CHEMISTRY OF LICHENIC AND FUNGAL MEMBRANES¹.

In this investigation the Lichens *Cetraria islandica*, *Peltigera canina* and *Evernia prunastri*, and the sclerotium of *Claviceps purpurea*, were subjected to examination. The work was suggested by a research of Winterstein², who has found chitin or a similar compound in the membranes of several Fungi. It was expected to find that the hyphal membranes of the Lichens would contain this substance, and the algal ones cellulose, as essential constituents. The sclerotium of *Claviceps* was examined to prove, if possible, the identity of mycosine³ with chitosan⁴.

I was unable to prove the presence of chitin or a similar body in *Cetraria*. The hyphal membranes appeared to consist principally of lichenin, and of a paragalactan or a mixture of several. Lichenin seemed to be a galactan, yielding an osazone melting at 191°–192° C. The algal membranes consisted principally of a cellulose, probably gluco-cellulose. From the hyphal membranes of *Peltigera*, a substance with physical properties agreeing tolerably with those of chitosan was obtained. The yield was small, and analysis did not give percentages reconcilable with those of chitosan. The algal membranes did not consist of cellulose. Lichenin was proved to be absent. No substance comparable with chitosan appeared to be with certainty obtainable from the hyphae of *Evernia*. The principal constituent seemed to be a substance which swelled greatly on treatment with hydrochloric acid and a solution of potassium-hydroxide, and disappeared during fusion with the latter. This compound was not examined. The algal membranes consisted of cellulose, probably gluco-cellulose. No cellulose could be obtained from the hyphal membranes of any one of these Lichens.

The sclerotium of *Claviceps* yielded a substance for the most part similar in physical properties to chitosan. Analysis did not confirm its identity with this substance, and the percentages differed from those of mycosine. A large fraction of the hyphal membranes seemed to consist of a compound, or several, which yielded during fusion one or more aliphatic acids; these were not examined for want of time.

¹ Abstract of a paper which will appear in Hoppe-Seyler's Zeitsch. für phys. Chem.

² Hoppe-Seyler's Zeitsch. für phys. Chem., Bd. xx, 1894; Bd. xxi, 1895.

³ E. Gilson: 'Recherches chimiques sur la membrane cellulaire des champignons.' Extrait de la Revue 'La cellule,' t. xi, 1 fascicule.

⁴ Hoppe-Seyler: Ber. d. deutsch. chem. Ges., 1894, S. 3329.

T. Araki: Hoppe-Seyler's Zeitsch. für phys. Chem., Bd. xx, S. 498 et seq.

For comparison I give the percentages obtained by analysis of the substances from *Peltigera* and *Claviceps*, as well as those given for mycosine and chitosan.

	Mycosine	Chitosan	<i>Peltigera</i>	<i>Claviceps</i>	
				I	II
C.	43.74%	43.97%	41.69%	41.33%	41.33%
H.	7.30,,	6.80,,	5.00,,	6.79,,	6.10,,
N.	7.31,,	7.32,,	1.35,,		

Nitrogen was present in the substance from *Claviceps*, but in such small amount that I do not think it could have approached anything like 7.32%. I had no time to conduct an analysis.

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DIAHELIOtropISM OF RADIAL MEMBERS. — The purpose of the present note is to call attention to the fact that the radial stems of *Pellionia Daveauana* afford a very good example of diaheliotropic irritability in a radial member. The stems of this plant normally grow parallel to the surface of the ground, the leaves lying in the horizontal plane with their superior surfaces uppermost. If the plants are suspended freely, and exposed to bright diffuse daylight falling parallel to the length of the stem, when the apex is directed towards the source of light the stem curves downwards; and when the apex is directed away from the source of light the stem bends upwards: so that in both cases the superior surfaces of the leaves on the apical part of the stem are as usual exposed to, and the inferior surfaces turned away from, the incident light.

If the plants are kept in darkness for some time, almost the entire length of the stem becomes erect, and the leaves face more or less irregularly. If such plants are exposed to very weak illumination from above, the stems remain horizontal, and the leaves present their superior surfaces upwards. Hence the radial stem of *Pellionia* is diaheliotropic and also apogeotropic; but its diaheliotropic irritability is very much stronger than its apogeotropic irritability, for quite weak diffuse daylight is a stronger directive agency than gravity is. The plant thus affords a very good example of a radial stem possessing marked diaheliotropic irritability.

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Escombe, F. 1896. "Chemistry of lichenic and fungal membranes." *Annals of botany* 10, 293–294. <https://doi.org/10.1093/oxfordjournals.aob.a088615>.

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DOI: <https://doi.org/10.1093/oxfordjournals.aob.a088615>

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