

[3] It is perennial and even strato-se, *i. e.*, forms a succession of layers of pores. Specimens from South Carolina and Indiana exhibit the latter condition. The species has been regarded as the type of a distinct genus, *Gauoderma*. It is possible that the supposed variations represent incipient and, perhaps, distinct species, yet the group in which the species occurs thoroughly defies all exact classification, a single species often in its variations overreaching generic and even family limitations.

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THE PROPOSED NEW SYSTEMATIC BOTANY OF NORTH AMERICA. By L. M. UNDERWOOD.

[ABSTRACT.]

Announcement of a new flora of North America, to be the combined work of the leading botanists of the country. Each group is to be monographed by specialists. The work is to consist of seventeen volumes octavo, of about 500 pages each and to be issued in parts. Separate parts of the work will also be obtainable, but at an advanced price.

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CELL STRUCTURE OF CYANOPHYCEÆ. BY GEO. W. MARTIN.

Contributions on the *cell structure of alga plants* have by no means reached a considerable degree either in point of number or in scientific results. Research in this line is comparatively an untried field; especially does it obtain in reference to the class of alga known as the *Cyanophyceæ*.

During the past summer the writer had an opportunity of studying *marine* as well as *terrestrial* forms of a number of species. Work was undertaken, chiefly, to discover, if possible, by use of various reagents, any method that might lead to the identification of constituent and structural parts composing the cell. The following is a brief *resumé* of the results obtained:

*Chromatophore*. It appears to consist of colored bodies, so-called "grana," embedded in a homogeneous, colorless, ground substance. The grana are bound together by a connecting substance into a monilliform, or necklace-like fibrilla. These are denser near the surface and run more or less spirally around the cell. Just here may be mentioned the fact that the fibrillar arrangement of the grana is denied by Palla.

In all cases observed, the chromatophore is *parietal and continuous*, and is separated from the wall by a delicate layer of protoplasm. In several instances it appeared to be vacuolate.

*Central Body.* On treatment with methylene blue a central body appears; it takes a living stain, is more or less rounded and central in the cell. According to the investigations of Palla it is homogeneous, but according to Hieronymus it is more or less differentiated into granules, having a fibrillar arrangement. The fibrille, however, are not surrounded by a membrane, and may extend in any direction throughout the cell, even penetrating the chromatophore. The granules are strikingly significant of the cyanophycin grains of Hieronymus. Though the central body in its reaction towards stains, etc., yields results similar to those of nuclei, yet it does not appear to be a nucleus, or at any rate it does not show in detail the characteristics of a nucleus, as found in the higher plants.

*Mucus Globules.* In the parietal part of the cytoplasm of most species occur globular structures which are most numerous along the septa. In appearance they harmonize with the description of Schmitz's mucus-globules. But according to the investigations of Hieronymus they are identical with cyanophycin grains. There is no similarity in results, for mucus globules are insoluble in hydrochloric acid and stain with methylene blue, while cyanophycin grains are soluble in hydrochloric acid and do not stain with methylene blue.

*Vacuoles.* Irregularly distributed through the contents of the cell are usually a number of transparent spaces of cell sap or vacuoles. They vary in size and in number.

*Oil.* Drops of oil were observed in the germinating spores of *Glvoirichia*.

*The Cell Wall.* The structure of the cell wall presents, to a slight degree, a form of lamination. It is of comparative thickness, and more or less colorless. As to its chemical composition, the results obtained by the application of acids and stains were too fragmentary to draw any satisfactory conclusions. However, I found it highly resistant on treatment with acids, especially 33 per cent. chromic and concentrated sulphuric. With the anilines very decided stains were obtained. In short, of the five recognized kinds of cell walls, one type possesses properties intermediate between those of *fungus-cellulose* and *cutin*.

*The Sheath.* Peripheral to, and conjunctive with the cell wall is the delicate, membranous sheath. In some species the sheath is wanting, but in most cases it is present and marked by varying degrees of thickness, even at times giving a stratified appearance. Chemically, it differs considerably from the cell wall, but it is closely allied to cellulose. In many cases it turns blue on treatment with chloriodide zinc; is mostly soluble in sufficiently concentrated chromic and sulphuric acid, but is insoluble in cupra-ammonia. Agreeing with cellulose, it, too, possesses the property of cuticularization.