



June 10, 1968

Mr. Robert Kline
Nibco of Texas
Box #727
Nacogdoches, Texas 75961

Dear Mr. Kline:

I must solicit your indulgence for my long delay in setting forth in writing my views concerning the problems with which your Company is faced in hygienic matters in your foundry in Nacogdoches, insofar as I can visualize them from the information made available to me by Mr. Pierce of the Industrial Hygiene Staff of the Kettering Laboratory, as obtained by him in his visit to the plant and as supplied to him through the observations of others. I can excuse myself for what must seem to you to have been a poor performance on my part, only because I have been required by prior commitments to travel fairly extensively during recent weeks, so as to have been in my office for only a few hectic days since March first. Meanwhile, you may have taken such steps as to render my comments obsolete. If such is the case, I hope the information which I transmitted by telephoning Mr. Hargis may have been somewhat helpful.

In any case, I shall attempt to make some amends through the memorandum which is enclosed in this letter. If it raises further questions in your mind, I shall be pleased to respond to them without undue delay.

Cordially yours,

Robert A. Kehoe, M.D.
Professor Emeritus of
Occupational Medicine

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enclosure

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Memorandum on the Hygienic Problems of Nibco of Texas

The hazardous conditions under which the operations of this foundry have been carried out in the recent past differ only in degree from those encountered by us in a number of lead-using foundries in various parts of this and other countries during the past thirty or more years. Considerable amounts of particulate compounds of lead, as both dust and fume, have been dispersed in the air in areas of the plant in which men were at work. The data of air analyses have demonstrated clearly that the quantities in the air in several of the work sites occur in concentrations which exceed acceptable standards of safety. The areas that are most hazardous in this respect, as would be expected on the basis of previous experience, are (1) the furnace area, and (2) the pouring area. Considering the variability of the results in these and other areas, there is little doubt that hazardous conditions exist elsewhere in varying degrees of severity from time to time. The available data are not sufficient in numbers or in relation to the sites or frequency of sampling to yield a comprehensive portrayal of the industrial environment.

Much more precise information concerning the actual and potential danger of the exposure of the workmen to lead in this plant has been provided by the analytical data on the blood of twenty-seven men engaged in ten different types of jobs. Considering these results at their face value (which, in view of their sources and the cross-checking performed, is believed to be a valid attitude), it is evident that the exposure to lead to which 5 of 5 furnace tenders, 5 of 7 "pour off" workmen, 3 of 4 "stemmers," 1 of 2 "weight shifters," 1 of 1 "shake-out" workman, and 1 of 3 molders have been subjected is excessive and can be expected at some time to result in cases of lead poisoning, unless the conditions of exposure are corrected. The other workmen in these categories of employment are at or near the threshold of danger, while only three of the twenty-seven men so investigated,

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a sandman, a coremaker and one of the three supervisors, were found to have a satisfactory margin of safety, in terms of the concentration of lead in their blood. Two of the workmen, on the other hand, a furnace tender and a weight shifter, were found to be at highly dangerous levels of lead absorption, such as might result in seriously disabling poisoning. (There is no level of lead concentration in the blood that signifies the actual existence of lead poisoning. All cases of poisoning occur, so far as present evidence indicates, in persons whose blood level is at 80 micrograms or more per 100 grams of whole blood. The actual time of the onset of poisoning is unpredictable, but is triggered by some mechanism, presently unknown, whereby harmless lead, probably chemically bound lead, is converted into toxic lead, probably ionic lead, in the tissues of the body. One factor which seems to be potent in this regard, is the sudden exposure of an individual to a considerable increase in the dose of lead taken into the body. Such an event can occur readily when there is an high variability in the day-to-day severity of the exposure.)

Very little more can be made out of the available data, and no useful purpose would be served by repeating the information in the report of Dr. Pierce as to the environmental conditions which he observed. Certain recommendations can properly be made, however, for gathering and utilizing more information, and for correcting the unfavorable conditions.

General Comment:

Whenever the environment of the work place is intrinsically dangerous, every effort must be made, in modern times, to subject the environment to a detailed and critical examination, and to bring it under control by appropriate engineering means, i.e., by suitable modifications of operating equipment, by properly tailored ventilation, by alert and sophisticated procedures of maintenance of equipment to correct deterioration, and by housekeeping designed to avoid the accumulation of dusts, debris and other lead-containing material in operating areas, so as to prevent its redispersion in the air by means of moving personnel and equipment. For example,

frequent and effective use of vacuum cleaning is preferable to sweeping, brushing and wiping techniques in the removal of dust and debris. Due attention must also be paid to the containment of toxic materials within the confines of the manufacturing establishment, so as to comply with existing or imminent laws and regulations concerning the pollution of air and water.

Well chosen methods of achieving satisfactory environmental control through engineering procedures are available, for the most part, and the only serious problem, in the long run, is that of the cost involved in bringing about the desired control. In general, it can be said that "short-cuts," makeshifts, and amateur engineering services turn out to be unduly costly in the end. However, the task must be accomplished to a degree that is compatible with a reasonable degree of safety for the employees and the feasible expenditure of funds, since the economic failure of the enterprise eliminates employment as well as profits, and penalizes both employer and employee.

In any such situation as this, the workmen will be subjected to the hazards that flow from incomplete measures of hygienic control for as long as these persist, even while improvements are being made. Under these circumstances, there should be competent medical supervision; whereby workmen can be maintained under adequate medical surveillance. It is not feasible to carry out an effective hygienic program involving even the minimum of medical examinations and clinical laboratory procedures (including analyses of blood for its content of lead) without having the services of a competent and well-informed physician. A medical regimen cannot safely be omitted or dispensed with in the more (potentially) hazardous lead-using or producing industries, until and unless the hazard of lead absorption can be brought under substantially faultless control. The liabilities and the social disruptions that result from industrial intoxications and disabilities are nearing insurmountable proportions in the increasing complexity of our national life, through the activities of labor unions, governmental controls and social legislation. Sooner or later, these problems must be solved by appropriate measures of preventive

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engineering and medicine. It appears that there remains some margin of time wherein effective plans and procedures can be developed without undue haste.

Final Note:

It seems likely that certain engineering measures are being planned or carried out for the improvement of your plant, and I would suppose that the "know-how" for this purpose is probably available.

The medical aspects of the matter, in these days of shortage both in the numbers and training of physicians, are not easily dealt with in many American communities. It is suggested that there may be a local physician of considerable competence, who would accept employment and set himself to learn what he needs to know for the specific task of handling the medical problems of this plant. Should such a person wish to visit me and spend a day or two in orientation, I would be only too happy to guide his self-preparation and provide him with published information.

Signed:

Robert A. Kehoe, M.D.

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June 10, 1968

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