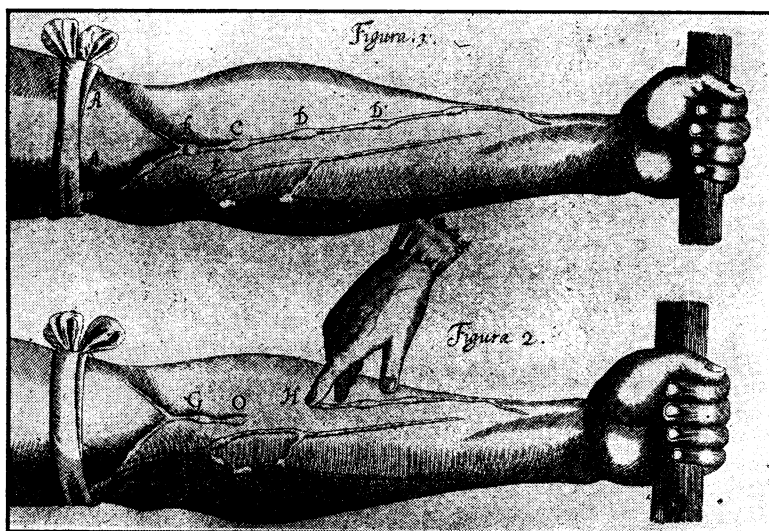


Classics of Science: Circular Movement of the Blood



HARVEY'S OWN ILLUSTRATION OF HIS EXPERIMENT which he described as follows: Let an arm be tied up above the elbow as if for phlebotomy (A, A, fig. 1). At intervals in the course of the veins, especially in labouring people and those whose veins are large, certain knots or elevations (B, C, D, E, F,) will be perceived, and this not only at the places where a branch is received (E, F), but also where none enters (C, D): these knots or risings are all formed by valves, which thus show themselves externally. . . . Apply the thumb or finger over a vein in the situation of one of the valves in such a way as to compress, and prevent any blood from passing upwards from the hand; then, with a finger of the other, streak the blood in the vein upwards till it has passed the next valve above, the vessel now remains empty; the finger being removed for an instant, the vein is immediately filled from below; apply the finger again and having in the same manner streaked the blood upwards, again remove the finger below, and again the vessel becomes distended as before; and this repeat, say a thousand times, in a short space of time. And now compute the quantity of blood which you have thus pressed up beyond the valve, and then multiplying the assumed quantity by one thousand, and you will find that so much blood has passed through a certain portion of the vessel; and I do now believe that you will find yourself convinced of the circulation of the blood and its rapid movement.

Dr. William Harvey here describes his reasons for believing that blood is sent out by the beating of the heart through the arteries, thence finding its way to the veins which return it to the heart. Although the microscope was then unknown, Harvey was able to demonstrate his belief by the easily duplicated experiment quoted here. It was not until four years after Harvey's death that Malpighi saw blood circulating in the lung of a frog.

AN ANATOMICAL DISSERTATION UPON THE MOVEMENT OF THE HEART AND BLOOD IN ANIMALS, BEING A STATEMENT OF THE DISCOVERY OF THE CIRCULATION OF THE BLOOD, by William Harvey, Franckfort-on-the-Maine, 1628.

Quantity of Blood

Thus far I have spoken of the passage of the blood from the veins into the arteries, and of the manner in which it is transmitted and distributed by the action of the heart; points to which some, moved either by the authority of Galen or Columbus, or the reasonings of others, will give their adhesion. But what remains to be said upon the quantity

and source of the blood which thus passes, is of a character so novel and unheard-of that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom become a second nature. Doctrine once sown strikes deeply its root, and respect for antiquity influences all men. Still the die is cast, and my trust is in my love of truth, and the candour of cultivated minds. And sooth to say, when I surveyed my mass of evidence, whether derived from vivisections, and my various reflections on them, or from the study of the ventricles of the heart and the vessels that enter into and issue from them, the symmetry and size of these conduits,—for Nature doing nothing in vain, would never have given them so large a relative size without a purpose,—or from observing the arrangement and intimate structure of the valves in particular and of the other parts of the heart in general,

with many things besides, I frequently and seriously bethought me and long revolved in my mind, what might be the quantity of blood which was transmitted, in how short a time its passage might be offered, and the like. But not finding it possible that this could be supplied by the juices of the ingested aliment without the veins on the one hand becoming drained, and the arteries on the other getting ruptured through the excessive charge of blood, unless the blood should somehow find its way from the arteries into the veins, and so return to the right side of the heart; I began to think whether there might be a movement, as it were, in a circle. Now this I afterwards found to be true; and I finally saw that the blood, forced by the action of the left ventricle into the arteries, was distributed to the body at large, and its several parts, in the same manner as it is sent through the lungs, impelled by the right ventricle into the pulmonary artery, and that it then passed through the veins and along the vena cava, and so round to the left ventricle in the manner already indicated. This movement we may be allowed to call cir-

(Just turn the page)

ARCHÆOLOGY

Irish Relics Not Genuine

The chipped stones from the sea-coast of Sligo, Ireland, which were recently described by the British archæologist J. P. T. Burchell as implements made by early Stone Age men, have become the subject of scientific controversy. A committee of Dublin investigators, R. A. S. Macalister, J. Kaye Charlesworth, R. Lloyd Praeger and A. W. Stelfox, have reported to Nature that they have investigated the caves on the Irish coast, and find that they are apparently of a much later date, geologically, than the Old Stone Age. They declare further that the chipped stones in question are of limestone, a most unsuitable material for implements, and that they can not find any evidence that the chipping is the result of anything but accidental fracture.

Science News-Letter, November 26, 1927

ORTHOEPEY

Accents Wild

On my shaky grammatical perch
I am made, very often, to lurch,
By some otherwise quite
Sane and sensible wight
Who says *re-search*, instead of
re-search.

Science News-Letter, November 26, 1927