

mitre in shape, and hence often called the *mitral* valve. The wall of the right ventricle is thinner than that of the left, from the simple reason that it has not the same propelling or forcing action to perform. The right and left auricle are alike in thickness, having the same object in view, that of receiving the blood and passing it on to the ventricle.

The *venæ cavæ*, you understand, are the channels by which the venous blood is collected from the body and carried to the heart, where it is first poured into the right auricle, from thence through the valve into the right ventricle. It next enters the *pulmonary arteries* for transmission to the right and left lung, where it is arterialised, and becomes, from being a dark red colour, a bright scarlet. This being accomplished in the capillaries, the blood passes to the *pulmonary veins* back again to the heart into the left auricle, from whence it passes through the valve into the left ventricle, finally being distributed or pumped through the aorta to the whole body by the smaller arteries, and so on to the capillaries again.

The *portal circulation* is simply a branch of the greater circulation. Certain arteries carry the blood to nourish the stomach, intestines, spleen and pancreas; after performing this office, it is collected by a number of veins at last uniting and forming a large vein, called the *portal vein*. This blood is carried by the portal vein to the liver, affording material from which that organ prepares the bile. The blood then enters the substance of the liver, and the portal vein breaks up into small capillaries. The liver then takes from the blood what it requires for the manufacture of bile, and the blood is finally again collected by the *hepatic vein* and conveyed to the inferior vena cava.

All this wonderful movement is accomplished by muscular contraction. The contraction of a ventricle or auricle is called its *systole*; whilst the relaxation is termed *diastole*.

The aorta and its branches, besides being surrounded by sheaths of cellular tissue and loose fat, are well protected, not only within the body, but even in the limbs, where the main arteries are placed on the inner side of the corresponding bones. The smaller branches of the arteries join frequently together, or *anastomose* as it is called, and by this means the supply of blood is equalised and insured against the effects of temporary pressure. Along the course of even small arteries the force of the heart's action is strongly exerted, and when one of these vessels is wounded, the blood escapes by jets corresponding in rhythm with the pulse. In the finer of the arteries, though the stream is slower, at last becomes a continuous stream, like that of the veins and capillaries. You

will find it useful to know a great deal more about the circulation of the blood than I am able to tell you, and I should advise you to read the very full and plain account of it in Mr. Marshall's work,\* from which I venture to copy for your use the following valuable remarks:—

“In case of an accident, or any escape of blood from a wound, you may distinguish without much difficulty whether it be venous or arterial. If it be venous the stream will be dark and continuous, and should be checked by pressure upon the wound, and on the side of the wound away from the heart; if arterial, by pressure upon the wound and between it and the heart, for in the former case the stream which supplies the escaping blood is returning to, and in the latter is coming from that organ. In exceptional cases, or arterial *arches*, as in the palm of the hand, pressure must be applied mainly over the bleeding point. A small pad of linen held down by the thumb, is as useful and certain a method as any for an unskilled person.”

I should advise you to make yourself acquainted as soon as possible with the names and directions of the principal arteries, for such knowledge may sometimes prove invaluable even to a Nurse.

It will be very useful also to practice yourself in feeling the pulse under different conditions. You ought to know well the condition of pulse usual in a state of health, of fever, of exhaustion. It may seem at first that such a thing falls only within the Doctor's province, and no doubt the nicer distinctions of a pulse are only to be discerned by the Doctor; but a Nurse who has accustomed herself to observation of the pulse, may by such experience be able to know when to go for the Doctor. In a healthy man you can generally count from sixty to seventy beats of the pulse in a minute, in a woman from seventy to eighty. The pulses of children generally beat rather faster.

I do not think that it will ever come within your province as Nurses to listen critically, as Doctors do, to the sounds of a patient's heart, but it may interest you to learn that there are two, one which is called the *systolic sound*, and coincides with the contraction of the heart. This is the first sound, and barely precedes the beat of the pulse at the wrist. The other is the *diastolic sound*, and takes place the instant the heart returns to the condition it was in before the contraction. The first of these sounds is a dull noise, the other a shorter, smarter sound. The whole period, from the beginning of one pulsation of the heart to the beginning of another, has been divided by some physiologists into five equal parts, two

\* A Description of the Human Body: its Structure and Functions. Illustrated by Nine Physiological Diagrams. Published by Alfred Jarrant, 17, Searle Street, Lincoln's Inn Fields, London.

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