

BACTERIOLOGY.

Some New Micro-Organisms Obtained from Air.

In the Royal Society's Proceedings (England) for 1887, appears a monograph by Mrs. G. C. Frankland and Dr. Percy F. Frankland, under the above title. It is there stated, "as these investigations were carried out with the aid of solid nourishing media, we were able to obtain a collection of fine cultivations of a number of micro-organisms derived directly from the air. It appeared to us, therefore, desirable to utilize the opportunity which these experiments furnished for minutely characterizing some of the principal forms which are thus obtainable from the atmosphere." There are many reasons which render this important. . . . It is not unnatural that the brilliant discoveries in connection with the etiology of infectious diseases should have absorbed the lion's share of the attention of investigators in the field of bacteriology, and that the non-pathogenic organisms should have come to be regarded as comparatively uninteresting by the side of their more formidable brethren. It must be remembered, however, that the functions of the non-pathogenic organisms in the economy of nature, are as yet but imperfectly understood, and that as far as these functions have been investigated they do not yield in point of importance to those of the most violent pathogenic forms. Thus the conversion of sugar into alcohol, the oxidization of ammonia to nitrous and nitric acids, besides many other natural transformations which are effected through the agency of such micro-organisms, are certainly not second in importance to the results, terrible as they are, achieved by the pathogenic forms. The organisms producing the above-mentioned change are known to be present in the air, and there can be little doubt that the numerous other aerial varieties will, in the future, be found to discharge important duties in the laboratory of Nature. The exactness with which bacteriological research can now be carried on, thanks to the beautiful methods of cultivation which have been developed during the past six years, renders it imperative that all future investigations on the chemical and physiological action of micro-organisms and not with mixtures, as has hitherto so often been the case. On this account the first step in investigations of this kind must consist in careful

delineations of the characteristics of the specific organisms that their identification may be readily accomplished. In this way it may with confidence be anticipated that the particular chemical and physiological properties of each specific organism will in the future be elaborated as has been done in a few cases already.

The methods for obtaining these organisms have been by means of Hesse's tubes and by the exposure of dishes filled with gelatine-peptones in the manner already described. Each organism deposited on the solid culture gives rise in a few days to a colony possessing a characteristic appearance. These can be transferred separately to a culture-tube by means of a sterilized platinum needle. The tube cultivation can thus with care be likewise obtained pure.

The gelatine tube-cultivations were first inoculated into test-tubes, one-third filled with solid sterile gelatine-peptone and plugged with cotton wool in the ordinary way. The appearances in these have been carefully watched, described, and in many cases, drawn. These appearances are, as is well known, of great importance in serving to characterize specific organisms, and frequently serve to discriminate between organisms of similar and almost identical microscopic appearances. Agar-agar tube cultivations have similarly been made by inoculating with the same organisms. These frequently served to establish differences between organisms, owing to their not being liquefied by any organisms, and thus surface-growths can be obtained. On the other hand some cultivations which are but little distinctive in agar-agar, present important marks of distinction in gelatine.

Broth-cultivations were similarly made of the same organisms. These being fluid-cultivations are generally very much less characteristic than those in gelatine or agar-agar, the chief difference being in the formation or non-formation of a pellicle on the surface of the liquid. There is, however, a special reason for carrying out cultivations in broth as the form of the individual organisms is generally more uniform and natural in a fluid than in a solid culture-medium, for the latter forms are occasionally distorted by pressure.

Gelatine-plate cultivations frequently present the most striking appearances of any method of cultivation, and though often characteristic, to the naked eye they are often far more so when ex-