

A Short Series of Lectures to Ward Sisters.

LECTURE I.—THE NATURE OF INFECTION.

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I propose in this course of lectures to tell you in perfectly plain language something of the present state of our knowledge regarding the diseases which are treated in this hospital.* About the actual details of clinical work I shall say very little, as I prefer to call your attention to these in the wards themselves, but the necessity for the methods that are employed here and elsewhere will become clearer, and the methods themselves, therefore, more interesting, if you are acquainted with the principles that underlie them—and it is not always easy to pick up these from the text-books.

It is, in the first place, essential that you should understand clearly what infection is. If you call to mind the diseases which you know, or have heard of, you will recognise that they naturally fall into several distinct classes. There are illnesses that arise from within, so to speak, or as patients say "come of themselves," or are due to errors of diet, bad habits, overwork of one organ or another, and so on: such are heart disease, indigestion, some tumours, etc., etc.

Others are the result of an attack from without by some cause which is not itself living: diseases due to exposure to cold or heat, such as bronchitis, sunstroke, etc., or injuries from accident or violence are examples of this class.

Then there is another class of diseases which are also due to an attack from without, but the attacking agent is a living thing. These are known as infectious diseases, because the attacking body can usually be passed on from one person to another, or, as we usually say, the illness is "catching." It is this class of disease that we have to recognise and treat in this hospital.

An infectious disease is then, in the first place, the result of a fight—a pitched battle, between the invading forces of the parasite and the body of the host, or the patient as we usually call him.

The parasite may be an animal, as in the case of the disease known as malaria, or a vegetable. To the latter class belong the bodies that we know as germs or microbes, and which are

responsible for such diseases as scarlet fever, diphtheria, and the various forms of wound infection. It is to diseases due to these vegetable parasites that I intend to confine myself in this course of lectures.

What then are these germs? They are bodies so small that they cannot be seen except under the highest powers of the microscope, and for practical purposes it may be said that they abound wherever there is visible dirt or dust, as well as in the surroundings of everyone who is suffering from an infectious disease. They may be present even in places that are clean to the naked eye, though they do not multiply there to any great extent. For their growth, warmth and moisture are necessary, and they feed on almost any kind of organic matter. They do not like fresh air or sunlight, and are killed by dry heat, by boiling, or by certain chemicals which we call disinfectants.

To ascertain whether they are present or not in any one place, a little wire or a swab is taken, freed from germs itself by passing through a flame, and rubbed over the suspected object and then over the surface of a substance, or "medium," which is particularly favourable to the growth of germs. The tube containing this medium is then kept at blood heat in an incubator, and the germs, as they come up, examined under a microscope. This process is familiar to you all, and is known as "taking a culture," it is simply a variety of gardening.

Roughly, these germs may be divided for our purpose into two classes: Those which always produce the same disease, such as enteric fever, diphtheria, consumption, and so on; and those which produce different diseases under different circumstances. The former are known as infective or pathogenic organisms, and the latter as non-pathogenic or septic. A good example of the latter class is seen in the germs known as "streptococci," which produce erysipelas when they are growing in the skin, or puerperal fever when they are situated in the uterus.

In the laboratory they are classified, according to their shape, into cocci or germs like little berries and bacilli which resemble little sticks. Now since these germs are very widely distributed—and it is probable that in the atmosphere of a building in which a large audience is sitting germs of almost every kind are present—it is obvious that people have these germs on or about them, though they do not always, as we say, "catch the disease." A child, for instance, who is suffering from measles may be brought into a church (and this I have seen myself) and the person sitting on his right hand may go home and develop

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