ON THE DANGER OF GREEN PAINT IN ARTIFICIAL LEAVES AND FLOWERS.

By ARTHUR HILL HASSALL, M.D.

THE injurious consequences resulting from the employment of arsenite of copper, Scheele's green, or emerald green, as a pigment, are by no means confined to the case of paper-hangings. At one time this substance was commonly used to colour sugar confectionery, and the practice is not yet wholly discontinued. But I now desire to direct special attention to its employment in the manufacture of the green leaves and flowers, so generally worn during the past year or two on bonnets, head-dresses, wreaths, and other similar ornaments.

The use of emerald green for the manufacture of artificial leaves and flowers has been for the most part resorted to only within the last two or three years, and I am informed that there are from two to three hundred leaf-makers, all using this poisonous substance. The condition of these people, mostly young women and girls, but including some men and boys, is wretched in the extreme. They all labour, and many in a severe form, under symptoms of arsenical poisoning. The poison is diffused throughout the atmosphere they breathe, and is of course inhaled; further, it acts as a local irritant and escharotic on the hands and other parts of the body to which it becomes mechanically applied. The symptoms may be arranged into the constitutional and local; the former consist of general derangement of the health, debility, nervousness, headache, thirst, sickness, loss of appetite, and diarrhoea; the latter in soreness of the throat and gums, œdema about the eyes, soreness of, and running from, the nose, and in ugly-looking sores on the hands, face, neck, and other parts of the body, to which the poison finds access.

Now, for all these evil effects, no necessity whatever exists. In the first place, it is more than probable that a suitable substitute for the arsenical pigment might be found; and in the second, even if its use could not be dispensed with, it is certain that the more injurious and distressing consequences might be avoided by the adoption of certain simple and obvious precautions.

Hitherto reference has been made only to the effects of the employment of the pigment on those engaged in the manufacture of the leaves and flowers. It is highly probable, however, that the wearers of these ornaments do not altogether escape from the serious consequences to which their poorer sisters are subject.

CASE 1.—Francis H.—, aged forty-five, was admitted an out-patient of the Royal Free Hospital, in February last; is a dyer of muslin sheets used for making the leaves and other parts of artificial flowers; has been engaged at this occupation off and on for about two years; used formerly to dust the colour—arsenite of copper or emerald green—on the muslin. This occasioned it to fly about the room, and to fall on the clothes; began almost immediately to feel ill, suffered constant nausea, loss of appetite, thirst and headache; had diarrhoea occasionally, soreness of the throat, and tenderness of the gums; is much more nervous than formerly. The eruption appeared four or five days after commencing to use the pigment. It began in the form of greenish pimples over the hands and face; these bursting, left holes, having eroded edges. Has also eruptions on the scrotum and groins. The skin of the palms of the hands is of a yellowish-green colour, being stained with the green dye. Left off using the emerald green at Christmas, 1858, for about four months; then used picric dye, which did not affect him, and, in two or three months, the eruptions entirely disappeared. Began to use the emerald green again about six weeks before Christmas, 1859, and soon experienced nearly the same effects as before, with this difference, that the eruption was not so bad, owing to the manner in which the colouring matter is now applied, not by dusting as formerly, but by dyeing the muslin and rubbing in the colour.

CASE 2.—Richard G.—, aged twenty-seven, also admitted an out-patient of the Royal Free Hospital, in February last; is an artificial leaf-maker—that is, he cuts the leaves out of the dyed sheets of muslin; has been engaged in the trade about twelve months; was in good health until he began to use the emerald green about two or three months since; began to feel the effects of the poison in the course of two or three days afterwards. The symptoms were as follows: Much thirst;

tongue white; highly nervous; sleep disturbed and unrefreshing; weakness; loss of appetite; bowels very much relaxed for the last eight or ten days, acting some six times daily; sense of weight on the chest and difficulty of breathing; the eyes swollen in the morning; the nose sore inside and discharging freely; gums tender. About fourteen days after using the colour, sores broke out in various parts of the body; on the hands, forehead, behind the ears, at the roots of the nails, and on the scrotum, the sores presenting a dark and very unhealthy appearance. The hands, especially the palms, and the roots of the nails, were stained, as in the previous case, of a greenish-yellow colour.

There were eight young women and two boys working in the same room with the men whose cases have just been described, and they were all affected much in the same way. They all had sores; the girls, at the back of the neck, on the sides of the nose, and on the hands; their eyes were also affected, and there was running from the nose. To such an extent was their health affected, that they were compelled from time to time to give up their work and return home.

Wimpole-street, Cavendish-square, Nov. 1860.

P.S.—Arsenite of copper is employed for a great variety of purposes besides as a dye for colouring paper-hangings. In a letter inserted in THE LANCET some months since, I pointed out that it was constantly used in the colouring of articles of furniture and dress. I also showed that another green pigment, probably scarcely less injurious than the arsenical preparation was still more constantly employed to colour carpets, table-covers, curtains, clothes, dresses, and numerous other articles. This pigment is known as false Brunswick green, of which three shades are prepared, and it consists of Prussian blue or indigo with CHROMATE OF LEAD.

MEDICAL REPORT OF A CASE OF POISONING BY ARSENICAL PAPER-HANGINGS.

By J. B. METCALFE, M.D.

CLARENCE W. KING, son of W. T. King, Esq., of Beresford Lodge, Highbury, aged three years and a half, first manifested symptoms of being unwell on the morning of Thursday, Nov. 1st. He refused his breakfast, complained of chilliness, and was sick; at ten A.M. he was seized with convulsions, for which he was put into a warm bath, and the attack soon passed off. On my arrival at eleven A.M. he was in a semi-comatose state, his countenance placid, surface of body warm; the bowels had acted several times, the stools passing off involuntarily, watery, bilious, and very offensive; pulse quick; tongue white; there was no abdominal tenderness on pressure. On visiting him again in the evening, I learned that slight convulsive twitchings of the facial muscles had been observed; that he had been more feverish, but was again less so; he had not been sick; the bowels were less freely relieved.

Thus far there were no symptoms of so grave a character as to lead to the supposition that they were attributable to any extraordinary cause; worms (to which the child was subject), or any other irritant, might have produced them. It was on the following day, at seven A.M., when having been sent for on account of another child having been seized with convulsions accompanied by violent shrieks and severe dysenteric discharge from the bowels, that I noticed the great change which had taken place in the little fellow; he was almost in a state of asphyxia, the surface cold, pulse feeble, countenance livid. The application of warmth, administration of ammonia, and frequent supplies of warm milk, after the lapse of a little time produced somewhat of reaction; but in the afternoon he was again seized with a severe tetanic convulsion, and from that time alternations of repose and convulsion (amounting sometimes to perfect opisthotonos) continued until the little sufferer sank at twelve o'clock, thirty-eight hours after the commencement of the attack.

It is worthy of note that although all these symptoms were due to arsenical poisoning, as will appear in the sequel, there was no violent sickness; only once at the commencement of the attack was the child sick, and on one occasion on the second day when beef-tea was given instead of the milk.

A post mortem examination was made on the following day, with reference to which it may be briefly remarked that the

appearances were indicative of a healthy state of system; the child was fat and well nourished. For the appearances presented in the stomach and those parts which were forwarded to Dr. Letheby, the reader is referred to the report which is appended.

CHEMICAL REPORT.

By H. LETHEBY, M.B.

On Friday, November 2nd, I received from Dr. Metcalfe, of Clapton-square, Hackney, a sample of green flock-paper, two napkins soiled with the dejections from a boy aged three years, and a bottle containing an evacuation of a girl aged two years; and on the Sunday following I received a jar containing a child's stomach, unopened, a piece of liver, and a piece of large intestine,—also a bottle of food.

1. The *flock-paper* was of a dull pea-green tint. It had no gloss upon it, and the size which held the pigment to the paper had been so far decomposed by moisture and air as to permit the colour to be brushed off by the slightest friction. The flock patterns were of a deeper green colour, and were in some places barely attached to the paper, on account of the destruction of the size. A piece of paper measuring 6 inches square (36 square inches) weighed 41·47 grains; and furnished, as the mean of three experiments, 12·99 grains of an arsenical green pigment, and 5·80 grains of carbonate of lime. The arsenical pigment was found to consist of 8·44 grains of arsenious acid, and 4·55 of oxide of copper; it was therefore nearly pure arsenite of copper, or Scheele's green.

2. The *dejections in the napkin* from the boy were deeply tinged with bile, and became of a deep blue-green colour with hydrochloric acid, but they did not furnish a trace of arsenic or copper.

3. The *evacuation from the girl* amounted to 2·5 fluid ounces. It had a deep yellow colour from the presence of bile, but it did not furnish any evidence of poison, although, from the discoloration of the copper, I at first thought that arsenic was present.

4. The *stomach* was unopened, and its contents were secured by ligatures at both orifices. Externally, it did not present any remarkable discoloration or sign of irritation; but on the inner surface, at the œsophageal end, there were small patches of a red colour, made up of the peculiar petechial spots which are so characteristic of arsenical poisoning. Diligent search was made for particles of arsenite of copper, but none were found. The contents of the stomach measured five fluid drachms. They were somewhat thick, like gruel, and had a dark chocolate-brown colour. On analysis, they gave a minute trace of copper, and very distinct evidences of arsenic.

5. The *piece of liver* weighed 945 grains. It did not present any abnormal appearance; but, on analysis, it yielded traces of both arsenic and copper.

6. The *piece of intestine* was somewhat redder than natural, and showed marks of irritation in the mucous coat, but it did not furnish a trace of poison.

7. The *food in the bottle* was perfectly free from poison.

The results of these investigations leave no doubt in my mind as to the cause of the child's death. The poisonous pigment existing in so large a quantity on the paper, together with the circumstance that the slightest friction would remove it, accounts fully for the origin of the poison; and the presence of it in the dead body answers the question as to the cause of death.

It may not be out of place to remark that the quantity of the poison on the paper is sufficient, under circumstances like the present, to be a source of serious danger: for a piece of the paper six inches square contains enough arsenic to destroy two adult persons; and, from the many cases of a like character which have been referred to me, I cannot hesitate to believe that the use of such papers is extremely hazardous. Within the last fortnight, I have had occasion to examine two specimens of green papers which were suspected to be the cause of illness, and in each of them arsenic was present to a large extent: in one case it amounted to nearly ten grains on a surface six inches square; and it almost invariably happens that the poisonous pigment is but loosely attached to the paper, and is easily brushed off by slight friction. When our artificers and manufacturers will learn caution in respect of the use of such poisonous pigments I know not, for already the danger of it has been sufficiently discussed. Nor is there the excuse that, in order to meet the demand for bright and permanent colours, there is any necessity for the employment of mineral

pigments. The French, who are our competitors in this matter, have long since abandoned the use of such pigments, and are yet able to outstrip us in the brilliancy of tint. It is high time that our manufacturers should imitate their example.

London Hospital Laboratory, Nov. 1860.

A Mirror

OF THE PRACTICE OF MEDICINE AND SURGERY IN THE HOSPITALS OF LONDON.

Nulla est alia pro certo noscendi via, nisi quam plurimas et morborum et dissectionum historias, tam aliorum proprias, collectas habere et inter se comparare.—MORGAGNI, *De Sed. et Caus. Morb.*, lib. 14. Proœmium.

ST. GEORGE'S HOSPITAL.

FRACTURE OF THE RIBS, STERNUM, AND LOWER JAW, WITH BLEEDING AND SEROUS DISCHARGE FROM THE TEMPORO-MAXILLARY ARTICULATION THROUGH THE EAR, FROM A FALL.

(Under the care of Mr. TATUM.)

It is seldom that a broken rib is met with but as the result of violence, whether applied in a direct or indirect manner, such as those recorded cases in which violent contraction of the abdominal muscles during parturition is said to have given rise to this lesion. Professor Pirrie mentions muscular action in coughing as a cause in persons of a cachectic habit of body. The number of ribs broken, and the situation of the fracture, will of course vary according to the nature and extent of the applied violence. A direct blow forcibly drives in a rib, breaking it at the seat of contact. When this is the case, the pleura or the lung, or other viscus, is wounded. On the other hand, indirect application of the injuring force will cause the ribs to bend outwards before giving way. The injury must be a severe one that shall break several ribs, and a peculiar one that shall fracture the first and second. These latter usually escape, from their protected position. Of four very interesting examples which we select for record on the present occasion, in three the second rib was broken, with others. This is explained by the nature of the force producing it, as detailed in the notes of the cases. In one patient—the child—the second rib was the only one broken, and gave rise to such serious symptoms as to cause death. In two of the cases, the ribs were most extensively fractured on both sides, one patient having ten ribs, and another eleven, broken, including both sides of the chest. It is interesting to observe the injuries that were associated with the fractured ribs. Thus, fracture of the jaw, sternum, spine, and radius, with dislocation of the clavicle, were found; also laceration of the pleura, lung, spleen, and spinal dura mater. In one patient, the liver was bruised, but not lacerated. Emphysema and hæmorrhage were prominent characteristics in two. So that the four cases together form an instructive series of fractured ribs produced by direct and indirect violence, as well as some of the complications usually met with, and their serious consequences.

In the first of the four cases, although there was extensive costal fracture near the cartilages on both sides of the chest, yet there was actually no displacement, and therefore no wound of the pleura. The upper part of the sternum was fractured longitudinally, but also without displacement. The left radius was broken, and also the condyle and coronoid process of the right side of the lower jaw. The man must have fallen forwards on to the front part of the chest.

We may draw attention to the ear symptoms in this case. Bleeding from the ear was first noticed, and afterwards serous oozing, as if there had been a fracture through the base of the