OUR PRIZE COMPETITION.

STATE WHAT YOU KNOW ABOUT THE PHYSIOLOGY OF THE OPEN-AIR TREATMENT.

We have pleasure in awarding the prize this week to Miss Lucy C. Cooper, Westminster Infirmary, Colindale Avenue, Hendon, N.W.

PRIZE PAPER.

The physiology of open-air treatment lies in the knowledge of the constituents of the atmospheric air, and the part it plays in life. Atmospheric or pure air is composed of oxygen, nitrogen, and carbonic acid gas; in 1,000 volumes the quantities of each are as follows: oxygen, 209; nitrogen, 799; carbonic acid gas, 0.4. Of these the principal is oxygen; without oxygen, plants would lose their colour, fires or lights refuse to burn, and the human blood lose its red colouring matter. Yet civilised human beings build houses and shut themselves up, shutting out the means of securing the very element which is to preserve health.

Education in sanitary science is doing much to enlighten people, but it was in connection with tuberculosis that what is known as open-air treatment was first carried out. But oxygen is nevertheless none the less valuable in all and every kind of illness when the sickness makes it impossible to get abroad to obtain it.

In a normal healthy routine life a certain amount of outdoor exercise enters into the arrangements of the day. Thus, the walk to and from school in childhood, or outdoor recreation when residing within school or college; walking to business in later life; in domestic life, the daily shopping; in society life, the walk, drive, or call, &c. In all these instances there is the healthy exertion; and the lungs, and with them the whole of the body, are cleansed of foul matter, and a good supply of the life-giving oxygen takes its place. In studying the physiological functions of the human body we find the greatest work is done by the blood, which has to carry oxygen into the most microscopic tissues all over the body; also to carry back waste matter, chiefly carbonic acid gas, which is produced by combustion of forces which go to make up energy. The oxygen is inhaled or inspired by the act of breathing into the lungs, and the carbonic acid gas is expired by means of the lungs. A certain amount of moisture, from 25 to 40 ounces, is also given off from the body by means of the lungs and skin; these waste matters are as dead ashes from a fire, and, in the same way that ashes are cleared right away from the grate, so ought the waste matters to be cleared right away from our bodies, and not by any means be re-breathed into the system. If such is done it shows itself as a slow system of poisoning, and we get headaches, lassitude, anæmia, loss of appetite, and gradually develop into a condition in which disease finds a ready entrance.

The danger is greater where, as in phthisis, it is the lung itself that is diseased, and so, to carry out both purposes, the well-known open-air treatment was inaugurated, and when climatic surroundings are favourable we get splendid results. Two very great drawbacks to be faced are, first, the unsuitability of our English climate for the steady carrying out of this system. Secondly, in nine cases out of ten the treatment is started too late to arrest the progress of the disease. In arranging for the carrying out of the open-air treatment a revolving shelter, with back and two sides closed, will be found most suitable, as, by turning the back to the windy quarter, we can keep our patient always in the open, yet free from the draughts which make the carrying out of the treatment indoors by means of open windows or doors so trying. We must meet the various changes of weather by additional clothing, hot-water bottles, and nourishing food, plenty of milk and fat foods, also cereals. Meat is in itself not so necessary a part of the diet. Exercise also, when possible, should be arranged as part of the treatment; this might be taken as a walk, gardening, or even being wheeled about in a chair. Drugs play a very important part in the treatment of a phthisical patient undergoing outdoor treatment, the object being to heal up the diseased tissue and strengthen what remains of the lungs. Sputa also are carefully removed, and all excreta from the body; also soiled linen is taken immediately away.

HONOURABLE MENTION.

The following competitors receive honourable mention:—Miss Dora Vine and Miss B. Macdonald. We have received fewer papers than usual this week, and the subject is one which evidently needs studying by our readers. We commend to their notice the "Report on Ventilation, and the Effect of Open Air and Wind on the Respiratory Metabolism," by Professor Leonard Hill, F.R.S., in his Reports to the Local Government Board on Public Health and Medical Subjects (New Series, No. 100), published by Wyman & Sons, Ltd., 29, Bream's Buildings, Fetter Lane, E.C. 1914. Price 9d.

Concerning this report *The British Journal of Tuberculosis* says:—

Professor Leonard Hill has embodied the results of an extended investigation regarding respiratory exchange in man under varying

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