ON A PROBABLE CAUSE OF LEAD COLIC.

BY

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IN 1876 I communicated to the Society a short paper "On the Nature and Mode of Origin of the Lead Line in the Gums," which will be found in the fifty-ninth volume of the 'Transactions.' I did not then know that about a year previously a French observer, M. Cras, had published in the 'Archives de Médecine Navale' precisely the same view as that which my own observations had led me to adopt.¹ My first acquaintance with the investigations of M. Cras was derived from a notice of them which appeared in the 'Lancet' for 1878.

M. Cras differed from me in having taken the portions of mucous membrane which he examined from the living, and not from the dead subject. And he proposed to make a practice of slicing off with a lancet a minute fragment of the gum in all cases in which the microscope might serve to clear up the nature of a blue or black stain, the character of which would otherwise be uncertain. This

¹ "Du Liséré Plombique," par le Dr. C. Cras, 'Arch. de Méd. Nav.,' Février, 1875.

procedure was adopted some time ago in a case under my care, and with a perfectly satisfactory result. Another point noted by M. Cras is that after a portion of gingival tissue blackened by lead was placed in nitric acid the vascular loops assumed a whitish-yellow colour, the sulphide of lead being converted into a white sulphate, while the substance of the capillary walls was turned yellow by the action of the acid.

A much more important matter, on which both M. Cras and I expressed identical opinions, was as to the probable formation of sulphide of lead in the mucous membrane of the intestine, by the reaction of sulphuretted hydrogen contained in the intestinal gases upon a soluble combination of the metal circulating in the more superficial capillaries. M. Cras, however, had had no chance of examining the interior of the body in a case of chronic plumbism. He examined the anal mucous membrane during life, but found no discolouration. I had once made an autopsy in the case of a painter, who had had colic fifteen years before, and who had while in the hospital (before his death from aortic regurgitation) complained of pain about the splenic flexure of the colon. In this instance I had found some slate-coloured cicatrices in that part of the bowel, but I was unable to say that their appearance was really due to impregnation with the metal.

Since the year 1876, however, I have had four opportunities of further investigating the question. And, although in two cases the result was negative, in the other two cases I found that there was marked and extensive blackening of the intestinal mucous membrane, while Dr. Stevenson, who was kind enough to make analyses for me, succeeded in obtaining from the blackened parts considerable quantities of lead.

I have thought it worth while to bring these observations before the Society, not only because they corroborate my former paper, but also because they possess considerable interest, as possibly conveying an explanation of the real nature of lead colic.

CASE 1.—W. J. E—, æt. 36, was admitted into Guy's Hospital under Dr. Wilks on December 21st, 1876, for aortic aneurism. He was a painter, and was said "for three years, off and on, to have had lead colic and palsy," but recently "his hands had been well." He died suddenly on December 30th of hæmorrhage, the result of the ulceration into the left bronchus.

The intestine showed no trace of blackening of its mucous membrane. In the colon there were a few cicatrices, probably the results of an attack of dysentery, which he had had in India several years previously.

There was a marked line on the gums.

CASE 2.—George W—, æt. 31, was admitted into Guy's Hospital under Dr. Pavy on July 21st, 1879. He was by occupation a house-painter. He had lived freely, and had once had a slight attack of gout. Four weeks ago he was seized suddenly, whilst at his work, with a gnawing pain in the lower part of the abdomen. The bowels had been constipated for three days previously. He had diarrhoea for three days, perhaps as the result of purgative medicine; afterwards constipation again set in.

On admission he was still suffering with abdominal pain, and lay principally with the thighs flexed on the abdomen. The tongue was moist and pale. The fæces were small and hard. There was no lead line on the gums. The complexion was earthy looking, as in lead poisoning.

The urine, of sp. gr. 1014, was very albuminous.

On the 24th he was attacked with cedema of the lungs, and died in a few hours.

At the autopsy it was found that there was a little urate of soda in the principal joint of each great toe. The kidneys were small, granular on the surface, and mottled with opaque yellow spots. The heart was hypertrophied, weighing twenty ounces.

The mucous membrane of the lower part of the ileum presented a remarkable appearance. It was covered with black spots, a little larger than solitary follicles. These

had not at all the look of ruptured and pigmented follicles such as are so commonly seen. The discolouration extended down to the ileo-cæcal valve. In the large intestine there was comparatively very little of it.

The microscope showed that the blackening was due to the presence of scattered oval or round granules, which appeared to be aggregated round the walls of the vessels in the villi, although this relation was not so clearly marked as I have found it to be in the lead line on the gums.

An endeavour was made to preserve some of the intestine in spirit, but its discolouration soon ceased to be visible.

Portions of normal and of discoloured intestine were handed for analysis to Dr. Stevenson, who was kind enough to write to me afterwards that, whereas the former "yielded a suspicion of colour with sulphuretted hydrogen, showing that lead or other metal forming dark sulphide was almost absent," he obtained from the latter "conclusive evidence of the presence of the metal, though in small quantity."

CASE 3.—Elizabeth J—, æt. 46, was admitted into Guy's Hospital under the care of Dr. Habershon on October 21st, 1880. She had been an intemperate woman; for three months she had been occupied at lead works. It was believed that she had had at least one epileptic fit several months before. When brought into the ward she was insensible, having had a succession of epileptiform fits; she soon died, the whole duration of her illness being little more than twelve hours.

I made an autopsy, which left the cause of her cerebral symptoms still uncertain, it being impossible to say whether the case was one of epilepsy, or whether the convulsions were due to lead poisoning, or whether the two conditions were combined, the metal having had an especially noxious action upon a person already liable to epileptic seizures. But the large intestine showed a remarkable discolouration. This began abruptly at the ileo-cæcal valve, and the

pouch of the cæcum was perfectly black on its inner surface, except that the solitary follicles projected as nearly white dots. In the course of the colon the abnormal appearance gradually subsided. I sent to Dr. Stevenson's laboratory a large piece of the intestine from this case, and have since received from him the following letter :

October 26th, 1880.

MY DEAR FAGGE,

There was a remarkable difference in the amount of lead in the blackened and the unblackened portions of intestine brought here from the post-mortem-room on Friday last. I took two separate portions for analysis :

1. Small intestine, uncoloured, two ounces. This yielded .0031 gr. of lead, or .00035 per cent.

2. Large intestine, blackened, two ounces. This yielded .0965 gr. of lead, or .01140 per cent.

(Signed)

Very truly yours,

THOMAS STEVENSON.

In other words, the blackened part of the bowel contained more than thirty times as much of the metal as the pale part.

CASE 4.—John W—, æt. 42, was admitted into Guy's Hospital on September 24th, 1880, suffering from Bright's disease, of which he died on December 22nd. It was stated that for eighteen years he had worked at a metallic *cork* manufactory, and that at Easter in 1879 he had suffered from lead colic.

At the autopsy the intestine was found pale in its whole length, there being no trace of any blackening from lead.

It is to be observed that in the two cases in which the intestine was found devoid of discolouration the fact that lead colic had occurred during life rested only on the patients' statements, and that a considerable interval of time had elapsed, during which it is possible that a deposit

of sulphide of lead might have undergone reabsorption. I must leave it to future observers to determine whether such a deposit is really constantly found as an antecedent to lead colic, or whether this is not the case.