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Two Monthly Production Records in October

New high monthly output records featured the October operations of the Marsman gold producers. San Mauricio, with a production of ₱440,168.51 from 9,332 tons of ore treated, was up ₱62,000 over the previous record established in September. United Paracale produced ₱227,362 to pass the mark set in July by a small margin.

Total production from the four lode and two placer operations amounted to ₱1,302,605.75 from the treatment of 58,143 tons of ore and the handling of 394,561 cubic yards of gravel. The total output was a gain of around ₱110,000 over the September figure.

SAN MAURICIO MINING COMPANY

San Mauricio produced ₱440,168.51 during October, from the treatment of 9,332 tons of ore, to set another new all-time monthly record, which was ₱62,000 higher than the previous record set in September. Average recovery was ₱47.17 per ton, while extraction was 93.59%.

Development footage totalled 1,358, of which 949 feet were capital and 409 feet operating development. Of the capital advance 327 feet were in ore, as were 204 feet of the operating advance. Ore values were much higher than average in the Tacoma Section.

Tacoma No. 3 north drift on the 300 level was advanced 77 feet in good ore over a width of 18 inches. Tacoma No. 1, 1180 north drift was advanced 50 feet over a width of 14 inches, also in high values. Tacoma No. 3 drift on the 400 level showed an advance of 146 feet with high assays over a width of 58 inches. The 1600 north crosscut east on the 500 level was advanced 22 feet; it is being driven to cut the Tacoma section on this level.

In the Santa Ana mine, the Santa Ana vein was cut on the 425 level. The north drift on the 425 level was advanced 9 feet in ore over a width of 66 inches.

General stoping operations were normal during the month, with all stopes in good condition. The mine continues to be in good shape with plenty of ore available.

A 500-gallon soda ash regenerating unit was installed at the power plant, for treating lubricating oil, and was put into operation. A steam unit was designed for this process, utilizing the waste heat from the engines, and is functioning satisfactorily.

Operating expenditures for October show a considerable reduction compared with the previous month.

UNITED PARACALE MINING COMPANY

Another new all-time high monthly production record was made by the United Paracale Mining Company in October with a production of ₱227,362.-79 from the treatment of 9,704 tons of ore. The previous record was ₱226,539, the output for July. Recovery for October was ₱23.43, and extraction was 90.85%.

During the month 1,461 feet of work were completed. Of the 964 feet of capital advance 83 feet were in ore, as were 245 feet of the 497 feet of operating advance. General development results were excellent, with better than average values showing.

On the Baluarte 400 level, 301 drift north was advanced 70 feet along the vein 3.3 feet wide with high values. 201 drift south, Longos 200 level was advanced 43 feet in ore. At this point crosscuts were run to the west and east for distances of 16 feet and 33 feet respectively. The west crosscut reached the peridotite contact, and at this contact 3 feet of the vein showed high assays.

Mill operations continued to be normal and satisfactory during the month.

The monsoon changed to the northeast during the early part of the month, after which generally unsettled weather with numerous showers was experienced.

SUYOC CONSOLIDATED MINING COMPANY

Suyoc Consolidated produced ₱150,-254.61 in October, from 6,627 tons of ore treated. Recovery per ton was ₱22.67, and extraction was 84.91%.

Development advance amounted to 1,589 feet, of which 994 feet were in capital and 595 feet in operating development. Of the capital advance 105 feet were in ore.

No. 1 shaft was sunk 41 feet during the month, and seems to be reaching more favorable ground.

Operations were resumed in 16154 drift after temporary suspension to investigate the east and west walls, and 77 feet of advance were made in this face on ore carrying good values over a width of 5.3 feet.

Capital investments were maintained at a minimum, the two major items being the purchase of a monorail electric hoist for the Moore filters at the mill, and current underground equipment.

Operating conditions in general continued to be normal.

COCO GROVE, INC.

The Coco Grove production for October, ₱95,102.50 from 345,740 cubic yards dredged, was slightly in excess of the estimate based on the low-grade ground being worked according to plan. Both dredges are now approaching ground of a higher value, and an increase in production is expected accordingly.

The dredger Mary Angus handled 166,690 cubic yards of gravel from which ₱48,138.33 was produced. The area dredged was 75,960 square feet, to an average depth of 59.3 feet.

The dredger Anne Petronella recovered ₱46,964.17 from 179,050 cubic yards of gravel handled. It dredged an area of 77,345 square feet to an average depth of 62.5 feet.

In general both dredges had smooth operation; weather was fair, during the month.

ITOGON MINING COMPANY

During October Itogon treated 32,480 tons of ore from which ₱371,043.56 was produced, a substantial gain over the last three months. Recovery per ton was ₱11.42 while extraction was 85.93%.

Development advance was 4,016 feet, 2,147 feet of capital and 1,869 feet of operating. Of the capital development 323 feet were in ore, as were 898 feet of the operating advance.

Two new raises have been started in good ore on the Taka vein. On the 3 level in this section of the mine the west drift was advanced through the old drift, and good values were encountered in the old fill, which is considered encouraging. 4B stope has produced some good ore; nothing but virgin ground has been mined in this section.

The 21 raise was driven vertically from the main counter drive until it intersected the Taka Vein. The fill gave a good average through this section and the raise was continued through the old fill to the 3 level.

In the Idol section, stoping is now under way on the 100 level. On the 200 level the east drift connected with the east 312 raise and is being driven to the east.

The 523 winze in the Sesame section was advanced 31 feet during October and is now about 120 feet below the 500 level. 875 level, 23 raise, was advanced 85 feet during the month; connection with the winze is expected by the first of December.

The 96 vein crosscut was advanced 226 feet in October, and has been turned to intersect the N 45 W branch of the 96 vein. The N 70 E branch of this vein was intersected by the crosscut during October, and a wide mineralized zone was encountered having commercial possibilities. Drifting on this feature will be started later.

By Ralph Keeler

SALTING[1]

It often happens that Mother Nature is not as generous in her distribution of minerals as the owners of mining properties would like; in such cases unscrupulous promoters often attempt to help the situation by "salting" the prospect or the mine.

"Salting" as the term is used in mining is, in effect "sweetening"; that is, the deliberate placing of gold, silver, or high grade ore in a mine or in samples to give a false impression of the value of the property. It has probably been going on over since the first gold mine was found, since there has always been, and probably always will be, a certain number of crooks hanging about the mining industry.

Crooked promotion and salting go hand in hand in the misrepresentation of mines. Both are criminal, and are punishable in the United States, the penitentiary being the maximum penalty in some of the mining states, and heavy fines in others.

It therefore becomes necessary for the examining engineer to keep a cautionary thought in the back of his head all of the time on each and every assignment to the effect that he is always open to salting, and that he should take every care to prevent it. The engineer can not relax his vigilance on the sealing or boxing or locking of his samples in preparation for the assayer. Not until the final calculations have been made, and the results carefully checked for inconsistencies, can the engineer consider his job done.

The basis of an engineer's detection of salting is on the principle of inconsistency of results. If for example, scratched flakes of placer gold are found in a sample from a lode mine, the engineer can be sure that Mother Nature had considerable help in putting them there (a case of this type happened in the Baguio district, a few years ago). If gold is found in a region where the geologic structure and general indications point to the impossibility of such a discovery, the engineer would do well to recheck his samples (this inconsistency was prominent in the imaginary "Bicol gold field" some two years ago). When several distinct types of diamonds, rubies, garnets, sapphires, emeralds, and amethysts are presumably "found" on a property, (an association practically impossible in Nature) the engineer would do well to investigate the promoters—such an example was the Great Diamond Hoax perpetrated in the United States in *1872.*

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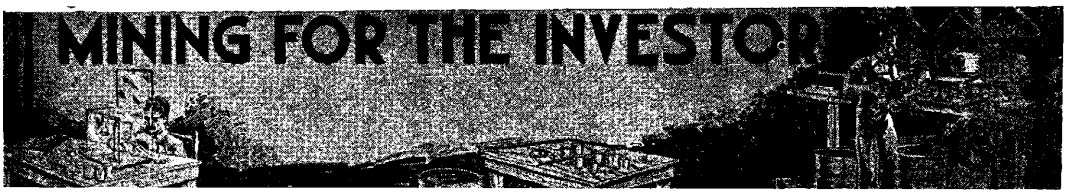
[1] This chapter was prepared with the cooperation of Professor V. V. Clark, head of the Mining Department, University of the Philippines.



There are many different ways of salting samples. Gold filings may be surreptitiously added to the samples themselves. Gold dust may be fired from a shotgun into the face to be sampled, or it may be included in a dynamite charge before a face is broken down. The engineer must watch lest gold chloride be injected into his samples with a hypodermic syringe. Amalgam may be dropped into the sample box. Holes may be bored in wooden or steel sample containers, and gold introduced. Gold solution may be sprayed over open samples. Some of the favorite tricks of the old-time salters were the use of a cigarette in which gold had been inserted, the ash being flicked into the sample; chewing tobacco loaded with gold particles which a clever spitter could adroitly place in the sample; pipe tobacco salted, and then spilled carelessly over the samples; home-made candy salted, and more clever spitting; particles of gold in the beard or mustache, and a few shakes or scratches at proper intervals; gold dust under the finger nails, to be dusted over the sample when the engineer wasn't looking; gold dust in the nostril and a timely sneeze over the sample; high grade concealed in the clothes for judicious distribution; gold dust in sandwiches or other food, to be added to the sample box during the lunch hour when quartering is unfinished. All of these methods, and many more have been used; millions of dollars have been stolen as a result of such salting.

If a silver property is under examination, the materials used for salting may be silver filings, silver nitrate in powder or solution, all applied as in gold salting. If a copper property is under examination, then copper filings, powdered chalcopyrite (sulphide of copper and iron), copper sulphate either powdered or in solution, may be used as described above. This applies particularly to drilling large disseminated low grade copper deposits.

Lead or zinc salting is not so common as in the case of the precious metals, for the main reason that their percentage in ore can be guessed quite easily by the experienced engineer if in commercial quantities.

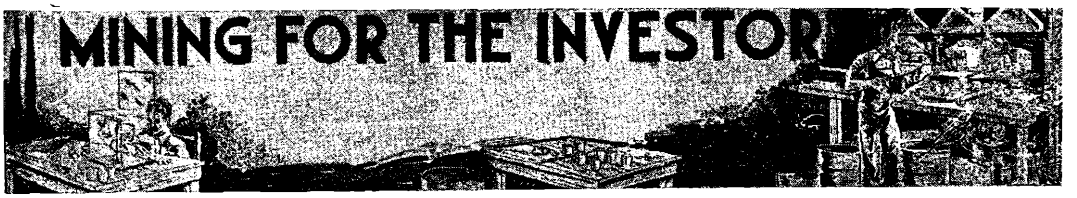
V. V. Clark, an examining mining engineer of long experience says: "Mercury salting has come under my observation only once on a mercury mine examination. It was so clumsily done that the mercury flask was found in the brush near the sluice box. It was used the night before and afforded unmistakable evidence as to the source of the large and inconsistent accumulation of free mercury in the sluice box.

"Nor has salting placer platinum ever come to my attention, either in literature or in my own practice.

"In the Philippines two new methods of placer salting came into my personal experience. On one property which was under a ₱200,000 option, I had a strong suspicion that the samples were being salted, but was unable at first to detect the source or the method. Two women were employed as panners to recover the gold values. Since the results continued to show inconsistencies, it was decided to bring in an independent drill crew and panner, of known reliability, to check the work of the two women panners. Consistency in the new crew's work at once appeared. Then the women panners were replaced by the new crew; consistency took the place of the former suspicious results. This concentrated suspicion on the women panners, but still the method had not been disclosed.

"Finally one of the women panners became conscience stricken and confessed: These people scratched a great deal. A small pocket almost invisible was sewn on the ladies blouse near the shoulder—within this was hung a small sack containing gold dust.

"When a doelang (or batea) of gra-



vel was being washed down to the concentrate, and with fingers wet, the lady would have to scratch, a finger found its way inside the slit, gold adhered to finger, and on resuming the panning operation the adhering salt was washed into the concentrates. This case happened on the Islands of Luzon.

"On the island of Mindanao I employed a woman panner. She was observed to pan tramp gold from a river bed between pannings of samples from our own drilling. I carefully watched her bring this river panning and permitted her to continue until she made bold to show up a heavy gold return from barren blue clay in which gold could not occur. She was discharged forthwith.

"Her successor, another woman, was honest but slow. Then we put our proven panner on the job. In the course of time an inconsistency developed; we watched the drillers and soon furtive glances from a native working on the dump box gave a clew. Finally he made bold to throw into the box a No. 3 colour, (weighing about 16 mgr.) which in a short time came, to the panner. On examining this colour under a glass it had one edge turned over and showed a hammer mark on top, and an anvil mark on the under side of the colour. This man was also discharged.

"Thereupon the work continued to the conclusion without further attempts to salt. But at the end of the campaign it was proved, by checking the previous driller's holes, that his samples had been consistently salted without his knowing it, throughout preliminary drilling of the same tract.

"All of which goes to prove that an engineer must be up on his toes all of the time with respect to anticipating salting from most innocent sources, and from assistants and laborers picked up locally. It is frequently imperative to use local laborers for drilling and other rough work for underground lode work or placer in connection with sampling operation, but other arrrangements should be made if possible.

"In the latter case the best safeguard is to have a number of trusted and tried assistants brought from headquarters. They can be detailed to watch sampling, the sample sacks, boxes, trunks, or whatever kind of container is used for carrying samples from the mine to assay office, watching in relays, and never allowing the samples to be out of their sight.

"And even then vigilance must not be relaxed. If it is a custom assay office the fluxes must be examined and assayed, and an assistant must watch the crushing and reduction operations, and see the whole process through even to the weighing. Reject samples must be replaced in their respective sacks, properly numbered, sealed, and boxed, with a view to reassaying if inconsistencies appear in the results.

"And that is where the "Law of Inconsistency" plays its part. Where inconsistencies appear run them to earth immediately, and do not rest until they are cleared up, or fraud is proved. It might require a trip back to the mine, to obtain conclusive evidence. But in this connection dummy samples and duplicate samples, not consecutively numbered, but bearing a code number, are frequently useful in throwing a salter off the track.

"Moreover, no matter how clever a salter is, it is impossible for him to be consistent in the amount of salt applied to check samples, as the bulk and weight of samples vary considerably. And that is where the law of Inconsistency shows up the "salter" every time.

"One of the best salting stories that ever came to my ears, was told to me by an American engineer who was commissioned to examine an alleged rich placer mine in Alaska. This engineer took a well known assistant engineer with him from the States. On arriving at the property, which was in a remote district, he found the owners (three partners) on the ground await-

ing his arrival. It was a hydraulic gravel mine, extensively worked. The Engineer and his assistant began sampling the banks and soon discovered that gold salt had been shot into all of them.

"Without disclosing their discovery to the owners, they continued their work, using the recovered gold salt over and over again in such a clever way to indicate to the owners that they were obtaining phenomenal values. The owners became excited, and finally offered to buy back the option at a high premium. The deal was made, the engineers got out of the district before the owners discovered the hoax and they never told that they had been beaten at their own game.

(To be continued)

MINDANAO MINING COMPANY

Operations are progressing satisfactorily, and the October production of ₱18,674.00 was the highest so far accomplished. The area dredged in recent months is in the upper section of the claims and the size of the boulders encountered made digging unusually difficult. The dredge and dragline are now working in easier ground which should result in increased yardage handled.

Several improvements have been effected in the dumping hopper and tailings stacker which will give greater capacity and facilitate operations considerably. The R.D.8 tractor recently purchased is being used for stripping the areas ahead of dredging, thereby allowing the dragline almost continuous operation on pay gravel.

Frank Dale, superintendent, has an excellent record in dragline operations in the United States and is being assisted by experienced operators, so that with the changes in dredge design and correction of mechanical difficulties which have been experienced in the past, it is indicated that improved production can be anticipated.

PHILIPPINE SMELTING COMPANY

The Cottrell plant went into operation on the 15th of October and is operating satisfactorily. A few adjustments and alterations are necessary to suit the local conditions and this plant will no doubt decrease the dust losses by better than 90%.

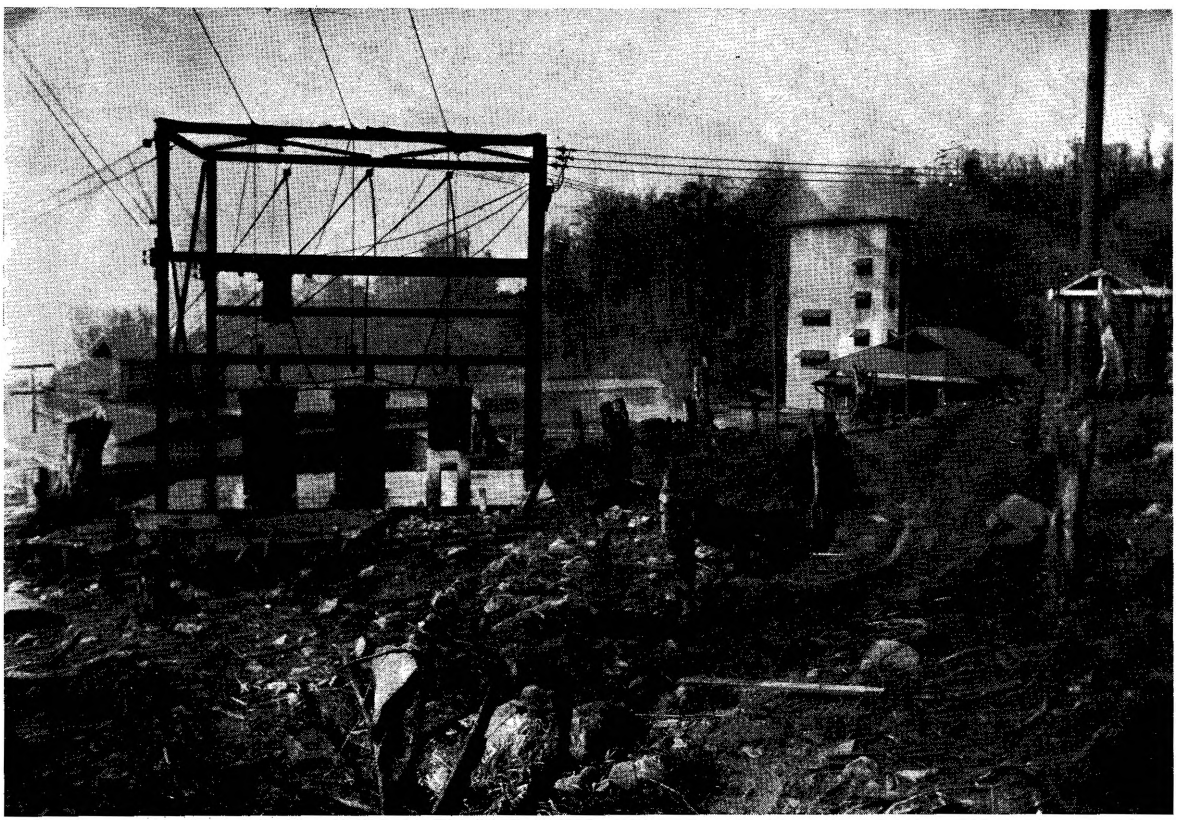
The blast furnace was down the first seven days of the month as everything on hand had been cleaned up. This time was utilized in making repairs and cleaning flues.

1684.16 tons of material was smelted, of which 1119.64 tons were concentrates.

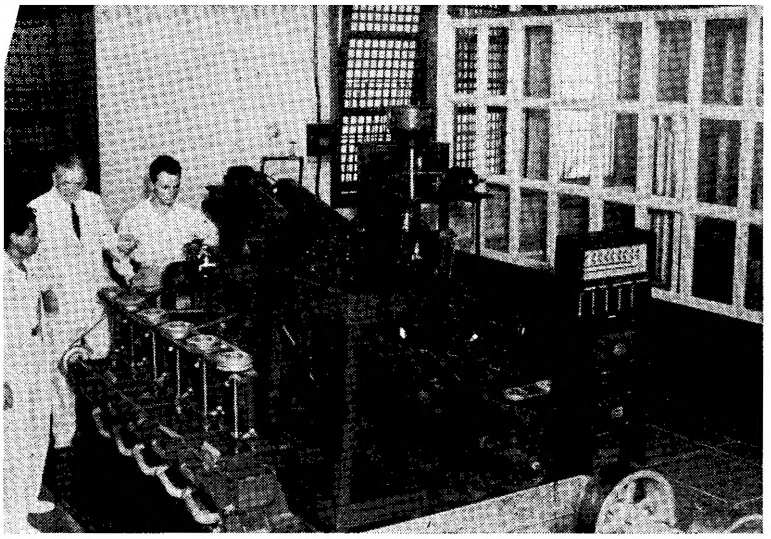
54.718 tons of smelter products were shipped to the refinery which contained 5980.2 ozs. Au, 10,554 ozs. Ag., and 45,613 lbs. Cu.

The ratio of concentration was 20.5 tons of concentrates to 1 ton of smelter products. This is the best figure obtained to date.

NEW COTTRELL PLANT OF THE PHILIPPINE SMELTING CO.



The new Cottrell plant at the Philippine Smelting Company's operation in Mambulao. By the use of this unit, the smoke nuisance will be practically eliminated.

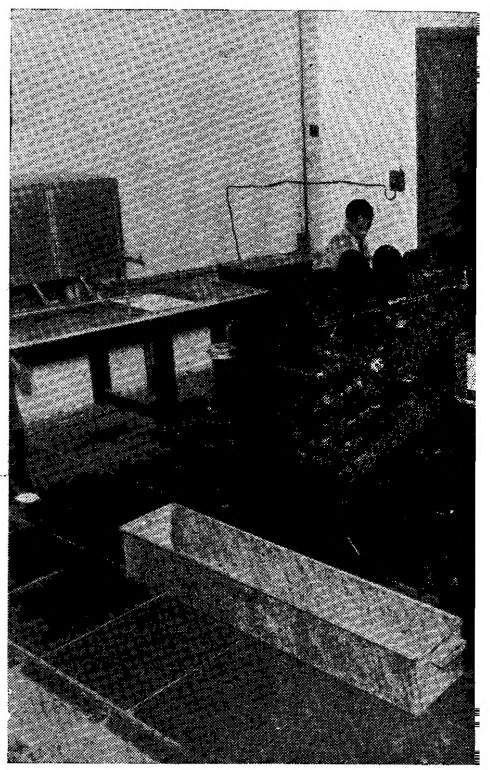


Professor V. V. Clark, head of the mining department of the University of the Philippines, explains the flotation cells to two of his students.

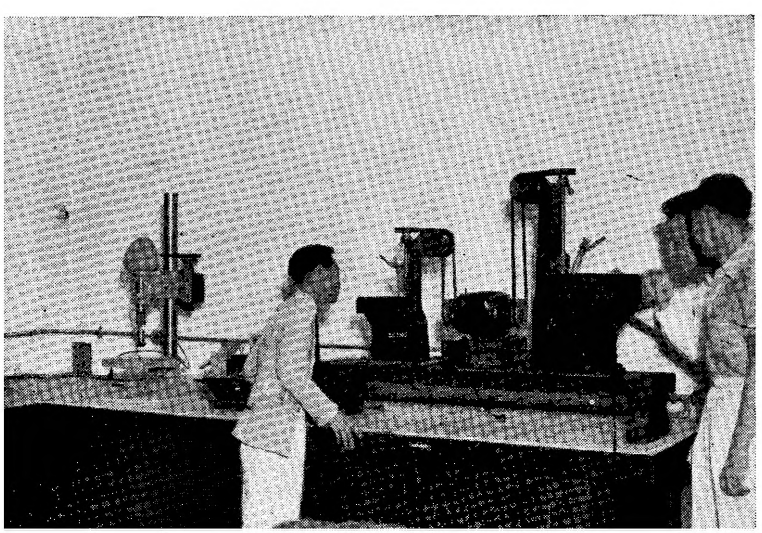
NEW UNIVERSI

Students of mining engineering at the University of the Philippines now have access to the most modern milling machinery and equipment, with the completion a short time ago of the installation of the new metallurgical laboratory by Marsman Trading Corporation.

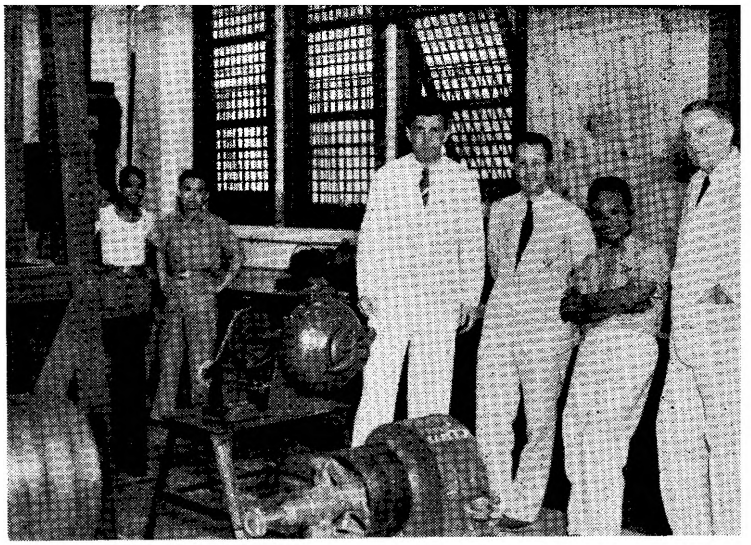
A flotation plant continuous laboratory (top) is the chief piece of equipment with which the U.P. students will pursue their studies. This plant has a capacity of 50 to 200 pounds of ore per hour. It can be used for research in ore dressing, particularly flotation, and as a miniature mill for experimental work where different combinations of reagents, rates of grinding, and changes in flowsheet can be studied accurately.



Front view of the new installa fier, and motors.



Laboratory flotation cells, Sub-A Fahrenwald type. These will be used to supplement the work of the main unit.



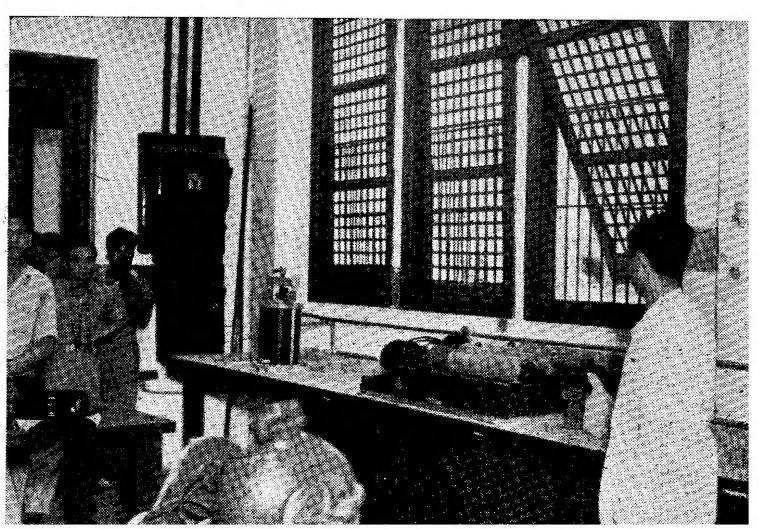
Left to right, Seton Foley, sales engineer for Marsman Trading Corporation; David Minton, instructor in metallurgy at the University; Professor Angeles, head of the mechanical engineering department of the U. P.; and Professor V. V. Clark.

'Y LABORATORY

on, showing the switch board, classi-

This unit, supplied by the Denver Fire Clay Company of Denver, Colorado, through Marsman Trading Corporation, consists of a steel ore bin, adjustable gate; belt ore feeder, reducer drive; 12-inch by 12-inch ball mill; 6-inch classifier, rotary type; vertical centrifugal pump; conditioner (agitator); 6-cell Sub-A Fahrenwald flotation machine; wet reagent feeder; 6-inch dry reagent feeder. The framework is of steel, bolted construction, and with wood flooring. The machines are of all-metal design with individual motor v-rope drives.

The University of the Philippines now has the best-equipped ore dressing laboratory in the Philippines. The mining students do their assaying in the Marsman Laboratory, presented to the University in 1936 by Mr. Marsman.



Laboratory ball mill and DFC pulverizer, to be used by the U.P. students in their metallurgical studies.

Mill Construction At Tuba Well Advanced

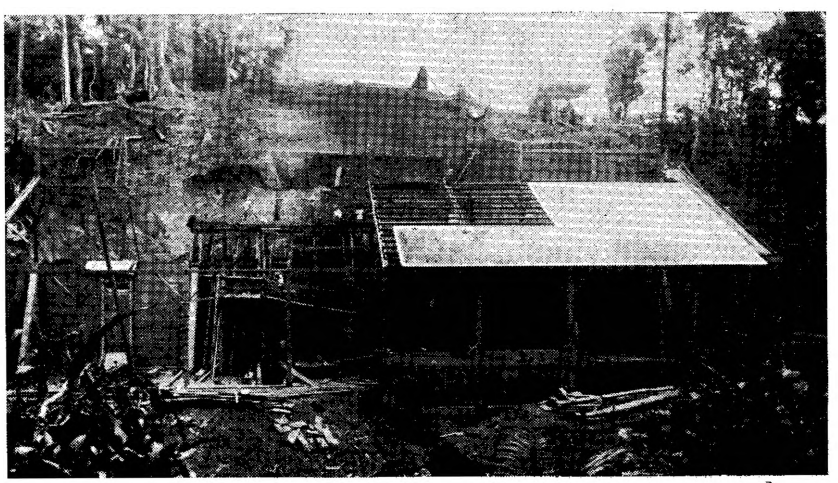
Construction work on the Tuba project in the Paracale district is well under way, and the plant will go into operation sometime in January, 1939.

The mill will be an all-slime cyanide plant with the exception that some free gold will be removed in the grinding circuit by the use of simple hydraulic gold traps.

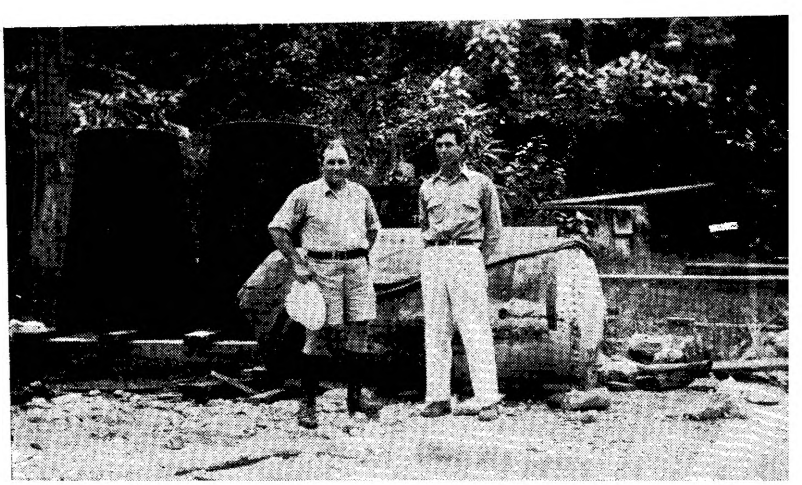
The capacity of the pilot plant will be 50 tons daily. Through this plant will be run the large accumulation of ore derived from development work. At present the mine is in a position to furnish the mill with 50 tons of ore daily; as development work progresses and more ore is exposed, additional units will be added as required.

The ore will be trammed from the main shaft to an inclined hoist which will deliver the ore to the mill bin. At the bin the ore will be dumped over a grizzly spaced at 2-1/2 inches. The oversize will go to a wheeling jaw crusher and be reduced to one inch size. The undersize from the grizzly will be conveyed to a trommel washer. The washer oversize will go to the crusher and the undersize to the Akins high weir type classifier which will also handle the circulating ball mill load.

From the fine ore bin the crushed ore will be fed to an Eimco 5′ x 4′ grate discharge ball mill. Hydraulic gold traps



The Tuba mill building takes shape.



C. A. Weekley, left, head of he metallurgical department of Marsman & Company, and L. H. Hinckley, general superintendent of the Tuba project.

will be placed between the ball mill discharge and the classifier to remove a concentrate rich in coarse free gold. This material will be tabled, amalgamated, retorted, and smelted along with the precipitate from the cyanide plant.

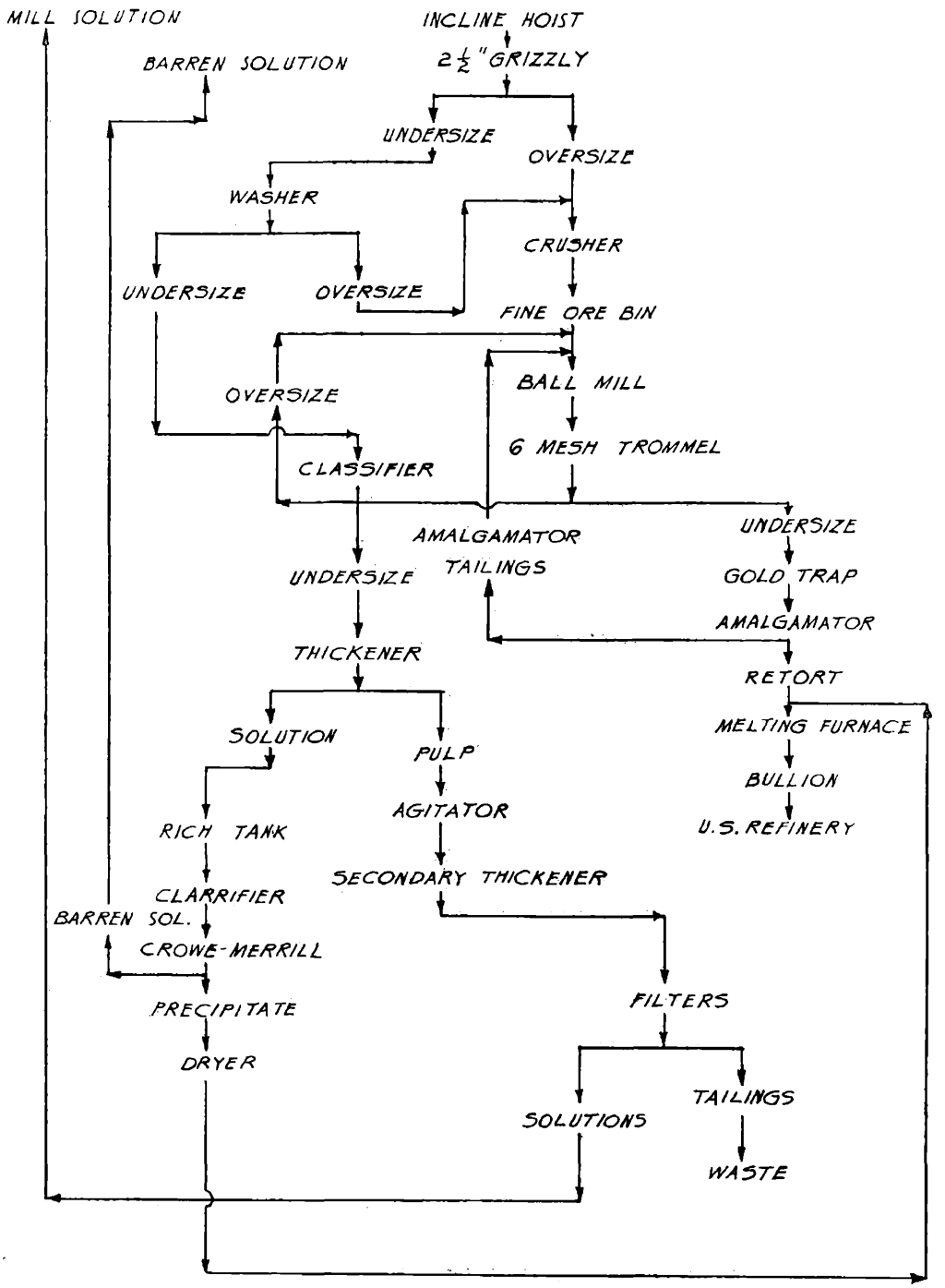
Dorr type agitators and thickeners of sufficient capacity are provided to give the required contact time for the economical dissolution of the values. From the final thickener the pulp will be filtered and washed with barren solution and water before discarding to waste.

Test work on the mine run ore indicates that a recovery of 90% or better can be expected. No elements detrimental to cyanidation have been encountered in the ore and no trouble from this source is anticipated.

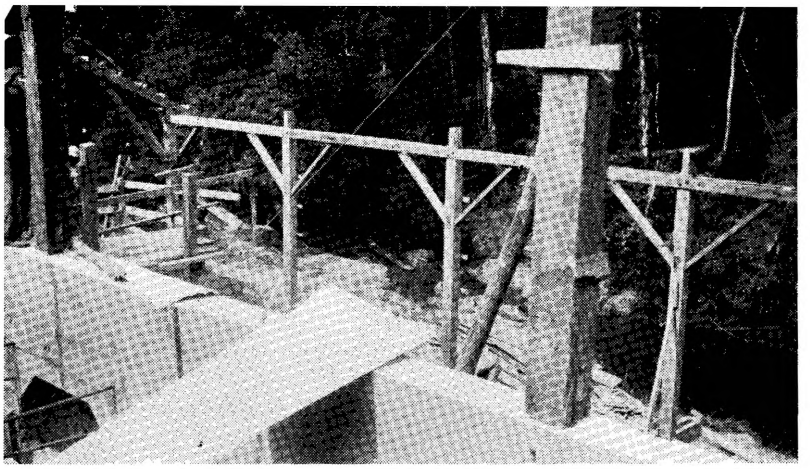
The Crowe-Merrill precipitation system will be used and the clean-up melted in a DFC tilting furnace.

L. H. Hinckley is in charge of the property and is supervising the construction work at the mill site as well as the mine development.

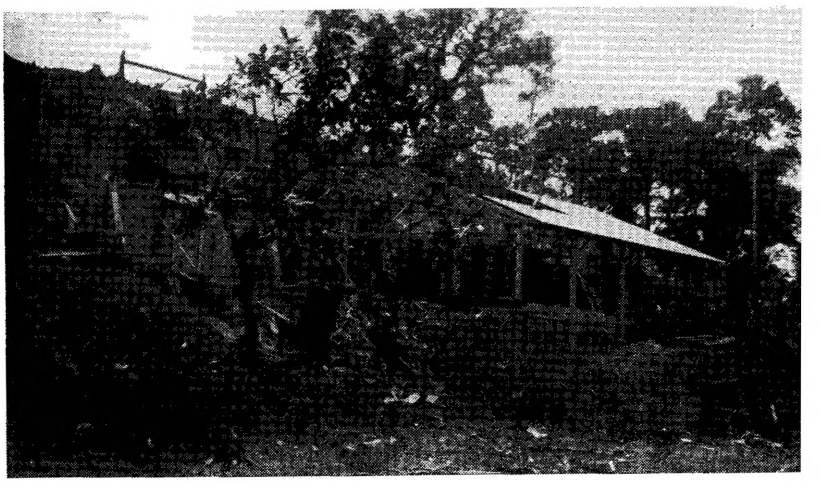
Testing of the ore and the designing of the mill were done by the metallurgical department of Marsman & Company, with C. A. Weekley in charge and H. G. Iverson as assistant.

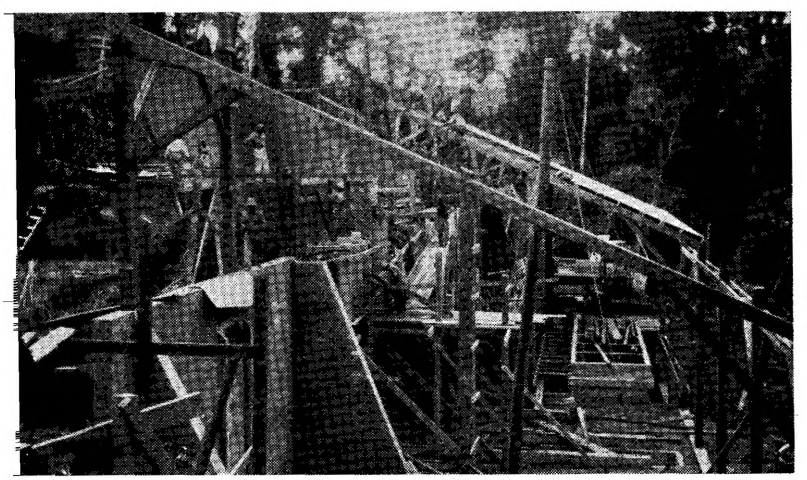


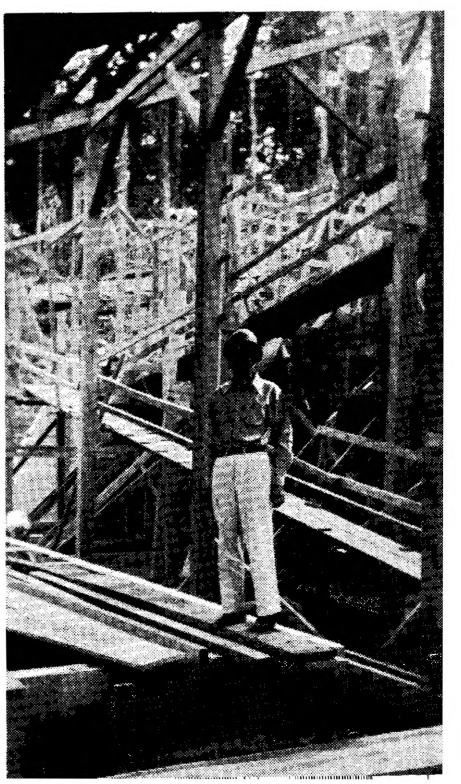
FLOW SHEET
TUBA MILL



The illustrations on this page show various stages of construction of the new Tuba mill, which will be the fifth milling plant to be put into operation in the Philippines by Marsman & Company.

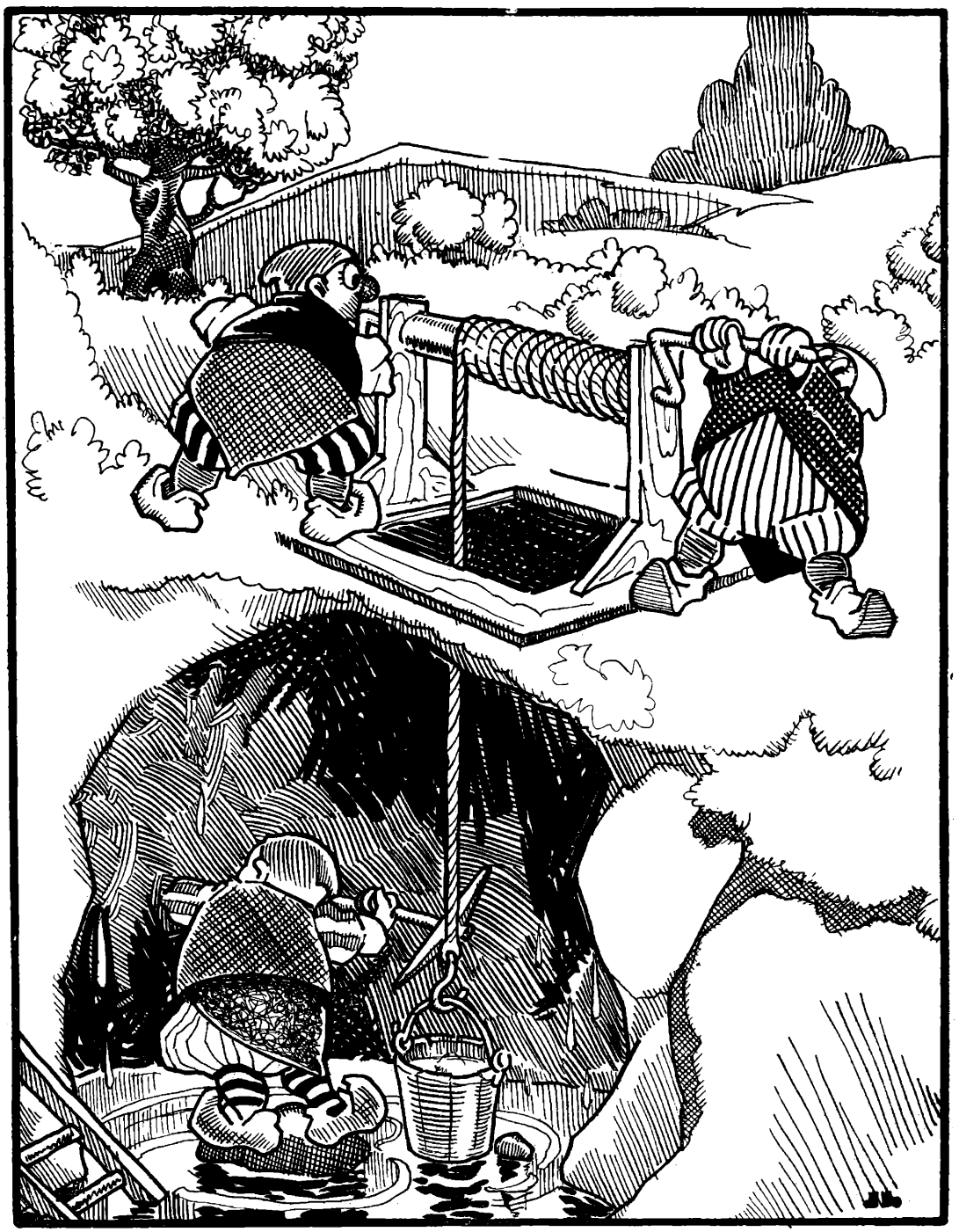






MYSTERIES OF MINING

This is the eleventh in a series of features describing various interesting phases of mining and the mining industry.



Primitive power consisted chiefly of elbow-grease, as this illustration (adapted from De Re Metallica). The need for power to dewater mines was one of the factors which brought about the development of steam power and, later, modern Diesel engines.

POWER

One of the most important contributions of the mining industry to the world has been the development of mechanical means for generating power. As soon as the early miners started to dig deep into the earth in their search for valuable minerals, they discovered that surface and underground waters seeping into their workings interfered seriously with their work. An English engineer, Captain Savery, patented a coal engine in 1698 which was used to pump water from the tin mines of Cornwall. From that simple beginning the development of power engines has been tremendous.

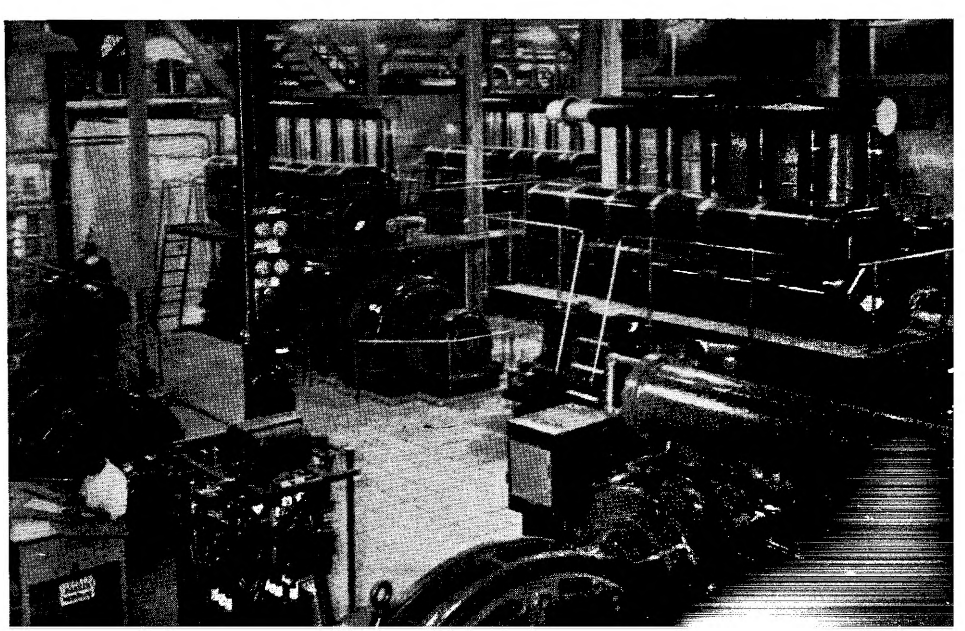
But what is "power", anyway? The engineer would define it as energy under human control and available for doing mechanical work. For the layman, power may be defined as the rate of doing work. The common unit for work is the "horse-power", which was defined by James Watts in 1783 as the equivalent of 33,000 ft. lb. of work per minute. This is about ten times as much work as can be done per minute by a laborer working eight hours per day.

There are five principal sources of power. The muscular energy of men and animals was the first to be used, and is still very essential; the coolies of China and the carabaos of the Philippines are good examples. The kinetic energy of the winds and streams is used to propel sail boats. The potential energy of water at high levels, of the tides, and of waves, is useful in the generation of water power and in the transmission of water and other liquids over long distances. The heat of the earth and of the sun are a tremendous, but comparatively uncontrolled source of power; volcanic power or natural steam has been used in Italy.

Heat derived from the combustion of fuels is the most common source of power. The first locomotives received their power from the burning of wood in steam boilers. Then came the introduction of coal, and soon coal boilers were providing steam for power and heat. Petroleum, with its many derivatives has become the modern source of power. Gasoline engines give remarkable speeds to airplanes, automobiles, boats, and trains. Fuel oil has revolutionized marine power; today most of the ocean liners and huge freighters have oil engines.

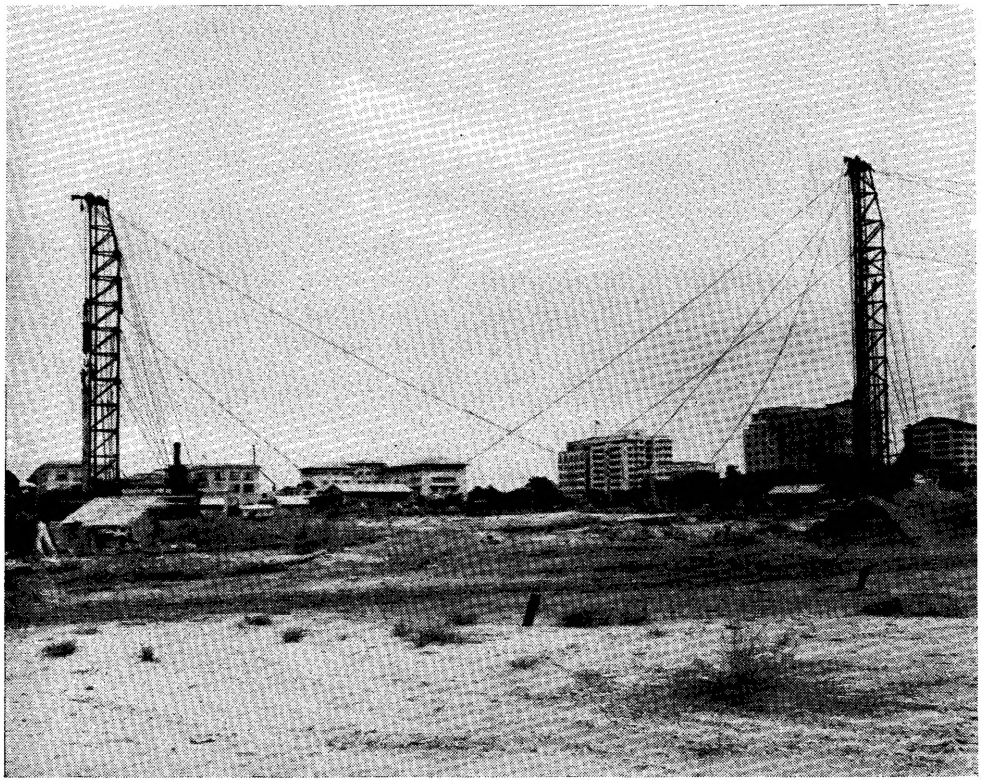
The mining industry, of course, has benefitted considerably from the improvements in power machinery. Great power plants make it possible to send compressed air to the depths of the earth for drilling, to light underground workings, to haul millions of tons of ore to the surface, and to treat them economically.

Most of the mining plants of the world today receive their power from Diesel engines, which use fuel oil. The constant search for greater economy, greater efficiency, and greater compactness in power plants has reached its height in the Diesel engines of today.

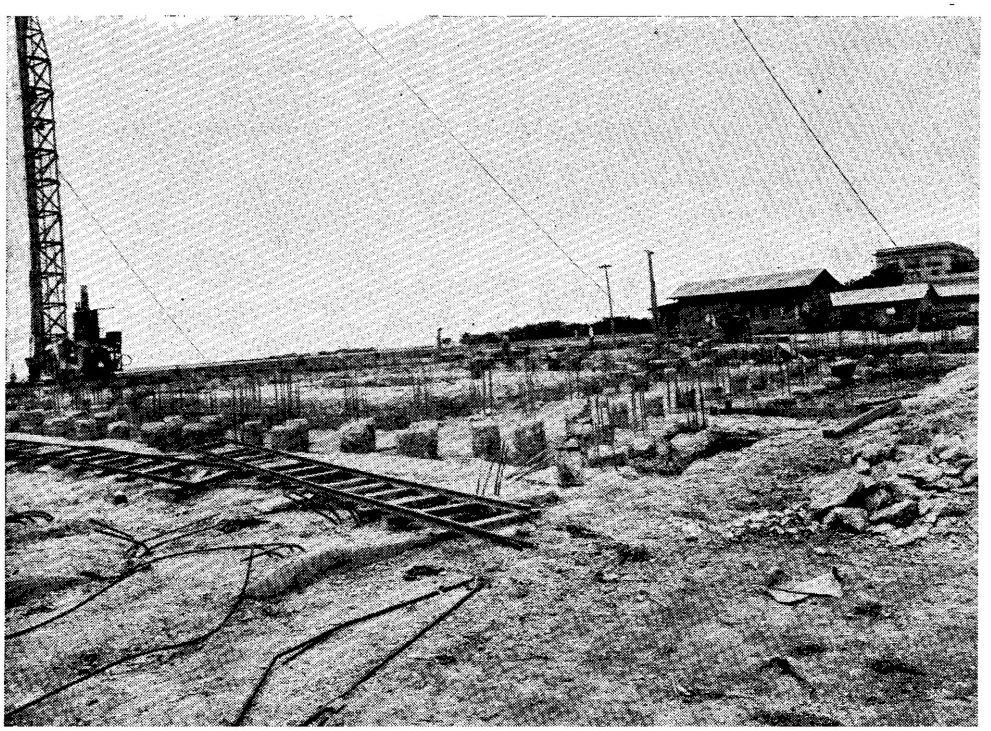


A modern Diesel engine plant. This view shows three 500 horsepower Allen Diesel engines, of the type used in the Marsman plants in the Philippines.

Good Progress on the AHC Building Project



These two Vibro pile drivers are completing the work of driving about 640 concrete piles to support the new home of the American High Commissioner on Dewey Boulevard, which is being constructed by the Marsman Building Corporation. The bottom view shows the completed piles in place. After the piles have been driven a steel and concrete foundation will be built on them.



MARSMAN AND COMPANY, INC.

Producing Mines

Name	*Location*	*Type Property*	*Plant Capacity Daily*	*General Superintendent*
Itogon Mining Company	27 km S. of Baguio	Gold Lode	1,000 tons	Warren Gilkison
Suyoc Consolidated	98 km N. of Baguio	Gold Lode	200 "	L. M. Robinson
United Paracale	Paracale, Camarines Norte, 200 km Sw of Manila	Gold Lode	300 "	R. H. Canon
San Mauricio	15 km N. of Paracale	Gold Lode	300 "	H. L. Barr
Coco Grove	Paracale	Gold Placer	13,000 cubic yards	F. A. Nowacki
Mindanao Mining Company	Zamboanga, Zamboanga	Gold Placer		Frank Dale

Properties under Development

Name	*Location*	*Type Property*	*In Charge*
Tuba Project	Tayabas	Gold Lode	L. H. Hinckley

EDITORIAL

A Parallel Growth

The Philippine mining industry has become one of the most promising markets for American mining machinery, equipment and supplies during the past few years. An increase of over 100 per cent in the shipments of mining and quarrying machinery from the United States to the Philippines during 1937 as compared to 1936 was announced by the U. S. bureau of foreign and domestic commerce in Washington recently. Imports of iron and steel and manufactures from the United State into the Islands for the first eight months of 1938 show a gain of some 50 per cent over the same period in 1937; this gain is likely to continue for some time, since the Philippine mining industry is still, comparatively speaking, in its infancy.

The local value of this trade between the two countries is more than likely to be misinterpreted, particularly since the exports from the Islands to the States have shown a decrease so far this year in comparison with 1937.

Every peso spent in machinery and equipment for a mining operation usually means the expenditure of a similar amount for transportation, con-

(Please turn to next page)

Table Of Contents

THE MARSMAN MAGAZINE

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The magazine is sent to all stockholders of Marsman managed properties and to all staff members of the companies associated with the Marsman interests.

NOTE: All ore values, bullion figures, etc., given in this magazine are expressed in pesos based on gold at $35.00 an ounce and silver at the market price. Figures given in monthly reports are based on mine assays, and may differ to some extent from final mint or smelter returns.

SUBSCRIPTION PRICE, P5 A YEAR.

RALPH KEELER, *Editor and Business Manager*

struction, erection, maintenance, and administration.

The start of a new mining camp means that much more new machinery must be imported. It also means that workmen must be engaged to operate the equipment; that houses must be built to shelter them; that food supplies must be arranged to feed them; that churches, schools, and hospitals must be constructed to care for them.

Around every new mining area a new center of population immediately springs up. As a matter of fact, the construction of villages and town comes before actual production of gold or other metals ever starts.

In the Philippines the prosperous city of Baguio, the thriving towns of Paracale and Mambulao and good-sized communities in Masbate and Surigao have added much to the well-being of the nation. Each of these communities owe their present prosperity, and their future prospects to the mining industry.

While United States trade with the Philippines in sugar machinery is now a matter of supplying repair and replacement parts, such is not the case with mining machinery. Constant improvements, frequent expansions, and new operations all over the Islands are providing a steady market for American products for use in the mining of Philippine minerals.

As this steady stream of American products comes to the Philippines, a similar steady flow of capital is going from the mining enterprises to the channels of Philippine trade. As the mining industry grows, and it may be expected to grow for many years, it becomes of more and more importance to the economic welfare of the Commonwealth.