18. That animal matters are only apparently dissolved in watery fluids, but that their ultimate globular molecules may at all times be rendered at once apparent, by the addition of any agent which will not alter their properties, but only render them somewhat more opaque.

19. That the animal matters of the urine, those of gelatine, albumen, caseum, &c., are possessed of these peculiar properties of animal matter, and their ultimate globular molecules may in many cases be even seen by means of first-rate instruments, without any additions being made to the fluid which holds them in solution.

20. That former experimentalists seem in many cases, (perhaps in all?) to have described this animal matter met with in the urine, as the lithate or urate of ammonia, from its possessing a few characters in common with that salt; and from the chemical agents employed for ascertaining its presence decomposing that animal substance, and giving rise to the formation of an animal acid—the uric or lithic acid; just in the same way as these chemical agents act on several other substances, converting them into animal or vegetable acids.

21. That this animal matter is probably more easily decomposed by chemical agents, in consequence of its being thrown off as a useless excrescence; its elements being perhaps thereby rendered more disposed to enter into new combinations.

Lastly, That I was perfectly justified in describing this as a new animal matter, and applying to it the term of *gravidine*.

21 Rutland Street, 15*th July* 1842.

Article V.—*Observations on Pericarditis and Endocarditis, and the best modes of Treatment in these Diseases. By* Edward Octavius Hocken, M.D., &c. &c.

Rheumatic inflammations of the pericardial and endocardial investments of the heart are so comparatively common and well understood, that all authors refer to these in their descriptions of pericarditis and endocarditis; whilst, on the contrary, other varieties are so uncommon, that what we really do know of these diseases, is derived from the clinical investigations of the rheumatic forms. In my following remarks I shall confine myself to the rheumatic inflammations of these tunics solely.

Rheumatic inflammations of the heart are confined to particular forms of this malady, (rheumatism), and to particular varieties of this form. To explain my allusion, I may state, that I am considering rheumatism as divisible into the specific or gonorrhœal, and the common or atmospheric varieties, whilst the

latter is again divisible into the muscular, articular, &c. Now in the first division, or the gonorrhœal, the heart is, as far as I am aware, always exempt from inflammatory disease, showing in this, as in many other particulars, a marked difference from common rheumatism. In the second, or atmospheric form, the heart suffers only in the articular variety, in which, as is but too well known, its external and internal investments are so frequently and dangerously involved. I wish to lay particular stress on this frequency of occurrence and danger, and on the necessity of constantly and carefully *watching for* and *searching after* the symptoms which lead us to disguise their very commencement. If we could rely on our statistical records of rheumatism, it would be found that at least one in every two cases of acute articular atmospheric rheumatism, would present some disease of the heart; frequently, however, not discovered, and very rarely terminating in immediate death. But although these cases rarely prove immediately fatal, they generally lay the foundation for future disease and future death, the two diseases pericarditis and endocarditis having an inverse ratio in these respects—the first more frequently terminating in immediate death, and less frequently in future disease, the latter less frequently killing *per se*, but when once fully formed, and detectable by the ear, never receiving a subsequent cure, but sooner or later originating valvular disease, of which the acute endocarditis laid the foundation.

The two investments of the heart more frequently suffer together than alone; but I have remarked that endocarditis is much more common as a separate disease than pericarditis, and that where the latter affection has occurred, the former is almost sure to come on; hence, then, it is well, not so much to consider them separately, as to include them together in a general consideration of the rheumatic affections of the heart.

All our experience tends to prove that these diseases are never cured unless stopped at once—that however well the patient may apparently become, if the pericardium has become adherent, and the valvular action attended with a bellows murmur, his recovery is apparent only, and not real—that the seeds of future disease are laid, which it requires time only to quicken into fatal and fearful activity, which although slow, is nevertheless sure, and finally successful. If we examine these patients when apparently recovered from all disease, the bellows murmur still remains, and will be found to continue in all its original intensity for months and years after the original attack, although the heart's action may be healthy, and no other morbid symptom exists. Our prognosis under such circumstances cannot be favourable, for who can doubt its ultimate termination, and that by and by the affected valves will become more and more implicated, and mark

their changes by the increasing imperfection with which their functions are performed? The majority of diseases of the valves of the heart receive, I doubt not, their first beginning in endocarditis, and many have fallen victims to these diseases who have little suspected the origin of their complaint. If these things are so, how necessary is it to detect these diseases, and to cure them in their very birth—to diagnose them at the only period when they are susceptible of a *real cure*, and are amenable to medicine—to watch for their very commencement; in fact, to search for them, and anticipate their results; and to keep the patient in a state ready to attack them at a moment's notice; for to detect and prevent such disasters is one of the grandest triumphs of medicine.

In my following observations, I shall endeavour to fill up a few blanks which still remain in the otherwise full and clear knowledge which we possess of these diseases, avoiding those parts which are best known, and enlarging especially on those subjects which I deem most important. Rheumatic inflammations of the heart terminate in three different ways:—they either proceed to a fatal termination speedily; most commonly, however, they terminate in apparent, but unreal recovery; and thirdly, they receive a true and lasting cure, which is most rare of all, and happens only when recognised and stopped in their very commencement. As it is obviously the duty of the physician to aim at curing these affections, and not at merely suspending active disease and present danger, it becomes him as zealously and constantly to auscult the precordial region as to feel the pulse, or note the inflamed articulations, and in fact more so, as being the greater and profounder malady, which he should consider always to exist, at each visit, until convinced to the contrary by the complete absence, not only of general, but physical signs. No stage of the rheumatism should be considered too early for these minute and frequent investigations, as they have been said occasionally even to precede the more obvious symptoms, nor should any period short of complete recovery be thought too late to search for, rather than be surprised with their outbreak.

Mere general symptoms are most deceptive guides, for in many cases a *bruit* plainly tells the ear what not one pain, uneasiness, or any morbid symptom had previously indicated, even to the patient himself, and much less to his medical attendant. But the stethoscope never deceives, if we wait long enough for a *bruit*, or the friction sound to be developed. It is, however, painful to hear these morbid sounds, and feel that we have allowed those inflammations to go on which we cannot now hope to cure permanently: hence it is obviously our duty to ascertain if any other physical signs exist, which, taken in connexion with the presence of acute articular rheumatism, plainly point out the

very commencement of cardiac inflammation, and if so, to strive earnestly to prevent the further progress of the pericarditis or endocarditis, beyond that at which the sense of hearing took up the diagnosis. Such symptoms truly precede the more confirmed, but not less diagnostic signs of complete valvular derangement and roughening of the naturally smooth and lubricated surfaces of the pericardium; and on these I shall say a few words.

Physical Signs.—It is generally allowed, that a friction, or to-and-fro sound, occurring *de novo* in acute rheumatism, is an undoubted sign of acute pericarditis, and that a bellows murmur, commencing under the same circumstances, at any one or more of the valves, is an equally unequivocal sign of acute endocarditis; few, however, have gone beyond this, and described the signs of preceding stages. It is, however, not difficult to surmise that incipient disease of a valve would be attended with some sign, before it extended to such an extent as to allow regurgitation, or produce a *bruit* from the onwards current, and that inflammatory injection of the pericardium would roughen the sound of the heart's passing to and fro, before effusion of lymph imparted to it the roughness and coarseness of a saw. Facts, indeed, prove that such is really the case, and many times I have known a lengthening and roughening of the sounds, especially the first sound detected at the time of its occurrence, and suspected to be the beginning of rheumatic carditis, and the next day has but too truly verified these suspicions. In these cases, the first discoverable change from the healthy condition of the heart's state, beyond the mere excitement of general fever, has been an augmentation and abruptness in the impulse, and an increase in the hurry of its actions, soon followed by the slight alteration of its rhythm which I have cursorily mentioned. The first sound becomes unduly prolonged and roughened in its character, when contrasted with the second, which also is, in general, similarly affected, but in a slighter degree, so that the period of the systole encroaches on that of the diastole. The exact valve or valves principally diseased, mainly determine the peculiarity of these changes, which nevertheless principally, if not entirely, affect the aortic and left auriculo-ventricular apertures and valves. These alterations in the character, intensity, and duration of the sounds, depend chiefly on a slight and incipient regurgitation of the current of blood, which will be found to impart a peculiar feel also to the pulse: it is a thrill or vibratory impulse, which may or may not at a subsequent period degenerate into the jerk of considerable regurgitation.

Very frequently, if we watch carefully the sounds of the heart's action day by day, or visit by visit, we shall detect, in addition to the foregoing alterations, which, perhaps, have gone on to the production of a *bruit* at the base and apex of the heart, a rough-

ness in the alternate or to-and-fro motions of this organ,—a roughness without any decided *frottement*. This, when heard, is the very commencement of pericarditis, but it is, as far as I am aware, always preceded by the signs of endocarditis, so that, from this knowledge, the incipient signs of valvular derangement should be considered as the incipient signs also of pericarditis; and in this diagnosis, the frequency of their complications will almost invariably bear out the accuracy of our conclusions.

If we review the incipient stethoscopic signs of rheumatic inflammation of the heart, they stand in the following order :—

1*st*, An increased and abrupt impulse of the heart.

2*d*, An increased frequency in the actions of the heart.

3*d*, A lengthening and roughening of the sounds of the heart, chiefly or entirely marked in the first sound.

4*th*, A diminution of the diastolic period, chiefly marked in the period of repose.

5*th*, The commencement of a distinct *bruit*.

6*th*, A roughening of the to-and-fro motions of the heart, without a distinct *bruit de frottement*.

These stethoscopic signs being combined with a thrill or vibratory impulse in the pulse, so frequently and invariably have I known these symptoms to pass into the more confirmed but not less certain indications of acute endocarditis and pericarditis, unless stopped by early and active treatment, that I feel convinced they are the incipient signs, and are as trust-worthy and as truly diagnostic as could be a loud bellows murmur, or a *bruit de scie*.

I have a few words to say on the subject of *frottement*, but I would previously remark on the exact tissues which are inflamed, and primarily involved in rheumatic endocarditis and pericarditis. The inflammation seems to commence and be principally confined to the true fibrous tissues, secondarily involving the serous membranes in contact with them. In cases of acute pericarditis which have terminated fatally, we find this to be the fact. Dr Macleod[1] says, that on raising the sternum, lymph is sometimes perceived even in the interior mediastinum. The bag of the pericardium is seen to be inflamed, and the inflammation marked by a greatly increased number of vessels carrying red blood. The pericardium feels pulpy, or fluctuating; and frequently on cutting through it, we do not at once expose the heart, but find a layer of lymph intervening, adherent partially or more extensively to both serous surfaces.

In endocarditis, this fact holds good in a still more remarkable degree, for it commences in, and is mainly confined to the fibrous zone which surrounds the base of the valves, the fibrous tissue between the duplicatures of serous membrane, constituting the

[1] Treatise on Rheumatism, p. 69.

valves themselves, and to the cordæ tendineæ which pass from this intervening tissue to the carneæ columnæ. A most accurate observer, and excellent physician, Dr Latham, has written some of the most sensible and faithfully depicted "Essays" on diseases of the heart it was ever my lot to read.[1] In his second essay, which is on the "Morbid Anatomy of the Internal Lining Membrane of the Heart," p. 113, he observes, that it is remarkable how curiously disease is apt to limit itself to the spaces just pointed out, (viz. the tough white circles which surround the apertures of communication between the auricles and ventricles, the tricuspid and mitral and the semi-lunar valves of the pulmonary artery and aorta.) Of the fibrous circle between the auricle and ventricle, and the valves which originate from it, and of the tendinous cords which connect the valves with the carneæ columnæ, there will not be the smallest space free from disease; but the disease will abruptly stop where the tendinous cords cease, and the carneæ columnæ begin. Where the portions of the endocardium suffer, he says that the disease has seldom originated there, but has generally spread from other parts of the same membrane. In about one-third where disease has been found on the left side, it has existed on the right side also, and been essentially of the same character. But there has been a remarkable difference in the extent to which it has proceeded on each side respectively,—while on the left, it has gone so far as to be the undoubted cause of death; on the right, although essentially of the same character, it has been only just beginning. These facts are not without their practical bearing, since they prove that the morbid sounds which their diseased state originated, are really and truly the very first indications of the endocarditis itself, and that being the incipient stage, it will probably yield more readily to treatment than if it had gathered strength by continuance in the continuous tissue. Had the disease commenced in or been confined to any other situation, auscultation could not have detected its existence until the valves themselves had been more or less affected by inflammation of their fibrous or serous tunics; but now we know that the very essence of the disease itself consists in inflammation in and around the valves, and hence that the first change effected in any of these parts, immediately produces an alteration in the healthy sounds of the heart, by which the ear takes up the diagnosis, and affords a period for the employment of active and judicious treatment.

When the inflammation has extended to the serous membrane, covering the fibrous tissue first involved, it is still most marked in those exact situations where the fibrous tissue is subjacent.

---

[1] *Vide* Medical Gazette, vol. iii.

Dr Watson has remarked,[1] that the valves may be divided into two parts, one thicker, the other thinner. The thicker part lies next the base of the valve; the thinner next its edge. A valve does not become thin by degrees, but the difference is marked by a distinct line of separation between the thicker and thinner portions, and this by a double curved line. It consists of two curved lines, running each from the centre of the edge of the valve, from the sesamoid body there situated to either extremity of the edge, where the edge joins the side of the vessel; so that there are two segments of a crescentic shape, thinner and less opaque than the remaining part of the valve, lying near the free margin. The anatomical cause of this arrangement is dependent on the fibrous tissue which is interposed between the duplicatures of serous membrane. It reaches the free edge of each valve at three points only; namely, at the centre, where it forms the *corpus aurantii*, and at the two extremities. Between these points it stops short, and presents on either side a scolloped edge, leaving two crescentic portions of the valve formed merely by the doubled endocardium.

The curious fact which first led Dr Watson to remark this natural structure was, that the minuter vegetations, which form upon the arctic valves, in acute rheumatic carditis, most commonly arrange themselves in a row, like a string of beads, along the line of union between the scolloped edge of the thicker scutiform portion of the valve, and the inner convex margin of the two thinner crescentic portions.

If we examine the recorded cases of rheumatic carditis, or, what is better, if we reflect on those we have ourselves witnessed, we cannot fail to be impressed with the great value of the signs of endocarditis, which always precede and accompany pericarditis. Valvular derangement is the first symptom or rather sign of cardiac implication, whether pericarditis follow or not, or whether it follow in a mild or severe degree. Dr Latham, in his first Essay, p. 214, as long ago as 1828, remarked that, in rheumatic pericarditis the *brouissement*, or *bruit de soufflet*, is always among the earliest symptoms referable to the heart, and sometimes the very first. The sign in question, of the peculiar sound accompanying the contraction of the ventricles, has not been absent in any one authentic case of rheumatic pericarditis, during a period of more than three years, and, he remarks, the number of such cases in so large an hospital as St Bartholemew's is considerable.

Supposing, however, we have failed to stop the progress of the disease, or are called in at a later period: lymph is thrown out, more or less abundantly in different cases, and the sounds of

[1] London Medical Gazette, vol. i. 1841–2, p. 691.

friction, or, more rarely, the creaking-of-new-leather sound, marks this result of inflammation in the pericardium. Now, the invariable rule of my observation in all such cases, and, I may add, of the experience of Dr Latham, (which is of much greater value,) commonly taught by him in his clinical instructions, although not published, is to the effect, that when once formed, it never terminates but in complete adhesion of the roughened surfaces, or in the death of the patient. However great the effusion of serum may be—however urgent the distress—however much the heart may be baffled in its actions, and strive and struggle until it become intermittent, irregular, and unequal in its contractions, still do the roughened surfaces pass over one another, and still the to-and-fro sounds of friction occur until death closes the scene. On the contrary, the sound may diminish, and finally cease altogether, whilst the condition (the present) of the patient improves in all respects. This favourable termination, because the best that, under such circumstances, can accrue, depends undoubtedly on the adhesion of the opposing roughened surfaces, and the consequent obliteration of such parts of the cavity of the pericardium. This adhesion of the inflamed portions of pericardium is, without doubt, the best present result of acute pericarditis, which has gone on to the effusion of lymph; it rescues the individual from the danger of immediate dissolution, although, as I shall presently have to show, it lays the foundation of future, but not less certain suffering and death.

I dwell on this subject from the fact that many authors of the best reputation on cardiac disease have erred in their opinions of the terminations of this sign. Drs Hope and Macleod, both of them, seem to be deceived in this particular, but I am glad to be able to add the testimony of so accurate an observer as Dr Watson to the opinions I have already expressed. Dr Macleod, in his recent work on rheumatism, says, at p. 55, that as the rubbing sound in pericarditis depends upon a cause which is transient, so is it one which does not endure beyond a very limited time; for if the opposing sides of the pericardium become coherent, or if they be further separated by serous effusion, then in either case the attriction ceasing, the sounds are no longer emitted, although the inflammation may still hold on its course. And, again, if the disease be overcome, the lymph may be absorbed, and thus the cause of the rubbing sound will equally be removed."

" These phenomena," says Dr Hope, (namely, attriction murmurs,) " only exist, 1st, At the commencement of pericarditis, before any considerable liquid effusion has taken place; 2d, In cases of what has been denominated *dry* pericarditis, that is, with effusion of lymph only; 3d, In cases where the absorption of the fluid portion has at length permitted the roughened surfaces to come in contact: for it is obvious that the interposition of any con-

siderable quantity of fluid, by separating the surfaces, would suspend the phenomena." That these gentlemen were, however, deceived in their expressed opinions, I have only to appeal to the observation of any one who has carefully and faithfully observed nature.

Dr Watson, in his lectures, already referred to,[1] has most correctly remarked, that "the to-and-fro or rubbing sound, is never of long duration, but it terminates in one of two ways: either the patient dies in a short time, the sound continuing to the last; and then the pericardium is found coated with rough lymph, but throughout the far greater part of its extent, or altogether *unadherent;* or the sound ceases, never to return, while the condition of the patient improves; or he even seems, to himself and to others, to recover his perfect health. In these cases the sound ceases, from a physical impossibility of its continuance, viz., from adhesion of the pericardium over the whole, or the greater part, of the surface of the heart. And in this category of apparent but unreal recoveries, I cannot doubt that many of Bouillaud's cases of '*pericarditis terminating in health*' ought to be included." I would add a caution, which, perhaps, need hardly be made, that in ausculting a rheumatic patient, we be well assured that the murmur we discover is not the effect of previous disease, before we diagnose a recent carditis. Many of these patients have suffered many previous attacks, and whether the heart has or has not been previously inflamed, can only be discovered by the history of the signs and symptoms of such attacks, and the intervening period.

The reason of the continuance of the to-and-fro sound of friction, even with very considerable effusion, extending with the increased dulness of the precordial region, and of the parts beyond it, seems to be dependent on the quantity of solid lymph which is always thrown out in these cases. We may feel the thrill, vibration, or *brouissement*, by applying the hand flat to the chest, in these cases, over the heart, and it is in these that the intercostal spaces between the second and third, and the third and fourth ribs are prominent, and present an undulatory motion, to be seen and felt, on each action of the heart.

I shall expend but little time in the consideration of general symptoms, before I proceed to the subject of prognosis. At the same time I should not be justified in overlooking one symptom, which is certainly very characteristic, when occurring in rheumatic fever, and one of the earliest indications of any implication of the heart. I allude to that peculiar expression of anxiety which the countenance so generally betrays, and which is foreign to the mere course of the rheumatism. The angles of the mouth are drawn backwards and upwards, and he seems to be conscious

[1] Med. Gaz., p. 694.

of some deep and impending evil. This anxiety is an occurrence quite independent and precedent of that distress and alarm of the system which profuse effusions into the pericardium, or polypous concretions in the interior of the heart occasion at a later period. It is these latter cases which Dr Latham has so graphically described.[1] He tells us that all the positions chosen by the patient, with the exception, perhaps, of that on the back, are positions of absolute constraint. The necessity of accommodation to any one of them (whatever it may be) is so urgent, that the patient is not merely unwilling, but feels as if it would be instant death to him to move. We should never lose sight, however, of the fact, that all general symptoms are fallacious, and that our main trust must be in the stethoscope, since wild and fierce delirium may set in, often quite independent of cerebral disease, and mask all the other symptoms. It may happen that cerebral symptoms alone attract any attention during life, and yet after death the nervous system be found quite healthy, and the heart alone diseased. Dr Latham details three such cases, in all which the brain and its coverings were found in a perfectly healthy and natural state. In one the heart itself was inflamed, the inflammation not being confined to its investing membrane. It was the most intense inflammation pervading both the pericardium and the muscular substance. In the second, the pericardium, towards which during life there was no symptom to direct the slightest suspicion of disease, discovered the unequivocal marks of recent and acute inflammation. The third case presented the morbid appearances of pericarditis solely and exclusively, and consisted of lymph deposited upon its surface, which had contracted slight adhesions, and some ounces of a green and flakey serum effused into its cavity.

Prognosis.—In my preceding remarks I have already intimated my opinion, that unless rheumatic endocarditis and pericarditis be stopped in their first stage, they never receive a perfect and satisfactory cure at all. But to set this proposition on a satisfactory basis, I will now enter again on the subject, to show the importance of an early diagnosis, before I go on to what I conceive to be the most judicious treatment. In the experience of Dr Latham,[2] the *bruit de soufflet* having once appeared, never subsides but with the complete reparation of the organ. The heart may resume its natural action; all pain, and all hurry of respiration may cease, and the patient, as long as he remains quiet, may believe himself well, yet the *brouissement* may remain; and if so, his return to the habits and exertions of health will bring back palpitation and other symptoms which bespeak the certainty of mischief still abiding in the heart.

It is a disease in which there is no medium between complete

[1] Essay v. p. 210.

[2] Lond. Med. Gaz., vol. iii., pp. 214, 215.

reparation and certain death. It is a disease which continues but for a very brief space of time within the possibility of cure; and, moreover, it is a disease which cannot be successfully combated by common remedies.

Dr Watson[1] says also, that acute pericarditis, so far advanced as to occasion the pathognomic rubbing sound, does not admit of a perfect cure, and that its best event is the adhesion of the membrane, and the obliteration of its cavity; and even then, he says, the change is not final. Mere adhesion does so embarrass the movements of the heart, as to produce at length, sometimes rapidly, sometimes slowly, hypertrophy, and other alterations. It is held, too, and I believe justly, that the inflammation which begins in the membrane sometimes dips into the muscular structure of the heart, weakens its elasticity and cohesion, and so leads ultimately to dilatation of its cavities. The number of patients that come annually into the hospitals of London, affected with acute rheumatism, is very large; and I do not think that I am exaggerating when I say, that nearly one half of them have the heart or its membranes implicated. The cardiac affection may be easily overlooked, both by the patient and the physician. The recovery may appear to be perfect; but after some time palpitation begins to be occasionally felt, and by degrees, other symptoms, marking disease of the heart, declare themselves, but their origin is unsuspected or forgotten. You will be surprised, if you search back into the past history of all the patients who apply to you, having disease of the heart, especially among the lower classes of society, to find how many of them will tell you that they have, at some time or other of their lives, been laid up with rheumatic fever.

Dr Watson has remarked, (*loc. cit.* p. 721,) that he once thought that if we caught the inflammation at its very commencement, (viz. on the first occurrence of a *bruit*, and friction sounds,) we might calculate upon a perfect cure, by first bleeding the patient freely, and by, secondly, putting him as speedily as possible under the specific influence of mercury. The more he sees of this formidable malady, the more reason he finds for fearing that it is seldom within the possibility of thorough repair. The inflammation may be stopped, or nature alone will effect this; and you may greatly assist the natural powers in effecting this. But that alone can be called a cure, which either leaves the structure of the part affected in its original integrity, or at any rate, leaves no spring or source of farther changes for the worse; and such complete recovery as this he seldom dares to hope for, in cases of acute and general pericarditis.

There can be no use in deceiving ourselves in this matter. In

[1] Lond. Med. Gaz., vol. i., 1841–2, pp. 694, 695.

a large proportion of cases the patients will *seem* to recover; "but," says Dr Watson, "the recovery is so far unreal, that it involves the germ of future destruction." Follow these patients in their subsequent lives, and you will learn that many of them very soon begin to find that they are incapable of doing or bearing all that they could do or bear before their illness, and if this does not soon happen, it does at last. The disease of the heart, (if the patient be not cut off by some other malady,) becomes at length obvious, and when he dies, the source of the ultimate change is commonly to be detected. There is an adherent pericardium, or there is disease of the valves, of which no other account can be given, than that it had continued to exist since the primary symptoms of carditis ceased, and that it had caused all the rest, viz. the hypertrophy, dilation, &c.

Treatment.—Having proved, I trust, on a satisfactory basis, that the rheumatic diseases of the heart are not really cured or curable, in the true sense of the word, even when detected on the first origin of a decided *bruit*, or subsequently on the commencement of a distinct to-and-fro sound, even by the most judicious and persevering treatment, and that these sounds are not really the first detectable signs of these diseases, but that an earlier diagnosis may and will reward him who employs suitable attention and unwearied diligence in its pursuit, I shall now pass on to consider the only treatment which holds out the shadow of promise of a true and permanent cure. We can accomplish this only before, and at the true and actual commencement of inflammation of the heart, viz. by prevention before, and by a prompt affection of the system by mercury at the time of its origin.

Expectant Treatment.—Every case of acute articular rheumatism, especially when the synovial membranes are comparatively free from implication, and the disease is erratic, threatens imminent peril to the well-being of the heart, and on this account should always be treated in expectancy of such an occurrence. Mere blood-letting has little effect either in the prevention or causation of cardiac implication, yet nevertheless it paves the way for a more successful use of mercury, when we wish to affect the system with this mineral. Rheumatism is one of those diseases which would never receive a cure by mere loss of blood in any manner, and is certainly injuriously affected by carrying it too far, or by occasioning a shock to the system by any mode. Hence it requires care in its use and adoption. According to the constitutional powers of the patient, and the severity of the disease, it is generally advisable to employ venesection, carried so far only as to the very beginning of faintness, in order to avoid all risk of shocking the system, and thereby increasing the danger when first summoned to the case. Any further bleeding is

as unnecessary as it is injurious, till we can detect any tendency to disease of the heart.

The foregoing is comparatively an unimportant part of the treatment, compared with what I am now to recommend. *Calomel in large doses*, mainly with the object of its peculiar action as a purge, should *always* and *immediately* be used. Small doses have quite a different, and a comparatively useless action. To be truly useful it must be in full doses, and determinately used. Ten grains, with half a grain of opium, is a moderate quantity, and should be administered every ten or twelve hours to the fifth or sixth dose, when it will most probably relieve the rheumatism, but if not, it can no longer be continued in such doses. If each dose of the calomel fails to purge in a few hours, it must be followed by a mild but efficient purgative, such as castor oil. The object of this treatment is not to salivate, and if it occasion any such symptoms, it will defeat the purpose we should always hold in view in its administration; and consequently it can rarely be carried with safety beyond the fifth or sometimes the fourth dose. Its specific effects are to cut short the rheumatism, and to prevent the occurrence of rheumatic carditis.

But when we have carried the remedy, in its large doses, to the extent we find justifiable in each individual case, we may continue to use it in smaller quantities, if the rheumatism still persists. What we should strive at, under these circumstances, is to keep the system of the patient so far under the influence of mercury, that we can produce soreness of the gums rapidly when we will it, by modifying the dose; and yet so far from it, that all the symptoms of salivation are absent, only the constitution is on the point, or very near to, their production. Not only is the rheumatism best treated in this manner, but it is of the greatest importance should disease of the heart supervene, since we shall then be able to institute efficaciously that treatment which holds out any real prospect of benefit, at the very moment of time when it alone can be available.

Another valuable remedy is opium, which I have already mentioned in combination with the calomel, but now I allude to larger doses than are meant merely as a guard to this preparation. Its operation quiets the nervous system, relieves the pain, which forms no unimportant feature in the disease, and tends to prevent any agency which may prove a check to the system, at the same time that it acts, by fulfilling these intentions, as a powerful preventive of inflammation of the heart. Of all the preparations of opium, I prefer the compound ipecacuanha powder given twice or three times a-day, in ten-grain doses, between the intervals of the calomel purge, and continued subsequent to the diminution of the mercury. There can be no objection to colchicum and antimony in the form of a saline draught; but what I have

already mentioned is the essential treatment; and not until we have given the full doses of calomel their fair trial, should I be induced to commence these remedies.

Treatment of Rheumatic Inflammation of the Heart.—When, notwithstanding all our care and treatment, lengthening and roughening of the sounds of the heart have come on, we must, in some degree, modify our treatment. It is rarely advisable to employ general bleeding afresh on the commencement of these signs, but we must content ourselves to abstract as much blood locally, by the cupping apparatus or leeches, as we may deem advisable, in accordance with the nature of the case. At the same time the constitution should be brought as speedily as possible under the decided influence of mercury. The calomel, in grain doses, with one-eighth of a grain of opium, should be administered every hour, until decided tenderness of the gums is induced, and, if we fail in occasioning this state speedily, the action of the calomel may be assisted by rubbing in the mercurial ointment. The great advantage of previously maintaining a mild mercurial effect on the system, is the readiness with which it may be carried further in this stage, and that without any delay, or loss of time—for as I have previously shown delay is ultimate death. Small and frequent doses of calomel, more speedily and effectually salivate, than large ones repeated at greater intervals; it is on this account that I recommend calomel in the way which I have now mentioned.

When the action of the heart is very violent and disturbed, digitalis may be combined and administered with nitre and antimony, in the form of a mixture, at the same time with the bloodletting and calomel. The bleeding and the mercury are, however, the essentials, and digitalis but an auxiliary, and, compared with them, of feeble power. It is calculated more to quiet the heart than prevent, or remove the morbid products of inflammation.

When local depletion has been carried as far as we may deem advisable, blisters may be used, and not without benefit, supposing the heart disease still to progress. But they act with most advantage when there is effusion into the pericardium of much serum; producing rapid absorption of the fluid, and manifest general and local relief. As, however, I intend to confine my observations chiefly to the earliest stages of rheumatic endocarditis and pericarditis, I shall omit any further considerations, feeling that, in doing so, I shall consult the feelings of my readers, by whom these matters are well understood.

In the foregoing pages, if I have convinced any one of the necessity of searching for the earliest indications of carditis in acute atmospheric rheumatism, and of the advantage of expectant and prompt treatment, as the only possible hope of a true and per-

manent cure, I shall feel contented in the idea, that my labour in the composition of this paper has not been lost or misspent.

15 Southampton Street, Covent Garden.

Article VI.—*On Restoring the Lower Lip.* *By* S. Chisholm, M.D., *Inverness.*

William Monro, from the parish of Urquhart, aged 60, was admitted to the Northern Infirmary in January last, having the whole of the lower lip involved in a cancerous disease. Owing to some family circumstances, he had to leave the house without having had any operation performed on him, and during his absence, applied to a medical gentleman in a neighbouring county, who excised the lip in the usual way, (V), bringing the parts together with the twisted suture. As might however be expected, from the great loss of substance, the parts, shortly after the operation, gave way. Repeated attempts to produce adhesion proved equally unsuccessful, and the man was re-admitted to the Infirmary about the end of March. On re-admission, the whole of the under lip, from angle to angle, and down to the chin, as represented in the plate, Fig. 1, was wanting. The saliva was constantly flowing down over the chin.

I first made an incision from the lower part of the breach in the lip, obliquely down to the side of the chin, as pointed out by the line A. Then a somewhat semilunar incision, (line B), from near the angle of the mouth to the termination of the first, and separated the flap thus formed from its connection with the gum underneath. The same was done on the other side, and the two flaps brought together with the twisted suture, as represented in Fig. 2. The parts healed kindly, and the man left the institution, extremely thankful for the result of the operation, which succeeded to my utmost satisfaction.

Inverness, 28th May 1842.

Article VII.—*Observations on the Development of the Blood Corpuscles in the Chick, with the various changes which they present from their first appearance to their full development; with some remarks on these changes.* *By* William Macleod, Esq., *Surgeon, late Assistant to Dr John Reid in the Pathological Department of the Edinburgh Royal Infirmary.*

Previous to 1838, physiologists were wholly unacquainted with any general law by which the development of structure could be