A PECULIAR CASE OF LEAD-POISONING IN WHICH THERE WAS MARKED LOSS OF VISION, BOTH FOR WHITE AND FOR COLOURS, WITHOUT ANY CHANGES IN THE FUNDUS OCULI; AND IN WHICH RAPID RECOVERY TOOK PLACE UNDER SULPHATE OF MAGNESIA AND IODIDE OF POTASSIUM.

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IN the great majority of cases of lead encephalopathy, in which dimness of vision is a prominent symptom, well-marked changes in the optic discs—double optic neuritis or optic atrophy—are recognisable by means of the ophthalmoscope.

The following case is, in my experience, quite exceptional, inasmuch as the discs were absolutely healthy.

The rapid manner in which the symptoms disappeared under treatment; the peculiar character of the limitation of the colour fields; and the presence of the muscular tremor—a symptom which is amongst the rarer manifestations of lead-poisoning—are interesting and important features of the case.

The notes of the case are as follows:—

J. H., æt. 30, employed in a paint manufactory, came under my notice as an out-patient at the Edinburgh Royal Infirmary, on October 19, 1887, complaining of dimness of vision, headache, general malaise, and exhaustion.

Previous History.—The patient stated that, until three years ago, he was employed as a fireman on board a steamer; and that until a year ago, when his present illness commenced, he enjoyed excellent health. He has never suffered from syphilis or gonorrhœa.

For the past three years he has worked in a paint-mill, and has had to take his turn with the other men in "mixing the litharge." Knowing that many of the men employed in this way suffer from lead-poisoning, he has been on his guard against it, and has been scrupulously careful to brush his teeth and wash out his mouth on returning home from work.

Twelve months ago, he first began to feel ill; and he has never been well since. During this period, he has lost colour, and has daily suffered from headache; the pain, which is chiefly frontal and worse at night, has at times been very severe; to use his own words, "it is sometimes awful." He has also suffered much

from sleeplessness. The bowels have been obstinately constipated, and he has had severe pains in the abdomen. The headache and sleeplessness were, he says, for the time relieved by purgative medicines. The abdominal pain, unlike that in most cases of lead colic, is, he says, increased rather than relieved by pressure.

For six months he has suffered from a constant trembling in the arms and legs, more especially in the right hand and arm.

Four weeks ago, his eyesight began to fail, and he can now hardly see at all. A fortnight ago he was able to read the newspaper. He states that he has occasionally seen double.

His appetite is bad; he feels very ill and weak; and has lost a great deal of flesh.

He has never vomited, but when working in the litharge he used to feel very sick and inclined to vomit. There has been no vertigo.

Present Condition.—On examination, the patient was seen to be very pale and anæmic. A small, swollen, projecting portion of gum, situated between two of the incisors in the lower jaw, presents the blue stain characteristic of lead poisoning; but the other parts of the gum are quite healthy. The central incisors in the upper jaw are wanting; the teeth are for the most part clean, and look as if they had been well cared for.

Vision is markedly impaired. In the right eye $V. = \text{less than } \frac{2}{30}$; in the left eye $V. = \text{rather more than } \frac{2}{24}$. Colour vision is much impaired, greens being confounded with blues, dark blue is said to be light blue, and green is said to be a darker blue than dark blue.

The fields, both for white and for colours, are very much constricted in both eyes—a little more so in the right than in the left. In Fig. 1, the condition of the field for white is represented as it was on October 19th; and the fields for colours as they were on October 27th (i.e., when vision had already considerably improved).

In Fig. 2 (p. 510) the condition of the fields, both for white and for colours, is shown as they were on November 15th.

By reference to Fig. 1, it will be seen that the constriction of the yellow field is proportionately much greater than the constriction of the fields for green, blue, and red. The red field seems to have suffered least.

On November 15th, the colour fields were practically normal, with perhaps the exception of a slight degree of constriction towards the right.

The pupils are equal, and moderately dilated; they contract, though not perhaps as briskly as normal, both to light and accommodation.

The fundus in each eye is absolutely healthy. (Dr. Berry, who was kind enough to examine the case, corroborated the foregoing statements as regards the condition of the fundus and the state of vision. His report was briefly as follows:—"I find $V. = \frac{2}{7}$ in both eyes; the fields concentrically limited; colour vision abnormal, especially defective for yellow and blue; blue and green

confused. Ophthalmoscopically, nothing abnormal. History of vision having become recently much worse. *Diagnosis*.—Poisoning of visual centres? I think this more likely than that there is any lesion elsewhere, chiefly on account of the colour defect, which is unlike anything else but hysterical amblyopia.”)

There is slight nystagmus on moving the eyes in the lateral direction; and there seems to be some slight paralysis of each external rectus muscle.

The right hand and arm, and to a less degree the left hand and

FIG. 1.—PERIMETER CHART OF THE FIELDS FOR WHITE AND FOR COLOURS IN THE RIGHT EYE, SHOWING MARKED CONTRACTION.

The field for white was mapped out on October 19th; and that for colours on October 27th (when considerable improvement had already taken place);

both lower extremities, are the seat of a fine tremor, which seems to be independent of voluntary movement or external irritation. There is no localised loss of motor power, and in particular no wrist-drop or localised paralysis in the extensor muscles of the forearms; the grasping power of the hands, as measured by the dynamometer, is equal (105).

The knee-jerk is exaggerated in both legs, more especially in the right. The superficial reflexes are normal.

Tactile sensibility is normal. The urine, which was examined on several occasions, was found to be normal; the presence of albumen was never detected. Dr. Stevenson Macadam, who was so good as to analyse one specimen for me, was unable to detect the presence of lead.

Diagnosis.—The case was evidently an exceptional one, but

FIG. 2.—PERIMETER CHART OF THE FIELDS FOR WHITE AND FOR COLOURS IN THE RIGHT EYE, SHOWING THE CONDITION AFTER RECOVERY (Nov. 15th).

The fields are practically normal; the extent to which the white field is still contracted is represented by the dark area.

the opinion formed was that the symptoms were due to lead-poisoning.

The occupation of the patient (which exposed him to the risk of lead-poisoning), the constipation, the blue patch in the gum, the colic, together with the fine muscular tremor, were in favour of plumbism rather than of intra-cranial tremor, which also suggested itself as a possible cause of the symptoms. The fact that there

was neither optic neuritis, vomiting, nor vertigo (when taken in conjunction with the positive facts in favour of lead-poisoning which have been mentioned above) seemed to exclude intra-cranial tumour.

The striking manner in which all the symptoms disappeared under the administration of large doses of iodide of potassium and sulphate of magnesia, corroborated the diagnosis of lead-poisoning.

It is strange that the chemical analysis failed to show the presence of lead in the urine; but this fact, *per se*, is hardly, I think, sufficient to destroy the diagnosis and to counterbalance all the other facts in favour of plumbism.

Treatment and Progress of the Case.—Sulphate of magnesia and iodide of potassium were prescribed in full doses. Under the treatment, rapid improvement took place.

On October 25th, when Dr. Berry examined the patient, vision had already improved.

On November 1st, the patient was looking altogether better and brighter. He stated that he was free from headache, and that he was sleeping and eating well, and feeling very much stronger. The muscular tremor was now scarcely perceptible. The acuity of vision, both for white and for colours, was normal; and the constriction of the fields, both for white and for colours, had almost entirely disappeared.

On November 15th, the fields were carefully mapped out by means of the perimeter, and were found to be practically normal (see Fig. 2). The muscular tremor could no longer be detected. The patient was entirely free from headache, and expressed himself as feeling very well.

On December 11th, the patient stated that he had been entirely free from any symptoms of lead-poisoning since the date of the last note. He is anxious to return to work, and would have already done so, had he not had a slight bronchitic cold, and had he not been afraid of again suffering from lead-poisoning.