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Attention is called to the "Wants" column. It is invaluable to those who use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

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AN INSTRUMENT FOR MAPPING HOT AND COLD SPOTS ON THE SKIN.

Preliminary Note.

VARIOUS defects and inconveniences in the apparatus employed by Blix, Goldscheider and Donaldson led to the determination to produce an instrument that would present a metal point of any desired temperature at any point of the skin. The temperature must be accurately known and must not vary. A registering apparatus was also to be provided, and the old system of testing till a spot was found and then marking it with ink was to be done away with.

In the present instrument the hot or cold stimulus is applied by water running through a small copper box that comes to a point at one end. The constant stream of water keeps the point at the temperature desired, and a thermometer projecting from the top of the box indicates this temperature. To prevent sudden changes resulting from the application to the skin, the sides of the box are rather thick, thus providing a mass of copper of great conductivity; a change of temperature at any one point is at once compensated by conduction without any measurable effect on that of the whole box.

To apply this box to the skin, an arm has been constructed which can be placed in any position and which by means of rack and pinion gives a motion to the box in the three planes of space. The arm is supported by a ball-joint so arranged that it can be clamped anywhere to a table or a chair in a manner that will bring the point of the litttle box near the skin-surface to be examined. Finer adjustments are made by the screws of the rack and pinion. The point is now applied to the skin, and is moved forward by one of the screws for a short distance, e.g., one centimeter, the person noticing the temperature spots as the point passes over them. Then the point is moved sideways one millimeter, and drawn back again. In this way the whole surface can be gone over with the greatest accuracy.

On the part of the arm moving with the point is a small electro-magnet carrying a pencil which descends when the circuit is completed. On the part that does not move with the point is a litttle flat plate, on which a piece of millimeter paper is fastened. The circuit is closed by a key in the hand of the person experimented upon whenever he feels a hot spot or a cold spot, as the case may be. Since the pencil executes the same motion as the point the result is an accurate map of the spots directly on the millimeter paper,

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SOME USES OF BACTERIA.[1]

EVERY farmer, of course, appreciates the value of keeping stock, and you all know that you cannot run a farm without your cows, your horses, your sheep, your hens, and your pigs. You do not appreciate, however, that it is just as necessary to keep a stock of bacteria on hand, on your farm, to carry on your farming operations. The farmer has learned to-day that he must keep a good breed of cows and a good breed of stock in general, but farmers generally do not appreciate that it is equally necessary to keep a good breed of bacteria. You cannot make butter or cheese without cows; you cannot make butter or cheese satisfactorily without bacteria. You cannot cultivate your fields without your horses to help you, but all the cultivation that you might give your fields would be useless were it not that these little creatures of which I shall speak this morning come in after you get through and complete the process which you have begun.

Now, probably many of you have never particularly thought that your farm is stocked with bacteria, but they are there. They are in your brooks, in your springs, in your wells, in your rivers; they are in your dairy, in your milk, in your butter, in your cheese, in your barn. They are in the air, they are in the soil, and your manure heap is a paradise for them.

Bacteria are in rather bad odor in the minds of most people, and we are all inclined to look with horror upon them. We have a sort of shrinking when any one speaks to us of the number of bacteria in the milk which we drink. The reason for this, however, is simply an historical one. When bacteria were first discovered it was early noticed that they had a causal relation to disease, and scientists went to work from the very first to investigate diseases in relation to bacteria. The result was that after a few years a great deal of information had accumulated showing that bacteria caused diseases. The so-called "epidemics" are usually the result of bacteria, and with minds intent upon this side of the question scientists did not pay much attention to the good that bacteria might do in the world. It was more interesting to study disease. People are very much interested when you begin to tell them why it is that they have small-pox, why it is that they have yellow-fever; the other side of the matter, however, is not so interesting.

But the fact is that the bacteria story has only been half told, and thus far it is the smaller half that has been told, if there is such a thing as the smaller half. It is true that bacteria are occasionally injurious to us, but it is equally true that they are of direct benefit to us. Hitherto we have looked upon bacteria as belonging to the medical profession; we think the doctors ought to know about them because they produce disease, but ordinary people do not need to bother themselves with these things. But I think, before I get through with my talk this morning, you will see that bacteria have a very much closer relation to you as farmers than they do to the doctors. It is the farmer to-day who ought to understand bacteriology. It is well enough for the medical man to understand the subject also, but bacteriology has already become a medical subject, while the agriculturist has generally neglected it.

I propose in my talk this morning to point out to you a few of the benefits which you as farmers derive from the agency of these microscopic organisms. I shall divide the subject into four

[1] An address by Dr. H. W. Conn, Wesleyan University, Middletown, Conn.