

died a few days later, after about 14 days of illness, having at the last had a few slight fits.

The two cases described were the exact counterparts of one another, though one died and the other recovered. Both, strange to say, had had attacks of influenza two or three weeks previously and they had not taken sufficient care of themselves afterwards. I cannot assert that influenza had anything to do with the attack in either case, but the association is worth noting.

The third case I saw in consultation with Dr. Coates and Dr. Webb. It was that of a man, aged about 60 years, who had been much overworked for many months. His first symptom was sudden headache and general illness, for which no cause was obvious. Routine examination of the urine—for no special symptoms suggested renal mischief—showed the urine to be nearly solid with albumin. The night of the attack he slept hardly at all; he was constantly muttering and wandering, was very restless, and was suffering intensely with general headache. He was treated on general principles. This condition lasted for three or four days and then improvement set in, both in the symptoms and in the state of the urine, and by the end of the week all albumin had disappeared from the urine and, except for debility, the patient was convalescent.

It is a remarkable experience that three cases of this kind should come under my observation in about as many weeks, for they must be extremely rare. They were all instances of most acute albuminuria, with blood, casts, and great diminution in the amount of urine, in the fatal case amounting almost to suppression (there were from four to five ounces only in the 24 hours), and in the two cases of recovery amounting to from 10 ounces to 15 ounces. These patients all passed at once into a condition of acute renal toxæmia, but not that form in which fits are predominant. The prognosis in all seemed desperate, yet when once improvement commenced it was very rapid and recovery became complete. The group of cases most resembling these is that in which acute albuminuria develops in the course of specific fevers—for instance, in scarlet fever; but there was nothing of the kind in these cases, unless the influenza of a few weeks previously is to be held responsible. Moreover, cases of such severity following specific fevers are almost invariably fatal.

A CASE OF ANTHRAX.

By EDWARD F. M. NEAVE, M.B., CH.B. EDIN.

ANTHRAX is such a very fatal disease that any point, however small, bearing on its etiology should be put on record. Though primarily a disease of cattle men are often affected by anthrax, due to accidental inoculation of the virus. In this country the disease occurs in two chief forms, the external or malignant pustule and the internal, of which there are two varieties, the pulmonary and intestinal. Most of the cases of malignant pustule in this country have come under observation at Guy's Hospital, probably owing to its vicinity to the great leather manufactories and tan-yards at Bermondsey and Rotherhithe.

The late Mr. Davies-Colley, to whom we owe a great deal for our present knowledge of the external form of anthrax, says¹ that most of the cases that came under his care at Guy's Hospital exhibited the external lesion or malignant pustule, infection thus occurring through the skin. At Bradford, on the other hand (where the disease goes under the synonym of wool-sorter's disease), it seems that infection takes place through the lungs, most of the cases exhibiting an asthenic form of pneumonia. Outside these two great centres the disease (in man) is not common, but amongst animals epidemics occur now and again in different parts of the country. Anthrax usually attacks animals by way of the intestines, the food being infected by foreign fodder, litter, and manures, or the animals may be infected by feeding on pastures in which the germs have been preserved. The outbreaks on certain farms which occur now and again may be explained by the fact that the spores can live in the earth for an indefinite time.

Malignant pustule usually occurs in men who come into contact with the hides or fleeces of diseased animals or with the diseased animals themselves, the poison gaining entrance through a wound or an abrasion of the

skin. Thus we find that butchers, shepherds, and knackers are very liable to be inoculated with the virus of anthrax. In all such cases the infection is, as a rule, easily traced, but there are certain isolated cases which sometimes occur where the infection cannot be easily traced. The following is a case in point. I shall first give the notes of the case and then discuss the interesting features in detail.

The patient was a middle-sized, muscular man, aged 50 years. He came to me on May 6th, 1900, complaining of an itchiness on the left side of the chest. He said that on the previous day he had felt the left side of his chest itchy and had been scratching it. At that time he noticed what he thought was a pimple above the left nipple. Since then the pimple had been growing larger and the skin around had become swollen and inflamed-looking. Otherwise he said that he felt quite well. On examination, on the left side of the chest, two inches above the nipple, there was a ring of small vesicles with a slightly depressed centre. The ring was of about the size of a threepenny-piece. Beyond the ring of vesicles there were slight swelling and redness of the skin. No enlarged glands could be felt in the axilla. The pulse and the temperature were normal. On the 7th the patient seemed to be fairly well, although the vesicles were larger and the surrounding skin was more swollen, redder, and cedematous. He was going about, but he said he did not feel quite able for his work.

When I saw him on the following day (the 8th) I learned that he had had slight rigors and had suffered from slight sickness and vomiting during the night. The vesicles were still larger and had become confluent, forming a large vesicular ring in the centre of which there was a small dark brown eschar of about the size of a pin-head. Round about there were great swelling, induration and cedema. The skin was dark-coloured, being almost black in patches, and the spreading edge of inflammation was irregular. Owing to the swelling and induration no enlarged glands could be felt in the axilla. The spleen was slightly enlarged. The breathing was regular and was 20 per minute. There was no cough. The pulse was 100, regular, and of good quality. The temperature was 99.4° F. On the whole the patient's general condition was fairly good. On the following night he slept fairly well, but next morning he was much weaker and was suffering from dyspnoea and cyanosis. The dyspnoea and cyanosis increased very rapidly and the patient died the same evening (the 9th), his mental faculties remaining clear to the end.

Through the kindness of Dr. McLagan Wedderburn, the medical officer of health of the county, the serum in the vesicles (obtained just after death) was examined bacteriologically and was found to contain large numbers of the anthrax bacilli (*bacillus anthracis*). Pure cultures were obtained on agar-agar and a guinea-pig inoculated with the serum died with symptoms of anthrax. The following are the interesting features of the case.

1. *The source of infection.*—On inquiry it appeared that there were no suffering animals on the farm or in the neighbourhood, nor was there anthrax amongst animals in the county at this time. As regards the man's work he had been engaged for the fortnight previously to his illness in sowing different kinds of grain along with artificial manure in the form of bone dust. The question is, therefore, Did infection occur from the grain or from the bone dust? The grain that the patient had been sowing three or four days previously to the beginning of his illness was grown on his own farm, and as no case of anthrax has been known to have occurred for a number of years in the neighbourhood, and as the period of incubation of malignant pustule is said to be from two to three days, I think we may put aside the grain as the source of infection. Bone dust, on the other hand, is known as a source of infection of anthrax. A sample of the bone dust which the man had been handling was examined bacteriologically but with a negative result. Notwithstanding this failure to cultivate the organism from the bone dust I am still of the opinion that the bone dust was the source of infection and that the patient had inoculated himself, his hands conveying the infection. This seems the more likely from the fact that the patient had been in the habit of putting his hand underneath his shirt and scratching his breast. On inquiry it appears that the bones from which the bone dust is prepared are imported from abroad. Greenfield² says that animals may occasionally

¹ Transactions of the Royal Medical and Chirurgical Society, 1882.

² Quain's Dictionary of Medicine.

be infected by water contaminated by bone dust, but I have not heard or read of any case in which man has been infected by bone dust directly.

2. *The rapid course of the disease.*—The patient first complained of the itching on May 5th and he died on the 9th—i.e., four days after the onset of the disease. This is about the earliest period at which death may occur, although several cases have been reported in which death took place on the third day. As a rule, however, the disease lasts longer than four days.

3. *The temperature.*—The patient's temperature did not rise above 100° F. Some say that the temperature in malignant pustule does not rise at all. Greenfield³ says: "This may be true in some cases in which there is no general infection. In other cases, while the surface temperature may be subnormal, the rectal temperature is elevated." Other authorities say that in cases of malignant pustule the temperature never rises above 102°.

4. *The site of the lesion.*—In this case the site of the lesion was unusual, for in no case which I have come across has the lesion been situated on the breast. The commonest sites are the face, neck, arms, and hands. In this particular case, as mentioned above, I learned that the patient had been in the habit of scratching his breast and it seems very probable that his hands had conveyed the infection.

5. *The absence of pain and severe constitutional symptoms.*—The absence of pain is of interest as distinguishing malignant pustule from phlegmonous erysipelas, a disease in which there is severe pain and with which malignant pustule is often confounded. As regards the absence of severe constitutional symptoms Greenfield⁴ says that "even in cases which prove fatal there may be few or no general symptoms at first and the patient may even continue at work with a large distinct pustule, or there may be only a slight degree of prostration with a little fever."

6. *The absence of feeling of distress.*—The absence of feeling of distress or anxiety on the part of the patient and his clear mental condition are also interesting features to which many writers refer.

The treatment which I adopted from the beginning was strong carbolic dressings locally and tonics. The majority of surgeons advise excision of the pustule, although it is said there is great danger in the operation in allowing the entrance of the bacilli into the blood stream. Others advise the injection of carbolic acid subcutaneously around the seat of inoculation.

Frickheim, N.B.

ON THE LIMITS OF THE HEART DULNESS IN CASES OF ANÆMIA AND CHLOROSIS.

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DURING recent years the diagnosis of valvular disease of the heart has undergone a remarkable change. 20 years ago the principal object of the physician was to recognise exactly the seat and the nature of the supposed valvular trouble, and to give a precise anatomical name to it. Nowadays this is no longer sufficient, and much more attention is paid to the state of nutrition and to the function of the heart muscle itself, its strength, and its ability to overcome the increased resistance of the blood.

Normally the wall of the heart, and especially that of the ventricle, has sufficient strength to expel the blood from its cavities into the arterial system, even when the blood-pressure is slightly increased. Of course, if the muscle loses its strength because its nutrition is impaired a complete contraction will be impossible and dilatation will occur. German and Swedish observers have studied minutely the mechanism of "dilatation from overstrain" (Ueberanstrengungs-dilatation) in cases of valvular diseases, of general affections, of anæmia, &c. It is produced when the relation between the blood-pressure in the heart cavity (and more particularly in the ventricle) and the strength of the muscle is no longer normal, the latter being unequal to the former. This may occur in two ways: (1) the blood-pressure may be abnormally increased; and (2) the muscle may be abnormally weak and its contraction less effective.

Many infectious diseases cause a similar weakness of the heart, accompanied by dilatation; it exists in a more chronic character in many kinds of valvular diseases or of infection (diphtheria, scarlet fever, typhoid fever, &c.), when the nutrition of the muscle cells is impaired because the blood of the coronary system is more venous or less oxidised, or because its chemical constitution is abnormal. In anæmia and in chlorosis the same conditions exist. In them an acute dilatation of the heart has been frequently observed, with or without recovery and return to the normal size of the heart when the disease had passed away. Recovery is, however, not always possible, for it seems probable that a certain amount of hypertrophy may be added to the primary dilatation.

What happens in chlorosis? The cause of the disease is still unknown—it may be a nervous, trophic, or chemical influence; it is certain, however, that many muscle cells, and especially unstriated muscle cells, lose their tonus and consequently the cavities in the wall of which they are contained have a well-marked tendency to dilate. Dilatation of the stomach and dilatation of the intestine are very frequently found. Professor Glax of Abbazia thinks that in chlorosis there is a general infiltration of the tissues by effused blood-serum—indeed, when the condition of the patient begins to improve the quantity of urine increases and the weight diminishes. Even here where the pure air, the walks, &c., cause an increase of weight in normal individuals after a few days passed in Spa, I often saw the weight of anæmic girls diminish whilst the symptoms markedly improved. It is possible that a similar infiltration as supposed by Professor Glax may exist in the heart tissue and cause a diminishing of force leading to dilatation of the organ as well as in the intestine or stomach. Of course no reference is here made to the common symptoms of heart murmurs in anæmia and chlorosis, only the functional strength of the muscle is at present under consideration. It is well known that a marked murmur may be produced by very little change in the heart's condition (accidental murmurs), or the contrary may be found in many cases. The trouble of the heart function itself is only to be detected by percussion, by examining the pulse, or by the use of radiography (Grünmach).

As it is very difficult for practitioners in bath resorts to obtain a complete history of patients, I here give the history of a young girl whom I saw in Professor Destrée's wards in the Brussels Hospital. She was 16 years of age and entered the hospital on March 25th, 1899. Her father died from tubercle. She had felt herself quite well until five days before her admission, when she suddenly suffered from severe pain in the right hypochondrium and the epigastrium. On examination no other trouble was detected than great anæmia with loss of hæmoglobin and a well-marked increase of the heart dulness, relative and absolute. The relative dulness extended upwards to the second rib and downwards to the lower border of the sixth rib. It extended three centimetres (one and a quarter inches) to the right and 10 centimetres (four inches) to the left from the medio-sternal line. Absolute rest was prescribed and the pain disappeared after three days. The patient soon left the hospital, saying that she felt quite well, the area of the heart dulness being little changed. Immediately after leaving she continued her ordinary hard work and was obliged to re-enter the hospital on July 27th. She only complained of pain in the epigastrium and in the left side. Her general state of health was worse. The stomach was neither displaced nor dilated, but the heart extended 11½ centimetres towards the left, and four and a half centimetres to the right. The apex beat was to be felt in the sixth intercostal space. The patient remained three weeks in the hospital. The limits of the heart dulness changed a little (11 centimetres at the left and three centimetres at the right side of the medio-sternal line). There was no tubercle.

In this case the extent of the dulness outwards and downwards without the slightest sign of heart disease, and its rapid increase during the hard work from the end of April to the end of July, clearly indicated the existence of an uncomplicated dilatation of the heart. This question is a very important one, for several German writers, including von Noorden, Müller, and others, think that in chlorosis there is no dilatation but only a displacement of the heart. The dulness would only seem enlarged because the diaphragm in those patients is higher than normal and causes the heart to be pushed upwards, its greater diameter becoming more horizontal and its right border being displaced towards the right, and the apex outwards but not downwards. Grünmach

³ Ibid.

⁴ Ibid.