SOME CASES
OF
DISEASE OF THE HEART,
WITH
AN INQUIRY
INTO THEIR NATURE AND CAUSES.

By J. H. JAMES, Esq.

SURGEON TO THE EXETER HOSPITAL.

COMMUNICATED BY
MR. ABERNETHY.

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ALTHOUGH much labour has of late years been bestowed on the investigation of diseases of the heart, it must be confessed that our knowledge of the subject is still very imperfect; nor indeed can this be a matter of surprise, since the physiology of the vascular system itself, is, after all, but very inadequately understood. It may appear a bold assertion to hazard, that we are far from having a correct knowledge of the functions of the various parts of the circulatory apparatus; but it is one which I feel no hesitation in making, and in ex-

tending also, to the pathology of this system. I feel myself accordingly justified in offering a few observations on the subject.

In the writings of the older authors, there are numerous cases recorded, of examinations of persons who have died with disease of the heart; many of them highly valuable, but few complete, inasmuch as the views entertained of this, as well as other subjects, were different in many respects from those of their successors; perhaps I may be warranted in saying, because they were less enlightened; and also, because they have in many instances omitted to give us a sufficiently detailed account of the appearance of other organs besides those principally concerned. In the works of several modern authors, there are cases related of much more value, from the greater care and fidelity of the examinations, and the more instructive views which they present; an addition to our collection of facts in this department, is still, however, very desirable; and I am, therefore, induced to lay the following cases before the Society. They are selected from among those which I had an opportunity of observing, particularly during the latter part of the period that I passed in attending Saint Bartholomew's Hospital, when I had very extensive opportunities of seeing the morbid appearances after death, as well as observing the symptoms before it; and my attention to this class of diseases

was particularly excited, from the frequency with which these cases occurred.

From the facts which I observed, I was led to form some opinions respecting them, which are in many points, I believe, peculiar; and although in the interval which has since elapsed, I have not been fortunate enough to have it in my power fully to confirm them, yet I have not seen sufficient cause to reject them as erroneous.

Whenever mechanical obstruction has been found to exist at either of the orifices leading from the cavities of the heart, some of these cavities have been found to be enlarged in size, and very generally strengthened in structure; one or more may have undergone this alteration, but most commonly, we find that cavity altered in particular, before which the obstructing cause is placed. Every one, therefore, has agreed to consider this as one of the chief causes of aneurism of the heart. But if contraction of the aorta at a distance from the heart exists, enlargement of that viscus, it is supposed, may equally take place; or this, indeed, may happen if obstruction be situated in any other part of the vascular system. Of such cases there are some on record * ; but a very few where there

* Morgagni, Book II, Letter XVIII, Art. 2.
Corvisart, Obs. XXIV, p. 117.

These are the only cases of this kind I find in two works very copious in cases of diseased heart.

is positive evidence of the fact ; and I am therefore particularly induced, in the first place, to offer the three following. In the first, there was evidence of obstruction in the course of the vascular system, and the heart was enlarged, but there was also obstruction at the aortic orifice ; nevertheless I am inclined to believe that this latter was consecutive. In the second, there was evidence of a contracted state of the aorta, with enlargement of the heart. In the third, there appears to have been obliteration of the vena cava, likewise causing enlargement of the heart. Independently of these points, there are some interesting circumstances belonging to these cases.

CASE I.

On the 31st of June, 1812, I saw the subject of the following observation, for the first time. He was a lad, eighteen years of age ; his name John Day. He was admitted a patient of Saint Bartholomew's Hospital, on account of a strain in the arm, and at first complained of no other ailment. At the time I saw him, he was in an apparently dying state ; there was an extreme degree of restlessness, anxiety, and feebleness, and he was exceedingly emaciated. The pulse at the wrist frequent, but feeble ; at the lower part of the abdomen, however, on merely placing the fingers on the surface (which was not very distant from the ver-

tebræ on account of the emaciation) a strong, large pulsation could be felt ; it certainly did not feel altogether like the heavy beat of an old aneurism, but yet it was so large and strong, when compared with the pulsations elsewhere, that it appeared very probable, that it was one, and this I believe was the general opinion at the time.

On the inside of the right knee, there was a patch about twice the size of a crown piece, of a bright red-colour, but the surface was not elevated, there was no secretion from it, and it occasioned no pain. The state of the limb was in other respects very peculiar : it felt much colder to the touch than the other, and there was no pulsation in the arteries. This condition of the limb was supposed to be connected with the aneurism felt at the bottom of the abdomen.

All I could learn of his previous history was, that his complaints had been of a very anomalous nature ; but he was supposed to have had disease of his vascular system, not only from the pulsations in the abdomen, but from their general fulness and strength elsewhere in the arteries, as well as in the heart ; the former being described as having a kind of incompressible firmness. The secretion of urine was much altered, being of the appearance of decoction of bark ; and he had pain in his loins ; besides this he had considerable sickness and vomiting, which were referred to the affection of his kidneys.

The following day, July 1st, he died, and his body was examined.

The *Thorax* contained a very small quantity of fluid; the lungs appeared pretty healthy: on one part of the surface, however, there was a red blush, but no effusion of lymph or other trace of inflammation. The pericardium was rather thicker than usual, and in its cavity was contained a small quantity of reddish fluid.

The heart was larger than natural, the cavities being considerably augmented in size; but the parietes were thinner than usual, particularly on the right side, and somewhat perhaps on the left. The muscular fibres were flabby. The cavity of the left ventricle was the most capacious. The valves of the aorta were covered with excrescences to a degree that must latterly have considerably impeded the exit of the blood, and also, by preventing them from performing their office properly, have occasioned regurgitation. There were several holes in the valves in the midst of these excrescences, which probably proceeded from ulceration; and beneath the valves, there was a small sac formed containing pus, which projected into the right ventricle. There were a few specks of disease in the thoracic aorta, but there was no thickening, and it appeared, if any thing, smaller than common. In the abdomen it certainly appeared to be so, and so were the branches proceeding from it: and

there was nothing in the slightest degree resembling an aneurismal tumor.

The state of the right lower extremity led us to examine the artery on this side, and just below Poupart's ligament we found a plug of coagulum, which led to an excrescence, growing from the inner coat of the vessel, precisely similar to those found on the aortic valves. It also blocked up the profunda, so that no passage could be allowed through either of these vesicles. They were however completely open to within a very short distance from this excrescence, where one or two small vesicles were given off. The trunks of these two arteries, (the femoral and profunda) although, in common with others elsewhere, they were considerably smaller than usual, yet could hardly be considered as much contracted in particular.

Abdomen. The stomach was of a dirty unhealthy hue, with a blush of dusky red about the cardia; the intestines appeared unhealthy and rather turgid with blood; there was not however any appearance of disease distinctly marked. The liver was not much altered from its natural appearance. The spleen was turgid.

The kidneys were larger and much diseased.

The head was opened, and a little serous effusion was found.

In this case, although I did not myself feel the pulsation of the heart and arteries, when they were full, strong, and incompressible, yet I cannot doubt the authority from which I received this information ; and the pulse at the wrist having been feeble a few hours before death can be considered no contradiction, for at that time the pulsations in the abdomen were remarkably large and strong.

As there was no aneurism there; as there was no increase of the size of the arteries elsewhere, but the contrary, how are we to account for the large and full pulsations? To me there seems no other mode, than by supposing, that there was in some part of the vascular system an obstruction afforded, which caused the large arteries to be distended, as where a ligature is applied upon a vessel. In one place there was positive evidence in this case of such obstruction ; to this I shall add the conjecture, that the obstacle elsewhere originated in the minute vessels ; but this will be a subject for future consideration. What tends, however, to render the conjecture probable in the present instance, is the peculiar state of the right limb. If the circulation be obstructed through the principal arterial trunk of an otherwise healthy extremity, the limb is certainly not found to be colder than the other; but if there is further obstruction afforded to the passage of the blood, as for example by tying the principal vein, deficiency of temperature commonly attends. Here proba-

bly there was obstruction situated beyond the principal trunks, producing a similar degree of influence.

The state of this heart approached more to passive, as the French have termed it, than to active aneurism. At the time of death the structure of the heart certainly seems to have been less powerful than natural; from the other appearances about it, I am disposed to conclude, that its own structure was unhealthy.

CASE II.

In the following case there seems to have been a nearly similar state of the abdominal aorta, with enlargement of the heart.

James Dudley, aged twenty-five, had been in Saint Bartholomew's Hospital about a month before I saw him, which was in June 1812; the account I obtained of the case was as follows:

He had been ill nine months, complaining of constant pain in the head; his spirits much depressed, and he had become greatly emaciated. A few days before his death he was taken speechless, and unable to support himself, and finally insensible; after a day or two, however, he recovered his

senses so far as to understand what was said to him, and to do what he was bid. He would put out his tongue when told to do so, but it seemed a matter of extreme difficulty to get it beyond his teeth, and when there, he would let it remain, not withdrawing it back again; every thing shewed extreme languor, but there was no paralysis. While in this state he sweated most profusely, and from his perspiration, but more particularly from his urine, a most powerful smell of ammonia was evolved, sensible to a considerable distance as if he had been rubbed with the linimentum ammoniæ. His urine was very red and turbid. Stools were procured by medicine. Before he died he again became insensible.

Inspection.

The scalp adhered more firmly to the cranium than it usually does, and there was a good deal of serous effusion into its cellular membrane. The cranium was also more vascular than common; there was no disease of the dura mater; there was effusion between the pia mater, and tunica arachnoidea, but in no great quantity; there was also more fluid than natural in the ventricles, but the quantity not excessive. There appeared to be a great deal of venous plethora about the head, and the texture of the brain was firmer than common.

The emaciation of this man had been great, and during life the abdomen was much sunk, and the aorta could be felt pulsating with uncommon strength; the actions of the heart also had been strong. The heart was found larger than natural; the increase was in the muscular structure of the left ventricle. The abdominal aorta would hardly admit the point of my fore-finger. The lungs were healthy.

Abdomen. The following were the appearances. The peritoneum was healthy, except behind the liver, where there were a few adhesions. It felt remarkably dry, as did the pleura also, forming a striking difference between the decreased secretions of the serous membranes, and the increased secretions from the skin. In the intestines there appeared to be a general turgescence of the vessels, but no inflammation, the vessels being all distinct, and there being no thickening; there was, however, an increased quantity of mucus effused into their cavity. The stomach was redder than the rest. In the colon were contained a great many hard scybala.

The liver was unhealthy, not enlarged, but considerably firmer than usual in its texture, and containing interstitial deposit. The gall-bladder was distended with very thick bile, of a very deep colour; some similar in appearance was contained

in the duodenum, perhaps pressed into it after death, for in the course of the canal, the more recent contents were very slightly tinged; and the scybalæ in the colon were quite destitute of bile, marking a former state of the liver, where there was entire cessation either of the secretion or the excretion of the bile. The spleen was rather larger than common. The kidneys appeared healthy, very red, and full of blood. In the bladder were several spots of dark inflammation, with little sloughy ulcers on each; was this idiopathic, or was it produced by the very irritating nature of the urine?

From the diminished calibre of the vessels, it is very clear that, in these two cases, the strength and apparent fulness of the pulsations could not have proceeded from the stream of blood; it must have been caused, I imagine, by the increased impulse communicated to the surrounding parts, from the difficulty of transmission through the trunks, or augmented “*sécousses*” of the arteries, as Bichat terms it.

CASE III.

This case occurred also in the summer of 1812. The name of the patient was Charlotte Lewis. I saw her only just previously to her death, when there was an extreme degree of anxiety, and she

had become nearly insensible, most probably from effusion taking place within the cranium. Of her previous history I could not obtain any account that was to be depended upon. There was much effusion throughout the body, but the arms, face, and neck were particularly swollen, and extremely suffused with venous blood. It was not long before she died from protracted suffocation, as I may safely venture to call it. Her body was opened shortly after death.

The *abdomen* was very much distended with fluid, which appeared to be serum only. The peritoneum was more opaque than usual, but was quite free from diseased appearances, except at one point; on the surface of the liver was a layer of lymph, so smooth and thin, as to appear altogether like an adventitious membrane. The liver itself was soft in its texture, and much loaded with blood : to me it appeared to be healthy, but it is right to add, that other gentlemen who saw it thought it otherwise. I believe this was only a deceptive appearance from its being so very turgid with blood.

The stomach and intestines were healthy ; the former contained some undigested aliment, mixed with mucus and bile ; the latter only a little pulpy matter, like *succus intestinalis*, mixed with bile.

Thorax. This cavity was much incroached upon

by the effusion into the abdomen; there was however considerable effusion into it, also of serous fluid. The pleura was thicker and whiter than common; the lungs healthy, but very much compressed by the effused fluid.

The pericardium was much distended with serum. The heart gorged with blood. All the cavities, the coronary veins and the great vessels full.

The right ventricle was thin: the left very strong in its structure.

The abdominal aorta was empty; its calibre was nearly the same as that of the vena cava at the same part; but the artery was capable of being stretched to a considerably greater extent, while the vein did not admit of being stretched at all; so that it is pretty clear that in this instance the artery was *capable* of transmitting much more blood than the vein.

Through a considerable space the brain was crammed full with a firm coagulum, which occupied the whole diameter of the vessel, and left no interspace whatever between it and the sides, which were at the same time thicker than usual. It was not a coagulum equally tinged with red particles throughout, or altogether without them, as in what have been mistaken for polypi in the heart; but more of

these particles were contained towards the sides all round, while the centre was nearly white. At the time this coagulum was observed so firm in the vena cava, the blood in the other veins was fluid.

Several parts of the internal coats of the artery had a deposition of lymph, which could be scraped off. I think the internal coat was thickened, the middle one was so, decidedly.

In the head great effusion was found between the tunica arachnoidea, and pia mater.

I think it will not be considered a very improbable conjecture to suppose that, whatever the nature of the disease might be, there was decided obstruction to the return of blood to the heart. And it is also highly probable, that the principal seat of this obstruction was in the vena cava. It cannot be proved that the coagulum, which filled that vessel after death, had existed during life ; but it is highly probable from the appearances that it did. The coagulum found was by no means like that which usually takes place spontaneously in the blood, which is never so firm and entirely solid as this. Besides, why should the blood have coagulated in the vena cava only ? From the lymph effused on the surface of the arteries, as well as from the peculiar state of the vena cava, it is not improbable that there was diseased action of the vessels generally.

In these cases, certainly in two of them, there was evidence of mechanical obstruction, situated in the course of the circulation, and I presume that the enlargement of the heart may be attributed to this cause. In that which follows, it also appears probable, that obstruction existed in the course of the circulation in the great vessels, however at any rate not *mechanical*, but *functional*.

CASE IV.

— Kibby, aged thirty-four, was admitted a patient in Saint Bartholomew's Hospital, early in the spring of 1812. At the time he came in, he appeared not far from his dissolution. His countenance and lips were livid, and rather swollen; his eyes effused with fluid, and red; his breathing excessively difficult, with a great deal of anxiety; and it cost him much effort to utter a sentence. A cough distressed him very much, and latterly it had been attended with a considerable degree of hæmoptysis; he was greatly debilitated, and his frame very much wasted. There was a slight degree of œdema of the feet; the pulse at the wrists was hardly perceptible, particularly in the left; and when it was to be felt, nothing can be conceived more irregular. His carotids beat strongly and evidently; his heart largely and forcibly. He could lay completely back in bed, and on either

side, but generally on the right. His bowels were irregular; his appetite lost; his urine very high-coloured and turbid, and exceedingly scanty, so as at times to amount only to three or four ounces in the twenty-four hours. He had from his own account lived freely and laboured hard; he formerly was very robust.

Lead was given him to check the hæmoptysis; together with castor oil, squills, and cascarilla.

It was long doubtful whether he was to live or die; but from the time his bowels became freely open, his state improved. The amendment however was marked more decidedly, when the kidneys began to secrete a greater quantity of urine, and it could be traced progressively, as this secretion became more copious.

In short he was discharged, after having been about six weeks in the house, reprieved, however, rather than cured. At the time he went out, the pulse at the *wrist* was moderately strong, and the action of the heart very considerably diminished.

In the month of August he returned to the hospital to finish his days. His state was nearly as bad as when I first saw him; his legs were much swollen.

Shortly afterwards I went into the country, and as he died before I returned, I did not see the termination of the case ; but his heart is in Mr Abernethy's collection, and proves what might have been inferred to be the case from the state of the pulsations during life, that there was no mechanical obstacle at the orifices of the heart from ossification or other disease ; for these would, I imagine, have permanently increased its pulsations, and lessened those of the arteries, or entirely extinguished them. With all the symptoms usually attributed to ossification of the valves, the heart of this man had undergone no other alteration, than the simple augmentation of the size of its cavities.

It will be observed in this case, as it may in many others of a similar nature, that there is much stronger evidence of obstruction to the passage of the blood *through* the vessels, than *from* the heart ; there was a great increase, for example, of the pulsation in the carotids, while those of the radial artery were almost extinguished. Could this have been the case if there had been obstruction at the orifices of the heart ? It was not owing to the reflux of venous blood in the jugular vein, for it was synchronous with the pulsations of the arteries elsewhere ; it was likewise firm and arterial, if I may be allowed the expression. Besides, there was a difference in the pulsation of several other arteries, those of the two wrists for example : and finally, if the obstruction had been originally situated at the

heart, how did it happen that the pulse was again restored to a considerable degree of fulness ?

This contrast between the fulness and strength of the pulsations of the heart, and the fulness of those, of some, or all of the arteries, is no very rare occurrence. It arises no doubt, in many instances, from mechanical obstruction situated in the heart ; but that it is sometimes attributed to this cause unjustly, is proved by the case I have just related ; and others are not wanting, of which the records establish the same fact. It is by no means unusual to meet with instances in diseases of the heart, in which the pulse at the wrist has been nearly suppressed and subsequently restored ; but although I have other notes to this effect, yet I think it unnecessary to multiply examples of this kind *, the fact being proved. It may, however, be worth while to enquire into the cause of this phenomenon.

There are many analogous states which tend to illustrate it : we know that if the functions of any part cease, or if it be removed from the system, the arteries leading to that part cease to transmit blood. The same happens if a ligature is applied ; the vessels contracting between the ligature and the next branch above. Whereas, on the contrary,

* For cures of this kind I refer to Corvisart *Sur les Maladies du Cœur*, Obs. XIII. p. 74. Obs. XIX. p. 96. Obs. XXXVII. p. 39. Obs. XXXVIII. p. 166. Obs. XVI. p. 86. Morgagni *de Caus. et Sed. Morb.* Book II. Letter XIII. Art. 34.

if the part to which an artery carries blood, requires an increased proportion, we find that the vessels fully allow its transmission, as for instance, in blushing, in inflammation, in the increased secretion of a gland, and in the anastomosing branches where a trunk is tied. The laws by which the contractions and the dilatations of arteries are governed, are still but very imperfectly understood ; but I think it is clear, that the right consideration of the class of diseases in question, must greatly depend on a knowledge of them.

It is evident, that in the case of a *local* affection, where the pulsation of the arteries leading to it, is either increased or diminished ; this increase or diminution cannot be attributed to the influence of the heart, which must in every case act equally on the whole system ; if I may be allowed the use of a simile, the arteries are like the pipes leading from a reservoir, through which, *by the guidance* of an intelligent hand, more or less fluid is sent, in different directions, at different times, according to the demand for it in various parts.

If the wants of the part supplied do not govern the quantity sent, to what can we attribute this power of regulating the supply ? The heart, as just stated, is out of the question, and the arteries, I think, must be admitted to dispose themselves, or be disposed to receive more or less at different

times, in consequence of an influence communicated to them by the parts they lead to. But there is the same consent between any one part and the arteries which lead to it; and also between the whole of the parts of which the body is composed, and all the arteries which go to them.

If any part be injured it inflames; we see the arteries leading to it in every direction allowing free ingress to the blood. If it be a part of consequence, the whole system sympathises with the affection of the part; and as the arteries leading to it are affected, just in the same way do those leading to every other part appear to be. For example, if it be an injury to an organ of no leading importance, as in skin, cellular membrane, &c. and attended with no very extraordinary degree of violence, vigor characterizes the local inflammation, and the full and free pulse denotes that the vascular system at large partakes of this mode of excitement. But if, on the contrary, the injury be of that sort which is attended with sloughing, the arteries of the part lose their powers, or rather cease to transmit blood; and the arterial system, in general, is affected in a manner differing in degree, but similar in nature. Again, when a part inflames, all its secretions are arrested; so are those of the system generally: but as soon as the natural ones are re-established, or diseased ones are set up, so soon are the secretions of the body at large re-

stored ; and throughout the state of the vascular system as a whole is found to correspond very exactly with that of the part.

If it be granted, then, that the actions of the arteries are regulated by the disposition of the parts to which they carry blood, and besides the arguments which I have just adduced, from pathological observations, there are numerous others which may be drawn from the physiology of man and animals in general, it will follow, that in this last case of Kibby, as in many others, we must seek for an explanation of the peculiarity of the pulsation, not in the state of the heart, but in the state of the system, which that heart is intended to supply. And if such a state of parts is often found to exist, as will determine a pulsation feeble and small ; it happens that, on the other hand, we meet with numerous others, where it governs one full, bold and strong. I do not now speak of fevers or other disorders, the explanation of whose phenomena, however, is of course liable to be affected by what has been here advanced, but confine myself to diseases of the heart, the causes of which, I may venture to repeat, still remain in a great degree of obscurity.

CASE V.

Henry Watkins, aged fifty-nine, a sailor, had

been subject to complaints about his chest for a considerable time. A little more than a twelve-month previous to his admission into Saint Bartholomew's Hospital, he had been a patient at the Haslar, for complaints similar to those for which he now applied for relief. He had at that time swelling of his legs and thighs, which, it should seem, was removed with difficulty. I did not see him till he had been in the hospital about two months, and previous to that, he had had a severe attack of erysipelatous inflammation in one of his feet, during which, and for a short period afterwards, the complaints of his chest were very materially relieved: he, however, caught cold, as he imagined, and they returned, with swelling in his feet.

When I saw him he had a sallow waxy countenance, cedema of the upper and lower extremities, but not considerable; difficulty of breathing, though capable of making a deep inspiration, and a good deal of cough. His abdomen swelled, without fluctuation, and pressure gave pain. The pulsations of the heart were large, strong, and frequent, and might easily be felt in the epigastrium, with a sensation "as if there were something alive within him." The pulsations of the arteries were correspondent in fulness and strength with those of the heart; the carotids beat with particular strength. Occasionally he had profuse perspirations; his urine was scanty, not amounting to

more than a pint in twenty-four hours. Shortly before his death he had copious clammy sweats, produced by violent pain in the epigastric region.

On the evening of the 13th of May, he died. There did not appear to be any material alteration in his state shortly before his death, nor did I apprehend so immediate a termination ; but he was seized with a violent retching, and shortly expired.

On the following day, May 14th, his body was examined, fifteen hours after death, and it was then still warm. The face was suffused with blood ; the jaws strongly clenched ; and there was a universal rigidity of the muscles.

On opening the abdomen, a small, and but a small quantity of fluid was found. The peritonæum bore no marks of inflammation, except at the back part, and there some lymph was thrown out. The liver had a good deal of interstitial deposit ; the stomach and intestines were free from disease. The spleen was larger than common, and more solid than natural.

The kidneys appeared healthy, although their functions had been so much disordered ; they were very full of blood.

Thorax. The pleura adhered most strongly and generally, so that it required great force to sepa-

rate the lungs at the back part; these adhesions were thick and strong like leather. The substance of the lungs also was altered apparently, but I rather think this was owing to their being gorged with blood; on pressing them a great quantity of mucus escaped.

The heart distended the cavity of the pericardium, which membrane was rather thicker and more opaque than common, and on its reflected layer, which covers the heart, was a broad white patch; one of those which are often found, and supposed to indicate no disease, because no other diseased appearance co-exists. To me it seems probable, that they are vestiges of former inflammation, and of lymph formerly thrown out, having undergone absorption to a considerable extent; for they frequently appear irregular, as if the absorbents had been at work upon them; and those which I have seen, were capable of being pulled off from the pericardium like adventitious membrane. But to return from this digression, the heart was very large, and its cavities were all gorged with blood; so were the *venæ cavæ*, pulmonary artery, veins, and aorta. The cavities of the right side were merely enlarged and filled with blood, but the left ventricle was not only enlarged in capacity, but its muscular structure was also greatly increased. The aorta was enlarged generally, and there was a great deal of ossification about the root of it. The valves were also ossified in some degree, but not so

as to prevent them from performing their functions properly. In the thoracic aorta were also some specks of ossification, and in the abdominal, it existed to a very great degree indeed.

In this case there was evidence during life, as well as after death, of augmented force of the action of the heart, and under distention of the arterial system. Analogy would lead us to suppose that it proceeded from obstruction ; but there was no organic alteration of structure about the heart itself likely to produce it, and it is therefore fair to suppose that the obstruction was situated in the minute vessels, of a very different nature perhaps from that which existed in the case last related.

Was the ossification and disease of the aorta an idiopathic disease of the vessels, or was it produced by the increased actions of the vascular system ? This disease is so common a concomitant of active aneurism, that it is difficult to avoid supposing it to be either a cause or an effect ; but if the former, that is, if it be idiopathic, why does it not as often occur in the pulmonary artery ? If it be considered as a consequence of the disease of the heart, this difficulty is easily explained, because that disease is found on the left side more frequently than on the right, in the same proportion probably as disease of the artery which leads from it. If we should be able to explain hereafter, how it happens that disease of the heart so much more frequently oc-

curs on the left side, then we may at the same time account for the ossification of the systematic artery being so much more general.

Where there is enlargement of the ventricle, and augmented strength of pulsations during life, increased capacity and strength of the arteries is found to exist after death, especially if the case has been of long standing; and also very commonly ossification and steatomatous thickening. That the artery should be enlarged in the same proportion as the ventricle, seems natural enough; and also that its parietes should be thicker, since it has to sustain the impetus of a larger column of blood, impelled with præternatural force; but if there be a difficulty opposed to the arteries in emptying themselves of their contents, which I imagine to be the case, it will follow that the vessels which are now immediately in the neighbourhood of the principal trunk, will have more especially the blood forced into them with undue violence; and this will be very likely to occasion unhealthy deposition in the parts so supplied. The vasa vasorum will be particularly exposed to this cause of derangement.

The coronary arteries in this case, as in most of a similar nature, were also greatly enlarged. If we suppose obstruction to the passage of the blood at the extremity of the arterial system, the resistance would of course throw back the blood to the heart more

particularly, as being the other end of the column. But at the orifice of the aorta valves are interposed to prevent their reflux. In addition, then, to the first and natural impulse caused by the action of the heart, there will be the re-action occasioned by the obstruction, and the effects of this will be more felt near that viscus. It is not therefore to be wondered at, that the coronary arteries are found to participate in an eminent degree in the alteration produced by this state.

Corvisart has considered this augmented influx of the blood into the heart as one of the causes of active aneurism: that this opinion is erroneous, I think I shall hereafter be able to prove; but this is a question foreign to my present purpose.

There is, however, another alteration of structure, on which I should wish to make a few observations: namely, a disease of the valves of the aorta, which is very commonly found where there is any ossification of that vessel, and which is generally believed to be a frequent cause of aneurism of the heart.

In the first place it must be observed, that these valves, when ossified to such an extent as to afford obstruction to the exit of blood from the ventricle, are commonly found raised and not parallel to the sides of the vessel, as might have been expected *a priori*, considering the current of blood flowing

through them from an enlarged heart. This peculiarity it is difficult to explain; but one mode of doing so would be, to offer as a solution of this phenomenon, obstruction situated at the extremity of the arterial system, the influence of the reflux determining their position.

In the second place, I have to state, that in the great majority of instances, where ossification of the valves is found, the calibre of the aorta is also greatly enlarged; now the obstruction thus situated at the orifice of the ventricle should, if it were the primary disease, by diminishing the stream of blood, have caused rather a diminution of the vessel. But if we suppose dilatation and disease of the vessel first induced, and this disease the ossification which makes the valves rigid; then there can be no difficulty in explaining, what is often found, an aorta of a preternaturally large diameter, where the aperture left by the valves would scarcely permit a quill to pass.

CASE VI.

May 6, 1812, I assisted at the examination of the body of William Holford, who died in Saint Bartholomew's Hospital; the following were the appearances observed.

On opening the thorax, the lungs and pleura

were found perfectly healthy, and there was no effused fluid. The bronchial glands were enlarged and hardened. The mucous membrane lining the bronchæ rather red. There was a great deal of fat in the mediastinum and about the heart. The heart felt very large through the pericardium ; on opening that membrane it was found covered with lymph, which was more particularly heaped up about the roots of the great vessels ; there were no adhesions. The cavities of both the auricles were larger than common ; of the ventricles, about the usual size. The muscular structure of the right ventricle was of its ordinary strength ; of the left, was most enormously increased in size and strength. The aorta unusually large and strong ; the coronary arteries much larger than common ; the aortic valves quite healthy.

The abdomen was not distended, but the caput coli was found to occupy a large portion of it. The œsophagus at its lower part, for six inches, was inflamed, and lymph thrown out ; the stomach also had some appearances of inflammation ; it was filled with matter apparently fæcal, much resembling what was found lower in the alimentary canal, and properly tinged with bile.

The colon was distended in two or three places into enormously large pouches filled with air, and in the intermediate space was contracted to a very

great degree ; contracted upon faecal matter, hard almost as bullets, which appeared to have remained in these pouches a considerable time, for where the scybala were lodged, the coats of the intestine had become exceedingly thin ; as if the contraction of the muscular coat had, by pressing the mucus against them, caused it to be thinned by absorption. There were large masses of these hardened lumps even in the rectum ; but there was in no part any of that diseased secretion, which often constitutes diarrhoea where there are scybala.

The liver seemed perfectly healthy. The peritonæum was not inflamed ; there was a good deal of fat deposited in every part of the abdomen, and there were a great many adhesions. The bladder contained a considerable quantity of healthy urine. The kidneys were very small and much diseased ; the renal arteries unusually large.

This man had lost much flesh, but his fat did not appear to be wasted. He had sores upon his legs.

He was opened shortly after death ; the corpse had a strong smell of perspiration, and was quite warm ; it was perfectly rigid.

In this case the aorta at its root, when cut open, measured three inches without being stretched,

and was very thick at the same place ; the pulmonary artery measured only two inches, and was quite natural.

It may be naturally supposed that the inflammation of the œsophagus and stomach, of the former especially, which was very decidedly marked, should have produced some symptoms. The account which I obtained from a very close examination of the nurse who had attended him, was as follows : that he was in the first instance admitted for bad legs ; that he had been in the same ward for the same complaint some time before ; and in this last illness, had been a patient about a month ; that during the whole time he had complained of a pain and a burning sensation about the pit of the stomach ; that his appetite had been bad, and that during the last week he had scarcely ate any thing. He had had great difficulty in swallowing, and this action was accompanied with much distress. Two basins of sago was all he had taken for the last four days, and this with great difficulty. He had generally been very thirsty, and was fond of drinking cold water ; nevertheless his friends had secretly brought him wine and brandy, which he had also drank. On the Sunday night preceding his death, he had, after a trifling exertion, been exceedingly ill, and was almost insensible the whole night. On the Tuesday he was again taken in the same way, and on the Wednesday he died. He had no stool for two or three days previous to his death, but be-

fore that, had, according to the nurse's report, gone to the privy regularly. This statement should be compared with the account of the appearance of the colon after death. There appears to have been no want of attention to the state of his bowels, as will be seen by the prescriptions which I subjoin. The case only shews that scybala will stand their ground against many purgatives. In the former part of his illness he had made rather a large quantity of urine ; latterly it had been very scanty.

The following are the prescriptions.

April 7. Inf. ros. cum magnes. sulph. (this was usually given at moderate intervals, in small doses, so as to produce gentle action of the bowels.)

April 14. Elect. senn. comp. p. r. n.

May 5. Sago cum vino ; cerevisiæ lbjss. Inf. menth. sativ.

May 6. Emp. lytt. capiti raso.

Inf. sennæ cochleatim omni semi-hora donec, &c.

Enema sapon. moll. si opus sit.

That evening he died.

Although so much disease of the vascular system was found after death, no very prominent symptoms existed during life ; or if they were present, they were confounded with those proceeding from the diseased state of the œsophagus and stomach.

It is difficult to say what was the immediate cause of this man's death. The head, it should seem, had been particularly affected during the last days of his life. The turgid state of the heart and great vessels also indicated suffocation, and I shall here beg leave to add a few remarks on the phenomena of death in this class of diseases.

In some cases emaciation only takes place, and the patient dies worn out, as it were, or with the powers of the vascular system quite exhausted ; and without any effusion taking place. In others, and more particularly in cases where the disease has existed a great length of time, effusion previously occurs, and this may go on to such an extent, as of itself to produce suffocation*. It however not unfrequently destroys life by its effects on the brain, when it takes place within the cranium. It sometimes is excessive in the abdomen, sometimes in the thorax, nor does it appear always possible to ascertain the cause of this difference ; but there is one observation which I shall here

* There is however one species of effusion which will be described below, that seems originally to form part of the disease ; and the termination of these cases is generally very speedy.

make, which is, that when, as in Case V., there are very general adhesions of the pleura so as to prevent the effusion from taking place into the cavity, the fluid seems to be separated into the cells of the bronchiæ in greater quantity, and thus more speedily produces death, as appears to have happened in the case of Watkins. In cases where there is great emaciation and little effusion, it will generally be found that some of the secretions are remarkably increased, more particularly the perspiration and urine. I believe life is often protracted till this resource of the constitution fails, and effusion ensues.

With regard to the effusion itself, it differs very much in different cases ; in some it is a soft and puffy anasarca, in others a firm and solid œdema. Of this I shall now give an example.

CASE VII.

Richard Willimer, aged sixty-two. This man had been ill nine weeks, from a cold which he caught, as he supposed : he was a man of robust make. When he was admitted into Saint Bartholomew's Hospital, his legs and arms were swollen. The œdema was firm, and the limbs retained their shape, except some puffiness at the back of the hands. He could not lay back in bed ; his abdomen puffy and swelled, particularly about the hypo-

chondria : when he does lay on one side, it is on the right ; he has cough, but little expectoration ; urine has been scanty ; appetite very good ; bowels tolerably regular ; tongue white ; pulse about 90, somewhat irregular.

The latter end of March he began digitalis with tartrate of potash and dec. juniperi.

He got better, and continued to mend, making a larger quantity of urine, till about the middle of April, at which time it was copious, and the pulse was reduced below 70. During this period he continued the medicines quoted above, after which the symptoms became stationary, then the affection of the chest increased, as also the swelling of the limbs, particularly the arms. On the 5th of May, the prescriptions were altered to a grain of calomel every night, and an electuary with tartrate of potash and steel. On the 10th he died, to my surprise, as I find by my notes, for I did not apprehend so immediate a termination ; this sudden change however is very common in diseases of the heart.

Inspection.

The thorax was extremely distended, so as to push down the superior viscera of the abdomen from beneath the hypochondria. The pleura was healthy. The lungs were quite healthy, light and

spongy in front ; behind they were loaded with blood, and so heavy, probably from this circumstance, as to sink in water ; it was doubted by some gentlemen present, whether there was not inflammation, but I should think there was not ; because none of its usual products appeared, and it was manifest that much of the density of this part of the lungs depended upon the contained blood, for in the first place, we could squeeze out a great deal, which rapidly became florid on exposure to air ; and, secondly, we were able to inflate this portion. The mucous membrane of the bronchiæ was red, blood-shot I may term it ; but there was little mucus contained in it. The absorbent vessels were remarkably large and numerous, and the absorbent glands were larger than common. The pericardium contained a considerable quantity of serous fluid. The heart was much enlarged, and contained blood on both sides, and in both the arteries ; the right cavities were of their usual strength, the left ventricle had its sides very much thickened. There was no disease of structure.

In the abdomen there was a little serous effusion ; there was no diseased appearance in the alimentary canal. The kidneys were by no means healthy. The cortical hair was almost white, and much hardened in texture.

It appears that in this case there was augmented energy of the pulsations, but not in the degree

that is often found, but as there was much solid oedema, it is not improbable that this prevented, as it often does, the strength of the pulsations from appearing so great as it really is, in consequence of the thickness of the integuments.

These cases, where the oedema is of a firm and resisting nature, hardly susceptible of pitting on pressure, and not gravitating, but preserving in a great degree the natural state of the part, are by no means uncommon. This state is general over the body; it appears to be connected with increase of arterial action, and generally occurs in young or robust men, especially after the application of a sudden chill.

There is a wide difference between this kind of effusion and that which occurs where there is merely obstruction to the return of venous blood to the heart. In that case I believe it sometimes happens that the secreting vessels pour forth a more than usual quantity of fluid; but it also often happens, that the swelling which takes place is owing merely to the accumulation of the natural secretions, which can no longer be poured into the vascular system again for want of room. This state is altogether analogous to that which occurs when pressure obstructs a lymphatic vessel.

But there is a kind of effusion where the fluid does not gravitate; where the skin does not lose

its colour, which pits with difficulty on pressure, which is tense and firm, and where the surface is hot and unperspiring. This frequently takes place in the neighbourhood of inflammations, particularly if they are deep-seated, or of an erysipelatous nature. The fluid effused is not the natural secretion, but approaches to gelatine. In the case which I last described, the œdema was very similar to that now mentioned, but instead of being confined to a part and produced by local irritation, it was general throughout the body, and idiopathic.

In the local œdema above-mentioned, there is reason to suppose increased action of the minute vessels, probably connected with obstruction to the free transmission of blood. In this species I should be inclined to believe that a similar state existed, but generally. In these cases, a person judging only from the state of the vascular system, would often be led to think there was inflammatory fever; the appearance of the blood, if any is taken, would rather confirm the supposition. But the disease is principally confined to this system. It is not fever. No proportionate derangement of the alimentary or nervous systems are found to co-exist. The disturbance of the vascular system is not governed by the others, but proceeds from causes more peculiar to itself.

As inflammation of the pericardium is often

found where there is active aneurism, it is natural to conjecture that this might have been the cause of the disease. But to this may be objected, that this inflammation can be by no means essential to the production of aneurism of the heart, because numerous cases occur where there is no appearance of inflammation of this membrane. Again, there is a species of pericarditis of which the symptoms are marked and decided ; it appears, like pleuritis or peritonitis, to be idiopathic inflammation, and to possess its own peculiar characters and influence. This is the acute form ; but the chronic may exist, and never be suspected, as was the case with Holford (Case V.); and the mistake is of very frequent occurrence. Corvisart says there is reason to suppose this kind to be consecutive ; and when it is considered that in these subjects not only inflammation of the pericardium, but of the pleura, peritonæum, and even sometimes of the pia mater, is often found, with effusion of lymph, perhaps, or of serum, or of both, and yet none have been marked by their characteristic symptoms, (and this I will be bold to assert is often so,) there will be much reason to consider them all as secondary affections.

In this man, Willmer, the viscera at the upper part of the abdomen were much pushed down by the effusion into the thorax. This is a circumstance likely to lead to mistakes in the nature of the case ; for the abdomen being thereby rendered

more tense and tumid, with anasarca of the integuments often existing at the same time, ascites is supposed to exist; and what tends to strengthen the opinion is, that the liver can be felt projecting much below the hypochondrium. M. Corvisart notices the "*engorgement*" of the liver, and its protrusion from its natural situation. Injurious courses of mercury are sometimes instituted in these cases,

There is another circumstance which I shall mention here, although it would have been more in place after mentioning Holford's case; and that is the eagerness with which the blood imbibes oxygen after death. This, coupled with the length of time during which the corpses remain warm in general, and the uncommon rigidity of the muscles, shews that the vital functions are often arrested before the vital powers are extinct in these cases: in short, they die of suffocation; every thing denotes a state of asphyxia; all the great vessels and all the venous system, more particularly that of the portæ, are gorged with blood; and as they died, so they lived; as long as the powers of nature could resist this state of things, and until the cause which first destroyed the balance of the circulation, has gone on increasing to such a degree as to be incompatible with further life.

In the lungs there commonly is found an extraordinary quantity of blood; but often these organs

are perfectly free from disease. Yet in the state which I have described in this paper, there are many symptoms indicative of great disorder in them. One of the most prominent is the extreme dyspnœa ; but still it will be found, on directing the patient to make a full inspiration, that he has the power of doing so ; there cannot then be much actual disease in the lungs. He has a great deal of cough, perhaps, but the sputa indicate no very morbid state of the bronchiæ ; it is simply mucus. In all the earlier stages, although a position with the shoulders elevated gives him much relief, yet he can lie back and remain in an horizontal position, and often does so, without difficulty ; it cannot therefore proceed from water in the chest. To me the most probable explanation of all these phenomena is this. We may suppose that the blood, no longer passing so freely through the heart, collects in and loads the small vessels of the lungs, as it does those of the face, lips, &c. as we plainly see. Hence that which is last sent into the organs of respiration, from the right side of the heart, is prevented in a very great degree from coming into contact with the air as it passes through them, and reaches the left side scarcely changed ; and this effect will be increased by the secretion which takes place in the bronchiæ ; for as we also observe in the eye, that it is overflowing with fluid separated from its mucus membrane, so similar secretions may well be supposed to take place into these cells, from the same cause.

There are a variety of other circumstances connected with this subject of secretion, bearing upon diseases of the vascular system, which I shall at some future time mention, but at present, this would lead me too far from my immediate object. In the preceding pages of this paper, I have pointed out various reasons for supposing, that a state of obstruction existed in the minute vessels of the body, and that the dilatation of the heart, which is so commonly attributed to obstruction at the orifices, does very often proceed from it, when existing in situations more remote. I will add more particularly in the minute vessels.

Whatever will fill the larger vessels will distend the heart; and therefore if these be kept in a state of plethora from any cause, such distension of the heart will be the effect; but plethora of the large vessels is not likely to be permanent, when the minute vessels are in a healthy state; but this is a subject also, which I have no room to discuss at present at length.

But independently of the quantity actually contained in the system, a greater or less proportion may be sent to and from the heart; and that this proceeds from the state of the minute vessels in the parts which the arteries supply, it has also been my endeavour to shew.

But there is another point which I wish to prove,

and it is, that not only dilatation and augmentation of strength are found to exist in the heart and arteries, when a larger quantity of fluid than natural is contained in them, and an extraordinary effort required to circulate it, but also that the converse of this is true, namely, that diminution of calibre and decrease of strength occur, where there is a less quantity of fluid and less effort necessary to propel it. I shall conclude this paper by giving two or three cases where such diminution was found to exist, consequent upon a lessened supply of fluids to the cavities so altered.

CASE VIII.

The subject of this observation was a young woman, whom I first saw on the 29th of February, 1812. There was no appearance of her having suffered from previous illness, and the account she gave of herself was, that three days before, she had fallen down stairs, and struck the lower part of the sternum against the edge of one of them. She had got up again without assistance, but she had been ill from that time, and having applied at Saint Bartholomew's Hospital, was taken into the house.

She was sitting upright in bed when I saw her, supported by pillows, and breathing laboriously, with a countenance suffused with blood. Her

pulse was more frequent than natural, but not remarkably disturbed. Her tongue slightly furred; and little disorder of her nervous system. The heart beat largely and strongly. She complained of pain and tenderness about the spot where she received the blow. She had also spit a considerable quantity of blood.

I imagined the symptoms proceeded from the eruption of some blood-vessel or vessels within the thorax, in consequence of the injury. She was bled twice, but this appeared to afford but little relief; the first blood taken was a little buffed, the second not at all, and neither were cupped. None of the symptoms appeared to indicate inflammation. They continued to augment; there being at the same time a great deal of cough, and expectoration of bloody mucus. The pulse became smaller, more frequent, and considerably irregular. On March the 3d they were carried to the greatest possible extent, and that evening she died, the functions of the nervous system remaining unimpaired to the last, notwithstanding the circulation of purple blood.

Inspection.

The cavity of the thorax was found as full as it could possibly hold of serum; the lungs were healthy, but compressed into a narrow compass; the

quantity of blood which could have passed through them latterly must have been trifling. They were so much consolidated by pressure, as barely to swim, when thrown into water. The trachea appeared either inflamed or blood-shot, and contained a good deal of bloody mucus.

The right auricle and ventricle were large and quite crammed with blood, the left auricle was also enlarged in capacity, and its sides greatly augmented in strength. The auricle, *properly speaking*, was occupied by a growth of diseased structure, one of those excrescences so frequently found attached to the inner lining of the heart. There was a similar one in the sinus, nearly closing the auriculo-ventricular orifice. The foramen ovale was open, and appeared as if it had been recently burst; the left ventricle was rather smaller than usual. In it was *a small coagulum*, easily separated from the diseased growth above-mentioned.

The abdominal viscera were considerably displaced by the effusion within the thorax. They were in general healthy. The ilium was of a darker red in some places than in others, but this did not amount to disease. The veins generally turgid. The spleen large, very spongy, and entirely separated from its capsule; in the stomach there were two puckered up places, looking like the vestiges of former ulcers.

In this case it will be remarked that there was no obstruction at the orifice of the left auricle ; that cavity was enlarged and its muscular structure increased ; the two right cavities were simply enlarged ; the left ventricle somewhat smaller than natural. This case terminated so rapidly, that there probably was no time allowed for the ventricle to diminish to any very remarkable degree. Also, there was no œdema. Could this be accounted for by the great effusion into the chest, in so short a time, especially when it is considered that the quantity of blood sent from the heart was much diminished ? That this blow accelerated the woman's death, cannot, I think, be doubted, but that it *produced* the excrescences which were the immediate cause of her death is highly improbable. What influence could it have had in opening the foramen ovale ?

CASE IX.

Ann Hogan, aged forty-eight. This woman, whose appearance denoted an age much more advanced than that she stated, was admitted a patient on the 26th of March, for ascites ; the preceding autumn she had been in the hospital for the same complaint, and was then tapped with considerable advantage. She was very eager to have the opera-

tion performed again ; and at her particular request it was repeated on the 9th of May.

When she came into Saint Bartholomew's, her state was as follows. The abdomen was very tumid, with evident fluctuation, very tender, and at times extremely painful, feeling, to use her own expression, as if it would burst ; her digestive functions much impaired, and the bowels a good deal purged, probably from the medicines she took.

The functions of the thorax were little disturbed ; she had not much dyspnœa or cough. She could fairly lay back in bed, and, in short, there was no symptom of difficulty in the return of blood to the heart. There was a little œdema of the feet. She was much emaciated ; her skin brown and dry.

The pulse was frequent, and not remarkable in any other way, than that the radial artery at the wrist was very tortuous, and felt much thickened, as if almost ossified. Examination afterwards shewed, that but little blood could have been sent into the arteries at each stroke ; but this, as it afterwards appeared, being thrown in with much force, into a vessel whose sides were thickened, the effect was calculated to deceive, the pulse appearing to be not less large or strong than natural. The urine was very scanty and high-coloured. All the symptoms denoted that kind of peritonitis,

which is attended with effusion of serum and lymph.

Rather more than three weeks before her death, she was so much worse, that I imagined her then dying ; but she fell into a state of deep sleep, which lasted thirty-six hours, and when she awoke, she was very much better, ate heartily, and made a good deal of urine. In a few days, however, she relapsed again. The day before she was tapped she had vomiting of morbid secretions ; but she always expressed so much eagerness to have the fluid evacuated, on account of the *bursting sensation* of the abdomen, that her desire was complied with ; four days after which she died.

Inspection.

On opening the abdomen, a vast quantity of serum escaped, although so short a time had elapsed since she had been tapped, and in the interim, she could have taken but little fluid, and the system, it might have been expected, would have been well emptied by continual vomiting and purging.

The serum at first flowed off pretty clear, but latterly it was turbid and bloody.

The omentum, mesentery, coverings of the viscera, and, in fact, every part of the peritoneum

were in a high state of inflammation, and very much thickened, lymph being thrown out on the whole of the surface. There were no adhesions in front, but at the upper part of the abdomen, and under the hypochondria, they were numerous and quite recent, and the surface of the liver and spleen were complete coats of lymph of old standing. This inflammation of the peritoneum may be considered as a sufficient cause both for the effusion and her death.

I thought it not impossible that we should find particular marks of inflammation, at the point where the trocar entered ; this, however, was not the case, it was simply closed by a coagulum. There was a good deal of ecchymosis around, but no increase of the inflammation, more than at any other part.

The mucous membrane of the alimentary canal was quite unaffected ; the contents were of the natural colour, and by no means in excess.

The liver was in a remarkable degree smaller than natural, and its anterior thin edge was gone. This edge, as it now existed, was situated considerably within the hypochondria, pushed up by the effusion probably, and quite thick and blunt. The substance of the liver was not firmer than common, it contained a good deal of interstitial deposit ; there was no specific disease in it ; the

bile was healthy. The lymph effused on the surface of this viscus looked as if moth-eaten ; from the action of the absorbents no doubt. The spleen had a deposition of lymph on its surface, equally old and thick. It was much enlarged, and rather consolidated in its texture. The kidneys were remarkably large ; seemed very turgid with blood ; no disease whatever was perceptible. The bladder contained a good deal of very high-coloured urine.

The thorax was examined as a matter of course, but with no expectation of finding any particular alteration of structure. There was a little effusion of turbid serum, but the lungs and pleura were healthy. The pericardium was healthy, and contained no unusual quantity of fluid.

The heart was very full of blood. This appeared rather an odd circumstance in a person who did not die from any obstruction to its passage. We found the right cavities much distended and large ; the left auricle was also filled with blood, and much larger than common. In endeavouring to pass my finger into the ventricle, I could only get the point of it through the annulus venosus with difficulty. On making a section of the heart, parallel to its base, there was found to be scarcely any cavity belonging to the left ventricle, while its parietes were remarkably thick and strong. The mitral valves were also found to have a sort of excrescence at-

tached to each of its most projecting parts ; these however were not large.

In this case there can be little doubt that the diminished size of the cavity of the left ventricle was owing to the diminished supply of blood sent into it. It will be observed, however, that there was no one symptom which led to the suspicion of the disease during life, and that there was no effusion into the thorax, or general œdema : how is this to be accounted for ?

In the first place, organic alterations in the vascular systems of old people are much less rapid in their progress, and it should seem that the constitution has time to accustom itself thereto. Secondly, there had been for a considerable time (several months) a degree of quietude and rest, rendered necessary by the abdominal disease. Thirdly, there were large evacuations constantly kept up from the kidneys and bowels, with a view to cure the ascites ; added to which, the effusion into the abdomen itself, might have proved a substitute for that into the other cavities.

The disproportion between the size of the cavity, and the size of the walls of the ventricle, was very remarkable. It is not improbable, that nature endeavoured to remedy the defect produced by the small quantity of blood which could be circu-

lated, by adding to the force with which it was transmitted.

I do not find it stated in the notes of either of these cases, that the calibre of the aorta was diminished. It is probable that the structure of the arteries being peculiar, may require some time for a noticeable increase or decrease to that place in them. In the first case the termination was too rapid to admit of it.

These two cases I have rather given on account of the singularity of the circumstances which attended them, than for any other reason ; they go to prove what I have before stated, that where there is diminution of quantity there is also diminution of cavity. For other examples of the same kind, in which, however, the calibre of the arteries was materially diminished, I shall, in a note, refer to other authorities *, as am loth to encroach upon the time of the Society by quoting cases, which, however, bear most strongly on the point in question. Of those which I have taken the liberty of laying before it, the I, III, IV, VI, VIII, and IX, are probably deserving of attention ; at least there are peculiarities about them, which are by no means common ; and they tend to illustrate

* Vide Corvisart, Obs. XIX. p. 96. Morgagni, Letter XVII. Art. 12.

some points of consequence in the pathology of these diseases.

In maintaining the opinion that alteration taking place in the minute vessels of the body, (I mean the nutrient and secreting,) is a chief and principal cause of diseases of the heart, I do not pretend to discard the proper influence of the vital powers of that viscus itself in producing its own diseases. Indeed from all the phenomena I observe, there appears to be very considerable power resident in it, of sympathizing directly with other parts, which implies the property of receiving morbid impressions immediately ; but my reason for supposing that it seldom undergoes any morbid enlargement, independent of the effects produced upon it by the minute vessels of the body, is principally founded upon the fact, that the left ventricle is more commonly enlarged than any of the other cavities, which is precisely the one most likely to be affected by changes in these vessels ; while the left auricle, which belongs to the same side of the heart, is more exempt from alteration of structure than any of the others ; which is the reverse of what we might expect, if the morbid state were idiopathic. To develop, however, the different arguments which may be adduced in support of this opinion, and to compare them with those which might be placed on the opposite side, would occupy a great deal more time than I should feel justified in taking up at present ; but I may at some future period

endeavour to lay before the Society the views I entertain on this particular subject more at large.

In detailing the cases, I have omitted to describe the palpitations, the sudden startings during sleep, the terrible anxiety, the coldness of the extremities, &c. &c. which are almost invariably concomitants of vascular disease. It would have taken up unnecessary time, since this is not a description of the malady, but an inquiry into its nature and causes. Also I have for the most part omitted to say any thing of the treatment; and that for two reasons. I wished to avoid doing so, as it was not directed by myself. Secondly, they were cases in the last stage, which are unfortunately but too much beyond the reach of assistance, or at any rate of cure; but such it was necessary to select, as my object was to illustrate the nature of the symptoms during life by the appearances after death.

Lastly, I have said but little of the opinions which others have expressed on this subject. To have stated that Senac has warmly espoused the doctrine of obstruction in the minute vessels, would have rendered a long discussion necessary on the validity of his opinions, as supported by his arguments. It would have been out of place in the present instance. In speaking of solid œdema, I should not have omitted to mention the opinions of Dr. Blackall, Dr. Wills, and Dr. Grapengiassic, but that the cases here recorded and the remarks made,

were collected and noted previously to my having seen the observations of either. The remarks indeed, under a somewhat different shape, were made the subject of an essay, which I read to the Medical Society of Saint Bartholomew's Hospital in the autumn of 1812, and was written in the spring and summer. The cases are almost altogether taken from among those I had observed before that period; and I have much to regret, that in consequence of not knowing at that time the coagulable nature of the fluid separated from the vessels of the kidneys and other parts in cases of this description, I could not make any observations on this point.

Exeter, January 15th, 1817.