

# PHILIPPINE SMELTING CO.

By

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The smelting plant of the Philippine Smelting Company is situated on the Mambulao Bay about 2 kilometers from the thriving town of Jose Pañganiban.

The present capacity of the plant is 40 tons of concentrate daily. When equipment now on the ground has been installed, this will be augmented to 120 tons daily.

Concentrates when received at the smelter are weighed on 10-ton truck scales. The loaded truck weighed in and the empty truck weighed out. Both weights are stamped on duplicate tickets. One of these tickets is retained by the smelter and the other given the representative of the shipper.

The trucks are then unloaded into concrete bedding bins of 220 tons capacity each. Ten per cent of the total bulk is taken as a sample and cut down in the customary way for a moisture and assay sample. The final sample is split into 4

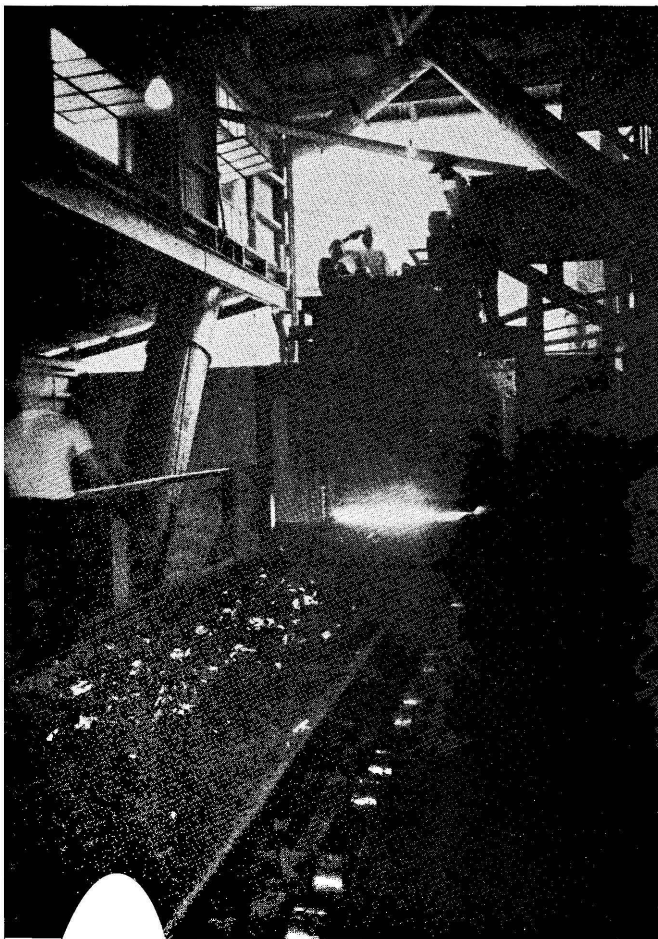
parts. The shipper and smelter receive one each, one is reserved for umpire, and one retained in case any of the other three samples are lost.

The concentrates now being treated come from the flotation plants of the San Mauricio and United Paracale mining companies and amount to about 35 tons daily. October figures showed these concentrates to contain the following analysis:

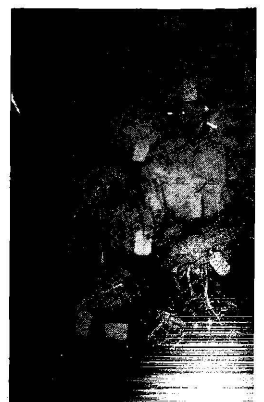
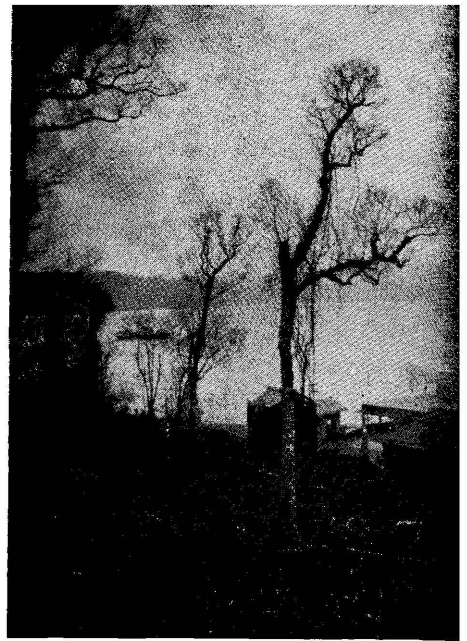
	<i>San Mauricio</i>	<i>United Paracale</i>
Au ozs. per ton	3.14	4.26
Ag " " "	9.40	10.90
Cu %	3.50	6.26
Fe %	31.10	34.30
Zn %	7.40	2.80
Pb %	5.70	2.00
S %	38.90	39.80
Insoluble %	10.30	9.70

The concrete bedding bins have a slotted opening in the bottom over a 24" conveyor belt. When a bed is complete, it is given a lot number and the dry weight and values calculated. It is then ready to be conveyed to the charging bins in the smelter building.

The concentrates are mixed with the required fluxes and conveyed to a pug



*Sintering  
Plant*





lica, lime, slag, and other ingredients which might be required to make a liquid and free flowing slag.

Alternate layers of coke and charge material are added to the blast furnace as required.

Ten ounces of air furnished by a Connersville Roots blower is blown through the charge to supply the necessary oxygen for the combustion of the coke and the reduction of sulphur.

The charge melts and flows continuously from the furnace into a brick lined settler where the matte and slag separate. The matte is tapped from the bottom of the settler into matte moulds and the slag overflows the top of the settler into portable slag pots and sent to the slag dump.

The approximate analysis of the slag and matte are as follows:

	<i>Slag</i>	<i>Matte</i>
Ozs. Au per ton	0.05	30.00
Ozs. Ag " "	0.65	70.00
% Cu	0.35	35.00
% Fe	35.00	31.00
% CaO	10.50	....
% Insol.	32.00	....
% S	.40	26.70
% Other base metals	no assay	7.00

The object of smelting locally is to convert a large tonnage of concentrates into a small bulk of matte, thereby saving sacking, transportation and treatment charges on a large tonnage of valueless material.

The ratio of concentration at the smelter all depends on the grade of material received. At present the smelter is limited to shipping a matte which

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mill where they are thoroughly mixed before being charged to the Dwight Lloyd sintering machine.

The work of the sintering machine is two-fold: First to roast out the excess sulphur and second to fuse the concentrates and fluxes together into a clinker which is called sinter. The amount of sulphur burnt off controls the ultimate grade of the matte produced. The charge goes onto the sintering machines with about 24% sulphur and the resulting sinter contains approximately 6% sulphur, or, a sulphur elimination of 75%. The sinter contains the approximate partial analysis:

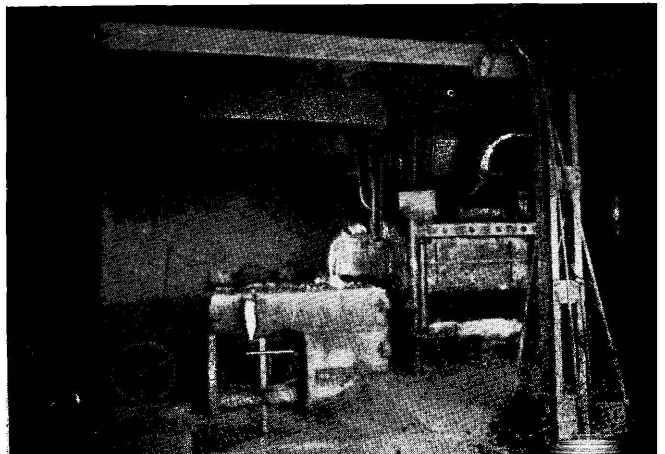
Au ozs. per ton	5.10
Ag " " "	9.50
Cu %	4.50
FeO %	41.00
CaO %	4.00
S %	6.00
Insol. %	28.00
Zn %	3.50
Pb %	3.00

The sinter cake is broken up into pieces ranging from 1 to 4 inches in diameter and fed to a Mace Company No. 4 blast furnace along with any si-



*Matte  
Ready  
For Shipment*

*Blast  
Furnace*



his way of thinking Harvard by necessity must remain young and changeless, always filled with young men, with young ideas and aspirations, with young brains, with young gaiety, and he wanted to saturate himself once more with the feeling of the untrammelled vigor of youth that he believed to be Harvard's essence. And so he had come.

I saw him at the Tercentenary. At the meeting of the Associated Harvard Clubs he carried the banner of the Harvard Club of Manila. He sat out all of the rainy morning of September 18. He dined with his class. It was hard work for him to do all this, yet, when later I reproached him for having done

more than was good for his health, he reminded me that the occasion was Harvard's Tercentenary and that he was a Harvard alumnus. There seemed nothing more to be said.

He left this country shortly afterwards, as quietly and unpretentiously as he came. He went to Barbados in search of a gentle climate. His death there has just been reported. I am sure that until the end he continued to think happily of Harvard, of Harvard's future, of his classmates, of the Yard, of the Tercentenary, of Harvard's vigor, of all the beacons of Harvard that on occasion had helped him to find his bearings. He was a valuable graduate. For he had Harvard Spirit.

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### VIBRO PILE... *(Continued from page 10)*

outlet of the tube a pressure exceeding the earth pressure acting on any part of the fresh concrete, as the tube has to be withdrawn when the concrete is deposited.

The cast-in-situ system of pile driving supplies this means most effectively and the VIBRO system has been developed to include almost all types of piled foundation work in the most efficient manner. In the VIBRO system a plain steel tube with a cast iron shoe is driven into the ground for the required depth or until the necessary set is obtained. Suitable reinforcement if required is then placed in position in the tube and the concrete poured. The tube is then extracted by means of a series of upward and downward blows of the steam hammer which while consolidating the concrete of the pile forces it into intimate contact with the surrounding strata and this close contact between the rough surface of the pile and the ground develops the skin friction of the pile to the greatest possible extent.

Cast-in-situ concrete piles have overcome almost all the difficulties and dangers of timber or pre-cast pile driving. There is no handling of the piles, such as transporting them to the site, and work can be started immediately a contract is arranged; no waiting for timber piles to arrive from the suppliers or concrete to set. Cast-in-situ piles can be driven to any length and can be cut off at ground level or at any level below ground level. They can be reenforced or be without reenforcement according to the work they are required for. There is no waste of materials and what is very important in all pile driving operations there is no danger of damaging the pile during driving as all driving stresses are taken by the steel VIBRO tube. The VIBRO cast-in-situ system of making concrete piles is the most up to date development in pile driving and can be employed efficiently in foundations of almost any type no matter how poor the ground.

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### PHILIPPINE SMELTING COMPANY

does not contain over 40% Copper. In which case a ratio of 8 to 1 is obtained from a concentrate carrying 5% Copper.

In the blast furnace section adequate dust settling chambers with a 60-foot steel stack 54" in diameter is provided to take care of the fumes.

The sintering machines are also

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equipped with a dust collecting chamber, but has a steel stack 100 feet high to carry off the sulphur fumes.

At present, as a by-product, the smelter is making a small amount of lead bullion high in gold and silver. This is shipped to the lead smelter at Selby, California,