

The clinical record in the case of [REDACTED] has been reviewed. There appeared to be no good reason for having this patient present himself for examination, since the facts in the case had been established, and nothing of real relevance could be added by means of further examinations at this time. The important points for discussion in this case are as follows:

(1) This man had had opportunity for some degree of exposure to lead for a number of years during his work as a stereotype journeyman. However, it is the common experience of investigators that men doing this job rarely develop lead intoxication. Our observations made from time to time in a number of establishments of this type have failed to obtain evidence of a significant degree of absorption of lead. The report of the industrial hygiene survey in this case indicates that the concentration of lead in the atmosphere of this man's work place was of the order of .09 mg. per cubic meter at the point of emission of fume during the period when the melting pots could be expected to give off the highest concentration of fume, (it was obviously lower in the usual breathing zones of the employees). It is unlikely that the opening or the closing of windows would influence the concentration greatly at the points at which atmospheric samples were obtained.

The conditions which lead to a significant degree of exposure to lead on the part of people engaged in this occupation are those associated with poor housekeeping, whereby dross from the pots is permitted to accumulate and is distributed into the atmosphere from dirty floors and equipment. No indication of the existence of such a condition has been given in the report of an experienced and critical

industrial hygiene engineer.

In consequence of these facts, the conclusion is inescapable that this man, in the course of his work, was not subjected to a significant or dangerous degree of exposure to lead.

(2) The disease process as described in this case, of "fullness in his ear, numbness over the right cheek, ~~and~~ a numb feeling in his right arm, and objective hypalgesia over the right malar eminence^u, constitutes a bizarre syndrome. If the patient had neuritis involving the maxillary branch of the trigeminal nerve, this would not have explained the symptoms complained of in the right arm and ear.

If these symptoms are regarded as neuropathic, there must have been a polyneuritis of a sensory and asymmetrical type. Although the neuropathy of lead poisoning is often that of a polyneuritis, the latter ~~affects~~, specifically, the neuromotor apparatus, ^{being} ~~and~~, practically uniformly, lesions of the extensor muscles of the extremities (without sensory changes as such), and ^{being} ~~are~~ usually symmetrical in distribution. Primary sensory changes, far from being compatible with the effects of lead absorption, tend almost imperatively to exclude lead absorption and lead poisoning.

(3) The single blood smear examined for "stippling" was reported as negative. Invariably, in severe lead poisoning, stippled erythrocytes are seen in abundance, and when neuropathy is present, lead poisoning is classified as severe. One cannot always be sure that the examination for stippling has been made by a person of competence and experience, so that the failure to find it in this case may not be

counted on as proof that it did not occur, but the lack of positive evidence is important, nevertheless.

(4) A single 24-hour specimen of urine was reported, by the Dayfield Laboratory, as containing .231 mg. of lead per liter. Such a finding, if valid, is indicative of an abnormal degree of absorption of lead. However, one does not know how this sample of urine was collected or how it was analysed. The method of collecting the specimen is of crucial importance, since it is the rule - not the exception, but the rule - that such specimens, collected by the usual methods, in any other than a special (chemically clean) container, are found to be severely contaminated. Moreover, the result obtained can be interpreted only if one can be free of all doubt as to the competence of the analyst, and if one knows the size of the ^{background} blank that is characteristic of the laboratory. A single analytical result, which is not verified by such standards, is not ^{to be relied upon} ~~only worthless~~, but is usually ~~misleading~~. This result, therefore, is not acceptable as evidence.

The use of the third decimal place is unjustified. .231 mg. is a very imprecise value, as is indicative of the degree of precision that can be expected in such results.

(5) The findings of the laboratory of Dr. Davidson, which apply to both the blood and urine, are in line with the expectations of the occupational history, and in addition they tend to confirm each other, since they are in complete agreement in being within normal (physiological) limits. (Dr. Davidson is not known to this reviewer, but is known to Dr. Ashe, who had his experience in this matter while a member of the staff of this Laboratory and is known to be both properly informed and adequately critical.)

It has been suggested that the results obtained in Dr. Davidson's laboratory can be explained as being low because of

the intervention of chelation therapy with calcium disodium "Versenate." This is indeed a naive suggestion. In the first place, if the "versenate" had been administered intravenously in one course, it could not have lowered the blood and urine to the extent indicated, in a case of severe plumbism. Secondly, the chelate was not given intravenously but rather orally, so that its effect could not have been great. (This is not a satisfactory method of therapy). At best, chelation therapy removes only a modest proportion of lead from the body, and in severe cases it has to be repeated several times - ^{most commonly, three or} four, ~~two~~ ^{intravenous} courses of four or five days each, with an interval of a week or so between each pair of treatments, ^{are employed.} It is not possible, much less probable, to remove the lead to such an extent as is indicated here, by a single course of oral therapy. The conclusion is justified, therefore, that the result reported as having been obtained by the analysis of a 24-hour sample of urine, is invalid and irrelevant intoxication.

It is the opinion of this reviewer, after considering the evidence, that this man did not have lead poisoning. The basis of this opinion lies in the following facts:-

(a) The clinical syndrome described as having been presented by this patient was not compatible with the known effects of the absorption of lead. If by any stretch, it can be regarded as being due to lead, it was a very atypical case which would require incontrovertible evidence of the absorption of a ^{comparatively} ~~relatively~~ large amount of lead.

(b) The history of occupational exposure to lead is not such as to be convincing. This man's occupation, as a rule, does not result in cases of lead poisoning. Rather, the occurrence of lead

poisoning in this occupation is unusual. Instead of being a supporting feature of the diagnosis, the occupational history casts grave doubt on such a diagnosis.

(c) The analytical data obtained to establish or exclude the absorption of lead in this instance, are contradictory. One result obtained by an undescribed method of analysis of a single sample of urine collected without well-defined precautions, indicated the presence of a moderately elevated concentration of lead. A second pair of analyses, one of the blood and one of the urine, carried out 10 days after the first (after the intervention of a single unsuitable and almost certainly ineffectual course of chelation therapy) yielded results which confirmed each other as being entirely within normal limits.

Summary. The clinical pattern of the presenting disease being atypical of lead poisoning, and the evidence of lead absorption being negligible, the diagnosis of lead poisoning is untenable. The precise nature of this man's neurological disturbance has not been established.