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Dissertation on iodine

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Dissertations

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XVI.

Dissertation on Iodine

By
John Tyler Lillibridge,
of New York,
Candidate for the Degree of Doctor in Medicine.

In 1812, a Gentleman of the name of Courtois, at Paris, was employed in the manufacture of Carbonate of Soda from the ashes of incinerated sea-weed; after acting upon these ashes with cold water and Concentrating the solution to crystallization he observed the residual or mother liquor to possess Corrosive and peculiar qualities.

In experimenting upon this liquid, for the purpose of ascertaining more particularly its properties, he observed, that Sulphuric acid threw down a dark colored, metalic like substance, which, upon being subjected to an increase of temperature, was sublimed into beautiful, violet colored vapours.—

He next presented a quantity of this substance to Clement, a French Chemist, who recognizing it as a new body, investigated and described some of its leading characteristics

The investigation was prosecuted more in detail and with still greater success by Gay Lussac

He described as the results of this labours some some of its most essential remarkable properties, and gave it the name of Iode from the Greek word on account

the intense and very beautiful violet
color it assumed when converted into
vapor.

It was at this time that Sir Humphrey
Davy, distinguished at home and abroad by
the extent & splendour of his chemical researches
was receiving amid the political convulsions
of France the tranquil homage due to his
genius. Gay Lussac presented Iodine to
Sir Humphrey, suggesting at the same time,
that he regarded its Combination with
Hydrogen (the Hydriodic acid) to be analogous
to Chlorhydric acid, an opinion which
was also entertained by Clement, with
whom he had Conducted his Experiments.

Sir Humphrey thought differently and
at once stated his belief, that Hydriodic
acid, was a new and peculiar acid,
and that Iodine, was a substance
analogous in its relations to Chlorine.

He confirmed by subsequent
researches the truth of these opinions and
made known the results of his investigations
to the Royal Society before Gay Lussac's
papers were published, though he claims
to have preceded the British philosopher

in demonstrating the peculiar nature of this substance. Sir Humphrey imposed a different termination and called it Iodine as better suited to our language.
To the French and English then our knowledge of this interesting body is equally due; the discovery like the name having commenced with the former and terminated with the latter.

Iodine is principally derived from seaweeds; and those which belong to the Tribe Ulvaceæ afford it in greatest abundance.

Fucus Saccharinus and Digitatus are the species sought for in its production. These after being reduced to ashes receive the name of Kelp; and it is from the leys and lixivia of this substance that Iodine is obtained.

It is supposed that this peculiar article is prepared or elaborated by the living economy of these marine vegitables; though it has not been ascertained in what state of combination Iodine exists in living plants (nominally).

Fucus saccharinus in which it abounds in greatest abundance, is said immediately to yield Iodine on being treated with sulphuric acid, without the previous proof of burning.

Some animals are supposed to produce it and it is very well known that a small insect (the Acula fatidipinnis) emits a yellow liquid which on being mingled with starch strikes a blue color peculiar to combinations of that substance with Iodine. In sea water it doubtless forms a binary arrangement with sodium. After incineration it is believed to exist in the form of Hydriodic acid with a base. The lixiviums obtained from these ashes, in which the salts is supposed to reside furnish Iodohydric acid in solution; this liquid is treated with sulphuric acid. in excess. then boiled. & filtered; on adding Deutoxyd of Manganese to this the whole of the Hydriodic acid is decomposed; its hydrogen uniting with the ~~Deutoxyd~~ oxygen of the Deutoxyd & forming water while the Iodine being set free is sublimed into

a cool section leaving sulphate of manganese in the retort.

Iodine thus obtained is a dark colored opake ~~like substance~~ crystalline solid of the specific gravity of about 4.948 possessing a very extensive range of affinities. It combines with starch & forms a compound of a dark blue color. So delicate is this test for Iodine that it will detect it in a liquid containing 1/45000 of its weight.

This combination has received the appellation of Iodid of starch, but I cannot find any record of its having been carefully and rigorously investigated. It vanishes on the application of heat, and is only formed with elementary Iodine.

Water is an exceeding feeble menstruum; to this liquid, of which it requires seven thousand times its weight for solution, it communicates a light brown tint. Its slight solubility in water, of course renders its aqueous solution of no importance as a pharmaceutic preparation. It is sufficiently soluble in alcohol & ether for medicinal purposes.—

Iodine has been found to possess useful and important medicinal qualities; and has ever been regarded a valuable acquisition to the Materia Medica.

Its medicinal powers were first observed in the cure of disease of the thyroid gland by Dr Coindet of Geneva.

Magendie, it is said first tried its effects upon brute animals

It acts as a powerful excitant upon the animal economy, its operations effects being confined principally to the secernent and absorbent or glandular system, manifested by a greater or less change of condition of diseased action in these parts.

It causes a resolution of certain chronic abscesses inflammatory tumours.

Its action is mainly exerted upon the absorbents, through the entire ~~glandular~~ glandular system is benefited and improved by its use.

It is particularly characterized by its resolvent power and a long continued protracted use is said to have produced an entire absorption of the female breasts, as well as other important

glands though even in a healthy state when entering upon its use.

Glands which are in a morbid or really diseased conditions are most susceptible to its resolvent power; yet those who have used Iodine extensively and methodically in small & appropriate doses declare that little apprehension need be entertained of its deleterious powers.

Iodine has been employed with considerable success in the cure of Cutaneous diseases. by obviating torpor and inactivity in the secretions and excretions of this function.

By some it has been asserted that Iodine occasions an increase of secretory activity of the liver; by others this is thought a very inconsiderable if at all perceptible effect of its medicinal power. The testimony with regard to its Sialagogue power is equally inconclusive; it is probable however that the salivary glands are effected though not to that extent to occasion salivation. Its emmenagogue power appears to be pretty well established and many cases are recorded of abstinate

and painful menstruation. complicated with scrofulous affections, entirely and permanently removed by its use.

There can be little doubt of its power over the reproductive organs; indeed we should naturally conclude that so powerful an excitant would not fail to produce its peculiar effect upon these parts.

The peristaltic motion of the intestines is frequently increased by the use of Iodine; hence some have found it in peculiar conditions of the system to induce costiveness.

The use of Iodine is probably contraindicated by phlogistic diathesis on the one hand, and great weakness and exhaustion on the other.

The action of the absorbents is particularly stimulated by the use of Iodine; the influence is propagated even to healthy structures, which have gradually disappeared and wasted away from its long continued and immoderate use.

Enlargements of the spleen and liver are said to have been removed by the

Tincture of Iodine after a great variety of other medicines had been employed in vain. Its influence in Bronchocle and other enlarged glands, whether of a scrofulous or incipient schirrhous nature, has been amply authenticated

In all ~~the~~ Paralysmata, says Dr Good, the various preparations of Iodine as remedial agents are worthy of our confidence and attention. —

Strumous affections of the mucous membrane of the fauces, Coryza chronica, and other conditions accompanied with a lax and torpid state of the part, are decidedly benefited by the internal use of Iodine.

The inhalation of the vapours of Iodine has been recommended in Phthisis

Some inconvenience arises from its use in unstable habits; yet by careful management these cases characterized by torpor and inactivity of the mucous follicles are greatly relieved not infrequently suddenly & permanently cured.

Iodine is better suited to the cure of chronic than entonic inflammatory diseases; indeed a long continued use in moderate and judicious doses seems requisite to ensure the full ~~effect~~ beneficial effect of the remedy.

The pharmaceutic preparations of elementary Iodine are the following viz:

Pills of Elementary Iodine
Tincture " "
Aether " "
Ointment " "
Emplastrum " "

Neither the pills, nor the Tincture are regarded as eligible forms for the administration Alcohol of the specific gravity of .796 will dissolve 44 grs to the ounce; but the difficulty of obtaining alcohol uniformly of this strength renders the Tincture an uncertain preparation.

A plaster may be prepared with ʒi of Iodine to ʒi of Burgundy Pitch.

An Ointment is readily formed by rubbing up ℈i of Elementary Iodine with ʒi of Hogs Lard.

The ointment is regarded of much service in discussing indolent glandular swellings which have for a long time resisted the action of other remedies.

Its external topical application to ulcers has been found to act kindly in facilitating their entire removal. Its local action is sometime violent and should therefore be applied with caution.

The internal use in susceptible subjects, has been known to occasion an erythema vesiculare; this is doubtless rather an infrequent effect.

Iodine exist as a component in various Compounds which have been extensively and successfully employed in the cure of disease. The Protiodid of Potassium is much employed by some practitioners; it exibits much the same medicinal qualities as Iodine, though in a much less degree.

Some have asserted that the Potassium retains in combination its antiphlogistic qualities; and that these effects are manifested by a long continued use of the ~~medicine~~ preparations

The preparation which has been found easiest of administration, and which is of general application where Iodine is indicated in the cure of disease is the combination of the Deutiodid of Potassium.

This preparation is prepared by mingling in solution the Protiodid of Potassium with Elementary Iodine in the proportion of their respective equivalents.

The solution is of a dark brown color, which is thought to be a combination of Potassium with two or more equivalents of Iodine; no such compound however has been obtained in a solid form.

That a combination takes place may be safely inferred, I think, from the fact, that the water is discolored by Iodine, an effect which could not take place without chemical action.

Yale College Medical Institution
January 1842.

John. P. Gilbridge

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