

4th.—The height of the thermometer does not necessarily indicate the intensity of the disease.

5th.—The fall of temperature does not indicate the cessation of mischief, but only that the disease is about to enter on the 3rd stage.

6th.—If a high temperature is maintained for a long time (more than 3 or 4 days) or a fresh rise takes place, it indicates a fresh attack in a previously healthy part, or the advent of a complication.

7th.—The temperature and pulse usually, though not always, rise and fall together.

8th.—The temperature usually decreases before the frequency of the respirations diminish.

9th.—A high temperature before the 6th day in a doubtful case generally indicates it to be one of pneumonia and *not* of typhus.

ART. XX.—*On the Therapeutic Properties of Ferric Iodate.* By CHARLES A. CAMERON, Ph.D., M.D., L.K. & Q.C.P.I.; Professor of Hygiene in the Royal College of Surgeons; Lecturer on Chemistry in the Medical Schools of Steevens' Hospital and Peter-street; Analyst to the City of Dublin, &c., &c.

ALTHOUGH it has been proposed to employ the iodates as therapeutic agents, these compounds do not appear to have found any favour with the practitioners of medicine. It has been urged as an objection to their use that they part with their oxygen too readily. Unless it can be shown that in parting with their oxygen free iodine or hydriodic acid is simultaneously evolved, I cannot see the force of such an objection. It appears to me that amongst the numerous compounds of iodic acid there are to be found valuable remedial agents, and I venture to suggest the employment of one of them—namely, ferric iodate (iodate of the sesquioxide of iron)—as a substitute for iodide of iron.

Before explaining the reasons which have led me to suggest the therapeutic use of ferric iodate, I propose, for the benefit of those whose chemical knowledge may be somewhat rusty, to briefly describe the preparation, composition, and physical properties of this body.

There are two iodates of iron—ferrous (iodate of protoxide of iron), and ferric (iodate of per or sesquioxide of iron). The

ferrous iodate is an unstable compound, but the ferric iodate does not readily undergo decomposition. On mixing iodate of sodium ( $\text{NaIO}_3$  or  $\text{NaO},\text{IO}_5$ , old notation) with an ammoniacal solution of ferric sulphate (sulphate of the peroxide of iron) a yellowish precipitate of ferric iodate takes place. The formula of this precipitate appears to be as follows:— $\text{Fe}_2\text{O}_3, 2\text{I}_2\text{O}_5, 8\text{H}_2\text{O}$ . It is, therefore, a basic salt, containing 51 per cent. of iodine and 11 per cent. of iron.

Ferric iodate is a fine yellowish red powder, closely resembling Turkey rhubarb in appearance. It is nearly insoluble in water, and is decomposed by hydrochloric acid, with the evolution of chlorine. It dissolves in nitric acid and sulphuric acid without evolving any odour, and forms with those fluids a colourless solution. If carefully prepared it is inodorous, but it is likely to possess a very faint odour of iodine. It is very nearly tasteless. At the temperature of boiling water it remains long unchanged; nor has the atmosphere any effect upon it.

The crystallized protiodide of the Pharmacopœia contains  $63\frac{1}{2}$  per cent. of iodine and  $13\frac{1}{2}$  per cent. of iron; its formula being  $\text{FeI}_2, 5\text{H}_2\text{O}$ . It is therefore richer in iron and iodine than the ferric iodate, but in the two salts the same relative proportions of iron and iodine exist.

The therapeutic value of the iodide of iron is undoubtedly very great, and few medicines are at the present time more generally or largely prescribed; but the instability and intensely disagreeable flavour of this substance are great drawbacks to its employment. Syrup of iodide of iron and *Blancard's pills* are devices not always successful to prevent the disruption of the particles of the iodide of iron. The ordinary pills of the iodide of iron are a most uncertain preparation; and Dr. Rawdon Macnamara remarks in his *Materia Medica*, "that when kept for some time they become very soft and lose all trace of iodine."

Iodate of iron is sparingly soluble; but in the case of so powerful a medicine great solubility is perhaps not a desirable attribute. Calomel is insoluble, but is it the less valuable because it is so? Antimonial powder and many other of our most valuable remedial agents do not dissolve in water.

As a substitute for iodide of iron, the iodate of iron possesses great advantages, some of which I shall enumerate. In the first place, it possesses a stability of composition, the want of which is so serious a disadvantage in the case of iodide of iron. Secondly, it is

a preparation capable of easy administration, being nearly tasteless, and producing no discolouration of the teeth. I have known many cases where patients exhibited so great a distaste to the acrid iodide of iron that they could not take it in any form. It is probable that *iodism* is produced more frequently by the use of the ferrous iodide than by the alkaline iodides. Thirdly, whatever medicinal virtues are possessed by the chlorates, so far as their oxygen is concerned, are in all probability also to be found in the iodates, which they so closely resemble. The only difference between common culinary salt and chlorate of sodium (chlorate of soda) is the existence of a large quantity of oxygen in the latter. There is the same difference between the chloride of potassium and the chlorate of that metal. In addition to the powerful properties which it derives from its iron and iodine, ferric iodate also possesses the advantage of having a large percentage of "condensed" oxygen. If, as Dr. O'Dwyer states to be the case, chlorate of potassium modifies the action of mercury upon the system, and prevents it from running riot, iodate of iron might have the same effect. In syphilitic affections it would be worth trying whether the iodate of iron might not with advantage be alternated with the mercurial preparations when it is found necessary to employ the latter.

I have not the opportunity of determining the relative merits of the sesqui-iodate of iron *versus* iodide of iron or the iodide of potassium in actual practice; some of my medical friends have, however, undertaken the experiment, and so far, they report favourably of the iodate. A member of my own family, who could never tolerate in any form the iodide of iron, is now taking pills composed of three grains of iodate of iron and two grains of extract of hyosciamus.

The ferric iodate has been introduced into several of the Dublin Hospitals, and, amongst the physicians who are employing it, I may mention Sir Dominic Corrigan, Bart., Drs. Hudson, Little, Jennings, Forrest, Ringland, Roe, D. Hewitt, Quinlan, and Macnamara.

Dr. William Moore, Professor of the Practice of Medicine in the University Medical School, informs me that he has prescribed the iodate of iron about twenty-five times during the last fortnight, and with great success. In no case was *iodism* produced, and no complaint was made relative to the flavour of the medicine. Dr. Moore used it chiefly in the case of atonic females, especially where there was reason to suspect a strumous taint.

Dr. B. F. M'Dowell, Surgeon to Mercer's Hospital, and Lecturer

on *Materia Medica* in the *Ledwich School of Medicine*, has favoured me with the following communication:—

“ Since you suggested to me the use of the sesqui-iodate of iron as a therapeutic agent, I have employed it frequently, and in some cases I found it almost invaluable.

“ I believe it to be best suited where free iodine, in any form, or its unstable compounds, such as those of iron, are likely to disagree with the patient, or where a permanent combination of iodine with iron is indicated.

“ In two cases in which I employed it the iodides of iron and potassium had been each tried, and had been followed by the peculiar train of symptoms which are developed by those remedies in certain idiosyncracies—such for example as frontal headache, coryza, &c.—and in these cases the ferric iodate was taken regularly with great benefit, and was not followed by any unpleasant symptom.

“ My experience so far is necessarily limited, and I cannot therefore lay down any exact guide for the cases in which it will be found most useful; but I shall quote one case from my note book in which its employment was followed by signal benefit to the patient.

“ Mr. ——— consulted me in the latter end of February for chronic induration of all the glands in the left groin. He had had a mild roseolar eruption and erythema of the fauces about three months previously, for which he took a mild mercurial course, under the influence of which and of an antiseptic gargle the eruption disappeared, and the throat got well. But he also had gonorrhea at the same time, which also disappeared under appropriate treatment. About six weeks ago a few of the glands of the groin became indurated to a slight degree, and this continued to increase until all the glands became engaged, and the groin was in a solid flag-like state of chronic inflammation, with no tendency to suppuration. He was anemic, his stomach was irritable, and he was unable to take exercise. Several remedies had been employed but without benefit, and the iodide of potassium did not agree with him, and its use was discontinued. He was ordered three grains of the sesqui-iodate of iron three times a-day, and a pint of porter, with fresh meat, every day, and an occasional purge. In a fortnight the induration had entirely disappeared, and he has not since suffered from it.

“ I will gladly give you the particulars of other cases after a little time.”

The iodate of iron may be given in the form of bolus, electuary, powder, lozenge, or pill—the last form is probably the best, except, of course, in the case of children. The dose is from two to five grains. It may be used wherever iodide of iron is indicated, but it partakes somewhat more of the character of a ferruginous preparation than the iodide—a feature which may in many cases prove desirable rather than the reverse. A two-grain dose of ferric iodate may be given in a three grain pill. I have some pills each composed of two grains of the iodate and one of extract of gentian, which were prepared a month ago. They have undergone no change since their preparation.

ART. XXI.—*The Treatment of Gonorrhea by an Improved Continuous Injector.* By Mr. MORGAN, F.R.C.S.I.; Surgeon to Mercer's Hospital and to the Westmoreland Lock Hospital; Professor of Surgical and Descriptive Anatomy R.C.S.I.

THE practical difficulty of thoroughly applying a medicated solution to the male urethra has been frequently recognized by practitioners, and has led to many differences of opinion as to the absolute value of injections as ordinarily applied—some believing that they attain much more fully the deeper parts, and others, again, that it is sufficient to reach the first two inches, or the “specific region” of the canal.

The superior efficiency, however, of injections that fill the urethra and reach to the deeper parts, is generally admitted, and the experience of continental and other surgeons confirm this view.

The few instances of *post mortem* examinations that have occurred prove the inflammation to have extended deeply down the canal; thus Rokitansky gives as the pathological change, “that not only the fossa navicularis but every point as far as the prostatic portion, and specially the vicinity of the bulb, is liable to become diseased.” Sir H. Thompson, from *post mortem* observations, found “unusual vascularity at the bulb and fossa navicularis.”

The result of deep urethral injections have, in the hands of Bonnet, Diday, Bumstead, &c., proved the most successful, the chief method of applying them being by means of catheter-pipes attached to the syringe, Tiemann's “universal syringe” being that generally used and most applicable. In the using of this syringe, however, or, indeed, of any other, I have found inconveniences; and I think it will be admitted that, with timid and nervous