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ON THE FUNCTION OF THE PAPILLARY MUSCLES OF THE HEART.

(Translated from the German of Prof. Weber and Dr. Scoda.)

DEAR SIR,—Should you think the following view of the Function of the Papillary Muscles of the Heart, which has not as yet, as far as I am aware, appeared in English, worthy of a place in your valuable journal, you will oblige by its insertion,

Your's sincerely,

ARTHUR FISHER, M.D., &c.

Bonaventure street, 1st June, 1845.

Dr. Scoda, in a note to his original and excellent work on Auscultation and Percussion, whence the following paper is drawn, remarks—"A view similar to mine respecting the function of the papillary muscles, has been already published by Professor Weber, (Hildebrand's Anatomy, vol. iii., p 137.) Of this, however, I became only lately aware; and as I had met with no attempt to explain their use in any physiological work, I published my view in the Austrian Medical Journal, (Medicinisches Jahrbuchern Oesterreichs.) vol. xiii., art. 2, supposing that to have been its first appearance in print."

"Laennec," says Scoda, "conceived the connection between the papillary muscles and the valves, to be of such a nature, that the contraction of the former must open the latter. This mistaken opinion, consequently, led to the erroneous conclusion, that the papillary fibres did not contract simultaneously with the other fibres of the ventricles, but during the ventricular diastole, in order by opening the valves to furnish a passage for the blood into the ventricles. Bouillaud, on the other hand, thinks it quite evident that the valves are closed by these muscles.

No degree of strength, by which the papillary muscles, and, consequently, the tendinous cords arising from them, can be drawn in the direction in which they lie in the heart, will either close the valves or diminish the size of their openings. Hence their contraction cannot close the valves. It has also not been observed that the blood passes with increased difficulty from the auricles into the ventricles, in cases where these muscles are found to be flaccid. The opinions of Laennec

and Bouillaud respecting their functions are both erroneous; and as the valves cannot be closed by the contraction of the papillary muscles, there remains only one way in which they can, viz., by the pressure of the blood against them. The cords passing from the muscles to the valves, are evidently for the purpose of steadying, and preventing the passage of the latter backwards; for were the free edges of the mitral and tricuspid valves not held by the tendinous cord, the valves must necessarily be driven during the systole of the ventricles, by the stream of blood, partly into the auricles, and partly against the mouths of the arteries, so as completely to prevent their closing.

Of such importance to the function of the valves is the peculiar disposition of the cords upon them, that were this otherwise, the regurgitation of the blood into the auricles during the systole of the ventricles, could not be prevented. Notwithstanding this, an exact description of this distribution of the cords in the mitral and tricuspid valves is nowhere to be found; and even Bouillaud, who has made the heart so much his study, does not seem to have appreciated this distribution, or known its object.

Several strong cords run from each papillary muscle, to be inserted into the ventricular surface of the valve, from its centre to the angle which it forms with the side of the ventricle. From about the middle of these cords, and from the papillary muscles, there arises a set of weaker ones, which are inserted nearer the free edge of the valve. These again furnish a fixed point for others still more slender, which are inserted nearer to or into the free edge of the valve. To the auricular surface of the valve there are no cords attached.

If the papillary muscles be drawn upon in the direction in which they lie in the heart, the stronger cords which arise directly from them will alone be rendered tense; the weaker ones which arise from the stronger and are inserted nearer to or into the free edge of the valve, remain flaccid even when the greatest force is used, consequently the free edge of the valve can never be rendered tense by drawing on the papillary muscles; that portion which lies between their junction with the ventricular wall, and the point into which the cords arising from the papillary muscles are inserted, will alone be expanded. The rest of the valve, viz., the