

**Lectures on Elementary Physiology
in relation to Medical Nursing.**

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LECTURE IV.—THE EXCRETORY ORGANS.

IT will be remembered that, in the first Lecture, it was shown that in the human body a large amount of waste and repair is always going on; that, just as the coal burning in the fireplace gives out heat and forms an ash and smoke, so the human body maintains an even temperature, life, and motion, at the cost of a constant consumption of its tissues and, therefore, a continual loss or waste of the substances of which these are constituted. In order to keep the body in working order, it is therefore necessary, as was previously shown, that the waste of these materials shall be compensated for, by the formation of new tissues; and that the repair must be equal to the waste if the body is to be maintained in health and strength. If the repair is not equivalent to the waste, the strength and then the health of the body must deteriorate. Consequently, the object of the organism is to exactly provide by reparative measures for the waste incurred by the processes of life. The chief organs of repair are, as we have seen, those concerned in the *Circulation of the Blood* and in the *Digestion of Food*—the latter preparing materials for the former to convey to every part of the body, and thus substitute new elements for those that are used up. The organs by means of which the wasted materials are for the most part thrown off from the body, and which therefore are called the chief organs of Excretion, are the Lungs, the Skin, and the Kidneys. The Lungs, we have already seen, remove carbonic acid from the blood, supplying oxygen in its place, and thus giving the tissues the element which they require, while removing from the body a waste product, the retention of which would be poisonous to the system generally. UREA and other forms of nitrogen, which represent equally poisonous products and waste, are chiefly removed by the Kidneys; while water and some acids are removed both by the Skin and the Kidneys, although no inconsiderable portion of the former also passes off from

the Lungs in the shape of insensible vapour. It is well to remember that whereas the Lungs—as we have seen—supply, in the form of oxygen, an element which is essential to the life of the tissues, the other excretory organs—the Kidneys and the Skin—give nothing, and only take away.

It is most important, also, to remember this close connection which exists between the work of the excretory organs; because, in consequence, illness affecting one has more or less influence upon the others. For example, patients suffering from some Skin diseases are very liable to suffer from disorders either of the Lungs or of the Kidneys. Patients in whom the function of the Kidneys is disturbed, very frequently suffer in consequence from serious Lung complaints. This important truth, common-sensible though it seems when one remembers the analogous parts played in the purification of the system by the three excretory organs, will explain to you many obscure symptoms which occur in the course of disease apparently affecting only one of the three.

To some extent, these organs assist each other in their work. For example, the Skin and Kidneys can relieve each other of no inconsiderable part of their respective duties. In cold weather, the skin is chilled and its action is therefore diminished, so that there is less perspiration formed—that is to say, less water is excreted from the surface than at other times. Then we find that, in a healthy person, the Kidneys take on increased activity, and the quantity of Urine is greater than usual. On the other hand, in hot weather, the Skin is warm and its vessels are more or less relaxed—consequently there is more perspiration; and then, as a result, the quantity of urine excreted by the Kidneys is diminished—that fluid becoming darker and thicker. As we shall see more clearly, hereafter, great practical lessons, in the treatment of Disease, may be learned from these simple physiological facts.

In the treatment of Skin diseases, medicines which increase the action of the kidneys and which are called *Diuretics*, are largely employed with the best effect. So again, in the treatment of diseases of the Kidney in which the quantity of the urine is greatly diminished, the greatest relief is afforded by medicines which stimulate the action of the skin, and which are known as *Diaphoretics*. In

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