Graduation Essay for the Degree of Doctor of Medicine of the University of Edinburgh, by

Thomas Blunt, L.R.C.P. Lond. and M. R. C. S. Eng.
Acute Rheumatism

Acute Rheumatism, or Rheumatic Fever, the terms being synonymous, is a disease, which occurs only in persons, who are of the rheumatic diathesis, i.e., in whose systems there is a latent condition liable to be developed into an active manifestation, by the influence of stimuli or excitants acting from within. We cannot discern a rheumatic, as we can a tubercular diathesis, from the aspect of an individual, for, although, both, are the subjects of a diathetic disease, in the one, there is a something, indelibly impressed in the features of the person, which, in most cases, enables us to say that his constitution is tubercular, in the other, there is nothing at all, which will lead to the opinion, that his constitution is rheumatic.

Rheumatism is an hereditary disease; and, if, the general law of hereditary affection be that advanced by Dr. Richard, viz., "that all original connate bodily peculiarities
"Tend to become hereditary, while changes in the organic structure of the individual from external causes, during life, end with him and have no influence on his progeny." It follows, that if hereditary, (and that it is so no one can doubt,) it must also be constitutional. Other proofs of its constitutional nature, are, that the victims of the disease, though strong, perhaps, and equal to much bodily exertion, are peculiarly sensitive to atmospheric changes; are prone to perspire; their urine often deposits water on standing, and is said to contain certain microscopical elements, peculiar to this diathesis (this assertion, however, which was first made by Dr. Laycock) I shall again advert to, when considering, more at length, the condition of the urine. Flying pains are often felt by them, on the slightest derangement of the general health; and on this system becoming lowered, or deranged, the acute form of the disease often shows itself. However, for the occurrence of an attack of acute rheumatism, it is necessary that there should be, not only, the rheumatic
diathesis, but also the presence of an external stimulus, to excite the latent condition into development. M. Chomel has noticed among the exciting causes excessive lactation, inordinate indulgence of sexual desires, and debility attendant upon convalescence. And, it is not, at all uncommon, to see, in our large hospitals, especially during the winter months, some patients, who, when convalescent from some disease, not rheumatic, are obliged to return to bed with rheumatic pains in the joints. But the exciting causes are very numerous, indeed almost anything, which depresses the nutrition of the system, in whole, or in part, may be so regarded. Thus when a stream of cold air is impelled on some part, say the shoulder, of a person of the rheumatic diathesis, it determines, as a more general exposure to cold might do in the same person, the rheumatic state of the blood, and it also determines the part, in which that rheumatic affection shall manifest itself, first, or alone. The depressed nutrition of the chilled shoulder
makes it more liable than any other part, to be the seat of inflammation excited by the diseased blood. This is only an example of a general rule, that a part, whose natural force of nutrition, is in any way depressed, is more than a healthy part, liable to become the seat of the chief manifestation of a general blood disease. Again, a part that has been the former seat of injury, or disease, and that has never recovered its vigour of nutrition, is always so liable. Thus, the old rheumatic joint is apt to receive the brunt of the new attack. If a person sprain his ankle, and he be, at a subsequent period, attacked by rheumatism, it will be sure to implicate the weak joint, probably earlier than any of the other joints. The same holds good as regards those parts, which are subject to violent and constant exercise. Blacksmiths, for example, very generally suffer most in the joints of the arm, and its muscles. Husherwomen, in joints of the hands and fingers. Gardeners, and others accustomed to digging, or stooping, are exceedingly liable.
to have lumbago, which is rheumatism of the fibrous tissues of the loins; and others, much employed in walking, are peculiarly subject to rheumatism of the legs. In all these cases, the nutrition of the parts affected is unusually excited; their power of attracting and separating from the blood, such matter as correspond with them in chemical constitution, is proportionally increased, and therefore a slight depressing cause will exert a powerful influence in arresting the elimination from the blood, at those parts, of those materials, which result from the decomposition of the albuminous and gelatinous tissues; their accumulation and probable disintegration in the blood exciting the local inflammation. This is the likely cause, why these particular seats are affected, previous to other parts. And, when we consider Dr Carpenter's statement that epidemic, and other zymotic influences, bear with peculiar force, on those, in whose blood there is an accumulation of disintegrating agitated compounds in a state of change, we have afforded us a probable explanation why acute rheumatism,
which is attended with the accumulation of
disintegrating agglutinated matter, sometimes
occurs as an epidemic, as it did in London,
and many parts of England, in the autumn
and winter of 1804. The seats of rheumatic
inflammation are those, which contain, or are
made up of the white fibrous tissue; thus
the disease affects the aponeurotic sheath,
the fascia, the capsules of the joints, especially
of the larger ones, the ligaments and tendons,
and the fibro-serous membranes in various
parts of the body, particularly the pericardium,
endocardium, and the valves of the heart.

Rheumatism is also a specific disease,
for its characters are dependent on a definite
and specific morbid condition of the blood;
the local manifestations of this disease being
confined to those parts, which are in a
state of malnutrition, consequent on the
presence, in the blood, of a morbid material.
The local disorder is attended with the
accumulation, and leads to the discharge,
or transformation, of that morbid matter.
It may be, that, the morbid condition of
the blood consists in undue proportion of
one or more of the normal constituents, or perhaps a new substance is added to, or formed in, the blood; in either case, the phenomena of the disease depend chiefly, and in the first instance, on a certain specific material, in the blood. And probably this materia morbi is incorporated with the characteristic morbid structures at the local seat of the disease. In opposition to this view of the specific character of the disease, and of the presence of the materia morbi, in the morbid structures, at the local seat of the affection, it may be said it is all hypothetical and totally devoid of proof. The answer to this is, that, although the actual existence of the morbid material has not yet been discovered, whether in the blood, or in the morbid structures, yet judging from analogy, we may conclude that its existence is highly probable: thus for example the diseases cholera and ague are caused by the introduction into the blood of morbid substances, which, by their presence, produce uniform results; but these morbid materials have never yet been discovered in the product of the diseased processes. Sp,
however, the hypothesis of the presence of a morbid substance, in the blood, with regard to the latter diseases, be accepted, why should it not be, with regard to rheumatism, in like manner, the carbuncular diseases, the various definite, but not communicable cutaneous eruptions, hydrophobia, diphtheria, and many more have not had their specific origin directly proved, yet when we consider that, the chief phenomena of these diseases are in close conformity with those, which are typically specific, e.g. variola, in which we find the morbid material incorporated in the product of the inflammation, their specific origin is highly probably. and, perhaps, the non-discovery of the morbid material, in the product of a rheumatic inflammation, is not due so much to its non-existence, as to our present imperfection of search.

There may be numerous predisposing causes, which tend to produce the rheumatic virus in the system, and numerous exciting causes which may each separately promote its action, and give rise to the immediate development of the symptoms, yet the poison, which is to produce a regular
and determined disorder, like acute rheumatism, must be invariably the same, must be in itself peculiar—specific, as giving rise to a specific affection. It has been much overlooked that a morbid condition of the blood, or perhaps, even of the nervous force, may determine, at once, the seat of a local inflammation, and the form or kind of inflammatory product. Thus, for example, a varicous condition of the blood will determine an inflammation of the skin, and a supplicative form of inflammation. So, also, a rheumatic condition of the blood, whether the local disorder be seated in muscles, ligaments, or synovial membranes, in serous membranes, or in fibrous tissues, tends to serous and fibrous effusions, which are slow to coagulate, or organize, and, even, help prone to suppuration. These facts go to prove the correctness of the statement that "each morbid condition of the blood is prone both to produce an inflammation, in a certain part, and to give rise to an inflammation a certain form or character." We have instances of local inflammation, occurring in consequence of general diseases of the blood, in the cases of the eruptive fevers, when the presence of morbid
materials in the blood is proved by the effect of their transference in inoculation, and the local disorders, which are present in cases of rheumatism, erysipelas, herpes and the like, are acknowledged by all in practice, if not in theory, to have their origin in the blood.

We have other evidences of the disease, being due to the presence of a mürbid substance in the blood, in the symmetry of the local symptoms; in the existence of premonitory fever; a large number of local seats; and lesions of internal organs.

What is the nature of this materiæ morbi? Dr. Farr, in his most recent nosological arrangement, has classed rheumatism under the order of miasmatic diseases. Dr. Garrod and Fuller, while they have failed to prove the existence of a definite poison in the blood, have shown, that the disease acknowledges no external source, and, therefore, it is presumed by inductive reasoning, that some mürbid material is generated by and within the bodies of those, in whom it is fully developed, and is not absorbed like the poisons of typhus and variola, and scarlatina from without.
Dr. Brunt suggested that the phenomena of acute rheumatism were to be explained by the presence in the blood of lactic acid, and this suggestion was enlarged upon by Dr. Todd in his Grossonian Lectures. He there says "that, as lactic acid is imperfectly excreted through its natural channel, in consequence of the influence of cold in checking perspiration, and is too freely developed in the alimentary canal, it is no wonder that it should accumulate in the blood, and become eliminated at every point. Moreover, the long continuance of the causes, which produce the defective cutaneous secretion, and the deranged gastric one, will give rise to the development of lactic acid, in the secondary processes of assimilation, thus infecting the blood from every source, and tending to perpetuate the diathesis."

Many facts go to prove that, the poison is identical with some excretion of the skin, which is probably its natural means of exit from the system, and if this elimination be, in anyway, interfered with, it leads to its accumulation in the blood, and then poisonous consequences ensue. Thus, for example,
a so-called stiff neck, which is rheumatism of the muscles of the neck is produced by a draught of cold air and is again easily removed, or at least relieved, by exciting the skin to action. The popular remedy being to apply a hot iron, this I think proves how intimate its connection is with a temporary suspension of cutaneous action.

The means which nature adopts for its relief and the circumstances which attend their imperfect development are also suggestive of a relationship between rheumatism and cutaneous secretion. No sooner is a person attacked by the disease than excessive perspiration is set up as if with the view of getting rid of some noxious matter, and the secretion is most profuse at the part where local inflammation is taking place. This scarcely requires to be noted for we meet with the fact in every case, and often the only part which is sweating is that which is the seat of the local post-inflammation at the time.

Dr. W. B. Richardson has recently made some experiments to try whether the theory
that the superabundance of lactic acid in
the system induces pathological phenomena
of the rheumatic type admits any direct
demonstration. He injected into the
peritoneum of a healthy cat seven drachms
of a solution of lactic acid with two ounces
of distilled water. The operation was performed
without accident. The opening in the peritoneum
was made palmar and only large enough
to admit a small injecting tube. Two hours
after the operation the action of the heart became
irregular. The animal was left for the night
about six hours after the operation and in
the morning was found dead. The inspection
showed no peritoneal mischief, but the most
marked endocarditis of the left cavities of the
heart. The mitral valve thickened and
inflamed was coated on its free borders
with firm fibrous deposit. The whole
endocardial surface of the ventricle was
intensely vascular.

Dr. Richardson afterwards repeated the
experiment on a healthy dog. The animal
died on the second day after the operation
and the inspection revealed the most striking
pathological signs of endocarditis. The tricuspid valve was inflamed and swollen to twice its ordinary size. The aortic valve swollen and inflamed was coated on its free border with fibrinous beads. The endocardial surface was generally red from vascularity. The pericardium was dry and injected. As before the peritoneum escaped injury. The joints were not affected, but there was distinct scleroditis in the left eye. These experiments prove that endocarditis may be physiologically produced by lactic acid.

Similar experiments were made about eleven years previously, by Mr. Simon of St. Thomas' Hospital. Thus then let us say that the phenomena of rheumatism are to be explained by the presence in the blood of a substance which has a close relationship with some excretion of the skin and that this substance is probably lactic acid; of actual demonstration of its presence we have however no proof.

Before enquiring on the symptoms of the disease let me so far anticipate them as to say that at the local seats of the disorder
especially in the joints and surrounding structures there is an effusion of fluid the nature of which I will attempt to describe. This fluid is the primary product of the inflammatory process and is named "inflammatory exudation" or "coagulable lymph." Probably this exudation is always at first a pellucid liquid which passes through the blood-vessels especially the capillaries of the inflamed part or perhaps only from them. When we examine the fluid, which has an alkaline reaction, effused in blisters applied to these parts, we find it to consist of two structures: namely corpuscles, resembling very much the white corpuscles of the blood and of granulations, and fibrine: these two structures vary in their relation to each other sometimes the one preponderating sometimes the other. The more cachectic the patient the more corpuscular the lymph while the fibrine preponderates in the more healthy subject. This proves nearly to a certainty that the character of the blood is that which chiefly determines the character of an inflammation.
corroboration of this Mr. Paget's observations on the materials exuded in blisters raised by carbolic acid plaster applied to the skin of thirty patients in St. Bartholomew's Hospital may be alluded to. He found that the difference in the general aspect of these materials was slight but that there were great differences in the microscopical characters and these differences so far corresponded with the nature of the disease and of the patient's general health, that at last he could in general guess pretty accurately, from an examination of the fluid in the blisters, what was the general character of the disease from which the patient suffered. Thus in patients who were affected with a local disease and who were in other respects sound, the lymph obtained formed an almost unmixed coagulum, in which, when the fluid was pressed out, the fibrine was firm, elastic, and apparently filamentous. In cases at the opposite end of the scale such as those of advanced phthisis, a minimum of fibrine was concealed by the crowds of corpuscles imbedded in it. The highest health is
marked by an exudation containing the most perfect and unmixed fibrine. The lowest by the formation of the most abundant corpuscles and their nearest approach even in their early state to the character of pus cells. Thus it is evident that the product of similar inflammations excited in the same tissue and by the same stimulus, may be in different persons very different, varying especially in accordance with the several conditions of the blood. To return to the characters of the fluid raised in blisters applied to the skin of a patient suffering from rheumatism we not unfrequently find when the blisters are removed and the cuticle cut that the serosity is prevented from escaping by the presence of a firm coagulum of fibrine immediately underneath the raised cuticle. In the corporeal variety no coagulation in the ordinary sense of the word takes place. If the exudation be of the fibrinous variety it is much more likely to proceed by development into the construction of tissues like the natural structures of the body:
while if it be of the corpuscular variety it will probably soon degenerate and become absorbed. Nevertheless the fibrine may remain in solution, or without coagulation, for an indefinite time within the body but will coagulate readily when withdrawn. One can rarely tell why the coagulation of the fibrine in these cases should be delayed, but it may be observed the delay of the coagulation is a propitious event, for so long as the effusion is liquid absorption may ensue on the subsidence of the inflammation but absorption is more tardy and more unlikely when the fibrine has coagulated. Thus large quantities of fluid which we may be sure contain fibrine disappear by absorption from the seats of acute rheumatism and leave only inconsiderable adhesion or thickening of the affected part, thus it is that the damage done by rheumatism in a part is on the whole in direct proportion to the length of time it has subsisted there, and the opportunity given by time for the coagulation of the fibrine. To sum up, the preponderance of fibrine in the lymph
is generally characteristic of the adhesive inflammation, the preponderance of corpuscles in the liquid is a general feature of the cachectic state of the patient.

Rheumatism is a disease which occurs in persons of almost all ages, but I have not heard of a case occurring under the age of one year or over eighty. The extremes are so great however that for practical purposes, it may be said to occur at any period of life. Its favourite age is between 15 and 25 years. From Dr. Macleod's and Mons. Homel's experience it would seem that very few cases occur before the age of fifteen and comparatively few after the age of fifty. From the reports of St. Bartholomew's Hospital, as seen below, it seems that although over the age of 45 the cases are few, and under 10 only 2.5 per cent; yet that between 10 and 15 a period of 5 years the cases are nearly as numerous, as between 45 and 65 a period of twenty years.
Statistical Table of patients suffering from acute Rheumatism in St. Bartholomew's Hospital from 1860 to 1863 inclusive.

Total number under treatment in 1860 = 263
  " of males = 150
  " of females = 113
Between the ages of 15 and 25. Males 59, Females 44 = 118
  " 25-35  29  25 = 54
  " 35-45  21  16 = 37
  " 45-65  20  9 = 29
Under the age of 15  15  8 = 23
Over the age of 65  2  = 2

Total number under treatment in 1861 = 267
  " of males = 155
  " of females = 112
Between the ages of 15 and 25. Males 57, Females 50 = 100
  " 25-35  41  27 = 68
  " 35-45  28  14 = 42
  " 45-65  17  10 = 27
Under the age of 15  18  10 = 28
Over the age of 65  2  = 2

267
Total number under treatment in 1862 = 293

of males 147
of females 146

Between the ages of 15 and 23. Males 47 Females 61 = 108
25 - 35 49 32 = 71
35 - 45 27 14 = 41
45 - 65 16 22 = 38

Under the age of 15 16 17 = 33
Over the age of 65 4 1 = 2

Total number under treatment in 1863 = 360

of males 194
of females 166

Between the ages of 15 and 23. Males 84 Females 77 = 161
25 - 35 44 30 = 74
35 - 45 31 18 = 49
45 - 65 17 12 = 29

Under the age of 15 16 28 = 44
Over the age of 65 2 1 = 3

Summary
Total number of patients under treatment during these four years. Males 652 Females 531 = 1183
Between the ages of 15 and 25 Males 250 Females 237 = 487
   25  35  153  114 = 367
   35  45  107  62  = 169
   45  65  76  53 = 193
Under the age of 15  65  63 = 128
Over the age of 65  7  2 = 9
   1183

Of the 128 cases under the age of 15 there were between the ages of 10 and 15 Males 53 Females 45 = 98
Between the ages of 5  10  12  15 = 27
Under the age of 5  3 = 3
   128

Thus it will be seen that 41 percent were between 15 and 25

22  35  35
14  35  45
10  45  65
8  10  15
2 5, under the age of 10

Now it is not that persons of 45 and upwards do not suffer from rheumatism for if the diathesis, they are generally very rheumatic and suffer from the slightest exciting cause: but it is because the acute form seldom arises when the irritability of the constitution is blunted by age; yet the variety in form,
depends not on any difference in the nature of the materies morbi but on the quantity on the nature of the constitution to be acted upon by it and on the influence exerted by age and its accompanying changes on the system. The younger the patient is, the more likely are we to get the joint affection, which may not be severe, complicated with heart mischief. It is not that the occurrence of an attack tends to strengthen the disposition to rheumatism but the diatheses remaining it is not long before the patient gets opposed to a cause which again excited the rheumatic condition of the blood and thus is the explanation why a person if he has had one attack generally becomes the subject of another. Those persons are naturally the chief sufferers who through want and privations and neglect of their general health are rendered most liable to that state of malassimilation whereby the materies morbi is produced, and who are most exposed to atmospheric changes and to other exciting causes of the disease. It is this
which explains the prevalence of rheumatism among the lower classes as compared with the higher and among men as compared with women.

Climate and season exert a powerful influence over the production of acute rheumatism but only as the exciting causes. It is not in the most inclement seasons or in the coldest climates that rheumatism is most prevalent but at those seasons and in those climates remarkable for damp and variable weather. It also appears that in its acute form at least the disease is very rare within the tropics and as we draw towards the poles the symptoms of acute rheumatism are almost unknown. In the one case the skin's action is so constant and profuse, that the rheumatic poison, if generated, is in all probability eliminated; in the other the mode of living being so simple and the system at the same time vigorous, that form mal-assimilation whereby the rheumatic poison is generated, is little likely to occur, and the proximate cause of the disease—
being absent, no rheumatism results. In our own country we find that the disease is most prevalent during the winter and spring months. For example out of 289 case admitted into St. George's Hospital there occurred in the order of frequency according to Dr. Fuller:

- May 30
- February 27
- September 22
- March 28
- October 21
- June 21
- November 28
- December 26
- August 16
- January 27
- April 25
- July 14

Now if we can form an estimate from this one example of statistics, and I think general observation bears it out, we see that more cases occur in the month of May than in any other month of the year. How are we to account for this? I believe the explanation is that as May comes many persons regularly leave off their winter clothing and put on thin summer clothes. We certainly get some very warm days but as a rule very cold days also, this variable state of the weather is very apt to prove the exciting cause of an attack of acute rheumatism. Again in July and August the weather is as a
rule warmer and legs variable than in any of the other months of the year; this will perhaps account for the few cases of rheumatism which we then meet with.

What are the symptoms of this disease? An attack of acute rheumatism is generally ushered in by a feeling of chilliness followed by some degree of fever, which may be slight or almost absent or very high indeed. One or more of the joints become very painful and the patient cries out when he attempts to move them. The joint affection may be prior or subsequent to the fever. We ask the patient how long he has been ill and he tells us that he has not felt well for a few weeks, he has been dull and listless, has suffered from headache and probably indigestion, he has had a few flying pains occasionally in the joints and has been very sensitive to the changes of the weather. On some morning, however, having gone to bed the night before feeling about as usual, he found that some of his joints were stiff and rather painful, he got up and ate his breakfast, he went to work but was
obliged to give up and return home. He then went to bed and had a
shivering fit. His skin became hot and sweating, and the joints so exquisitely
painful that he could not move them, and he has had no sleep since. We have
here the history of an attack which was
looming in the distance for some time,
before it became actively manifested. Often
however there are no premonitory symptoms
or rather the patient disregards or does not
take any notice of them and the first
symptoms perhaps is a feeling of pain in
one ankle or knee which is quickly followed
by all the signs of an acute attack. It
may be that the patient will be able to
refer his illness to having a day or two
before, or to having slept in a damp bed,
or perhaps, and this is very frequently the
case, he will tell us he felt that
he has no idea how it was brought on.
We find him in the following condition.
He is lying on his back in bed, face is
flushed, his expression is anxious and evidently
denotes great suffering, there is complete loss of
sleep, he cannot move and screams out if the painful joints are pressed upon in any way, even the weight of the bed clothes causes him to suffer. We examine the joints and find them swollen. They are hot to the touch. They look tense and shining and have a pink blush over them. In the angle of flexion, it is profuse, sour-smelling and reddens like new paper. The skin generally is bashed in sweat, and on the forehead and upper lip especially, it is seen to stand in large drops. The temperature to the thermometer is increased, it is 100°F or it may be as high as 102°F or 103°F. I have never seen it higher than this without there having been some complication. The temperature is higher at a painful joint than it is at the corresponding which is not painful. The respirations are a little quickened the pulse is very soft, full, compressible, and bounding, it is not very frequent and if there be no complication it will probably not exceed 100 per minute perhaps not more than 90 or even less. He is very thirsty and drinks large quantities. He has no appetite.
Tongue is thickly coated with a whitish film. The saliva is acid. The bowels are generally constipated. The urine presents the usual characters of febrile urine: it is scanty, of high specific gravity, deeply pigmented, and loaded with urates. I have here described a typical case, and as all agree more or less in most of the symptoms, I will now analyze a little more at length some of the conditions. First: the temperature in the thermometer will be found to vary considerably in the twenty-four hours, at one time it will be 100°F, then 101°F, then 102°F, then 103°F, and perhaps will again come down to 100°F. As aye, as the might a priori expect, a direct relation to the severity of the pains, when they are most severe the temperature is highest and vice versa. If there be any complication such as pericarditis or pneumonia, the temperature will rise to 104°F or 105°F and in one case which is related by Dr. Ringer it reached shortly before death 110°F. I have however never seen it anything like so high as this. Is there any good to be obtained by ascertaining
the temperature where there is no complication and where the tendency is doubtless to get well? Perhaps not, but still I am inclined to think from a series of observations, that by taking the temperature daily at the same time, we may make our prognosis more certain as to whether there is a likelihood of any complication occurring: for instance, if during the second week of the attack the thermometer has noted 102°F each day, and on a certain day it stands at 103°F or 104°F it will immediately excite our fears that some complication has taken or is about to take place, particularly if no other points become affected: if on the contrary the temperature instead of rising from 102°F begins to fall and continues steadily falling for two or three days until it reaches (say) 99.5°F, the local affection at the same time diminishing, we have very good reason to think that the patient is now in a fair way to recover, and that the poison has been, to a considerable extent, eliminated or at any rate has lost its injurious effects. The perspiration is I may say always acid
and very profuse, during the acuteness of the attack, so much so that the patient is literally bathed in an acid sour-smelling perspiration. Much stress has been laid on this condition of the sweat as pointing to an acid condition of the blood which requires large quantities of alkalies to neutralize it. But does the perspiration in these cases differ in composition from that which is always present in all persons? To determine this let us consider for a moment the nature of the secretion of the sudoriferous glands in health. It has almost invariably an acid reaction owing to the presence of free lactic acid. The sweat contains a quantity of azotized matter very prone to decomposition, as well as an odorous principle. The proportion of water varies with the temperature and hygroscopic condition of the atmosphere, with the amount of liquid swallowed, with the kind of exercise taken and with the rapidity of the circulation. Among the solid constituents we have chloride of sodium, lactates, butyrates, and acetates of ammonia and soda, besides small quantities
of phosphate of lime, the sulphates are only in small amounts. Boracic acid and nitrogen, especially the former, are exhaled from the surface of the body in considerable quantity. Having shown that sweat is acid in its reaction in the healthy as well as in the rheumatic condition, the question remaining is whether there is more acid removed in the latter than in the former condition of a person. It is evident that there is absolutely a greater quantity of acid removed from the blood by the sudorific glands in rheumatism than in health, but it is difficult to say whether the acidity alone is increased or whether the other constituents of sweat are proportionably increased also. I incline to the opinion that the relative amount of acidity is greater.

Much stress has again been laid upon the acid condition of the saliva as proving the excess of acidity in the system. What is its normal reaction? It is feebly alkaline; the alkalinity is increased during mastication and diminished after the process of digestion is completed.
Thus, we see that, the saliva, which in health is feebly alkaline, even when mastication is not being performed, is in an attack of rheumatism, acid. But, its reaction is also acid in all inflammatory affections of the perona, vice, and in various other inflammatory diseases. Thus, though, instead of being alkaline, as in health, it is acid, this condition is not peculiar to rheumatism, but exists also in various derangements of the digestive organs.

It has been said that, the urine is abnormally acid, and that it contains lactic acid, but the readiness, with which this acid forms after the urine is voided, renders the excretion by the kidneys very doubtful, and all things being considered, I think, it is probable correct to say that it is not so excreted. I will now consider a little more at length the condition of the urine during the rheumatic attack.

The water is diminished: the solids are increased, especially the urea and pigment. Dr. Parks has noticed the urea to be increased from one fourth to one fifth, over
the physiological amount. The uric acid is increased. There is usually a great precipitate of urates, during the height of the disease, and at the commencement of the improvement. Brattler says, that the disposition for the urates to fall disappears at the period of improvement, but Dr. Parkes thinks, it is some days later; and from my own experiments, I am inclined to think, that Dr. Parkes' statement is the more correct. The chlorides are diminished, but this may be accounted for, by the deficient ingress in food, and increased egress by other channels. The sulphuric acid is generally much increased; and, at one time, it was thought, that, in no disease was the amount of sulphuric acid so great; but, in pneumonia, it has been found to be quite as much. The composition of the blood, in these two diseases, is similar, and in no others is the fibrine so much increased.

The pigment and extractives are always increased (Vogel)
The free acidity appears to test paper to be very great; this arises in part if not altogether from concentration; for Professor Vogel, in one case, found the free acidity to be greatly reduced. The normal acidity in twenty-four hours in men is given by different observers, as follows:

<table>
<thead>
<tr>
<th>Name of Observer</th>
<th>Acidity equal to grammes of nitric acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>2.75</td>
</tr>
<tr>
<td>Dr. (another man)</td>
<td>1.924</td>
</tr>
<tr>
<td>Vogel</td>
<td>2 to 4</td>
</tr>
<tr>
<td>Kernin</td>
<td>1.924</td>
</tr>
</tbody>
</table>

From my own experiments, I am inclined to think that the amount of acidity represents most nearly the normal standard. It must not be forgotten that the acidity of the urine of women is not quite so great as that of men.

The experiments, which I have made on four cases during the rheumatic attacks, the results of which I will now describe, have led me to conclude, that the absolute acidity of the urine is not increased.
<table>
<thead>
<tr>
<th>Day of Illness</th>
<th>Amount of urine passed in 24 hours in cubic centimetres</th>
<th>Sp. gr.</th>
<th>Acidity equal to grammes of oxalic acid</th>
<th>Required of the soda solution to neutralize cubic centimetres of urine</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 ( \frac{A}{d} )</td>
<td>760</td>
<td>1030</td>
<td>2.43</td>
<td>16 c.c.</td>
</tr>
<tr>
<td>14 ( \frac{A}{d} )</td>
<td>980</td>
<td>1032</td>
<td>2.74</td>
<td>14 c.c.</td>
</tr>
<tr>
<td>15 ( \frac{M}{d} )</td>
<td>550</td>
<td>1031</td>
<td>1.65</td>
<td>15 c.c.</td>
</tr>
<tr>
<td>16 ( \frac{L}{d} )</td>
<td>1150</td>
<td>1032</td>
<td>2.76</td>
<td>12 c.c.</td>
</tr>
<tr>
<td>18 ( \frac{L}{d} )</td>
<td>760</td>
<td>1030</td>
<td>2.128</td>
<td>14 c.c.</td>
</tr>
<tr>
<td>20 ( \frac{L}{d} )</td>
<td>570</td>
<td>1032</td>
<td>1.7</td>
<td>15 c.c.</td>
</tr>
<tr>
<td>21 ( \frac{M}{d} )</td>
<td>740</td>
<td>1027</td>
<td>2.22</td>
<td>15 c.c.</td>
</tr>
<tr>
<td>22 ( \frac{M}{d} )</td>
<td>990</td>
<td>1025</td>
<td>1.65</td>
<td>8 c.c.</td>
</tr>
<tr>
<td>6 ( \frac{A}{d} )</td>
<td>950</td>
<td>1021</td>
<td>1.71</td>
<td>9 c.c.</td>
</tr>
<tr>
<td>8 ( \frac{A}{d} )</td>
<td>680</td>
<td>1028</td>
<td>1.77</td>
<td>13 c.c.</td>
</tr>
<tr>
<td>9 ( \frac{M}{d} )</td>
<td>620</td>
<td>1025</td>
<td>1.364</td>
<td>11 c.c.</td>
</tr>
<tr>
<td>11 ( \frac{M}{d} )</td>
<td>1140</td>
<td>1024</td>
<td>2.28</td>
<td>10 c.c.</td>
</tr>
<tr>
<td>15 ( \frac{A}{d} )</td>
<td>1060</td>
<td>1030</td>
<td>2.97</td>
<td>14 c.c.</td>
</tr>
<tr>
<td>16 ( \frac{A}{d} )</td>
<td>860</td>
<td>1030</td>
<td>2.58</td>
<td>15 c.c.</td>
</tr>
<tr>
<td>17 ( \frac{A}{d} )</td>
<td>750</td>
<td>1024</td>
<td>1.8</td>
<td>12 c.c.</td>
</tr>
<tr>
<td>18 ( \frac{A}{d} )</td>
<td>790</td>
<td>1025</td>
<td>2.84</td>
<td>18 c.c.</td>
</tr>
<tr>
<td>19 ( \frac{A}{d} )</td>
<td>1140</td>
<td>1024</td>
<td>1.824</td>
<td>8 c.c.</td>
</tr>
</tbody>
</table>
Day of Illness. | Amount of urine | Pne. gr. Acidity equal. | Required of the 
passed in 24 hours | to grammes of 
in cubic centimetres | opalic acid. | neutralize double 
cubic centimetres of
25th | 520 | 1020 | 1332 | 13 c.c.
26th | 700 | 1015 | 7 | 4 c.c.
28th | 550 | 1020 | 1.24 | 11 c.c.
29th | 1300 | 1013 | 1.56 | 6 c.c.
30th | 1700 | 1013 | 1.36 | 4 c.c.

15th | 1730 | 1011 | 1.38 | 4 c.c.

I regret, that, I am not able to relate more cases, as these may appear insufficient to establish anything; at the same, I would wish to state, that, from many observations, which I have made, although those above are all that I have been able to arrange into a table, the general left on my own mind is that the condition of the urine, as regard acidity, is not much altered. In none of the above cases, was any medicine taken, during the time allowed for the observation, and it appears, that, in none did the acidity reach to 3 grammes,
and in one case (a woman) it was only 7 grammes. If, therefore, we take the normal acidity to be that declared by Vogel, it is evident, that, in these cases, the acidity was not increased, but often diminished. Thus, I conclude, the statement, that the acidity of the urine in acute phthisis is increased, is fallacious, for, if we consider the acidity excreted in the urine, it is found to be beneath the normal standard; and, that, the apparent acidity is due to the diminished quantity of water, and consequent concentration.

I have said, that, the blood in phthisis contains a morbid material, whose natural exit appears to be the skin, the sudoriferous glands being stimulated to increased action by its presence, in the blood, and, that, there is no positive proof that it has any other natural exit from the system. Still however, it is very probable that its elimination is accelerated by acting on the kidneys, and the relief which follows one or two watery, alvine evacuations, makes it almost that it may be carried out of the system, by the bowels.
The skin and kidneys do not always act in antagonism, during an attack of acute rheumatism; for sometimes, when the skin is sweating profusely, the kidneys are secreting large quantities of urine. We account for this apparent anomaly by the fact that the patient drinks large quantities of diluent, which act upon the kidneys, and that, at the same time, the morbid material is stimulating the sudoriferous glands to action: in addition to the above cause of diuresis, there is no doubt, a certain stimulating effect produced on the kidneys by the blood, and this stimulation may produce congestion of the organs, when there will be a diminished quantity of urine, containing probably, if the congestion continue, traces of albumen or even blood itself. In one case, which came under my own notice, the amount of albumen was considerable, and blood cells not a few, in twenty four hours however, every trace of albumen and blood disappeared.

Dr. Saycock has described, as being present in the urine of persons" diabetically
rheumatic or arthritic", certain microscopical elements, namely 1. Nucleated cells, resembling the epithelium cells of the convoluted tubuli uriniferi. 2. Rounded masses of granules a nucleus 3. Free nuclei. These several bodies float together, and constitute the "granular small curd-like masses, which float here and there in the mucous cloud". He considers them to be "the epithelium cells and nuclei of the convoluted tubuli uriniferi, inter-mingled with similar products from the calyces, pelvis and ureters" and are considered to be especially indicative of the rheumatic condition. I have often seen these elements in the urine of persons convalescent from an attack of acute rheumatism, but I have not been able to convince myself, either of their universal presence, or that they are peculiar to the rheumatic diathesis. I have seen these elements in the urine of persons, who have not inherited the rheumatic tendency, (as far as history could establish the fact) and who have never suffered from rheumatism. When I have detected their
presence after an attack of acute rheumatism, I have thought it, due to their having become separated from the kidneys, in consequence of the serosity, on congestion of these organs, passing through the basement membrane of the tubules, and loosening the attachment of the epithelium cells to their walls, which then get washed out and are found in the urine. Against this explanation, it may be urged, that we have no proof of the kidneys being congested; it is true, we have not, in a great number of cases, a direct proof, but still the occasional presence of albumen in the urine, during the height of a rheumatic attack, shows that the kidneys are sometimes influenced by this condition of the blood, and therefore is it not possible, that, in most of the cases, they are congested, only to such a slight degree, as to occasion the small quantity of albumen to be overlooked? And, I feel sure, were albumen always tested for, it would be frequently found present. Nevertheless, the fact of the existence of these microscopical elements in the urine of persons of the
rheumatic diathesis, as asserted by Dr. Laycock, is, if true, very interesting, and I hope it will not be thought to be presumption on my part to question its correctness, especially as it comes from such an accurate observer.

Before entering on the treatment of the disease, I will say a few words on the affection as occurring in children, and on the complications we often meet with.

If the child be under twelve or fifteen years of age, the fever may be almost absent, and the joint affection scarcely present, and yet the patient's system is undoubtedly impregnated with the rheumatic poison. On inquiry the will probably will be found to inherit rheumatism, and, during his illness, the real character of the disease will be very likely to show itself, in the form of an inflamed joint. This is important to notice, and it is a fact not to be forgotten, that in a child the feverish symptoms may be slight, the joints scarcely affected, and yet the system may be so thoroughly poisoned, that pericarditis and endocarditis will ensue, and it is
the great probability of this complication occurring, which makes us so fearful, when we are called to see a case of rheumatism in a young subject. In these cases, the premonitory symptoms, being very slight, are overlooked, and the patient, although looking poorly for some few days, is not noticed to be really ill until pericarditis has set in, with terrible earnestness. In the adult, the higher the fever runs, the greater is the danger of getting heart mischief. In addition to endocarditis and pericarditis, we have as other complications of the acute attack, pneumonia, pleurisy. The latter I think is, almost, if not always, subsequent to pericarditis, and never or very seldom occurs by itself. This fact seems to point to the conclusion, that the pleurisy is caused by an extension of the inflammation from the pericardium, to the pleura, from continuity of structure, and this is borne out by the fact that, it is almost invariably the left pleura, which is implicated first or only. The pneumonia seems to be the result of the general blood disease, and may be prior or subsequent to the pericarditis: it is, however, very rare to have rheumatic pneumonia without
pericarditis. In children, it is more frequent to have pericarditis with pleurisy than with pneumonia, while in the adult it is the reverse, pneumonia much more frequently supervening than pleurisy. Another complication of pneumonia is cholera, this, however, does very rarely show itself, after puberty is thoroughly established. It differs from the other complications, in that, when present, the rheumatic condition is often latent, and that, so soon as the rheumatic local affection is manifested, the cholera begins severity or disappears. By some pathologists, cholera has been thought to be due to a rheumatic inflammation of the membranes of the spinal cord; it may or may not be so; however, I do not think it is a necessary conclusion to come to, and certainly it has not been proved to be the case. The frequency, however, of cholera in subjects diathetically rheumatic, and the frequent occurrence of a joint becoming inflamed during cholera affection, makes it certain that these two diseases bear a very intimate relation to each other. As necessary for cholera occurring with rheumatic condition of the blood, we must have a peculiar
sensitive state of the nervous system, and without it we shall not have rheumatic chores. The delirium, which is so constantly present in acute cases, when the pericardium is affected, is not due, as was formerly thought, to metastasis, but to the circulation through the brain of a poisoned blood, and possibly in some cases to slight inflammation of the membranes of the brain. Whenever it exists, however, it is always a sign of failing powers, and necessitates the administration of stimulants.

Treatment. — What object have we in view, when we are called upon to treat a patient, who is suffering from an attack of acute rheumatism? First: To relieve pain. Second: To cure the patient as quickly as possible. Third: To leave him as well as he was before the attack. Bearing in mind the theory, with which we started, that the phenomena of acute rheumatism are consequent on the presence, in the blood, of a materia morbi, which is lactic acid, or something analogous to it, and whose natural outlet from the system is the skin; we have, as the chief object of our treatment, to assist nature in eliminating this poison: now can
we do this, or are we, as in typhus, only able to keep up the strength of the patient whilst the poison exhausts itself? I think the former. Again, is our treatment to be constitutional or local? The answer is both.

It is not my intention to advance all the various modes of treatment, which different men trust to; it is almost needless to say, however, that the patient, in many of the cases, would be well sooner, if all active treatment were suspended and nature only assisted by the patient keeping his bed. The tendency of rheumatism is to get well, and a great number of patients recover within three weeks, but the usual duration of the attack is perhaps six weeks, although we meet with cases, in which the disease has lasted even as long as three or four months, but in all these, we shall find, on inquiry, that the patient has been very freely plunged, and perhaps leached and kept on very low diet; if he then begin to take tonics for instance iron and quinine, the symptoms of rheumatism will soon pass away. This chronic form of the acute disease generally occurs at or after the middle period of life, very rarely
In early life, anything, however, which favours the cachetic condition of the patient, will favour the continuance of the disease. It is this tendency of the disease to get well, which has led to many different observers to declare such and such medicines to have a specific action in curing the affection: they all cure their patients by different means, and each says his treatment is the best, but the reason of this great difference existing, is that, in many of these cases, the patient would have got well without any medicine at all.

When we are called to treat an acute attack, we should first insist on the patient lying between the blankets, and that he should wear a flannel shirt or flannel dressing gown; the object of this is to prevent the chilliness, which is caused by fresh portions of linen coming in contact with the hot surface of the body, and thus checking the skin's action. Patients will often object to lie between the blankets, saying that it will be so uncomfortable for them, but it should be insisted upon, and all scruples about its inconvenience will disappear, as soon as the patient finds that he is more comfortable than when lying between the sheets.

The diet should consist of milk and light broths.
or deep sea. If the pulse be very feeble, and more especially if there should be any delirium towards evening, small quantities of wine or brandy should be given. Of all the substances contained in the materia medica, I know of none, which is so good, as an internal remedy, as opium; we need not be afraid of giving it largely, for the system appears to be very tolerant of its influence; it relieves pain, it procures sleep, and, if combined with ipecacuanha, it increases considerably the action of the skin. In addition to the opium and ipecacuanha, nitrate of potash may be given, for it tends to eliminate sulphuric acid, which we have shown to be in excess in the system. The nitrate is I think much more desirable than the sulphate, which is contained in divers powders, for the one tends to eliminate the excess of sulphuric acid, which is present and the other increases that, which is already in excess.

The following is a good formula for administration.

Ay. – D. Opii q. t r

D. Ipecacuanha, q. t r

Pellagra Vulturis q. t r 4th horis

The patient should not be purged, with the intention of evacuating the poison by the bowels, for the exposure, which is necessary when the bowels
are relieved, checks the action of the skin, and thus there is substituted an unnatural exit for a natural one, with this disadvantage, that the patient will be exhausted after a free purging, if, however, it be necessary to give a slight purgative, I know of nothing better than a small dose of calomel at night, to be followed the next morning by a dose of sulphate of magnesia. It will be quite sufficient if one or two watery stools be produced. We give the calomel so that the secretion of bile, which is checked by the opium, may be accelerated, and thus the injurious effects of the opium counteracted. To combine a little calomel with the opium occasionally is a very good plan.

What is the effect of the so-called alkaline treatment, which means giving large doses of the bicarbonate of potash and other alkalies, so as to render the urine neutral or alkaline? When this effect is produced, it is said, that the acidity of the blood is neutralized, and the ill effects of the poison are no longer to be feared. I must say, that I think this alkaline treatment is, not only, of no use, but positively hurtful. The pains remain, I believe, in the great majority of cases, not only unrelieved, but convalescence is protracted, and
the patient is months before he regains his natural strength: he is also made very anaemic, for, in addition to the rheumatic poison, which tends to destroy the red blood cells, we have the like injurious effect produced by the alkalies. It is said by the upholders of this treatment, that, when the urine becomes alkaline, we need not fear any heart complication, and if this be true, it is certainly a most useful treatment, and requires many disadvantages to counterbalance the advantage. But, of its truth I have great doubts, for I have seen pericarditis come on when the patient had been saturated with alkalies for several days, and I am quite sure, that if the heart be affected, when we see the patient, to the extent of making his urine alkaline, we render matters worse. And, I think, it is the fact, that more sudden deaths occur from syncope, caused by the formation of a clot in left auricle or ventricle, which impedes the passage of the blood into the aorta, in patients, who have been thus treated, than in those who have been treated otherwise. The only two cases, which I have seen thus terminate, had been, and were at the time, taking large doses
of alkalies.

If, in addition to the nitrate of potash, as recommended above, we give a few doses of the acetate of potash, which probably does not increase, as the carbonates do, the metamorphosis of tissue, although it is converted into a carbonate during its transit, and, if with it, we combine a few doses of the bicarbonate of potash, the result will probably be, by increasing the amount of urine, beneficial; but, if carried on to produce alkalinity of the urine, and to keep it so, it will by making the patient anaemic do him harm.

If fluid water should be drunk in large quantities, for it will, by acting as a diaphoretic, assist elimination, and also by diluting poison will render it less active.

If the rheumatism seems to depend, in any way, on malaria, quinine will be found very useful.

When the poison is eliminated, we have to treat the anaemia, which is always present to a certain extent, by giving tonics especially iron and quinine. Another very beneficial mode of treating rheumatism is by vapour baths, and, whenever the skin does not act well they ought to be tried. Their good effects are, perhaps, more often seen in cases of sub-acute and chronic
rather than in acute rheumatism. And here I will just remark, that persons subject to rheumatism find that a Turkish bath will often appear to ward off an attack; and persons who suffer from occasional fleeting pains experience great relief from this kind of bath. The patient will, sometimes, get considerable ease by wrapping the inflamed joints in cotton wool, and covering them over with oil silk; on removing the wool, it will be found to be saturated with a fluid, which is intensely acid, and which has a sour smell. Sometimes, however, instead of this local application relieving the pain, it increases it, then instead of continuing it, we change it for linen cloths dipped in cold water; this will probably be found to relieve the pain. I know no way, however, of telling beforehand, which patient will be relieved by warmth, and which by cold.

The theory of applying leeches to a part, in order to remove a poison, which is present in the blood, is plausible, but when put into practice, as it has been, and is so still to a certain extent, in cases of acute rheumatism, it is found to be fraught with danger. And this treatment for acute rheumatism has been now generally, and
rightly abandoned. Nevertheless, when we consider
that the danger consisted not in removing injury
but the blood itself, its cells and colouring matter,
thus rendering the patient less susceptible of
withstanding the effects of the poison, which
remained; we do not like giving up the idea
that it is possible to remove this poison, without
the injurious effects of leeching or bleeding.
This we attempt to do by the free application
of blisters. The treatment of acute rheumatic
inflammation, by blisters, was practised by the
old practitioners, and so it is no new plan.
There is this difference, however, that, by them, the
blisters were of small size, and only applied to one
or two joints. The pain was always removed, but
generally returned in a few days; when, strange to
say, the blisters were not again applied, and the
good which they had commenced to do was nipped
in the bud. It is to Dr. Davies, of the London
Hospital, that we are indebted for bringing
the blisters, treatment again to notice, and the
plan of applying them.
How do blisters act in these cases? Are their
beneficial effects due to their derivative action,
that is, by diverting the circulation of the blood,
from the congested vessels of the affected parts to
the blistered surface? or to their evacuant action,
which means removing from the blood a certain
quantity of fluid, which may, or may not, con-
tain a morbid material? I think the cases, which
I shall relate, prove the latter to be their
action, for ceteris paribus, the more fluid
removed, the greater was the benefit. In one
case fourteen ounces escaped, when the blisters
were taken off, and in two others eight ounces
escaped. If the theory be correct, that there is
a poison in the blood, and, that, this poison
has a special attraction for the fibro-serous tissue,
or the fibro-serous tissue have a special attraction
for it, then, it follows, that, if we have any
means by which we can remove from these attractive
seats, that material, which seems almost to
invite us, to assist its escape from the blood,
by meeting us, at so many superficial spots,
we are really only assisting nature to get rid of
that, which it would rather be without; and,
although as yet, the maderes morbi has not been
discovered, in the fluid effused, we have, I think, all
but demonstrative proof of its existence. The
proofs to my mind are these: if a patient be
evidently thoroughly impregnated with the rheumatic poison, shown by several joints being affected, and have been ill, perhaps, a week, and we then apply large blisters, near the painful joints, as the blisters rise, the rheumatic pains and redness disappear, and when they are removed, a large amount of fluid escapes. The joints then feel stiff from the effects of the blisters, but can be moved without any pain. The patient falls into a sound sleep, and wakes up refreshed, and so brave, that he will tell us, he would much rather suffer the pains from the blisters than from the rheumatism. He goes on improving, perhaps for several days, his tongue cleans, his pulse is less bounding, but is still soft and compressible; he gets out of bed to have it made, or to relieve his bowels, and in the night has a return of pain, in a joint, which was probably not before implicated. Here, we suppose, the poison, which had not been thoroughly eradicated, although, so long as it could escape from the skin, it was inert, received a check to its elimination, and its consequent accumulation in the blood gave rise to pain in the joint. We then blister the painful part in the same way as before, and the result is the same. Dr. Davies says, that the
in some of his cases, alkalinity of the urine followed the free application of blisters. This result is not easily accounted for, and in none of the cases, which I have carefully watched, to determine this point, has the urine been made alkaline.

It is necessary, to obtain the good effects of this treatment, that the blisters should be large, for the larger they are, the greater the evacuation will be, and the more poison will escape; they should be applied, not to the joint, but should encircle the limb, either above or below, and their width should be about three pinchers.

Wherever a joint is painful there a blister should be applied. After they are removed, linseed meal poultices should be put on. Sometimes, slight strangury follows the blisters, but this result may be obviated by placing, between the blisters and the skin, a thin piece of gauze or paper well soaked in oil. The oil, being a solvent of the vesicatory principle, transfers its effects, without any diminution to the skin, while the paper absists the gousse of the fly.

I will, to conclude, relate a few cases, to illustrate the beneficial effects, which are produced by the free application of blisters.
Case 1. — William Pettengill, aged 22, was admitted on December the 8th into St. Bartholomew's Hospital. The attack, which is his first, came on ten days ago with pain in both knees followed by redness and swelling. The ankles were next similarly affected, then the shoulders and elbows and the muscles of the upper arm, the wrists were lastly implicated. The pains have prevented him sleeping and he looks worn out and haggard. The shoulders, wrists, and ankles are now the seat of the local affection; he sweats profusely. Father and paternal aunt were rheumatic. The complains of pain at midsternum which is increased by breathing. He was put on milk diet, and no medicine was given. He was ordered a cat. Sinapis sterno and six blisters one to be applied near each affected joint. On the 10th blisters all rose well. All the rheumatic pains are gone, he says that they gradually went as the blisters rose and quite left him when they had been on about twelve hours. Has no shivering. He has slept for several hours since blisters removed. The pain in the chest has left him. Dec 11th. No return of pain. Has a little scalding when pouring water and is often wishing to void it. Blisters dressed with zinc ointment. The swelling of the joints has not...


1st Attack. Six days before admission he was seized with pain in the right knee followed by pains in both hips, left knee, right arm, just below the elbow, and wrists. Three days before admission the ankles became painful. Has had no good sleep since the commencement of the illness. Is not aware what caused the attack, thinks he has had the rheumatism flying about him for some few weeks. On admission both knees and right wrist and elbow were swollen and red. Boils had not been open for three days. Heart no murmur, but action quick and heaving at apex, no pericardial sound or pain in the chest. Dec 9th Systolic murmur soft and blowing at apex and base, second sound rigging at base. Treatment. A purge but no other medicine.

Blister to be applied to each painful joint.

Temperature 101°F, skin sweating. Dec 10th All rheumatic pains gone has a little stranguary.

Temperature 99.4°F, skin moist. Dec 11th No return of pain. Tongue very thickly coated; action
of heart regular. Dec 12th. Has a little pain in left elbow and knee. Ordered a blister to each joint. Dec 13th. The pains have disappeared from the blistered joints, but the right shoulder is again affected. Ordered a blister on that joint. Dec 14th. No pain anywhere. Blisters are well. Dec 15th. Brumpleing sound heard at base of heart. Ordered a blister to the chest. Dec 16th. Blisters rose well. Brumpling sound still heard. No pain anywhere. Dec 20th. Took some bactol oil last night and the bowels have freely acted two or three times since, in getting out of bed he was chilled and has a little pain in left knee, but otherwise feels better. Ordered another blister to painful joint. Dec 21st. No pain anywhere, is convalescent.

Case 3. — Charles Partridge. Age 20. Admitted Dec 8th. Second attack. Was seized when at work on November 25th with pain in left knee, which was followed by redness and swelling. No cause for the attack known. His father died of rheumatism, and he has one sister rheumatic. The right wrist and both knees and right ankle are swollen red and painful. Heart natural. To have no medicine. Dec 9th. Blister to be
applied to each affected joint. Dec 16th. Blisters all rose well. Rheumatic pains quite gone. Dec 17th. Appetite ravenous, feels quite well and wishes to get up.

I could mention many more cases treated in the same way with equally satisfactory results, but I have thought these sufficient to prove the benefit derived from this treatment.

Thomas Blunt

London.
March 30th, 1865