

spread and epidemical microbes that we have at the present moment the greatest difficulty in regard to the exact bacteriological diagnosis. That these microbes, by their presence and growth in the system, causes disease no sane [and competent] bacteriologist has the smallest doubt, but we have before us in relation to typhoid, cholera and diphtheria, not to mention other cases, a series of problems that are as yet unsettled. The right solution of these problems is, from the point of view of the public health officer, of vital importance. As yet I cannot regard these problems as having been fully solved or nearly solved; and in this view I believe I shall have the support of my fellow-bacteriologists.

The main problem before us at the present time is in relation to the determination of species. Are we to conclude that there are, it may be, several closely allied species which are capable of inducing the main symptoms of any given disease, or are we to regard the several slightly divergent forms which may be gained from different cases of what clinically we recognize as a single disease as but varieties or races of one species which have obtained more or less permanent characters setting them off from the type? What, in short, are we to regard as the limits of variability? Apart from a constant recurrence to experimental inoculation (which is not always possible) how are we surely to recognize the pathogenic nature of the form we isolate from cases of disease?

Take, for instance, what is found in connection with typhoid; no one in our days, who has made actual observations, has the slightest doubt as to the cause of that disease; every one is agreed that it is due to a bacillus, having, on the whole, well defined characters, if once we obtain the bacillus from the body of a patient in a fairly early stage of the disease. No one, again, doubts but that typhoid spreads through the water, through contamination of the water supply, but now here is the difficulty. If we examine, in the first place, the water supply supposed to be contaminated, in case after case we may be successful in