

## PROCEEDINGS OF THE CARDIAC SOCIETY OF GREAT BRITAIN AND IRELAND

The TENTH ANNUAL GENERAL MEETING of the Cardiac Society of Great Britain and Ireland was held at the Physical Chemistry Laboratory, Oxford, on Thursday, April 11, 1946. Chairman F. G. HOBSON.

The Chairman took the Chair at 10.0 a.m.; 64 members and 10 visitors were present.

### PRIVATE BUSINESS

1. The minutes of the last meeting having been printed in the Journal (7,210, 1945) were approved and signed.
2. The accounts, audited by East and Brown, were approved: they showed a balance of £17 8s. 5d. The Council had decided that the ordinary subscription should be collected for the year 1946/47.
3. Maurice Campbell having completed the five years for which he was elected Secretary and five additional years during the war, Shirley Smith was, on the nomination of the Council, elected Secretary, to take office after the conclusion of the present meeting.

4. The following new members were elected:—

#### *Ordinary Members*

R. Ellis  
Evan Jones  
A. Morgan Jones  
J. D. Olav Kerr  
W. Phillips

#### *Associate Members*

R. Kempthorne  
Peter Kerley  
D. Lewes  
H. E. S. Pearson  
W. Stokes

Eight Associate Members were re-elected for another period of three years.

5. Geoffrey Bourne, London, and J. H. T. Towers, Leeds, were elected members of the Council for the years 1946–50.
6. The following changes in the Rules were carried, *nem. con.*, on the recommendation of the Council:
  - Rule 1.* The Society shall be called the British Cardiac Society.
  - Rule 4.* Insert Corresponding Members.
  - Rule 6.* Ordinary Members shall not exceed 75 (instead of 60).
  - Rule 9.* Associate Members shall not exceed 50 (instead of 30).  
. . . not more than 20 instead of 15 shall be allowed in any year.
  - Rule 15 (New).* Corresponding Members may be elected on the nomination of the Council from recognized cardiologists in the British Commonwealth or abroad.
7. The Secretary reported that on the instructions of the Council he had written to the president of the Royal College of Physicians with reference to (i) the appointment of representatives on the Consultant Services Committee, and (ii) the absence of any suggestions for Cardiology in the present list of specialties in a Consultant Service for the Nation. The Society decided to appoint William Evans as their representative on the Consultant Services Committee, and instructed the Secretary to write to the President of the College with regard to the formation of a standing Committee of the College to deal with Cardiology on the same lines as the Committees appointed for other specialties such as Neurology and Dermatology.
8. Correspondence with the Secretary of the Association of Physicians was reported. The possibility of some joint meetings was favoured and the Secretary was instructed to reply accordingly.
9. Williams Evans was again asked to act as Recorder.
10. Cardiac Emergencies was chosen for the main discussion at next year's meeting and the Secretary and Secretary-elect were deputed to divide up the subject and choose opening speakers.

### DISCUSSION ON THE TREATMENT OF BACTERIAL ENDOCARDITIS WITH PENICILLIN

R. V. CHRISTIE (*introduced*) described the results of the team of workers who had been treating infective endocarditis with penicillin. Preliminary results had been published in the

*Brit. Med. J.* (1946, 1, 881) but he was able to add to the number of cases and to follow them for rather longer.

He concluded that the duration of treatment was most important and the course should be continued for 28 days; that half a million units a day appeared an adequate amount to give; and that heparin should not be added. The occurrence of fever was not a reason for continuing treatment longer. Relapses, if they occurred, were generally in the first 10 days and nearly always in the first 30 days. Relapse after a short course did not seem to prevent later success, but relapse after a long course mattered more. After a relapse the same amount should be given for 6–8 weeks.

The sensitivity of the organism to penicillin did not matter, except that if it was 10 or 16 times more resistant than the standard, the cures were 30 per cent instead of 60 per cent.

The prognosis was better in congenital than in rheumatic heart disease. Severe heart failure was of grave import and 90 per cent died. The state of nutrition was also important and treatment within the first 6 months of onset was favourable.

Heart failure was the main cause of death, and emboli were also important.

G. E. S. WARD described 19 cases of bacterial endocarditis in which a blood culture showed *Streptococcus viridans*, and where 60,000 units of penicillin were injected intramuscularly at three-hourly intervals. Two of the 9 cases given penicillin for 21 days relapsed and had the same dosage for another 28 days. The remaining cases were treated for 28 days and none relapsed. Four of the 19 died, but only one of these could be regarded as having failed to respond to penicillin therapy, for in one cerebral embolism took place on the second day; another died of hæmorrhage from œsophageal veins in hepatic fibrosis; a third died from rupture of an aortic cusp. Of the 15 surviving patients, at least 11 are apparently cured and the other 4 may be. Two have been well for over a year, 5 for almost a year, 4 for nine months and 4 for shorter periods. One had congestive heart failure on two occasions but recovered. Dental extraction appeared to have precipitated the infection in 3 cases, and 9 others had dental sepsis (*Streptococcus viridans*); these 9 had teeth extracted under cover of additional injections of penicillin for 48 hours. Ward emphasized the danger of dental sepsis in rheumatic and congenital heart disease, and the importance of penicillin therapy before dental extraction in such cases. After reviewing the clinical features of the series he said that penicillin sensitivity gave no real clue to the prospect of success or failure, but that the number of colonies grown on culture media seemed to have a bearing on prognosis. Early and prolonged treatment, with adequate dosage of not less than half a million units of penicillin daily for 28 days, was essential; and in the case of a relapse, a further course lasting six weeks should be given.

HENRY COHEN (*introduced*) reported that the Liverpool findings closely paralleled those of other centres. Of 20 unselected consecutive cases (12 m. 8 f.) treated with penicillin, 8 (3 m. 5 f.) patients had died; the remaining 12 had survived for periods ranging from a few weeks to over a year. All three congenital heart cases had responded well. Patients preferred three-hourly intramuscular injection to a continuous intramuscular drip. Cohen spoke of the risks of major emboli, and made reference to a case of aneurysm of the left renal artery which was recognized and successfully treated by nephrectomy, several months after the endocardial infection had subsided. He stressed the importance of appreciating that dangerous sequelæ needing surgical intervention may follow the recovery from infection and the consequent prolongation of life. Another patient had been re-admitted to hospital with rapidly fatal heart failure due to rupture of an aortic cusp recurring long after the infection was overcome, and as the autopsy revealed the endocarditis was healed. Suggestive evidence was forthcoming, though a large scale investigation was necessary for proof, of the value of 100,000 units of penicillin daily for 2 to 3 days following dental extraction or tonsillectomy in a cardiac patient. There must always remain a proportion of cases—probably about 25 per cent who would succumb in spite of adequate penicillin therapy, from congestive heart failure, nephritis, major emboli, ruptured valves and aneurysms, and endocardial reinfection with a penicillin-resistant organism or strain.

GILCHRIST, BOURNE, BRUCE PERRY, and MORGAN JONES also recounted their experiences with a series of cases treated with penicillin.

#### SHORT COMMUNICATIONS

##### THE ACTION OF THEOPHYLLINE-ETHYLENE-DIAMINE IN HEART FAILURE

S. HOWARTH (*introduced*), J. McMICHAEL, and E. P. SHARPEY-SCHAFFER found that the theophylline component of theophylline-ethylene-diamine lowered venous pressure and increased cardiac output in normal hearts. The venous-pressure-lowering action was more persistent than the stimulating action on the heart, the latter being transient and often passing off within half an hour. Striking rises in cardiac output occurred in hypertensive heart failure, but the effects were less prominent in mitral stenosis.

##### THE HEART IN DEPRESSION OF THE STERNUM

BY WILLIAM EVANS

(Published in full, 1946, 8, 162.)

##### CHRONIC DISSECTING ANEURYSMS

BY A. MORGAN JONES and F. A. LANGLEY

(Published in full, 1946, 8, 191.)

##### BERNHEIM'S SYNDROME

TERENCE EAST described three cases in whom the heart failure was of the right ventricular type, although the lesion affected the left ventricle.

The first case was a man of 30 with aortic stenosis. There was the usual congestive failure, but the circulation rate was not greatly slowed. Post-mortem, the aortic valves were calcified, the left ventricle bulged into the right and reduced its capacity, and the lungs were free from engorgement and œdema.

The second case was that of a woman of 47 with aortic stenosis. Post-mortem, the valves were calcified, the lungs were free from œdema and engorgement, the septum bulged into the right ventricle, and there was general anasarca.

The third case was a man with hypertension who had begun to develop signs of right ventricular failure, the lungs remaining clear and the circulation rate not being much slowed.

Casts of the right ventricle in the first two cases were shown illustrating its diminished capacity.

Bernheim's syndrome may be expected in a case with a lesion affecting the left ventricle in whom failure of the right side develops, the circulation time not being unduly prolonged and the lungs remaining relatively clear.

##### DEMONSTRATION OF INTERATRIAL SHUNTS BY CARDIAC CATHETERIZATION

E. P. SHARPEY-SCHAFFER and J. McMICHAEL said that catheterization allowed the estimation of the oxygen unsaturation of blood in the right ventricle, right auricle, and superior and inferior venæ cavæ. In left to right shunts auricular blood was less unsaturated than caval blood. Estimation of arterial samples indicated right to left shunts. A case was also shown in which other evidence suggested an interatrial shunt but catheterization showed that a shunt was not present.

##### WOUNDS OF THE HEART

PAUL WOOD drew attention to delayed and recurrent attacks of pericarditis with or without effusion as a sequel to pericardial foreign body.

##### UNIPOLAR PRÆCORDIAL AND LIMB LEADS

C. W. CURTIS BAIN discussed unipolar chest leads. Standard leads are bipolar, and represent about equally the potentials of the two extremities connected to the galvanometer. With præcordial leads the influence of the remote electrode is very much less than that of the præcordial electrode, since it is so much farther from the heart; but any effect all from this electrode must be regarded as distortion. This applies especially when the potentials

at one point on the præcordium are to be compared with those at another. Wilson in 1932 devised a means of obtaining a remote electrode at almost zero potential, by connecting all three limbs to the galvanometer through a central terminal, and using this as the remote electrode. By this method, according to the Einthoven triangle hypothesis, all forces parallel to the plane of the triangle are cancelled out. There are also forces perpendicular to this plane and these impart a slight negativity to the tracings, but they are probably nearly constant throughout the cardiac cycle, and do not exceed 0.3 mv. For practical purposes these leads (V leads) can be considered to be unipolar. Wilson interposed resistances between each limb and the central terminal, but Goldberger in 1942 showed that they were unnecessary.

When using unipolar leads it is possible to obtain the potentials at any point on the body. Unipolar limb leads, reflecting the potentials at the right arm, left arm, and left leg, are useful in showing the position of the heart. The heart becomes more vertical when there is right-sided hypertrophy or a low diaphragm from emphysemà or a long narrow chest. The heart becomes more horizontal when the left ventricle is hypertrophied or when the diaphragm is high. Six præcordial leads are taken, as standardized by the American Heart Association (1938), extending from the right of the sternum to the mid-axilla. In a normal series the height of R in leads over the right ventricle (V1 and V2) is about half the depth of S; S is absent in leads over the left ventricle (V5 and V6). The transitional point, where R and S are equal, occurs about V3, which lies over the position of the normal septum.

The diagnosis of ventricular hypertrophy is based on the relative time taken by the impulse to spread through each ventricle. It is, therefore, unaffected by the position of the heart. In left ventricular hypertrophy R becomes small and S deep in leads V1 and V2; the voltage of the complexes usually increases; the transitional point swings to the left; in advanced cases T is inverted in V5 and V6. In right ventricular hypertrophy a Q wave appears followed by a large R in V1 and V2; there is no S. In V5 and V6, S waves are seen, but there is no abrupt transitional point.

When left-sided weakness is followed by right-sided hypertrophy, as in many cases of advanced hypertension, standard leads usually fail to show axis deviation, since the vertical twist of the heart caused by the right-sided hypertrophy cancels out the left axis deviation. Chest leads, however, continue to register the lengthened time taken by the impulse to pass through the thickened left ventricle. At the same time unipolar limb leads will show that the heart is vertical.

Chest leads in bundle branch block have the same general characteristics as in hypertrophy, but the QRS is widened. In left branch block a deep S follows a diminutive R in V1 and V2; in V5 and V6 a broad R occurs, and there is no S. In right branch block a broad R, sometimes preceded by a Q, is seen in V1 and V2, and a slender early R followed by a broad S in V5 and V6. Concordant and homophasic curves are shown to be due only to unusual positions of the heart. It is nearly always possible to determine the side of the lesion.

Anterior infarcts can be divided into antero-septal and antero-lateral types, according to whether the changes are more pronounced towards the right or left. Antero-septal infarcts often do not cause characteristic changes in lead I: small ones may only show inversion of T in V1, V2, and V3, and so would be missed if lead IV only were taken. Large anterior infarcts have deep Q waves and inversion of T in all the chest leads. Involvement of the septum can sometimes be diagnosed. Left branch block obscures the changes of infarction, since the left ventricle receives the impulse late. But this does not apply to right branch block, and the characteristic changes of branch block and the anterior infarct can both be seen clearly.

#### HEART FAILURE OF UNKNOWN AETIOLOGY IN AFRICANS

D. EVAN BEDFORD and G. L. S. KONSTAM (*introduced*) described a series of 40 cases of unexplained heart failure in African troops, mostly from West Africa, serving in the Middle East. Their ages were usually between 20 and 30, and all but two were under 40. They were admitted to hospital either with severe left heart failure or with combined pulmonary and systemic congestion and ascites. The history was of increasing dyspnoea for a few weeks or months, and sometimes of attacks of nocturnal dyspnoea with hæmoptysis. The main clinical

findings were normal rhythm with a very small rapid pulse, and often extrasystoles. Alternation was the rule. The heart was grossly enlarged to the left, and the sounds distant with a triple rhythm at the apex; systolic murmurs were common and the pulmonary second sound was much accentuated. The blood pressure was often low, below 120 mm. systolic, but sometimes slightly raised to 140 to 160 systolic. The diastolic was relatively high, often 100 mm. or just over. X-rays showed gross general enlargement of the heart with a prominent pulmonary artery and conus, and in half the cases the aorta was unduly small.

The Kahn was positive in about half, but this was common in African patients and ascribed to previous infection with yaws. The urine was usually normal and there was no evidence of nephritis. Blood examination rarely showed any anæmia and sickling was excluded, but eosinophilia was sometimes present. Ankylostomiasis and other parasitic infestations were common. There was no evidence of avitaminosis, no peripheral neuritis, and no malnutrition. The diet was adequate and far better than they were accustomed to at home.

There was no response whatever to thiamin given in adequate doses, both intravenously and by mouth. The response to digitalis and mersalyl was moderate. Some improved and became free from congestive heart failure, though they could do little; in these the heart diminished in size, though remaining considerably enlarged. Seventeen patients had died in hospital and necropsies were done in all these.

The hearts showed gross enlargement involving all cavities, and due more to dilatation than hypertrophy, though the weight was increased. There was no valvular disease, except in two cases with old mitral endocarditis and thickening. The coronary arteries were healthy in all. In three cases there was marked hypoplasia of the aorta, but the size of the aorta had not been specially noted in the earlier necropsies. In some cases there was an obvious and extensive subendocardial fibrosis, with fibrous areas resembling shallow infarcts in the ventricles, adherent to which was organized antemortem clots. Histological examination was still in progress, but some sections examined had shown extensive subendocardial necrosis and fibrosis without appreciable inflammatory reaction.

The aetiology was briefly discussed in relation to hypoplasia of the aorta, primary myocardial failure of French authors, "isolated myocarditis," hypertension, nutritional deficiencies, and tropical diseases. The clinical and pathological findings corresponded to cases described in America of recent years under the heading of "isolated myocarditis" or Fiedler's myocarditis, and especially to those described by Smith and Furth in 1943. The possibility of heart failure being the end result of previous nutritional deficiency had to be considered, as had a constitutional factor associated with aortic hypoplasia.

#### THORACO-LUMBAR SYMPATHECTOMY AND HYPERTENSION

W. T. COOKE and J. A. BARCLAY (*introduced*) presented the results of thoraco-lumbar sympathectomy (performed by W. H. Sweet) in 23 cases with hypertension. According to the criteria adopted by Keats, Wagener, and Barker, ten were Grade 4, six Grade 3, and the remaining seven Grade 2. Encouraging results were noted in Grades 3 and 4, twelve to forty months after operation. Two cases died before the completion of the second stage and one twelve months later. The remainder showed marked symptomatic improvement, resolution of eye changes, and a return to normal blood pressure in three. Studies of renal function in 5 patients, before and after operation, and 4 further patients before operation, showed a marked fall in  $T_m$ . The ratio of blood flow to  $T_m$ , however, was increased in varying degree in all cases except one in whom renal biopsy showed marked arteriosclerotic changes. Operation did not affect the ratio. The findings supported the observations of others, that the renal changes were probably not a primary factor in the genesis of essential and malignant hypertension.

#### DEXTRCARDIA FROM EVENTRATION OF THE DIAPHRAGM

J. K. RENNIE described a woman who had been suffering from bronchitis for three weeks. Dullness had been noted at the left base and was ascribed to fluid. She was a frail woman of 69 who had never suffered from any serious illness except she had a gastro-enterostomy performed for suspected duodenal ulcer 22 years before. The chest was very narrow, with

much kyphosis. On the right side in the fifth interspace a pulsation was apparent four inches from the midsternal line, which on palpation was found to be undoubtedly the apex beat. There was dullness half-way up the left back with absent respiratory murmur. The cardiogram proved to be normal. X-ray revealed a typical Petit's eventration of the left diaphragm with pronounced displacement of the heart to the right (plates shown revealing characteristic deformity). Displacement of the heart to the right is, of course, a constant finding in eventration of the left diaphragm but this is generally remarkably small in extent, even in middle-aged patients. This case shows how dextrocardia may be simulated, especially in the elderly with the chest changes described for this patient.

#### ACUTE PERICARDITIS IN STILL'S DISEASE

BERNARD SCHLESINGER mentioned that an adherent pericardium was not an uncommon finding at autopsy in the earliest accounts of this disease, but it was remarkable how this had rarely given rise to symptoms or signs during life, and for this reason it had never been suspected. He then described four cases that began with high fever, great distress, and evidence of acute pericarditis. This was subsequently followed by glandular enlargement, splenomegaly, a rash, and general rheumatoid involvement of the joints. A high leucocytosis was one of the features. Pericarditis thus appeared to be a definite and important part of the clinical picture of rheumatoid arthritis in childhood. The sequence of events favoured some specific infection, as yet unidentified, as the cause of rheumatoid arthritis. Finally he concluded that the separation of rheumatic fever and rheumatoid arthritis into two watertight compartments might not be justified and should receive further consideration.