

ART. XIV.—*Report on Poisonous and Adulterated Confectionery.*

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DURING the latter part of the year 1870 I made an examination of a large number of specimens of sugar confectionery on sale in Dublin. The specimens were obtained in the following manner:—An officer of the Public Health Committee of the Corporation of Dublin purchased a quantity of confections at thirteen establishments, wherein the sugar boiling industry is carried on. When buying the samples he gave notice to the vendors of his intention to convey them at once to the city analyst, in order that they might be analysed. This notice was given in accordance with one of the provisions of the Food Adulteration Prevention Act of 1860, which is intended to give the vendor an opportunity of accompanying the purchaser to the analyst, so as to prevent the articles bought from being tampered with *in transitu*.

The total number of different kinds of confections submitted to me for analysis amounted to 123. Those manufactured at three establishments were quite pure: the collections obtained at the other shops (10 in number) contained poisonous pigments and other impurities in a large proportion of the items; and these I shall now describe.

Yellow Confections.—Out of 40 confections coloured yellow, only 2 owed their hue to saffron. 1 was coloured with gamboge; and all the others were coated with chromate of lead, or blumbic chromate, commonly termed chrome yellow. The amount of the latter pigment varied from $\frac{1}{400}$ th to less than $\frac{1}{1000}$ th of the weight of the confections. The common sugarstick, sold at $1\frac{1}{2}$ d. per two ounces, contained the largest proportion of chromate of lead.

Orange Confections.—12 articles—chiefly lozenges and “sugar almonds”—had a bright orange hue, due to the presence of a variety of chromate of lead.

Red Confections.—38 of the specimens—comprising “peaches” sugar almonds, lozenges, comfits, sugarstick, sugar balls, &c.—had various shades of red, from a faint pink to a bright scarlet. Of

these, 36 specimens were coloured with cochineal, 2 contained vermilion (mercuric sulphide, or bisulphide of mercury) in the proportion of 4 grains per ounce of the confection—which was the cheapest kind of sugarstick.

Green Confections.—At one time arsenite of copper was frequently used to impart a brilliant green colour to confectionery; but the numerous accidents which occurred from the employment of this poisonous pigment have so alarmed the public that green confectionery is now scarcely to be met with. Only 1 of the specimens examined by me was coloured green, and that was only a small figure of a baby, with a green frock on it. The colour was composed of a mixture of Prussian blue and chromate of lead.

Blue Confectionery.—Blue is not a popular colour; only 1 specimen having streaks of this colour was contained in the 123 samples. The pigment employed was ultramarine.

Mauve and Magenta Confectionery.—9 specimens were brilliantly coloured with mauve, magenta, &c. The new dyes, when allowed to come in contact with the skin, occasionally produce toxic effects. Several cases of dermatitis, produced by the use of shirts and stockings coloured with these dyes are recorded in the *Journal of Cutaneous Medicine* for July and October, 1869. Similar cases are described in the *Bulletin de l'Academie Imperiale de Medecine* for February and March, 1869. My friend Mr. Mervyn Crofton, Chief of the Pipe Water Department of the Corporation of Dublin, lately suffered from a severe cutaneous eruption after wearing for a few days a shirt coloured with a magenta dye. The garment was then well washed and boiled for a considerable time, but its toxic power survived these processes. Striped white and Magenta stockings worn by the same gentleman produced inflamed circles on his legs, corresponding in size to the coloured bands on the stockings, proving clearly that the dermatitis was not produced by friction from the stockings.

The Coal-tar Dyes.—As the coal-tar dyes are liable to contain traces of lead, mercury, and arsenic, and as their use for the purpose of colouring confectionery has been prohibited by the authorities in Paris, it would appear to be the safer plan not to place these dyes on any substance intended for human food. The quantity used is, however, so small, that no serious consequences are likely to arise from eating confections coloured with these substances.

An article of food containing more than a grain of chromate of lead per ounce may well be regarded as a slow poison. Soft water containing less than 1 grain of lead per gallon (70,000 grains weight) has often produced poisonous effects on individuals and families. Chromium (an ingredient of chromate of lead) is also a poisonous metal. 6 grains of a salt of this metal injected into the jugular vein of a dog caused the death of the animal. Workmen engaged in the preparation of chromate of potash (potassic anhydro-chromate) often suffer from an ulceration of the throat, resembling that of secondary syphilis; and also from slow necrosis of the nasal bones. I have not the slightest doubt but that the use of confectionery coloured with chromate of lead produces a large amount of infantile disease.

Vermillion was at one time an officinal medicament; but it is no longer administered internally, though still employed in mercurial fumigations. It constituted the basis of Boerhaave's red pill—a celebrated nostrum of former days. There is a general belief in the inertness of this salt of mercury, but I find that it is capable of producing mercurialism, when given in very large doses. In $1\frac{1}{2}$ d. worth (2 oz.) of sugarstick I found 8 grains of this salt. As the dose of calomel—one of the mildest compounds of mercury—for a young child is only a grain, it is evident that vermilion, notwithstanding its great insolubility and comparative inertness, if consumed by a child at the rate of even 2 or 3 grains per diem, would produce some ill result. My friend Dr. Benjamin F. M'Dowell has kindly tried the effects of vermilion on some of his patients at the Lock Hospital, and the following are results arrived at:—

“I have employed the persulphide of mercury, or ‘vermillion,’ in a number of cases since November last, with a view to ascertain whether or not it is ‘inert,’ and also to discover if any special therapeutic action might be assigned to it.

“In all the cases selected mercurial treatment was indicated.

“In several of them I was not able to pursue my observations sufficiently long to form an opinion as to its action in continued doses. I give a sketch of the particulars of three which are carefully recorded. In small single doses it produces no apparent effect.

“On the 30th November, having first ordered an aperient for each, I directed three of my patients this drug in doses of four grains three times a day, with sugar.

"2nd December.—None of the patients complained of any unusual symptom or sensation, except head-ache, but as this is a manifestation which often follows the use of other mercurial preparations, I attached no importance to it; accordingly they were all directed to have double the previous dose, that is, twenty-four grains per diem.

"8th December.—One of the patients left the hospital, and so I could not pursue the inquiry any further in her case—but neither she nor the other two complained of any abnormal sensations, except slight head-ache and griping pains in the abdomen—in one of the cases there was, I thought, slight mercurial fœtor from the breath—but it was badly defined.

"14th December.—Gums are vascular, evidently tender in one case, and there is a faint mercurial fœtor from the breath; in the other, who is pregnant, there is no mercurial fœtor, and the gums are not at all tender—the latter, however, are somewhat vascularized.

"December 14th to 26th.—There was a gradual development of symptoms of mercurial saturation in the case of the pregnant woman, less marked than in the other case.

"26th.—The medicine was discontinued in each case.

"January 10th.—The gums of each of the patients are still tender; this is remarkable, but there has been no salivation in either case, either during the use of the drug or since.

"16th January—Gums still very tender, yielding blood at the slightest touch. The characteristic blue hue is very apparent. The vermilion used was examined by Dr. Cameron and found to be pure. The patients to whom the salt was administered were visited by him.

"*Remarks.*—The case in which the medicine was discontinued on the 8th December had taken about one hundred and eighty grains without any prominent symptom; the other two took in all about six hundred grains each—in both these cases the usual symptoms produced by a mercurial course manifested themselves; in the one case no doubt less prominently than in the other for obvious reasons.

"The history of the treatment of these cases clearly proves that the usual symptoms produced by the other preparations of mercury in repeated doses will follow the use of this drug.* I am not

* The after-effects of the salt appeared to be more decided than those produced by the ordinary mercurial compounds; it would seem as if it were longer retained in the system.

inclined to attach any special importance to it as a mercurial agent, on the contrary, I believe it to be slow and uncertain in its action.

“I have used it in the form of fumigation in putrid ulceration of the throat some years ago in the Lock Hospital, but I found it difficult to regulate its action, and it produced irritation of the air passages. The application of a simple solution of sulphurous acid, or the spray into which it is converted, is better, and other mercurials are more convenient where fumigation treatment is called for.

“Regarded in a hygienic point of view, I believe the continued use of small doses would act injuriously on the constitution.

“17th January, 1871.”

“B. F. M'DOWELL.

Vermillion is very liable to be adulterated. The Chinese vermilion is generally very pure; but cheaper varieties very frequently contain minium, or red lead—an oxide of lead. In the vermilion used to colour the confectionery which came into my possession, I found nearly 20 per cent. of red lead—a far more active poison than mercuric sulphide.

Adulteration of Confectionery.—The lozenges purchased at two of the thirteen sugar confectioners' shops contained from 12 to 15 per cent. of an insoluble white clay, known in the trade under the term of *terra alba*. The peaches, sugar almonds, lozenges, and comfits, contained rice, starch, and gum arabic. Cough lozenges and bath pipe contained gum, sugar, and extract of liquorice—a few of them being slightly medicated by the addition of opium and camphor (probably in the form of paregoric elixir). Small quantities (under 3 per cent.) of plaster of Paris were found in the bath pipe and cough lozenges; but they were probably derived from adulterated liquorice extract.

A figure of a baby in its cradle had the following composition:—The cradle was composed of a mixture of plaster of Paris (calcic sulphate) and sugar; the body of the baby was sugar and rice starch. Its eyes were Prussian blue, its cheeks tinted with cochineal, and its dress was painted with chromate of lead.

The ten sugar confectioners above mentioned, whose wares I have now described, were prosecuted before the police magistrates. Five of them on paying costs (£3) and promising to abandon the use of poisonous pigments, were “let off with a caution;” the others were fined respectively, £5, and £3 costs; £1, and £1 costs; £1, and £1 costs; 10s., and £3 costs; and 10s.

In analysing confectionery for the purposes of a prosecution the methods of procedure must be very accurate. One may, however, readily determine the presence of impurities in the following manner:—Dissolve a little of the article in water; if vermilion be present it rapidly sinks to the bottom of the vessel, whilst cochineal remains in solution. Add a few drops of solution of chloride of lime and the red colour instantly vanishes. Chromate of lead forms an opaque colour, whilst saffron is more or less transparent. Rub off the colouring matter, and heat it to redness in any convenient crucible or capsule. A dirty green or yellowish green residue indicates that chromate of lead had been used. To be certain of this point, dissolve the residue in a few drops of pure nitric acid, heat gently to drive off the excess of acid, add a little water, and test for lead. Solution of ammoniac sulphide (hydro-sulphate of ammonia) gives a dark brown precipitate, and solution of potassic iodide a bright yellow precipitate. These operations may be conducted on the most minute scale. The coal-tar colours are so remarkable that the eye can hardly fail to recognize them.

Incinerate in any convenient vessel—an iron spoon over a coke fire, if no better apparatus be available—100 grains of the confection. If pure no residue should be obtained. Terra alba remains as a greyish heavy powder.

In conclusion, I think it would be desirable to limit the colours used by confectioners to three, namely—cochineal (or carmine); saffron; and, for opaque yellows, Madras turmeric.

ART. XV.—*Clinical Report of the Rotunda Lying-in Hospital, for the year ending 5th November, 1870.* By GEORGE JOHNSTON, M.D.; Fellow of the King and Queen's College of Physicians; Master of the Hospital, &c., &c.

I CONSIDER that I cannot serve the interests or carry out the great object of this Society (which has always been that of eliciting truth from practical observations) in a more beneficial manner than by giving you a continuation of the clinical reports of the Rotunda Lying-in Hospital, more particularly as I am convinced that the obstetric statistics of large internal maternities, such as it, are the only ones that can be relied upon, and that it is from them only