

May 4, 1940

Mr. D. A. Kohr, Pres.
The Lowe Bros. Company
424 E. Third Street
Dayton, Ohio

Dear Mr. Kohr:

My associates and I have discussed the questions which have arisen out of the visit which Mr. Gall and I paid your plant on April 5th, and although I am not prepared to propose detailed and concrete plans for the completion of all the work which might be done in a comprehensive survey of hygienic conditions, I am ready to suggest the means of attack on the matters which seem most important. By way of preface let me say that if the expense of a survey were of no concern to you, and if time were no object to us, we might approach the study of your plant in a frankly experimental manner, beginning at any point and proceeding until the possibilities had been exhausted. Such a procedure is, of course, impossible. Therefore, I am disposed to study such definite hazards as are potentially in existence, and to leave other problems for future consideration if and when they seem to justify study. In the latter category are the exposures to volatile solvents, which to me seem scarcely significant. A few observations will serve to determine whether or not this impression is correct and these can go until a later date.

The hazards which should be studied as promptly as possible, in my opinion, are those which arise from dusts. Therefore I have selected the sites in which these dusts are present for first consideration. My recommendations and estimates refer only to these areas and to the men who work within them.

I list these below and note the number of men opposite each location which it seems desirable to examine.

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Location	Number Employed	Number to be Examined
Mixing room, 5th floor, Bldg. 4	10	10
Small order dept. 4th floor, Bldg. 4	3	3
Receiving dept. various locations	9	9
Maintenance dept.	11	5*
Advertising painting dept, 6th floor, Bldg. 1	6	3 **
Raw Material Handling, Varnish plant	1	1
Mixing room, Lacquer plant	3	3
Janitor, Lacquer plant	1	1
Total	44	35

* This includes the four men alternating in stone-dressing, and one additional man of prolonged service, with the greatest and most prolonged exposure to silica. Others might be included if there is doubt on this score.

** At least 3 men who have had the longest and most severe potential exposure to particulate material (paint) in air, as well as to solvents, should be selected. If more are desired for any reason, they could be included at the start or later.

It is my opinion, from observations of conditions in the plant, that there is significant exposure to lead in most of the areas listed above. This, I believe, is the greatest potential threat to your workmen. There are also exposures to certain other metals which have to be given serious consideration, as Zinc and Titanium. Considering the fact that there has been no medical supervision, I believe that the entire group of severely exposed men should be examined carefully. Representative men chosen from the other areas of less severe exposure should be similarly examined. The examinations should cover their previous and present medical histories in detail, and physical examination should include careful tests of their nervous system. Laboratory studies on each man should include (1) a clinical analysis of the urine for specific gravity, acidity, the presence of sugar and albumin, and in indicated cases, a microscopic examination for pathological cells or structures; (2) examination of the blood for hemoglobin content, enumeration of red corpuscles, leucocytes, different types of leucocytes, reticulocytes, and stippled red corpuscles; and (3) analyses on the feces, urine and blood for their content of lead and certain other metals.

The cost of the type of examination described above when figured in terms of the expenditures of time and materials by the laboratory staff will approximate \$30.00 per man. It could not be less than \$25.00 per man, without our making

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some actual contribution of our time and effort, unless we were to eliminate certain items of work, which, although not imperative, would be useful. (We intend making certain extra analyses of urine at our own expense in order to satisfy ourselves that we do not miss anything of importance. The other we regard as absolutely necessary for your information.)

There are also certain areas in which exposure to silica may be significant, i.e. in the mixing rooms, the small order department, maintenance department and the handling of raw materials. We believe these men should be checked, in addition to the examination described above, by stereoscopic x-ray examinations. About 20 men are involved, and we can arrange to have these taken and read at a cost of \$10.00 per man. This cost is very high as compared to the other costs, as for example, our own cost and charge for lead analyses, which are technically much more difficult and time-consuming than x-ray examinations, of \$5.00 per analysis. On the other hand this is a service we cannot provide in the laboratory, and it has to be done at a hospital, where the cost, while a little less than the standard charge, is, nevertheless, subject to very little reduction.

On the basis of my selection of men for examination, which you may wish to modify by an increase or decrease, the cost of the clinical work can be estimated as follows:-

Clinical examination of workmen, including all laboratory tests except x-ray and analysis for lead and other metals

35 men at \$15.00 (2 hours of technical work per man) . . . \$525.00

Analyses of blood, urine and feces for lead and certain other metals, (3 analyses per man at \$5.00 per analysis)

35 men at \$15.00 \$525.00

X-Ray examinations

Estimated 20 men at \$10.00 *Business given 7.50 per man* \$200.00

Total for clinical work \$1250.00

Certain other men might be added to the group indicated above, by selecting representatives of various other departments. Some men, properly selected from the grinding room would give information of the dangers, if any, in this type of work. The men who clean tubs and other equipment on the 4th floor of Building No.2, might well be added, although their exposure to dusts would not seem to be great. Any additions

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would increase the expense accordingly.

One means of reducing the expense per man would be to reduce the analytical work. The analyses on the blood could be eliminated with the least loss of necessary information. If, on the other hand, the estimated expense per man is within the expected or feasible limits, this could well be done to advantage since it contributes considerably to the accuracy of the estimates of exposure in a given case.

An additional clinical item, if desired, might well be the examination of the blood for serological evidence of syphilis. This is done routinely in some industrial plants and, therefore, may well be considered. We have no wish to urge it, since it is not a part of our problem, but it could be done conveniently if desired.

Dust Determinations.

In addition to examinations of the men, it seems advisable to go into the question of exposure to dusts by a study of the conditions in the plant. This will provide a basis for the identification of the foci of exposure, and will point the way to the application of measures to control the exposure.

We would obtain samples of the dust in known volumes of the air from the various sites at which dust is distributed into the air. These samples should be analysed for lead and other metals and for free silica. (Your raw siliceous materials must also be analysed for their free silica content.) Dust counts will also be required to measure the silica hazard, and petrographic (microscopic) studies of the dust must be made.

Samples of dust from rafters and other undisturbed sites (and from collector systems if any exist), ought to be taken for study, as evidence of the general character of the dust over a long period of time. This is necessary, in view of the variability of the dust in the mixing room.

An estimate of the cost of this work is less precise than the foregoing estimates on the clinical work, for the reason that the amount of work required to obtain the answer is never entirely predictable. However a reasonable estimate can be based on the following breakdown.

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Sampling by electrostatic means, and analysing samples obtained from air in workrooms where dusts occur;

Approximately ²⁵40 samples at \$5.00 ^{125.00}\$200.00

Analyses of indefinite number of materials for free silica

Nor more than 20.00

Dust counts and petrographic examination of samples from air of workrooms;

Approximately ¹⁸40 samples at \$5.00 ^{90.00}200.00

Analysis for metals and silica and petrographic examination of samples from rafters and other undisturbed areas

20 to 30 samples at \$5.00 to \$8.00 per sample. . . . 240.00

Total \$660.00

Briefly to summarize our suggestions and proposal, we have every reason to believe that we can present you with a sound report on the hygienic status of your plant, with respect to dusts, through the clinical and technical studies outlined, at a total cost in round numbers of \$1900.00. In the course of the clinical examinations we will undoubtedly learn a great deal about the significance of exposure of your men to volatile solvents, and on this basis can outline any further work which may be indicated in that question.

If this proposal is in reasonable agreement with your ideas as to the expense which could justifiably be incurred for such a purpose, I would suggest that we proceed promptly with preparations for the examination of the men, on the understanding that we are not to go beyond the limits of expenditure indicated above without consulting you further, and that our estimate is to be the maximal expenditure unless we should find some unforeseen situation which in our judgment and yours requires further study.

Cordially yours;

RAK:1s

Robert A. Kehoe, M.D.

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