Wassermann reaction. Technical error was excluded by repeating the test on the same fluid, and cross-checking was afforded by three other tests on the fluid—namely, protein, total number of cells, and globulin. All three were increased. Absence of evidence of syphilis during life and on necropsy raised a question whether the positive Wassermann reaction was a biological false positive result. This is very probable, but could not be definitely decided, as spinal fluid was not examined during life.

Reynolds (personal communication) states that of the many conditions in which the biological false positive reactions have been reported in the spinal fluids encephalomalacia is possibly the only one which suggests that post-mortem changes can cause a false positive reaction in cerebrospinal fluid. Stokes *et al.* (1944) mentioned cadaver blood as one of the conditions giving false positive serological reactions. Thomson (1947) quoted Bertolozzi, who found positive reactions in sera of a large percentage of 50 corpses whose blood he examined, but Kolmer (1928) stated that blood collected before bacterial contamination takes place would not give false positive reactions. I could not find any reference in the literature to the false positive reaction in cerebrospinal fluid collected after death. Four other cerebrospinal fluids that were collected after death and examined by me two to three days later showed a trace of blood and were found to be anticomplementary. It is hoped, however, that those who have facilities will report on the incidence of false positive reactions in cerebrospinal fluid collected after death.

Summary

A case of arsenical encephalopathy in an individual in whom no evidence of syphilis could be established during life or on necropsy has been described.

Absence of evidence of syphilis suggested that the positive Wassermann reaction of the cerebrospinal fluid collected ten hours after death was a biological false positive.

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The Minister of Food has appointed a working party to make recommendations about precautions which are considered practicable and desirable for securing the observance of sanitary and cleanly conditions in the catering trade. Sir William Savage, consultant to the County Medical Officer of Health for Somerset, has accepted the Minister's invitation to act as chairman. The other members are: Mr. H. E. Burdett (Fullers, Ltd.); Mr. P. N. R. Butcher (Ministry of Health); Mr. H. Crane (National Union of General and Municipal Workers); Mr. W. C. Crozier (catering manager, Scottish C.W.S.); Mr. N. R. C. Dockeray (Ministry of Food); Mr. P. T. Grove (Permanent Vice-president of the Health and Pleasure Resorts); Mr. E. Hartley Smith (hotel proprietor); Mr. J. Hollingshead (Director of Catering Division of British Tourist and Holidays Board); Mr. R. Hood (Richard Davis, Ltd.); Mr. G. M. B. Hutcheson (Director of Hotels Division of British Tourist and Holidays Board); Brigadier S. O. Jones (Director of Home Holidays Division of British Tourist and Holidays Board); Dr. W. A. Lethem (Ministry of Food); Mr. E. Vivian Rogers (Wm. Hancock and Co., Ltd.); Mr. A. W. Ritchie (Chief Sanitary Inspector of the City of Edinburgh); Dr. A. J. Shinnie (Medical Officer of Health for the City of Westminster); Mr. L. W. Slark (John Gardiner (London), Ltd.); Dr. E. L. Sturdee (Ministry of Health); Dr. I. N. Sutherland (Department of Health for Scotland); Dr. R. Sutherland (Medical Adviser and Secretary to the Central Council for Health Education). The working party held its first meeting on Nov. 26.

AORTIC COARCTATION WITH PATENT DUCTUS ARTERIOSUS

BY

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Coarctation of the aorta and patent ductus arteriosus are now recognized as defects which are amenable to surgical treatment, but the opportunity seldom arises of treating them simultaneously. The following case is reported because of its rarity, the development of characteristic signs at an early age, and the electrocardiographic findings.

Case Report

The patient had been treated for pink disease at the age of 2 years 4 months. The presence of a systolic murmur was noted and the diagnosis of congenital heart disease made, but the precise defect was not determined. When seen on Nov. 27, 1947, at the age of 7, she presented typical signs of aortic coarctation. She had always been a quiet child and disinclined to take much exercise, but cyanosis had not been observed. Her nutrition was poor and she was undersized for her age.

A systolic murmur of a rumbling character was audible at the apex and a soft systolic murmur was heard along the left border of the heart and to a less degree over the praecordium. A more pronounced systolic murmur could be heard over the whole of the posterior thorax but was maximal over the scapulae. The blood pressure in both arms was 140/70. The femoral arteries were imperceptible and blood-pressure readings could not be obtained. In the stooping posture arterial pulsation was visible and palpable medial to the vertebral border of the left scapula. The electrocardiogram showed right axis deviation (Fig. 1). X-ray films of the chest revealed

FIG. 1.—Electrocardiogram taken on Nov. 27, 1947.

notching of the ribs and a double shadow in the region of the aortic knuckle. The possibility of a patent ductus was anticipated because of the right axis deviation (Gilchrist, 1947), although there was no systolo-diastolic murmur.

Operation, Nov. 28, 1947

Cyclopropane and oxygen were given through an endotracheal tube and closely fitting face-piece connected with a rebreathing system incorporating the Waters absorber. With the patient in the right dorso-lateral position a curved incision was made below the left breast from the edge of the sternum opposite the third costal cartilage to the posterior axillary line. A flap of skin and pectoral muscles was reflected up and the chest opened through the third interspace, with section of the

third costal cartilage. The chest wall was more vascular than normal, but not nearly so vascular as in two adult cases of aortic coarctation.

On examination of the mediastinum the aortic arch was felt pulsating forcibly, but below a point 1 cm. distal to the left subclavian artery there was no pulsation and a slight systolic thrill was felt. The mediastinal pleura was incised and reflected to expose the main arteries and the vagus nerve (Fig. 2). An aortic coarctation, marked by a narrowing of the exterior and by a palpable thickening of the wall, was found 1 cm. beyond the left subclavian artery, and a small patent ductus, suspected clinically, was attached to the aorta near the level of the coarctation. The ductus was about 5 mm. in diameter and proved very friable; during its mobilization and division it tore in the angle of junction with the aorta, and the ligature cut through it at the pulmonary artery end. These difficulties, not encountered in any of ten uncomplicated cases of patent ductus treated by ligation, took some time to overcome, but the blood loss was not severe. The aorta and left subclavian and intercostal arteries were mobilized without division of any of the latter.

A Blalock type of clamp was applied across the aorta and left subclavian artery and a second clamp to the aorta 3 cm. below the coarctation. Two intercostal arteries were controlled

FIG. 2.—Showing findings at operation.

by bulldog clips. The coarctation was resected and found to be almost complete, admitting only a fine probe. The opening of the ductus was immediately distal to the coarctation. The ends of the aorta were anastomosed by two stay stitches and a single running suture of black silk on an eyeless needle. The suture passed through all coats and an endeavour was made to get square apposition of the cut ends of the vessel.

On removal of the clamps there was slight leakage from the right side of the suture line, but this was easily controlled by a patch of fibrin foam. The chest was closed and the air aspirated from the pleural cavity by a needle inserted intercostally above the wound.

Progress

The patient was nursed in an oxygen tent for a few hours. Four days after operation 80 ml. of blood-stained fluid was aspirated from the left pleural cavity. Convalescence was complicated by a swinging temperature, which became normal two days after stopping penicillin and sulphamezathine. She was allowed up eighteen days after operation, and subsequent progress was uneventful. Five days after operation the blood pressure in the arms was 118/80 and the femoral and popliteal pulses were palpable. Two months later the arm blood pressure had fallen to 90/58. The generalized systolic murmur disappeared immediately after operation, but a low-pitched rumbling systolic murmur has persisted over a limited area near the apex. The significance of this murmur is uncertain, but it may be due to some degree of mitral stenosis.

At the time of writing the patient is a very lively, healthy-looking child, and the parents have commented on the great

improvement in her general condition and activity. There has been a striking increase in the muscular development of the lower limbs. An electrocardiogram taken on Oct. 24, 1948 (Fig. 3), showed that right axis deviation still persisted.

FIG. 3.—Electrocardiogram taken on Oct. 24, 1948.

Discussion

In published series (Abbott, 1928; Bramwell, 1947) the ductus was patent in only about 10% of cases of aortic coarctation of the adult type. The double lesion is therefore very rare. In our case the early appearance of a well-developed collateral circulation indicated a severe degree of coarctation, and the ultimate prognosis without operation was regarded as poor. In this connexion the literature shows a mortality rate of about 50% before the age of 30 and about 70% before 40. The presence of a patent ductus presumably increases the risk.

In cases of aortic coarctation the electrocardiogram usually shows a left axis deviation; the right axis deviation seen in our case is therefore noteworthy. Gilchrist (1947) has suggested that the explanation of this finding lies in the presence of a patent ductus arteriosus opening distal to the coarctation. In these circumstances the blood is believed to flow from the pulmonary artery to the aorta, thus throwing an additional load on the right ventricle. Our case supports Gilchrist's theory, though the small calibre of the duct and the persistence of the right axis deviation eleven months after operation suggest that this is not the full explanation. In bringing the ends of the aorta together no attempt is made to secure eversion of the edges as practised by Gross, since it is felt that anatomical apposition of the coats gives a stronger union. Crafoord passes the sutures down to but not through the intima; it was felt, however, that this practice increases the risk of a dissecting aneurysm. The rate of blood flow in the aorta seems to be an ample safeguard against clot formation over the sutures, a belief confirmed by observations in dogs (Gross and Hufnagel, 1945).

We are indebted to Mr. D. W. Purser for his drawing.

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In *Whereas They Were Blind* Dr. R. M. Macphail describes the ophthalmic work of a medical missionary in India. In 1894 his father founded the Bamdiah Mission Hospital in spite of the scepticism of colleagues and the timidity of Indians unused to the ways of European medicine. However, in 1947 over 8,000 patients were treated there and nearly 7,000 operations were performed. The pamphlet is handsomely illustrated and is obtainable for 1s. from the Foreign Mission Committee of the Church of Scotland, 121, George Street, Edinburgh.