Lectures on Anatomy and Physiology as Applied to Practical Nursing.*

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LECTURE II.

(*Continued from page 4.*).

The points at which the various opposed bones touch each other are known as *joints* or *articulations.*

The ends of the bones are coated with *cartilage* so as to lessen friction and assist in the easy movement of the joints. Covering the cartilages is a skin which is termed the *Synovial Membrane* and which secretes an oily fluid which lubricates the joint, and as we shall shortly see, this membrane and its oil play an important part in joint diseases. Outside the cartilages, the joints are bound together by fibrous bands which are termed *ligaments*, and which prevent the opposed surfaces from slipping out of apposition with each other.

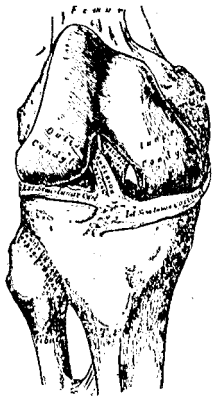

Fig. 21.—Showing the cartilages and internal ligaments of the knee joint.

Finally, over the ligaments pass the muscles, which, as we shall see later, are attached deeply into grooves in the bones themselves, and by their contraction and relaxation enable the bones to move freely over each other at the joints. Fig. 21 illustrates the arrangement of the cartilages and internal ligaments of the knee joint and the binding together of the *femur* above and of the *fibula* below to the head of the *tibia.*

The joints are generally classified into *perfect* and *imperfect.* The imperfect joints are those in which the conjoined bones or cartilages have no free surfaces capable of rolling easily upon one another, but are connected by continuous cartilages or ligaments, and therefore have only just as much power of movement as is permitted by the movability of the joining substance; for example, such joints are found in the spinal column—the flat surfaces of the bodies of the vertebræ being bound together by thick plates of elastic cartilage which subserve another purpose besides that of junction, inasmuch as these form buffers between the bones, and so not only prevent undue friction and consequent wear and waste of the bony substance, but, just like the buffers of a train, prevent jarring. They confer a certain amount of elasticity upon the whole spinal column, and yet allow a limited amount of movement between the different bones. As a practical illustration of this, we know that when we jump from a short height, and alight upon the feet, if the distance be an ordinary one, we feel no excessive amount of jolting—the force of the shock being spent and distributed upon the buffers between the bones of the lower limbs and those of the spine.

In the pelvis, the pubic bones are united to each other in front, and the iliac bones to the sacrum behind, by a tissue which is denser and firmer than ordinary cartilage, and is therefore termed fibro-cartilage. This prevents much movement and yet permits a little more elasticity than there would be if the pelvis was all one solid bone. This fact is of special importance in obstetric work because it explains the certain amount of pelvic distension during labour. It also explains the object of a modern operation which consists of cutting through the cartilage which unites the pubic bones, in cases where contraction of the pelvis exists to such an extent that ordinary labour is rendered difficult or impossible. The effect of the operation, which is a very simple and fairly safe one, is to permit the separation of the bones in front, and thus a general enlargement of the pelvis in consequence; and delivery has been safely effected, in some cases even of extreme deformity, in which, formerly, the child would have been removed piecemeal, or the mother's life would also have been risked by the performance of Cæsarian section.

In *perfect* joints, the opposed bones roll freely upon one another, and are of various shapes; *convex*, or rounded like a ball, like the head of the upper arm, fitting into the *concavity*, or saucer-like hollow, of the shoulder joint; or to a still greater extent in the case of the hip-bone and thigh; and these are termed *ball-and-socket joints.* The *hinge joints* such as the elbow and the knee, and the *pivot joints* such as the axis

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previous page next page