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AN

INAUGURAL DISSERTATION

ON

Iodinium

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BY

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OF

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Iodinium.

This elementary body was discovered in 1812 by Courtois a soda manufacturer of Paris. It has been found to exist in a variety of situations, chiefly in the plants of the ocean, and in the animals, which inhabit it, as the sponge, oyster, cod, etc, all of which are believed to obtain it from seawater, in which it exists to a small extent. The water of many springs, both in Europe, and America, and many fresh water plants, among them the water cress, and water hemlock, contain iodine. It has been found united with the metals in various minerals; is said to have been found in a Mexican coin, in fossil remains, and in some species of coal.

Iodine is said to be diffused through the atmosphere, and to be found in rain water; but these assertions have been denied. It is principally obtained from seaweed, in which it is thought to exist as the iodide of sodium. These are burned, forming a dark mass called kelp; in which besides the iodide of sodium, are found the chlorides of sodium, and potassium, the carbonate of soda, and other substances, which commonly result from the combustion of plants. The ashes are lixiviated, the solution being evaporated and concentrated. An excess of sulphuric acid is then added, and the whole submitted to heat in a glass retort, iodine distilling over into a receiver.

Iodine is a non-metallic body of a

deep bluish black color, and of a semi-metallic lustre. Its specific gravity is 4.948; its combining proportion is 127.

It is a powerful electro-negative body.

When brought into contact with the skin, imparting a yellow stain, which however soon disappears. It is very brittle, and volatile, evaporating even at ordinary temperatures; when heated to 225° it melts, and boils at 344° . The vapor of iodine is of a rich purple color, from which its name is derived. Its specific gravity is 8.7, being the heaviest aeriform body known. It is irrespirable, being irritating to the nostrils, exciting cough, and causing spasmodic closure of the glottis.

The contact of a cold surface condenses it into crystals. A burning taper immersed in vapor of iodine burns very

much as it does in chlorine gas; dry phosphorus placed in contact with it also takes fire. The odor of iodine is peculiar, resembling that of sea beaches; the taste is hot, and acrid. It is readily soluble in alcohol, and ether, but in water it has very little solubility, requiring 7,000 times its weight of that liquid to dissolve it; but it is rendered more so by the addition of other substances, as the iodide of potassium, chloride of sodium, nitrate of ammonia, and also though not to so great an extent by Tannic acid. The solution in water is tasteless, has very little odor, and is of a light brown color. Alcohol, and ether form with it a black liquid. There is a marked similarity between iodine, and chlorine, in their situations, in their properties,

and in their effects upon other bodies; and indeed after viewing them in all their relations, we should almost expect, that they were not elementary, but compound bodies, differing but little in the elements of their composition.

The chemical affinities of Chlorine however are much stronger.

Iodine unites with almost all the elements. With oxygen it forms four compounds, and with hydrogen a very important acid, called the hydriodic, which has much resemblance to muriatic acid. But its most important compounds are those, in which united with the metals, it forms the iodides, which are most frequently used for procuring medicinal effect.

The purple vapor of

iodine, will detect it, when it is present in large quantity; but starch is generally resorted to as a test. Starch in solution with iodine yields a deep blue color, and so delicate is this test, that it will manifest iodine in 45,000 times its weight of water. The iodine must be free, and the solution cold, or the change will not take place. The solution is rendered colorless by heat, but the color returns on cooling, if the solution has not been boiled. The more iodine there is in solution, the bluer will the tint be. Many other tests are spoken of, but as they are all inferior to starch, there is little need of mentioning them. Chloroform is said to produce a violet color in ~~the~~ union with it; and benzoic a red.

color. Iodine is sometimes mixed with coal, plumbago, and many other such substances, which are easily detected by not being vaporizable. Iodide of cyanogen is sometimes present, discovered by the production of white crystals of a pungent odor in the sublimation of iodine. Many other substances are often present, and are detected by the tests, which are peculiar to each of them.

But that which is most frequently and indeed almost constantly present is water. However as it only dilutes, and renders the iodine milder, it is not of much consequence. A large quantity of water will cause the iodine to adhere to the inside of the bottle.

Experiments were first made by Magendie to determine

The effect of iodine upon the healthy economy of man; among others it was by him injected into the veins, ^{and} without ill effect. For the same purpose, Orfila took two grains, fasting, which produced no result, except a disagreeable taste, and some nausea. The next day, he swallowed four grains; constriction, and heat in the throat immediately followed, lasting a quarter of an hour, and succeeded by vomiting of a yellowish fluid impregnated with iodine.

A slight oppression was felt during the day. On the second day, he took six grains fasting, and soon afterwards there followed a sense of heat, and constriction of the throat, nausea, eructation, an increased flow of saliva, and pain at the pit of the stomach.

Ten minutes subsequently he was attacked by copious bilious vomiting, and slight colic pains, which continued for an hour, and were removed by two emollient glysters. The pulse rose from sixty beats in the minute to eighty or ninety, and was much stronger than usual. The breathing continued tolerably free, but from time to time there was a great obstacle to dilatation of the Chest in inspiration. The urine was more highly colored. All the symptoms were removed by the copious use of gum water, and of other beverages of the same kind.

From the experiments of these, and other eminent men, it appears, that the primary effect

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of iodine upon the alimentary canal is that of an irritant, in small being gently stimulant, in large ones poisonously irritant. Fatal inflammation, and ulceration of the stomach, and bowels have followed from its too free use.

When it is introduced endemically however, it appears not to produce poisonous effects even in large doses. There has been a great difference among writers in relation to the effects of iodine, ascribable in a great measure, to the different preparations used; free iodine, or any preparation of it, which will set it free in the stomach, being much more irritating than preparations which do not.

The danger from the use of this medicine appears to have been greatly overrated by the early writers on the subject. Iodine has been given in large doses endermically, and it never accumulates in the system, but the surplus seems to be carried off by the secretions, chiefly the urinary. But notwithstanding this is generally a safe remedy, sometimes even when given in the ordinary dose, it produces dangerous effects; two kinds of poisoning are said to have been produced by it; the first ^{resulting from} an overdose, and remedied in the same manner as other irritant poisons; the second a state called iodism, caused by the prolonged use of it, perhaps in the ordinary dose, sometimes in

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doses smaller than usual, probably producing injurious effects, because of some degree of gastritis. It should be treated by amygdalaceous, and mucilaginous drinks, abstinence, and rest. The appearance of the first symptom of iodism, should cause the iodine to be laid aside.

It is said that a train of symptoms, such as depression of spirits, palpitations, dulness of the special senses, tremors of the hands, mark the full effect of iodine; that the system is then saturated by it, and iodism is on the eve of occurring. The iodine they say in this event should be discontinued for a time, and on resuming its use, it will be found to act with

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renewed vigor. Combined with opium,
it may not be attended with any of
these evils, or at least their severity
is greatly mitigated. The effects of
iodine are sometimes directed to the
brain, producing neuralgia, and other
nervous phenomena. It enters the blood,
and has been found both in the
serum, and crassamentum, and also
in all the secretions. Acting as a
stimulant to the whole glandular
system, it increases the secretions from
the liver, the salivary glands, from the
urinary organs, and, from all other
secreting glands. Salivation is said
occasionally to have resulted from
its use. As a stimulant to the ab-
sorbent system, it has been accused
of producing emaciation of the whole

body, atrophy, and disappearance of
the mammae, testes, and other glands.
But as Lugol, and others, whose
extensive use of it should make them
acquainted with the subject, deny it,
and say that their patients gained
strength, and health, under its use,
there would seem to be some error
in the assertion. Cases have been
recorded, which have every evidence
of truth on their side, but in general,
so far from causing the effects just
mentioned, it appears to have a tonic in-
fluence upon the system, and if emaciation
ever does occur, it most probably results
from the interference of the medicine
with the process of digestion, and not
from any peculiar property resident
in itself. The skin is of all the

tissues, the easiest affected by iodine, and almost every variety of cutaneous eruption is said to have been caused by its use, all of which, however generally disappear after discontinuing its use, some requiring a long, and some a short time.

Iodine belongs to that class of medicine, which, for want of a better understanding of their operation are called alteratives. Coindet first used it in the treatment of disease. He was induced to try it in bronchoceli, from the beneficial effect, which sponge had on that disease. It at once acquired a high reputation as a remedy in that affection, which it has maintained to the present time; and it seldom fails in producing

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a cure, unless the gland has become cartilaginous. After the successful treatment of goitre by its agency, it was used in all kinds of enlargements of glands, in a majority of which, its use was attended with benefit. But as all enlarged glands are not thus cured, and as it soon began to be indiscriminately used in almost every disease, it was soon brought into disrepute. For the removal of carcinomatous, or other malignant tumors; of tuberculous, or other deposit of the kind, iodine as an alterative is powerless. But in all chronic enlargements of any gland, or tissue, resulting from inflammation, and, also in pure hypertrophy, and, indurations, iodine is always a good remedy.

In any disease complicated with acute inflammation, or with febrile excitement, iodine should not be used, as it might aggravate the disease. Scrofula is the malady, in which iodine reached the acme of its reputation, and conferred the greatest benefit on mankind.

Immediately after its discovery, it was used to some extent, in that disease, and always with benefit, unless there was some concealed inflammation in the case. But it had not attracted the attention of the medical profession, before the publication of the papers of M. Gugeol about the year 1830. His treatment of scrofula by iodine, was found to be so successful, that it was at

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once adopted everywhere. And it has
sustained its character to the present
time. Probably iodine has no curative
power over the scrofulous diathesis,
for unless assisted by hygienic, and
tonic measures it is not of much
value; but then, its great influence
is found in removing the results
of scrofulous inflammation. In scro-
fulous swellings of joints, in scrofulous
ophthalmia, and in all affections which
have this taint the use of iodine
should not be omitted. For phthisis
inhalation of the vapor of iodine
has been recommended by some, but
it appears to have met with the
disapprobation of almost the whole
medical profession. In tubercles of
the liver, mesenteric glands, and even

of the lungs, iodine has been used very beneficially; it does not affect tubercles already deposited, but removes the tendency to their deposit. In the tertiary form of syphilis, iodine has almost superseded all other remedies, and indeed is the only one of much benefit. The secondary form also manifests much improvement under its use. In uncomplicated syphilis, the iodide of mercury, possessing the properties both of mercury, and iodine, should be used; but in scrofulous cases the iodide of potassium is best. In the conclusion of the mercurial treatment of syphilis, some preparation of iodine should always be used, allowing a few days to elapse after discontinuing the

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mercury. For the cure of acute gout,
iodine is highly esteemed; it has
been used successfully in chronic
rheumatism, especially in those cases,
which result from the effects of
syphilis. It has been employed with
assented success in chorea, epilepsy,
and neuralgia. Old ulcers, obstinate
cutaneous eruptions, and obstinate cases
of leucorrhoea are sometimes relieved
with surprising promptitude. Iodine
is an emmenagogue, and is occa-
sionally used for the cure of
amenorrhoea. When the amenorrhoea
occurs in chlorotic females, the iodide
of iron is an excellent remedy.

In colica pictorum, and lead palsy,
and also in the mercurial disease,
in which the metals exist as an

unnatural substance in the tissues of the body, the iodide of potassium is a very good remedy, uniting with the poisons, rendering them inert, and afterwards removing them from the system. Like many other remedies, which have been fashionable at times, and which have been indiscriminately used, iodine has had temporary reputation in many diseases, over which, it had no influence.

The strong tincture of iodine may be used locally in variola, in erysipelas, and in phagedenic, spreading, or sloughing ulcers, being brushed over, or around the affected spot. It is applied sometimes to carbuncles, boils, buboes, and when concentrated to all

the purposes of a caustic. As an injection, ⁱⁿ serous cysts, in enlarged bursae mucosae, in ovarian dropsy, and in chronic abscesses, which have formed sacs around them, iodine is very valuable, exciting inflammation and granulation. Iodine has been used in the treatment of dropsy, internally, and sometimes by injection after tapping. When it cures ascites, it is probably by removing a tumor, or enlargement of the viscera of the abdomen, which may have been obstructing the passage of blood, through the portal vein, or some of its branches. Iodine is said also to invigorate the tone of the blood vessels, and thus to relieve congestion, which may have been a cause of dropsy.

The tincture, or some preparation of iodine should be employed for all doubtful tumors, to produce their absorption; it has caused the disappearance of some, which were previously believed, to be of a malignant character, and hence among some, who believe in the curability of cancer, it has excited the belief, that iodine can effect it.

The dose of pure iodine is about one fourth of a grain; but it is seldom given in substance. The tincture is liable to set the iodine free in the stomach; a watery solution was much used by Tugol, and is still used to some extent. But the iodides are now most frequently used, and of these the iodide of potassium in a dose

varying from two to ten grains,
is by far the most thought of.

Externally, it may be used in the
forms of tincture, lotion, ointment, and
bath.

Kufus Alphonso Crockett.
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