and in the very small proportion of solid constituents which it contains; these amounting to only five per cent. of its weight. Lymph may, therefore, be regarded as blood which is without any red corpuscles, and which is more diluted with water. You will remember that the lymph is poured into the blood from the thoracic duct, and being derived in large measure from the absorption of chyle from the alimentary canal, thus serves as a constant feeder of the blood with the nutritive material which has been taken up from the food.

The blood is propelled all over the body in a manner which is termed its *circulation* by the Heart, which may be shortly defined as a double pump. It consists of two separate halves, completely divided from each other by a solid partition down the centre, each half being again divided into two separate chambers, the upper one of which, on each side, is called the *Auricle*, while the lower one is called the *Ventricle*. From the ventricles pass the large vessels which are termed *arteries*, and into the auricles pass other large vessels which are termed *veins*. The object of the arteries is to pass the blood from the heart all over the body, and that of the veins is to return the blood back again into the heart.

Starting, then, with the right auricle, we find the blood being poured by the *superior vena cava*, or great vein of the body, into its cavity; the auricle contracts, just as the ball of a Higginson's syringe is capable of contraction by your hand. By so doing, you can pump fluid through the syringe and the appended tube. The Heart, by its contractions, pumps the blood through its own cavities and through the attached arteries. The right auricle then forces the blood which it has thus obtained into the right ventricle below it. The right ventricle pumps the blood into the pulmonary artery, which, dividing into two, conducts the fluid through every part of both lungs. Here, as you will see when you come to study physiology, the blood is purified by taking up oxygen from the air, and is returned by the pulmonary veins into the left auricle, from whence it is forced into the left ventricle, which, in its turn, contracting, pumps its contained fluid into the *Aorta*, or great artery of the trunk, and then through its many divisions and subdivisions into every part of the body. The arteries as they pass onwards become smaller and smaller as they divide and subdivide, and finally merge into what are termed *capillaries*, because these are vessels which are like hairs in their minute calibre. Then, just as streamlets starting from a mountain side run into other brooklets, and so unite to form small water channels, which, being joined by other effluents, gradually assume larger and larger size, till they reach the dimension of rivulets, which, again, being joined by others of like or greater magnitude, in time assume the name and size of rivers, and so flow onwards until in larger and larger volume they finally reach the sea; so the capillaries, joining others, gradually become merged into the vessels known as *veins*, and these by coalescence form the venæ cavæ, which, as we have seen, finally open into the right auricle of the heart, and so the cycle of the circulation of the blood is duly fulfilled. I need not here go into details with respect to this matter because they fall more fittingly within the purview of physiology, and to text-books on physiology I would therefore refer you for further information upon it.

The essential point, however, is to remember the cycle of circulation, because it will explain to you matters which would otherwise be obscure, and which will frequently come under your notice in surgical nursing. For example, bleeding is one of two kinds, either arterial or venous, according as the blood is coming from a torn artery or a ruptured vein. The causes of bleeding will be sufficiently obvious to you to need no great consideration; externally, a cut or tear may pass through a superficial vessel, and cause the exudation of its contained blood, or, in the deeper tissues, a sprain or fracture, as we have already seen, may have the same effect in tearing through the vessels. What we must understand is the symptoms of the differences between arterial and venous bleeding, because upon our correct comprehension of those differences will depend the reasons which will actuate us in our treatment. Arterial bleeding, then, is distinguished by coming forth in jets. Raise a Higginson's syringe with its outer end in the water, and squeeze the ball sharply. The jet of fluid which will be propelled into the air exactly resembles the jet of blood which the muscular action of the heart and the contraction of the arteries causes to be propelled from a torn artery. Turn the nozzle of the syringe downwards and allow the fluid to flow away steadily, gently, and without any rhythm, and you have the character of venous bleeding; the blood having its suction force in front—at the heart, and the propelling power of the arteries having been lost by the intervention of the capillaries, the blood can only flow away from the veins, and is not forcibly pumped out as from the arteries. Arterial blood, again, which has been oxidized by its passage through the lungs, is as a rule of a bright scarlet colour, and is therefore distinguished from the venous blood, which, having passed through the tissues, and having taken up their impurities, is of a dark and purplish appearance. This distinction, however, is to some extent theoretical, because very rapidly after the blood flows into the air it becomes oxidized and assumes the scarlet colour of the arterial fluid. The character of the jet is, therefore, the sign upon which we must place most reliance in determining the nature of the vessel from which the hæmorrhage is coming.

previous page next page