patient is placed under suitable conditions of rest and treatment (notably digitalis), and this is a favourable sign, as showing increased cardiac power.

In all these conditions (which I hope to be able to show you to-day) it is evident that there are many sources of error, because, though each one of them is marked by certain definite signs, it is clear that no one description can possibly include them all. When it is remembered that any one of these can be, and often is, complicated by mitral regurgitation or disease of the other valves—that is, for instance, an extreme case of mitral stenosis might be marked only by a 'sharp clicking first sound, no murmur, and no second sound;' on the other hand, a ‘diastolic’ murmur, which may completely conceal mitral stenosis or mitral regurgitation, is not to be forgotten at all.

A case remarkably illustrative of this condition is now attending as an out-patient (C. D., No. 8297), in whom the cardiac rhythm is so irregular and the heart's action so feeble, that, though the heart beat is 132, the radial pulse is only 84. While standing up nothing can be heard over the apex beat except a succession of short blowing whiffs, with no second sound. When lying down, every now and then the heart stops, and in one of these attacks there is a pause, a hesitation, and then a long rolling presystolic murmur ending with a snap. (Fig. 2.)

TO BE CONTINUED.

THE EFFECTS PRODUCED ON MAN BY SUB-CUTANEOUS INJECTIONS OF A LIQUID OBTAINED FROM THE TESTICLES OF ANIMALS.

BY DR. BROWN-SÉQUARD, F.R.S. &c.

On the 1st of June last I made at the Société de Biologie of Paris a communication on the above subject, which was published in the Comptes Rendus of that Society on June 21st (No. 24). I will give here a summary of the facts and views contained in that paper and in two subsequent ones, adding to them some new points.

There is no need of describing at length the great effects produced on the organisation of man by castration, when it is made before the adult age. It is particularly well known that enunuchs are characterized by their general debility and their lack of intellectual and physical activity. There is no medical man who does not know also how much the mind and body of men (especially before the spermatic glands begin to exert their full power, or when that power is declining in consequence of advanced age) are affected by sexual abstinence. Everyone admits that semen is a powerful stimulant to muscular and mental activity. Everyone also knows that seminal losses, arising from any cause, produce a mental and physical debility which is in proportion to their frequency. These facts and many others have led to the generally admitted view that in the seminal fluid, as secreted by the testicles, a substance or several substances exist which, entering the blood by resorption, have a most essential use in giving strength to the nervous system and to other parts. But if what may be called spermatie anaemia leads to that conclusion, the opposite state, which can be named spermatie plethora, gives as strong a testimony in favour of that conclusion. It is known that well-organised men, especially from twenty to thirty-five years of age, who remain absolutely free from sexual intercourse, or any other causes of expenditure of seminal fluid, are in a state of excitement, giving them a great, although abnormal, physical and mental activity. These two series of facts contribute to show what great dynamogenic power is possessed by some substance or substances which our blood owes to the testicles.

For a great many years I have believed that the weak-nerved and emaciated man depends on two or three unknown causes of organic changes and the gradually diminishing action of the spermatic glands. In 1869, in a course of lectures at the Paris Faculty of Medicine, discussing the influence possessed by several glands upon the nervous centres, I put forward the idea, that if it were possible without danger to inject semen into the blood of old men, we should probably obtain manifestations of increased activity as regards the mental and the various physical powers. Led on by this view, and desirous of testing it on myself, I paid a short visit to Nahant, near Boston (United States), in 1875. In some of those experiments, made on a dozen male dogs, I tried vainly, except in one case, to engraft certain parts or the whole body of young guinea-pigs. The success obtained in the experiments to which I have just referred, and which are described in detail, gave me hopes that by a less difficult process I should some day reach my aim. This I have now done. At the end of last year I made on two old male rabbits experiments which were repeated since on several others, with results leaving no room as regards the rightness of the means and the good effects produced in all those animals. This having been ascertained, I resolved to make experiments on myself, which I thought would be far more decisive on man than on animals. The event has proved the correctness of this decision.

Leaving aside and for future researches the questions relating to the substance or substances which, being formed by the testicles, give power to the nervous centres and other parts, I have made use in subcutaneous injections, on a horse and on a dog, of a liquid obtained by filtering through Pasteur's filter, the pains and other bad effects having been ascertained, I resolved to make experiments on myself, which I thought would be far more decisive on man than on animals. The event has proved the correctness of this decision.

For reasons I have given in many lectures in 1869 and since, I consider the spermatie plethora to be the principal gland (kidneys, liver, &c.) when they exert their normal activity. Any increase of the position of blood, such as is possessed by the spleen, the thyroid, &c. led by that view, I have already made some trials with the blood returning from the testicles. But what I have seen is not sufficiently decisive to be mentioned here.
remained seated all the time, or almost all the time, in the laboratory. I used to come out of it quite exhausted after three or four hours of experimental labour, and sometimes after only two hours. For many years, on returning home in a cacophonous state of mind, I was unable to write. For some time after, in the laboratory, I was so extremely tired that I invariably had to go to bed after having hastily taken a very small amount of food.

Very frequently the exhaustion was so great that, although extremely sleepy, I could not for hours go to sleep, and I often slept only a part of the night. When I succeeded in getting to sleep, I was frequently awakened by a intolerable pain in the abdomen, which often occasioned me to get up at 2 or 3 o'clock in the morning. I sometimes went on working and confined myself to writing, feeling no need whatever to sit down. Still more: one day (the 23rd of May), after three hours and a quarter of hard experimental labour in the standing attitude, I went home so little tired that after dinner I was able to go to work and to write for an hour and a half a part of a paper on a difficult subject. For more than twenty years I had never been able to do as much.

4 From a natural impetuosity, and also to avoid losing time, I had, till I was sixty years old, the habit of ascending and descending stairs at a rate that has caused me rather those of running than of walking. This had gradually changed, and I had come to move slowly up and down stairs, having to hold the banister in difficult staircases. After the first injection I found that I had lost all the power I had before in going up and down stairs so rapidly that my movements were rather slow and four o'clock. For a great many years I had lost all power of doing anything in the evening. At first the injections I have used have frequently been able to do such work for two, three, and one evening for nearly four hours.

5 The day after the first subcutaneous injection, and still more after the two succeeding ones, a radical change took place in me, and I had ample reason to say and to write that the loss of power and strength which had persistently been one of my main complaints for a long time was a thing of the past. I possessed a power which, from my first acquaintance with injected fluid, I have myself experienced, on the day after the first subcutaneous injection, and still more after the two succeeding ones, a radical change took place in me, and I had ample reason to say that after the first days of my

6 In my third communication at the Biological Society, I said that both the intense pain each injection has caused me and the inflammation which this produce without doubt, that the effects were of a transient kind and that they resulted only from nutritive modifications, perhaps with a very great measure from purely dynamical influences exerted by some of the principles contained in the injected fluid.

7 The paper of Dr. Variot and my remarks upon it have appeared in the Comptes Rendus of the Societe de Biologie, No. 38, 5 Juillet, 1850.

8 Since writing the above I have received a letter from Dr. Variot announcing that, after injecting the liquid drawn from the testicles into the veins of one of his patients, he has obtained the same strengthening effect.

9 My friends know that, owing to certain circumstances and certain habits, I have for thirty or forty years gone to bed very early and done my work between the hours of 8 in the evening and 10 or 11 at night. This power was rather good and four o'clock. For a great many years I had lost all power of doing anything in the evening. At first the injections I have used have frequently been able to do such work for two, three, and one evening for nearly four hours.

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RAYNAUD'S SYMMETRICAL GANGRENE IN A PATIENT SUFFERING FROM CONSTITUTIONAL SYPHILIS.

WITH SOME REMARKS ON THE HISTORY, NATURE, AND MANIFESTATIONS OF THE DISEASE.

BY JOHN ED. MORGAN, M.A., M.D.OXON.,
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(Continued from page 66.)

RAYNAUD'S two contributions to this disease—his original thesis published in 1862, and a supplementary paper written twelve years later, in 1874—contain a record of thirty-one cases. The mean age of the patients he refers to is 27.7 years. Twenty-two of his cases were females and nine males. Five of the sufferers were children between three and nine years of age. As I have already stated, I have myself collated ninety-three cases, which correspond more or less closely with the description given by Raynaud. I have omitted all examples of the disease in which the symptoms appeared due to organic changes in the heart and in the vessels; also numerous other cases which appeared to depend on diabetes or arteriosclerosis; and likewise others where the cause was considered to be the result of the previous use of some protopathic wasting disorder, such as typhoid fever, associated with thrombosis of the veins of the lower extremities. In these ninety-three cases the mean age of the patients was 20.6, a number which very nearly corresponds with the mean age of Raynaud's cases. My statistics do not support his statement that females between eighteen and thirty are most liable to be affected. My tables go to show that the disorder is pretty evenly distributed between the different decades of life up to sixty years of age; indeed, if there be any period of life when it is especially prone to occur, it is in very early childhood. Thus, in no fewer than thirteen of my cases the age of the patient ranged from two and a half to five years, eleven from five to ten years, fourteen from ten to fifteen years, sixteen from fifteen to twenty years, twenty from twenty to thirty years, fifteen from thirty to forty years, thirteen from forty to fifty years, and ten from fifty to sixty years. Doubtful cases of the disorder have been described in the literature; but in the present case I considered the example of the disorder the age was two years and a half, the oldest fifty-nine. Of the ninety-three cases, forty-four were females and thirty-nine males; thus the proportion of males to females in my tables was very much larger than appears from Raynaud's statistics. In the numerous examples of the disease recorded in early childhood is somewhat remarkable, no fewer than twenty-four of the ninety-three sufferers being under ten years of age. In early life, as is well known, the sympathetic system, as distributed to the child's body, is comparatively more susceptible to disturbing influences, and many of the cases observed among the very young proved singularly grave in their progress and in their consequences; indeed, it is among these little patients that we meet with examples of gangrene which may be described as the agminate form of the disorder. The child perhaps has died in thirty or forty hours, while the progress of the disease has been continuously from bad to worse. Here there is nothing paroxysmal about the attack; the symptoms proceed uninterruptedly and terminate fatally. Such a case was brought before the Pathological Society of London by Dr. Sonthey. He showed the body of a child, aged two years and a half. On Dec. 22nd livid patches were noticed on the back of the calves; they got blunter, and extended over the legs; the backs of the arms were similarly affected. The buttocks next got livid. The lesions were symmetrical; the child was seized with convulsions and died. She was ill for thirty-two hours only. In another case, reported by Mr. A. D. Murray, a boy aged two, was taken ill on March 5th; both feet became black and gangrenous; in an hour the hands and arms were dusky; on the 4th a discoloured patch was observed on the back of the thigh, and in the course of the day this became livid. The patient died at 10 P.M., being ill for two days only. Dr. Tannahill also refers to a case in which a child similarly affected died thirty-six hours after its admission into hospital; while Mr. E. Bellamy has described one in a child aged six years, in which death occurred on the third day. Other cases have been recorded in which the disorder assumed an equally grave character, though the symptoms were far more protracted; as, for example, in Mr. Solly's case, where all the extremities were lost, and the patient destroyed by death. Similar examples of the disease were reported by Mr. Thomas Smith, M. Bocquet, Dr. Grayhill, and others, all occurring in very young children, and tending to show how destructive in its effects symmetrical gangrene may be when it affects the young. In Raynaud's own thesis, he dwells with marked emphasis on the numerous instances in which he has found this variety of gangrene associated with irregularity of the menstrual functions in young women; indeed, he more than once asserts that it is almost a constant result of the suppression of the menses. This opinion was disputed by Vulpius, whose observations are strikingly confirmed by my own tables, which conclusively show that in very few instances was any irregularity observed in the cata- lyst. Indeed, in several of the most serious cases, it is distinctly stated that the monthly period exercised no special influence over the symptoms of the disease. In alluding to this variety of gangrene, the distinguished discoverer of the disease remarks: “The nose almost always escapes”—an observation that meets the case in a remarkable degree. I am not aware, however, that in these situations complete mortification has been observed. Both before and since Raynaud's investigations were published several cases have been recorded where these organs were at least partially destroyed by the gangrenous process. Dr. Nott observes, in reference to a patient of his, a boy aged ten, “the tip of the nose and the ears and the lips dried and dropped off, leaving the surface underneath healthy.” So, again, Mr. J. R. Bigg wrote to The Lancet in 1870 regarding a delicate woman suffering from symmetrical gangrene, and stated that forty days after the commencement of the symptoms it was necessary to remove the tip of the nose, and portions of both ears. Mr. Clifford Beale also speaks of a considerable part of the helix having been lost; Mr. J. R. Bigg also speaks of a considerable part of the helix being being destroyed by the gangrenous process. Mr. J. R. Bigg also speaks of the nose being wanting, in consequence of the ravages of this disease. In Mr. Grindall's case, also, the nose was entirely destroyed by mortification; and it was further observed that in my patient a considerable portion of the helix of the ear sloughed away, part of the cartilage of the ear being at the same time destroyed. In considering the outward manifestations of this curious neurosis, it will be instructive to recall the different parts of the body in which symmetrical patches are said to have occurred co-incidently with the establishment of the rash in the extremities. Indeed, had not either toes, fingers, ears, or nose been simultaneously affected, it would not, from our present standpoint, have been permissible to speak of it as a pathological symmetrical disease. In the first place, they are in the vast majority of cases met with in those portions of the trunk and limbs in which each side of the body has its corresponding counterpart on the other side—parts to which Dr. J. R. Bigg has called attention. Indeed, the homologue of the rash was observed; in some, various portions of the back; in some, the cheeks and lips. Petri has described how curiously he himself was affected; some of the patches on his own body being over the deltoid muscles, others over the clavicles, others, again, over the situation of the medial nerve, a few inches above the wrist;