

Colour-variations have long been known. I have confirmed the occurrence of white varieties of crimson forms, and find considerable variations in yellow pigmented forms. An interesting case is that of white varieties of a violet *Bacillus*, so permanent that I have cultivated it for weeks and even months as a white form, and can only get it to produce its pigment in broth, though otherwise it seems vigorous enough.

In view of these and other results, which I hope to publish later, it seems extremely probable that the following three propositions are true.

(1) That variations in the form, rate of growth, size and colour, and other characters of plate-colonies result from much slighter variations in the gelatine and other environment than has hitherto been recognized.

(2) That, regarding the water of a river as the food-medium, the vicissitudes which a *Bacillus* has been exposed to in this medium previous to its capture and isolation in the laboratory, may have stamped on it such differences that its plate-colonies differ considerably at different times of the year, or even in the same season according to the length of time the individual germ isolated has been in the river.

(3) It is in great part owing to the coincidence of these causes of variation that it is often so difficult to recognize a given 'species' described in Eisenberg and other authorities: in fact, the same 'species' recurs under different names, because the conditions preceding and during its cultivation in the laboratory have differed more or less.

The only way out of this difficulty will be, I think, to cultivate each form from the beginning for a sufficiently long period under conditions as accurately known as possible, and strictly according to some carefully arranged plan agreed on by bacteriologists in council beforehand.

H. MARSHALL WARD.

**A FALSE BACTERIUM**<sup>1</sup>.—During my investigations of the bacterial flora of the Thames, a form has turned up which well illustrates the truth that the methods of tube-plate-cultures of minute organisms may lead one astray, and that in order to settle the question of the nature of such forms we must employ the methods of direct cultivation from a single germ under powers of the microscope: that, in fact, we must supplement the macroscopic gelatine-plate-cultures of Koch and his followers by the original *microscopic* gelatine-cultures of Klebs, Brefeld, and De Bary, which preceded and suggested the now usual methods.

<sup>1</sup> Read before the Botanical Section of the British Association at Ipswich.



The organism in question forms non-liquefying porcelain-like white or cream-coloured colonies on gelatine, and behaves exactly like a Schizomycete when grown on Agar, Potato, and in Broth, Milk, and other media. It does not ferment glucose, and when examined in the usual way under the microscope it appears as a Bacillus-like form 2-4  $\mu$  long, and about 1  $\mu$  thick, or as 'cocci' about 1  $\mu$  diameter staining normally by Gram's and other methods, without movements, and with no known endogenous spores.

Nevertheless, on tracing its development even *in alkaline gelatine*, under the one-twelfth and one-twentieth immersion, it is found to branch and to grow by acropetal apical growth. When a short branch-system has been formed, the whole segments up entirely into joints like Bacilli, which eventually separate at the septa, and are at length cut up into shorter and shorter portions almost like micro-cocci or extremely short Bacteria.

From all the evidence there can be no doubt that we have here an öidial form of a true Fungus, and not a Schizomycete at all, and it raises some interesting questions concerning alleged forms of 'branching' Bacteria, and the very various origins of the different micro-organisms commonly grouped together as 'Bacteria.' In particular, it is an excellent case in point, illustrating the fact that an organism must not be assumed to be a Schizomycete merely because it is small, grows on gelatine, and can be stained by the methods of bacteriology.

H. MARSHALL WARD.

**ON A NEW FORM OF FRUCTIFICATION IN SPHENOPHYLLEAE**<sup>1</sup>.—The author gave an account of *Bowmanites Römeri*, the fructification of a new member of the Sphenophylleae. It is only recently that the work of Williamson and Zeiller<sup>2</sup> has given us a clearer insight into the structure of the fructifications of *Sphenophyllum*, which consist of successive and similar whorls of leaves arranged in a spike, the leaves of each whorl being coherent at the base. The numerous sporangia are seated on the inner and upper side of this

<sup>1</sup> Abstract of a paper read before the Botanical Section of the British Association at Ipswich. For the full illustrated description see Jahrbuch der K. K. Geolog. Reichsanstalt, Wien, 1895, Band 45, Heft 2.

<sup>2</sup> See Williamson, Organization of Fossil Plants of Coal-measures, Parts V and XVIII, Phil. Trans. 1874 and 1891; Williamson and Scott, Further Observations on Organization, &c., Part I, Phil. Trans. 1894; Zeiller, L'Appareil fructificateur des Sphenophyllum, Mém. 11 de la Soc. Géol. de France, 1893.





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