between the more inelastic tissues composing
 the joints. In the knee, for example, the swelling
 will be chiefly lateral. When metastasis occurs
 in this form, it is to the eyes or mucous
 surfaces. If to the former, the sclerotic and
 conjunctiva are liable to be affected. The bursal
 attacks adults and weakly persons, whereas
 the fibrous generally attacks the young and
 robust. The bursal is not so migratory as
 the fibrous; usually confines itself to a few small
 joints, as the fingers, unless there be great pre-
 disposition to it; and it is more apt to degenerate
 into chronic diseases. Moreover, it is more closely
 allied to gout than the fibrous form, and yields
 to the remedies appropriate for gout. It is
 also more renal in its character than the fibrous,
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and the urine contains a greater amount of mucus. If this copious discharge of mucus occur along with fever in an individual diathetically predisposed, the urine should be examined, and renal epithelial cells will probably be found, indicating catarrh of the kidney. Professor Laycock mentions cases of this kind.

The fibrinous form attacks a great variety of tissues, so that various terms have been applied to it, according to the part affected. Thus, the epicranial aponeurosis may be affected, and then there is very violent headache. This is termed epicranial rheumatism.

Or the intercostal muscles may be the seat of the disease: This is Pleurodynia. Doubtless, this form is often mistaken for mild cases of pleurisy.

Or the diaphragm may be affected. This is a very dangerous form. The pain is intense, and the patient, fixed in one position, is unable to move.

Again, the dorso-lumbar aponeurosis may be attacked: This is Lumbago. It frequently happens that the muscles adjacent to affected viscera are

are attacked; thus, the intercostals, when the pleura is affected; the diaphragm, when the heart.

The testicles and ovaries may also be the seat of rheumatic inflammation - the fibrous capsule. The cervix uteri is sometimes affected. And many other tissues in a similar manner, as the aponeuroses of the muscles of the neck, and gluteal region, as well as the muscles themselves. Rheumatic neuralgia sometimes occurs, attacking either the meningeal coverings of the cord, and roots of the nerves, or the neurilemma of the nerve itself; or even the fibrous canals or foramina, which transmit the nerves.

And now as to the Etiology. The predisposing cause is manifestly the presence in the blood of a poison, without which, no exposure to cold or wet could produce rheumatism. Much discussion has taken place on this subject, both in regard to rheumatism and the allied disorder - joint. Most of the older theories, however, such as that of Cullen, that it is a disease of the nervous system, are exploded, and the prevailing theory now is, that it is due to the presence of lactic acid in the blood.

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Richardson in Medical Times & Gazette. July 1857

This theory was first propounded by Prout, and since then, has been adopted by many eminent authorities, as Todd, Fuller, & Spencer Wells &c. The experiments of Dr. Richardson tend to confirm the theory. He injected lactic acid into the peritoneal cavity of dogs, and changes were produced, similar to what occur in the human heart suffering from rheumatic carditis. Within two hours after the injection, the heart's action became irregular, and the animal died next morning. On examination, the peritoneum was found normal, but the left cavities of the heart shewed well-marked indications of endocarditis. In another of his experiments, sclerotitis in the left eye ensued, but no affection of the joints.

It may be mentioned, however, that Dr. Joseph Meyer, Physician to the Charite Hospital in Berlin has repeated the experiment several times, and failed in every case to produce the changes described by Dr. Richardson. In one case, he injected four ounces of a strong solution of lactic acid into the peritoneal cavity of a dog, but without any result. And in his other experiments, the animal was killed shortly afterwards, but

but the heart was found normal. Dr. Meyer has either published, or will publish, the results of his experiments.

In the hursal form of rheumatism, it is probable that uric acid is also present in greater or less quantity. This is rendered the more probable, as the latter form of rheumatism approaches in its characters to gout, in which the poison is uric acid. Experiments, similar to those performed by Richardson with lactic acid, might be made with uric acid, in order to ascertain its effect on the heart, as it is said that the fibrous form of rheumatism, in which lactic acid is the poison, has a greater tendency to attack the heart than the hursal, in which ~~uric~~ acid is probably part at least, of the poison.

The influence of age may be mentioned among the causes predisposing to rheumatism. It is mostly found attacking individuals between the ages of fifteen and forty; but its occurrence in children is no rare exception.

Then, the Arthritic diathesis, is of course predisposing. And so we see there is hereditary predisposition

Fuller. quoted in Monthly Journal of Med. Science. Jan'y 1833.

predisposition. Dr. Fuller says that he traced the hereditary tendency in twenty-nine per cent. of the cases of rheumatism in St. George's Hospital.

The exciting cause is undoubtedly exposure to cold and wet. This is probably due to the influence which such exposure exercises on the functions of the skin, in diminishing or suspending its eliminatory power. And the fact that the disease is much more common in the lower, than in the higher ranks of life, supports the idea that this is the exciting cause.

The diagnosis of Rheumatic Fever is not always simple, unless in ~~its~~ ^{its} most typical form. The disease with which it is most liable to be confounded is Gout. Not indeed with a first attack of Gout, when usually only one joint is affected, and the restlessness of the patient is sufficiently pathognomonic. But in the advanced stages of gout, there may be some doubt, though the difference is pretty well-marked. The characters by which the two disorders may be distinguished are the following. In gout, there is complete remission of pain, which is of a neuralgic and throbbing character;

Alison's Outlines of Pathology &c. Part. I. p. 183.

in rheumatism, pain is persistent. In gout, the redness of the inflamed part is of a much brighter hue than that of rheumatism, and there is more adema. In the latter, the symptoms are usually gradual in their development; in gout, the attack is sudden. The profuse acid perspirations, and the deep bilious tinge of the urine are characteristic of rheumatism. The age of the patient will assist, rheumatism being most frequently before the age of forty; gout after that age.

A very important distinction is that in gout there is no tendency to carditis, as in rheumatism, the digestive organs being more liable to be attacked in that disease. Dr. Alison says: "Gout is very generally preceded by disorders of the stomach, and often alternates with violent affections of the stomach, sometimes inflammatory, often apparently neuralgic." Gout is most frequent in the higher ranks of society, rheumatism in the poorer. The itching and desquamation which occur in gout are absent in rheumatism. The presence of chalkstones is characteristic of gout.

It may also be mistaken for neuralgia. Pain

in the latter, however, is very changeable, ceasing suddenly, and reappearing with as little warning. In it too, inflammation and fever are absent.

Sometimes it is necessary to distinguish Rheumatic fever from inflammation of the serous membranes. The patient with pleurisy breathes in a shallow manner, looks distressed, and may perhaps hold his side to take a deep inspiration. In pleurodynia, on the other hand, the uneasiness is not entirely due to actual pain, at any rate, it is of a kind, which causes a tendency to laugh.

In many cases, we must be on our guard, as when typhoid occurs in an individual predisposed to rheumatism, as the symptoms may be developed during that disease. Another source of doubt is, in cases of paraplegia.

Periostitis may sometimes be mistaken for rheumatism, but the leading features are sufficiently distinct. In the former, the seat of disease is generally on the bones most exposed, as the tibia, the cranial bones, &c. The extreme tenderness on pressure differs from rheumatism. The history of the case will also aid in the diagnosis.

Again

Watson's Practice of Physic. vol. ii. p. 508.

Ibid: vol. ii. p. 903.

Alison's Outlines. p. 361.

Again, the pains produced by lead poisoning are similar to, and liable to be mistaken for those of rheumatism, but the characteristic blue line observed on the margin of the gums in the former disease will sufficiently prove its nature.

Lastly, Dr. Watson states that he has frequently observed pains, very similar to those of subacute rheumatism, supervene when the rash of scarlatina was disappearing, but that in those cases, the tenderness on pressure ~~differs~~ was absent, so that they were relieved by friction, and that in no case did he observe the heart become affected. He admits, however, that in the latter point his observations may have been fallacious, for Dr. Scott Alison has written an Essay on the supervention of pericarditis on Scarlatina.

As we have already mentioned, a case of uncomplicated rheumatic fever has rarely a fatal termination. Cases are not wanting however of the inflammation in one of the larger joints going on to suppuration, and the patient dying exhausted by hectic. When the case has been of long duration, we may look for the thickening of the synovial membranes and ligaments, and

and sometimes enlargement of the ends of the bones themselves occurs. When the fascia and sheaths of the muscles have been long affected, a greater or less degree of atrophy, along with weakness, often result. After the bursal form, particularly when it has been of long standing, nodosity of the smaller joints is apt to ensue, especially in women. And chronic arthritis may follow these uncomplicated cases. The fibrous form is said to terminate more favourably than the bursal.

But by far the most serious and fatal sequelae are those which result from the complications of rheumatic fever. And it is necessary that we say something of these. In many of these complicated cases, life is brought to a speedy termination, without any respite to the patient, but in the majority, there is partial recovery; though the patient is probably doomed to a life of misery from internal lesions. In few cases is the recovery complete. These complications are comprehended under the four following classes,

- I. The Cardiac.
- II. The Encephalic.
- III. The Pulmonary.
- IV. The Renal.

And

Wardrop in Diseases of the Heart. p. 526.

And first, as to the Cardiac complications. When speaking of the diagnosis between rheumatism and gout, we omitted to mention one important point in which they differ, viz. the large amount of fibrin present in the blood of the rheumatic patient, while in gout, it is comparatively deficient in quantity. And since, as already mentioned, the fibrous tissue is most subject to the attack of the rheumatic poison, so, in cardiac cases, we may expect to find its effects manifested in that part of the organ composed of fibrous tissue. And unfortunately it is so. For that tissue is most largely developed at the orifice of the large vessels and openings in the heart, and in the valves guarding those orifices, so that the slightest change produced at those parts, cannot but be attended with most important consequences.

It is extremely improbable that the muscular tissue of the heart is ever the seat of rheumatic inflammation. This we may infer from what we observe when other muscles are so affected; the slightest motion causes acute pain, so that the contraction of the muscle is impeded.

Indeed

Watson's Practice of Physic. vol. ii. p. 290.

Latham on Diseases of the Heart. Lect. viii.

Indeed, it is probable, that in such a case, death would immediately ensue.

In discussing cardiac complications, we will speak of them under two heads, viz, the Pericardial and Endocardial, though, Dr. Watson believes that the two are almost invariably associated.

Latham's Statistics on this point are valuable. Between the years 1836 & 1840, he had in St. Bartholomew's Hospital 136 cases of Acute Rheumatism. Of these, 75 were males, 61 females. Of the 75 males, the heart was affected in 47, unaffected in 28. Of the 47, the endocardium alone was affected in 30; the pericardium alone in 3; and both in 7. In 7 others, the seat of disease was uncertain. Of all the males, 3 died; and in these, both membranes were inflamed. Of the 61 females, the heart was exempt in 18, affected in 43. Of the 43, the endocardium alone was affected in 33; pericardium alone in 4; and both membranes in 4; in 2 the seat of disease was doubtful. None of these died.

First, then, of pericarditis. When we observe a rheumatic patient's countenance become anxious, when he is restless, lies supine, breathes in a shallow and hurried manner; complains of pain

Wardrop on Diseases of the Heart. p. 533.

or uneasiness in the cardiac region, faintness, shooting pains to the clavicle; avoids lying on his left side, we may suspect that inflammatory action is set up in the heart or its investing membrane. It might seem surprising that with such an array of well-marked symptoms, the disease should be so often overlooked. But it is very seldom that all these symptoms exist concurrently; and in not a few instances are they almost entirely absent. If however, the heart be carefully watched, and frequently examined by means of the stethoscope, the disease would be recognised in numerous instances when its existence eludes observation. For the characteristic sounds produced by the rubbing of the opposite surfaces of the pericardium on each other is not audible at all times. On the contrary, the physician may examine the organ before effusion is so far advanced as to give occasion to the friction sound; and again examine when the process is so far advanced, that the surfaces are glued together for life, when, of course, he fails to perceive the presence of the disease.

very often absent or slight

Dr. Wardrop questions whether it is possible that the surfaces of the pericardium can emit
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Latham on Diseases of the Heart. Lect. viii.

Watson's Practice of Physic. vol. ii. p. 291.

an audible friction sound, considering the consistence of the effused lymph. How can he explain the characteristic sound otherwise? Stokes case

In many cases an undulating motion is often visible between the cartilages of the ribs on the left side; Latham says, always between the second and third, or third & fourth, or both at the same time. Likewise, a vibrating motion is often perceptible to the finger over the same spaces. These, however are not such valuable marks in the diagnosis, as auscultation furnishes us with; they are seldom present till the disease is pretty far advanced.

The character of the effusion is such as is observed on other serous membranes. The appearance of the effused lymph on the surface of the membrane has been likened to various familiar objects; as for example, the appearance produced by separating two boards of wood, between which lintter has been compressed. After the two surfaces are adherent, the lymph becomes organized, but the connecting layer gradually diminishes in thickness with age, and the heart is visible through the membrane. If the patient die, however, shortly after

after adhesion has taken place, the opposed surfaces are easily separated, the effused lymph being still soft. Or effusion may take place to a great extent without reabsorption of the effused liquid. In these cases, the pulse and voice are feeble; there is frequent a bulging over the cardiac region, and percussion shows the heart dulness to be pyriform, broader below than above, and often almost quadrilateral. The heart sounds appear distant, and there is absence of the respiratory murmur in front. In such cases, the patient seldom survives beyond a few days. Pleurisy may be mistaken for this condition, but in that disease, the dulness is posterior, and the heart sounds are audible. Besides, the expression of anxiety, or even despair, so well-marked on the countenance of the patient with pericarditis, is absent in the pleuritic patient.

Pericarditis is often associated with renal disease, and this is a most serious complication. Indeed, we find that the renal is a dangerous complication in all forms.

The nervous forms of pericarditis have attracted considerable attention. Various symptoms of the

D. J. W. Beqhis - Monthly Journal of Med. Science. Jan. 1833.

Medical Gazette, 1830.

The nervous system are associated. Delirium is often developed; of this, however, we will say more under the encephalic complications. Jactitation, chorea, &c are sometimes observed.

Chorea is sometimes developed in rheumatic subjects without the concurrence of pericarditic symptoms. Dr. Begbie relates the case of a little girl suffering from rheumatic fever, in whom chorea and heart affection supervened immediately on the cessation of the fever. His theory is that the morbid condition of the blood which gives rise to rheumatism, also gives rise to chorea, and this case certainly supports his views.

Similar cases are related by Dr. Kirkes, with the exception that in his cases, the heart was affected during the rheumatism, while in Dr. Begbie's case, there was no evidence of cardiac disorder till the rheumatism had subsided.

The causes of these symptoms have given rise to much discussion. Craigie ascribes them to reflex irritation from the nerves of the head; while, according to Taylor, they are due to the same cause as uraemia.

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Watson's Practice of Physic, vol. ii. p. 312.

The tendency to cardiac disease is much greater in youth than in adult age, and probably greater about the age of puberty than at any other time. At that time the irritability of the heart is a strong predisposing cause; for whatever renders it irritable, causes proclivity to its being attacked. And so, probably, women are more liable than men, and the pale and debilitated more than the robust. Dr. Watson, however, says that the younger the patient, the greater is the tendency to cardiac complication; and he states that he has observed only three cases of rheumatic fever prior to the age of puberty without cardiac affection.

Moreover, it is not dependent on the severity, though it is on the character, of the rheumatic fever; for Latham states that it is as frequent in mild as in severe cases, but far more frequent when the inflammation is of a migratory character. All depressing agents tend to produce it: copious bleeding may thus give rise to it.

As to the period of the disease at which cardiac symptoms are most liable to be developed, there is no regularity. Indeed the cardiac disease often

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Latham on Diseases of the Heart. Lect. VIII.

often precedes the articular for some days; while in other cases it is not observed till the decline of the disease.

Scarcely less serious is inflammation of the lining membrane of the heart. This manifests itself by a feeling of discomfort about the heart, irregular action, palpitation, but no pain or tenderness on pressure. The pulse is very small, usually very rapid, and often intermitting. The countenance wears a look of great anxiety; the lips are livid; the features pale and shrunk in. If there be obstruction to the flow of blood, there is great dyspnoea; and a troublesome cough is frequently present. Besides these symptoms, there is a great tendency to delirium, of which we will speak presently.

From the statistics given above, it appears that "endocarditis occurs nine times in Acute Rheumatism for pericarditis once; that simple Endocarditis constitutes more than two-thirds of all rheumatic cardiac affections, and simple pericarditis only one-thirteenth, and that pericarditis is more frequently found in combination with Endocarditis than alone."

Now, what are the appearances presented when the heart is examined in such cases? We find the membrane reddened, sometimes on the entire surface; but much more frequently the redness is patchy, and the surface rough and velvety; and along with this, there is infiltration and thickening to a greater or less extent. Or the morbid changes may be confined to the valves alone, and cause alteration of structure in them quite explanatory of the sounds, and other symptoms manifested during life. And the most frequent appearance we meet with is the effusion of coagulable lymph in the form of little granulations, which assume a variety of shapes. Not infrequently, however, the deposit takes place beneath the membrane, causing thickening and puckering of the valves, with loss of their natural pliancy. Doubtless, the formation of these granulations is often the result of reckless bleeding, acting injuriously in two ways; viz, by the irritability which it causes; and by the great reduction in the force of the circulation, facilitating the deposit, as retarded movement of the blood is known to do; or if the bleeding be to actual syncope, ^{the}

the tendency is still further promoted by the temporary stagnation.

As to the physical signs, there is no bulging, but with each beat, the heart is lifted up, and there is a peculiar undulating movement; the area of dullness is not much increased; at least, not at first.

The Endocardial murmurs are generally well-marked, especially if there be obstruction to the flow of the blood. It must be borne in mind, however, that the loudness of these murmurs, depending as they do, on the force with which the blood is propelled through the orifices, will vary very much; so that after the exhibition of powerful sedatives, they may be very weak.

Of these sounds there is great variety, denoting aortic regurgitation &c; but it is not necessary that we enter on them here. The seat of lesion may often be inferred from observation of the Carotids &c; and if it be aortic, it is often heard along the whole course of the aorta in the back. ?

But besides, there are probably cases of murmurs unconnected with valvular disease.

The Carnea columnae may become spasmodically contracted, rendering tense the free margins of the valves

Latham on Diseases of the Heart. Lect. III.

Corrigans in Dublin Hosp. Gazette. Jan'y. 1858.

values, and not admitting of closure. Prof. Laycock mentions a case of this kind, which happened in the Royal Infirmary; mitral murmurs were heard, and yet there was no valvular disease. Dr. Latham, too, states that endocardial murmurs may arise from other forms of mechanical impediment than valvular disease; and he states, moreover, that there are cases of endocardial, arterial, and venous murmurs, which proceed from an impoverished condition of the blood. Even external pressure may give rise to them, especially in children, in whom the ribs are tender and yielding.

Nevertheless, in the great majority of cases, it is otherwise. If the murmurs are persistent, there is probably structural disease; but if they vary - one day loud, the next, inaudible; it may not be so.

Dr. Corrigan explains the feebleness of the pulse in endocarditis, which, of course, is the result of the feeble action of the muscular organ, the heart, by what we observe of muscular tissue in analogous instances. Thus, when there is acute inflammation of the pleura costalis, the intercostal muscles

do

Latham on Diseases of the Heart. Lect. III.

do not act. Likewise, in peritonitis, the muscular structure of the intestines is generally inert; and even in articular inflammation, the muscles connected with the joint obstinately refuse to act.

As to the results of these cardiac affections, let us again look to Dr. Latham's statistics.

Of the 90 cases of rheumatism in which the heart was affected, in 63, the seat of disease was the endocardium alone, of whom, none died; but of that number, only 17 recovered completely. And of the 7 cases of pericarditis, none died. But what resulted? The friction murmur disappeared, but we cannot infer from that that permanent structural change had not taken place, as we may venture to do on the disappearance of the endocardial murmur. The established doctrine now is, that in these cases there is permanent adhesion. And, lastly, of the 11 in whom both membranes were inflamed, 3 died; the endocardial murmur ceased in 2, but remained in 6; while in all, the pericardial lesion was probably imperfectly repaired, as above stated.

But

Virchow. Cellular Pathologie. s. 184-188.

Bardleben's Chirurgie und Operations-lehre. 2^{te} Lief. s. 242.

But the danger of endocarditis does not limit itself to the heart alone. A very frequent and very serious occurrence in these cases is the washing off from the valves of some of the granulations already spoken of, and occasioning plugging in the arterial system. This subject has been successfully wrought out by Virchow, and the above-mentioned obstruction to the flow of the blood has been termed by him "embolismus". Very serious consequences ensue when an artery is thus obstructed, on whose supply some important function depends, as the ophthalmic. This is one of the common causes of apoplexy in these cases; the cerebral artery (usually the right) being plugged, and loss of consciousness ensuing as instantaneously as if the carotid itself were obstructed. Cases have occurred, in which the main artery of a limb has been obstructed, and gangrene followed; and others, in which the splenic artery has been so obstructed as to cause great congestion, and even rupture.

A great variety of phenomena may thus result from the passing along of these emboli into such arteries as the pulmonary, renal, &c.

Before Virchow explained the origin of emboli,
and

and the accompanying changes, the occlusion of the arteries was ascribed to arteritis.—

These, then, are the most important primary and immediate changes connected with cardiac complications. They may be so severe as to terminate life speedily, or they may, by inducing still further changes, as hypertrophy, dilatation of the chambers, &c., shorten the patient's career, and render miserable what does remain of it.

Having thus given a short sketch of the most important of the cardiac complications, let us say a few words regarding the encephalic, which, as already mentioned, have great tendency to supervene on the cardiac. In these cardiac cases, the occurrence of delirium, coma, convulsions &c is very frequent; and especially so in nervous and irritable individuals, and in those who have had much mental exertion previous to the attack, such as hard study, or anxiety. Drunkards are very liable too.

When pain is intense, and great restlessness during night, loss of sleep itself is a highly predisposing cause.

The occasion of these symptoms has been explained

Watson's Practice of Physic. vol. ii. p. 312.

Fuller in Monthly Journal of Med. Science. Jan. 1853.

Monthly Journal ^{& Retrospect} of the Medical Sciences. Jan. 1849

Latham on Diseases of the Heart. Lect. 18.

plained in various ways. They have been ascribed to metastasis, but Watson says this is by no means common, though cases are mentioned by him, D. Fyfe of Newcastle and D. Fuller. They have been considered due to the action of the materies morbi itself; to the balance of the cerebral circulation being disturbed by the cardiac affection; and, lastly, and has been conjectured that these phenomena are reflex, originating in irritations of the cardiac nerves.

Mr. Ansell relates a remarkable case of rheumatism complicated with arachnitis, and a very diseased state of the heart. The latter organ weighed 23 oz. and almost every part of it presented some morbid lesion.

Pulmonary complications also very frequently exist concurrently with cardiac, and, as might be supposed, add very materially to the danger of the case. They are said to be present in 1 in every 6 cases of Rheumatic fever. This accords pretty closely with what D. Latham observed in his practice. Of 136 cases of Acute Rheumatism, the lungs were inflamed in 24, or 1 in 5½. Of the 24, 4 were affected with bronchitis,

Edin. Monthly Journal of Med. Science. July. 1853.

18 with pneumonia, and 2 with pleurisy; and all were of a very serious character. And, to show their more frequent occurrence with heart disease, Latham observed in 46 cases of acute rheumatism, in which the heart was unaffected, the pulmonary diseases occurring as 1 to 9; while in 90 cases of cardiac lesion, they were as 1 to 5.

Dr. Fuller also states that of 246 cases of acute Rheumatism observed at St. George's Hospital, pulmonary complications were present in 41, or 1 in 6: pleurisy or pneumonia, or pleuro-pneumonia, were present in almost all the fatal cases of carditis.

Dr. Laycock has observed bronchitis to be the most frequent form when there is no cardiac disease, while pleurisy or pneumonia are more commonly associated with cardiac lesions.

As to the renal complication, it is indeed part of the disease. We have already said that there is a mucous cloud in the urine; but, more than that, white granules are sometimes observed, containing nuclei, and similar to renal epithelium, in different stages of

Watson's Practice of Physic. vol. ii. 923.

of development. Probably, the kidney is involved in a simple nephritis. Prof. Layerck mentions cases of this kind. Very different phenomena are apt to ensue.

An affection, very frequently, coexistent with Rheumatism and Gout is ophthalmia, inflammation occurring in the fibrous tunic of the eye - the sclerotic. But it does not always limit itself to that tissue; it often extends to the conjunctiva and iris. It is seldom that the inflammation results in any permanent structural change; at any rate, when limited to the sclerotic: iritis, however, is always a serious affection.

Various other morbid states of the system are found to be associated with Rheumatism, which it is not necessary to mention here. Thus, Erythema nodosum has been observed by Rayer; and Watson mentions two instances of it, one preceding, the other following a case of Rheumatic fever.

There is perhaps no subject connected with the practice of medicine, regarding which there has been so much discussion as the treatment of Rheumatic fever. And as we observe with respect

Medico-Chirurgical Review. London. July 1836.

respect to many other diseases, for which we have no certain remedy, a vast number of medicines has been boasted of as specific, each enjoying its day of repute, but as surely falling out of use again. And the most opposite plans of treatment have been proposed, founded on the various theories of the nature of the disease. In short, the diversity of opinion has been so great as to lead the majority of practitioners to establish and follow out a plan of treatment, each for himself. Some of the more important of these methods we will briefly consider.

As might be anticipated, one of the oldest is the much abused practice of blood-letting. M. Bouilland carried this practice to an enormous extent, bleeding the patient daily, till he was almost exsanguine. He says, "The genuine specific for acute articular rheumatism, its cinchona, if I may so speak, is the anti-phlogistic treatment, and above all, blood-letting, which is the prince of antiphlogistic".

By many, it has been practised under the supposition that the inflammation is of the ordinary

ordinary

Latham on Diseases of the Heart. Lect. x.

ordinary character; and the amount drawn has been erroneously regulated by the buffy appearance of the blood, which frequently continues after the abstraction of a large quantity. Doubtless in a young robust man, when the inflammatory fever runs high, venesection may afford temporary relief: but it must be borne in mind that the patient has a long and exhausting illness before him. If it had the power of cutting short the disease at the outset, the practice would be quite justifiable, but even the advocates of bloodletting admit that it has seldom that power. Moreover, when we consider that rheumatism is a disease which chiefly attacks individuals in the lower ranks of society, whom poverty and privation have already debilitated, there must be few whose constitutions admit of a free venesection. We have reason to believe also that it produces irritability of the heart, as above stated, and renders that organ more liable to the formation of vegetations.

D. Latham gives striking & very varied results from the employment of this remedy in Rheumatism; results which warn us to be very guarded

in bleeding in that disease; and one of the principal hazards he considers to be the shock which the nervous system is apt to sustain.

The cases, then, suitable for abstraction of blood are very few; and when it is thought necessary, it is as preparatory to the administration of other remedies, not as being the principal remedial agent itself, and it is to be done with caution.

As to local bleeding, the migratory character of the disease is sufficient to prove it useless, and it may be hazardous, by causing metastasis to some of the viscera.

One of the most suitable methods of treatment, and one much in favour at present is that by alkaline remedies. This method was suggested by the observation of the acid properties of most of the secretions, the urine, the saliva, the perspiration. Here again, we find physicians differing as to which is the most efficient of these. Garrod strongly recommends the bicarbonate of potass in large doses, to be given continuously for some days. Under this method, he reports that he was very successful, the average duration

D^r Sandwith, quoted in the Dublin Hosp. Gazette. Jul 1857.

Barlow, quoted in the Med. Times & Gazette. Aug. 1857.

duration of the disease being not more than fourteen days, while many recovered much earlier.

Again, the acetate is much lauded by many eminent authorities. Dr. Sandwith of the Hull Infirmary reports great success under this treatment, and ascribes its superior properties to the rapidity with which it acts as a Zelenifuge. He gave it in the dose of one or two drachms daily, dissolved in half a pint of water, and most of his cases recovered within fourteen days. Dr. Goding Bird also gives his testimony to the efficacy of this medicine, after a good deal of experience, both personal, & among hospital patients. Dr. Barlow recommends it in preference to the bicarbonate.

The nitrate has been used with much success. Professor Bennett prefers this preparation to any of the others, and has treated several cases in the Edin. Infirmary very successfully. But all these forms are suitable, and the success of one or the other in different cases may perhaps be attributed to varieties in the diatheses of the patients. It is fortunate that most of these remedies have a diuretic action, the ejection of the poison being thus favoured.

Dr.

J. J. Alexander on Rheumatism in Joints. 1838.

Watson's Practice of Physic. vol. ii. p. 747

Christison's Dispensatory, p. 334.

Dr. Alexander says that these remedies are usually given in a too concentrated form, so that they pass off as purgatives, and thus their diuretic action is lost. - They are likewise said to have the power of preventing the deposit of the fibrin of the blood, and thus averting one of the most formidable parts of the complaint. If they really possess this action, their value is much enhanced. Besides they are very easily administered, and indeed are grateful refrigerant drinks during the fever.

Again, colchicum has long been considered, and still is held by some to be a specific in Rheumatism. But its success in this disease is not to be compared to its wonderful effect in arresting the paroxysm of Gout. Indeed its employment in the latter disease led to its extension in the treatment of all forms of Rheumatism. Its beneficial effects, however are almost entirely confined to that form which we have already spoken of as Bursal Rheumatism, which approaches more closely to gout than the fibrous form.

Christison is of opinion that its action in these

D. J. M. MacLagan on Colech. Autumnale in
Ed. Monthly Journal of Med Science. Dec. 1851.

loc. cit.

Graves. London Med. Gazette vol. vii.

diseases is not so much to be attributed to a specific effect as to the powerful sedative influence which it exercises on the circulation.

And Macleagan states that it seldom alleviates either gout or rheumatism, without producing its physiological actions, such as lowering the pulse, causing diarrhoea, diuresis, or diaphoresis.

Chelius of Heidelberg was the first to discover a remarkable effect produced by Colchicum, viz, the increase of the urea & the uric acid in the urine. It has been supposed that the uric acid becomes converted into urea, but the proof is not very clear. Dr. Graves ascribes to it the power of putting a stop to the morbid formation of the lithates.

When it is given, it should be cautious, as its effects in what are called medicinal doses frequently approach to the symptoms of narcotics-acid poisoning. Urgent diarrhoea and griping, dryness of the throat, and great heat in the abdomen, besides nausea and vomiting are often thus produced; and to push it further after the development of these symptoms, which may be looked upon as indicative of its specific action.

Latham on Diseases of the Heart. Sect. XI.

Neligan's Materia Medica. p. 105.

action on the system, asoptalism after mercury, or tinnitus aurium after quina; to push it further would be not only useless, but perhaps hazardous.

D. Latham advises great caution in the administration of this drug. In his opinion, it is suitable only in the milder cases, and even then, far from sure; and the only occasions on which he employs it, are such as ^{when} the symptoms have abated under the influence of some other remedies, but none of them entirely abolished, in order to speed the cure; or when a relapse has taken place, which he states is seldom so severe as the primary attack. In these cases, he has administered the drug alone.

Moore Deligan says the cases are very few, in which the exhibition of colchicum is admissible, and that in all cases in which it is employed, it should be commenced in small doses, gradually increased; both on account of the variability of its action in different individuals, and the variable strength of the preparations.

The plan of treatment by lemon-juice, as recommended by Dr. Owen Rees, has not the beneficial

Moose in Dublin Hosp. Gazette. July. 1837.

Neligan's Materia Medica. p. 314.

Dr. J. Alexander on Rheumatism & gout. 1838.

beneficial effects which were at first expected; like most of the other specifics proposed for this disease, it has fallen into comparative disuse. Notwithstanding, we have the testimony of many eminent authorities as to its efficacy. Dr. Moore of Dublin prescribes it along with the acetate of potash, and ascribes to it a sedative action, besides possessing the power of keeping the bowels and other excretories open. And others corroborate this statement as to its sedative action, besides possessing the power of relieving the agonizing pain. Meligan states that, like colchicum, it is more adapted to those forms of Rheumatism which approach in their character to Gout than to any other form; and that, though he has observed very beneficial effects from its use in many cases, yet in others, no good result whatever followed its employment. Dr. Alexander remarks also that he has found it very uncertain in its action, and sometimes causing even prejudicial effects, as griping, purging, &c. He says, "Where it succeeds, I believe its success is attributable to the vegetable salts

Prof. Bennett. in Edin. Monthly Journal of Med. Science. 27/53.

salts of potash that it contains, citrates, malates, tartrates, &c, in a high state of dilution".

D. Bennett has recorded four cases in which he used this remedy. In all, he gave it in large doses, but in none did it seem to alleviate or control the disease. He contrasts its efficacy with that of the nitrate of potash, from which he has observed decidedly beneficial effects.

D. Rees gives from one to four fluid ounces daily, but it may be administered in much larger quantity. Besides these actions ascribed to lemon-juice, it certainly is also a most pleasant refrigerant.

Many practitioners, taking into consideration the prominent symptoms of pain, direct their treatment principally to the nervous system.

And the consideration is well worthy of attention. Pain is apt to be looked upon as rather troublesome than dangerous, while in truth there are few constitutions which do not give way under the prolonged influence of pain; inducing, as it does, sleeplessness, and so giving rise to encephalic changes. Now the principal medicine which has been used for the fulfilment of this indication

Watson's Practice of Physic. vol. ii. p. 745.

-tion is opium. Many eminent authorities recommend the use of this drug, but all enforce the necessity of giving it in very large doses, so large as to assuage the pain. And it is a well-known fact that pain enables the nervous system to withstand the influence of narcotics, gives "tolerance," as it is called of the drug. In tetanus, for example, it has been given in enormous quantity, without the development of any narcotic symptoms, (though its efficacy in that disease is doubtful.)

Latham administers it in doses of three or four grains daily, beginning of course with smaller doses; while Corrigan of Dublin "found twelve grains in the 24 hours to be the requisite amount." This, however, is probably too much for the majority of individuals; half that amount, or less, would be nearer the mark.

Another plan of treatment is that introduced by Dr. Chambers, viz, that of purgation. The remedies chiefly employed are calomel in the dose of 10 gr. at night, succeeded by a dose of the black draught in the morning. When tormina and tenesmus and other disagreeable symptoms result from this treatment, it must be in-

-mediate

Medical Times & Gazette. Nov. 1857.

Watson's Practice of Physic. ii. 750.

-mediately discontinued. The success of this method is stated to be very favourable. Dr. Latham ascribes the good effects rather to the influence of the mercury on the secretions than to the actual purgative action of the dose, though it is thus named. One serious objection to such treatment is the inconvenience caused in such a painful disease by so many calls to evacuate the bowels.

Dr. Kauschka recommends iodide of potassium in combination with morphia, from 15 grs. to 4 scr. of the former, with from 1/2 gr. to 1 gr. of morphia.

Various other remedies have been tried and recommended, such as guaiacum to produce diaphoresis, tartrate of antimony, and a list of others, but it is unnecessary to go into detail regarding these.

Local applications are frequently of great service, and are very grateful to the feelings of the patient. They should never be cold, as the danger of metastasis is thereby increased, but warm alkaline and opiate fomentations are not to be rejected. Dr. Fuller uses a solution composed of half an ounce of
Carbonate

carbonate of potass, in nine ounces of hot water, with six drachms of liq. opii. sedativum.—

With regard to the treatment of the cardiac complications, it is unnecessary that we enter fully into such a wide subject. In many cases, we have the opportunity of making use of preventive treatment, if any remedy has the power of preventing the development of cardiac symptoms; while in the majority, the cardiac disease is established before the patient applies for relief; and lastly, in a few, the articular is actually preceded by the cardiac affection.

Now, suppose we have the treatment of a case of rheumatic fever, before any symptom of cardiac disease has shown itself, can anything be done by way of prevention? Remedies have been mentioned, but it is manifest how difficult it must be to arrive at satisfactory conclusions as to the efficacy of these remedies. For in a great number, cardiac symptoms supervene, even after the continued use of prophylactic remedies, and in those cases where they do not supervene, how are we to know whether to attribute the exemption to remedial influence or not?

Latham on Diseases of the Heart. Lect. XII.

Watson's Practice of Physic. ii. 321.

Latham on Diseases of the Heart. Lect. XIII.

Of those remedies, then, the most highly lauded are opium and venesection. The latter is highly commended by Dr. Latham, but only in certain cases; while he warns strongly against its reckless use. He says: "All the remedies put together cannot compensate the loss of this, whether for cure, or for prevention". This, of course, he does not mean to apply to all cases, for in many, especially those of an irritable disposition, such a measure is very hazardous.

When the cardiac disease is established, local bleeding is often of great service, especially in pericardial cases. Dr. Watson recommends this treatment in preference to venesection. When there is much effusion, a blister is often very efficacious in causing disappearance of the effused fluid.

Mercury has been applied to these cases, as to inflammations of all other serous membranes, on the ground of its peculiar efficacy in promoting absorption of the morbid effusion. Dr. Latham recommends it as he recommends blood-letting, not in all cases indiscriminately, but in many; and from the results of his practice

practice, he ascribes to it a reparatory, rather than an antiphlogistic power.

Having thus briefly mentioned the principal remedies recommended for the treatment of these cardiac lesions, let us, in conclusion, give a short resumé of the treatment of Rheumatic Fever.

Our object is to facilitate the elimination of the *materies morbi*; for the fulfilment of this indication, alkaline remedies are probably the most suitable. Venesection is to be cautiously employed, and in few cases is it indicated. Opium is of much service, as it is in all diseases where pain predominates; only, when there is tendency to head symptoms, it is to be administered with caution.

As to the use of colchicum, lemon-juice, iodide of potassium, &c. the nature of the case may indicate whether they are expedient.

Local fomentations of alkaline and opiate medicines combined are highly serviceable.

It is the duty of the physician to watch attentively when the first symptoms of cardiac implication arise. Still, there is danger in examining the heart too frequently, as it directs the patient's

patient's attention to it. When its action is very strong, digitalis or aconite may be given, their effects being carefully watched. Perfect quietude and rest constitute the principal treatment in these cases.

Cough is a very troublesome symptom apt to arise; chloric ether or other antispasmodic remedies may suffice to allay it. When encephalic symptoms are strongly developed, it may be necessary to shave the head, and apply cold; or when there is much congestion, a few leeches may be applied to the temples. Mustard poultices applied to the feet often give relief.

In convalescence from Rheumatic fever, bark, or the chalybeates, are of much service, and the patient should wear flannels next his skin.