CASES AND COMMENTARIES.

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III.—Dissecting Aneurism.

CATHERINE DOOLEY, aged 24, but looking much older, and with a turgid bloated aspect about her face, the eyes being very much puffed and semi-closed, as if from oedema, giving her a Chinese appearance, by occupation a servant, and having worked very hard at her situations, but led a regular and quiet life, was admitted into Charing Cross Hospital in November 1868. Her father is living; her mother died when she was young, cause unknown. She has four brothers and a sister living; one sister died of cholera.

She was always quite well up to four years ago, when she had rheumatic fever very severely; she was confined by it to her bed for six months, and did not get over it for twelve months. She was ill three months at home, and the remaining nine months she was in a metropolitan Hospital. There was some doubt, from the state of her knee after her recovery, whether she might not be obliged to have her leg amputated. She had no special shortness of breath, or palpitation, at the time of the attack, and does not remember whether her heart was examined, or even whether the stethoscope was used; but she was so delirious during a portion of her illness that it might have been used without her recollection of it. For six or seven months after leaving the hospital, she did not notice anything the matter with her heart; she was then seized, one evening when she was taking her tea, with a sudden attack of palpitation—the heart beat most violently, and there was a severe pain passing through from the chest to the back; she was obliged to walk up and down the room, not knowing what was going to happen to her; there was no shortness of breath. In the course of the evening, on going upstairs, she found she was obliged to stop from renewed palpitation and pain in the back. She has never been free from these symptoms since; in three months she had to leave her place owing to them, and since that time has frequently lost places in consequence of them. She has found, too, ever since, that her breath has been affected; she is unable to run upstairs, but is obliged to stop half way and recover her breathing. On three or four occasions she has brought up blood, in small portions, mixed with phlegm, and bright. She has suffered, too, very much from headache. She is often obliged to jump up in bed for breath when she is asleep, and has been compelled to sleep high at head, lying low immediately bringing on the breathlessness. These symptoms have all gradually increased since their first appearance. Before coming into the hospital her feet swelled a good deal, but the swelling has nearly subsided. For the last twice she has been regular; previous to that she saw nothing for ten months. For about a month previous to her admission she first noticed a difficulty in swallowing—the food seemed to lodge, and she was unable to get each mouthful down without a drink. This has improved a good deal since she was in the hospital, but she has still some difficulty of deglutition left.

Physical Examination.—The first things that strike one on exposing the chest for examination, are:—(1) a conspicuousness of the veins ramifying over the front of the chest, especially on the left side; and (2) the difference of the shape of the neck on the two sides, the posterior triangle being conspicuous on the right side, concave, and well-marked, whereas on the left it is filled up and effaced, being, in fact, occupied by a general swelling, passing down from the neck to the clavicle, and giving a fulness and convexity to that side. On the right side the edge of the clavicle and sternomastoid are sharp and prominent; on the left they are invisible. On listening to the heart, a basic diastolic murmur is heard, of maximum intensity at the right border of the sternum, at the junction of the cartilage of the third rib, but heard from that point at a radius of three inches in all directions. At the sternum, downwards, upwards, and to the left, it appears single and confined to the diastole, the systole being clear and natural; but to the right, not only is the tone of the diastolic murmur altered, but there appears a systolic murmur, short and rough, preceding it. I can, I think, by the greatest care, detect the slightest possible thrill, accompanying both sounds at the base. Both pupils are alike, both pulses alike, 80 in the minute and jerking in character; respirations 34.

The patient remained under observation in the hospital for two months; and the conclusion that we came to with regard to the nature

of her case was, that there was some source of pressure in the upper part of the chest, as evinced by the enlargement of the veins, the puffed condition of the neck and face, and the difficulty of swallowing, and that this pressure, in spite of the exceptional character of some signs and the absence of others, was probably aneurismal.

On February 25th, 1869, she presented herself to me at my house, evidently in great distress, and complaining of breathlessness, and an agonising pain passing through the upper part of the breast-bone to the back. The pain was accompanied by a sense of burning, and fullness, as if the contents of the chest were rising up into the throat. She stated that these symptoms had been increasing for some days past, that they were aggravated by the slightest exertion, and that the day before, in one of the paroxysms of them, she had fallen down unconscious. Her distress was evidently very great; she could hardly sit still in her chair; she kept putting her hand to her chest and exclaiming "oh! dear!" and breathing deeply, as if to get rid of a sense of oppression there. I examined the heart and found its action rather laboured and occasionally a little irregular, and the diastolic murmur much louder than I had heard it before. Except the evidences of cardiac hypertrophy, this was all I observed. This was Thursday. On the following Monday, March 1st, her master called and told me that on the previous Saturday, two days after I had seen her, she had fallen down dead suddenly on the kitchen floor. She had only a few minutes before carried up a tray to her mistress, and seemed no worse than she had done for several days. Shortly after this, her mistress, ringing, and not getting any answer, went down into the kitchen, and found her quite dead on the floor. Mr. Adams, of Harrington Square, was immediately sent for, but on his arrival found life quite extinct. An inquest was ordered, and Mr. Adams made the *post mortem* examination. He removed the heart, and, knowing that I had previously seen the girl and took an interest in the case, set it aside that we might examine it together, which we did the next day, and found the following state of things. But, first, I must mention that on opening the pericardium, before removing the heart from the body, he found it full of coagulated blood, and discovered a rupture in the aorta through which the blood had escaped into the pericardial sac, thus revealing the immediate cause of death.

Both ventricles were empty. On cutting them open the walls of the left were found to be considerably thickened, from three-quarters to seven-eighths of an inch thick; the right, I think, attenuated, and over the chief part of its surface its muscular tissue seemed supplanted by fat, to as much as half the thickness of the wall, so that, indeed, in some parts, there seemed very little muscular tissue at all. The roots of the great vessels were matted together, and covered and thickened by a quantity of exudation, which evidently was seated in the subpericardial areolar tissue surrounding the vessels, and was of a firm gelatinous consistence—except that it was almost too hard to be called gelatinous. The little hole in the pericardium through which the blood had escaped into the sac was linear, and, when stretched open, about as big as a small pea; it was just behind the right or convex margin of the vessel, and about three quarters of an inch from its root. On examining the aperture more minutely, it was found that the pericardium here, and its subserous areolar tissue, was detached from the vessel beneath, that the two could be moved freely one over the other, and that the small aperture in the pericardium corresponded to a much larger one in the vessel. On slitting up the aorta from the ventricle the state of things on which this separation depended, and its extent, and the method of its production, were shown. Three considerable slits, or transverse tears, through the middle coat of the vessel were seen, clean and sharp, and exactly transverse, and about three quarters of an inch in length—one just above the free margin of the semilunar valves, one about four inches up the arch on its right or convex side, and the third hardly so high up on the left or concave side. On inserting a probe into these transverse slits, they were found to open into a free and capacious space, bounded externally by the dilated outer wall of the vessel, which was everywhere thickened and strengthened, as I have already said, by a quantity of adventitious areolar tissue, and internally by the inner and middle coats, which were undilated, maintaining the natural cylindrical form of the vessel. It would perhaps be more correct to say that the middle coat was split, that its inner portion, together with the lining membrane, maintained its natural size and shape, while its outer portion, together with the external areolar coat, was distended into a more or less cylindrical aneurismal dilatation. Into this aneurismal dilatation the blood found free access through the three transverse slits which I have described, and thus the inner portion of the aortic wall formed a tube, of the natural size and shape of the vessel, lying free within that portion of the wall that had undergone the dilatation, and bathed with blood on both sides; in fact, it lay in the current of blood, in mid-stream, part of the blood flowing through it, and part escaping by the

slits and flowing outside of it. The inner surface of the vessel was atheromatous throughout, rough, opaque, and brittle.

It is easy to see how such a state of things was produced. It was, in fact, simply a dissecting aneurism of peculiar structure and relations. The first step must have been the insinuation of a little blood through the frayed or cracked lining of the vessel; this must have burrowed into the middle coat, and, extending among its fibres, split it up into an inner and outer portion; the outer gradually becoming more and more dilated, and thickened by adventitious fibrous tissue. It was through this outer portion, at a point where it was thinner than elsewhere, near the root of the vessel, that the blood ultimately burst into the cavity of the pericardium. It was probably not until the aneurismal dilatation had attained considerable dimensions, and there was a large volume of blood passing through it, that the transverse splits extended to such a degree as was found after death; and, of course, it was not till the instant before death that the outer wall gave way, and the blood burst into the sac of the pericardium.

The whole thing will be much better understood by reference to the accompanying diagram, which represents an imaginary section of the

left ventricle and arch of the aorta. At *a* is shown the cavity of the left auricle; at *b*, the cavity of the left ventricle; at *c*, part of cavity of right ventricle; *d d d*, sac of pericardium; *e*, its point of reflection on the aorta; *f*, part of imaginary cavity of pericardium. At *g* is shown the inner cylinder of the ascending aorta, consisting of the inner portion of the split middle coat and the lining membrane, and maintaining its natural cylindrical and undilated shape and course. Three apertures are seen in this portion of the wall of the vessel, two on its convex and one on its concave side; these represent the three transverse slits I have referred to, and I have indicated by arrows the course I conceive the blood to have taken through these slits at the time the ventricular systole was driving the blood forward through the arch; of the two on the convex side I have but little doubt; through the proximal one, the current must have set out of the vessel, and through the distal one, I should think it must necessarily, as a consequence, have set in. Of the direction of the current through the single slit on the concave side I do not feel so certain; if it was inwards, as I have represented it, the blood must have been derived by that escaping from the proximal slit. At *h* and *i* are represented the outer wall of the aneurismal dilatation, composed of the external areolar coat and the outer portion of the split middle coat; the diameter of the entire dilatation is, of course, the distance from *h* to *i*. The splitting of the coats of the vessel is seen both above and below—below on each side close to the root of the aorta, in the immediate neighbourhood of the valves; and above, on the convex side at the root of the innominate artery, and on the concave side, in the concavity of the arch. The course of the blood in the adventitious cavity external to the undilated portion of the vessel's walls is shown by the arrows and dotted lines, and it is at once seen how the inner portion of the split walls must have been bathed with blood on both sides. Just above *f* is seen the aperture in the outer wall of the aneurism, through which the blood finally escaped into the pericardial cavity. This figure must be understood as simply a diagram, and not in any way representing a drawing of the dissected parts.

There are two points about this case of special interest, besides some

others of secondary importance. One is the isolation of the inner portion of the split vessel-wall, its maintenance of its original shape unchanged in spite of its diseased state, and the peculiarity of its relation to the blood-stream. Its comparative integrity, in spite of its thinness and atheromatous condition, and the fidelity with which it had kept its shape, were probably owing to this very relation to the blood-stream—to its being supported by blood on both sides of it. Although there could be nothing like a free stream in the outer chamber between the split coats of the vessel, and although the main bulk of the blood must have passed through its accustomed channel, yet the communication between the inner and outer blood through the splits was probably sufficiently free to establish a tolerable equality of pressure on both sides; otherwise one can hardly understand how an arterial wall robbed of half its thickness and eaten out with atheroma could have so long supported the force of a ventricle so considerably hypertrophied. One question that arises, in connection with this dissected condition of the ascending aorta and the isolation of its inner portion, is how it could have been nourished. The *vasa vasorum* of an artery ramify and break up in the external areolar coat—the supply of nutrition to its walls is from without. Now, here, the inner cylinder was entirely cut off all round from such supply. The answer, therefore, to the question how it was nourished probably is that it was not nourished at all—that all nutritional change was, and has been for some time, suspended in it; and the degree of toughness and resisting power which it still possessed, furnishes an example of the tenacity with which white and yellow fibrous tissue retain their physical properties in spite of the most powerful disorganising agencies.

The second point of interest relates to the murmur. The principal murmur, as I have stated, was diastolic, strong and of extended area; but there was, besides, a systolic murmur, much less pronounced, and confined to the right border of the upper sternum. Now, on examining the aortic valves after death, they were found, in spite of the atheromatous condition of the walls of the vessel in their immediate neighbourhood, to be perfectly healthy and competent. Here, then, was a puzzle; how were we to reconcile the existence of a murmur pointing to aortic regurgitation with the competency and healthy condition of the valves? The only way in which I can explain it is by imagining that at the diastole some of the blood in the outer chamber of the aneurism rushed back into the inner cylinder through the proximal slit close to the valves, and impinging on the valve opposite it, as shown in

the accompanying diagram, prevented its falling in, and so kept the orifice imperfectly closed. There was no appreciable dilatation of the vessel at the circle of attachment of the valves, so that it seemed difficult to explain the regurgitation in any other way. If this was its true explanation it is a most curious example of a way in which, by a fortuitous piece of morbid anatomy, regurgitation may comport with healthy valves.

The very existence of atheroma at such a degree at such an age is in itself a remarkable thing. Atheroma and its accompanying calcification is, as a rule, a change of advanced life. In estimating, irrespective of other circumstances, the probable nature of valvular lesions, I generally consider them to be probably of inflammatory origin if the age of the patient is below forty, and probably atheromatous if the age is above fifty. The same rule, of course, would apply to the vessel as to the valves. Now, here we have a girl of 24 with as advanced atheroma as I have ever seen. The healthy condition of the valves, the regurgitant murmur, the girl's age, and the atheromatous nature of the mischief, constitute a group of circumstances the more remarkable and the less such as might have been expected, when we remember that the symptoms began to develop themselves about six months after an attack of rheumatic fever four years previous to her death. The case raises a question in my mind, which many cases have raised—whether the aorta itself may be the seat of rheumatic inflammation, and whether

the disorganisation resulting therefrom may favour the development of atheromatous change. Of the association of gout and rheumatism with a tendency to early atheroma there can be no doubt.

With regard to the mode of formation of dissecting aneurisms, certainly such an aorta as this favours Dr. Peacock's view (which, indeed, I suppose would be the general view) rather than Rokitsky's. Dr. Peacock believes that the first event is the giving way of the inner coat, and the consequent insinuation of a portion of blood, which splits up the middle coat and thus produces the dissection. Rokitsky thinks that the first step wrong, at any rate in some instances, is a morbid condition of the external coat, which causes its separation from the other coats, and that they, being thus unsupported, give way. The disease here was certainly in the inner coat and inner portion of the middle coat, which were so eaten out with atheroma as to account for any amount of giving way in any part of the vessel. An inner coat so broken up as this could hardly be conceived capable of preventing the leakage of blood at some points into the wall of the artery. Moreover, the two principal ruptures were situated exactly at the part where the brunt of the stream would fall, and where the force from within and the penetrating power of the blood would be most felt.

REMARKS ON AN EPIDEMIC OF INTERMITTENT FEVER IN MAURITIUS DURING 1866-67-68.*

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My excuse for venturing to read to the British Medical Association a paper on a disease so well known and understood as intermittent fever, is that, as late Medical Superintendent of the Poor-law Commission of Mauritius, I had certain opportunities favourable for observation afforded me. My objects are to endeavour to lay before you some of the facts connected with the appearance of intermittent fever in a new field—a colony to which it had been previously a stranger—and to trace its progress around and over the island; not for the purpose of submitting my deductions and opinions, but rather that the members of the Association may have data for forming their own: and to mention, very briefly, a mode of treatment which a consideration of the causes of malaria suggested to me; the result of which treatment, as far as it was carried out, was, I think, one more fact confirmative of the theory that this disease owes its origin to the spores or seeds of a vegetable growth of low order. And for these objects it will perhaps be permitted me to give a short account of Mauritius, its climate and meteorology, and of its inhabitants and their condition.

The island is situated within the tropics, is of volcanic origin, and, up to the appearance of a so-called Bombay fever, to which I shall presently allude, bore the character of being extremely salubrious—so much so, that at one time it had been a resort for those of our Indian invalids who lacked time or means to reach their native land. It has a surface of seven hundred square miles, and of this from one-half to two-thirds is cultivated, principally in the production of the sugar-cane; the remaining third being crown reserves, mountain, and forest.

The mountains are in some parts bare, but the majority are covered with trees to their summits; and it is a noteworthy fact, that it was to a dense leafy screen of this kind that the inhabitants of Savanne owed their immunity from this fever for some fifteen or more months after its first outbreak in an adjoining district.

The rivers exhibit a diminished, and, it is feared, a diminishing quantity of water, owing partly (possibly) to geological changes, partly to a decreased rainfall—this decrease again being by many considered to be the consequence of the destruction of forests and trees bordering on water-courses.

The whole island is surrounded by a coral reef, having several inlets. The water between the coast and the reef is, in places, shallow; and organic matter brought by the rivers to the sea is neither fairly nor quickly carried away. This reef is distant from an eighth of a mile to three or four miles. There are large marshes existing even in the higher portions of the country.

The seasons are hot or hurricane, and cool or winter: the former lasts from December to April, and the latter absorbs the remainder of the year. The mean temperature of the hurricane season is from 84 to 86 degrees; of the cool, about 77; the mean of the whole year, 81 degrees. In the hills, at times, you may enjoy 50 degrees and a fire; in the plains, you may groan under a temperature of 90 to 95 degrees. The barometer is highest in July, lowest in January.

The prevailing winds are south-east and east-south-east; but during

the hurricane season the hot wind of Madagascar, which has passed over the arid plains of Africa, seldom fails to visit the island for a few days, and its effects are depressing, blighting, and even destructive, to animal and vegetable life.

The rainfall has been gradually decreasing: 1866 was exceptionally dry, thirty-four inches only having fallen during the year. On the 12th and 13th February, 1865, not less than ten inches fell.

The population at the end of 1866 amounted to 360,000. Less than one-fifth, or about 65,000, were Africans, who had been slaves, and their descendants; three-fifths, or 220,000, were Indians, with a few Chinese; and rather more than a fifth, or 80,000, were Europeans and creoles. Of these last I do not think more than 3000 or 4000 were Europeans; the rest being creoles, a few white, and the great majority of all shades of colour between white and black; of all kinds of parentage, crosses of English, French, Spanish, Dutch, etc., with Bengalis, Madrassees, Africans, and Malgaches, *cum multis aliis*; and recrosses innumerable and incomprehensible of the descendants of these with each other. I may safely say that the manners of these coloured creoles are polite, their customs beastly; but I cannot enter into particulars. Suffice it that many of them lead dirty, vicious lives, and, being improvident and wanting in energy, are content to continue their existence in the midst of filth, huddling together in one small room or mud-hovel, with every door and window close fastened. A creole hates nothing more than clean water and fresh air. The diet is simple. Indians and Malabars eat rice, a very little salt-fish, and manioc or cassava; creoles add to this more salt-fish or pork, and brêdes (the leaves of the *Solanum nigrum*), and other vegetables. Very little nitrogenised food is consumed by either of these classes; they both indulge freely in condiments, and when they can in country rum, which, until a recent increase in the duty, was very cheap. It may be added that want and themselves are always near neighbours; a slight rise in the price of the staple food, rice, invariably causing great distress and its consequences, as was well shown in 1865, during which year there was a famine in India, whence is principally drawn the supply of rice for Mauritius, and its dearthness caused great misery; added to this was the fact that the dependent and pauper population was larger than ever, because, owing to failures in sugar-crops during this and former years, many proprietors had been obliged to turn adrift whole gangs of labourers, whom they were no longer able to employ; and the always large loafing community of this colony had received too many recruits from families who had been in better circumstances.

A few remarks are required about a former epidemic of fever, and these will, I regret to say, involve some statistics; but I have made them as few and short as possible, and have selected them from three representative institutions, as being those in which the greatest care and skill would be likely to be exhibited, and whose returns and observations would be considered as reliable and trustworthy. They are the civil hospital of Port Louis, admitting all classes and sections, being both a *pension médicale* and a public hospital, under the charge of several English medical gentlemen; the prisons' hospitals, admitting all sections of the community, representing every district, and under the charge of government medical officers; and the vagrant dépôt at Grande Rivière, which receives only the most miserable and destitute, and which is under the care of the superintendent of the government lunatic asylum. These statistics, and some of the observations contained in this paper on the previous condition of the island, I owe to the blue-book, and to the reports of the Fever Commission of 1868.

Some of the older practitioners speak of the occasional and limited appearances of remittent and bilious remittent fevers among Indians as early as 1839-43-44, and opinions were divided as to whether the disease was or was not contagious, malarious, endemic. In 1862, there was recognised by some of our English brethren a disease called by them bilious remittent fever, but, I think, considered by a majority of our French *confrères*, and by some English practitioners also, to be a bilious-typhoid or pseudo-continued fever, with splenic and hepatic complications. From this time to 1867, when intermittent seemed to supersede remittent, this Bombay fever, as it was popularly called, became epidemic in one district after another. I have not time to give even a brief outline of this disease; it was exceedingly fatal, the mortality in proportion to the attacks being very great; and it was almost confined to the Indian population. In 1867, the percentage of deaths to attacks in the three institutions I have just named was twenty-six; in 1868, it was only ten per cent. You may observe that the ratio was very much diminished in the second year: this was not the case with the intermittent epidemic.

We have now arrived at, and even passed, the period at which intermittent declared itself; and I beg a few moments to place before you, as well as I can, the condition of the country and of its people at this time.

For some years there had been a diminishing rain-fall; trees and

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