

Notes on Physiology for Probationers.

Lectures delivered to the Nurses at the National
Hospital for Heart Disease.

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DIGESTION.—Food in some form or other is a necessity to all animals, because all parts of the body serve some purpose, and are constantly in action, and to make up for the wear and tear thus involved, new materials must be taken up and assimilated, in such a manner, that they may help to build up new growing tissues, and repair the loss of those tissues already in use. The subject of digestion is a very wide one, and embraces not only a description of the various kinds of food taken by man, but also an account of how these foods are changed and re-changed in the body, until they finally become modified, and are able to be absorbed by the blood, by which means they are distributed to all the tissues of the body.

Classification of Foods.—We can classify foods into four great categories.

1. Nitrogenous or Proteids.
2. Hydro-carbons or Fats.
3. Carbo-hydrates or Starches.
4. Inorganic or mineral.

1. *Proteids.*—This very important class contains substances of complex chemical composition; the commoner chemical elements found in proteids are carbon, nitrogen, hydrogen, oxygen, and sulphur. The chief proteids which enter into our daily food, are albumen in eggs, myosin, which is found in the muscles of animals, casein in cheese, gluten in bread, legumen in peas, and a small amount of albumen exists in potatoes.

Proteids increase the oxidation changes in the tissues, leading to a very rapid consumption not only of themselves, but also of non-proteid foods as well. Sometimes it is necessary in disease to give proteids in excess, such as those in which a rapid renewal of the tissues is sought for; on the other hand, proteids sometimes, when taken in excess lead to disease, a fact known by the presence of uric acid, a derivative of proteids, always being found in the urine of patients subject to gout.

When proteids are completely oxidized they yield ammonia, carbonic acid gas, and water, but in the body this complete oxidation never takes place.

2. *Hydro-carbons or Fats.*—The fats which are taken as food are three in number—olein, palmatin, and stearin—the first named is fluid, palmatin semi-fluid, and stearin is one of the solid fats.

The use of fats in the body is for the production of heat and the performance of muscular work; it is stored away as adipose (fatty) tissue till it is required. The reason why fats are of so much use in producing force is that they contain such a great quantity of hydrogen and carbon, and experimentally it has been shown, that the capacity of a material for force production depends upon the amount of carbon and hydrogen it contains in an unoxidized form, and among all substances which we take as foods, none have this character more marked than fats.

Carbo-Hydrates or Starches.—The chief starches are ordinary starch, cane sugar, grape sugar, and milk sugar. Starches contain carbon, hydrogen, and oxygen, but the oxygen exists, relatively, in much larger proportion in starches than it does in fats. The use of the starches are for giving rise to heat and force production; they become changed in the body and finally are broken up into carbonic acid gas and water.

Inorganic or Mineral Substances.—More than half of the food we take consists of water in some form, and we find it necessary to take certain mineral salts in our food, the ordinary one being the common table salt, which in chemical language is called chloride of sodium.

Diet.—It has been clearly demonstrated, not only by experiments on animals but by observations of our daily life, that a mixed diet is essential for the maintenance of health, and by mixed diet I mean a proportion of each of the four great sub-divisions into which food-stuffs are divided. The one food, in itself, which contains all the four varieties is milk, and it is a matter of every day experience to everybody how babies are nourished on this fluid, and to you, as nurses, is afforded the opportunity of observing how life is maintained, in some cases for weeks and weeks, by this solitary food.

Dietaries.—Different amounts of food are requisite in the varying conditions of life, thus, much more is necessary when a man has work to perform than when one is in a state of idleness, and as is well known, the quantity of food that will keep children alive and healthy would be totally inadequate in the case of adults.

Errors in the quantity of food.—Food in excess is injurious, and the injury it causes is dependent upon the kind of food which is taken in too large a quantity; briefly, if there be an excess of proteids too much work is thrown upon the excretory organs, especially the kidneys, and gout and in-

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