Orchidectomy.

Orchidectomy is indicated (1) when malignancy is suspected, (2) when orchidopexy is difficult or impossible in a patient beyond the age of puberty, and where the other testis is healthy. It is probably wiser to perform it in any patient over twenty who has an imperfectly descended testis with a normal one on the opposite side.

Abdominal reposition has been advised by some when orchidopexy is not possible. Campbell, in a paper already quoted, considers that the liability to malignant change in an abdominal testicle is four times higher than in one situated in the inguinal canal. This in itself is a strong contra-indication to abdominal reposition. When orchidopexy is impossible and the other testicle is healthy, orchidectomy is indicated. When the other testicle is absent, orchidectomy may be undesirable, since it would remove the internal secretion entirely. In these cases it is justifiable to leave the testis in position, and unless there is some strong reason for not leaving it in the inguinal canal (e.g. attacks of pain or exposure to trauma, as judged by the patient's past experience), it is better not to move it. If malignant change should subsequently occur, it is more likely to be noticed in an early stage if the testis is in the inguinal rather than the abdominal position.

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Practicalities

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THE CLINICAL STUDY OF THE CARDIO-VASCULAR SYSTEM

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PART I

Before discussing the diagnosis of cardio-vascular diseases it would be advantageous first to recall the routine method of clinical examination, second to consider briefly such aetiological factors as are involved in the disease processes, and finally to describe the symptoms of heart disease. It should be possible then to marshal these facts into one comprehensive survey and to discuss the actual diagnosis of heart disease from a purely clinical point of view.

In order to make a complete routine examination it is essential that the patient should be stripped to the waist and given some cover—either a coat or a cape. He should be put at ease and examined, first of all, sitting in a chair. The radial pulse should be palpated and its characteristics noted over a period of one to two minutes. These characteristics include the state of the artery and its wall, the number of pulse beats one feels per minute, the regularity or otherwise of such beats, the volume of the pulse both between beats and at the time of the beat, and the nature of the pulse wave itself.

Normally, the artery should not be palpable except when the beat is present, and the beat should occur regularly and at a rate of about 72 to the minute. The character of the wave so palpated is that of a simple sudden upstroke, with a downstroke following it. But it must be remembered that there are other sites for detecting the pulse wave which may show a marked variation from that felt at the wrist, and which will give useful information as to the normality or otherwise of the cardio-vascular system. For instance, it is often of value to feel both radial pulses at the same time to discover whether or not they correspond to each other, not only in rate but also in volume and type.

The state of the arterial wall may be judged from an inspection of either the brachial or temporal arteries, and information about the patency or otherwise of the more distal arteries may often be obtained from palpation of both the dorsalis pedis and the posterior tibial arteries.

Next, a general inspection of the patient's attitude, colour and whether or not he is breathless whilst at rest should be made. An attitude of tiredness or strain may indicate an anxiety neurosis or neuro-circulatory asthenia, or merely that the patient is upset by the thought of what one may have discovered by the completion of the examination. Certain characteristic facies may point to a diagnosis; there is that facies associated with advanced mitral stenosis, in which there is some cyanosis of the lips, the tips of the ears and the extremities, together with a cyanotic flush of the malar region. Another characteristic facies is that of the patient with heart disease due to hyperthyroidism—the nervous, perspiring, dyspnoeic, exophthalmic patient. In case of advanced aortic incompetence, the markedly pulsating arteries in the neck, associated with extreme pallor without cyanosis, is almost diagnostic, whereas in cases of sub-acute infective endocarditis, the neck pulsation may still be present (due to aortic incompetence), but the patient has a distinct *cafe-au-lait* colour. Or it may be noticed that the patient is slightly jaundiced. The significance of this will be appreciated when one has considered the symptomatology.

At this stage it is as well to give a quick glance at the nails and fingers; the finding of clubbing there would lead one to suspect that one is dealing with either congenital heart disease or some chronic disease of the lungs, such as bronchiectasis; the presence of cyanosis will also manifest itself here, or there may be small tender spots suggesting the multiple emboli of infective endocarditis.

One then turns one's attention to the chest and carries out the classical methods of examination—inspection, palpation, percussion and auscultation. Normally the cardiac apex is seen to be in the 5th left intercostal space within the mid-clavicular or nipple line, and it is unusual to see any other pulsation on the front of the chest. The presence of distended veins coursing over the chest wall will indicate increased venous pressure due to increased intrathoracic pressure or cirrhosis of the liver. The cardiac pulsation may be verified by palpation with the tips of the fingers to find the position of the maximal thrust with each heart beat. This is the true apex of the heart. The flat of the hand should be laid over the precordia, but normally one will feel nothing save the impulse already referred to. Percussion should next be attempted, but there is no point in trying to differentiate between the areas of superficial and deep cardiac dullness by means of light and heavy percussion. Such methods are notoriously misleading. Moderate firm percussion should be used, and it is usually possible to map out with a fair degree of accuracy the left border of the heart, but the right and lower borders are almost impossible to find because of the proximity of the sternum and the liver. For auscultation of the heart there are many types of stethoscope used, but there is no doubt that the diaphragm type will give the best results once one has used it for some time. The stethoscope should be first placed over the point of maximal intensity of the thrust, and one hears characteristically the two heart sounds—*Lübb-Düpp*—which occur regularly with a typical rhythm, and are found to be loudest at this point; this is additional confirmation of the position of the cardiac apex. In some cases, however, it is still difficult to place the cardiac apex, and help will be obtained by noting, first with the patient sitting up, the position at which the heart sounds are heard best, and then by making him lie down and turning him on to his left side. In this case the heart sounds are now best heard at some point to the left. Normally the impulse is mobile, usually moving about an inch to an inch-and-a-half to the left when the patient lies on that side. From the data obtained, the position of the apex can be fairly accurately inferred. Following this, auscultation is then performed in those areas to which it has been found the sounds are best carried from the underlying valves. These are the 2nd left intercostal space, about one inch from the sternal border—to which area the sounds from the pulmonary valves are best transmitted; over the 2nd right costal cartilage, to which the sounds emanating from the aortic valve are best heard, whilst those from the tricuspid valve are heard best at the lower end of the midsternum. Before finishing with auscultation one should always listen to the bases of the lungs during deep inspiration, to notice whether or not there are any signs of transudation.

The patient should be told to lie down, and the examination of the heart should be performed again in this position. In many cases, it may be advantageous to exercise the patient first before repeating the examination or to turn the patient on the left side in order to bring out certain abnormalities (*vide infra*).

Then the abdomen should be palpated, with especial reference to the size of the liver, the presence or absence of ascites, and, in certain cases, whether or not the spleen can be felt. After

this the legs should be examined for any pitting oedema, and at the same time one should note whether or not there are any local causes for such oedema, such as varicose veins, sprained ankles, old fractures and the like. In cases which have been in bed for some time, oedema should be looked for over the sacrum.

The estimation of the blood-pressure is now undertaken, and it is essential that for such estimation both the patient and the examiner be comfortable and at ease. If this point is overlooked much erroneous data may be gathered. This is well illustrated by the following example.

A young girl was brought to see me by her mother for a routine overhaul. The patient was of an excitable temperament, and during the course of auscultation I found a systolic murmur at the apex of the heart. I enquired rather specifically about rheumatic fever, and proceeded during this conversation to take the blood pressure. I was surprised to obtain the reading $\frac{180}{90}$. The patient was made to lie down and told to relax.

Half an hour later the blood pressure was $\frac{125}{75}$, which was well within the normal limits.

This case has been mentioned to give warning of the absolute necessity of making the patient feel at ease and comfortable before recording the pressures.

The armband of the sphygmomanometer must be applied carefully just above the bend of the elbow, so that on inflation there are no "bulges." It is as well to inform the patient of the procedure. The armband should be inflated and the pressure which just causes disappearance of the pulse wave at the wrist on palpation noted. Rapid deflation is allowed to occur. That part of the brachial artery below the armband should be palpated and the stethoscope applied directly over it; inflation is performed once more. One of two methods should be used now—either the pressure should be raised rapidly to the 200 m.m. mark and a fairly rapid deflation allowed, noting the point of the appearance of the first Korotkow sound, or the pressure should be raised rapidly to about 20 m.m. above that required to obliterate the pulse wave at the wrist. But whichever method is used, the appearance of the first Korotkow sound is taken as the systolic pressure, which should be read to the nearest multiple of 5; e.g. 122 as 120, or 158 as 160.

The first Korotkow sounds are heard as a series of dull thuds, the first of which is taken as the systolic reading. These thuds are known as "first phase" Korotkow sounds and are succeeded by "second phase" sounds which are blurred and muffled. Lower down the pressure scale the sounds again take on a clear character which becomes progressively more intense—this is the "third phase." These loud clear sounds are followed by a diminution in intensity at first slowly and then abruptly. The abrupt diminution in intensity marks the transition from the third to the "fourth phase" and is taken as the diastolic reading. But this point is sometimes not clearly defined, and only an approximate reading of the diastolic pressure can be obtained.

It must be emphasised again that to obtain correct readings of the blood pressure it is essential that (i) both patient and examiner are comfortable, (ii) that the patient be relaxed. If necessary repeat the readings until uniformity of results is found, (iii) that compression be performed rapidly, and (iv) that the pressure in the armband be lowered as soon as possible.

Before completing the examination of the cardio-vascular system, useful information may be obtained from an examination of the urine, from looking at the fundus oculi with a good ophthalmoscope, and by a careful palpation of the thyroid gland (*vide infra*).

In no other field of medical investigation is there found such a specificity of aetiological factors as there is in cardiology. Thus we know that the story that mitral stenosis was caused by a simple uncomplicated attack of whooping cough is untrue. Therefore, before discussing the symptomatology of cardiac disorders, it will be well to recall the possible aetiological factors of cardiac disease. They can be grouped under the following headings:—

(i) *Congenital*.—In severe lesions, symptoms and signs have been present from birth or appeared in the neonatal period. In lesser cases, discovery of the lesion may only be made by a routine examination, or in the pathologist's ward, since in some cases the signs are equivocal, and a clinical diagnosis is well-nigh impossible.

(ii) *Rheumatic fever* is a specific disease of childhood and early adolescence. Thus, the diagnosis of a first attack occurring either before three years of age or after thirty years of age is nearly always incorrect, although in the latter case the original attack may have been so

slight as to pass unnoticed. Furthermore, it is recalled that "rheumatism in children licks the joints but bites the heart," and the converse, as far as a first attack, is true of adults.

(iii) *Syphilis* in its late stages shows its mark upon the aorta, especially in the parts nearest to the heart. The direct effects upon the heart are due either to dilatation of the aortic ring or to involvement of the all-important coronary arteries by scarring of the aorta.

(iv) *Acute infections* by certain specific illnesses may cause cardiac symptoms. Thus diphtheria and typhoid fever may directly affect the cardiac muscle, whilst repeated attacks of tonsillitis may lead to the same pathological changes as occur in rheumatic fever (*sic*).

(v) *Thyroid dysfunction* will cause, directly, cardiac disorders. Thus the most common cause of auricular fibrillation, in a case where previous rheumatic fever can be definitely excluded, is hyperthyroidism, and cure of this condition may lead to a spontaneous disappearance of the arrhythmia. Conversely in hypothyroidism, symptoms of heart failure are nearly always present.

(vi) *Hypertension* of either essential or malignant type is a common cause of cardiac symptoms in later middle life, and usually leads to left ventricular failure, with or without signs of coronary insufficiency.

(vii) *Superadded Infections* of the endocardium do not occur unless there has been a previous abnormality caused by an earlier infection of rheumatic fever or by a congenital malformation.

From such brief consideration of these factors it will be realised that the correct diagnosis of cardio-vascular disease is greatly helped by a knowledge of the exact aetiology of the condition, and this may, in many cases, be discovered by a careful examination of the patient's past history.

The symptomatology of cardio-vascular diseases has a somewhat similar specificity and knowledge of these symptoms are also of great importance in the assessment of the diagnosis.

Of the symptoms pointing to disease of the cardio-vascular system the most important are dyspnoea and pain.

Dyspnoea can be defined as the subjective feeling of laboured breathing. In other words, the patient becomes conscious of a normally unconscious act, and this may vary from the realisation by the patient that he cannot perform the violent exercise that he was once able to do without any discomfort, to the presence of laboured breathing whilst at rest. Between these two extremes are many grades, and it is the one symptom *par excellence* of cardio-vascular disease. But it must be remembered that there are other causes of dyspnoea such as pulmonary disease, especially where there is marked fibrosis, severe anaemia, either of the primary or secondary type, or that dyspnoea may be due to upset of the acid-base equilibrium of the blood stimulating the respiratory centre in the medulla. This occurs in such conditions as starvation, uraemia and diabetes. Lastly, it must be remembered that the dyspnoea of which the patient complains may be purely functional in origin, but such a diagnosis must not, of course, be made until all other possible causes have been ruled out.

Cardiac pain may be divided into two great groups, firstly the group of ominous significance, and secondly the group which, although the patient may consider the pain to be of serious importance to himself, in point of fact has very little significance from the prognostic point of view.

In the first group the outstanding type of pain is that found in *angina of effort*, and this pain has certain definite characteristics without which the diagnosis of angina of effort should not be made.

During the critical examination of the patient's history he should be made to describe in his own words the mode of onset and the position of the pain; whether the pain radiates to any other part of the body, the mode of offset and the length of time which he has been conscious of it. True angina of effort comes on only with effort, and in the early stages is associated with the rather more severe grades of exercise. The patient will tell that it appears either subternally or across the chest, seemingly beneath the sternum, usually at its upper end, and sometimes it appears to go through to the back. As this pain develops it may radiate upwards towards the angle of the jaw or down the inner side of either arm, but especially the left side. It often manifests itself at the flexor surfaces of the wrists, and a patient with true angina may complain that even when he has no real anginal pain in his chest there is this uncomfortable painful feeling at the flexor surface of the forearm or wrist. This pain characteristically comes on with effort, and there is in most cases a marked constancy of the amount of effort necessary to bring on the pain, although it must be remembered that such conditions as a heavy meal or a cold wind will naturally decrease this critical amount of effort. Equally characteristically

the pain passes off as soon as the patient rests, or when vasodilator drugs are used. Occasionally the site of onset of the pain is atypical, being situated around the scapular region behind or beneath the left axilla, or even referred to the apex of the heart. But even if this pain is atypical in site of origin, it is always typical in its behaviour. In other words, it always comes on with effort and passes off with rest.

This same type of pain may come on, however, at rest, but then it is due to a different causal agent—the blocking of one or other of the coronary arteries or their many branches by thrombus formation. The pain of such a *coronary thrombosis* is often of the same distribution as that of angina, but it differs from anginal pain in these important respects. It may come on when the patient is at rest, or some time after severe exertion has been performed, or often when the patient is in bed, and the circulation is most sluggish; the pain is persistent and often of growing intensity over a period of hours; the pain is not relieved by rest or the usual vasodilators; it often makes the patient very restless, and is accompanied by a varying degree of shock. The pain gradually passes off over a period of days, and not minutes as with angina.

The third type of true anginal pain which occurs is that caused by spasm of the coronary arteries, and known as *paroxysmal angina*. In this type, the angina, although associated with effort, is liable to come on in paroxysms, often when the patient is lying down, but it is diagnosed by the history of its frequent recurrence and the fact that it is not associated with marked shock, and otherwise has all the characteristics of angina of effort. It often occurs in patients who are excessive tobacco smokers, and removal of this habit will very often improve the patient considerably.

But the pathology of these three distinct types of ominous cardiac pain is essentially the same, namely ischaemia of the cardiac muscle, caused by narrowing, blocking or spasm of the coronary arteries.

Of the less important types of cardiac pain, the most common is the *left-sided inframammary pain*. This pain is situated around the apex of the heart and passes into the left axilla, and patients usually describe it as stabbing in character, with or without a dull ache constantly present. It is in no way associated with effort, but usually becomes more severe when the patients become fatigued, towards evening. It has no prognostic significance as far as the cardio-vascular system is concerned.

Of the other similar types of pain there is a type associated with *neuro-circulatory asthenia*. It usually occurs in young people who have passed through some psychological upset, and who complain of marked dyspnoea, fatigue, lassitude, giddiness, palpitation, and pain again situate around the cardiac apex, usually occurring on the slightest exertion.

Then there is the patient whose father, or brother, or some near relative, suffered for years with heart disease, who because of temperament, develops an *anxiety neurosis* concerning the cardio-vascular system. The diagnosis is made, after careful examination to eliminate any pathological changes, and the inconsistency of the history. The pains about which the patient complains vary greatly from day to day, depending upon the mental state and the general outlook upon life.

Differentiation of these types of pain is of great importance, and most of them can be differentiated by the taking of a careful history.

Of the other symptoms of cardio-vascular disease, oedema, palpitation, fatigue, dizziness and faintness, cough, haemoptysis, and jaundice are the most important groups.

The *oedema of cardiac disease* is due to increased venous pressure, which is assisted, whilst the patient remains mobile, by the increased hydrostatic pressure due to gravity. Therefore, cardiac oedema starts in the most dependent parts and increases as the day goes on; it decreases considerably at night. The presence of oedema (in the absence of local causes such as varicose veins, etc.) means that the heart has been working against a continuous burden, and is in some degree of failure.

Palpitation is one of the most common of the symptoms of heart disease, but its importance is dependent upon the mental attitude of the patient. In highly-strung nervous individuals, palpitations may cause great distress and mental upset, but the sole cause may be an occasional extrasystole. On the other hand, in the phlegmatic type of individual the patient may merely note it in passing and not refer to it in his history until pressed, yet the cause in this case may be the most gross and irregular fibrillation of the auricles. Palpitations may be a symptom of many cardiac disorders. It occurs in hypertension, in paroxysmal tachycardia,

in auricular fibrillation or flutter, in simple extrasystoles, or partial heart block, or it may be due to some digestive upset—"Wind under the heart, Doctor"). The stress laid upon this symptom must, therefore, vary from case to case, and care must be taken to place it correctly in the assessment of the diagnosis.

Dizziness and *faintness* are common complaints of a patient with cardio-vascular disease, but the patient rarely falls and rarely faints; it is more of a subjective feeling of which the patient becomes conscious. Here again it is largely dependent upon the type of temperament with which we are dealing, as to how important these symptoms are to the patient.

Fatigue is another common symptom of which a cardiac patient may complain; it is often remarked that this fatigue is worst during the morning and that, as the day wears on, the patient begins to feel better. It is due to the circulation becoming "warmed up," leading to an increased blood supply to the higher centres.

Cough may be caused from either congestion in the pulmonary vessels due to back pressure, as in mitral stenosis, or to the pressure of a grossly enlarged left auricle in mitral stenosis upon the recurrent laryngeal nerve, or it may be due to an associated bronchitis, which a cardiac patient is very liable to develop—due to diminished resistance of the bronchial epithelium to infection, because the disturbed circulation leads to tissue anoxaemia.

Pulmonary congestion is recognised clinically by the crepitations which are found on inspiration at the bases of the lungs. In gross cases it may lead to actual transudation of fluid into one or other of the pleural sacs, usually, for some unexplained reason, the left side, giving all the classical signs of a pleural effusion. Or there may be rupture of a blood-vessel in the lungs leading to *haemoptosis*.

Pressure upon the recurrent laryngeal nerve can be diagnosed when there is absence of other signs of bronchitis and possibly some associated voice change. Inspection of the cords with a laryngeal mirror will put the diagnosis beyond doubt, since the one vocal cord will be in an abnormal position or show abnormal movements. Bronchitis is diagnosed by the association of a greater dyspnoea than might be expected from the condition of the circulation, together with the presence of rhonchi and rales all over the chest, as found by auscultation.

Jaundice is sometimes a symptom of heart disease, and is usually of great prognostic importance. In most cases it is due to increased venous pressure in the systemic veins disturbing the normal function of the liver; when jaundice manifests itself clinically in such cases, the prognosis must be worsened. Jaundice may occur following pulmonary infarction and is due, in this case, to the breaking down of the haemoglobin in the infarct in the lungs.

There is one type of jaundice occurring in heart disease which must be remembered. It is caused by the haemoglobin breakdown following the reduction in the physiological polycythaemia, which has occurred during longstanding heart failure; when that failure has been adequately treated and the normal tissue oxygenation is restored again by means of an efficient circulation the excess of red blood cells is no longer required. This type of jaundice therefore occurs in the later stages of active treatment. It is a good prognostic sign.

PART II. The assessment of symptoms and signs for diagnosis.

(To be continued in the next issue.)

Clinical Page

A CASE OF INFECTIVE POLY-ARTHRITIS ASSOCIATED WITH CHRONIC BILATERAL BRONCHIECTASIS

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History and description of case

The patient, a girl of 21, was admitted to the Brompton Hospital for observation on October 5th, 1941. Her parents said that she had suffered from cough and expectoration practically all her life. At the age of 3 she had had a thoracotomy, and a large quantity of fluid had been removed from the chest. Details of the operation were not available, but it was presumed that she had had an empyema, and that a secondary bronchiectasis had resulted. No particular attention had been paid to her chest after she had recovered from the immediate effects of the