

plete. The columnæ carneæ and muscoli papillares are very slightly developed; round and oval pits or depressions are seen over the ventricular surface. The conus arteriosus is contracted, measuring only 1.7 cm. in circumference close to the ring. Great difficulty was experienced in passing a probe through the *pulmonary* orifice, and on slitting up the artery it is seen that the segments of the valve have coalesced, leaving only a narrow orifice, through which a probe .9 of a millimetre in diameter can pass. The margins of the valves are fibrous, and the edges of the tiny orifice firm. The sinuses of Valsalva are large, appearing dilated. Pulmonary artery a little distance above valve measures 2.5 cm. in circumference. Interior healthy, except at one spot, near ductus arteriosus, which is atheromatous. Orifice of ductus arteriosus small, and tiny bristle can be passed through into the aorta. *Left auricle* presents nothing worthy of note. *Left ventricle* appears much smaller than the right. Length of chamber from aortic ring to apex, 4 cm. Mitral and aortic valves healthy; orifices of normal size. Aorta natural-looking. A small funnel-shaped dilatation exists at orifice of ductus arteriosus.

Measurement of the walls:—*Right Ventricle*—Outer wall at base, behind posterior segment of tricuspid, 1 cm. Anterior wall, middle, 1.3 cm. Close to septum, where excision has extended from base to apex, 2.7 cm. *Left Ventricle*—Anterior wall, near septum, 1 cm.

CASE III.—*Atresia of Pulmonary Orifice—Hypertrophy of Right Ventricle—Imperfection of Septum Ventriculorum—Patent Ductus Arteriosus.* (Plate.)

A. B., male infant, aged 13 days, cyanotic from birth. Body well nourished and of fair development. Skin of face of leaden hue, chest and abdomen darker. Umbilical cord at birth very small. The child suffered from paroxysms of dyspnoea, and died in convulsions.

Nothing special in *abdomen*. In *thorax* heart in pericardium occupies an unusually large area in anterior part of chest.

Heart large, all the chambers dilated and full of dark clots and blood. Length from root of aorta to apex 4 cm., circumference at base 12 cm., of which 7.5 cm. formed by right ventricle.

Right auricle dilated; endocardium natural. Foramen ovale partially closed, an oval aperture remaining, 5 m. long, 3 m. broad; behind this, separated from it by a thick process, is another tiny orifice in the septum. Superior and inferior cavæ large. Auricular surface of tricuspid valves studded with numerous gelatinous vegetations about the size of millet seeds. Tricuspid orifice looks large. *Right ventricle*: Length of chamber 3 cm., circumference 5.5 cm. Tricuspid valves healthy. Conus arteriosus narrowed to a small funnel-shaped tube which ends in a cul-de-sac, corresponding to which, on the exterior of the heart, is attached a narrow, cord-like vessel. Behind and to the left of the tricuspid orifice, occupying a position between the conus and left segment of the tricuspid, is a mass of beaded, gelatinous vegetations, from the apex of which a cord passes to either wall of the ventricle, anchoring it in this position. On inspection these vegetations are seen to spring from a thin membrane which forms the upper part of the ventricular septum; on pushing this back, an orifice is seen in the septum measuring 9 m. in transverse, 7 m. in vertical diameter. The lower border of this opening is formed by the muscular wall of the septum, which is here 5 m. in thickness, the endocardium about it thickened, and upon the free edge are some fresh beads of endocarditis. The upper part of the orifice is bounded by a thin translucent membrane, which extends in a valve-like form into the right ventricle, where by its beaded extremity it is anchored by the afore-mentioned chordæ tendineæ. This imperfection of the septum is

limited to the anterior part, the posterior portion is closed by a thin membrane, and to this the adjacent segment of the tricuspid valve is attached. Walls of right ventricle measure—anterior wall, middle, 9 m., at base 1.2 cm. Muscle substance pale and fatty.

Left auricle about half the size of the right. *Left ventricle* dilated, measures from aortic ring to apex 3.5 cm., circumference 6 cm. Valves healthy. Mitral and aortic orifices about normal size. Muscle substance not so pale as in right ventricle. *Aorta* is large, 2 cm. above valves measures 2.7 cm. in circumference. From under surface of arch a large ductus arteriosus springs, which joins the pulmonary artery at its bifurcation; the vessel is 8 m. in circumference. The *pulmonary artery* after leaving the heart passes as a narrow tube for 7 m., widening gradually until it reaches the point where the ductus arteriosus joins the main branches. In its narrowest part the artery admits a probe 1 m. in diameter. Main divisions of pulmonary artery appear of full size. *Lungs* present scattered patches of collapse. Nothing abnormal in the other organs.

CASE IV.—*Descending Aorta, with Left Subclavian, given off from Right Ventricle—Innominate and Left Carotid Arteries from Left Ventricle—Ventricular Septum Imperfect—Fusion of Segments of Semilunar Valves.*

Specimen was procured from a fœtus at the 8th month, which presented numerous other malformations—enormous umbilical hernia, spina bifida, hydrocephalus, talipes, &c.

Heart somewhat larger than the child's fist. Right auricle of moderate size, contains blood and clots; cavæ normal. Eustachian valve large; foramen ovale open, but a thin, translucent membrane can be drawn up from the posterior border of the annulus, and half closes the

orifice. Tricuspid valves present two bead-like hæmorrhagic nodules. Right ventricle larger than the left, walls 2 to 3 m. in thickness; conus arteriosus normal. From this chamber a large vessel is given off, 8 m. in width at the root, passes over the vessel emerging from the left ventricle, across the left bronchus and then descends as the thoracic aorta. Seven millimetres from its origin it gives off small pulmonary branches to the imperfectly developed lungs, and, just before it reaches the spine, the left subclavian, which passes vertically up to the 1st rib. There is no communication with the vessel arising from the left ventricle.

Left ventricle is smaller than the right, but the walls are thicker—3 to 5 m. Mitral orifice and valves normal. A vessel is given off from this chamber, which passes up upon the trachea for 1.2 cm. and then bifurcates, forming the innominate and left carotid arteries. The vessel is only about half the size of that given off from the right ventricle. The septum between the ventricles is imperfect. There is a small orifice, the size of a goose quill, situated in the upper and back part of the septum; to its upper border the left segment of the tricuspid valve is attached, and can be drawn down so as almost to close it.

Left auricle is small; pulmonary veins normal. Semilunar valves in both vessels are abnormal; in the branch from the left ventricle there are only two; in that from the right, there are only two of full size, and a tiny, imperfect one between them.

Remarks.—Cases ii. and iii. illustrate much more common varieties of cardiac abnormalities. Thus, of 181 cases of malformation of the heart, Peacock¹ found stenosis or atresia of the pulmonary artery in 119.

The point of interest in connection with Case ii. is the extreme degree of stenosis without imperfection of the

¹ On Malformations of the Heart. 2nd Ed., 1866.

EXPLANATION OF PLATES III AND IV.

PLATE III.

Fig. 1.—Atresia of Pulmonary Artery. With patent Ductus Arteriosus.
P.A. Pulmonary Artery.
D.A. Ductus Arteriosus, Case III. p. 186.

Fig. 2.—Ductus Arteriosus and Arch of Aorta in Case of General Dropsy of Fœtus.

A. Aorta.
P.A. Right branch of Pulmonary Artery.
D.A. Ductus Arteriosus, appearing as a direct continuation of the Pulmonary Artery. The aorta is narrowed just above the entrance of the duct. Case I. p. 177.

PLATE IV.

Illustrating Case of Stenosis of Pulmonary Orifice.

Fig. 1.—Shows the Pulmonary Artery laid open, the narrowed orifice, and distended sinuses of Valsalva.

Fig. 2.—Shows the stenosis of tricuspid orifice and the greatly hypertrophied right ventricle. Case II. p. 185.

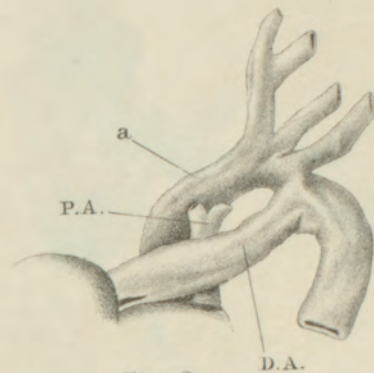


Fig: 2.

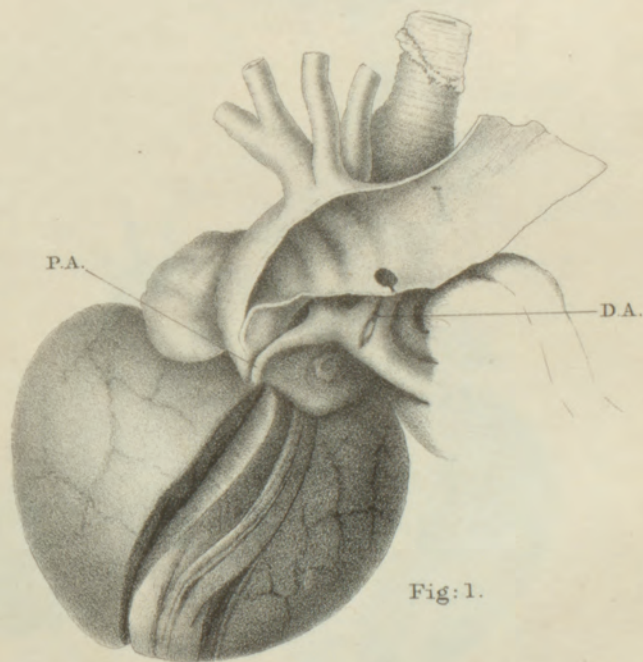


Fig: 1.