

irritability and sensibility, they will frequently be excited to painful efforts for this purpose.

Fifth. Not only the organs immediately affected, but others, subsidiary to them, will have their secretions altered in quality, and for the most part increased in quantity.

Sixth. The constitution will be affected by sympathy ; more powerfully, if the inflammation affects the stomach in any considerable degree ; less, if it be confined to the bowels. Also the whole system will suffer, though not so immediately, from the want of nourishment.

A comparison of these remarks with the description of symptoms will perhaps afford a sufficient explanation of those symptoms.

(To be continued.)

CASES

OF

ORGANIC DISEASES OF THE HEART AND LUNGS.

BY JOHN C. WARREN, M. D.

IN the commencement of the year 1809, I had the honour of communicating to the Massachusetts Medical Society some cases of organic diseases of the heart, in which were mentioned the Clinical Lectures of Professor Corvisart, a few of which I had attended in the hospital of La Charité in the year 1802. Since the time of that communication M. Corvisart's lectures have reached us, and unfolded the history of these diseases in the most satisfactory manner. As a translation of this valuable work is promised the American public, I shall not pretend to give any account of it at present ; but continue to contribute my labours to the general stock of information, by occasionally selecting and publishing a few of the numerous cases that are presenting themselves. Of the three cases, which I have at present selected, the first has been chosen because it affords an opportunity of comparing the symptoms produced by an aneurism



of the aorta with those of diseases of the heart already published ; the second because it is rare and curious ; the third because it will probably throw light on the cause of symptoms in these interesting diseases.

CASE I.

Aneurism of the origin of the Aorta.

Mr. —, a gentleman of small stature, but uncommon muscular power, was affected in the autumn of 1808, with pains in the right shoulder, arm, and leg. His complaint being supposed to be rheumatism ; he was bled and blistered. The pains often returned, and became so severe in the shoulder, in the spring of 1809, as to induce Dr. Eustis, a friend of his family, and Dr. Bates his physician, to make an examination of this part. When the breast was uncovered, Dr. Eustis observed with astonishment a small pulsating tumour on the right side of the thorax, between the second and third rib, at the distance of one or two inches from the sternum, Dr. Eustis pronounced to the friends of the patient, that his disease was of an incurable and fatal nature.

Soon after, I examined this gentleman with Dr. Warren, senior, and Dr. Bates. We found the tumour very slightly projecting from the surrounding surface, possessing a strong pulsation, and a little tenderness on pressure. It was about two inches in diameter. The internal jugular vein of that side had a considerable pulsation. The pulse in the right arm was not sensibly different from that of the left, and neither of them changed from the healthy state. The patient informed us that he was much troubled with dizziness and headach ; that he had been formerly subject to enlargement of the hemorrhoidal veins with discharges of blood, which had not lately occurred, and that in other respects his health was unimpaired. We learnt from his friends that he had accustomed himself to very severe and dangerous equestrian exercises, in which he took pride, and was very expert, and that he had long discovered signs of weakness in the thorax, especially in the year 1788, when he suffered greatly from the pressure of a bayonet-belt on that part, during his exercises in a military company.

Although, at the period of our examination, he scarcely admitted the existence of symptoms which might indicate disease in an important organ, it was not long before the sufferings, connected with organic diseases in the heart, began to advance with slow, but formidable steps. After his complaints had made some progress, they were suddenly arrested on the application of a large blister, and allowed him an interval of ease of four or five months duration. In the month of March, 1810, after exposure to

cold and moisture, his symptoms were increased in a very sudden and alarming manner. His respiration became laborious and suffocating, his cough incessant, and pain in the breast more violent than at any former time. He started often from sleep with the dread of suffocation, and was compelled to sit upright in bed. One of the most distressing symptoms was a difficulty in swallowing, which greatly increased in this paroxysm of disease. His cough was violent, and attended with a copious expectoration of whitish mucus. This paroxysm was alleviated; but he never had an easy day, nor a quiet night, afterward. The disorder occurred in fits of two or three days duration. In the intermissions, he was comparatively comfortable, and able to attend to business. The symptoms scarcely changed afterward except in degree, and in the increased frequency of their recurrence.—The respiration became at last very laborious, and was attended with a loud noise. The cough more violent, expectoration greater, and tinged with blood. The right jugular vein was dilated enormously; while the carotid artery of that side apparently lost its pulsation. The pulse was weaker on the right than on the left side, and in the last paroxysm intermitted. This paroxysm occurred in August, 1811. It continued about four days, and terminated with the appearances of suffocation.

In the course of the disease, Dr. Bates frequently relieved the symptoms by blistering, by calomel with opium, and other medicines which promote expectoration. Dr. Warren employed bleeding and various narcotic substances, particularly stramonium and cicuta with temporary advantage.

DISSECTION.

On the day following the patient's death, I examined the body in presence of a number of medical gentlemen.

The countenance was slightly bloated and livid. The extremities were not œdematous. We observed that the third rib of the right side was pushed out, at least the space of an inch. The projection was greatest at about two inches distance from the sternum. The skin over it was livid, and appeared thin, as if ready to burst. When the cartilages of the ribs had been divided, and two or three ribs sawed, we found it difficult to raise the sternum, which was discovered to adhere to a substance in the thorax. The ribs were very carefully separated, but not without tearing open this substance, and exposing a cavity. This we discovered to be a great tumour from the right side and posterior part of the aorta, at the root of the arteria innominata. This tumour had a narrow base, so as to leave half the circumference of the aorta uninjured. It pressed forward on the second and third ribs, and the right edge of the sternum, which had become carious. There was a separate tumour on the back part of the arch of the aorta, extending from the arteria innominata to the left carotid artery.

of smaller size than the other. The latter involved the origin of the *arteria innominata*, which was placed on its superior and posterior portion. It extended to the spine, pressed on the trachea, and adhered to it at the bifurcation, and pressed also on the oesophagus. The upper and central part of the thorax was occupied by these two aneurisms, from the sternum to the spine. The cavities of both were filled with coagulated blood; yet not in such manner as evidently to interrupt the canal of the aorta, or of the great arteries of its curvature. The plate, which accompanies this case, represents about half the extent of the largest aneurismal tumour. Such a view as would have exhibited the tumour more completely, must have concealed its connection with the aorta. The heart was of a small size. The texture of the lungs was healthy, and not much filled with blood. The air vessels of the lungs were crowded with a very white coloured mucus. In the right cavity of the thorax we saw about ten ounces of water; and five or six ounces in the cavity of the pericardium. The abdominal organs were sound, and their cavity without water.

CASE II.

Opening in the mitral valve.

A healthy female, 21 years of age, who had been married 5 years and had two children, the last of which had been weaned a week, when she was taken ill; was suddenly attacked with an acute pain in the left foot, that continued a whole night, and subsided in the morning. On the afternoon of the following day she was affected with an acute pain in the left shoulder, darting thence through the clavicle to the heart. Her skin was hot, face flushed, and pulse hard. Dr. Bean, who was called to her, bled and blistered her without effect, but she was eventually relieved by the use of opium. The pain recurred at intervals afterward. About a week from the time of the first attack, she had a very severe chill, accompanied with extreme lividity of the face. These symptoms subsided in about half an hour, but recurred two or three times a day afterward, and frequently terminated in fainting. A numbness of the left side, which she had experienced at first in a slight degree, increased very much. Her respiration became extremely difficult, and required her chest to be raised high in bed. Her sleep was interrupted by frightful dreams, during which she started up and screamed that she was suffocating. The pulse at this time was very irregular and intermittent. The heart palpitated violently. About six days before death, the legs swelled, and the pain in the shoulder subsided. She expired on the twentieth day from the first attack, with symptoms of suffocation. The fatal paroxysm invaded her in the manner described above. Her respiration was laborious, pulse scarcely perceptible, lips livid, and eyes wild and staring.

DISSECTION.

The body was examined by Drs. Jackson and Bean. When the heart was opened, the mitral valve nearest the aorta was discovered to have an opening, through which one's finger might be passed. The edge of the opening was surrounded with a thick substance, which gave it the appearance of a fringe. The cavity of the thorax contained a large quantity of water. The appearance of the subject was unusually white, and generally œdematous.

CASE III.

Disease of the Lungs, the symptoms of which much resembled those of organic diseases of the Heart.

Susan Collier, aged 27, was attacked on the 28th of January, 1810, with profuse hæmorrhage from the lungs, and raised by coughing large quantities of florid blood. This attack was accompanied with severe pain in the left side of the chest, greatly increased upon forcibly inspiring. Her breathing was quick and laborious, and her pulse hard and frequent. She complained of pain and dizziness in the head, her face was florid, and her skin hot and dry.

Upon inquiry it appeared, that the patient had been troubled with cough for several days, and she mentioned of her own accord, that she had observed an unusual palpitation at her heart for some time. Six weeks had elapsed, according to her account, since the last appearance of the menstrual evacuation. She had been costive, and entirely lost her appetite. Sixteen ounces of blood were drawn from her arm, muriatic acid was directed, and a blistering plaster was the next day applied to her side.

During the month of March, the cough was very distressing through the night, but in the day time not very frequent. It was quick, almost spasmodic. She expectorated, largely, thick frothy mucus. The palpitation of the heart could now be observed through her clothes by the bystanders at a considerable distance. It appeared by regular paroxysms, almost invariably at 11 in the morning, and at 5 or 6 o'clock in the evening. In the night, when awaked by coughing or frightful dreams, which frequently happened, it was most violent, and attended with such difficulty of breathing as to force her to start up and remain with her body erect, until the paroxysm abated. She laid with her head raised very high by pillows, but said she breathed much more easily, when sitting in a chair. Pain in the side continued and was occasionally severe. She became subject to frequent profuse sweats at night, and, in the morning and at noon, to chills followed by flushes of heat. Her pulse became more irregular, particularly in the paroxysms of dyspnoea and palpitation. It was generally frequent, but varied very much

in hardness and fullness, and sometimes intermitted. Venesection and blistering gave some relief as before.

In the two succeeding months her symptoms were highly aggravated. The cough became more violent and the attacks of palpitation more distressing, particularly in the night time. She laid in bed with her head so much elevated by pillows, as to be almost upright. When she sat in a chair she often rested her head upon her arms, supported by her knees. The palpitation of the heart was felt extending over a large part of the side, but perceived most distinctly at the epigastric region. It was accompanied with a constant sense of pain and distress in the whole course of the sternum, which she sometimes described as if a weight were laid over her heart, checking its motion. The carotids could be observed at a great distance pulsating very strongly. Her pulse became highly irregular, sometimes intermitting as often as once in 10 or 15 strokes. In the left arm it was usually slower and rather more contracted than in the right. Sometimes it was the *bis feriens* of authors. Large doses of hemlock and opium gave but little relief to the attacks of distress in the night, which were so severe as often to induce her to prefer sleeping in a chair to lying in a bed. Occasionally, but not often, hectic chills appeared in the morning. The perspirations in the night no longer continued profuse. She expectorated thick, whitish mucus, generally mixed with large quantities of a clear pellucid fluid. When difficult it was often relieved by squills. Her appetite was tolerably good, and her bowels were extremely costive, probably from the use of opium.

The violence of the paroxysms varied very much. One day she would feel comparatively easy and happy, as her breathing would be free and the palpitations slight. The next, her symptoms would appear with renewed violence, and induce a state of absolute despair. Two attacks were so severe as to require venesection. Vesication over the sternum was kept up as constantly as possible.

May 15th, her feet and ankles began to be swelled and soon became oedematous. This appearance, however, after the assiduous use of friction with flannel, subsided in about ten days. On the 28th, in the afternoon, she became delirious, wildly rolling her eyes, tossing her limbs, recognizing no one. She answered questions put to her, though confusedly, and complained of violent pain in her head. In the evening venesection was employed to give her relief, and while the blood was flowing from her arm, she became perfectly sensible. Her head continued dizzy, and she long complained of pain shooting through her temples. Blistering at the back of the neck and behind her ears finally removed these troublesome symptoms, and for a fortnight before her death she remained perfectly free from them.

On the 29th of June her pulse became extremely small and frequent. The cough and fruitless attempts to raise mucus from her throat, together

with short and laborious respiration, gave her exquisite distress. In the night the palpitation was unusually violent, and the next morning at ten she expired.*

DISSECTION.

The body was examined on the day after death. The countenance was quite livid. When the heart was opened, we were surprised at finding no appearance of disease in it, excepting a very moderate ossification of the coronary arteries; such as is often found in patients, who die without a symptom of affection of the heart. The aorta was small in proportion to the heart. The pericardium contained one or two ounces of serous fluid. The lungs were universally in a state of induration much resembling that of a scirrous breast. They yielded but little to pressure, and did not collapse in any degree when cut, nor their vessels, as usual, pour out blood. The cells contained a quantity of frothy mucus. No pus could be found. The pleura of the ribs was closely adherent to the lungs in every part, so that the thoracic cavity was completely filled by a resisting, solid body.

Each of the cases, related above, contains something worthy of particular remark.

In the case of aneurism of the aorta, we find many symptoms, such as accompany disease of the heart, and yet an absence of some of the most important and characteristic. Among the former, are the difficult respiration, cough with copious expectoration, difficulty of lying in a horizontal posture, starting from sleep, and paroxysms of suffering with intervals of ease; but we do not observe the violent palpitations, the irregular pulse, and the watery effusions which commonly attend diseases of the heart. How can we explain the absence of these appearances? Probably, the symptoms of disease, in this case, ought to be attributed, rather to disturbance, in the respiratory apparatus, than in the organs of the circulation. The pressure of a great tumour on the lungs would necessarily impede the exercise of their healthy functions, while it excited them, and irritated their vessels to increased secretion of mucus. Hence we should have difficulty of breathing, cough, and copious expectoration. But the canal of the aorta remaining open, no interruption existed to the discharge of blood from the heart, therefore no palpitations,

* The notes of this case were principally taken by my late ingenious pupil, Mr. Henry Carnes.

no irregularity in the pulse; no impediment to the transmission of blood from the capillaries, and of course, no effusion from the exhalants. If this explanation be just, it will follow that this case is precisely the reverse of case third; for in the former, a disease in the organs of the circulation produced disturbance in the respiratory function, while in the latter, a disease of the organs of respiration deranged the function of circulation. It is scarcely necessary to remark that the difficulty in swallowing was caused by pressure on the esophagus; and the acute pain in the shoulder and arm, by pressure on the first dorsal nerve, going to the brachial plexus, or by pressure on the phrenic nerve.

The second case exhibits the terrible effects of a sudden change in the organization of the heart. It would be a deviation from the main object of this paper to inquire, whether the diseased orifice, in the mitral valve, was the effect of rupture from some unknown cause; or whether it was the consequence of inflammation and ulceration. The thickened and tuberculated appearance of the edge of the orifice affords grounds for the latter suspicion; yet no traces of inflammation or ulceration could be discovered in any other part of the organ. The observations of M. Corvisart give us reason to believe that a rupture in the valve might occur suddenly, without previous disease, from a cause, which the patient would not very readily disclose.

The case of diseased lungs appears unintelligible at first view; for we observe in it the symptoms of diseased heart, without a correspondent change in the structure of that organ. It must be confessed, that on the examination of the body of this patient, we were not a little disappointed and embarrassed; and our difficulties were not removed till lately, on meeting with a certain memoir of M. Portal, which has lead us to a new view of this case, and to consider it as confirming, rather than subverting, the doctrine of pathognomonic symptoms of diseases of the heart. This memoir treats of the action of the lungs on the aorta during respiration; and is accompanied with the remarks of M. Bordeu, by which he endeavors to show "that the connection of the left bronchia with the aorta, may produce modifications in the pulse, that may be called pectoral modifications, or pectoral pulse." It seemed probable and even nearly certain,

that if the pressure of the bronchia on the aorta influenced the circulation of the blood, in a healthy state of organs, that this influence must be greatly increased in some diseases of the lungs.

Before we inquire how such an influence could operate, we are naturally led to some investigation into the causes of the phenomena, attendant on diseases of the heart. These seem principally to depend on disturbance in the organs of respiration and circulation : but the symptoms of disease in the respiratory organs evidently arise from disorder in the circulation of the blood, at least in most cases, as may be shown presently. Our researches are therefore narrowed to an inquiry into the cause of disorder in the organs of the circulation. This cause seems to be a mechanical obstruction to the circulation of the blood, as it passes through the heart or great artery ; for whether the disease be an induration of the auriculo-ventricular or aortal valves, or an aneurismal enlargement of the heart, there must generally be an obstruction to the passage of blood out of the heart ; arising from disproportion between the quantity of blood to be transmitted, and the size of the passage to receive it. If the heart cannot discharge the whole, or at least the greater part of its blood, that portion which remains, must prolong the stimulus on the organ, or rather, repeat it too suddenly. The heart, thus imperfectly stimulated, will contract imperfectly, with a tremulous motion, constituting palpitation. This tremulous motion, propagated along the blood in the arterial system, produces irregularity in the pulse. M. Corvisart informs us that the left side of the heart is more frequently diseased than the right, especially with ossification. If the blood be obstructed in its passage through the left side of the heart, it must be so in the pulmonary veins, and of course in the whole vascular system of the lungs. There accumulated, it compresses the air cells, prevents the free admission of air, and excites difficult respiration, cough, and their concomitant symptoms. The copious discharge of mucus from the lungs, and in the latter stages of the disorder, discharges of blood, proceed from the exhalant vessels of the lungs, which receive an unusual quantity of fluids from the capillary vessels, because the latter cannot freely empty themselves into the veins. Continuing to pursue the circulat-

ing system backward, we observe accumulation of blood in the jugular veins and in the veins of the face and head, causing dizziness, intense headach, and purple colour of the lips and face; we sometimes also observe such accumulation in the liver. The whole venous system seems overcharged with blood, which is probably the cause of the permanent dark colour of the skin, observed in some violent cases. As the blood is collected in the venous system, it cannot readily be emptied by the general capillary system into the origins of the veins, will therefore be thrown upon the exhalant vessels in every part of the body, and thence its thinner or serous portion will be poured into the cellular membrane, into the cavities of the abdomen, thorax and pericardium. These explanations seem to flow very naturally from a little observation of the phenomena and morbid changes in organic diseases of the heart. They are however offered with diffidence as results, which have occasionally suggested themselves, and not as the consequences of any very profound research. They may also have been presented, atleast in part, by those able hands into which the investigation of these diseases has fallen.

If it should be admitted that the symptoms of diseases of the heart arise from a mechanical obstruction to the circulation of the blood through that organ, there will be no difficulty in explaining the appearances in our case of diseased lungs. A mechanical cause on the outside of the heart, or aorta, may certainly obstruct the passage of blood as much as a cause existing within. The lungs transformed into a hard tumor, filling nearly the whole thoracic cavity might we suppose, make such pressure on the aorta near the spine, or perhaps on some part of the heart itself, as to interrupt the passage of the blood. From that interruption would follow the symptoms of organic disease in the train we have pointed out.

After examining the best writers on morbid anatomy I have not been able to discover a case of similar disease of the lungs, whose symptoms corresponded with those of this case. That, which approaches most nearly to it, is to be found in Lieutaud, who quotes it from De Haen, and is headed, "The heart false-

ly accused." * "On examining the body of a certain little young woman who for many years encountered a violent palpitation of the heart, panting, anxiety about the præcordia and frequent cough, in spite of various remedies; the vital organs were found to be perfectly healthy, if you except a genuine but very slight adhesion of the lungs to the pleura. Moreover, three worms were discovered in the intestine ileum."

A CONCISE VIEW OF THE RESULTS OF DR. DAVY'S LATE
ELECTRO-CHEMICAL RESEARCHES.

(Continued from p. 51.)

SILEX, ALUMINE, ZIRCON, GLUCINE.

THE results of the action of the galvano-electric matter on these earths, were much less satisfactory and conclusive than those resulting from the application of the same agent to the alkalis and alkaline earths. In no instance did Dr. Davy succeed in obtaining their bases independent of the substances with which they were mixed or combined, for the purpose of facilitating their decomposition. Yet "from the general tenour of these results and the comparison between the different series of experiments," observes this gentleman, "there seems very great reason to conclude that these, like the alkaline earths, are metallic oxides, for on no other supposition is it easy to explain the phenomena that have been detailed."

AMALGAM PROCURED FROM AMMONIA.

From the experiments of Mess. Pontin and Berzelius of Stockholm, and of Dr. Davy, ammonia is inferred though not

* *Cor falsò incusatum.* Obs. 611. Lib. 2. Lustrato cadavere cujusdam feminae juvenculæ, quæ multis abhinc annis, *vehementi cordis palpitazione, anhelitu, anxietate* præcordiorum, tussique frequenti, frustra variis adhibitis præidiis, conflictabatur; vitalia viscera sanitatem illibatam adeò referebant, ut nihil illibatius, si excipias genuinam, sed lævissimam, pulmonia adhesionem ad plevram. Deprehendebantur insuper tres lumbrici in intestine lico. *Clar. Haen.*