Thesis on Jodine
In treating of the subject of Iodine, I propose to speak of it under the following heads; viz:

1. History.
2. Natural History.
3. Mode of Preparation.
4. Physical Properties.
5. Chemical Properties.
7. Impurities.
10. Therapeutic Uses.
11. Preparations.
12. Dose.
13. Mode of Administration.
15. Antidotes.
History. Iodine, an element which has proved of such eminent service, both in medicine and the arts, was discovered, by M. Courtais, of Paris, in 1812, while engaged in the preparation of carbonate of soda, from help. It obtained the name of Iodine, from the Greek \\

iodys, violet-coloured, on account of the beautiful violet-coloured vapour it yields when heated. It was first described by Clement in 1813, but was afterwards more fully investigated by Davy and Gay-Lussac, especially the latter. It was first introduced into medicine by D. Foundet, of Geneva, in 1820, who employed it with great success in the treatment of goitre.

Natural History. Iodine has been found in both the organic and inorganic kingdoms of nature. In the latter it exists in sea water, combined with sodium, potassium, K, magnesium, also
in many mineral springs, combined with the same elements, but in so small a proportion as to be with difficulty detected. Iodine has been found in coal and fossil fuel; in combination with silver, lead, and mercury; in some Silesian ores of zinc also contain it. M. Bussy has detected it in the coal gas liquor of the gas works of Paris, in the proportion of one part in five thousand.

In the organic kingdom of nature Iodine has been detected in both plants and animals. It was formerly believed to exist only in marine plants; but more recently Chatin & Macadam have detected it both in fresh water and land plants. Water-cress, Marsh marigold, Water Lily, common Reed, Brooklime, Forget-me-not, Water Mint, Iris, Digitalis, Oak, Beech, Birch, common Ferns, Mosses & Lichens, Ranunculus, Veronica, Galium, & some Beet roots, are among the principal land
and fresh-water species which contain iodine. The sea plants in which it has been found are chiefly the Alga especially the following varieties, as Fucii, Ulvi, Laminaria, Chorda filum, and some of the Confera. These are the varieties of Alga which constitute the chief source of iodine. In the animal kingdom, iodine exists in marine molluscous animals, various Polypes, and some belonging to the genera Spongia. Certain fish oils especially that obtained from the cod's liver contain iodine. Finally, according to some statements of M. Chatin, it would appear probable, that this element is as widely disseminated as the researches of Townes, Dr. George Wilson & others, have proved Flavo-nin to be.

Mode of Preparation. British iodine is almost exclusively manufac-
tured at Glasgow, from kelp, or
The half-vitrified ashes of sea-weeds, prepared by the inhabitants of the Western Islands, and the northern shores of Scotland and Ireland. Kelp was formerly prepared for the carbonate of soda, which it yields in the proportion of, from two to five per cent; and although other methods for obtaining soda have superseded this, yet it is still prepared for the sake of the iodine contained in it. According to some observations of Mr. Whitelow and G. Kemp, the long elastic stems of the Sarcus palmatus, &c certain laminarian species yield most of the iodine which is present in kelp. (The following description of the mode of preparing iodine is for the most part from Graham's Elements of Chemistry.

For preparing kelp, the sea-weed thrown upon the beach is collected, dried, and afterwards burned in a shallow pit, in which the ashes accumulate.
and melt by the heat, being of a fusible material. The fused mass broken into lumps forms kelp, which is leviated in water, to which it yields about half its weight of salts. The solution is evaporated down in an open pan, and when concentrated to a certain point, begins to deposit its soda salts—viz., common salt, carbonate and sulphate of soda—which are removed from the boiling liquor by means of a shovel pierced with holes like a colander. The liquid is afterwards run into a shallow pan to cool, in which it deposits a crop of crystals of chloride of potassium: the same operations are repeated upon the mother-liquor of these crystals until it is exhausted. A dense dark-coloured liquid remains, which contains the iodine, in the form it is believed of iodide of sodium; but mixed with a large quantity of other salts, & this is called iodine lea. To this lea sulphuric acid is added gradually, and in such quantity as to leave the
liquid very sour, which causes an evolution of carbonic acid, sulphuretted hydrogen, and sulphurous acid gases, with a considerable deposition of sulphur. After standing for a day or two, the ley so prepared is heated with binoxide of manganese, to separate the iodine. The operation is conducted in a leaden still, supported in a sand bath and heated by a small fire beneath. The prepared ley, being heated to a temperature of about 140°, the binoxide of manganese is then introduced, and more sulphuric acid from time to time if necessary. The iodine immediately begins to distil over in the form of vapour, into a series of glass receivers inserted into one another, in which it is condensed. I have already stated that the iodine is obtained chiefly from the iodide of sodium (and also perhaps from the iodides of potassium and magnesium present in small quantity) in the kelp liquor. After the addition
of sulphuric acid and binoxide of manganese, and a certain temperature, certain decompositions take place which I will here represent;

\[
\text{(Iodide of Potassium)} \quad = 167 \\
\text{(Binoxide of Manganese)} = 44 \\
\text{(Sulphuric Acid)} = 80
\]

or, the following simple formula will express the changes which take place;

\[
\text{I}_2 + \text{MnO}_2 + 2\text{SO}_3 = \text{H}_2\text{SO}_3 + \text{Mn}_2\text{SO}_4 + \text{S}
\]

The late Dr. Gregory recommended the following method to be employed for obtaining iodine. The mother liquor containing
the iodides is precipitated by a mixture of sulphate of copper and sulphate of iron, in the proportion of one part of the former to two and a quarter parts of the latter. The precipitate, which is the subiodide of copper, if heated with peroxide of manganese alone, or with the addition of sulphuric acid, yields the iodine as a purple vapour, which condenses in black crystalline scales on the cold part of the apparatus. It is to be purified by a second sublimation. The chemical changes which ensue on the addition of the peroxide of manganese and heat are shown in the following equation:

\[ 2CuI + 2(MnO_2) = CuO + 2MnO_3 + I_2. \]

Physical Properties. Iodine is met with in soft, friable, opaque crystalline scales, very frequently accreted into nodules. Its colour is bluish-black, with an imperfect metallic lustre, resembling that of plumbago. It has a strong
disagreeable odour resembling that of chlorine, and an acid taste. From a solution in liquid hydrochloric acid, it may be obtained in crystals, which are sometimes very large and brilliant. The crystalline form which iodine assumes is the oblique octahedron with rhombic base. The sp. gr. of iodine is 4.948.

Chemical Properties. Iodine is a non-metallic elementary body. Its equivalent weight is 127 (Toumès). Iodine is a solid body, but evaporates at the ordinary temperature if exposed to the air, and more rapidly if moist. Hence it should be preserved in dry well-stoppered bottles. Exposed to an increased temperature, it is sublimed in the form of a beautiful violet-coloured vapour, whence it is derived its name, Idoys, meaning violet-coloured. Iodine unites with oxygen to form certain compounds.
the most important being the iodide acid IC\textsubscript{5} and the periodic acid IO\textsubscript{7} with hydrogen it forms the hydrate acid H\textsubscript{2}I. The Sp. Gr. of the vapour of iodine is 8.716 (Towens). Iodine fuses at 225° (107.2 C) and boils at 347° (175 C). (Towens) It requires for solution about 7000 parts of water, which nevertheless acquires a brown colour. It is far more soluble in alcohol and ether than in water. Solutions of hydriodic acid, and the iodides of the alkaline metals also dissolve a large quantity. The presence of tannin in water renders iodine more soluble, which property may be taken advantage of in prescribing it in medicine, the addition of any astringent tincture or syrup increasing its solubility.

Tests: The tests for ascertainning the presence of iodine are very satisfactory. It may generally be recognised by the beautiful characteristic
violet vapour which is evolved on the application of heat. But where the vapour cannot be made evident, it may be detected by means of the starch test, which was first discovered by Jolin and Gaultier de Claibry. This test distinguishes iodine, by forming a rich blue iodide of farina, with a cooled decoction of starch, and is so delicate that it will indicate its presence in 4,500,000 times its weight of water (U.S.D.). The particles of starch are composed of an external tegument termed Amylin, and a contained mucilage named Arridin. Now it is only on the Arridin that iodine acts, not altering the colour of the Amylin, consequently it produces no effect on starch when merely moistened with water, requiring either heat or triturations to burst the tegumentary membrane. A cooled solution of starch is directed to be employed, because the iodide is soluble in a hot
one. The iodine must be in the free state, and if it exists in the form of iodide, a little nitric or sulphuric acid should be added to set it free, in order that either the starch test, or the one I am about to speak of may be successful. Mr. Babourbin has proposed chloroform as a test, on account of the purple tint communicated to it if iodine is present in only a very minute quantity (Chem. Gaz. Jan. 15th 1851). If iodine is in combination with oxygen the starch test will not act, but if some substance, such as anorphia or sulphurous acid be added, so as to remove the oxygen, & set free the iodine, then on the addition of the starch solution, the characteristic blue iodide of jaurina is immediately produced. This test is applicable either for the detection of anorphia or iodine as iodic or the periodic acid.

Impurities. The substances which are
mentioned, as having been employed for the adulteration of iodine, are very numerous, but neither Dr. Christison or Panerina, have been able to discover many of the impurities, which are said to be employed. The following are named in the London Pharmacopoeia—viz., iron, sand, charcoal, plumago, sulphur, of antimony, oxide of manganese, & chloride of calcium; at the same time it says exposure to heat will detect them all. By far the most important impurity however, is water, as was pointed out by Dr. Christison some years ago. Until within a recent period Dr. Christison had not met with any British iodine which did not contain upwards of twenty per cent of this impurity. Water may always be suspected to be present as an impurity when the iodine adheres to the sides of the bottle. The Edinburgh
college has given an excellent test, which detects all impurities, of whatever kind, above two per cent. The directions given in the Ed. Ph. for the employment of this test are:—Thirty-nine grains (of iodine) with nine grains of quicklime, and three ounces of water, when heated short of ebullition, slowly form a perfect solution, which is yellowish or brownish if the iodine be pure, but colourless if there be above two per cent. of water or other impurity. This test is founded upon the fact, that pure iodine, diffused in water, forms a colourless solution of iodide of calcium and iodate of lime, with a certain proportion of quicklime. The quantity of quicklime here ordered is not quite sufficient to form a colourless solution with the iodine, if it contain only two per cent of impurity. Accordingly if the iodine contain more than two per cent of
Physiological Effects on Man and Animals. I shall first state what has been observed with regard to the physiological effects of iodine on animals. Experiments on the lower animals have been chiefly confined to horses, dogs, and rabbits. McDick has made some experiments upon the horse, giving iodine in very large doses to a horse, for three weeks, without observing any other effects than an unusual disregard for water. The average daily allowance was two drachms, administered in quantities ascending from a drachm up to two ounces. The other experiments on dogs and rabbits were conducted by Magendie, Orfila, and Dr. Fogwell. Magendie threw a drachm of the mixture of iodine into the veins of a dog without
causing any obvious effects. The same experiment was repeated by Dr. Fogwell with similar results. The last observer however found that two drachms of the tincture injected into the veins was fatal. Dr. Fogwell also gave 73 grains of iodine to a dog in nine days. Five days after the cessation of the iodine the dog was killed; the urine contained an appreciable quantity of iodine, and a trace was also found in the blood, brain, and stomach. Arfila applied 72 grains of iodine to a wound on the back of a dog; local inflammation, but no other inconvenience resulted. One or two drachms administered by the stomach caused vomiting, but when this was prevented by tying the esophagus ulceration of the alimentary canal and death took place. From these experiments on animals it may be concluded that iodine is an
irritant and caustic poison, though not of a very energetic kind. The whole of the foregoing experiments, (at least those which tend to show that iodine caused death) are liable to the very serious objection, of how far death may be attributed to other agencies independent of the iodine. In Orfila's experiment where two drachms are said to have caused the death of a dog, the serious operation of ligature of the esophagus must also be taken into account. In the case of Dr. Fogswell's experiment, where death resulted from the injection of two drachms of the tincture, the alcohol which the tincture contains must also be taken into consideration. Now as to the physiological effects of iodine on man; I shall speak of it:

1. When given in large doses.
2. In continued small doses.
3. The local action of iodine.
4. When given in large doses. The cases
of this kind which have been recorded are very few; a fatal case however is recorded by Tink where iodine acted as an irritant poison. The symptoms observed in this case were, restlessness, burning heat, palpitations, very frequent pulse, violent priapism, copious diarrhoea, excessive thirst, trembling, emaciation, and occasional syncope. The patient died after six weeks illness. On another occasion where the same physician had an opportunity of examining the body after death; the bowels were found highly inflamed, and in some parts had the appearance of phacelation. The liver was also found very large and of a pale rose colour. It is not improbable that the use of iodine in large doses, may cause congestion & even inflammation of the liver. Dr. Christison has observed two examples of such cases of death from iodine however
are very rare, and in many instances even when taken in enormous quantities, has caused scarcely any effect if properly diluted.

2. When given in continued small doses, iodine given in medicinal doses for a great length of time, frequently cures or alleviates disease without producing any perceptible alteration in the functions of the body. Very frequently however iodine does exert a very considerable influence upon the functions of the different systems; and I will now speak of the influence it may exert on these systems individually. First with regard to the digestive system, iodine has been said by some to cause loss of appetite, much emaciation and derangement of the digestive functions; by others, to increase the appetite and even to cause a tendency to embonpoint. In irritable subjects and those disposed to
dyspepsia, it occasions nausea, sickness, heat of stomach, and loss of appetite, especially after its use has been continued for some time. Some observers have spoken of the bowels as being relaxed & others as being constipated under the use of iodine. If iodine has any effect upon the bowels in this way, it is certainly not a constant one.

Secondly, on the glandular system. Iodine acts as a special stimulant of this system, and under its use the quantity of fluid secreted is usually increased, though this effect is not always observed. Jorg and his friends found, in their experiments on themselves, that small doses of iodine increased the secretion of nasal mucus, of saliva, and of urine, and they inferred that a similar effect was produced on the gastric, pancreatic, and biliary secretions. (Pareura. Nat. Med.) Light says that,
Iodine is a powerful diuretic, Sipindet believes however from his observations that it does not increase the quantity of urine. Pareira in some cases which he watched did not find any diuretic effect produced by it. Iodine has been said to act as an emmenagogue by Sipindet, Magendie, Breza &c., but Dr. Manson does not believe in its emmenagogue properties. On rare occasions iodine has caused salivation and soreness of the mouth. The most remarkable effects however, which have been attributed to the use of iodine, are absorption of the mamma and wasting of the testicles. Of the first of these effects three cases are recorded in Hufeland's Journal, and Dr. Christison also mentions a case of a similar kind. The wasting of the testicles and absorption of the mamma are however, of very rare occurrence, and both Magendie and Pareira say
they have never met with a single case. M. Bonnet also corroborates the
rarity of these effects, for he says, that
he has not seen iodine administered
for a long time produce loss of flesh,
and atrophy of certain organs. Far
from having these effects, says the
author, iodine, in his hands, has
invigorated patients, and favoured
the development of organs. (Lancet
Oct. 23rd 1858).

Thirdly the action of iodine on the
cutaneous system. It is said some-
times to produce diaphoresis. Dr.
Vogel also relates the case of a lady,
of yellow complexion, who from the
internal use of iodine, the author says,
became suddenly brown, besides
suffering with other morbid symp-
toms. I imagine, it is doubtful,
whether the pigmentary deposit
was due to the administration of
iodine in this, in all probability
it was not.
Fourthly, its effects on the nervous system. A disordered state of this system has been caused by the use of iodine in a few instances. Slight headache and giddiness are not unfrequently caused by it. Lugol says that iodine baths produced headache, drowsiness, intoxication, and even stupor. In some of Dr. Manson's cases there were slight convulsive movements.

Lastly, in some instances the continued use of iodine, has given rise to a disordered state of the system generally, which has been designated iodism. The chief symptoms of this condition are—nausea, headache, general languour and loss of appetite, followed by violent vomiting and purging, extreme depression, frequent small pulse, great weakness, fainting, and dry cough, occasionally attended with inflam-
-mation of the mucous membrane of the air passages, and ultimately resulting in death if its use be not discontinued. Iodism is however in the present day a rare occurrence, and if it should occur, is easily checked by suspending the remedy.

3. The local action of iodine. If applied to the skin it acts as an irritant, stains the skin of an orange yellow colour, causes itching, redness, and desquamation. The brown or orange yellow stain caused by iodine is due to the for-

-mation of the iodurated hydro-

-de acid (Iodurea). If the vapour of iodine mixed with air be in-

-haled, it excites cough and heat in the air passages, and promotes bronchial secretion. If the inha-

-lation however be too long con-

-tinued, or diluted with too little air, it will cause great irritation,
on even inflammation of the air passages.

Modus Operandi. Dr. Glover explains the modus operandi of iodine, thus: It is well known, he observes, to all practical men, that iodine acts as a diuretic, but it is not equally well known that the urine contains large quantities of urea. Now, urea is the product of the albuminous tissues, and, as it has been clearly shown by chemical analysis that the tubercle is composed chiefly of albumen, we can understand how iodine acts by carrying a large quantity of albumen out of the system, thus retarding the growth and promoting the absorption of tubercular matter. Some consider that iodine acts as a general tonic, improving and strengthening the digestive organs.
establishing a healthy tone of the system, and thus retarding the development of tubercular disease. (Warning) The therapeutic actions of iodine have also been ascribed by Dr. Billing to a contraction of the capillary vessels; by Dr. Panco to a liquefaction of the blood; by others to a direct stimulation of the absorbent system. It probably counteracts morbid operations in some way that we do not understand. (Headland) That iodine is absorbed and passes into the blood when employed internally or externally, we have indisputable evidence by its detection not only in that fluid but also in the secretions. Sanguin has detected it in the urine, sweat, saliva, milk, & blood. According to Dr. F. E. Dalton of Boston, iodine, taken in a single moderate dose, appears in the urine in thirty minutes, and
may be detected for nearly twenty-four hours. (U.S.D) I have repeated the preceding experiment; I swallowed about six minims of the tincture of iodine, and then at the end of thirty minutes, tested the urine, for its presence, but without success; thinking however that I might not have taken sufficient, immediately swallowed six minims more, and again tested the urine, at the end of another thirty minutes but with no better success. Iodine passes off by the urine, and other secretions, in the form of iodide, consequently when testing for its presence in secretion a little nitre acid should first be added to set free the iodine, & then a cooled decoction of starch. The following is a convenient method for ascertaining its presence; take a strip of starched paper, moisten it with the saliva or urine of the
patient, and then touch it with nitric acid. If iodine is present a more or less intense blue will be produced. (Nayer)

Therapeutic Uses. Iodine was first employed in medicine, as I have already mentioned, when speaking of its general history, by Dr. Foudet of Geneva, in the treatment of bronchocele. This physician employed it with great success in the treatment of the disease in question, and subsequently Dr. Manson, Copland, Watson, Heoghan, &c have all borne testimony to the great efficacy of iodine in the treatment of bronchocele. This disease as Dr. Watson states in his Lectures on the Practice of Medicine should be defined as hypertrophy of the thyroid gland; and these alone are the cases in which iodine is
applicable, and, consequently if iodine is employed for all enlarge-
ments of this gland indiscrimi-
nately, failure will frequently
be the result. In the treatment
of scrofula iodine has obtained a
high reputation, and in this disease
also Dr. Joubert was the first to
employ it. Dr. Manson subsequent-
ly made an extensive series of
experiments, in the treatment of
scrofula, and scrofulous opthah-
almia and reported very favoura-
ably of its efficacy. Dr. Lugol in
a very extensive series of experi-
ments as to the efficacy of iodine in
scrofulous disease obtained the
most successful results. M. Leriches
of Lyons, in some valuable arti-
cles in L'Union Medicale, as to a
new method of administering
iodine, (and which I shall again
have occasion to refer when
speaking of the mode of admin-

istration of iodine) reports very favourably as to its efficacy in the treatment of a series of scrofulous patients. In the space of three years M. Leriche treated thirty-eight patients with this remedy; twenty-one were perfectly cured; eight did not improve at all; and nine improved but slightly, either because the treatment was left off too soon, or carried on imperfectly. (Lancet, Oct. 23rd 1858). M. Borenet, in a paper read before the Academy of Medicine of Paris on the 28th of September last, in which he proposes to use iodine as an article of food, was very successful in the treatment of scrofula with this remedy. Trials were begun by M. Borenet as far back as 1848, upon subjects suffering severely from the well-known scrofulous symptoms, & most of them were cured.
after the employment of the
iodized food for several months.
(Lancet, Oct 23rd 1858) Iodine and
its compounds, have been much
praised for their reputed efficacy
in phthisis. Given in small doses,
Dr. Watson thinks iodine often
exerts a beneficial influence upon
the general health, but says he
has never known it work a cure
of the manifested disease. This
is the conclusion which I think
our best physicians have now
arrived at. Sir Charles Scudamore,
Sir James Murray, and Dr. Corrigan,
have recommended the inhalation
of iodine vapour in phthisis, but
general experience has proved its
ineffectiveness. Dr. Snow has recently
given the iodine inhalation a
fair trial, and corroborates the
idea commonly entertained,
that little benefit is to be derived
from it when thus employed.
But it is especially in that form of tubercular disease, called scrofula, whether it may show itself by affections, of the bones, joints, lymphatic glands, of the skin, or as opthalmia, enterhaa &c., that the efficacy of iodine and its preparations have been well tested, & their efficacy fully demonstrated. Of all remedies however which have been advanced for the cure of the tuberculous state, whether as phthisis, or struma in all its varied forms, cod's liver oil as introduced by Dr. Bennett of Edinburgh, is the one which has obtained the greatest and most uniform success. My reason for speaking of this remedy, is, that some authorities maintain its ability to depend upon the iodine which it naturally contains. Whether this be the case or not, its efficacy is now placed beyond doubt. It is very
probable that the beneficial results, arising from the exhibition of cod liver oil in tubercular diseases, is not due to any one component part of the oil, but rather to the fatty and biliary matter, iodine, chlorine, bromine, &c. in combination. In the secondary syphilitic affections more especially the periostitic, osseous, and cutaneous, iodine and its preparations, have to a great extent taken the place which mercury formerly held. In proof of its superiority over mercury, we have only to look back to those terrible cases of mercurio-syphilitic disease, so common in past years; to go into our museums, and look at the numerous preparations, which plainly tell the ravages, which the poison of syphilis, is capable of committing, when aggravated by the injudicious use of mercury. Then compare the results of the present
treatment of this disease with the old method, now for the most part fortunately exploded. In hypertrophy of the tonsils the tincture of iodine is often useful. In croup Dr.cope- man employed it with success, and states that he derived great benefit from its external application two or three times a day. It probably tends to prevent the formation of false membranes. In chronic enlargement of the liver, accompanied with jaundice, and also in splenic enlargement, Dr. Aber-crombie states that he has seen very good effects from the external use of iodine as an ointment. The local application of iodine for the discussion of buboes iodine is often very useful. In the enlarged and swollen joints of rheumatism and gout, the local application of iodine is often attended with the best results. In glandw-
lar enlargements, as adenoid tumours of the mamma, parotid, and other glands, the local application of iodine generally suffices for their removal. In superficial opacities of the cornea the application of the preparations of iodine is strongly advocated by M. Desmarres. (Journal of Pract. Med. & Surg. Jan. 1859.) Dr. B. Martin, of India, was the first to employ iodine for the radical cure of hydrocele. His experience extended over upwards of two thousand cases in the native hospital of Calcutta; and the failures were under one per cent. Dr. Simpson has employed iodine, as an injection, for the radical cure of ovarian dropsy in some ten or twelve cases; and in some of these the cure appears to have been permanent. Iodine injections of appropriate strength
have been repeatedly used by Vil-pauw with success in hydrarthrosis, and where the operation failed no bad consequences followed to the joint. The abdomen has also been injected with iodine after tapping, for the radical cure of ascites, and several successful cases are reported by French surgeons; still the practice is extremely hazardous and should not be imitated. Iodine has also been employed in cases of old non-united fracture, to promote the deposition of ossific matter. Iodine and its preparations have been given internally and applied locally in a great variety of cutaneous affections;—as lupus, elephantiasis, lepra, impetigo, eczema, acne, lichen, pruritus pudendi, &c., as recommended by W. Wilson, &c., in most of them it has been attended
with beneficial results. Iodine has been proved serviceable as a local application in erysipelas and chilblains. Dr. Crawford, of Montreal, first called the attention of the profession to the local application of the tincture of iodine in variola, and gave a favourable report of its success. Subsequently many other medical men have confirmed his views. In discolouration of the skin from the long continued use of the nitrate of silver, Dr. Patterson strongly recommends the internal and external use of iodine and its salts. Churchill in his manual on the Diseases of Women, says he has found iodine useful in hypertrophy or induration of the uterus. Drs. Churchill and Ashwell both speak favourably of iodine as a remedial agent in fibroid tumours of the uterus. Iodine has been
employed in amenorrhoea, but D. Churchill and most observers imagine, have not much faith in iodine as a remedy in this disease. In dysmenorrhoea D. Churchill states that he affected a cure, by the repeated application of the caustic tincture of iodine to the cervix uteri. In chronic synovitis the topical application of iodine is frequently of the greatest benefit. Lastly iodine has been recommended as a remedy in gleet, gonorrhoea, leucorrhoea, gout, palsy, chorea, &c. &c. but in all these cases its efficacy is very doubtful.

Preparations. Only one simple preparation is official in the British Pharmacopoeias, and that is the tincture of iodine of the 6D. Ph. and is prepared as follows.
Incertura Iodinii. C.P.

Iodine 3ijs.
Rectified Spirit Iij

Dissolve the iodine in the spirit with the aid of a gentle heat and agitation; keep the tincture in well closed bottles. One fluid drachm contains gr. iij ½ of iodine.

The reason of there being so few simple preparations of iodine official in the British pharmacopoeias, is due to the fact that iodine is more frequently given in combination with the iodide of potassium than alone.

Dose.

Pure iodine gr. ½ to ½ gradually increased.

Incertura Iodinii M v to xij

Mode of Administration. Iodine may be given in the form of pills, made into a mass of proper
consistence, with liquorice powder and extract of gentian. More frequently, however, it is administered in the form of mixture, in combination with the iodide of potassium, and a simple syrup added as a flavouring adjunct. M. Leriche of Lyons, has published some valuable articles in L'Union Médicale, wherein he endeavours to show that iodine, combined with vegetable substances advantageously replaces cod's liver oil. He proposes a syrup made of the juice of water-cress and iodine, and also an iodine wine. The wine is composed thus:—Bordeaux wine, eight ounces; concentrated infusion of red roses, about thirteen drachms; tincture of iodine one drachm and half. The syrup has the advantage of not fermenting, and each ounce of both the
syrup and wine contain one grain of iodine. From one to six table spoonsfuls may be given daily, according to the indications and age of the patient. Mr. Boinet proposes to use iodine as an article of food. He administers iodine as found in nature, viz. - combined with those plants which contain the greatest amount of the alkaloid. The latter being thus given, in a continuous, and almost imperceptible form, yields most advantageous results. Mr. Boinet uses fucal, marine plants, cruciferae, salts containing iodine, and some mineral waters holding iodine in solution. His recipients are, ordinary bread, ginger-bread, cakes, biscuits, chocolate, wine, beer, syrup, &c. some being especially calculated for children. (Lancet: October 23rd, 1858.) These methods
of administering iodine are very ingenious, and the results are reported by the authors to have been very successful. To avoid gastric irritation, iodine should not be administered on an empty stomach. Neither should it be administered immediately after a meal, since if potatoes, bread-pudding, sago, tapioca, or other amylaceous substances have been taken, an iodide of tarina will be formed, which is very insoluble, and thus the beneficial action of the iodine is greatly diminished. The most suitable periods therefore, for its administration would appear to be, about an hour or so after a meal has elapsed. Dr. Lugol has also recommended the use of iodine baths in cases where the remedy should disagree with the stomach from any cause. He recommends
from two to four drachms of iodine, with double that amount of the iodide of potassium, dissolved in water, in a wooden bath tub, in the proportion of three grains to the gallon of water. In the composition of these baths as used by Dr. Lugol, the iodide of potassium is merely used to promote the solubility of the iodine, and not as a medicinal agent, since upon trial, a bath containing the iodide of potassium alone proved almost inert. Iodine is also frequently used with advantage externally, at the same time with its internal administration as in the treatment of bronchocele &c. For this purpose an ointment, made in the proportion of a scruple of iodine to the ounce of lard or simple cerate, or the iodine ointment of the C.D.Sh. which
contains iodide of potassium, may be used; or the tincture of iodine of the C.D. Pk. may be painted over the part. Or the ethereal solution of iodine and mastic, as recommended by Dr. Thomas Smith Rowe, of the Margate Infirmary, may be painted over the part. It is prepared as follows:

Spiritus vin. rectificati 3v
Atheris sulphurici 3ij
Musce et adige,
Gummi, masticchae gr xxv
Solve et colai, dein adde
Iodinii 3ij
Flat solution.
The mastic forms a varnish-like film on the skin, which detains the iodine, and facilitates its absorption. A useful external application for scrofulous tubercles &c. Iodine is also administered in the form of injection
for the radical cure of hydrocele, in the proportion of one part of the tincture to three of water.
Lastly the inhalation of the vapour of iodine, was at one time much employed in the treatment of phthisis, but experience has proved its inutility.

Incompatibles. Iodine is incompatible with the following substances; viz., ammonia, sulphur, phosphorus, metals and their salts, hydrosulphates, nitric and hydrocyanic acids, and the vegetable alkaloids. (Religan)

Antidotes. When an overdose of iodine has been taken, either accidentally or from any other cause, emetics should be administered, the best for this purpose being one or two tablespoonfuls of mustard mixed up with su
or eight ounces of water; or half a drachm of the sulphate of zinc may be given. Their operation should be aided by demulcent and amylaceous drinks, as starch, flour, sago, arrowroot, &c., which should be boiled in water and exhibited freely. These at the same time assisting the operation of the emetics, and acting as antidotes, by forming the almost insoluble and inert iodide of farina. If any symptoms of inflammation of the alimentary canal should subsequently arise, they must be treated with the remedies proper for that condition.

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