properties. It is soluble in 50 per cent aqueous alcohol, insoluble in 98 per cent alcohol, insoluble in aqueous butyl and amyl alcohols, not adsorbed by fuller's earth, adsorbed by norite, not soluble in phenol, *p*-cresol, etc.; on hydrolysis with dilute mineral acids or by pepsin, further quantities of Factor 3 can be produced.

A clear-cut and absolute division into an active and inactive fraction has never been obtained; 70–80 per cent of the activity is the most that any one process will yield, so that on purification there is always a loss of material, and the complete separation of the three factors is a matter of some difficulty.

Prof. R. J. Williams has very kindly supplied us with samples of his folic acid, and comparative tests have been carried out with this fraction. The results obtained have not been very satisfactory; and even with the addition of Factor 1, only small amounts of growth and acid production have been found to occur with the media used in these laboratories[5].

We hope to publish shortly a fuller account of this work discussing the methods and media employed; and shall then endeavour to show, so far as possible, the connexion between these factors and the many similar factors obtained by other workers interested in the same field of research.

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A New Genus of Terrestrial Algæ

IN the damper hothouses of the Cambridge Botanical Gardens, there occurs in some quantity a green alga growing on fragments of oolitic limestone. It constitutes a new genus (Cladophorella) of Cladophoraceæ, and its discovery is of interest from several points of view. Pieces of the same kind of oolitic rock are present in some of the cooler houses, as well as in parts of the rock garden; moreover, a very similar material has been used in the construction of many of the Cambridge colleges. A search has failed to reveal Cladophorella elsewhere than in the hothouses, so that on present evidence it would appear to be an introduced tropical form. The Cladophorales were the only major group of Green Algæ in which so far no truly terrestrial representatives had been found, and the discovery of Cladophorella shows that the capacity for a subaerial existence is general among the groups of Chlorophyceæ.

The alga consists of a complex system of horizontal threads, readily breaking away from one another at the septa and attached to the rock by elongate, for the most part unicellular, rhizoids. From the horizontal threads arise erect-growing branching filaments reaching a height of 3–5 mm. and forming dense tufts. Growth of the threads is apical. The cell-structure is that of a Cladophora, the vegetative cells possessing a parietal reticulate chloroplast with numerous pyrenoids and a limited number of nuclei internal to the chloroplast. As the erect threads elongate, the bulk of the cell-contents concentrates in the cells at the tips of their branches. These cells develop into akinetes with a thick lamellate membrane and a dense chloroplast harbouring numerous large pyrenoids; there is probably also some multiplication of nuclei. Apart from fragmentation of the threads *in situ*, the akinetes seem to constitute the only means of reproduction. They are readily detached and are no doubt wind-dispersed.

A feature of particular interest lies in the special properties of the surface-layer of the membrane, covering the akinetes and other of the upper cells. This layer, which forms a continuous covering, approximates in many respects to a true cuticle, such as has, so far as I am aware, not yet been demonstrated in an alga. It resists 60 hours immersion in concentrated sulphuric acid and prolonged treatment with a 50 per cent solution of chromic acid. The persisting cuticle, after removal of the acid, stains distinctly with Sudan III or Sharlach *R*, although the stain is in general not very deep. Treatment of fresh material with either of these reagents affords some evidence of staining of the surface layer of the membrane in all parts of the plant and it seems likely that it may exhibit some cuticularization throughout, though this is only pronounced on the upper parts of the erect threads. Mature akinetes exhibit practically no contraction when allowed to dry in the air of the laboratory and, while other factors may come into play as well, this is no doubt largely due to the properties of the enveloping cuticle.

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Carbon Dioxide Content of Atmospheric Air

As a sideline to an investigation on the water vapour content of the upper air, the carbon dioxide content has been determined in a number of air samples obtained by balloon soundings from heights of 4–10 km.

The samples were analysed by freezing out the carbon dioxide and water with liquid air and, after pumping off all the other gases, the pressure of the combined water vapour and carbon dioxide was measured in a McLeod gauge both at 100° C. (p_{100}) and at 0° C. (p_0). By deducting the saturation pressure of water (4·56 mm. mercury) from the latter value, the carbon dioxide pressure was obtained. As the quantity of condensed water was only a few micrograms, the solubility of carbon dioxide in the condensate was completely negligible.

The method of collecting the air samples was developed in collaboration with Mr. L. H. G. Dines, of Kew Observatory, and was similar to that used in obtaining air samples for the determination of the helium content in the stratosphere[1]. The vessel was opened—as described by Dines[2]—by breaking a capillary attached to the sampling vessel, and it was closed by fusing the same capillary by means of an electrically-heated spiral of platinum wire. Even with such a clean method, the danger of contamination by carbon dioxide from the burning of traces of