

*See Background file on
Lead Industries*

Oct 1955 - Aug 16, 1956

October 11, 1956

Dr. William U. Giessel
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215 Milby Street
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Dear Doctor Giessel:

I have not been able to find time to go over the material which you sent me with your letter of August 9 until today, and even now I must give it a priority over a number of other matters that would be given prior attention but for the uses of professional courtesy and your request for my advice on a specific problem. I shall do my best to respond to the latter.

I shall omit any discussion of the similarities or differences in our viewpoints and methods in our approach to preventive medicine and industrial hygiene in the lead trades. The only basis for any real discussion of these matters lies in the facts of life, as these relate to the social, economic, physiological and clinical backgrounds concerned. That is why I offered to spend some time with you, which if you were here in my office, I could give you, but which, for a number of reasons, I cannot spend, in anything like equivalent quantity or effectiveness, in correspondence. I turn then to your practical problem.

You begin by asking me to make certain assumptions which I dare not make, although I shall go along with them as far as I can. For example, you give me data obtained by the analysis of certain samples of air. Am I to assume that there were only five analyses? If so, these, with their high variability, give me very little idea of the general level of the lead hazard involved in the work of this plant. And how about the men in other parts of the plant, or those who move about as they work? All I can conclude from these wholly inadequate data, is that the ventilation, regardless of the "competence" of the persons who installed it, is not maintaining the kind of cleanliness of the air, with respect to lead compounds, that is necessary for the safety of the men.

The foregoing conclusion is amply confirmed by the analytical results on the urine of certain of the employees. The latter items of data, like those referred to above, are not sufficient in number or in their spread over the various occupations, or in relation to the duration of the exposure of the individuals, to show anything about the specific hazards of the specific

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occupations and work areas of the plant, except that the plant, apparently as a whole, is dangerous. Two pipe press men, two truck drivers and one furnace operator have yielded some results that are within the upper normal range. All of the others are excreting lead at a rate that is clearly indicative of hazardous absorption. The arithmetic average value for this entire group of results is 0.17+ mg. of lead per liter. If these men were representative of the jobs in this plant, and if these samples were representative of the general level of their urinary excretion, this plant is indeed unsafe, and regardless of who has done the industrial hygiene engineering, the measures of environmental control are sadly in need of improvement. What is needed is a thoroughgoing investigation of the over-all situation and a revamping of the system of controls.

Now as to these men. If they continue in work of this type, in such an environment, there will be severe cases of lead poisoning among them. You wish to avert such cases of poisoning. There are certain procedures that can be employed with some hope of benefit.

1. On the assumption that a plant so poorly equipped with facilities for atmospheric hygiene, is probably as poorly equipped otherwise, and on the evidence of the high levels of lead absorption, I consider it likely that these men are ingesting appreciable quantities of lead. What are the conditions with respect to locker rooms, changing of clothes, wash rooms and shower equipment, and a clean lunch room? I am fully aware that respired lead is important, but there are many industrial situations in which it is by no means so preponderant as to justify any degree of disregard of the opportunities for ingestion. The lead that men swallow (except for that trapped in the upper respiratory tract and that in their normal food and beverages), can be avoided by careful and not unduly costly attention to the prevention of ingestion. This often makes the difference between serious and borderline hazard. Such sources of lead absorption can be eliminated by means of proper facilities and a sound program for the training of the personnel under good supervision. It is much less costly than certain types of ventilation, and the establishment of such a regimen is actually a requisite for the development of real understanding on the part of both workmen and management.

2. The plant can be surveyed economically, but adequately for initial purposes, either by a carefully planned series of air analyses, or by a carefully considered program of analyses of the blood or urine (or both) of representative personnel, so as to define the loci and severity of the hazard. It is advisable, if possible, to apply both of these procedures, but if only one is chosen, the biological procedure is much the best. Either of them can be done quickly, and if they are ^{done}/intelligently, they need not be prohibi-

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tively expensive.

3. On the basis of sound evidence, the needs of the situation, from the aspect of control, can be established, and the worst situations corrected first. By concentrated attention to the latter, the over-all expense can be greatly reduced.

4. While the plans are being made and the appropriate steps are being taken (after the survey indicated above), the men who are in danger can be partially protected by a number of devices.

a. Respiratory protection can be provided to individual men, and, with proper education and supervision, this can be made fairly effective for a time. It should not be counted on as more than a stop-gap, while appropriate equipment to control the exposure is being installed, but, I repeat, it can be made to work beneficially.

b. Unduly exposed man can be moved from the more dangerous jobs to those less dangerous. Those in immediate danger of developing illness should be removed from exposure, temporarily. Sound criteria for such action, and for the return of these men to their jobs, have been developed and published, and are in successful operation in quite a number of industrial plants. If the plant is such that some jobs are available in safe areas, this is fairly easy to do. If no such jobs exist, or if the plant as a whole is involved in highly variable and insufficiently controlled exposure, it is very difficult. The dismissal of men who are in a situation of this type, is, I agree, almost unthinkable. Indeed it is an act of utter irresponsibility and barbarity on the part of the management.

In my opinion, the physician operates against the proper approach to this situation, if he resorts to the measures of "prophylaxis" that are represented in the use of EDTA. The procedure might be used with some propriety, if we knew enough to use it with complete safety and with the assurance of a satisfactory outcome for the man (which we do not), if it were used, temporarily and rarely, to deal with a specific clinical and personal problem during the period required to achieve safety by proper means. That is, if the situation as a whole were fully understood by management, faced by them honestly and intelligently, and proper steps initiated to solve it, one could help men who are in danger but not ill, to hang on to their jobs and livelihood and thereby help indirectly to keep the industry out of avoidable trouble. If, however, one is merely trying to work against the inevitable, with no real understanding on the part of the men and no sound and informed attitude and effort on the part of the management, the doctor has no choice but to hew to the straight medical line and let the chips fall where they may. A man who is ill, in consequence of lead absorption, no matter how slightly, is a candidate for enforced retirement from work with compensation. He should not return to his job until it is safe for him to resume exposure. I agree that the medical semantics here have been deplorably misguided and obscure. It is plainly true that there is a well defined zone of lead absorption, well

above the normal level, within which men do not suffer any illness at all at any time. There is a zone, also fairly well defined now, at which danger begins and is revealed by a low incidence of mild (call it "incipient" or "latent" or anything you like, but it is clinical lead intoxication, as defined by deviations from the physiological state) lead poisoning. Above this zone, the incidence of poisoning increases as does the severity of the disease. Within the zone of danger, we should act to reduce or eliminate exposure before illness develops.

Exposure and absorption can be reduced in a number of ways; (a) by shortening the time of exposure per day, per week or per year. A period of freedom from exposure, regardless of when it comes, reduces the body burden of lead, and if such periods are properly spaced, they can be employed to prevent lead poisoning; (b) by alternating the severity of exposure through scheduled changes in work and location; (c) by specific and instructed efforts, on the part of workmen, to avoid undue exposure, through achieving an understanding of how it occurs (avoiding the plume of fume that follows a moving pot or escapes from an open furnace, avoiding crude acts that disperse clouds of dust in the air, and keeping on the off side of sources of dust and fume so far as possible, while carefully avoiding all ingestion of lead by reason of dirty hands, food and beverages. The foregoing measures may sound a bit like "gilding the lily" in the ears of the novice or the "hard boiled," but having had the direct responsibility over many years for the safety of men who work in the most dangerous (potentially) of all of the lead trades, I have been able to investigate and measure the influence of several of these factors. They are of practical, and not academic, significance. Moreover, in this, the most intrinsically hazardous of the lead-using industries, we do not have cases of lead poisoning. It has taken a long time to achieve the understanding of the problem, in the terms of practical performance, but the criteria for safety are now clear, having been tested by time and experience.

You may say, at this point, that the situation referred to above is all very well for a large and wealthy industrial organization, but that it cannot be achieved by a small company or owner with limited resources. To this frequently stated bit of tripe, I reply that this same thing has been accomplished by certain small organizations and owners, who, whether or not they are socially sensitive, have learned by their own or, if they are really intelligent, by the experience of others, that the financial jeopardy associated with the operation of a frankly dangerous plant is too great to be endured by a prudent manager. This is a matter of wise management based upon an understanding of the problem, and it is the function of a physician who has appropriate access to management, to see that such understanding is arrived at. The role of the physician is a gracious and beneficent one, so far as the endangered personnel are concerned, but it is that of the insistent instructor, stern critic and judge, with reference to the hygienic

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responsibilities of the owner. It is rare indeed that there is any social justification for the persistence of an industry that remains actually unsafe for any considerable period of time. If a material or a process cannot be handled or operated safely, it is a social liability, and we, as the responsible protectors of the health of the people, should be the last to stave off the just judgment of society as expressed in its medical and hygienic knowledge, regulations and laws.

This has turned out to be a long letter, as I feared it would when I finally got around to it. The fact is that this is one of the oldest and most troublesome problems of industry and industrial medicine. It is far from simple, and its medical and social implications are confused because they have gone so long without sufficient examination and elucidation. Neither we as doctors nor the responsible people in industry have come right down to and faced the real issues, except occasionally and under exceptional circumstances. We have hidden under the obscurity of "unusual susceptibility" and the alleged unpredictability of the effects of lead absorption, and have failed to direct the thinking of industrial management when indeed we have not actually misled it by our ignorance and our lack of social wisdom. We no longer have our ignorance of either the danger or the uncertainties of the disease to justify our inaction. Moreover, I look to the new era of occupational medicine, in which the responsibilities of the industrial physician are being defined and clarified, to stamp out the backwardness of our approach to this and other somewhat comparable problems of industrial health.

Sincerely yours,

Robert A. Teshe, M. D.

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C. C.: Mr. Manfred Bowditch (Blind)

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