

BOOK REVIEW BY ROBERT A. KEHOE, M.D.

Title: SUB-CLINICAL LEAD POISONING

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This is indeed an unusual book. The authors have documented it by an extensive and painstaking review of the scientific literature of the world, with particular reference to modern investigations, but not to the exclusion of the earlier historic record. Almost 1300 references to the work and ideas of more than 1500 authors have borne obvious testimony to the curiosity and interest of a huge number of investigators, and even more to the utterly astonishing naivete of these authors in persisting in their adherence to a point of view represented in the title of the book, namely, "Sub-Clinical Lead Poisoning." If this title has any meaning at all, it must mean that there is a remarkable lack of evidence of the ability of lead, when absorbed into the animal or human organism, regularly, to induce an illness of a distinct type - a specific clinical entity - in the organism. Let us look into this matter before proceeding with other aspects of our review.

First, is the matter of the physiological examination of the behavior of lead in the animal organism. Much of modern investigation has concerned itself with these normally occurring phenomena and with the mere occurrence of lead in nature, including animal and human tissues. There can be little doubt that investigations of this type have emphasized, at least in the minds of some investigators, the physiological behavior of lead in the animal organism, rather than its toxic effects therein. With such ideas in mind, lead has been administered

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cautiously to animals, and with special caution to man, so as, if at all possible, to delay or avoid the induction of illness. Some surprising results have been encountered in the administration of lead slowly and in low dosages, while the investigations of lead in the body of man, and in his environment, have revealed quite a number of facts concerning normal lead which have altered appreciably our concepts of the nature of a poison - concepts which may be profoundly disturbing to the orthodox mind of man, whether that of laymen or expert (the professional mind is not always readily altered).

Secondly, it is not believed by clinicians concerned with handling the urgent problems of lead poisoning in industry or in the larger community, that there is no typical clinical pattern of lead poisoning to be dealt with. Truly, there is more than one such pattern - for example, in the adult, employed in unsatisfactorily controlled lead trades involving inorganic lead, there is almost regularly one pattern, currently. There is another, and a more difficult one to deal with, in lead poisoning in the very young child. There is yet another in the lead alkyl industry. These three divergences provide little difficulty in the diagnosis of lead poisoning by trained and experienced physicians in the individual fields; they do often afford serious difficulties to medical novices. And here, the quantitative aspect of the problem is the significant one. What is surprising in the present situation, is the apparent confusion of mind of these (and other) authors in the midst of the enormous mass of information collected from the literature, which is represented in their apparent failure to take into account the lack of clinically recognizable illness among the large numbers of persons, especially young children whose exposure to lead is generally of a very low order of magnitude, and who fail to develop any seemingly distinct abnormality. It seems to these authors, in view of the presence of lead in the bodies of all persons,

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including children, and in view of the fact that there are certain evidences of reactions of lead within their bodies (which, for all one know, are strictly physiological), that lead poisoning actually exists. It may seem strange that all persons yet examined with sufficient care have lead /a poison(?) in their tissues. But is it strange, or is it not a fact, that we, in the past - all of us - have spoken and thought of lead as a poison - under all circumstances - and not of lead as a poison, only under appropriate circumstances? "Aye! there's the rub," which is the more traumatic in situations such as those involving the small, helpless and very young darlings of children, concerning whom in so many situations, sentiment is so often substituted for sense. Such is the common assumption, obviously shared by these investigators. They - the young - must certainly be more susceptible to the untoward effects of hazards, generally, and certainly to poisons. But is there any such evidence in this instance? And yet another critical remark may as well be introduced at this time so as to complete this aspect of our review at one time. Very little is said, or apparently thought, by these authors, concerning the quality of the analytical results which play so large a part in the interpretation of modern evidence in this field.

It is evident that the quantitative relationships in modern investigations of the effects of lead upon the animal organisms have been the principal feature which has differentiated modern from earlier investigations. Indeed, it may be held in this instance, as well as certain others, that the introduction of quantitative relationships (not always accurately) into the study of this ancient poison has created the necessity for a new definition of a poisonous substance. The poisonous character of materials, generally, is no longer, in fact, an inevitable quality of their occurrence in a given medium, but rather is a property of their concentration in that medium. Thus, a poison in the living organism,

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under certain circumstances, may be the elixir of life, under other circumstances. The finding of quantitative relationships involving the toxicity of lead and of certain other metals has been high, indeed, among the phenomena of modern investigation. Indeed, the fact has been revealed that the quantity (concentration) of lead involved in a given situation is the most important aspect of its relationship thereto. Therefore, the authors of this book in touching so lightly on this aspect of the matters at issue have indeed neglected a most important issue.

Concerning this review, itself, it is extremely difficult to make seriously critical comments. The authors have presented the information given by a very large number of investigators with great diligence and apparent accuracy. The book, therefore, provides one of the best and most complete means of covering the facts and opinions which have been made available concerning the metabolism of lead in man. It portrays fairly well, also, the clinical effects exerted by lead on the human organism. However, the literature of the entire world, does not, as yet, and may not for a very long time, if ever, provide uniform, agreed upon or entirely trustworthy evidence, as to the quantity (concentration) of lead in the blood or in any tissue, which is significant or entirely insignificant, in relation to the toxic effects of lead within the human body.

The problem presented by an instance of "Sub-Clinical Lead Poisoning" is significant, in all probability, only in the case of certain young children. In such an instance, this reviewer would suggest that the finding of a valid concentration of lead, in the blood of a child prior to the age of six years, in excess of 0.04 micrograms per 100 grams of whole blood, might well be regarded as significant in relation to the hazard of the absorption of lead. This level of lead in the blood of such a child is regarded as indicative of the existence of a source of abnormal (unusual) exposure to lead; furthermore, unless such a child

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is maintained under expert observation (so as to detect and eliminate the source of the abnormal exposure to and absorption of lead, by precise analytical means), it is necessary either that the child be removed from the threatening environment or that he be checked at intervals of one month (less if the elevation of the lead concentration in the blood be found to be increasing significantly, i.e., if the increase within the first month should be greater than the common error of the analytical method employed for the analysis of the blood).