Royal British Nurses' Association.

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LECTURE: BIOLOGY.

By MR. IAN REES, B.Sc.

Mr. Rees explained that it was impossible in an hour to do justice to such a subject. After defining the term biology he said that it has nothing to do with life in the sense of living, that is a matter for sociology. Neither has the study of it anything to do with life and death, that lies in the sphere of the physician. It may be said to hold the central place among the sciences and is capable of being divided into many sub-divisions, such as bacteriology, zoology and others. Mr. Rees named some great biologists from Aristotle down to William Harvey, whose book on the subject is a classic. The study of biology would not have progressed much farther but for the invention of the microscope, and the names to be remembered in connection with its early use are Hook, Grew and Malphigi. Then came the famous Linnæus, who is responsible for the nomenclature now in use in botany and zoology. The great advance in chemistry arose when the nonconformist minister, Priestley, discovered that the atmosphere consists of gases and he, in co-operation with a French noble, Levoisier, brought the subject farther, establishing the fact that the burning of a candle and the metabolism of an animal are exactly the same in process. The next step in biology was the discovery of protoplasm, a semi-fluid substance endowed with the property of life. Charles Darwin's is the best known name in the history of the study of biology.

The lecturer gave examples of how characteristics and physical conditions are transmuted in certain generations and not in others. Then, in speaking of the cell, he described its discovery as a great triumph upon which the modern science of biology had been built up. Mr. Rees drew diagrams showing the cell as a unit consisting of protoplasm containing a small body of modified protoplasm termed the nucleus and, contained within this, a still smaller body the nucleolus. Also in the protoplasm are small granular particles, which may be waste products, and here and there a vacuole may occur. All living things are composed of cells, but the character of these vary enormously; at the one end of the cell are living creatures, the amœba, consisting of a single cell, at the other end are the animals and man, built up of modifications of the cell, such as muscle cell, bone cell, etc. The single amœba, often found in ponds and ditches, when examined under a microscope, shows cell wall, nucleus, waste products and possibly a food particle. The amœba, this minute particle of semi-fluid life, can move about rapidly, it can assimilate food and reject what would be harmful to it; it is sensitive, it breathes and it eliminates waste products.

With regard to the question "What is protoplasm?" the answer is difficult; it is the essence of all living structures, but its composition is one of the fundamental problems of biology. It consists of 75 per cent. of water and, for the remainder, it is composed of protein, carbohydrate and mineral salts. The important point in relation to protoplasm is its metabolism. It has the characteristic of growth; it has properties of nutrition and excretion, and it requires oxygen, hence respiration is necessary to plant and animal life. Plants derive carbon dioxide from the air, and nitrogenous substances from the soil. By means of a chemical action, known as photosynthesis, plants can absorb carbon-dioxide with the underside of their leaves and build up carbon in themselves. Very little is known about photosynthesis except that it comes about by the action of sunlight on the green colouring matter of plants, *i.e.*, chlorophyll, a substance about which a good deal of nonsense is written and spoken. There are in fact four chlorophylls.

Mr. Rees next gave particulars of the effect of temperature and its changes on protoplasm and of how the changes, effected by temperature, influence growth. In concluding, he said that, with reference to material benefits, a study of biology is important to the food supply, the conquest of disease and the quest of positive health. Through such study two plants can be made to grow where only one did before, and biology solves many problems in finding how suitably to use up waste land; it is also called in to solve the question of feeding the increasing population in certain countries. Instances of the development of wheat growing through a study of biology were related. Poultry farming also owes much to biology.

In concluding, Mr. Rees gave considerable information on the relationship of the various vitamins to biology; as comprehensive articles on these have already appeared, we need not recapitulate his remarks. At the close of his lecture, Mr. Rees was accorded a very hearty vote of thanks for his interesting lecture, which we have only been able to report very briefly.

THE JANE BATH MOORHEAD MEMORIAL.

The Helena Benevolent Fund, by its title, memorialises the first President of the Association, her late Royal Highness the Princess Christian, and a custom has arisen, almost of itself, in recent years of placing within this fund memorials to members of the Association who have taken part in its varied activities and shown that they have a realisation of the responsibilities of membership. There are those who become members for what the Association can bring to them personally, as, for instance, when through it they can join the co-operation. There are others who join from a purely professional spirit, from the point of view that, by becoming members, they will strengthen organisation and lend their support wholeheartedly to the efforts of the Association to promote and to defend professional progress. It is not to be desired that the names of these should sink into forgetfulness, and when Miss Mary Little sent us, a number of years ago, a sum of money in memory of her sister, Miss Charlotte Little, one of those who left their mark in the profession and the Association, this was invested and established the "Charlotte Little

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