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H.L. Smith

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Spectroscopic Examination of the Diatomaceæ. By H. L. SMITH.

The vegetable nature of the Diatomaceæ is now generally admitted; but if any further proof is needed, we have it in marked results from the application of the spectroscope. I have been enabled to prove the absolute identity of *chlorophyl* or the green endochrome of plants with *diatomin* or the olive-yellow endochrome of the Diatomaceæ. The spectrum-microscope is now too well known to need any description here. The one I have used was made by Browning of London. It is not at all difficult to obtain a characteristic spectrum from a living diatom, and to compare it directly with that of a desmid, or other plant.

I need not here give the results in detail. Suffice it that, from about fifty comparisons of spectra, I can unhesitatingly assert that the spectrum of chlorophyl is identical with that of diatomin.

The spectrum in question is a characteristic one, and is figured below.

A very black narrow band in the extreme red, reading at the lower edge, which appears to be constant, about $\frac{7}{8}$ of Mr. Sorby's scale, is too characteristic to be mistaken. There are two other very faint bands, not easily seen, and somewhat more variable in position. The black band in the red is always present, and is remarkably constant in the position of its lower edge. In making comparisons of spectra it is of the utmost importance that the slit of the spectroscope should be absolutely in the focus of the achromatic eye-lens. If this be not attended to, there will be a slight parallax; and bands really identical in position, *e. g.* those of blood (scarlet erurine), will not absolutely correspond when two spectra are formed, one from blood on the stage of the microscope, and the other from the same on the stage of the eye-piece.

The dark band of the chlorophyl-spectrum is slightly variable in width; and the action of acids and alkalies sometimes causes a slight displacement, the former raising (moving toward the blue end) and the latter depressing. The endochrome of a diatom after treatment with acid is green, and the acid, in this case, produces scarcely any displacement of the band, which may be observed even in the dark reddish mass of the dead Diatomaceæ, almost identical in colour with the ferrous carbonate so often found in bogs where the larger diatoms are abundant; and what is more remarkable is, that the carbonate gives no absorption-bands at all. As a general rule, alcoholic solutions of chlorophyl and diatomin have the band slightly depressed, reading 1 to $1\frac{1}{2}$ on the interference scale.—*Silliman's American Journal*, July 1869.