

July 10, 1940

Memorandum on Baton Rouge Visit

Excretions

These results are the first obtained with the expanded group. Few dangerously high results are noted, but the general levels show an increase, the mean value for urinary excretion now being 0.090 ± 0.003 , these results being computed with the omission of all abnormally high results. With the urinary excretion at this level the Baton Rouge group is now in the same general level as the Deepwater group, which fact coincides with our observations in the previous report. The recent mean values for all of the Baton Rouge urinary results compared with the Deepwater group are given in the attached sheet.

The fecal results are also in general very much higher. A number of extremely high results were encountered but were thrown out of the calculations as they were out of the probable range of excretion of the men and were likely due to contamination either of the sample, or of foodstuffs with shot or other lead-bearing materials. Even when the abnormally high results are omitted, calculation of the mean value gives the result of 0.661 ± 0.034 , which is the highest obtained for some time.

Because Braud was erroneously included in the Alloy group in the previous calculation of the mean, these figures were recalculated, and were made to include the results obtained in the last sampling period. The results are given in the attached sheet, where it can be seen that the mean value for fecal excretion has dropped from 0.784 to 0.587. This drop which is not statistically significant is to be expected in view of the known greater exposure

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of men in Furnace operations where Braud was working. If the mean value is computed using the old set of figures, but with Braud omitted an even greater drop is noted, as can be seen in Mr. Herndon's report, but until the last group of samples was obtained too few subjects from the Alloy operation were included for adequate study and there was undue weighting of the results by this one man.

Despite this correction of the mean values, the men in the Alloy operation have a fecal lead excretion of the same general order of magnitude as do those in the Alloy operation at Wilmington. This indicates that for the present the Central Alloy operation is not significantly more or less hazardous than is the Alloy operation at Wilmington. However, when the fecal excretions are compared with those of the men in the remainder of the Baton Rouge plant (Furnace excepted) the Alloy operation now bears approximately the same general relationship at Baton Rouge as does the Alloy operation to the remainder of the plant at Wilmington.

Status of Central Alloy

Numerous improvements designed to reduce exposure are projected for the Central Alloy. Some 75 sight glasses have been blanked, leaving about 99 still in place, of which latter group 12 require opening once or twice a shift. The precipitator samples obtained at Baton Rouge indicate that the opening of the sight glasses on the casters is a source of air contamination and it is proposed to install ventilating equipment to remove lead dusts at the time these glasses are open. A new type of clamp has been designed which will reduce the length of time that the sight glasses have to be opened for cleaning and will further insure a tighter fit when closed. In the past about

6 to 10 sight glasses have been found leaking at the testing periods.

Alloy has been perceptible in the air of the building at all of our visits and search for the source of the contamination will be continued. In the past, the system has been checked with ammonia about once in six weeks, the tests being carried out with ammonia under about 12 inches of oil pressure, this representing about 4 times the normal pressure in the system. On the average, about 25 to 30 feet of leaks at the gasketed connections on the head of the system have been found at the testing periods. As there are about 2,000 feet of system, this would represent about 1 to 1-1/2% of leakage. These studies should be continued. As it is necessary to cool down the system before introducing the ammonia, the leak tests are therefore not carried out under conditions identical with operation and it is hoped that some method will be devised for tests at higher temperatures. In this connection the continued use of an electrical precipitator for grab samples at various points about the system would be of great aid in localizing the source of leakage and the use of one of these instruments is projected.

Another source of possible contamination is found in the rubber boots with square ends, at the ends of the casters and coolers. These are being replaced with boots of different design and round corners which should greatly reduce possible leakage. Here again the use of grab samples taken with an electrical precipitator at the site of suspected leaks would be of great use as a control on the operation.

Ventilating ducts will also be placed about the agitator shafts on the melt pot; their use should improve conditions.

As a check on the efficacy of the projected improvements in equipment and ventilation in the Central Alloy, arrangements were made to collect an extra set of samples on the 12 men now under study in that operation. The second quarter samples are in process of collection and these with the preceding sets will give a very good idea of conditions in the Alloy as they now are. Ten days or two weeks after the improvements in the Alloy have been completed and the place has been thoroughly cleaned by vacuum apparatus, another set of samples will be obtained from the group and will be accompanied by blood samples. It is to be expected that any improvement in general conditions will be reflected in reduction in the fecal lead excretion and this extra set of samples will enable more rapid estimation of the magnitude of the improvement than would be possible were one to wait until the subsequent quarterly samples are collected.

General Conditions

Two of the Wash Houses have been converted to use as Blenders. Odor was apparent about the sludge pump and ditch in one, similar conditions having been noted about these pumps before. There seems to be no reason why this condition should obtain in the C Wash House (where it was found) because of the use of the building as a Blender. (A and C are used for this purpose and B and D continue to be used as Wash Houses.) A similar condition was found in both A and B buildings, being particularly bad in A, where sludge was noted beneath the shaft of the pump.

Conditions on the Third Floor remain about the same. There is

no odor outside the Enclosures and the manheads within the Enclosures are closed when not being worked on. An occasional one is left open however with resulting contamination of the air within the Enclosures. As there seems to be no way to keep odor from emanating from these manhead covers unless they are kept closed, this point in house-keeping merits particular attention. No sight glasses were found leaking at this time and practice of releasing 4 bolts on the manhead covers prior to completion of the distillation has been abandoned. With the closing off of communications between the Fourth and Third Floors into the Still Enclosures, improvement in ventilation seems to have resulted and when all of these points are corrected, general conditions should be bettered.

Conditions have improved in the Bulk Storage Pump House and Tank Car Wash House where no odor was noticeable.

Willard Machle, M. D.

July 1940

New Calculations

Baton Rouge Alloy Lead Excretions

(Braud Omitted)

	<u>Feces</u>	<u>Urine</u>
Mean (Previous) B.R.	0.7837 $\pm$ 0.083	0.0853 $\pm$ 0.0056
Mean (Braud out) B.R.*	0.6480 $\pm$ 0.058	0.0768 $\pm$ 0.0034
Mean (Braud out) B.R.**	0.5871 $\pm$ 0.042	

$$\text{Diff. - } \frac{\text{Previous Result and Present Result}}{\text{P. E. of Difference}} = \frac{0.7837 - 0.5871}{\pm 0.093} = 2.22$$

Mean Wilmington	0.3875 $\pm$ 0.035	0.0853 $\pm$ 0.0032
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$$\text{Diff. - } \frac{\text{B.R. and Wilmington}}{\text{P. E. of Difference}} = \frac{0.5871 - 0.3875}{\pm 0.055} = 3.63$$

No significant difference exists between the mean values for urinary excretion, the greatest difference being 1.81 times its own probable error.

High Results (First Quarter)

	<u>High Results</u>	<u>No. Men</u>	<u>Per Cent.</u>
Buildings	18	43	41
Alloy	6	15	40
Furnace	6	6	100
Mechanics	4	7	60

* Includes results obtained last sampling period - 1st quarter for 1940.

* One abnormally high result omitted in calculation (36 mg).

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