ANALYSIS OF ONE HUNDRED CONSECUTIVE
CASES OF CARDIAC DISEASE.*BY
W. BLACK JONES, M.D., B.S.LOND.,
BUILTH WELLS.

DURING the past few years knowledge of diseases of the heart has been notably advanced, and I will here give an analysis of 100 consecutive cases of cardiac disease occurring in my practice at Llangammarch Wells, and discuss the symptoms, the prognosis, and treatment, in the light of modern research.

When a patient with a disordered heart presents himself it is advisable, before proceeding to the physical examination, to make inquiries as to the symptoms. Frequently they have been neglected, and more stress has been laid on the presence or absence of certain physical signs, and an erroneous impression of the case has been obtained.

At rest the heart uses only a small portion of its energy in keeping the blood circulating, but during exercise a larger amount, called reserve energy, is used; in violent exercise this may amount to three or four times that used at rest. When heart failure begins this reserve energy diminishes, thus lessening the amount of work the patient can do.

Heart failure is indicated by certain symptoms, such as pain in the region of the precordium, shortness of breath, exhaustion, etc. The basis for estimating the strength of the heart, and therefore the amount of reserve energy present, is the amount of physical work the patient can do. The first inquiries are therefore directed to ascertain how far the patient can walk without exhaustion, and whether he can ascend one or two flights of stairs or a moderate hill without feeling short of breath. This is a valuable test, and as the patient recovers he can estimate the increase in the reserve energy by his ability to walk further afield without distress. It is the object of this paper to call attention to these symptoms of primary importance, to indicate their relative frequency and their value in diagnosis, prognosis, and treatment.

Patients with certain physical signs, such as murmurs, have often been misled as to their condition because the physician laid too much stress on the presence of a murmur when no other sign or symptom of cardiac failure was present; and, on the other hand, some practitioners have been puzzled by the condition of a patient, obviously seriously ill with some cardiac disorder, because no murmur could be heard, as if a valvular lesion were the sole cause of heart failure.

In the medical examination for life insurance the examiner is generally asked to state whether the sounds of the heart are normal and whether the organ is enlarged. In many cases these are the only questions directed to the condition of the heart excepting those as to the character of the pulse. It is, however, encouraging to find that one insurance company at least has appreciated the value of modern researches on cardiology, and in addition to the above asks the following questions: "Does the proposed suffer from precordial pain, breathlessness on slight exertion, or any other symptom of impaired cardiac efficiency?"

The following are my methods of examination and the results I noted in 100 consecutive cases:

1. Age.

The average age was 54 years.

2. Occupation.

It is not enough to learn that the patient is, say, a solicitor or an engineer, without inquiring whether the strain upon him is physical, or mental, or both. When the questions of prognosis and treatment are concerned we have to ask ourselves what proportion of this work he can do in the future, whether he can do half, or must give up all his work. Of 100 cases, 65 were males, and as to occupation 26 were of the working class.

3. Pain.

Pain in the chest is a most valuable symptom: it may be regarded as a sign of the degeneration of the muscular

fibres of the heart and of the exhaustion and failure of that organ. It is often slight, but in some cases, especially when the pain is more or less constant, sudden death occurs. Whether slight or acute, it does not necessarily indicate the calcification of the coronary arteries, a lesion which is known to accompany many cases of angina pectoris. The pain is usually felt over the area of the heart. It is of a reflex nature, caused by the irritation of the cardiac nerves, by which impulses are transmitted to the spinal cord, reflected to the sensory nerves, and referred to various parts of the trunk and arms. Pain is a valuable measure of the amount of degeneration of the myocardium and is a guide to prognosis and treatment.

Of the above cases under my care, 73 complained of pain over the heart or neighbouring part of the chest; 9 of them complained of pain in the region of the lower ribs on the left side; in many of the cases the pain was only a dull ache; in all the pain was intermittent. On exertion or excitement the pain often radiates to other parts of the body. Of these 73 cases, 33 experienced an increase in the area of the pain, 30 referred the pain to the left arm, two to both arms, and one to the right arm only.

4. Causes of the Pain.

(a) *Exertion*.—Fifty-one patients attributed the pain to exertion. Careful inquiry should be made as to the amount of exertion that causes this pain; it is a valuable indication in treatment, as in many cases the pain can be wholly or partly avoided by reducing the amount of work.

(b) *Excitement*.—Thirty-six persons stated that mental excitement caused the pain. Worries in the daily life that can be avoided must be ascertained.

(c) *Indigestion*.—Thirty-four persons attributed attacks of pain to digestive disturbances. Flatulence due to chronic gastric catarrh is one of the most frequent causes of such cardiac disturbances as pain, palpitation, shortness of breath, etc. The stomach, if distended with flatus, may either act reflexly or mechanically on the heart. Probably the latter cause is the more frequent, as it raises the heart up and alters its axis, thus disturbing its anatomical position. The treatment of this condition is of the utmost importance, and in some cases I have devoted my whole attention to the treatment of the gastric rather than of the cardiac symptoms. Frequently immediate relief to distressing cardiac symptoms is afforded by a few simple directions as to diet.

(d) *Pain at Rest*.—Twenty-one patients complained of pain while in bed. This symptom often indicates advanced degeneration of the myocardium, and the prognosis is unfavourable.

5. Breathlessness.

In 89 cases patients complained of shortness of breath after slight exertion. This is one of the earliest and also one of the cardinal symptoms of cardiac failure. It is nearly always accompanied by exhaustion.

6. Exhaustion after Exertion.

This occurred in 85 cases. In the treatment of the patients these two symptoms—breathlessness and exhaustion—are of great importance, as when they abate they become measures of the progress towards recovery.

7. Palpitation.

This was noticed by 36 persons, of whom 13 were males and 23 females. It frequently occurs in neurotic women, and if there are no other symptoms of cardiac failure the prognosis is frequently good.

8. Faintness and Giddiness.

Faintness was noted in 6 cases; in only one of these was the prognosis good. Giddiness occurred in 29 persons. It is an important sign often noticed in tall people; the prognosis is generally not favourable.

9. Pulse.

(a) *Frequency*.—The rate of the pulse was 76 or under in 71 cases; it was above that rate in 29 cases. In 2 of the latter it was markedly irregular owing to auricular fibrillation.

(b) *Tension*.—In all cases the systolic pressure of the pulse was noted. I have adopted the classification of Oliver, who defined as cases of high tension those in

* Being a paper read before the North Glamorgan and Brecknock Division of the British Medical Association, at Brecon, September 24th. 1919.

which the pressure is above 145 mm. in persons under 40 years of age, and in those above that age in whom the tension is above 160 mm. Out of 100 cases, 36 had high tension; of these, 25 had symptoms of anginal pain and 11 were without pain. When the high tension is not accompanied by dilatation or other signs of cardiac failure the prognosis is more favourable than when signs of degeneration are present.

10. Dilatation.

In 61 cases the heart was dilated, and in 22 of these a murmur was present; in one case the murmur certainly had no prognostic significance, as it was the only cardiac symptom present.

11. The Urine.

Albumin was present in the urine in three cases and sugar in one.

12. Prognosis.

In 17 of the 100 cases prognosis as regards life was good, provided the patients did not exceed the limits of the amount of strain put upon the heart. Of these cases, 4 were due to affections of the nervous system, and were all amenable to treatment, and 8 suffered from cardiac pain, but this either disappeared on treatment or was so infrequent as to cause little anxiety. In two cases the cardiac symptoms were of no importance.

Treatment.

The first essential is rest; its degree must be left to the judgement of the physician, (a) whether the patient is to go to bed for some weeks, or (b) whether he is allowed to be up and about, and is to have his exercise graduated according to the amount of work the heart is able to do. All the cases mentioned in this paper are comprised in the latter class. In estimating the capacity of the patient for exercise it is always necessary to inquire how far he can walk without bringing on pain or producing shortness of breath, palpitation, or exhaustion. After a few days' treatment it is often found that the patient is able to walk further without distressing symptoms, and has lost the sensation of lassitude.

The second essential is the careful regulation of the diet, especially if gastric catarrh be present. Frequently immediate relief to distressing cardiac symptoms is afforded by a few simple directions as to diet. The main principles I adopt are as follows:

1. The teeth are to be in good condition.
2. The avoidance of indigestible foods, such as pork, veal, and other hard meats and warmed-up dishes. All underground roots, including potatoes; also sloppy food, such as bread and milk, broth and soup, strong tea, coffee, alcohol.
3. Each meal is to consist of a very few articles, and over-eating is to be avoided. The food is to be well masticated, and eaten dry.
4. Hot water is to be taken after the meal; when flatulence is present, a soda mint tablet may be taken with advantage.
5. A pill containing a grain of calomel is to be taken once or twice a week.

Among the working classes indulgence in strong tea has in many cases caused more damage to the gastric mucous membrane, and thus eventually shortened life, than indulgence in alcohol.

At Llangammarch Wells these patients had spa treatment in addition to rest from their various occupations and anxieties, and change of air and scene; they had the benefit also of balneological treatment, consisting of the internal administration of the mineral water, of baths, and of massage, which I have fully described elsewhere.*

Many of the patients are seen year after year, and the progress made by some of them is noted below.

CASE I.

A man, aged 60, consulted me in July, 1916, having had symptoms of cardiac failure a month previously. He complained of pain over the precordium, which occasionally radiated down the left arm. He also suffered from giddiness, palpitation, and shortness of breath. There was evidence of gastric catarrh, the heart was dilated and the sounds feeble. The pulse was regular, the rate 76 and the tension 150 mm. He had been

addicted to alcohol. I recommended a strict diet, the mineral water, and abdominal massage, and advised him as to the amount of exercise he was to take. He soon began to improve, and lost most of the distressing symptoms and was able to walk much better. The improvement was maintained when he was last seen during the summer of 1919.

CASE II.

A man, aged 32, was first seen in February, 1918. He complained of pain over the heart, which at times was of a stabbing nature, and which radiated down the left arm on exertion or after attacks of indigestion. He had experienced this pain occasionally for two years. He had the usual symptoms of shortness of breath and exhaustion, and was at times in considerable distress. The heart was dilated, and there was marked gastric catarrh. He was a commercial traveller, and had not only been much overworked, but his meals were most irregular.

After several weeks' rest and careful diet all the distressing symptoms abated, and he gradually returned to his duties; at present is able to do a considerable amount of work. He is very careful as to his diet, and often is able to obtain an extra day's rest at the week-end. I am of opinion that the prognosis is good in this case.

CASE III.

A man, aged 55, consulted me in May, 1919. He had worked abroad for many years, and his heart had been weak since 1915. He complained of pain over the precordium and shortness of breath, which were aggravated by exertion. The heart was dilated, the pulse rate was 80, and the tension 140 mm. Occasionally he had Cheyne-Stokes breathing and the stomach was dilated.

After six weeks' treatment the pain left him, the Cheyne-Stokes breathing disappeared, and he could walk several miles without exhaustion. The prognosis in this case is distinctly good.

CASE IV.

A lady, aged 50, had suffered from palpitation and exhaustion for eight years, subsequent to an attack of influenza. She was in poor health, the attacks of palpitation occurred frequently at night, and her sleep was much disturbed. She had slight pain over the heart, was short of breath, and easily fatigued on exertion. There was marked flaccid distension of the stomach, the heart was dilated, and the pulse tension was 140 mm. The diet was strictly regulated and ammonium bromide prescribed. In a few days she began to improve, the palpitation was much less, the digestion better, and she slept well. After a month's treatment she said she was more active and was feeling stronger than for several years. The prognosis in this case is good.

CASE V.

A man, aged 47, consulted me in August, 1917. He had had rheumatic fever ten years previously, and had worked very hard for many years. He complained of a stabbing pain over the heart, but it did not extend down the arm. He often had attacks at night, when he also experienced a smothering feeling. He was breathless and easily exhausted, and the stomach was distended with flatus. The heart was dilated; the tension of the pulse was 160 mm. He was carefully dieted and advised to reduce the amount of his daily work as far as possible, but at the same time my prognosis in his case was bad. I saw him in September, 1918, when he was much improved; the pain was less, and although he still had a smothering sensation at night there was less exhaustion, and he was able to get through his work fairly well. I saw him again in August, 1919, and found the improvement maintained. The pain was not so frequent, and he could walk three or four miles a day.

ON THE DIRECT CULTIVATION OF TUBERCLE BACILLI FROM TISSUES.*

BY

G. HASWELL WILSON, M.B.,

LECTURER IN BACTERIOLOGY, GLASGOW UNIVERSITY; PATHOLOGIST,
ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW.

THE method of isolating tubercle bacilli from tuberculous tissues described below was devised in the course of an investigation, undertaken on behalf of the Medical Research Committee, into the types of tubercle bacilli found in children. It depends on the use of (a) a special medium for culture, as described below, and (b) the trituration of the tissue with dry quartz sand before the application of antiformin to destroy contaminating organisms.

The efficacy of antiformin as an aid to the detection or cultivation of tubercle bacilli in sputum, etc., is generally recognized, and the benefit derived from its use may be said to depend on two factors. In the first place, the antiformin exercises a disintegrative action on tissues and cells and liquefies mucus, so that the organisms may be concentrated by centrifugalizing, and, secondly, contaminating bacteria are killed off. So far as sputum or

*The Mineral Water of Llangammarch Wells, BRITISH MEDICAL JOURNAL, October 24th, 1903.

*The expenses of this research are being defrayed by the Medical Research Committee, to whom I have pleasure in recording my indebtedness.