Elementary Anatomy,

AS APPLIED TO NURSING.

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LECTURE II.

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THE points at which the various opposed bones touch each other are known as *joints* or *articulations*. These 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, and 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. When you begin to study obstetrics, you will realize the importance of this fact in connection with a new operation which is now coming into much favour, and 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 safe one, is to permit the separation of the bones in front, and thus a general enlargement of the pelvis in consequence, and so delivery can be safely and easily 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 bony surfaces roll freely upon one another, and are covered with cartilage, while between them is placed a sort of sac, which lines these cartilages, and to some extent forms as it were the side walls of the joint. This sac secretes an oily lubricating fluid called the *synovia*, and itself is termed *synovial membrane*. The opposed surfaces of these perfect joints are of various shapes; convex, like the head of the upper arm fitting into the concavity of the shoulder joint, or to a still greater extent in the case of the hip bone and the 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 and atlas—as the two uppermost vertebræ of the spinal columns are called—are good examples of the other forms of joints. 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. 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 play freely over each other at the joints.

An essential point to remember with regard to the joints is that where great mobility is required the surfaces of the joints are shallow, or, so to say, saucer-shaped. Place, for example, a marble in a saucer and you can understand the extreme range of motion which it possesses; so with the upper arm, the saucer-shaped cavity of the shoulder permits the humerus to swing backwards or forwards, outwards or inwards, or to rotate round, with a large range of mobility. But where great strength is required, we find that the joints are cup shaped, giving certainly a greater strength to the opposed bones, but just as much reduced a power of movement as the marble would have, compared with its movements in the saucer, if we now transfer it to an ordinary cup. A good example of the cup-shaped joint is presented, therefore, in the hip joint, which practically has to bear the weight of the whole trunk. The practical importance of this point to Surgeons and Nurses is that we find, as we might expect, that dislocations or displacements of a joint much more commonly occur in the freely moving bones, that is to say, in the saucer-shaped joints, than in those that are provided with deeper and stronger surroundings.

With reference to the injuries to which joints are liable, the most common is that which is known as a *sprain*. The history of such an accident is simple—a sudden forcible strain takes place, as, for example, in the case of a man

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