full, the author concludes, that they are in the ratio of the areas of the orifices, independently of their shape; and nearly as the square roots of the heights. In pipes bent at various angles the retardation occasioned by the flexure was not in proportion to their number.

A paper was read, "On the Sources and Nature of the Powers on which the Circulation of the Blood depends." By A. P. W. Philip, M.D. F.R.S. L. & Ed.

In the first part of this paper the author discusses the opinions which ascribe the powers that maintain the circulation in the veins to the elasticity of the heart, the resilience of the lungs, and the dilatation of the thoracic cavity in the act of inspiration. He shows experimentally that the circulation continues unimpaired when all those causes have ceased to operate; and that the very structure of the veins, the coats of which are so pliable as to collapse by their own weight, when empty, renders it impossible that the motion of the blood could be maintained in them by any cause corresponding to a power of suction in the heart.

The latter part of the paper is occupied by an inquiry into the sources and nature of the powers which really support the circulation of the blood. The capillaries, he observes, maintain the motion of their blood long after the heart has ceased to beat; this motion not being immediately affected even by the entire removal of the heart; but being accelerated, retarded, or arrested, according as the action of the capillaries is increased, impaired, or destroyed, by agents of which the operation is wholly confined to the vessels themselves. As the destruction of the heart does not immediately influence the motion of the blood in the capillaries, so the action of this organ, when in full vigour, can produce no motion of the blood in the capillaries, when these vessels are themselves deprived of power. Experiments are related with the view of proving that the arteries and veins, and more particularly the latter, are also capable of carrying on the blood they contain, even in opposition to the force of gravitation, with the greatest ease, and without the aid of any extraneous power. With regard to the nature of the power exerted by the blood-vessels, the author shows that the capillaries are as readily influenced by stimulants and by sedatives, as the heart itself; and that the arteries and veins may also be made to obey the action of stimulants; and further, that the power of the vessels bears the same relation to the nervous system as that of the heart, which is peculiar, and very different from the relation subsisting between that system and the muscles of voluntary motion. From the whole of the facts and experiments stated in this paper, the author deduces the conclusions, that the circulation is maintained by the combined power of the heart and blood-vessels, and that the power of both is a muscular power.

A paper was read, entitled, "A critical and experimental Inquiry into the Relations subsisting between Nerve and Muscle." By