Elementary Anatomy,

AS APPLIED TO NURSING.

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LECTURE II.

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We now come to consider a class of tissues of the body which are more easy, perhaps, to understand than those which we have hitherto discussed, because their presence and their action can, to some extent, be easily ascertained by anyone. If you place your left hand upon the upper part and front of your right arm, and lift the right hand towards the head, you will feel a soft mass under your hand swell, harden, and become more prominent. As you extend your arm again, removing the right hand from the head, this mass and hardness diminishes and disappears. Now, if the skin were removed from the front of your arm, you would find that the body which you thus feel, is a mass of flesh covered with a thin fibrous fascia, and ending, above and below, in tendons, by means of which the *muscle*, as it is called, is attached to the bones. And, the swelling and hardness illustrates the peculiar property of muscles, upon which their usefulness depends—the power, that is to say, of contracting by shortening in length, becoming broader and thicker in consequence, and then of returning to their original length, and diminishing in breadth when the contraction ceases. It is in consequence of this contractile property of muscle that this tissue is the great moving power of the whole body, the muscles being so arranged and so attached to bones that, by reason of their contraction, movements must ensue. Look, for example, again at the upper arm, and you can understand that the muscle which you felt converts the upper arm and forearm into two levers, the fulcrum being at the elbow joint, and the muscle forming the power which moves them. In general terms, therefore, it is well to remember that the whole of the skeleton consists of systems of levers, each one of which has its own fulcrum; that is to say at the connecting joint, and each of which is moved by the various muscles which are attached to the opposed bones.

It usually happens that the bone to which one end of the muscle is attached is absolutely or relatively stationary, whilst that to which the other end is fixed is more or less moveable. In this case the attachment of the stationary bone is termed the *origin*, and that to the moveable bone the *insertion* of the muscle. Sometimes the fibres of muscles are fixed directly into the bones along hard ridges, but more commonly the muscles end in strong cords or bands of fibrous tissue, called *tendons*, which are inserted into the bony attachments. When the tendons or muscles play directly over hard surfaces, such as the ends of the bones, they are generally separated from these surfaces, and so friction is reduced to a minimum, by small bags containing fluid, which are called *bursæ*, the internal lining of which is similar to the internal membrane of joints, and secretes an oily fluid resembling the synovia. Sometimes these bags become inflamed from long continued pressure upon them, a most frequent example of which is seen in the condition popularly known as the *housemaid's knee*, a strictly analogous condition being known as the *miner's elbow*; the kneeling of one inflames the bursa over the patella, while the pressure of the miner on his elbow, while hewing at the coal in front of him, causes inflammation of that over the olecranon. The consequence of this inflammation, which is termed *bursitis*, is first of all considerable swelling, with pain and redness over the affected place. This often disappears with no other treatment but rest, but if the swelling persists, it is customary to try first of all an application of iodine or some similar counter-irritant, so as to remove, if possible, the effused fluid, and if this measure fails, or if the contents of the bursal sac become purulent, an opening has to be made into it, treating it as if it were an ordinary abscess. Prevention, however, is better than cure, and when any tendency to *bursitis* shows itself, a thick pad of flannel or cotton wool should be worn over the bursa, so as to prevent the harmful pressure upon it.

When we look more carefully at the exact constitution of a muscle, we find that it consists of a large number of fibres bound together precisely as a piece of elastic consists of a number of threads all bound together by transverse bands around them; and, as was previously said, a broad piece of elastic is in its action strictly analagous to the action of muscular fibre. The fibres are bound together by what is termed connective tissue, with blood vessels and nerves running amongst them, into small bundles, and these small bundles again are bound together by stronger fibres or connective tissue or fascia, so as to form muscles of various shapes and sizes. It is very easy to understand that muscle during life is a very elastic and soft substance; but when a muscle is removed from the body and the blood which it contains has been removed, pressure upon it causes a fluid to be exuded which coagulates very rapidly; and at a shorter or longer time after death, this same coagulation takes place in the dead muscle, making it more or less opaque, instead of clear and transparent as during life; fixing it into hard rigid masses which retain the form which they possess when this coagulation commences. Now, this is a very important practical fact, because it explains to you why the limbs become fixed in the position in which death found them, and why a corpse passes into the condition which is known as the death stiffening or *rigor mortis*. After the lapse of a certain time this coagu-

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