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This inquiry covered four possible industrial dangers, namely, mercury, lead, silica and sulphur dioxide. Besides visiting the departments in which these are encountered, I went to Hospital Station 1, which I had not seen for some four years.

The possible risk from mercury has been investigated by Dr. Cowle during the last few months and she has found that the laboratory workers are the ones most exposed to volatilized mercury. This exposure is not great nor constant but is frequently repeated owing to the spilling of mercury on the wooden block floor. The droplets collect in the cracks of the floor and evaporate. The rooms are large and high and are abundantly ventilated so that the concentration of mercury is slight, nevertheless tests of the air by means of the General Electric selenium sulphide detector sometimes give positive results. Even more significant are the results of Dr. Cowle's examinations of the blood of these laboratory workers, which point to the absorption of a heavy metal, in this case undoubtedly mercury.

Recommendation: - To correct this situation there should be (1) an even more careful avoidance of spilling mercury; (2) covering the floor with smooth linoleum, the edges curving up on the wall, as has been done in the Cowper-Hewitt plant in Hoboken, where the floor is kept clean by a repeated brushing with a soft long-handled brush.



It is more difficult to provide for the protection of workers necessarily exposed to mercury, workers who belong to an important class of employees. If it were lead we should be able to interpret the blood findings and we should know what degree of air contamination with lead would be dangerous, but we know far less about mercury. Dr. Cowie wishes to carry on some relatively simple experiments with animals to determine two points; first, at what concentration mercury in the air does the blood change noted (monomaleic) appear, and second, what, if any, organic injury accompanies this change in the blood. I should approve of this plan, although I recognize that it is not the habit of the General Electric Company to undertake such studies, but this is particularly a problem of the Company because of the development of the mercury boiler. The Company has perfected a delicate and accurate detector for mercury in the air which it can give to the users of mercury boilers, but the Company is not in a position to tell the user what is the reaction which points to danger. Moreover, the General Electric plant at Schenectady is much better equipped to carry on such experiments than are most bio-chemical laboratories because the chemical and physical problems in these experiments could be so easily handled.

The department in which repairing of old rectifier machines is carried on and where there was decided risk from mercurial vapors in welding has been very well equipped with booths and exhaust ventilation and masks for the welders. No recommendation is needed here.

Lead work is carried on in 70 D, on the second and third floors of 53, in 85, and in 97. In 70 D lead enamel for resistor tubes is mixed. The lead is in the form of litharge, which is kept in a closed container but weighed in a large pan on scales and mixed with other ingredients by means of a long-handled pole. The mixture is then shoveled into buckets and fed into the enamel furnaces with a scoop. In all this work the men take care not to raise dust, but it cannot be altogether avoided, especially in filling the buckets, in emptying the last of the batch from the mixing pan, and in filling the furnaces. A further source of dust is the sieving of the ground frit from the furnaces through a 100 mesh screen which is shaken with compressed air. Lead borate is produced only twice a week and takes about two hours, the work being done in the same way as the production of blue and black enamel.

Recommendation: - The three men working here should all be given routine medical examination about every three months.

In 53, second floor, this fritted enamel is ground to a paste without production of dust and the process is open to criticism only because paste is allowed to spill on the floor where it dries and becomes dusty. Even more undesirable is the practice of dry sweeping. On the third floor the enamel is applied to resistor tubes partly by hand dipping, partly by machine, and the excess removed by a stiff brush. The dipping should involve no risk to health provided the men wash hands and forearms thoroughly before they eat their lunch and at the end of the day, and provided their working clothes are fairly clean, but unfortunately much paste is scattered over the floor around the dippers where it dries, and here too dry sweeping goes on four times a day during working hours. This dust is said to contain 55% of lead. Brushing the dipped tubes is worse than dipping, for it produces and scatters very fine dust which falls partly on the floor, partly

into a big truck below, and part blows about. There is said to be no technical reason why the finishing should not be done while the tubes are still wet. In addition, eighteen men use scratch brushes to remove enamel from terminal bands and the brushes are not provided with suction to carry off the dust. It is true that the material scratched off is fired enamel which should not contain soluble lead, but examinations made by Dr. Cowie of the blood of seven of these men showed changes in five suggestive of lead absorption. With the ten dippers and four brushes there are thirty-two operatives more or less exposed to lead.

Recommendation: - If dipping cannot be carried on without splashing the enamel on the floor, the latter should be removed before it has had time to dry, by scraping and shoveling but not by sweeping. Dry sweeping should be forbidden. It would be well if it were possible to have a shallow pan of water placed so as to catch the splashes. Finishing should be done before the enamel has had time to dry and the paste scraped or brushed off should be caught in a pan of water. If the work must be done dry, then it should be done over water and in front of a strong exhaust, as is the practice in well managed potteries using lead glaze. In such potteries it is held to be a great economy to save the glaze in water and keep it clean instead of letting it fall on the floor. Since we have reason to suspect that the dust from the fired enamel contains soluble lead, I should advise having some of it subjected to the Thorpe test by Dr. Cowie, and if soluble lead is found to be present an exhaust system should be installed to carry off the dust from the scratch brushes and also at the benches where girls are working. If the test gives a negative result, it is probable that the men at the scratch brushes are breathing lead dust from the dry sweeping and the enamel brushing.

Building 85, where cables are coated with lead, is very well equipped and conducted and there is no recommendation to be made here except that these barrels be covered, perhaps with a valve cover so that fumes and dust will not escape while the material is still hot.

In Building 97 lead scrap is melted down and skimmings refined. The department is quite separate, the room is large, well ventilated, with a rough but clean floor. The melting down is done in well hooded kettles and there is neither dust nor fumes while work goes on. But the dross and scrap for refining are dusty and handled dry. There is, however, a good hood and exhaust over the feed door.

Recommendation: -- Dross should be dampened before it is shoveled and the men employed here should be given a medical examination once in six months.

The risk from silica sand is found chiefly in buildings 25, 67, and 95. It will hardly be necessary to go into detail with regard to conditions in the sand blasting or refrigerator cabinets. It is enough to say that the majority of machines are more or less out of order and leak sand continually. This is true of the Fawcett, the Sly, and the West machines. The air is cloudy and a fine grit collects on the paper of a note-book in a minute's time. In 69 there is a machine with no automatic feed and the men must pour in the sand by hand. The rooms are very over-crowded. The sand blasters wear helmets and respirators. The men outside do not but they are exposed to the danger all day long.

It is really a bad situation and if it is to continue it should be gone into thoroughly and a real effort made to keep the air free from sand, which means to prevent leaking. There should be provision for dust

estimations, for that is the only way to make sure that the air is safe to breathe. It is impossible to expect that men working outside the sand blast chambers should wear efficient respirators, for the only efficient respirator is one with positive air pressure, and these men are moving about all the time. Yet without such protection they are at the present time working in a dangerous atmosphere. That it is possible to do sand blasting with very much less danger to the workers is proved by numbers of other establishments. It is simply a problem of engineering. In 95 the sand used is coarse and less dangerous, nevertheless the men should wear a respirator with positive pressure, and it would be better to close the chamber for particles of sand fly out now into the shop and might injure the eyes of other workers.

Recommendation - Control the escape of dust and have the men examined at three months' intervals.

Hospital Station 1. This branch hospital is handling now too large a number of cases for the space and for the personnel. In the nine months of this year some twenty-one thousand cases have been treated, an average of ninety-five a day. About 35% are women. There is only one waiting room for men and women and it has space for only four chairs. A stock cupboard, a scrub woman's cupboard, a big radiator and a big sprinkler pipe take up all the rest of the space. The vestibule has two more chairs, but cannot be used in cold weather. There is only one toilet room and no cot, although one has been ordered.

Recommendation: - A trained nurse should be added to the staff. It would seem advisable to take the smaller room for women, with at least one cot, the larger for men, also with at least one cot. A toilet room for men should be provided. A separate waiting room should be provided for women or the present room should be enlarged.

The department in which sulphur dioxide is supplied to ~~the~~ refrigerator units was visited and was found to be beyond criticism in every respect.