

E. Chicago, Illinois

Memorandum

On the Hygienic Conditions Encountered
in the Plant of U.S.S. Lead Refinery,
Incorporated at 5300 Kennedy Avenue,
East Chicago, Indiana on June 8, 1965

Little reference will be made herein to the various buildings or areas of this plant. The intent is not to cover the situation in a detailed and comprehensive manner, since any attempt to achieve such coverage, as the result of a single tour of inspection, would be futile; while the assumption that this had been done would be misleading. Rather, the purpose of this memorandum is to direct the attention of the experienced and knowledgeable managerial personnel of this plant toward certain problems that require solution by means which they will better be able to apply satisfactorily (over the long pull), than can this consultant.

As was expected, on the basis of previous experience in industrial plants engaged in comparable operations, there were faults to be found in the techniques of hygienic control. Those concerned with engineering measures of control have been assessed by more precise methods than those of visual inspection, and are in the process of being corrected. They will be mentioned only in passing. Those concerned with the methods and equipment of housekeeping and the application of personal precautions were intended to be and, indeed, are the subject of

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this memorandum. It should be said of these methods and procedures, that they apply toward the avoidance of unnecessary exposure to the personnel to lead - unnecessary in that the opportunities for such exposure are multiplied in large part by inattention to certain important details of cleanliness, and by a species of carelessness derived from the acceptance of the intrinsic dirtiness of certain operations. This is to say that good housekeeping and attention to certain considerations of personal hygiene, in industrial operations of this type, have been neglected so regularly in industry generally so to be regarded as redundant. They do not require "smart" engineering, but rather, patient and persistent care in their performance, and hence they are relegated to occasional outbursts of attention when the situation becomes so obviously bad as to interfere with orderly production, or to be productive of injury or illness among the employees.

Recognition of the importance of these matters may be facilitated by some considerations of the contribution which they make to the overall exposure of the workmen to lead. Each operation within the plant makes some contribution, however slight, to the dispersion of lead into the surrounding air. To this almost unavoidable contamination of the air is added that which is picked up, in a dry state, from the flat surfaces in the area, by currents of air (such currents are induced by ventilating devices, by the excessive heat of the operations, and, by the movements of equipment (vehicles, etc.) and people

within the area. Particles of dust are in a constant process of being deposited and redispersed. Only a small quantity, over all, is required to give rise to a measurable increase in the absorption of lead by workmen in the area, and every little bit makes its inevitable contribution. As little as a gram (1000 milligrams) of lead, absorbed into the body of an adult over the period of several years (consider how small a quantity may be absorbed day by day) may cause poisoning. The clothing and skin of workmen become dusty and soiled, by reason of the work itself, but they become heavily coated with the dust deposited on every object with which they come in contact in their environment. It seems futile to attempt to be clean - even to make some gesture toward cleanliness - in a filthy area. The result is an acceptance of their filthy state.

The only remedy for this situation is the constant cultivation of environmental and personal cleanliness. And this, under the ordinary conditions of these occupations, may make the difference, acquired at relatively low cost, between hazardous and safe operations. There are a few situations in this plant that require somewhat drastic engineering measures for their correction. With these exceptions, however, the exposure to lead that is associated with most of these operations can be reduced appreciably by a careful, persistent regimen of housecleaning. Such a regimen is an imperative

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factor in the cultivation of some interest, on the part of the workmen, in personal cleanliness. The effective utilization of the facilities for achieving cleanliness depends, in very large part, on the nature, the convenience, the cleanly and attractive appearance of these facilities. One should come out of a shower bath and a change of clothing with a strong sense of having put behind him the soiled state of his clothing and body. This cannot be realized if the facilities are soiled and unattractive. (In this connection, the policy of providing work clothing, laundering it at appropriate intervals, requiring and supervising showering and changing clothes, has come about as a matter of necessity in the cultivation of good practices of personal hygiene. It is my belief that this will be required in all parts of this country, through legislation, as it has now in certain States, in relation to such lead-using trades as smelters, foundries, recovery plants and the like, in which good practice requires that the exposure to lead should end with the end of the work-day. The wearing, after work hours, of clothing contaminated with dusty compounds of lead continues the respiratory and alimentary intake and absorption of lead - the inhalation of dust and the swallowing of lead compounds from objects of all kinds that are put into the mouth by dirty hands, kept dirty by contact with dirty clothing. I hesitate, when there are other more urgent problems, to make a definitive recommendation that this policy be implemented at this time.

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I think however, that it will be forced upon you, and I would not be disposed to wait until this occurs. It is a sound requirement for the achievement of a good hygienic regimen, as contrasted with one that may, somewhat dubiously, meet the bare minimum. If this is to be done, the washrooms and locker rooms will have to be cleaned and brightened. They did not impress me as being clean or, in any sense, inviting. If men are dirty by nature and lack of training, the present condition of these facilities is calculated to keep them so. On the other hand, it would not be very difficult to bring these facilities up to the point of being acceptable to such persons as ourselves. If one looks at them with this attitude, and meets this specification, persistently, the stage will be set for a better performance. I doubt that such performance can be achieved otherwise.)

A further matter of significance which is worthy of consideration, before dealing with specific hazards, is that of the use of respirators. It must be accepted, I think, despite the fact that it represents hard doctrine, that any job, in a lead trade, that requires the use of a respirator continuously, is an example of the failure to achieve environmental control by engineering means. There are, I believe, such jobs in the lead industries, but, for the most part, these are somewhat unusual. The reasonable justification for the use of respirators is the existence of a job that has to be done

occasionally or for a brief period of time. The effort should be made, continuously, to find means of controlling the escape of particulate lead into the atmosphere in all situations which now demand the use of masks, so as to dispense with the necessity of their use. So long as they are required, there should be rigid discipline in the manner of their handling and use. On the basis of previous experience (not through observation in this plant), I doubt that the procedures for the use of respirators are adequate, especially as to detailed and convincing instructions to the men (implemented by supervision) for persistent use and the avoidance of leakage. It is apparent, for example, that one of the men whose blood was high in lead, would not have reached such a level of concentration, if he had worn his mask effectively and continuously. This is another of the matters that cannot be left to hope and faith. Moreover, the plea (which I did not hear in this plant) that the men are provided with respirators, but do not use them properly, is irrelevant. They never do adhere to regulations unless the fear of death is upon them, or unless they are instructed and supervised persistently.

Departing now from general considerations, certain comments on specific matters, as well as certain recommendations, are made for consideration.

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In improving the housekeeping, each situation, e.g., the casting building, the area of the tube furnace, the area of the blast furnaces, and the area out of doors within which lead-containing materials are piled and stored, should be examined for its potentialities for adding to the air-borne lead.

It is believed that certain materials which get to be spread about in working areas can be confined in (preferably covered) containers. Dross, wherever it is to be handled, can be put into covered containers for transportation to points of disposition, or, perhaps, in some instances, it can be removed from pots or furnaces into the receptacle (equipped with a lid) of transport equipment, and taken away promptly from the area of its origin. In any case, spilled dross or spattered metal should not be permitted to remain on floors or working areas, in which there may be human or vehicular traffic, for longer than is required to gather it up.

Similarly, lead-containing dust or agglomerated fume should not be permitted to remain within areas in which it has escaped from operating equipment and has been deposited on such equipment or on pipes or flat surfaces. The dust which collects on objects in such areas is evidence of its escape; its escape should be prevented by appropriate engineering means, but when it escapes it should be cleaned up regularly and frequently, so that the evidence of escaped dusts can always be related to present (current) operating faults and not to something that occurred some time ago.

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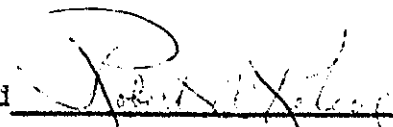
Materials out in the yard, especially those which are not wetted readily, should be in closed containers, or in bins of some sort which prevent their spread into the areas around them and in the pathway of vehicles. This may or may not be feasible, as a general rule, but certainly the gray lead oxide observed in small piles at one point in the yard could have been collected (inside) in a container and picked up and transported outside (if need be) by a fork truck, by which it could later be reintroduced into the flow of materials.

It appears that much of the material for reclamation, broken batteries, for example, can be kept in a wet state and handled without dispersing dust in the air. It seem likely however, that less spillage would occur, and the wetting process be facilitated, by storing these materials in concrete platforms with concrete walls of appropriate height at all points other than at the entrance of the vehicles. This would keep the remainder of the area reasonably clean and would prevent the distribution of dust by the wind.

In order to achieve the desired cleanliness of the operating areas, it appears that both equipment and personnel will have to be augmented. Persons to whom cleaning operations are delegated may have to be detailed to this job alone, in certain areas. Additional vacuum cleaning equipment will be needed in certain areas. Certainly brooms, floor and surface brushes will have to be removed from the areas in which they may be used occasionally or regularly, by operators. It may

be that a proper procedure of sweeping - after wetting down the area, or applying adequate quantities of materials for keeping the dust down or using a vacuum sweeper - can be prescribed for use by a cleaner after careful consideration. It is recommended that careful consideration be given to procedures of housekeeping that will achieve the desired degree of cleanliness without undue interference with the regular operations. A coordinated effort should be made by those responsible for the operations in the several areas, together with some person or persons with technical experience and judgment to whom the decision as to methods of cleaning has been delegated, to find and adopt practical methods for regular application. This, in general, is the task of an industrial hygiene engineer. It is fair to say, however, that methods of good housekeeping can be devised by an intelligent person with some ingenuity, who understands what he is attempting to do, and can accept the limitations imposed by the nature of the operations in a given area. An experienced industrial hygiene engineer could do this with the least loss of motion, but the job could be done for practical purposes by such a person as that indicated above who had the time and inclinations to do it. The difficulty is that the people engaged in operations have neither the time nor the inclination, considering the demands of their primary job.

Signed



Robert A. Kehoe, M.D.

June 17, 1965

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June 17, 1965

Mr. F. L. Warner, Vice President
U.S.S. Lead Refinery, Inc.
East Chicago, Indiana

Dear Mr. Warner:

I enclose herewith a memorandum in which I have given you the impressions derived from my visit to your Refinery on June 8th, and certain recommendations for the improvement of the conditions associated with your Company's operations.

I am sure that you will realize that I would not expect to be able to prescribe the details of your methods of achieving the results which I consider desirable. Nor would I expect that these results would be obtained at once. I would expect that every reasonable effort would be made to overcome the hazards, with respect to the absorption of lead by your Company's employees, at the earliest feasible time, and to the extent that may be possible under present circumstances. In part, the latter comment recognizes the fact that there are trends in legislation and in state regulatory procedure, as well as in collective bargaining, which make it prudent to achieve an appreciable margin of safety, in many industrial operations, including those of the lead industries. In the more important consideration of human welfare, which I know you share, there can be no doubt that compliance merely with the letter of the law or of minimal requirements, is not enough. What is needed is some leeway in order to be able to meet periods of stress (in terms of prolonged hours of employment or the development of unusual circumstances), without outward results. After all is said, workmen are the least predictable and the most vulnerable resource in industrial production, and therefore there is justification for loading the scales of industrial hazard somewhat in their favor.

Let me say that it has been a pleasure to be associated with you in your approach to the protection of your Company's employees, and I have the highest hope that I have been able to serve you and these employees advantageously.

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Mr. Warner (2) June 17, 1965

I enclose a bill to cover the out-of-pocket expense of my trip to East Chicago, and a separate one for the reimbursement of the Laboratory for the services rendered to your Company. I would appreciate it if you would cover these separately so as to simplify the procedure in relation to the requirements of the Federal Internal Revenue Service.

Cordially yours,

Robert A. Kehoe, M.D.
Director

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Enclosures

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