



## XIII.—On a leather-like substance found formed upon a meadow

Charles Kersten & Prof. Ehrenberg

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discrepancy of the results, that the method is not susceptible of sufficient accuracy for the present purpose.

In my own analyses of naphthaline, the carbon and hydrogen bear such a relation to each other, that assuming its constitution to be  $C_5 H_8$ , the number for carbon, according to each experiment, will be

(1)	(2)	(3)
6·026	..... 6·059	..... 6·096

The mean of which gives 6·06.

It appears to me therefore on the whole, that the analysis of certain hydrocarbons offers a surer mode of settling the question at issue than a comparison of the densities of the two gases; and of all known substances of this kind, none seems better adapted to the purpose than naphthaline, inasmuch as its very peculiar physical and chemical character renders it a matter of no difficulty to obtain it in a state of complete purity. It is obvious that a considerable number of analyses, made under different circumstances, and with various samples of the substance, will be necessary in order to obtain an approximation sufficiently good to be relied on.

In the experiments above related the usual means were adopted to guard against the besetting error of organic analysis—the tendency of the oxide of copper to attract moisture from the air, and so render the hydrogen estimation worthless. I am indebted to the kindness of Mr. Everitt for the use of the instruments employed, and take this opportunity of expressing my gratitude.

I remain yours most respectfully,

GEO. FOWNES.

6, Coventry Street, April 5, 1839.

XIII.—*On a Leather-like Substance found formed upon a Meadow.* By CHARLES KERSTEN, Prof. of Chemistry in Freiberg, Saxony, and Prof. EHRENBURG, of Berlin\*.

**I**NCLOSED I send you an interesting vegetable production, having a deceptive resemblance to white dressed glove-leather, and which was found by M. Lindner on a meadow above the wire-factory at Schwartzenberg in the Erzgebirge.

A green slimy substance grew on the surface of the stagnant waters in the meadow, which, the water being slowly let off, deposited itself on the grass, dried, became quite colourless, and might then be removed in large pieces. The outside

\* We are indebted for this communication, and for a specimen of the substance described, to the kind attention of Prof. Kersten. The original appeared in Poggendorff's 'Annalen,' Part I. 1839.—R. T.

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of this natural production, as you will observe, resembles soft dressed glove-leather, or fine paper, is shining, smooth to the touch, and of the toughness of common printing-paper\*. On the inner side, which was in contact with the water, it has a lively green colour, and one can still distinguish green leaves, which have formed the leather-like pellicle. I dare say a botanist could still determine the *species* to which they belong.

I have made the following experiments on the leather-like substance, having separated it from the green inner coat.

It catches fire very easily, burns with a wax-yellow flame, leaving a pale-red rough light ash. When heated in a small retort dense white fumes are evolved, an odour of burnt paper is perceived, and simultaneously drops of a yellow empyreumatic oil are deposited on the neck of the retort. Somewhat later, water, having a strong acid action, is given off, which evaporates without leaving any residue. A light charcoal remains in the bottom of the retort.

Water, alcohol, æther, nitric acid and aqua regia have no action on it, nothing being dissolved, nor does its texture alter when heated with these re-agents. A solution of hydrate of potassa dissolves it to a brown slimy fluid; caustic ammonia has at first only a slight action, but after some days it swells out, becomes like wet printing paper, and is partially altered.

If the substance is gradually heated with hydrate of potassa, and the gas then given off conducted into a solution of nitrate of mercury, there is *no* black precipitate, neither are white fumes observable when the gas is brought into contact with a glass rod dipped in acetic acid: consequently *no ammonia is formed when the substance is burnt*, and, therefore, *it can contain little or no nitrogen*. The ash of itself, or when moistened with sulphuric acid, does not colour the oxidizing flame of the blowpipe. In borax it is dissolved, giving a gloss which while warm is of a deep yellow, when cold of a pale yellow colour. With the double salt phosphate of soda and phosphate of ammonia it gives a pale yellow glass, leaving a thin scale of silica. Fused with soda and saltpetre on a platinum plate the ash gives a deep green mass. It has no alkaline action, does not effervesce with acids, nor does it contain any salt soluble in hot or cold water.

Thus the ash of the substance in question is composed essentially of silica, oxide of manganese and oxide of iron. The substance itself appears to be an aggregation of leaves, from which the green colouring matter, the extractive matter, and also the organic matters have by some organic process entirely disappeared.

\* Unsized paper.—EDIT.

I shall endeavour to find out the circumstances under which this complete discoloration of the ligneous matter of the leaves takes place, for this is interesting in a technical point of view.

*Postscript by Dr. Ehrenberg.*

The very meritorious attention of Prof. Kersten to this leather-like substance has recalled to my mind the subject formerly touched upon p. 119 of my work on Infusoria, but particularly so in relation to the meteoric paper of Courland\* that I could not omit submitting it to a microscopic examination. With regard to this meadow-leather of Schwarzenberg, it consists most distinctly of *Conferva capillaris*, *Conferva punctalis* and *Oscillatoria limosa*, forming together a compact felt, bleached by the sun on the upper surface, and including some fallen tree leaves and some blades of grass. Among these confervæ lie scattered a number of siliceous infusoria, chiefly *Fragilaria* and *Meridion vernale*. I have observed sixteen different sorts of such siliceous infusoria, belonging to six genera; besides these I have found three sorts of infusoria with membranous shields, and dried specimens of *Anguillula fluviatilis*.

Thus the silica is quite explained, as well as a part of the iron, of which last another part, as also the manganese, may arise from a little dust which lies in irregular particles with the infusoria among the confervæ. I have treated more circumstantially, before the Academy of Sciences, of the meteoric paper of 1686, which I found to be similar to this in composition.

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XIV. *Notices respecting New Books.*

*Chemistry of Organic Bodies. Vegetables.* By THOMAS THOMSON, M.D., F.R.S., &c., and Regius Professor of Chemistry in the University of Glasgow.

THE object of the present volume, we are informed by its author, is to lay before the British chemical public a pretty full view of the present state of the chemistry of vegetable bodies; and he truly observes, that "this branch of the science has made so much progress of late years, that a very wide and inviting field has been laid open. Several hundred new substances have been either discovered, or their characters have been determined with such precision, and their composition investigated with such accuracy, as to give a pretty accurate idea of their constitution, and of their connexion with each other. These ultimate analyses, with very few exceptions, have been all made upon the continent, and chiefly in Germany and in

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\* A translation of Dr. Ehrenberg's notice on the meteoric paper of 1686 has appeared in the *Annals of Natural History*, vol. iii. p. 185.