

An ingenious & well-reasoned
essay. Good grounds adduced for the opinion that
Kant's *Grundgesetz* depends upon a material truth, & a
fair argument in favour of this matter being an
acid - probably lactic.

Acute Rheumatism-

James Collinge
March 1853.

The Causes of Acute Rheumatism -

The causes of this serious and often intractable malady hitherto, from the differences of opinion held by medical men, appear to be unsatisfactorily explained - The origin of the disease, like that of many others, being obscure, and when once established, its subsequent course so uncertain & variable, it is not at all surprising to find so many discrepancies on the subject in medical writings -

Exposure to cold and moisture have held prominent positions in accounting for the cause of rheumatism, and until within the last few years medical men felt satisfied the disease could not be traced to any other agency -

Some have supposed that cold applied to the surface of the body by suspending cutaneous evaporation, and so giving rise to the retention of effete matters in the blood, was the essential & true cause of rheumatism -

But the disease, sometimes, occurs without the agency of cold, for it has often been observed that patients, who have been for a

long time in the Boards of Hospitals, have been suddenly seized with severe attacks of acute rheumatism, and upon the strictest enquiry no such cause could be traced - "Dr Fuller, in his works on Rheumatism" cites "the case of a man, aged 34 years, who was "admitted into St. George's Hospital, and was "confined to his bed by severe ulceration of "his leg. He was much out of health, but "presented no symptoms of rheumatism "until 25 days after his admission. The "symptoms gradually increased in severity, "his joints became very painful, red, swollen, "and inflamed - The disease ran its - "usual course"!!!

Moreover, if the mere suspension of the cutaneous transpiration were the true cause of the disease, we should naturally expect the disease to subside rapidly when the function of the skin has been re-established, and profuse perspiration has taken place; but this is not found to be the case, for in acute rheumatism the perspiration is excessive without any

alleviation of the symptoms, or tendency to abatement of the disease -

If we assign to cold the real & essential cause of rheumatism, it is highly probable we should find the disease much more common than it is - There are many facts to induce us to discountenance this view - Numerous instances are on record of shipwrecked mariners, all exposed to the same vicissitudes of temperature and the same privations, when some have entirely escaped any diseases, whilst only one or two have been seized with an attack of rheumatism, and the rest with inflammatory affections of an ordinary type -

forget
presuppo
tion

"Captain Parry" in the first Journal of his "Arctic Expedition" makes the following observation - "We were constantly in the habit of undergoing for some months a change of temperature of from 80° to 100°, and in several instances of 120° of temperature, in less than a minute; and what is most extraordinary, not a single inflammatory complaint, beyond a slight cold, which was

"Cured by common care in a day or two,
 "occurred during this particular period"
 Not more than two cases of rheumatism are
 mentioned as having occurred out of two
 ships' crews -

From the statistical reports of cases,
 which have occurred among the
 troops stationed in different parts of the
 world, it appears, that out of every 1000
 patients admitted into the military
 hospitals, there are 57 cases of rheumatism
 at the Cape of Good Hope, whereas there
 are 30 only in the cold & variable
 climate of Nova Scotia & New Brunswick.

"Baron Larrey, in his *Memoires des Chirurges
 Militaires*, in detailing the conditions of the
 soldiers during the Russian Campaign,
 makes the following observations:-
 "During the three or four exceedingly cold
 days, which immediately preceded the
 battle of Eylau, the mercury had fallen
 to 10, 11, 12, 13, 14, and 15 degrees of Reaumur's
 thermometer; and during these days, and
 during a greater portion of the nights of

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"the 5th, 6th, 7th, 8th, and 9th of February,
"the soldiers had been exposed to the snow
"frost, yet no soldier presented himself
"at the ambulance, and it was not
"until the night of the 10th, when the
"temperature had risen about 18° or 20°,
"that they felt the first effects of cold.
"They then began to suffer, not from
"rheumatism, but from gangrene of the
"extremities, one of the common and
"true effects of cold."

One of the most remarkable circumstances
in connexion with acute rheumatism
is that of the heart becoming affected in
a great number of cases. The nature
of the lesions occurring in that organ
we can now ascertain with great
accuracy by means of percussion and
auscultation.

Admitting that cold could produce
the disease as it affects various joints, Why not!
at the same time, we should hesitate
to say that it was capable of producing
inflammation of the membranes of the heart.

Many pathologists believe lesions of the heart take place by Metastasis, that is, by the disease subsiding or ceasing in the limbs and fixing itself upon the heart. Even if this were the true explanation, it would not hold good in all cases of acute rheumatism, because it has been observed by physicians to large hospitals that the disease, in some cases, did not abate in the slightest degree in the extremities at the time the membranes of the heart became inflamed. Moreover a few instances are recorded of the heart having become implicated, before the disease made its appearance in the joints, or any other part of the body.

“Dr Watson, (Lectures on the Practice of Physic, Vol. 2 - Page 293), relates an instance of a boy, who was seized with pain in the left side of the chest, and violent beating of the heart. He applied immediately to a medical man, who bled him. In the course of the evening (ensuing), he began, for the first time in his life,

Why is the heart hable?

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"to feel some stiffness beneath and about
"his knee - On the evening of the second
"day, the joints became painful & swollen"
"Dr Fuller, "in his work on rheumatism-foot
"note - page 138", mentions three instances of
"this sort, which fell under his own
"observation - In two cases, the patients
"laboured under pericarditis two days,
"and in the other, three days prior to the
"appearance of articular inflammation"
His Colleague, Dr Wilson, recorded another
striking case of the same kind in the
Lancet for Novr 1844 -

Dr Graves, (Clinical Lectures - vol. 3 - page 160 -)
gives another case in point - It was the
case of a young woman, aged 19 years,
who had an attack of pericarditis
without articular inflammation, but
had all the other symptoms of rheumatism -
Since acute rheumatism & Gout (this in
its acute form and on its first appearance),
are so very much alike in their con-
stitutional symptoms at the onset, also,
sometimes, mistaken for each other, is

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it not more reasonable to assume that rheumatism essentially depends upon a vitiated condition of secretion and excretion; or a defective assimilation of certain particles of the food, or disintegrated particles of the tissues? - In this way giving rise to a poison, if we may so term it, in the system -

Gout is admitted by all, I believe, at the present day to depend on constitutional derangement arising from defective assimilation, and perverted metamorphic changes; in proof of which, the peculiar deposit - urate of soda - that takes place in the small joints of the hands & feet, has been detected in the blood of gouty persons - Moreover gout has been clearly ascertained to be hereditary; and that the children of gouty parents are often subject to attacks of acute rheumatism. Animal chemistry, having made such rapid progress of late years, has worked a complete change in the pathology of many diseases, as well as in their treatment -

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"Dr. Williams, in his Principles of Medicine, says
"the cutaneous secretion contains lactic
"acid and lactates of soda and ammonia,
"which probably proceed from the trans-
"formation of the textures, particularly the
"muscular, which the recent researches of
"Liebig have shown to contain a prepon-
"derance of this acid (Lactic). Hence
"these products abound during great
"muscular exertion, and when the
"perspiration is checked by external cold,
"they may be retained in the blood,
"causing rheumatism, urinary disorders,
"or various cutaneous diseases""

Dr. R. Willis has suggested that checked perspiration may prove injurious by rendering the skin dry, and therefore unfavourable for vital changes supposed to take place in the cutaneous capillaries. If the checked perspiration were the only cause of mischief in rheumatism, we should expect the disease to subside immediately on the re-establishment of cutaneous secretion by use of the

warm bath and diaphoretics -

This is not consistent with facts, for it is well known, that as soon as acute rheumatism has once become fully established, the perspiration is excessive, and preternaturally acid, more especially around the affected joints.

Dr. Prout is of opinion that all the phenomena of acute rheumatism are due to lactic acid, which is developed in too great quantity in the system in consequence of defective assimilation.

"Simon, (Animal chemistry-Page 108), says
 "that lactic acid, which is the ordinary
 "free acid in sweat, is increased in
 "cases of rheumatism and gout; the
 "sweat in these diseases has a strong
 "acid reaction."

There are many circumstances which favour the idea of a poison being generated in the system, in order to give rise to all the various phenomena presented in acute rheumatism -

1st - The disease not subsiding immediately.

on re-establishment of the cutaneous secretion, which ought to do, if rheumatism depended merely on the suppression of that secretion from cold, and also the quantity of acid that passes off by the skin must be much greater than could have accumulated in so short a time from its suppression.

2nd - If the mere occurrence of cold coming in contact with the surface of the body, or even in conjunction with moisture, were sufficient to give rise to rheumatism, we should expect to see the disease breaking out epidemically and endemically at certain periods of the year, I mean those periods when there exists the greatest variations between the temperature of night and day; but daily observation shews us clearly that the disease occurs sporadically.

3rd - Rheumatism appears to be a disease of a specific nature; it attacks chiefly if not wholly, those structures, which are composed principally of white fibrous

tissue, such as ligaments, and their sheaths, tendons, and aponeuroses or fasciæ -

4^{thly} - Inflammation of an ordinary kind frequently passes on to the suppurative stage, and sometimes in a very brief period; whereas the inflammation attending rheumatism may continue for weeks, and then subside without any suppuration; and when this circumstance does occur, it is found to depend on a scrofulous, or cachectic state of the constitution, which has induced a weakened vital action in the parts affected -

5^{thly} - We admit that gout is dependent on some specific agent or material generated in the body; when gout localises itself, it attacks the interior of the joints, where deposits of urate of soda take place. Rheumatism locates itself in the fibrous structures, those more especially in the neighbourhood of joints. There is a disease called rheumatic gout, which

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partakes both of rheumatism and gout, a hybrid of the two; this disease affects both the fibrous structures surrounding the joints, and the synovial membranes lining them; sometimes causing thickening of the membrane, as well as alterations in the cartilages.

Here is an analogy between gout and rheumatism, and strong proof that both are dependent on the same cause.

6^{thly} - If lactic acid and its salts be eliminated by the skin, which we have no reason to doubt, seeing they have been detected in the perspiration by most able chemists, we at once acknowledge its production in the body. Whether its production be dependent on imperfect primary or secondary assimilation we have no means of ascertaining. Then as lactic acid is one of those products resulting from various metamorphic changes, which are constantly taking place, is there any

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just reason to doubt its production
in great excess under certain certain
circumstances, such as impaired digestion,
alterations in the secretions, excessive
exertion, and exposure to cold & moisture;
in short, anything that has a tendency
to establish a change in the functions
of various organs? -

In reply, I am inclined to believe that
such an excess does exist in rheum-
atism, because as soon as the disease
is once established, excessive perspi-
-ration commences, which has a very
sour smell, much more so than
the perspiration of health.

It would appear as if nature brought
on this excessive sweating in order
to get rid of the poison - If the
perspiration be at all checked, the symp-
-toms are aggravated -

Furthermore, after the space of 24 or
30 hours from the commencement of the
attack, there is usually observed a
copious sediment in the urine, composed

chiefly of lithates and free lithic acid;
 "Dr Golding Bird says:- "If, as has been
 "supposed, an organic acid (Lactic or
 "Butyric) be an element of the perspired
 "fluid, it is quite possible that by being
 "retained when perspiration is obstructed,
 "it may find its way to the urine, and
 "precipitate uric acid"!"

Probably, it is from this cause, that
 uric acid is detected in the urine at
 so early a period of this disease, because
 in other diseases of an inflammatory
 nature, deposits of lithic acid and its
 salts do not take place until they
 (diseases) have been established for several
 days, and frequently not until they
 are on the decline -

Upon the supposition that lactic acid
 possesses the power of decomposing
 the more soluble lithates, we can readily
 imagine that the uric acid must be
 eliminated either by the kidneys, or
 combine with some other base -
In rheumatism, it would seem to

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pass off by the kidneys - In gout,
it appears to combine with soda,
(the blood is always alkaline in health;
the alkalinity depending either on carbonate
of soda, or on the tribasic phosphate of
soda, or on both), and become deposited
in the joints, shortly after the disease
makes its appearance in the hands
and feet; a good example of nature's
handy-work, in those cases where this
happens, instead of allowing the forma-
-tion of calculi in the kidneys & bladder.
Some imagine that rheumatism is
due to the formation of uric acid,
in consequence of defective oxidation
of the nitrogenous elements -

The presence of uric acid in the urine,
I am inclined to think is due to its
being set free by some other acid,
which appears to have been generated
in the system, and upon which
(acid) the sour smell of the perspiration,
so characteristic of rheumatism, is
dependent -

What acid it is that gives rise to all
 the phenomena of acute rheumatism,
 is hard to say; still there is one
 thing certain, that the Materia Morbi
 is an acid of some kind, which is
 capable of being eliminated by the skin.
 I have endeavoured to shew that cold
per se cannot cause rheumatism;
 yet it may, and undoubtedly does,
 in conjunction with other agencies,
 such as depressing influences, impaired
 digestion, defective secretion and excre-
 tion, improper food, and deficient —
clothing, act as a cause of predispos-
ition, thereby favouring the production
 of the Materia Morbi, which appears
 to be essential for the full manifes-
 tation of the disease.
 Cold is the most powerful of all
 exciting causes, and it is in this
 way it acts principally —

Hereditary tendency to rheumatism

The hereditary tendency to rheumatism was formerly, and is by some at the present day, doubted -

The doubts upon the subject arise, most probably, from the difficulty of ascertaining, even on careful enquiry, whether the parents or relatives of those afflicted have been subject to the disease -

There appears to be a great analogy between gout & rheumatism - Gout has been traced from one generation to another; furthermore, children of gouty parents have been known to suffer from attacks of acute rheumatism at the youthful period of life -

Gout is rarely met in young persons; it seldom makes its appearance before the age of forty - What strengthens the idea that rheumatism is hereditary is the existence of a disease, known by the name of rheumatic gout; which partakes of the characters of both gout & rheumatism -

Young persons born of gouty parents, who are exposed frequently to atmospheric vicissitudes, and pay little attention to their general health, may become the subjects of acute rheumatism, owing to the poison being more early & quickly developed, and then producing so much irritation to the whole system that nature attempts to get rid of it by setting up rheumatic fever - On the other hand, those, who in the earlier periods of life pay due attention to their general health, and avoid unnecessary exposure to cold and moisture, may ward off the disease altogether, or at least until the period of senescence: the seeds of the disease lay dormant, and fail to attain their full developement for want of sufficient nourishment - The celebrated John Hunter, who opposed the doctrine of affinity between gout and rheumatism, considered a severe illness in his own person to be

rheumatism, although it ultimately turned out to be disguised gout -

It is not surprising to find so little proof in our records of the hereditary character of rheumatism, when it is borne in mind, that the class of patients who are admitted into hospitals, generally speaking, pay little attention to the peculiarities of constitution in their families & relatives. Medical men in private practice, with only few exceptions, keep no records whatever of the cases that fall under their notice. I believe it is principally to private practitioners we must look for the disease being traced from children to parents, and vice versa -

Dr. Mackay, a most careful observer, and one who has paid especial attention to the subject, states that he believes that rheumatism is hereditary - Mr. Choull has arrived at the same conclusion -

¹¹⁴ Dr. Guller says the records of the consumption hospital exhibit the operation

"of an inherited predisposition in little
 "more than 24 per cent of the cases there
 "admitted; and that the annals of
 "insanity supply data to shew that
 "its influence obtains in less than 13
 "per cent among the inmates of lunatic
 "asylums; whereas, among the patients
 "(rheumatic) admitted into St. George's Hospital,
 "I have traced it in nearly 29 per cent."

I have subjoined a Table, of Dr. Fuller's, which
 shews the strong hereditary tendency which
 exists amongst those cases of acute rheumatism
 which are earliest developed -

Age	Total number of cases	Hereditary	Not Hereditary	Uncertain	No note on the subject
Under 15	15	8	6	1	—
From 15 to 20	58	22	31	3	2
20 - 25	63	19	36	3	5
25 - 30	50	13	26	5	6
30 - 35	22	5	13	1	3
35 - 40	17	3	8	2	4
40 - 45	9	—	7	—	2
45 - 50	9	1	7	—	1
50 - 55	1	—	1	—	—
55 - 60	2	—	2	—	—
	246	71	137	15	23

This Table exhibits the influence of an inherited predisposition in,

1 out of every 1.9 patients under the age of 15-

1 ----- 2.6 ----- 20.

1 ----- 3.5 ----- between the ages of 20 & 30-

1 ----- 6.6 ----- over the age of 30-

M. Chomel ascertained the hereditary tendency in one-half of the cases admitted into the Hôtel Dieu -

If all the cases admitted into hospitals were as carefully recorded as those of Dr. Haller's, it is very probable that rheumatism would ^{be} found as hereditary as any other disease -

Age and Sex -

Sir Chas. Scudamore considered the age most prone to acute rheumatism was from the 15th to the 30th year; and to the chronic, as an original complaint, from the 30th to the 60th year; but those who have become constitutionally rheumatic may continue to suffer occasionally till the latest period of life -

Dr Macleod gives a report of 199 patients suffering from acute rheumatism:

8 of them were between the ages of 10 & 15-

180 ----- 15 & 40-

10 ----- 40 & 55-

1 had passed the age of 55-

Of 289 cases reported by Dr Fuller,

16 were between the ages of 5 & 15-

241 ----- 15 & 40

25 ----- 40 & 50

7 had passed the age of 50-

Children of tender years sometimes suffer from attacks of acute rheumatism - Dr Heberden saw a few instances from four to ten years of age -

In the Medico-Chirurgical Review for Oct- 1817, Dr Davis related several cases of acute rheumatism in children from the third to the seventh year - Last autumn, I saw a child, 12 months old, suffering from an attack of acute rheumatism - It may be said that there is scarce any period of life exempt from the disease, below the age of 60; because cases have been seen, and no doubt are now met with, in men at the age of 50 - It will generally be found that those who suffer from acute attacks from 40 to 55 or 60 are strong & robust of their years, and have enjoyed very good health up to the period of their present sickness - The greater liability of young persons to acute rheumatism than those more advanced in years is due, in all probability, to the greater activity of the assimilative processes, which on becoming disordered, if there be any tendency in the system to the rheumatic

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diathesis, the poison is produced rapidly and accumulates in large quantities; the Materia Morbi causes so much irritation in a system, which is early roused into action, that nature at length attempts to get rid of it by setting up rheumatic fever -

Sex. - Either sex is liable to acute rheumatism; but as men are more exposed to wet and cold, use greater exertion, and are more subject to committing excesses than women, we should expect to find the disease occurring more frequently among the former than the latter. - And such is found to be the case, for Dr. Haygarth gave the proportion of 98 males to 73 females, or nearly as four to three -

Dr. Latham gives 136 cases of acute rheumatism; 75 were males, and 61 females.

Of 289 before mentioned cases of Dr. Haller, 151 were males & 138 females

Of the 199 cases given by Dr. Macleod, there were 115 males & 84 females -

The Symptoms of Acute Rheumatism.

These have been so well described and commented upon by different authors on rheumatism, & consequently must be familiar to all, that entering ^{*} minutely ^{*} into may be deemed superfluous on my part; therefore I shall only give a brief outline of those symptoms, which are of the greatest importance -

Acute rheumatism in its mode of attack presents great diversities -

Sometimes, it commences without any very apparent derangement; the patient is suddenly seized with pain and stiffness in his limbs on slight exposure to cold and moisture after violent exercise -

Then the pain and stiffness gradually increase in severity, and, in the course of a few hours, are followed by redness, & swelling, with great tension and tenderness around one or more joints, accompanied by symptoms of marked general constitutional disturbance -

Sometimes, the attack is ushered in

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by febrile excitement, attended with very slight pain, tenderness & swelling in & around the joints; and the disease may even run its course with little or no articular inflammation - But in the majority of cases, upon careful enquiry, it will be found that the patients complain of having felt languid, chilly, uncomfortable, and very sensible of atmospheric changes for some days prior to the attack - Also, having experienced pain, or at least a threatening of it, from time to time in the limbs - There is likewise more or less derangement of various functions, such as a capricious appetite, a white and coated tongue, a disagreeable sour taste in the mouth, the bowels irregular and generally constipated, and the urine of a high colour and often turbid - The complexion usually presents a sallow and unhealthy appearance; the eyes are dull and heavy; and

the conjunctivae of a yellow colour -
 These are the premonitory symptoms
 (though all of them are not witnessed in
 every case), that are, generally speaking,
 observed before the full developement
 of the disease -

A paroxysm once fully established
 the patient presents a most pitiable
 aspect - One, two, or more joints have
 become swollen & very painful; the
 ankles are usually attacked the first;
 then follow the knees, wrists and elbows
 in succession, and occasionally the
 hips & shoulders - The slightest motion
 of the affected limbs occasions ex-
 -cruciating pain - The patient lies
 motionless on his back, is very restless,
 and in dread of any one approaching
 his bed, lest the already agonizing
 pain should be increased by accidental
 pressure -

After the space of a few hours, febrile
 excitement sets in, attended with
 excessive sweating; the linen of the

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patient becomes saturated with perspiration of a peculiar, sour and disagreeable odour, which is very characteristic of rheumatism - The fever is believed to be greater the stronger and more robust the individual attacked - There is observed a marked difference in the appearances between rheumatic and continued fever: in the former the countenance is not so dull, heavy, and depressed as in the latter - nor is there the same dry burning heat of skin - The expression of countenance usually indicates the amount of suffering and severity of the disease - The pulse is increased in frequency, generally ranging from 90 to 120 or 130, seldom below the former number; it is also full & bounding, with a degree of hardness -

The urine is scanty, dark coloured, very acid, of a high specific gravity, and loaded with lithates: when it has stood for some time in a vessel, there

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is deposited a sediment of a red-brick
dust colour (Lithic acid) -

Considerable effusion often takes place into the areolar tissue around the joints, which usually gives great relief. Exacerbations occur at night, preventing the patient obtaining any sleep; and the fever is usually more severe at that period of the day -

About the end of ten days or a fortnight, there is generally some amendment; the pain lessens, particularly at night, and the fever gradually abates with a diminution of the perspiration. The urine becomes more abundant, and less charged with lithates; the appetite returns, and thirst diminishes; at the same time, the pulse falls nearly to its -

Natural standard - The movements of the limbs are more free, so that the patient is able to vary his posture. This course of improvement does not always advance without interruption,

for sometimes exacerbations come on with pain and swelling in one or more of the joints that have been already affected to the astonishment of the patient. But if there should be no relapse, improvement advances gradually, until at length the patient feels quite well; the secretions acquire their healthy and natural condition. The fluid effused into different parts is rapidly absorbed, and the joints regain their natural form and usual freedom of motion. However, they continue weak for some time, with slight pain at night. In cases which terminate less favourably, the effusion into the synovial capsules is not wholly absorbed, a portion of it only; and the ligaments often remain in a thickened state for a long time, causing considerable uneasiness and stiffness. The length of time required for the disease to run its course under ordinary treatment, when unattended

by any internal complication, varies from two to six weeks -

Dr. Wm Budd says, in some instances, he has seen convalescence supervene as early as the second week, but it is more frequently deferred to the sixth week, or a still later period -

Mr. Chomel believes that four weeks is about the average period for arriving at convalescence, and that recovery never takes place before the twentieth day - Dr. Macleod thinks that, probably, five or six weeks may be about its average duration - From a table given by Dr. Fuller, I find the average duration in 289 cases, admitted into St. George's Hospital, was 35 days -

It appears, from the observations of the above named authors, that from three to six weeks is the period limited for convalescence to take place -

Rheumatic affection of the Heart

So long as the joints manifest the only local signs of acute rheumatism we have little to dread, because the disease usually runs its course without any ill consequences - The external symptoms were for a long time looked upon as constituting the sum total of the disease, and the existence of its internal complications were undiscovered - But since the time of Laennec, our means of diagnosis by the aid of percussion and auscultation have attained such a degree of perfection and delicacy, that we are enabled to detect any material alteration, which may take place in the heart - This improved method of diagnosis, in conjunction with Morbid anatomy, has discovered the important fact that the membranes of the heart frequently become implicated during the progress of acute rheumatism - It is this complication, we have most to dread the consequences of, for

inflammation of an organ, the mechanism of which is most easily deranged, and which, when deranged, "lays its own hard conditions upon the continuance of a man's life, and almost settles beforehand the manner of his death". (Dr. Latham's Clinical lectures).

Though inflammation of the cardiac membranes, in connection with acute rheumatism, is not, in the majority of cases, fatal during the attack, yet we know that the changes following it are such as to produce most serious results in after-life. The nature of the cause of cardiac affections in rheumatic patients is a subject worthy of great attention. Many authors attribute it to a metastasis, - that is, the disease suddenly abating in one or more joints, and fixing itself upon the heart.

Recent observations shew that the cardiac inflammation sometimes precedes for several days the articular

inflammation - Dr Macleod mentions four instances of pericarditis coming on prior to the external affections - Dr Taylor, "in the Medico-chir. Trans.", vol. 28, page 527, states that he met with two cases of pericarditis, which came on prior to the arthritis -

I have quoted several instances of the same kind at pages 647 of this Essay -

Dr Wm Budd (article rheumatism, in the Library of Medicine) expresses himself on this point as follows: - "The period at which the cardiac disease comes on varies, according to our observation, from the eight to the twenty-seventh day - In general, it may be said to come on when the disorder is at its height, but we have seen one instance in which it was highly probable that pericarditis came on as early as the first day of illness - When the heart becomes affected the rheumatism of the joints does not subside, but continues as before; the fibrin-serous

Is it right. Which side of heart
most liable. Why?

"textures of that organ do not become
 "affected by metastasis from the joints,
 "nor must their affection be considered
 "as accidental, but as one of a series
 "of local affections, which implicates
 "identical tissues in various parts
 "of the body."

As the lining and investing membranes
 of the heart are composed chiefly of
 white fibrous tissue, why should
 they not become affected as readily
 as other structures of the same
 constitution in other parts of the body?
 The heart is as much, if not more,
 exposed to the irritant properties of the
 materies morbi, which is the true cause
 of rheumatism, as any other part of
 the body, because the poison must
 circulate in the blood in order to
 cause inflammation in and around
 the joints; therefore I do not see any
 occasion to attribute the cardiac
 inflammation to metastasis.

Symptoms - The first symptoms of rheumatic inflammation of the heart are chiefly sudden pain in the precordial region and palpitation, attended with difficulty of breathing, and frequently a sense of oppression - When these signs, along with increased pain on pressure being applied over the cardiac region, make their appearance in a patient suffering from acute rheumatism, we may safely say that the heart has become implicated, constituting one amongst the local affections, which characterize this malady -

The precordial pain sometimes extends to the left hypochondrium, is increased during inspiration, and often the patient is unable to lie on his left side - The pulse is usually increased in frequency, and maintains its regularity in the majority of cases -

Sometimes these symptoms are so slight at the onset, that they are not complained of, and their occurrence

is only to be ascertained by inquiry. In some cases, the only indication that the heart has become implicated is the increased frequency of respiration, which is believed by some to be the most constant of all the symptoms of rheumatic cardiac inflammation. The breathing appears to be more affected than the pulse as regards frequency.

The severity of the above described symptoms usually abates in the course of 24 or 30 hours from the commencement of the attack; the pain remits, and the dyspnoea and oppression gradually pass away. In some cases, the pericardium is the seat of mischief; in others, the endocardium; and again in others, both are implicated.

When the pericardium is the seat of inflammation, the most prominent signs are increased dullness on percussion in the precordial region;

prominence or bulging in that region, sometimes so great as to efface the intercostal spaces; and a rubbing sound, termed a friction murmur, which is double -

The normal extent of precordial dulness is seldom more than two square inches in extent, as the lung (left) overlaps the remainder of the heart, and yields a clear sound on percussion - But when effusion takes place into the pericardial sac, the space occupied by the heart and its envelope increases, the lungs are pushed aside, and the chest is found to yield a dull sound where it had previously given out a well marked resonance -

If the effusion be very abundant the dulness may extend as high as the second left rib; and sometimes, it passes over to the right side of the sternum - Whenever a friction sound has suddenly disappeared rapid

* (which have been roughened in consequence
of the inflammation) -

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effusion into the pericardium ought to be suspected, and it will invariably be ascertained by percussion.

It is quite evident, that if a large quantity of fluid be poured into the pericardial sac, that the opposed surfaces of the serous membrane* must be separated, and consequently the rubbing cannot take place.

In proportion as the effusion increases, so will the dulness extend, and so will the heart's action become more and more embarrassed; its impulse more feeble and irregular, and its sounds more distant and less audible.

It may happen ever and anon, that the heart may not be attended to until so much fluid has been effused into the pericardium that a friction-sound cannot be detected. It is cases of this sort, whenever they occur, that percussion is so valuable.

As soon as pericarditis sets in the smooth and glistening membrane

No. Sometimes only high

becomes dry, and after a time, which varies according to the intensity of the inflammatory action, covered by a quantity of effused lymph; its smoothness is consequently destroyed; and its motion, which previously was noiseless, is accompanied by a sound of friction, caused by the rubbing of the two opposed roughened surfaces -

This sound is sometimes harsh and rattling, sometimes resembles the creaking of new leather; these different tones evidently depend on the amount and the mode of deposition of the exuded lymph - This sound is double - a to and fro sound -, and is superadded to the natural sounds of the heart - When pericarditis is accompanied by endocarditis, there is sometimes a difficulty in distinguishing one sound from another; there is this peculiarity in the friction murmur, it is always double and more superficial than endocardial murmurs -

Sometimes the friction sound ceases to be heard, and this may arise from two causes; either from complete separation of the two layers of membrane by the effusion of a large quantity of serum, or from their agglutination by means of the exuded lymph -

In the former case the cessation of the friction-sound is only temporary, because as soon as the serum is re-absorbed, and the roughened surfaces come again into apposition, the rubbing noise is almost certain to return; in the latter, the cessation is permanent, and when the adhesion is firm and the two layers are adherent throughout their whole extent the friction murmur can never recur - The duration of the friction-sound varies; in most cases, it continues from a week to a fortnight, but as the curative process advances gradually becomes less loud and more limited, and at length ceases altogether - Dr Wm Budd says

he met with a case where the friction sound continued two days only, and was almost the only physical sign of the affection, for the effusion was not in sufficient quantity to occasion extensive dulness, or alter the form of the precordial region -

There is a physical sign described by Dr. Huller, which, I believe, has not particularly noticed by other writers on this subject - It is a peculiar thrill communicated to the chest, and from the chest to the hand, when placed over the situation of the heart -

He says this strange sensation is most perceptible between the cartilages of the second and third, and the third and fourth on the left side of the chest -

Like the friction sound, it results from a vibration occasioned by the attrition of the two roughened surfaces of the pericardium; hence it imparts to the touch the same information, which is conveyed by the friction sound to the ear.

He further mentions, that in every case accompanied by this thrill, in which he had an opportunity of examining the conditions of the parts after death, the outer layer of the pericardium has been found glued, as it were, to the parietes of the chest by lymph exuded into the anterior mediastinum -

He also states that he has verified this observation in 5 instances, and is satisfied of its correctness - This may occur occasionally, but it must be very rare, or it could never have escaped the attention of other careful observers - When the endocardium is the membrane affected in acute rheumatism, there is first detected a murmur, which resembles the blowing of a pair of bellows, or some modification of it -

This may accompany, either the systole, or the diastole of the heart, or both - Sometimes, the ordinary signs of incipient endocarditis, such as pain, difficult respiration, and palpitation are so slight, that, unless we were

acquainted with the previous condition of the heart, it might be a difficult matter to say whether the murmur arose from mere functional disturbance, or from a deposition of lymph on the valves, or an altered condition of the valvular structure, such as thickening, puckering, or rigidity of the valves themselves.

Then, by the commencement of a bellows murmur or sound we are made aware of the access of Endocarditis, and by the position of the sound, by the direction in which it is heard, by the time at which it occurs, and by the state of the pulse, we are enabled to judge with wonderful accuracy of the site of the lesion from which it originates - I shall confine my remarks to the left side of the heart, as rheumatic inflammation of the valves of the right cavities is very rare. If the murmur be synchronous with the systole of the heart, it is referable

either to obstruction at the aortic orifice, or to regurgitation through the mitral opening - If it be synchronous with the diastole, it must accompany the entrance of blood into the ventricle, and it is due either to regurgitation through the aortic orifice, or to obstruction at the mitral opening -

It is sometimes very difficult to make out the exact seat of the lesion, which gives rise to a murmur; we are to be guided by its position, by the direction in which it is heard, and by the character of the pulse -

If a murmur accompany the systole, is heard loudest at the apex, along with irregularity and inequality of the pulse; then the disease is situated in the mitral valve - The murmur is produced by a regurgitation of a portion of blood into the auricle during the contraction of the ventricle -

If a murmur be synchronous with the systole, heard most distinctly at

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the base, and along the aorta, then it is due, most likely, to obstruction at the aortic outlet of the ventricle, probably, constriction of that orifice; it is still more probable if the pulse be weak -

If, on the other hand, the murmur be heard loudest from the middle of the sternum upwards towards the base, instead of downwards towards the apex, and accompany the diastole of the heart, it is produced by the reflux of blood through the aortic orifice into the ventricle, and indicates a lesion of the sigmoid valves - This lesion may be of such a nature as to entirely destroy the second natural sound of the heart - But a lesion of the mitral valve sometimes produces a murmur during the diastole - If the mitral valve be so diseased as to cause a sonorous vibration in the blood passing from the left ~~ventricle~~ auricle to the corresponding ventricle

a murmur may accompany the diastole, which is heard most distinctly about the middle of the sternum, and thence downwards towards the apex - The pulse will be small owing to the obstruction presented to the flow of blood into the ventricle -

A double bellows murmur sometimes occurs at the same time; one synchronous with the systole, and the other, with the diastole of the heart; this may be produced by disease either of one valve, or by two separate valves - Thus, in the former case, the Mitral valve may allow of regurgitation during the systole, and also cause obstruction to the flow of blood into the ventricle during the diastole - In the latter case, the Mitral valve may allow of regurgitation during the systole, and the aortic valves permit a reflux of blood during the diastole -

A still greater complication is described

* sometimes

by some authors on Diseases of the heart. It is this, a systolic murmur, arising, partly from mitral regurgitation, and partly from aortic obstruction, is followed by a diastolic murmur, produced, partly by mitral obstruction, and partly by aortic regurgitation. To make out this state of matters require an excellently tutored ear. During the progress of acute rheumatism, inflammation of both membranes, comes on at the same time in the same individual; and a very serious complication it must be, if there should happen to be a large quantity of serum effused into the pericardial sac.

Having given a brief outline of the symptoms, and physical signs obtained by percussion and auscultation, we now proceed to notice the various changes which take place in the heart and its membranes as the results of the inflammation -

The effects which follow an attack of pericarditis vary according to the extent of the disease, and the nature of the products in each particular case. When the membrane has been only partially inflamed, the exudation of lymph may be so trifling as not to cause adhesion between the two folds of serous membrane; it is gradually reabsorbed leaving nothing more than a white patch on the surface of the heart. But if the inflammation has been extensive, the lymph will be exuded in abundance, and the two opposed ^{surfaces} will become glued together, provided the effusion of serum has been small in quantity and quickly re-absorbed, so as to keep the ^{not} surfaces at a distance from each other for any length of time. Whenever the effusion of serum is very abundant, with a small proportion of lymph, adhesions take place less readily; and when they do are

only partial and irregular -
 Sometimes, the lymph is of such
 low vitality, and mixed with so large
 a quantity of serum, which keeps the
 pericardial sac continually distended,
 that even temporary recovery is very
 slight, the heart's action is impeded,
 the patient suffers from palpitation
 and paroxysms of dyspnoea and
 other urgent symptoms, which soon
 put an end to his existence -

In instances of this description, the
 pericardium has been opened, after
 death, and found to contain serum
 mixed with pus, and shreds of curdy
 looking lymph possessing little plasticity -
 The most favourable issue to be ex-
 pected is adhesion of the pericardium
 to the surface of the heart; if the lymph
 be exuded in moderate quantity, and
 possess a high degree of plasticity, it
 soon becomes organised and forms firm
 adhesions - Dr. Watson does not believe
 that the whole of the lymph is ever

re-absorbed, and that those cases of pericarditis M. Bonillaud describes as terminating in health ought to be placed under this mode of recovery. It is in persons, who previous to their attack of pericarditis have enjoyed tolerably good health, this happy termination is mostly to be expected.

In those of weakly and scrofulous habit of body, the exuded lymph is not so healthy in character, consequently there is not the same tendency to organisation; and furthermore the effusion of serum is generally greater, keeping the opposed surfaces separate, and preventing adhesion taking place. The lesions that ensue in the lining membrane are equally well marked and as disastrous as those of the investing membrane.

The transparency of the membrane may be replaced by whiteness and opacity; fibrin may be deposited upon it in different situations, forming beaded

excrescences, or it may be exuded
 beneath it or on its surface causing
 puckering and rigidity of the val-
 vular apparatus - The valves are
 the most frequent seats of the lesions.
 The fibrinous deposits, which constitute
 the most frequent form of rheumatic
 valvular lesions, vary much in their
 appearance in different cases, and at
 different stages of their existence;
 they vary in size from a pin's head
 to a millet seed, and are sometimes
 very numerous - Deposits of this
 kind are usually confined to the valves,
 especially their edges of contact, so
 that they are said to arrange themselves
 on the sigmoid valves in a double
 crescentic form - Dr. Watson was the
 first to point out this peculiarity -
 At one time they are isolated and distinct,
 at another partially blended together,
 and if several should happen to
 spring from a common base they may
 form a mass of considerable size -

When fibrinous deposition has taken place rapidly, as it occasionally does, long filaments of various shapes, some presenting the appearance of pendulous tumours, hang loose into the ventricle and are moved backwards and forwards by the current of blood, which is being continually impelled against them—whenever these large depositions occur, they are generally more extensively distributed over the lining membrane. But the formidable termination of * Endocarditis is ulceration of the * valves, and the ulcerative process extending to the muscular substance of the heart—Dr Watson relates two cases of rheumatic endocarditis, when upon examination after death, the whole of one of the valves (aortic) was, in each case, a mass of ragged ulceration; and the adjacent portions of the two other valves were, in a slighter degree, implicated in the mischief—In one of the cases, the

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ulcerating process had penetrated through the valve, and into the muscular substance beyond, and had eaten a hole completely through the septum ventriculorum -

Endocarditis is not so often directly fatal as pericarditis; still it is to be dreaded the most for two reasons: 1st Endocarditis occurs much more frequently than pericarditis; the average proportion from various statistics appears to be as 6 cases of the former to one of the latter -

2nd - When pericarditis terminates favourably, as it often does, by adhesion of the pericardium to the heart, it does not produce those distressing symptoms in after-life that are so likely to result from Endocarditis -

If the adhesion of the pericardium to the heart take place merely by a few bands attached to the upper of the right ventricle, very distressing symptoms may ensue - The patient

suffers great pain in the precordial region on resuming the recumbent posture; this is easily accounted for, the bands are put on the stretch and impede the free movement of the heart at each contraction -

On the other hand, when the adhesion is continuous over the whole surface of the heart, the movements of that organ are more accurately performed, not causing a greater stress upon one part than another, consequently giving little or no distress to the patient.

The sequels of endocarditis are very different from those of pericarditis. The impediments to the flow of blood through the valvular orifices, together with alterations in the valves themselves, allowing of regurgitation, are sometimes of such a nature as to cause very remarkable changes in the ~~change~~ heart. One, two, or more of its cavities may become dilated along with hypertrophy, especially

of the left ventricle - Dilatation of the left auricle is almost certain to occur if the mitral valve be so much altered as to allow of free regurgitation - The same thing takes place in the left ventricle if the aortic valves permit a reflux of blood into it; and if there should happen to be any contraction at the aortic orifice, hypertrophy of the muscular substance will accompany the dilatation -

The time, which is necessary to produce these results, varies in different cases; in some, a few months may suffice; in others, two, three or more years may pass before they are fully developed - Much depends on the sphere of life in which the individual is placed; those in good circumstances may be able to ward off the direful consequences of a damaged heart for a lengthened period, but it is far different with the poor

artizan, who has to labour hard for
 a subsistence, is exposed to excessive
 exertion from time to time, and though
 he feels himself, as it were, unable
 to the task, still he perseveres until
 at last he is obliged to seek an
 Hospital or Asylum, probably, to pass
 a life of misery; he becomes subject
 to attacks of palpitation and dyspnea,
 followed by cough, bronchitis, and
 may be effusion into the abdominal
 & thoracic cavities, and last of all
 general anasarca; thus, he lingers
 on until death puts an end to
 his sufferings -

Treatment-

Acute rheumatism, like all other -
diseases, has undergone different
modes of treatment -

Blood-letting, purgatives, sudorifics,
colchicum, lemon juice, nitrate of
potash, calomel and opium, and
cinchona have all had their advocates.
Little need be said of cinchona and
its preparations - It was employed on
the pure stimulant plan - It was
first employed by Dr. Morton, but was
opposed by Fuller, and was little used
until the late Dr. Haygarth revived
the practice - The results, even of Dr.
Haygarth's own showing, were not
very encouraging, for he lost 12 cases
out of 170 - Since the time of Dr.
Haygarth, the practice has been
revived in France, more particularly
in Paris - M. Biquet states that
large doses of quinine were as
successful in the treatment of -
rheumatism as of ague -

Mr. Monneret gives 22 cases which were treated with quinine; one patient took 54 grammes (3xiv) in 12 days, another took 50 grammes (3xij) in 11 days. The smallest dose administered was 2 grammes (ʒss), and the largest was 6 grammes (ʒiʒss) - There were only 7 cases out of the 22 cured, so that two-thirds remained uncured - The effects upon the nervous system were remarkable; it produced great excitement resembling that of intoxication, or a state of collapse similar to that of typhus fever; and it was noticed that the effect upon the articular pains seemed to correspond with the intensity of the nervous affection -

This practice is almost, if not entirely, abandoned -

Blood-letting - This is a practice to which medical men have of late years paid particular attention -

Some say that it is the most efficacious of all remedies in acute rheumatism,

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and the only one to be depended upon; others again have condemned the practice, and say that it is attended with serious consequences, causing a tendency to heart complication by metastasis, as some have supposed.

Dr. Heberden advocated copious blood-letting for a long time, but from experience in his own practice came to the conclusion that large bleedings were unsuitable to the majority of cases of rheumatism.

Dr. Craigie, a strong supporter of the practice, was in the habit of bleeding largely; he used to take 20 or 30 oz. at once, and within twenty-four hours repeated the operation and took as much more.

Two of the most strenuous supporters of large and repeated bleedings are Dr. Macleod and M. Bouillaud.

Dr. Macleod takes from 12 to 20 oz. of blood, and repeats this quantity twice or thrice in the course of five or six

days, from moderately robust persons. M. Bouillaud usually abstracted from 3 to 6 pints on the first three or four days of the rheumatic attack. One, ^{half} of his cases had more or less heart complication; can this be attributed to the abstraction of large quantities of blood, thereby causing great nervous irritability?

It is very probable they were due to this cause, because it is well known that large losses of blood are followed by great irritability of the whole system, and that the heart is an organ which soon suffers from such excitation.

Audral & Gavarret have shown that in acute rheumatism the fibrine is increased in proportion to the other constituents of the blood, which they say is due to the local inflammation, and that blood-letting has little or no controul over it, unless the local affections are on the decline.

* The quotations are too lengthy to be inserted here.

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The blood drawn is remarkably buffed and cupped, and a large quantity may be abstracted before syncope comes on - But neither the buffed ~~and~~ ^{nor} cupped appearance can justify copious depletion, and particularly a repetition of it, because this appearance will continue when depletion is no longer safe, and when it has been carried to such an extent that an Anomic murmur is heard accompanying the sounds of the heart -

Andral made a series of experiments, and found that whilst at the first bleeding the corpuscles reached on an average 120 per 1000 parts of blood, at the fourth bleeding were as low as 95 per 1000 - Large bleedings then reduce the number of corpuscles but have no effect on the amount of fibrine -

Dr Latham expresses himself rather emphatically on this subject in his Clinical Lectures - vol I - page 193 - *

He says from his own experience that large depletions are more frequently hurtful than beneficial; but at the same time believes that small & moderate losses of blood in young plethoric and robust persons are ~~attended~~ of great service by subduing excessive vascular action -

Dr. Fuller is of the same opinion as Dr. Latham - Dr. Watson states that he now rarely prescribes phlebotomy, although he is in the daily habit of treating acute rheumatism -

Those, who have adopted this heroic practice in the treatment of acute rheumatism have regarded the disease simply in relation to its inflammatory character. Rheumatic inflammation is very peculiar, it is seated chiefly, if not wholly, in the fibrous structures; it is dependent upon an *materia morbi* circulating in the blood, and is very different to that of ordinary inflammation; in proof of which, its transient character, and rarely

passing on to suppuration -
 Blood-letting of itself cannot cure
 the disease, it may relieve pain and
 subdue increased vascular action; but
 there are other remedies which will attain
 these two objects fully as well as
 general depletion, and ^{be} attended with
 less danger. These remedies will be
 discussed afterwards in their turn -

Purgatives - These have been freely
 administered by some practitioners with
 the view principally of reducing excessive
 vascular action - The more powerful
 purgatives have the power of producing
 this effect, but it is doubtful if that
 ought to be our object - They act very
 beneficially by unloading the bowels of
 a large quantity of unhealthy and
 offensive secretions and accumulated
 fecal matter; at the same time, favour
 elimination of the natural secretions,
 by which means a large quantity of
 rheumatic poison may be got rid of -
 At the commencement of the disease,

The patient's bowels are generally con-
 stipated, along with hepatic derangement;
 he complains of a sour taste in his
 mouth; his breath is disagreeable,
 tongue coated and yellow, and his
 motions, ^{are} dark coloured and offensive.
 In fact, occasionally, there seems to
 be so much torpidity of the bowels, a
 want of healthy secretion, together with
 an accumulation of matter in the
 system, which ought to have been excreted
 by the bowels, that it is expedient to
 produce, at least, two or three abin-
 evacuations for the first two or three
 days after the attack - They frequently
 give great relief; the pain and fever
 decrease, and the patient finds himself
 much better after several copious,
 dark-coloured, and offensive stools -
 Active purgatives, though necessary
 for the first two or three days, ought
 not to be given with the view of
 acting on the bowels two or three
 times a day after they (bowels) have

been fairly cleared out; one free evacuation daily is quite sufficient. Drastic purgatives should always be avoided, as they are liable to give great uneasiness to the patient; if accumulations in the lower bowel be suspected, enemata are preferable, because they produce less uneasiness, consequently create less irritability in the system, which ought always to be guarded against as much as possible - Violent purging continued for several days is quite as injurious as large bleedings; both act, in a great measure, on the same principle, that is, by causing debility and nervous irritation -

There is another great objection to frequent evacuations, namely, that of exposing the patient, whilst attending to the calls of nature, to fresh attacks of cold; as well as giving him excessive pain by the movements which cannot be avoided -

Many practitioners are in the habit of giving calomel in three or four grain doses along with purgatives; they believe it acts beneficially by stimulating the liver and other glands so as to increase their natural secretions-
Sudorifics- These were formerly much in vogue- Though the patients were bathed in perspiration, Dover's powder, and large doses of antimony were freely administered with the view of causing still further sweating. The diaphoresis thus produced was so great as to completely saturate the bed-clothes; still those put under this treatment obtained little or no relief, their pains did not abate in the least. One fact was observed, that the strength was reduced to such a degree as to cause the recovery to be much more uncertain and tedious-

Dr Hope, who was averse to the sudorific treatment, expressed himself somewhat quaintly: - "That he had seen patients

"stewed and parboiled (if you will excuse
 "a culinary expression) for four, six &
 "eight weeks, and gain - What? - a
 "more attenuated frame, chronic pains,
 "and a confirmed susceptibility of rheumatic
 "attacks on the slightest variations of
 "temperature" -"

This treatment has, in a great measure,
 fallen into disuse; nevertheless,
 there are some who still adopt it -
 In cases, where the skin is hot and
 dry, diaphoretics will be found ben-
 eficial by restoring the secretion of the
 skin, but should not be persisted in
 after free perspiration has supervened.

Colchicum - This drug was first in-
 troduced as a specific for Gout, and
 on account of the analogy between
 gout and rheumatism, it was thought
 that it would be as useful in the
 latter as in the former disease -

Sir Everard Home, who was a victim
 to Gout, considered it as such from
 observation of its effects on his own

person - This gentleman was the first to recommend it in the treatment of acute rheumatism -

Colchicum is administered chiefly on account of its diuretic and sedative action. Some, who have used it, say that it does little or no good in acute rheumatism unless it be gradually pushed on until its physiological action is witnessed on the system, such as diarrhoea, a lowering of the pulse and diminished action of the heart, with giddiness and headache - The practice must be a very dangerous, if the drug has to be given to such an extent to produce any beneficial effect -

Hitherto, this remedy has been extensively employed, but has disappointed the expectations of many, and is ^{now} entirely cast aside by some physicians of eminence, who formerly believed it to be the best remedy for acute rheumatism -

Lemon juice - Dr G. Owen Rees introduced this remedy; he supposes that, by the excess of oxygen it contains, it promotes the conversion of Lithic Acid into Urea and Carbonic acid, and thereby favours its excretion from the system - Admitting that Lemon juice contains a large quantity of oxygen, still it must be remembered that it contains as large, if not a larger, proportion of Carbon and hydrogen. All organic acids undergo transformations after entering the stomach, and are never eliminated in their original form - It is believed that they are converted chiefly into Carbonic acid; be this as it may, there is one thing certain they are reduced to forms of a less complex nature than themselves. The changes in acids containing so large a proportion of carbon and hydrogen must be produced chiefly by oxidation. I do not see that Dr Rees' hypothesis will hold good, if organic acids are

converted into less complex substances by the process of oxidation -

If this be true, Lemon juice would have a contrary effect by appropriating to itself that oxygen in the blood, which ought to convert uric acid into Urea and carbonic acid - This is a very difficult point, because we do not thoroughly understand the ultimate changes of complex substances, which are continually taking place in the body. Though the chemist may give us the changes as they are witnessed by him in the laboratory; yet we have no means of ascertaining with any degree of certainty how these changes take place in the living body, because it is admitted by most medical men that they are governed by vital forces - However, without any more theorising, I shall briefly state the results of the practice - when first introduced, it appeared to succeed in the hands of a few, but entirely disappointed many,

who ^{had} given it a fair trial -

In the Clinical Boards of the Edinburgh Infirmary, Dr Bennett has tried it in large doses in several cases of acute rheumatism, but I believe in nearly all the instances proved unsuccessful -

Dr Fuller watched its exhibition in 22 patients, and although in several it produced much depression, in some griping pains in the abdomen, and in one gave rise to violent diarrhoea, accompanied by a copious discharge of blood from the bowels, yet in 3 patients only did it appear to afford relief, or to hasten recovery -

From numerous reports of cases treated by Lemon juice, it appears to have given general dissatisfaction to the majority of those, who have given it a fair trial -

Nitrate of Potash - This salt has been extensively employed in acute rheumatism, and its supporters speak very highly of the benefit to be derived from

its exhibition - It was introduced by Dr. Brocklesby as far back as 1764 - Mr. Mouton Solon tried it in 33 cases; of these, 20 were cured from the 3rd to the 7th day, 11 from the 9th to the 10th day, and 2 from the 11th to the 15th day -

The quantity exhibited was usually 7 1/2 drachms in 24 hours, but in 10 cases it was carried as high as 15 drachms -

Dr. Bashaw, who treated many cases ~~many cases~~, speaks highly of its value when given in large doses -

He ordered from 1 to 3 oz. to be taken in 24 hours, and states that he never saw these large doses produce either nausea or vomiting - In a few instances, he observed griping pains of the abdomen, with watery evacuations, which speedily ceased on discontinuing the remedy -

Mr. Monneret tried it in 8 cases, in all of which the rheumatism was recent and intense - He gave it in doses from 8 to 30 grammes;

(from Zij to Zoij), but never observed any benefit result from its employment. He further states that it produced no alteration whatever; that the articular pains were not relieved, the fever and pulse continued the same, and that the urine was not even increased in quantity -

Dr Fuller says that in 17 cases he has exhibited nitrate of potash to the extent of one ounce daily, and in one instance only did it appear to exercise any decided controul over the course or duration of the disease - In this one case, it gave rise to copious diuresis with manifest relief to the pain and inflammation; but in all the other cases, it had no obvious effect upon the excretions; the disease continued of average intensity, and ran on to its ordinary duration -

In the Clinical Wards of the Edinburgh Infirmary, the remedy has had several trials; Dr Christison, from his own

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observations, has come to the conclusion that it does little or no good -

Dr. Bennett gives a rather ^{more} favourable opinion of the remedy, but at the same time admits that he has been disappointed with the results of the practice.

It appears very difficult to come to any definite conclusion as to the effects of Nitrate of Potash on acute rheumatism.

It has succeeded in the hands of some, and completely failed in those of others; the failure cannot be said to be due to its having been exhibited in too small doses, because Dr. Haller and Mr. Monneret gave it in large quantities -

What remarkable virtues does this salt possess that many of the other salts of potash do not? -

None whatever; it is diuretic and refrigerant, and so are many of the potash salts - It is said to pass through the kidneys unchanged; though it has been detected in the urine.

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yet it is very doubtful if the whole of the salt has remained undecomposed after having been absorbed. - If it passes through the kidneys without undergoing any change, then it acts merely as a diuretic, and upon this alone its virtues must depend. - But, if a portion of it be decomposed, then it may beneficially act by neutralising the excess of acid, which is always present in acute rheumatism. The salts of potash, the nitrate, bitartrate, and acetate more especially, are excellent remedies in the treatment of this disease; they all act as diuretics, and neutralize the excess of acid; still not of them ought to be solely depended upon to the entire neglect of all other remedies.

Calomel and Opium - This plan of treating acute rheumatism was first adopted by Dr. R. Hamilton of Lynn Regis; he first bled his patient and then gave calomel & opium at suitable intervals, until the disease ceased, or the

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specific effects of the medicine were produced -

There is not a remedy in the whole Pharmacopoeia, which has been more extolled or more abused than mercury. There are a few practitioners, who say that it does no good in any disease; still the majority of them are in the habit of using it daily -

There appears to be ~~no~~ necessity for the exhibition of calomel in acute rheumatism, and furthermore, it has been observed that patients, who been salivated at the commencement of the disease, have not ~~escaped~~ rheumatic inflammation of the heart -

Opium taken by itself is one of the best remedies we possess in the treatment of this disease - It allays pain, produces sleep, and tends to subdue nervous irritability; these are always to be desired, because the more irritable the heart, the greater is the liability of inflammation of its membranes -

Having taken a review of all the plans which have been adopted in the treatment of acute rheumatism, I shall now briefly state what appears to me the safest and most judicious method of treating the disease -

The indications are, -

First, to treat symptoms - When a paroxysm has once been established, there is excruciating pain producing pervigilium, which gives rise to nervous exhaustion, and consequently great irritability of the whole system - The heart is peculiarly obnoxious to the effects of such irritation; therefore, it is manifestly desirable to relieve these symptoms, because that organ is continually exposed to the irritating properties of the poison, which is the essential cause of rheumatism -

If we can allay pain these distressing symptoms abate - This is best accomplished by Opium and its preparations - Any of the following may be used, crude or powdered opium, the tincture, liquor Opii sedativus,

and the murriate and acetate of Morphia -
 If we wish to induce, as well as to allay
 pain, the tincture is the best, or a com-
 bination of the tincture with solution of
 murriate of Morphia. In general, the doses
 required to produce any good effect must
 be larger than those ordinarily prescribed.
 A combination of opium and henbane
 is supposed by some to have an advantage
 over opium alone, as the henbane has not
 a tendency to produce constipation, but
 rather the contrary - The articular
 pains may be greatly relieved by the
 application of tepid fomentations of
 decoction of poppy -

Frequently the rheumatic fever runs very
 high, attended with increased vascular
 action - The heart beats with increased
 force and frequency as indicated by the
 pulse and by placing the hand over the
 cardiac region - The fever is produced
 by the poison in the system -

It is principally the increased vascular
 action which we have to look to, and try

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to reduce it to its natural condition -
To accomplish this object there are
several remedies from which we can
take our choice: these are general
blood-letting, aconite, conium and
digitalis - When reviewing blood-
letting at pages 61-65, it appeared to me
that the results of the practice were
any-thing but satisfactory - to wit,
M. Bouillaud's cases - and that in the
majority of cases it does no good
whatever but often proves hurtful -
Still, - as "Dr. Latham says" - small
and moderate losses of blood in
young, plethoric and robust patients
are of service by subduing excessive
vascular action - Whenever depletion
is indispensable in order to subdue
increased vascular action, care should
always be taken that a dose of opium
or morphia is given after the operation.
Aconite is a powerful sedative;
Dr. Christison has great faith in it;
he says that it lowers the action of the

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heart most effectually - It is a dangerous
remedy, but may be exhibited with
tolerable safety, if its effects be care-
fully watched from day to day -

Conium is also an excellent sedative,
and has the same effect on the vascular
system as Aconite - I have seen
Conium in combination with morphia
produce a striking effect in a case of
rheumatic Endo-pericarditis; the heart
prior to its exhibition was very tumult-
uous and beating quickly; these
symptoms abated considerably on the
third and fourth days of its administration -

Digitalis is one of the most powerful
sedatives; its action is directed chiefly
upon the heart - It is a dangerous
remedy, owing to its accumulative
action, and is sometimes attended
with serious consequences -

Aconite and Conium are both ap-
propriate remedies, and will in
almost every case attain the same
object as general blood-letting -

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Secondly to effect elimination of the
materia morbi existing in the blood

Elimination of the materia morbi is to be effected by acting on the bowels, and the exhibition of alkalis and neutral salts, especially the salts of Potash - Purgatives at the commencement of the disease are beneficial by ridding the bowels of obnoxious accumulations, and increasing the natural secretions, thereby favouring elimination of the poison - The objections to drastic purgatives and too long continuance of active purging are clearly pointed out page 67 of this Essay -

The salts of potash, particularly the nitrate, bitartrate, and acetate, are powerful diuretics; also by undergoing decomposition, they neutralise the acid, which is the cause of the disease; by these means a portion of the poison is got rid of by the kidneys as an excretion - Potash is also useful as it keeps the fibrine of the blood in

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solution, and tends to prevent its deposition.
Thirdly, to prevent the formation of fresh
materia morbi -

This is to be attained by restoring the secretions to their healthy state, by improving digestion, by the use of warm clothing and avoiding all unnecessary exposures to variations of temperature -

The intestinal secretions require due attention for some time after convalescence ensues. Gentle laxatives are of great service by obviating the sluggish state of the bowels, and preventing fresh accumulations of effete matter.

The exhibition of tonics, such as the bitter infusions in combination with alkaline salts, (the carbonate or bicarbonate of potash especially), are often beneficial by improving the digestive functions - Sulphate of Quinine is thought by some to be the most useful tonic in the convalescent stage -

Particular attention must be paid to the diet; it should be bland, rather nutritious, non-stimulant, and taken in moderate quantity until entire recession of the disease.

Fourthly, to watch for, and treat complications -

As ~~the~~ heart complication is the most frequent in acute rheumatism, it is the only one I have directed my attention to in this Essay -

This organ ought to be examined daily so as ^{to} ascertain the exact period of an attack of pericarditis and endocarditis -

If either, or both, of these complications do occur, the truly antiphlogistic treatment must be brought to bear upon them in order to ward off the dangers of a permanently deranged heart -