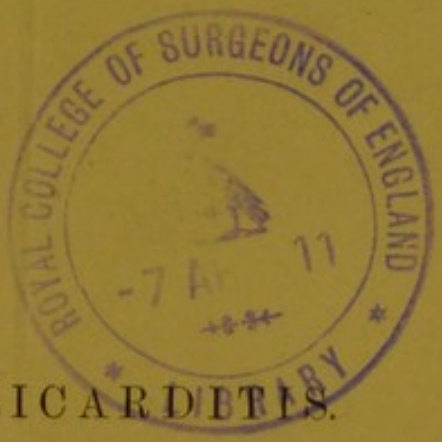
Pericarditis / by T. Lauder Brunton.



PERICARDITIS.

By T. LAUDER BRUNTON, M.D., LL.D., F.R.S., F.R.C.P.

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PERICARDITIS.

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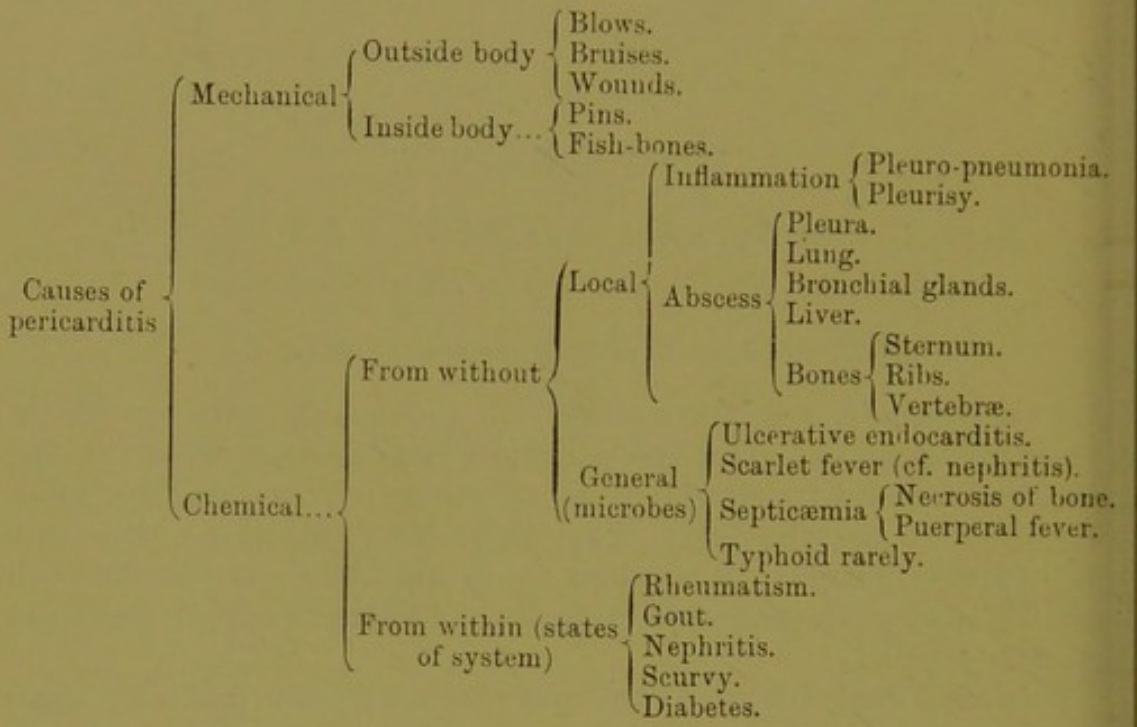
(*A Lecture delivered at St. Bartholomew's Hospital.*)

I believe there are three sorts of people in this world, in regard to mistakes. The first are those who never learn from the mistakes either of themselves or of others: these are the fools. There are those who learn from their own mistakes: these are the ordinary people. And then there are those who learn both from their own mistakes and from those of other people: these are the wise people.

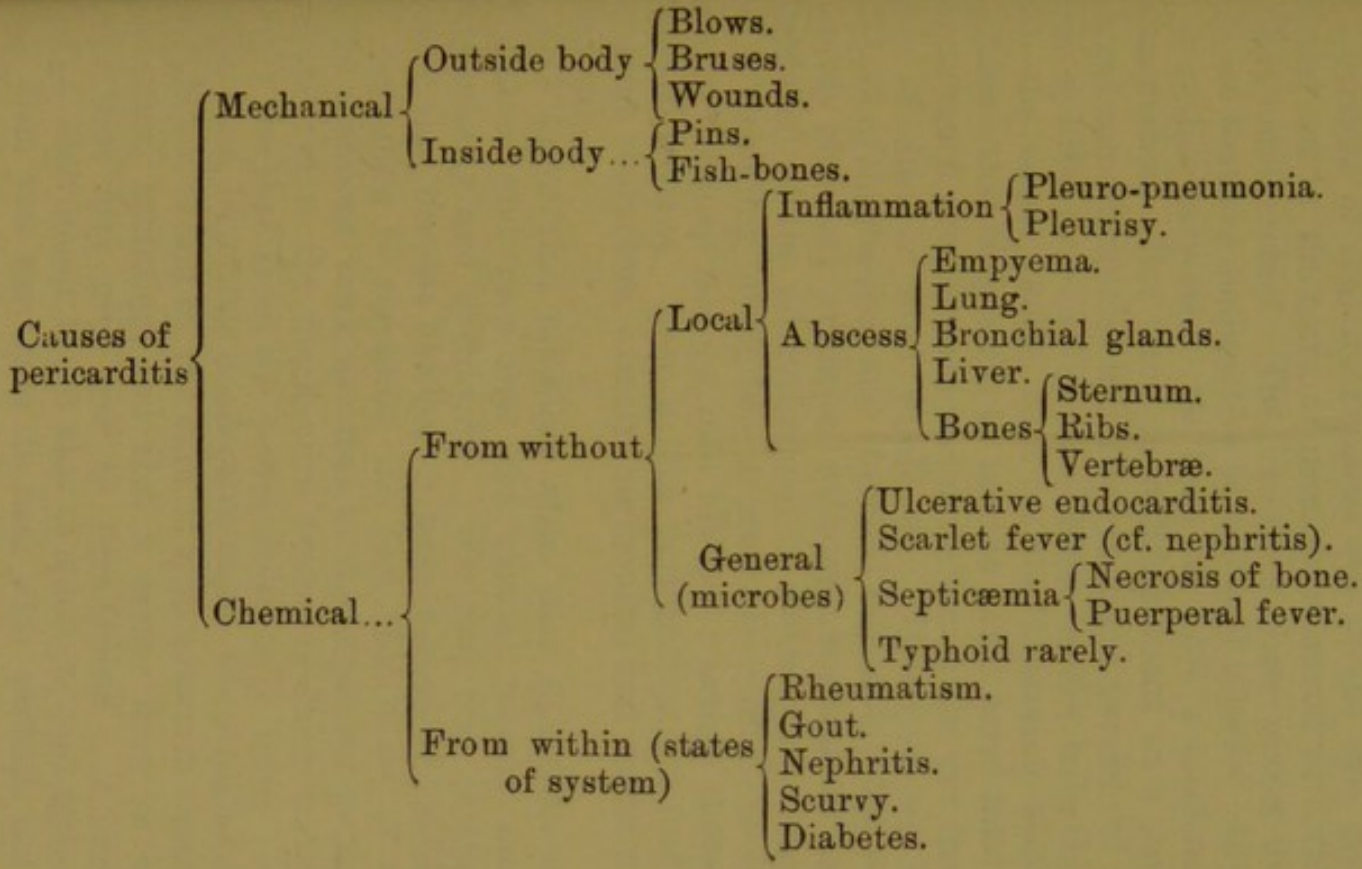
I confess that I have learnt more from my own mistakes than from my own successes. I forget a very great many facts in anatomy, but there is one fact that I have retained, and that is the position of the right great splanchnic nerve in the diaphragm as it passes into the abdomen. And the reason that I remember this is that, when I was a student, in dissecting the abdomen, I made a cut right through the great splanchnic nerve with my dissecting scalpel, and I seem to this day to see the cut end of that nerve staring me in the face. Now, in medicine, we are apt to make mistakes, and it will be a lucky thing for you if you can learn, not only from your own mistakes, but from those of other people. I shall have to discuss to-day one point at least in which I ought to have known better, and in which I did not make the diagnosis I ought to have done. I need only discuss this one, though there are a good many other points, which I will not refer to, in which I might have succeeded, and in which I did not succeed.

The subject that I have to take up to-day for my clinical lecture is Pericarditis, and my reason for choosing this subject is that there are no less than three cases in the wards at present, and there was one other case not long ago; so that within the last two months we have had four cases of pericarditis in the wards—a rather unusual number. It may have perhaps struck you that out of those four cases, two have been cases of rheumatic fever, or at least of acute rheumatism with pains in the joints, and two others have had a quantity of albumin in the urine. We

have, therefore, two great classes of cases before us, namely, cases of pericarditis coming on in acute rheumatism, and cases of pericarditis coming on in the course of nephritis. But these are not the only causes of pericarditis, although they may be reckoned as the chief causes. There are a great many others, which I have put down for convenience in tabular form. You can readily see



that the pericardium will be liable, like other parts of the body, to inflammation. We cannot see the process of the inflammation going on in the living. We can see in the dead-house the results of inflammation, but we cannot see the process itself; but if we look at inflammation on the outside of the body, we can see the process, and we can to a great extent learn the causes of the process. For example, if you look at the legs of some patients in the surgery, you may find that inflammation has come on in consequence of a severe blow, and that around the part where the blow has been given the tissues are red, swollen, painful, œdematous; they would pit on pressure. But you must note that this pitting is quite a distinct thing from the pitting that you get in a case of ordinary mitral regurgitation, where the legs are pale, swollen, and pit upon pressure. And yet you may find intermediate stages between the two, the so-called active œdema and the so-called passive œdema; because in the course of heart disease you may find that those pale, swollen legs will take on an inflammatory action, and will become red and tender also. Now, apparently, in the pericardium we find differences of inflammation, which we shall have to discuss presently when we come to consider the symptoms of inflammation. Outside the body, too, we find differences quite readily observable. We see the processes of inflammation very readily in the eye, and we only too often


Causes of pericarditis
Mechanical
Outside body
Blows.
Bruses.
Wounds.
Inside body...
Pins.
Fish-bones.
Chemical...
From without
Local
Inflammation
Pleuro-pneumonia.
Pleurisy.
Abscess
Empyema.
Lung.
Bronchial glands.
Liver.
Bones
Sternum.
Ribs.
Vertebræ.
General (microbes)
Ulcerative endocarditis.
Scarlet fever (cf. nephritis).
Septicæmia
Necrosis of bone.
Puerperal fever.
Typhoid rarely.
From within (states of system)
Rheumatism.
Gout.
Nephritis.
Scurvy.
Diabetes.

have occasion to notice the causes of such inflammation. Some day we are travelling in a railway carriage, and we heedlessly put our head out of the window, and a particle of coal dust from the engine flies into the eye. We draw our head in quickly again with a great deal of discomfort, and with a good deal of trouble the particle of coal dust passes out of the eye, generally being washed out by the tears, or possibly removed with the corner of a pocket-handkerchief. The irritation then passes away, but we still see that the conjunctiva is red and injected; in other words, it is rather congested. So, here, we have a mechanical cause of inflammation. But often in walking about on a summer's night you get something else into the eye, not a particle of dust, but one of those little rove-beetles; and these beetles have this in common with the larger beetle, such as the blistering beetle—the cantharides—that they seem to secrete some acrid fluid which gives rise to much greater pain and irritation in the eye than the simple piece of dust or sand would do. Therefore we have here a mixture of mechanical and chemical irritation; but you may have a purely chemical irritation without a mechanical one, as you see illustrated in the advertisement of Pears' soap, where the dirty boy is wrinkling up his face in great discomfort, probably because some of the soap has got into his eyes; acting there as a purely chemical irritant. Now, in the pericardium, we find irritation of the same characters, namely, mechanical and chemical, and purely chemical.

We know that microbes when they find their way into the circulation and pass into the various tissues, may act there mechanically and chemically. We find that in the kidney the vessels may become blocked by large masses of bacilli, but yet we are beginning to recognise the fact that most of the misdeeds which microbes work are due to the chemical products of their life, and not to the mechanical action of their bodies. You can readily see that, from the pericardium only being covered by the breast-bone, by a little connective tissue, the remains of the thymus gland below it and by the skin, it is to a certain extent exposed to mechanical irritation, and that a severe blow or bruise on the breast-bone may give rise to pericarditis. A wound from a pointed instrument is apt also to cause it; and although this is a thing that you may have to deal with perhaps not very unfrequently, if some of you should live abroad, yet it is rare in this country, because the practice of stabbing is fortunately in this country a very rare one, although in many other countries it is comparatively common. But wounds of a penetrating nature generally reach the pericardium, not from the outside of the body, but from the inside. Thus, in a person swallowing either pins or fish-bones, which pass down the œsophagus—and the œsophagus, as you know, lies just behind the pericardium—the pin or fish-bone in passing down with the point projecting forwards may catch, and

may gradually, by working through the anterior wall of the œsophagus, perforate the pericardium, and thus give rise to pericarditis.

The great majority of cases of pericarditis, however, are not of mechanical but of chemical origin; and I have divided the chemical into those which we may term from without, that is to say, into local irritation and general irritation; and also into those from within, namely, states of the system. But states of the system are comparatively few — rheumatism, gout, nephritis, scurvy, and diabetes. Amongst irritants from without, I include the infective diseases, where the minute microbes actually penetrate into the tissues, in the same way as a pin penetrates from the œsophagus into the pericardium. In these diseases, as I have already said, the microbes enter from without, and act chiefly by the chemical products of their decomposition.

You can readily see that irritation may pass from one part of the body to another, and especially to an adjoining part, and therefore that a bruise on the sternum, which does not give rise to immediate inflammation of the pericardium, may afterwards do so by the sternum being injured, the bone becoming necrosed and an abscess forming beneath it; and then the inflammation spreading from the abscess to the pericardium itself. The same might occur if inflammation were present in the pleura. Now, this does not occur so often in simple pleurisy as it does in cases where the serous effusion has become converted into a purulent exudation. In cases of pleuro-pneumonia, you may get the inflammation spreading from the lung to the pericardium; and in cases where the bronchial glands have become inflamed and suppurate, the suppuration may cause pericarditis also.

In some cases inflammation of the pericardium has occurred from irritation in the bones, giving rise to abscess; not merely irritation and inflammation of the sternum, or even of the adjoining rib, but sometimes from abscess connected with the vertebræ. Occasionally, too, an abscess has formed in the liver, has perforated through the diaphragm and caused inflammation in the pericardium, but these are all comparatively rare cases. Most of the cases that we meet with are really due to microbes, and, first of all, I should mention the streptococci, which occur in ulcerative endocarditis. These give rise very frequently, not only to inflammation in the interior of the heart, but also in the pericardium.

In scarlet fever we meet very frequently with pericarditis, but how far this is due to the microbes to which the scarlet fever is due one cannot quite at present say. I think that, in the two cases in the wards at present, where the pericarditis is found in connection with albuminuria, that both the cases have had scarlet fever—one three years and the other five years ago. We do not often meet with pericarditis consequent upon typhoid, but the

day before yesterday I saw a case in private where this seems to have occurred. It is, however, comparatively rare.

Now, in looking over the cases that we have in the wards, we are struck by the fact that the symptoms of pericarditis are very slight; they are not what we would have expected from such an apparently severe disease. We generally hear that pain is a marked symptom in pericarditis; and I remember perfectly, when I first began practice on leaving hospital work, that, whenever I had a case of pain over the cardiac region, I always listened for heart disease, and especially for a pericardial friction. Whereas, in 999 cases out of 1000, if you get pain under the left nipple, especially in a woman, it is not due to pericarditis, nor even to endocarditis, but to leucorrhœa. There is only mention of pain in one of the cases that we have had in the wards, and that only of a slight character, in the girl, J. Q., æt. 11, in "Elizabeth" Ward. Pericarditis came on with effusion, but without pain. It gradually in a few days subsided; then there was a recrudescence of symptoms, and the recrudescence was accompanied by pain, but of no very acute character. This is the only case in the wards in which pain has appeared. Then, in many of these cases, the temperature has not reached the height that we would have expected. In two of them, those having nephritis, there was no rise of temperature. In the other two, in which we had the pericarditis associated with rheumatism, there was a rise, but in one of them, S., it was difficult to say whether the rise of temperature was associated with the pericarditis or not. The high temperature which we found on admission was probably due to the condition of the joints, and then afterwards we had a rise of temperature very similar to what occurred in Q.'s case, but there did not seem to be with this rise of temperature in S.'s case any corresponding change in the cardiac condition. In none of them have we had the symptom which is sometimes observed, namely, great distress and tendency to syncope; but the distension has not been excessively great in any of the cases. When the distension is very great this distress and syncope may be looked for, but it has not appeared in any of the patients in the wards.

The pulse in the two cases where pericarditis occurred in the course of albuminuria hardly rose at all. In one case, that of E., it was only 60, but in the two cases where it was associated with rheumatism it rose considerably. In Q.'s case it went up to 150, and in S.'s case it went up to 120. Still, as you know, 120 is by no means an excessively high pulse rate, but Q.'s pulse of 150 was exceptionally high, and indicated irritation of a local nature in the heart itself. A quick pulse, as a rule, is due to stimulation of the heart by heat, but you do not usually, though you may sometimes, get it running up above 120, excepting when there is some sort of definite irritation. You always look out for a local irritation of

the heart, or else for something very much wrong with the nervous system, in cases where the pulse rate goes up to 150 per minute. You will notice, then, as the result of these observations in the wards, that the symptoms of pericarditis are very slight indeed, and may very easily be overlooked.

In consequence of the slightness of the symptoms, cases of pericarditis are very frequently overlooked, and therefore no record is taken of them. I believe that in many cases the patients may have pericarditis and get well again, and that no notice will ever be taken of it, so that you may get adherent pericardium years afterwards without finding any history whatever of the occurrence of pericarditis. There was one patient who came for a considerable time to the out-patient department. He was a man remarkable in appearance, because he was tall, clean-shaven, and wore gold spectacles—a very unusual thing in out-patients. He was a hairdresser by occupation, and had no symptom to complain of, except that he was feeling a little weak, and that he perspired violently when he was attending to his customers. On examination of the thorax we found an enormous cardiac dulness of a triangular shape, the apex above and the base below. The apex beat was hardly felt, and, in fact, we found all the signs of very great pericardial effusion. Gradually the effusion became absorbed, and the man returned to his work; in fact, I believe he had continued to attend to his business the whole time. He ceased to attend at the Hospital, and we found that the effusion had nearly disappeared; but, if anyone else should see that man in years to come, he will probably find that there is evidence of pericardial adhesion, and, except for the fact that the man attended at the Hospital, he would get no indication in the history of the existence of great pericardial effusion.

Now, on inspection, you may, I believe, occasionally see bulging at the chest. There was, however, no marked bulging of the chest in any of the patients in the wards; but in the case of the hairdresser there was a certain amount of bulging, though not very great. It was chiefly the dulness which had attracted our attention. The only sign that we have observed by inspection in any of those cases was in the boy E., not during the period when the effusion was great, but when the effusion had begun to be absorbed. We then noticed a sort of wriggling movement over the greater part of the cardiac area, apparently from the fluid having been absorbed and the front surface of the heart having become attached to the pericardium, and, through the pericardium, having given rise to a movement of the chest wall during the contraction of the heart. On palpation we found no definite sign, excepting the one which I have mentioned. In the other case, on admission there was a distinct systolic murmur; there was a distinct thrill at the apex, such as is usually associated with a presystolic murmur and obstruction of the

mitral orifice; but, on careful auscultation, we could find no distinct presystolic murmur whatever. We could not find any part of the murmur distinctly presystolic, although this thrill was present. This thrill ought to have attracted my attention more than it did, and ought to have made me look out for signs of pericarditis and adherent pericardium, because the girl had been in the Hospital before with rheumatism, and, I think, also there was cardiac disease noted at that time. The reason why I did not attach much importance to this thrill as evidence of pericarditis, was that it was not in the right place. It was at the apex of the heart; whereas a pericardial thrill that can often be felt in pericarditis is over the exposed part of the heart. I have brought here a model of the heart and lungs, and you will see that the part where you get the thrill is that which is not covered by the lungs. On the part covered by the lungs the thrill is not perceptible, as a rule, because the lungs deaden it. The lungs are simply expansible things, like a piece of sponge, and they do not convey a thrill. In the case I have alluded to, the thrill was at the apex over the part covered partially by a bit of lung, and so it did not occur to me that that thrill was due to a pericardial adhesion. I do not know now that it was due to a pericardial adhesion, but, in view of the occurrence of pericarditis afterwards and the great effusion, I think it is very likely that there was an adhesion there. In none of the cases, on auscultation, have we noted anything very definite. Only in the case of the girl Q. has there been anything very definitely like a friction. There was something in the case of the other girl, S., where the first sound became a little rough over the aorta, and we thought that seemed to indicate the possible existence of pericarditis, but in neither of those cases was the murmur very distinct. The murmur that you usually get with pericarditis is heard most distinctly over the exposed part of the pericardium which is not covered by lung; and very naturally as the heart gets rough, and rubs against the pericardium, there is a to-and-fro sort of movement—backwards and forwards. In some cases it is limited to the systole, and not heard in the diastole, but this is unusual. It is generally a backward and forward rubbing, and then it has got the character of being apparently nearer to the ear than the endocardial murmurs have. It has less of a blowing character, more of a rubbing, and seems more superficial. Sometimes you can get it distinctly increased by pressing the stethoscope firmly down upon the sternum, so as to increase the pressure between the two surfaces of the pericardium. It is generally most marked at the base of the heart, and sometimes audible also at the apex, but not so readily. In all the cases I have alluded to we should have been inclined to pass over the occurrence of pericarditis if we had attended simply to the symptoms, to the palpation, to the

inspection, or to the auscultation, and the way in which the occurrence of effusion has been detected by percussion.

Percussion reveals to us, normally, the size of the heart as exposed by the lungs, and the part of the heart exposed forms a figure which has been described as a quadrangle, although some people might be inclined to describe it as a triangle with a very blunt base. The pericardium covers the heart, and is reflected from the large vessels about a couple of inches above the point where they spring from the heart itself.

The position it takes is of necessity varied in different cases. As the fluid begins to fill the pericardium, you find that this gets a little distended, and the distension pushes the thin layer of lung further and further back, pressing this thin layer just at its anterior margin, and so you find the cardiac dulness becoming more and more increased. The cardiac dulness in a case of advanced effusion is such as I have shown; an increased amount of dulness having a somewhat triangular or pear-shaped form, with its base below. You will notice that sometimes it is said that at the beginning of the affection the dulness has got its base above; that instead of the dulness being ▽ in shape it is △, on account of the effusion having been more marked on the upper part of the pericardium than at the lower. This has not occurred in any of the cases in the wards, but dulness has been definitely with the greater transverse diameter at the lowest part, and not at the upper.

In the time that remains I have, first of all, to consider the prognosis. What is the prognosis in a case of pericarditis?

In pericarditis pure and simple occurring in the course of rheumatic fever, the prognosis is good, especially in a young subject. They nearly all get well, and this fact was impressed upon me very markedly when I was a student doing dispensary practice, because I had a case of a girl who had pericarditis with an enormous effusion; so much so that one found in her all those symptoms marked which we have not in the cases in the wards, namely, great distress of breathing, great weakness, and great tendency to collapse.

I thought that she was so ill that she could not possibly recover. It was just about the end of March or beginning of April, and I was leaving my work for a holiday before the summer session, so I asked an old college friend of mine to take charge of her. When I returned to work, about six weeks afterwards, I asked him if this patient were dead. "Oh no," he said, "she is as well as ever she was." I was greatly astonished, and wondered what medicine had effected this marvellous cure. I said, "What did you give her?" and he replied, "Plenty of brandy, and nothing else, and she got quite well upon it." I daresay you have observed that we have, in the treatment of the cases in Hospital, followed this idea to a considerable extent. You must remember, however,

that, although uncomplicated, pericarditis is almost certain to recover; it is very often complicated, because it occurs in the course of other diseases, and you have to reckon what the effect of the other diseases will be on your patient before you give a definite prognosis. For, although the patient may do perfectly well as far as respects the pericarditis, he may not do at all well in respect of the other troubles from which he is suffering. For example, in a case of ulcerative endocarditis, the patient may perfectly well die, although he would not have died from the pericarditis; because, in ulcerative endocarditis, you have to reckon not only with the pericardial condition, but with the endocardial condition, and also with the exhaustion which may come on from the thrombosis or embolism, which frequently occurs in ulcerative endocarditis.

Then, in regard to treatment, as I have said, we have followed to a great extent the plan of giving stimulants, without very much else. In some cases we have given other remedies, but these were more for the conditions that were associated with the pericarditis than for the pericarditis itself. One remedy we have applied directly for the pericarditis, and that was a blister over the chest wall. Many people disbelieve in the use of blisters, but, as I have just said, you can see the effect of things much better outside than you can inside. There was one patient in "Elizabeth" Ward, where the blisters were applied to the joints above and below, and under the effects of the blisters the fluid in the joints has become absorbed, and the pain in the joints has become much easier, so that we can very readily see the good effect of the blisters upon the joints. In the same way, I think, when a blister is applied to the chest in pericarditis, it tends to cause lessening of the inflammation and absorption of the fluid. There is one fallacy in estimating the use of blisters. Not infrequently, after applying the blister to the chest in a case of pericarditis, you will find that the rubbing, which previously was well marked, has disappeared, and, naturally, one is inclined to put the credit of this down to the blister; but, unfortunately, we cannot always do this with certainty, because a pericardial rubbing has a way of coming and going at intervals. At one time it may be heard quite distinctly, but at another, when you listen, you find there is no rubbing at all, and yet in the meantime nothing that you can discover has been done or taken by the patient that could have any effect in altering the pericarditis.

Now, there was one other plan of treatment that we adopted in the case of the boy E., where there was a good deal of effusion, and that was in order to cause absorption of the effusion. You know that fluid in a serous cavity accumulates when more passes in than is able to get out, and you know that in the ordinary course of life the fluid from the serous cavities is being steadily absorbed by means of a regular pumping mechanism. I

daresay some of you have seen that very beautiful injection of the central tendon of the diaphragm, which you get by cutting a dead rabbit in two and pouring over the lower side of the diaphragm some Berlin blue, and then keeping up artificial respiration in the thorax, so that you get the diaphragm alternately rising and sinking The Berlin blue is so rapidly absorbed that you get a most lovely blue injection of the central tendon. And we know that, in the ordinary course of things, the peritoneal fluid is absorbed from the peritoneum to a great extent through the central tendon of the diaphragm by alternating movements of the diaphragm in respiration. The same thing occurs in absorption of the pleural fluid, and again also in absorption from the pericardium. Each time that the heart contracts it tends to form a vacuum between itself and the pericardium, and then to suck the fluid in. Each time that it relaxes it tends to close up this vacuum and drive the fluid out into the lymphatics. So that, if you can get excessive action of the thorax, you may tend to cause absorption both from the pleural and pericardial cavities. You do not get very much action in ordinary breathing, but you may get it by forced inspiration. Now, I do not know that there is any way in which you can get inspiration so forced and so general as in the ordinary action of yawning, and so we advised our patient to yawn every half-hour at first, and then to yawn twice every half-hour. It is by no means a bad plan, especially if you get patients to do it by the seashore, where all the air that they take in is perfectly pure. The lungs then become thoroughly filled, and you get a regular kind of massage exerted upon the heart and upon the lungs.

There is just one point more that I should like to touch upon. It is simply in relation to the prevention of pericardial adhesion. This can sometimes be done by doing the very opposite of what everybody would think was the right thing, and, instead of keeping the patient perfectly quiet, allowing him to do things that he ought not to do. For information on this point, I must refer you to a letter by Mr. Cantlie in the *British Medical Journal.*

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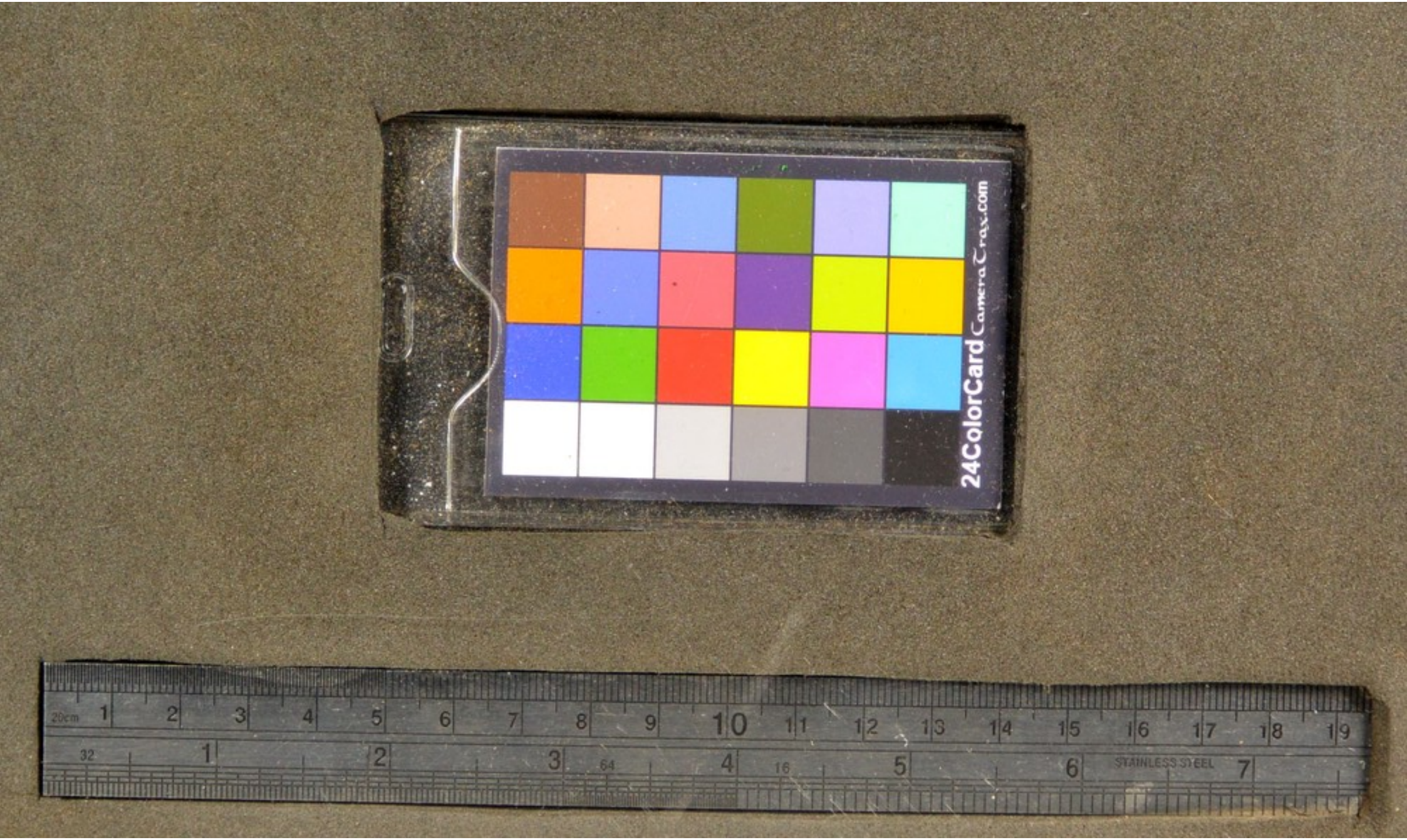
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