

the tubercle bacillus, the diphtheria bacillus, and the staphylococcus all grow extremely well in the blood; in fact that they grow by preference in the blood. Therefore the explanation cannot be that the blood does not contain nutrient media. Our bodies contain very succulent food indeed, and the microbes would be only too glad to live on us. When you consider how the blood differs from the nutrient medium used in the laboratory, you find two outstanding differences. To begin with, it contains white blood corpuscles, and these have the faculty under certain circumstances of picking up the microbes and ingesting them and killing them. Now the blood fluids are not simply an indifferent medium—as Metchnikoff the author of the theory of Phagocytosis thought. In other words the blood differs from the broth not only in the fact that it has white corpuscles, but that it also contains substances which act on the bacteria. They act upon them somewhat after the manner of antiseptics; the analogy is not very close, but it is something of that sort. In other words your blood represents a fluid somewhat comparable to weak carbolic acid in which are white corpuscles. These antiseptics in the blood may be partly responsible for keeping the blood free from bacilli, but are not wholly so. By a certain technique we found that it was possible to separate the white corpuscles from the blood fluids, to test them separately and see what white corpuscles could really do. So we took white blood corpuscles obtained from our own blood and an emulsion of bacteria, mixed them together in capillary tubes, kept them at blood heat for about half an hour and watched to see what occurred. We were astonished to find that under those circumstances the white corpuscles did not ingest the bacteria; and therefore it looked as if the white blood corpuscles were of no use at all. Then we mixed with the bacteria and the white blood corpuscles a portion of the fluid of the blood, and we found the fluid of the blood influenced the microbes in such a way as to prepare them for ingestion. If you will refer to this diagram (Fig. 1), you will see that almost all of the white blood corpuscles have picked up tubercle bacilli. We found then that when you mix bacteria and white blood corpuscles together the white blood corpuscles have no power of taking up the bacteria; but when, on the other hand, you add the fluid of the blood to the mixture of leucocytes and bacteria, the fluid of the blood alters the bacteria in such a way as to make them palatable for the white blood corpuscles. In other words the blood has prepared the bacteria for ingestion. For this phenomenon we had to find a name, and spending some time over Greek and