

bers in the surroundings of our patients and ourselves, but I will first tell you how we detect their presence.

Suppose you had a packet of various kinds of seeds, and you wanted to find out what plants they would produce? Well, if you were a very expert botanist, you might be able to tell, in many cases, by looking at them and comparing them with other seeds that you knew all about, but you would probably be often wrong, and you would not, in any instance, be able to say whether any particular seed would produce a vigorous or a weakly plant. No, you would sow them in a suitable soil, and see what kinds of plants came up, and whether they were strong or weak varieties. This is gardening, and the science of bacteriology is mainly gardening too. So, if we want to see whether there are germs, say, in a patient's throat, or on the floor of a ward, we take some of the suspected matter, and place it on the surface of a suitable soil, or "culture medium," as it is called, in a tube or dish. We then place the vessel in a warm chamber (called an incubator) where the germs will grow quickly, and after a few hours we shall see that the surface of the medium is covered with a thin scum, which is simply a mass of germs of various kinds. We then take some of the scum, spread it out on a glass strip, and look at it under the microscope, and see what has come up. By other methods, with which I need not trouble you now, we can also find out whether any particular set of germs is harmful—vigorous that is to say—or harmless and weakly.

Now, what are the surroundings of our patients? Well, they are, firstly, the air they breathe; then, clothes we put on them, and the bed-linen, the surfaces—walls, floor, and so on—of the ward we put them in; and then our own hands with which we treat them, and our own clothes, which we cannot help bringing near them.

Let us, then, test these: I have here some round glass dishes containing a thin layer of a material on which most organisms grow readily: it is made of gelatine, beef tea, sugar, and other things. This dish (No. 1) was left exposed to the air for half an hour in one of the wards, and then incubated for twenty-four hours. You will see that it is covered with a scum which I find contains a large number of different germs, some harmless enough, but many—more than I like to see—distinctly harmful to a wound.

Now we will come a little nearer home, and I will take one of your own aprons, and shake it gently over another dish. You shall see the

result next week. (This plate was also covered with organisms, many distinctly harmful.) I will streak the surface of another plate with my own fingers, and put this aside also, and will then wash my hands in the ordinary domestic way, as you see, with the toilet soap that we use in the wards. I will then dry them on what is apparently a clean towel. My hands are now visibly clean, and I will inoculate another plate with my fingers in the same way. These two plates I will show you next time. Another plate I will sow with some dust from behind a radiator in one of the wards, and yet another from the shakings of a blanket.

As I want to impress the point on you now, I will show you two plates which were inoculated with my own fingers before and after the ordinary process of hand washing in a former lecture, and you will see that there is scarcely any difference, both being covered with scum as before. You do not, therefore, remove germs from your hands to any great extent by this sort of washing. (The plates inoculated at the second lecture showed practically the same results.)

So you see the germs are there, and you will now at once understand why we have to take them away from the neighbourhood of any wound or sore place that any of our patients may have. Whether the wound is one that exists already or whether it is made deliberately by the surgeon's knife, it must be kept free from germs. We do this in two ways: firstly, by removing organisms from the surroundings, and, then, by protecting the wound, so that even if organisms are near, it is impossible for them to get inside. Both methods must be adopted in every case.

The protection of the wound is such a simple matter that it is frequently omitted. How many of you, for instance, always cover up a scratch on your own fingers? and how many deaths occur from neglect to do this? Look at the erysipelas ward and see—and erysipelas, you must know, is simply a variety of wound infection with streptococci. If you read the histories of these cases you will see that in almost every instance the trouble arose from a neglected sore or scratch, and not from a serious wound. For this reason a wound made in the operating theatre is covered up immediately with dressings of various kinds which are kept in position as long as may be necessary.

We must also get rid of the germs by taking them away whenever possible and killing them when we cannot take them away. It is on this account that in a hospital of this kind the sur-

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