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### PART I.

### ORIGINAL COMMUNICATIONS.

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ART. XII.—*Iodic Purpura*.<sup>a</sup> By GEORGE F. DUFFEY, M.D.,  
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IN September, 1877, Dr. Alfred Fournier published in the first volume of the *Revue Mensuelle de Médecine et de Chirurgie* a paper on Iodic Purpura, or Petechial Iodism, in which he describes in elaborate detail a variety of purpura following the internal administration of the iodide of potassium. In an abstract of this paper in the "Periscope" of the *Dublin Journal of Medical Science* of April, 1878, I referred to cases of iodic purpura, described by former observers, that had been noted by Dr. W. G. Smith in three of his "Reports on Materia Medica and Therapeutics" in this Journal. No allusion to these or to any similar cases is made by M. Fournier; although it would seem that Ricord, M. Fournier's distinguished master, was one of the first to observe the production of purpura by the use of the potassic iodide.

Having recently had under my care in Mercer's Hospital a case in which purpura was similarly produced, I am led to bring it forward as an additional instance of this peculiar form of a medicinal eruption:—

CASE.—A wine-porter, aged twenty-five, was admitted into hospital on the 6th October, 1879, with rheumatic pains in his feet. The ankles

<sup>a</sup> Read before the Medical Society of the College of Physicians, March 3, 1880.  
[For the discussion on this Paper see p. 323.]

and knees were slightly swollen, and he had a mitral regurgitant murmur. He stated that exactly a year previously he had had rheumatic fever, for which he was under treatment for two months in another Dublin hospital. Since then he had been more or less subject to rheumatic pains in his joints, and to cardiac palpitation, which incapacitated him from working. Notwithstanding the temptation offered by the nature of his employment, he affirmed that he had always been a moderately temperate man, and he denied ever having had syphilis.

On the day of his admission (October 6th) he was ordered ten grains of iodide of potassium three times a day (3 ss. per diem) in water; and on October 29th, the dose of the iodide was increased to fifteen grains (gr. 45 per diem), with which, in consequence of his anæmic condition, was combined tartrate of iron.

On the evening of the 6th November, exactly one month after his admission—the patient having taken the iodide continuously, and with apparent benefit all the time, to the total amount, presumably, of about  $2\frac{1}{4}$  ounces—he complained to my clinical clerk, Mr. H. G. Myles, of a slight sensation of warmth and itchiness in both shins.

Mr. Myles, on examining the legs, noticed an eruption on them of small round spots, which the patient had not himself observed before, or on any previous occasion, and which he was confident were not there that morning.

The next day his state was as follows:—He had had a good night, and felt well; his appetite was good; there was no fever; and now no heat or itchiness in the shins. There was slight swelling and a little redness on the dorsum of the foot, similar to what he had on former occasions, and which was ascribed to rheumatism.

Over the lower four-fifths of the anterior and lateral aspects of both legs, and on the dorsum of both feet, was a copious eruption of small, discrete purpuric spots. They were circular, of a dark blood-red colour, varying in size from that of the head of a pin to that of a lentil; did not disappear upon pressure, and were not elevated above the surface. They were confined to the legs, chiefly the anterior tibial regions, and the insteps; and, with the exception of a few acne-like spots on the forehead and under the left clavicle—probably, also, due to the iodide—there was no other cutaneous affection or discoloration of the skin. The gums were not spongy, and there was otherwise no hæmorrhagic tendency. No constitutional disturbance of any kind existed. There was no coryza, no feeling of languor, depression, or weakness, and no albumen in the urine.

The iodide was at once discontinued, and the eruption grew gradually fainter in colour and finally disappeared; and in eleven days not the slightest trace of it could be distinguished. A week after this—viz., on November 19th, no medicine having been given him in the interval—

he was again ordered, as a test experiment, fifteen grains of iodide of potassium in infusion of quassia three times a day. The following morning, after having taken three doses of the medicine—*i.e.*, forty-five grains—the purpuric rash had reappeared on both legs, but not preceded by any sensation of heat or itchiness. On this occasion some fifty or sixty spots were counted on each leg—a smaller number than existed on the first appearance of the eruption. It also seemed more confluent than, and not so bright in hue as, before, but was equally as distinct in its general characters. The medicine being discontinued, the rash again faded, and in four days had quite disappeared.

As his general health continued very good, and as he was freer from arthritic pains than he had been for some months, I was desirous, in the first place, of testing his susceptibility to some other preparations of potassium, before trying the effects of the other alkaline iodides. He was accordingly ordered, on November 24th, fifteen grains of chlorate of potash three times daily. Two days subsequently, however, he complained so much of a return of the pains in his right hand and wrist, that I substituted the iodide of sodium in ten-grain doses three times a day for the potassic chlorate. The pains, however, shifted from the right to the left side, involving the shoulder and knuckles, and subsequently the knee; and, as he complained that the medicine, of which he had now taken altogether two drachms, gave him no relief, it was stopped for one day, and five grains of Dover's powder given every third hour. This having procured relief, the iodide of sodium was resumed; and, as he had now lost his former good appetite, he was allowed a glass of marsala daily.

On December 4th he had taken another two drachms of the sodium salt, making half an ounce altogether, without its producing any eruption. At this time he was in good health again, his appetite was improved, and he had no pains. The iodide of ammonium was now (December 4) ordered in ten-grain doses in water three times daily. The same evening, after two doses (twenty grains) of the medicine, as he was sitting before the fire, the eruption reappeared—chiefly on his right leg, and more towards its posterior aspect than on former occasions. His leg felt hot before the rash came out, probably only in consequence of his sitting close to the fire at the time, but there was no itchiness, or other constitutional or local symptom of any kind. The medicine was discontinued, and on the third day the eruption had quite disappeared again. He was shortly afterwards discharged from hospital in good health.

Although the special subject of this communication is that particular form of eruption produced by the administration of the iodide of potassium internally now known as iodic purpura, it may

not be uninteresting to mention briefly the different varieties of cutaneous affections that have been ascribed to the use of iodine and the alkaline iodides. I say iodine as well as the iodides, for in the light of recent researches, to which I shall refer presently, it may, I think, be assumed that when the iodides are administered, free iodine is liberated, and acts as such on the system.

Dr. H. E. Fischer, of Vienna,<sup>a</sup> distinguishes four principal forms of exanthem produced by iodine—viz. (1), the erythematous; (2) the papular; (3) the nodulose-pustular; and (4) the eczematous form. There is no allusion in the extract of Dr. Fischer's paper, which alone I have been able to consult, to a purpuric form of eruption, further than by the observation, under the third form, that Ricord has seen iodine produce an infiltration of blood and serum in parts formed of loose and soft cellular tissue. I have not been able to verify this particular observation of Ricord's; but in his "*Études sur l'action pathogénique de l'iodure de potassium pour servir à régler l'administration de ce remède*,"<sup>b</sup> this author, in describing its action upon the skin, says that there is hardly any form of acute cutaneous eruption which the iodide of potassium may not excite—in one person it is eczema, in another herpes, and in a third simply erythema. The most common variety is a psudracious form of eruption, much resembling the pustules of acne. He proceeds to state that he has seen two patients who, at two different intervals, presented an eruption of papular erythema in some places, and of erythema nodosum in other. In a patient suffering from cancer of the face to whom the iodide was given in very large doses, he has seen it cause an eruption of impetigo on the scalp, and of rupia on the legs and forearms—phenomena which subsided as soon as the remedy was suspended, only to reappear as soon as its use was begun again. Ricord has several times seen the iodide of potassium give rise to "a veritable purpura hæmorrhagica;" and refers to the case of a gentleman in whom, on three different occasions, after being given for a fortnight, it produced on his legs a true morbus maculosus of Warloff (Werlhof). In a lady also, whom he saw with M. Cruveilhier, very similar effects resulted from its use. Again, in a discussion in the *Académie de Médecine* on a report by Trousseau on a communication from M. Rilliet on Iodine,<sup>c</sup> Ricord, in the recital of numerous unpleasant symptoms which he had seen

<sup>a</sup> L'Union Méd., 31st Jan., 1860, p. 200, from Wien. med. Wochenschrift.

<sup>b</sup> Bull. Gén. de Therap. Tome XXIII., p. 161. 1842.

<sup>c</sup> Gaz. Méd. de Paris. 1860.

follow the administration of iodide of potassium, said that it might produce all forms of skin eruption, and that its effects were sometimes "brutal."

Bazin<sup>a</sup> describes three forms of iodic eruptions—the erythematous, the papular, and the pustular, but makes no mention of a purpuric form. Dr. Petitjean, the most recent writer on the subject, in his Thesis (No. 343) for the Doctorat en Médecine, entitled "*Accidents des Côté de la Peau et des Muqueuses déterminés par l'administration de l'iodure de Potassium*," presented to the Faculté de Médecine de Paris last July, describes five forms of eruption—viz., the erythematous, the papular, the tubercular, and the eczematous forms; and, finally, iodic purpura.

Most of the standard works on *Materia Medica* and *Therapeutics*<sup>b</sup> allude to the peculiar effects iodide of potassium occasionally produces on the skin. The so-called iodic acne is doubtless the most common of these manifestations; and as it has been mistaken for the eruption of both smallpox and of syphilis, its recognition is of importance.

In an article on "*Pemphigus Produced by the Administration of Iodide of Potassium*,"<sup>c</sup> the late Dr. Bumstead, of New York, describes the case of a young man with an imperfect venereal history, who was admitted into hospital for ecthymatous ulcerations upon the leg. He was prescribed a mixture containing twenty grains of the iodide of potassium, to be taken twice daily. On the following day, after having only taken three doses, an eruption of very large bullæ appeared upon those portions of the integument which were exposed to the air. The patient reported that on three previous occasions during the last year he had taken the iodide, and always with the same unpleasant result. As stated by Bumstead, Fischer<sup>d</sup> makes no allusion to a bullar eruption due to iodide of potassium. And, according to Bumstead, so far as he knew, it is only referred to by Boinet,<sup>e</sup> who states that Cazenave has seen "eruptions of bullæ filled with sero-sanguinolent fluid which are readily torn, and which may be followed by ulcerations difficult to heal."

<sup>a</sup> *Leçons Théoriques et Clin. sur les Affections Cutanées Artificielles*, p. 201. 1862.

<sup>b</sup> *E.g.*, Pereira's *Elements*, edited by Bentley and Redwood, p. 150, 1872. Ringer's *Handbook*, 6th Ed., p. 111. Smith's *Commentary*, p. 573. Stillé and Maisch, *The National Dispensatory*, p. 1131, 1879. *Cf.* also Tilbury Fox, *Skin Diseases*, 3rd Ed., p. 133. Wagner's *Manual of General Pathology*, p. 215.

<sup>c</sup> *Amer. Jour. Med. Sci.*, p. 99. July, 1871.

<sup>d</sup> *Loc. cit.*

<sup>e</sup> *Iodothérapie*, 2nd Ed., p. 63. 1865.

In 1877 the late Dr. Tilbury Fox described<sup>a</sup> a severe "quasi-bullous" form of eruption induced by iodide of potassium. He related particulars of two cases of this pemphigoid rash, and gave it as his opinion that it did not appear save as the rarest phenomenon. Bumstead's case, the case of so-called hydroa figured in the New Sydenham Society's Atlas (Plate XXXIII.), and described in the Catalogue (Part II., p. 111), as well as the other cases reported by Mr. Hutchinson, and by Dr. Taylor of New York, also referred to in Dr. Fox's paper, seem to be instances of this same rare form of eruption, which Dr. Fox contended is of glandular origin.

A description of a similar bullous rash in a patient of Mr. Howard Marsh's, is given by Dr. Thin in the last volume of the "Medico-Chirurgical Transactions."<sup>b</sup> And in the last volume also of the "Clinical Society's Transactions,"<sup>c</sup> Dr. Dyce Duckworth reports two cases of iodide of potassium rash, in both of which the eruption was of a vesicular, varioloid aspect, mixed with some hard and "shotty" papules. On puncture a little opalescent fluid exuded, which yielded equivocal evidence of the presence of iodine.

Prof. Louis A. Duhring also reports<sup>d</sup> a case of bullous eruption, confined for the most part to the hands and forearms, which he attributed to iodide of potassium. And, more recently still, at the annual meeting of the British Medical Association, at Cork, Dr. Finny<sup>e</sup> described a case in which iodide of potassium had caused a vesiculo-pustular eruption with an erythematous blush, which he termed hydroa (?), on the trunk.

Examples of the simple congestive, and of an erysipelatous variety of the erythematous form of eruption, as well as of that rare form, iodic eczema, are given in M. Petitjean's Thesis; and in the article on Iodine in the "Dictionnaire de Médecine et de Chirurgie"<sup>f</sup> it is stated that erythema, urticaria, and acne, complicated with subcutaneous œdema, have also been noticed as following its internal administration.

The case of iodic purpura, under the care of Dr. Bradbury of Cambridge, noted in *The British Medical Journal*,<sup>g</sup> appears to have been the first of its kind published in this country.

<sup>a</sup> Clin. Soc. Trans. Vol. XI., p. 40. Illustrated.

<sup>b</sup> Vol. LXII., p. 189. 1879.

<sup>c</sup> Vol. XII., p. 39. 1879.

<sup>d</sup> Philadelphia Med. and Surg. Rep. Vol. XXXVII., p. 89. 1877.

<sup>e</sup> Brit. Med. Jour., Vol. II., 1879, p. 291.

<sup>f</sup> Vol. XIX., p. 359.

<sup>g</sup> Vol. I., 1871, p. 120.

Virchow<sup>a</sup> states that "Ricord observed purpura in a syphilitic subject whenever he administered iodide of potassium," and that he (Virchow) himself had seen a case of cancer in which, after full doses of iodide of potassium, severe hæmorrhage from the gums and genitals appeared. Dr. Stephen Mackenzie,<sup>b</sup> in addition to a case he records of purpura almost immediately following the administration of a single dose of  $2\frac{1}{2}$  grains of iodide of potassium to an emaciated and puny syphilitic infant of five months old, and proving fatal, refers to other cases of iodic purpura he and his colleagues, Dr. Barlow and Mr. Warren Tay, have also seen, and likewise quotes a description of the eruption from Van Buren and Keyes.<sup>c</sup>

Including the three cases he gives in detail, M. Fournier<sup>d</sup> has met with fifteen examples of iodic purpura. According to this accurate observer the eruption always follows, after a very short interval, the administration of the drug, and is often only accidentally observed; hence it is probable that it occurs much more frequently than is thought, and may thus be many times overlooked. In the first case Fournier gives, the patient noticed the spots when in a bath. The eruption in this case appeared on three different occasions at intervals following the renewed use of the iodide, of four months and of one year respectively. In another of his patients, four successive administrations of the iodide caused four times a purpuric eruption. Fournier's third case is that of a patient who three times, at intervals of several months, was attacked with this purpuric eruption. This case, the subject of which was a medical student, is further remarkable from the fact that, notwithstanding the nature of the eruption was recognised, the iodide of potassium was continued, and yet, nevertheless, the eruption gradually disappeared. If, now, the daily dose of the iodide was increased—doubled, for example—there was a marked recrudescence of the eruption, or rather a new crop of the purpura each time the dose was augmented. On these occasions the eruption was much less abundant than on its first appearance. It was noted also that in the case under my care the eruption on its second and third manifestation was not so numerous as on its first. With one exception, in which the eruption was on the trunk,

<sup>a</sup> Handbuch der spec. Pathol. und Therap., Band I., s. 242. Quoted by Mackenzie, Med. Times and Gaz., Vol. I., 1879, p. 279.

<sup>b</sup> Loc. cit., p. 173.

<sup>c</sup> A Practical Treatise on the Surgical Diseases of the Genito-Urinary Organs, p. 566.

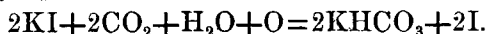
<sup>d</sup> Loc. cit.

Fournier has always seen iodic purpura on the legs; he has never seen it on the feet. The peculiar limitation of the eruption to the lower three-fifths of the anterior tibial regions gives a particular physiognomy to the affection, which has also been noticed by other observers; but one of Dr. Petitjean's cases and the one I record show that the purpura may invade the dorsum of the foot.

The case of pemphigoid eruption described by Bumstead presented, in addition, an eruption of purpura upon the feet and legs. Although Dr. Bumstead states that he suspected the purpura was also due to the iodide, such is doubtful, as the patient was confident that it had existed there for a long time.

In all M. Fournier's cases, the subjects of the eruption, without exception, enjoyed flourishing or average health. They presented no other hæmorrhagic tendency. Sex, age, temperament, profession, external temperature, appeared to be without influence on its production. The same has been noticed, in the majority of cases, by other observers, and all seem to think that "individual predisposition" is alone capable of accounting for its occurrence. Ricord<sup>a</sup> also says that there are certain idiosyncrasies which render the employment of the iodide impossible, whatever may be the dose employed; and Mr. Hutchinson remarks<sup>b</sup> that the production of iodide of potassium rashes appears to depend far more on the idiosyncrasy of the individual than on the dose administered.

In examining these remarkable effects of the iodide of potassium it is necessary to consider its physiological action. Binz,<sup>c</sup> in explaining how so harmless a substance—as he calls it—as iodide of potassium may give rise to iodism, states that the salt, in presence of the oxygen of the blood and the carbonic acid of the tissues, is transformed into the bicarbonate of potassium with liberation of free iodine:—



Kaemmerer<sup>d</sup> locates the place of this change in the blood, not in the tissues. In either case the action of potassium iodide in the organism, as before mentioned, undoubtedly may have the specific effect of iodine should such a change take place.

<sup>a</sup> Gaz. Méd. de Paris. Loc. cit., p. 147.

<sup>b</sup> Catalogue of New Sydenham Society's Atlas. Loc. cit.

<sup>c</sup> Arch. für Pathol. Anat. und Phys., T. LXII., p. 124; and Rev. des Sci. Méd., Tome V., p. 485.

<sup>d</sup> Ziemssen's Cyclopedia. Vol. XVII., p. 291.



Bogolopoff,<sup>a</sup> as the result of his experiments on dogs and on frogs, says that in non-poisonous doses the action of iodide of potassium on the circulatory system consists in a rapid dilatation of the peripheral vessels; while M. Sée<sup>b</sup> affirms that the circulation is manifestly modified by iodine, contraction of the arteries being a true symptom of poisoning by it.

In no less than twenty-seven recorded cases has the injection of solutions of iodine into ovarian cysts been followed by death.<sup>c</sup> In one of these cases (Rose's) free iodine was found in the stomach and alimentary canal, a solution of one drachm of iodide of potassium and five ounces of tincture of iodine having been injected ten days previously into the cyst. On the fourth day, exanthematous blotches, not disappearing on pressure, appeared on the skin and in the mouth, the sputa became bloody, and menstruation appeared two and a half weeks too soon.<sup>d</sup> Prof. Cunéo, of Toulon, has seen purpura hæmorrhagica produced by the application of tincture of iodine,<sup>e</sup> and Tilbury Fox has known the local application of iodide of starch give rise to urticaria from the absorption of iodine.

Kuess<sup>f</sup> is said to have frequently observed hæmorrhages from the lungs during the employment of the iodine treatment; while in a few isolated cases metrorrhagia, or habitual increase of the periodic menstrual flow, has been demonstrated.

Purpura has been ascribed to some change in the blood, to fatty degeneration of the capillaries, and to vasomotor paralysis.<sup>g</sup> Mr. Hutchinson<sup>h</sup> describes a variety, which he designates as purpura thrombotica, from thrombosis of the capillaries, being, as he believes, the principal condition present. Occurring as the purpura in my case did, in a rheumatic subject, it should be mentioned that the appearances and symptoms did not correspond with that form of purpura sometimes met with in cases of rheumatism, as described by Schönlein,<sup>i</sup> in 1839, under the name of peliosis, or purpura rheumatica. In this form of disease, which has been also termed roseola

<sup>a</sup> Arbeit aus dem pharmak. Labor zu Moskau (de Sokolowski), p. 125, 1876; and Rev. des Sci. Méd., Tome X., 1877, p. 92.

<sup>b</sup> London Med. Record. Vol. I., p. 777.

<sup>c</sup> Ziemssen. Loc. cit., p. 288.

<sup>d</sup> Wood. Treatise on Therapeutics, p. 335.

<sup>e</sup> Dict. de Méd. et de Chir., Vol. XIX., p. 359.

<sup>f</sup> Ziemssen. Loc. cit., p. 305.

<sup>g</sup> Minich. London Med. Rec., 1875, p. 359.

<sup>h</sup> New Sydenham Society's Atlas, Plate XXXIX., and Catalogue, Part II., p. 133.

<sup>i</sup> Pathologie und Therapie, zweiter Theil. S. 42.

rheumatica,<sup>a</sup> local extravasations occur in the skin, and erythematous patches about the joints, which are swollen and painful. Dr. Richardson<sup>b</sup> has defined three forms of purpuric disease, termed by him (a) aqueous purpura, (b) saline purpura, and (c) vascular purpura. Aqueous purpura is so called because in it the water of the blood is in excess, and the colloidal and the crystalloidal parts are relatively decreased; and although there is no evidence of the fibrin being reduced, it is distributed through too large a volume of water. In saline purpura the blood is surcharged with some saline soluble substance, by which the colloidal part is held in undue solution. Dr. Richardson has seen this form induced by the excessive use of chloral. In vascular purpura the blood is not modified at all, but owing to some defect in the vessels of the minute circulation, they allow the blood to escape if subjected to any blow, strain, or pressure.

Microscopic examination and chemical analysis of the blood in cases of purpura have thrown but little light on the cause of the disease. The varieties of purpura, especially the scorbutic, were formerly attributed to a diminution of the fibrin in the blood. But the analyses of purpuric blood by Frick, Garrod, and Parkes,<sup>c</sup> prove incontestably that the fibrin may be in excess, and that there is not necessarily any deficiency in the coagulation of purpuric blood. According to Neligan,<sup>d</sup> the proximate cause of purpura is manifestly atony in the capillary system of blood-vessels, combined with an abnormal fluidity of the blood from deficiency of its solid constituents. As bearing upon the condition of the tissues in purpura, Dr. Wilson Fox found, in a fatal case in a syphilitic subject, that in some portions of the skin, close to the affected spots, the capillaries and arteries broke down very easily; that some presented a peculiar glistening, waxy look, while others had a non-granular appearance.<sup>e</sup> The vessels affected with this change, which he describes as waxy degeneration, became acted upon in a very marked manner with iodine. Dr. Mackenzie, therefore, in his valuable contribution to the literature both of syphilitic purpura and of iodic purpura previously referred to, asks may it not be that the action of iodine upon the diseased vessels observed by

<sup>a</sup> A. T. Thomson. *Practical Treatise on Diseases of the Skin*, p. 338. Edited by Edmund A. Parkes. 1850. P. 338.

<sup>b</sup> *Lancet*. Nov. 21, 1874.

<sup>c</sup> A. T. Thomson. *Loc. cit.*, p. 341.

<sup>d</sup> *Diseases of the Skin*, p. 355. Second Edition.

<sup>e</sup> *Brit. and For. Med. Chir. Rev.*, 1865, p. 480.

Dr. Wilson Fox under the microscope, occurs also during life, and by thus altering the constitution of the diseased vessels, modifies their capacity for resisting the pressure of the blood contained within their channel, and allows either of transudation of coloured blood-corpuscles to take place *per diapedesis*, or even causes them to rupture, and thus give rise to extravasation?

It is natural to suppose that in purpura there must be rupture of the capillaries, as blood particles escape from them, but whether this depends on mere congestion, or on disease of the coats, or on other causes independent of the vessel, is not yet known definitely. However, as bearing on the theory of diapedesis advanced by Dr. Mackenzie, it is interesting to note that Prussak<sup>a</sup>—even although his experiments have not been confirmed by Cohnheim—observed the diapedesis of the red blood corpuscles in frogs and rabbits, into the skin of which he had injected a solution of chloride of sodium—thus inducing an artificial scorbutus. Becquerel, according to Neumann,<sup>b</sup> has shown that the blood in purpura is less coagulable than in the normal condition. As the blood in purpura is very rich in alkaline salts, Becquerel believes that the disease may be induced by the administration of large doses of alkalies. In the majority of the cases of iodide of potassium eruptions, however, that have been noted, the eruption appeared within a few days of taking the medicine, and in many cases after the use of but small doses of the iodide. In Dr. Mackenzie's fatal case a single dose of  $2\frac{1}{2}$  grains alone was taken. It cannot, therefore, be maintained that any saturation of the system, either with iodine or the alkaline iodides, is necessary in order to produce these, in many cases, alarming results. M. Petitjean believes that in some persons there is even a temporary predisposition to the occurrence of iodic purpura, so that patients may for a long time take the iodide of potassium in large doses without having any purpuric manifestation. If the medicine is then ceased for some time, when it is again taken the purpura appears. It has been shown by Guttman, Ringer,<sup>c</sup> and others, that potash salts are far more poisonous than soda salts, and that the symptoms of poisoning induced by these salts are due to the potash, and are producible by all potassium salts. Several cases of poisoning by the chlorate of potash have been also lately

<sup>a</sup> Neumann. Text-book of Skin Diseases, p. 201. Translated by Pullar. 1871.

<sup>b</sup> Loc. cit.

<sup>c</sup> Handbook of Therapeutics. Sixth edition. Pp. 124, 165.

published.<sup>a</sup> But from the analogy in many respects between the bromide and the iodide of potassium, and from the effects that iodine are known to produce, it would seem more probable that purpuric manifestations, at least, are due to the iodine rather than to the potassium. So far as I am aware no case of purpura following the administration of the bromide has been published. This point is specially referred to by M. Hallopeau, in the report of a case of cerebral hæmorrhage which he believed to have been caused by the administration of iodide of potassium. The patient had also iodic purpura.<sup>b</sup>

In the microscopic examination of a portion of skin which was the seat of a bullous iodide eruption, Dr. Thin<sup>c</sup> found evidence of disorganisation of the walls of the blood-vessels. The affection of the blood-vessels was localised in a circumscribed area of the skin, and attended by effusion of constituent parts of the blood. "The *rationale* of iodide eruptions, therefore, seems to be that there are conditions in which iodine, when present in the blood, attacks and disorganises the blood-vessels at certain localised points. As a result of this injury to the wall of the vessel, there is an escape of blood fluid into the surrounding tissue, and more or less plugging of the vascular tube by coagula." Dr. Thin thinks that his demonstration of an affection of the blood-vessels as a cause of iodine-bullæ suggests an explanation of the other changes known to be produced in the skin by iodine. It may be considered that the papule of iodic acne, the iodic bulla, and the iodic purpura spot, represent different degrees of injury to the blood-vessels. "In the first we have a limited œdema with congestion of the vessels; in the second, an effusion of serum with more or less of the formed elements of the blood; in the third, destruction of the wall of the vessel and hæmorrhage."

Dr. Duckworth and Dr. Harris's microscopical examination of portions of skin, including pustules—removed after death from a patient of Dr. Duckworth's who suffered from iodide of potassium rash<sup>d</sup>—showed that the blood-vessels were very numerous in all the specimens. Immediately beneath the pustule they were dilated, but empty of blood. They were also ensheathed in streaks of exudation corpuscles; but no rupture of any blood-vessel could be

<sup>a</sup> Lond. Med. Record, 1879, pp. 402, 424, and 445.

<sup>b</sup> Gaz. des Hôpitaux, p. 45. 1879.

<sup>c</sup> Med. Chir. Trans. Vol. LXII., p. 189. 1879.

<sup>d</sup> Trans. Path. Soc. Lond. Vol. XXX., p. 476. 1879.

found, or any evident cause of the superficial localised dermatitis—to which the eruption was attributed—be demonstrated. The sweat-glands seemed entirely unaffected.

As having an important bearing on the causation of these different varieties of eruption, it should be noted that Dr. Dyce Duckworth, who has reported two cases of iodide of potassium rash,<sup>a</sup> calls attention to the fact that defective action of the kidneys has probably much to do with the occurrence of such eruptions, since they have been observed as specially apt to follow the use of the drug in patients that are suffering, as his were, from nephritis, and who are much reduced in health. There would seem to be, he says, in such instances, less good eliminating power, and thus the drug is longer maintained in contact with the tissues of the body, and there is manifestly some special susceptibility to the influence of the soluble iodides. In the case reported by Dr. Thin there was also renal disease, and the same complication existed in a remarkable case under the care of Dr. Fenwick, in the London Hospital,<sup>b</sup> in which, in addition to the development of a pustular and papular eruption, the most alarming symptoms of œdema glottidis set in after four 10-grain doses of iodide of potassium. Life was only saved by the prompt performance of tracheotomy. M. Petitjean<sup>c</sup> records three other cases in which œdema of the glottis was also induced by the administration of iodide of potassium. In two of these also tracheotomy had to be promptly performed, with a fatal result in one patient, the subject of albuminuria. A female patient of Nélaton's, too, became affected with œdema of the glottis during the use of iodide of potassium,<sup>d</sup> and a similar, but fatal, case of the same accident occurred in the practice of Dr. Lawrie.<sup>e</sup>

It may also be observed that in five of the cases referred to in this paper as published in England, and in my own case, there was heart disease. All of these five cases, which were those presenting the bullous form of eruption, died shortly after its making its appearance.

The action of the other alkaline iodides in producing a petechial rash, has been also tested by Dr. Sydney Ringer.<sup>f</sup> In a case in

<sup>a</sup> Clin. Soc. Trans. Vol. XII., p. 39. 1879.

<sup>b</sup> Lancet. Vol. II., 1875, p. 693.

<sup>c</sup> Loc. cit., p. 27.

<sup>d</sup> Abeille Méd., p. 317. Tome X.

<sup>e</sup> Stillé's Therapeutics and Materia Medica, p. 763. Third edition, Vol. II.

<sup>f</sup> Practitioner, p. 129. March, 1872.

which iodide of potassium was given in 10-grain doses, thrice daily, to a lad convalescent from acute rheumatism for a few lingering pains, it produced, on three different occasions, coryza and purpuric spots on the front of the legs and ankles. The iodide of ammonium rapidly caused the same results, but the iodide of sodium, as in my case, had no effect. Dr. Ringer's patient took between 2 and  $2\frac{1}{2}$  drachms of the sodium salt, and my patient half an ounce. It would seem, therefore, from these two experiments, that this preparation is less active than either the potassium or the ammonium salt. Gamberini, of Bologna,<sup>a</sup> also states that he prefers the iodide of sodium to the potassium salt—one of his reasons being that it does not produce the eruptions which the latter determines. Possibly the relatively large proportion of potassium salts in the red blood corpuscles, and of sodium salts in the plasma,<sup>b</sup> may have some as yet unrecognised bearing on the point. Barra-lier, the author of the article on Iodine, in the "*Dictionnaire de Médecine*," says that the iodide of ammonium has a more energetic and more rapid action than the two other iodides—a clinical fact which perhaps may be chemically explained by its containing a larger percentage of iodine (87 per cent.) than they do.

If it be granted that the effects of the alkaline iodides on the system—which, as we have seen, may occasionally be very alarming—are in great measure due to the action of free iodine liberated from them, the chemical purity of the salt for medicinal use is of much importance. Iodates are a frequent impurity of iodides; and the freedom with which the former, in the presence of the latter, give rise, by mutual reaction, to free iodine, is well known to chemists.<sup>c</sup>

<sup>a</sup> Dict. de Méd. Loc. cit.

<sup>b</sup> Foster, Text-book of Physiology, p. 29. Third edition.

<sup>c</sup> I am indebted to Dr. Walter G. Smith for the following further references to the literature of Iodic Purpura:—R. Abbe, Archives of Dermatology, 1878, IV., No. 2; St. Petersburg. med. Woch., 31, 1878; Labat, La France Méd., 1878, No. 72; Mora, Courier Méd., 1878, XXVIII. (Index Méd., Jan. 1879.)—G. F. D.