

tery subjected to the sphygmograph, it produces an effect similar to the reservoir of a fire engine; the systolic shock is almost completely destroyed, the blood circulates by one continuous impulsion, and consequently the sphygmographic tracing becomes very perceptibly straighter.

This instrument must, therefore, become useful in recognising certain intrathoracic or auxillary aneurisms, when other means of diagnosis are difficult.

There are certain diseases which produce well-marked and characteristic changes in the circulation. Aneurism, chlorosis, and above all typhoid fever, increase the normal dichrotism; which is due to the feeble tension which exists throughout the circulating system.

We are here only able to give a sketch of the applications of the sphygmograph to physiology, as we have not had an opportunity of seeing the results of Dr. Marey's numerous experiments, which have only very recently been published; but to his kindness we are enabled to give a series of sphygmographic tracings, which represent the diseases most commonly met with in the circulation.

I.—Of the Pulse in Aneurisms.

The first of these tracings represents the normal pulse. The vertical and ascending line indicates the systole.

It is vertical because the systole is sudden, quick. The oblique descending line represents the intermediate time between two systoles.

The tension diminishing suddenly, the lever of the instrument descends: but, in the middle of its course, it receives a little shock, which is indicated by a slight curve: *this is the dichrotism*.

The second tracing shows an equality almost perfect of the ascending and descending line in the pulse, with a remarkable reduction in the angles and curve.

The aneurismal tumour destroys suddenly the impulsion of the column of blood given by the heart, in consequence of its elasticity.

II.—The Pulse in narrowing of the Aorta.

According to M. Marey, the difficulty which the blood has to overcome in passing from the ventricle into the arterial system causes the lever of the instrument to rise slowly, therefore, the ascending line becomes oblique. The dichro-

tism is here deficient in consequence of the slowness of the wane of the blood.

III.—Insufficient closure of the Aorta.

This tracing, which represents the general type of insufficient closing of the aortic valves, shows two remarkable things. The extreme vertical direction of the ascending line, which coincides or agrees with the violent shock felt by the finger when feeling the pulse; a sensation already adverted to and described by Corrigan, and also the extreme acuteness of the angle at its summit, which can be explained by the incomplete closure of the sigmoid valves, by which the column of blood is not prevented from flowing back suddenly into the ventricle, after its systolic expulsion.

IV.—Insufficient closure with narrowing of the Aorta.

These cases are of frequent occurrence and offer many varieties, yet, they all have their principal symptoms alike.

The vertical ascending line and the little hook, prove the insufficiency, the curved line slightly ascending, which follows, indicates narrowing.

V.—Affection of the Mitral Orifice.

The principal sign or symptom in these cases, is that the pulsation, so to speak, is abortive, besides which the pulse is very irregular.

Where there is narrowing or insufficiency of the mitral valves the column of the blood cannot be driven into the vessels with vigour or force.

Mr. Marey has not up to the present time specified the varieties of lesions to which the mitral valves are liable as indicated by the sphygmograph. But you perceive that the ascending line is not ample, and in some of the tracings some affection of the aorta co-exists.

VI.—The Pulse in Typhoid Fever.

The peculiar characteristic here, is the extreme manner in which dichrotism is shown, and which in this diagram is delineated by a convex curve intermediate between the ascending and descending lines.

VII.—A Curious and Undetermined Case.

The patient was extremely cachectic and suffering from lead colic.

The recent cardiographic labors of M. M. Cheveau and Marey have also thrown more