The walls of the veins consist also of three layers, but there is very little elastic and muscular tissue in these and more of the connective tissue outer coating than the arteries possess. So when a vein is cut across, the vessel collapses and closes its opening, the thin walls falling together. But when an artery is cut across the thicker and more elastic walls do not collapse and so the vessel remains open. This will explain to you the reason why, in an operation, when an artery is cut this usually requires to be tied; because otherwise the bleeding would probably continue. It also explains the reason upon which stress is always laid in Lectures on Anatomy, why the blood coming from an artery issues out in jerks or jets, corresponding to the contractions of the heart and of the artery itself; whereas, when a vein is wounded the blood slowly oozes out, and the bleeding can be easily stopped by simple pressure. So in the circulation of the blood, the movement of the fluid through the veins is more slow than in the arteries, and is at the same time not caused so much by pressure behind, that is to say, by the contraction of the heart, as by suction in front. You know, for example, that in using a Higginson's syringe you squeeze the ball empty in order to clear it of air, and so form a vacuum into which the water from the basin is sucked up; so the right auricle when it contracts and pumps its blood into the right ventricle, forms a vacuum in its cavity which sucks up the blood from the larger veins, which again creates the flow upwards from their smaller and more remote tributaries. But it seems strange to many students that the blood should flow up the limbs and body so easily against the action of gravity, and the explanation of this is that at frequent intervals throughout the course of the veins, there exist little pouches or valves which, just like the valves of the heart, fall together and so prevent the regurgitation backwards of the blood above them.

There are certain diseases to which the arteries and the veins are subject, which you can now easily understand. Supposing the inside of the artery, at certain spots, became thinned, the pressure of the blood would cause a little indent, we will suppose, in the *endothelium*. This, in time, would become a little pouch, and the three coats would be pushed in front of it, and so a little bulging on the outside of the artery would be caused. Then, continued pressure would make the inside pouch, and so the outside bulging, larger and larger, until at last there would be inside the artery quite a distinct cavity, and on the outside a corresponding swelling. That, of course, would mean that the walls of the artery at this point would be stretched, and, therefore, thinner than they should be; and what is called an Aneurysm is formed. In such cases, Nature at once tries to prevent further danger and damage, because it is evident that if the thinning of the artery were to continue beyond a certain extent an opening in the artery might be formed — what is called a "rupture" would take place—and the blood, instead of coursing along its artery, would be poured out through the opening into the surrounding tissues, and, most probably, the patient would speedily die. Nature then attempts to strengthen the outside bulging by causing it to irritate the surrounding tissues, and these pour out a milky fluid known as *lymph* which, coagulating and hardening, forms an outer wall round the artery protrusion. Sometimes this process cures the aneurysm by raising a firm, solid barrier of new tissue round the artery. But, inside the vessel, Nature is also at work, and makes the blood, which is propelled into the aneurysmal cavity, clot slightly and so cause a deposit of *fibrin* on the thinned and sometimes ulcerated *endothelium*. Sometimes, again, the aneurysm is cured without the intervention of medicine or surgery, simply by this method of Nature's repair; layer after layer of fibrin being deposited by the blood as it flows over, round, and out of, the cavity until it is completely closed. Now you will understand that in cases of aneurysm of any artery of the body the efforts of the doctor are first directed towards preventing the rupture of the artery, because that almost inevitably means death, and secondly, towards closing the cavity by assisting the blood to deposit these fibrinous layers along its walls.

It is therefore essential that a case of aneurysm should be kept absolutely at rest, and should not be allowed to make the slightest bodily effort. If the doctor directs the quantity of fluid given to the patient to be restricted, this must be most carefully measured. By lessening the fluidity of the blood its tendency to clot and deposit fibrin in the aneurysmal cavity is of course increased. In external aneurysms, treatment often consists in making pressure upon the main artery above the swelling; for example, when the popliteal artery is affected and a pulsating arterial swelling is felt in the space at the back of the knee joint, pressure by the fingers is sometimes kept up for many hours upon the femoral artery as it passes from the pelvis, down the thigh, through the middle of the groin. By this means, the circulation of the blood through the aneurysm is lessened or prevented, and so its closure and cure is often effected. Internal aneurysms, of course, in the chest or abdomen cannot be treated in this method, and usually require direct surgical measures.

(*To be continued.*)

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