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The Steptoe Valley Mill and Smelter

A Concentrating Mill of 4000 Tons Daily Capacity and a 1000-ton Smelter with McDougall Roasters and Three Reverberatories

BY WALTER RENTON INGALLS

These works are being built by the Steptoe Valley Smelting and Mining Company, which is owned jointly by the Nevada Consolidated Copper Company and the Cumberland-Ely Copper Company. They are situated on the McGill ranch, on the eastern side of the Steptoe valley, about 14 miles northeast of Ely. The area selected for the works is a gentle slope at the foot of the Shell Creek range, sufficiently high above the broad valley to afford an easy run for the disposal of mill tailings and furnace slag with an immense storage for both. Indeed it is unbelievable that any trouble will ever arise over that subject. The company has secured a large area of territory in the valley and thereby has doubtless guarded itself well against any smoke complaints. At present there is a little grazing in the valley, but in general the latter is too arid to be agricultural. The works will be connected with Robinson cañon by two lines of railway, viz., the main line of the Nevada Northern and the "high line" which will have better grades than could be secured when the main line was being advanced to Ely with all possible dispatch. The main line runs right through the town of Ely and a rather silly dispute on the part of the town authorities arose respecting the operation of trains, which led the railway company to construct a new line for the ore traffic which will pass to the north of the town.

The Steptoe smelter follows the plan of the Washoe smelter in having the concentrating mill and smeltery proper in close association. The ore comes into the sampling mill at the south end of the yard and thence passes to the concentrating mill, from which the concentrates go north to the smeltery. The combined plant is laid out with magnificent distances. From the southern end of the concentrator to the northern end of the smelter the distance is about a mile. Midway between those extreme points, but west or down-hill from the line connecting them, are situated the administration buildings. At present these are rather far both from the smelter and the concentrator, but it is planned that extensions of the smelter will be made to the south and of the concentrator to the north; and it is contemplated that at some time the two departments will approach closely together. This, of course, will depend upon the developments in the mines. The works now under construction will have capacity for the treatment of 4000 tons of crude ore per day. The relation which this bears to the developed reserves of the mines has been discussed in a previous article.

ADMINISTRATION BUILDINGS

GENERAL OFFICES

The Concentrating Mill

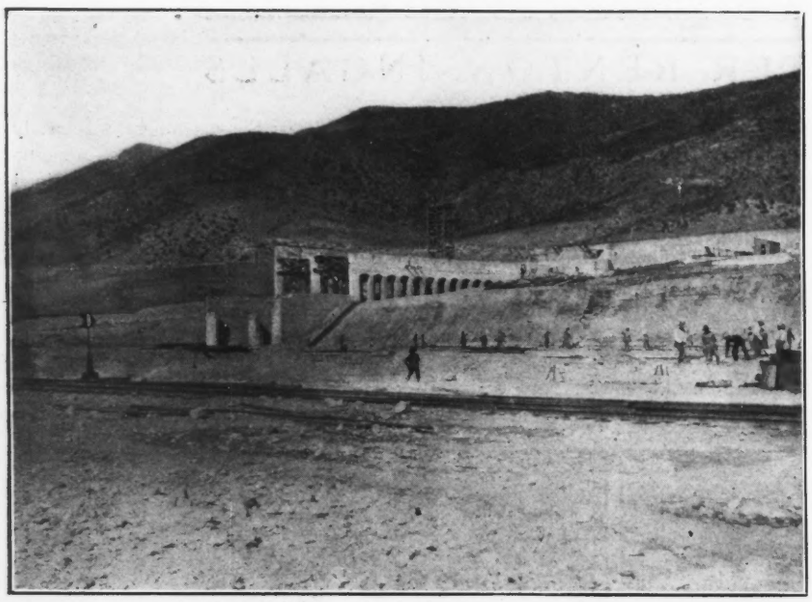
At the time of my visit (July 25) the mill, although under construction for somewhat more than six months, was not sufficiently advanced to permit of a description that would be anything like complete. The foundations were all in, the main floors were laid, the steel frame of the first unit was being erected, and considerable of the machinery was ready to be put in place, but a vast amount of work, probably five months', remained to be done before even the first unit would be ready for operation. My description of this mill is therefore based necessarily on the plans from which the building is being done.

The mill is a steel structure covering a floor area of 567x338 ft., the floor being arranged in terraces and supported by beams of reinforced concrete as at the mill of the Utah Copper Company at Garfield, Utah. It is divided into three units, each of 1333 tons daily capacity, each unit being further subdivided into two sections, one right hand and one left hand. The dimensions of each section are 94 ft. 6 in. width and 338 ft. 5 in. length, not including the bins behind the mill in which the ore is received from the railway cars, or tanks for receiving the concentrates below the mill. The ore bins behind the mill are of timber construction. They have a capacity for 6000 tons per unit, or 18,000 tons for the three units. The ore to be received in these bins will pass a 2-in. aperture. From the bottom of the bins the ore is drawn upon a belt conveyer, which takes it to a small distributing bin at the head of each unit. These bins deliver to each section, or half-unit.

Crushing

The sections, or half-units, are duplicates of each other, and each of them can be operated independently. The follow-

ing description is of a single unit. From the distributing bin the ore passes to No. 1 trommel, which has 7/8-in. apertures. From this trommel the oversize goes to the No. 1 rolls, which are 36x15 in., and the undersize to No. 2 trommel, which has 5/8-in. apertures. No. 1 roll delivers to elevator which returns its product to the screening system. The oversize of No. 2 trommel passes to No. 2 rolls, 36x14 in., which delivers its product to the elevator, the undersize of No. 2 trommel going directly to the elevator. This elevator discharges into a pair of trommels, having 3/8-in. apertures, of which the oversize goes back to No. 2 rolls and thence returns with the regular flow of material. The undersize of the 3/8-in. trommels goes to a set of eight 2-mm. trommels, of which the oversize goes to No. 3 rolls, 36x14 in., which delivers its produce to the elevator in the same manner as the No. 2 rolls.



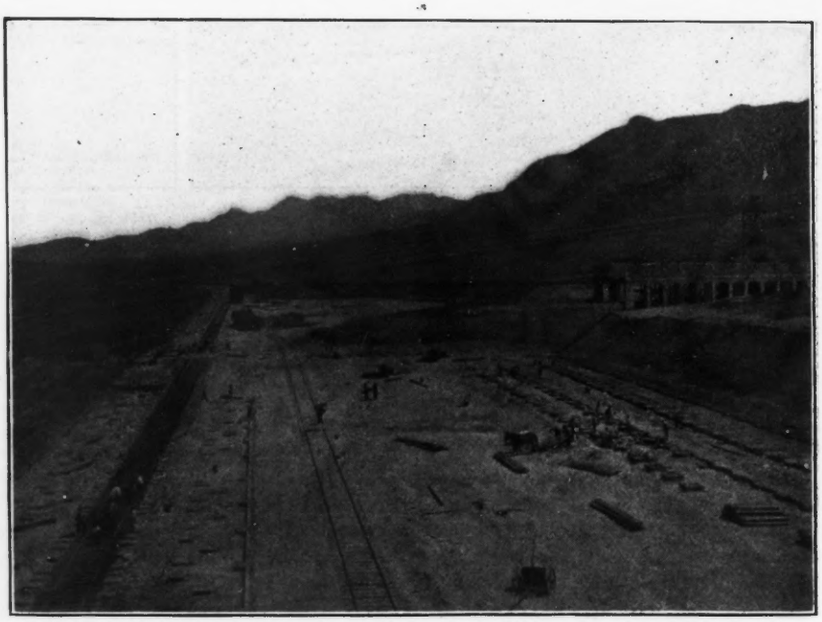
THE LARGE DUST FLUE

It will be observed that the ore is reduced to 2-mm., or about 6-mesh, size before any separation is attempted, and the crushing is performed by degrees with careful screening between each stage, which ought to reduce the formation of slimes to the minimum. The ore is of friable character and as received at the mill will comprise a large proportion of fines in which the mineral is already released. Consequently screening is a highly important consideration and the crushing to be done is reduced in comparison with many ores. It is estimated that in milling 4000 tons of this ore daily the total power requirement will be only 2400 h.p.

Classifying and Jigging

The 2-mm. product is passed to a set of eight Richards vortex classifiers, which give two spigot products. The coarser of these is treated by five jigs, which make finished concentrates, a hutch-product for further treatment on seven Wilfley tables (which make finished concentrates), and tailings which pass to Huntington mills for regrinding.

The finer product of the Richards classifiers is taken to 10 Wilfley tables, which make finished concentrates, tailings that are discarded and middlings. These middlings together with those from the Wilfleys treating the coarser product and the tailings from the jigs are combined and taken to three Callow settling tanks, the thickened pulp from which is reground in four 6-ft. Huntington mills, crushing to 60-mesh size.



THE SMELTER SITE, LOOKING NORTH

Treatment of Fine Sands

The product of the Huntington mills is elevated to the screen floor where it joins the overflow from the Richards classifiers and goes first to a dewatering tank and thence to screens. The latter, five in number, are 24-in. Callow, duplex belts, with 60-mesh screens. The oversize from these screens is passed back to the Huntingtons, by which it is reground and thence returned to the screens. The undersize (60-mesh) of the screens, together with the overflow from the dewatering tanks, goes to a set of five V-boxes.

The spigot product of the V-boxes is delivered to a set of 19 Wilfley tables, while the overflow is carried to 10 Callow settling tanks which give a thickened pulp that is fed to another floor containing 20 Wilfley tables. The Wilfleys treating the spigot and overflow products both make finished concentrates and tailings that are discarded, but their middlings are subjected to further treatment. Those of the first series of tables are carried to a set of eight Callow tanks on the vanner floor, which give a pulp for treatment by sixteen 6-ft. Frue vanners, making final products of concentrates and tails. In a similar manner the middlings from the second set of Wilfleys are delivered to another set of eight Callow tanks and the thickened pulp is treated by sixteen 6-ft. Frue vanners.

The overflow from the third Wilfley settling tanks, together with that from the first and second vanner settling tanks, is taken to a series of eight tanks for final settlement before passing outside of the mill. These tanks give a product which passes to a third set of vanners, eight in number.

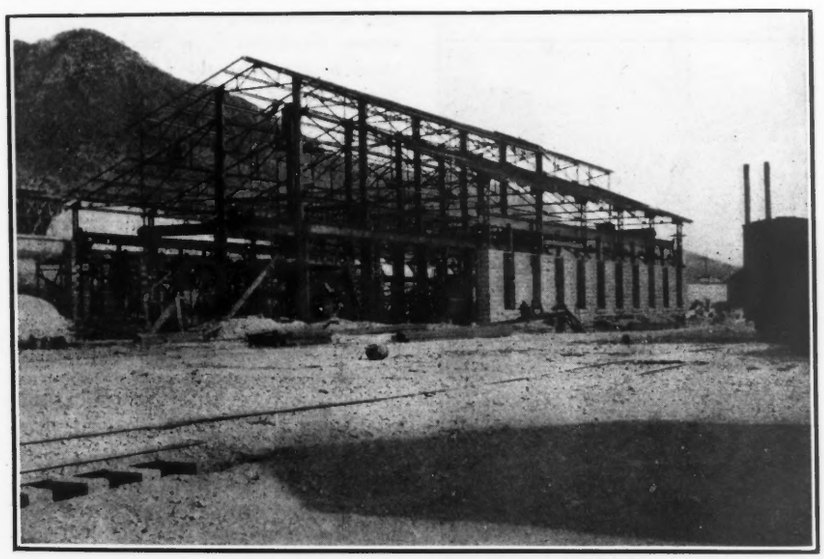
Handling the Concentrates

Throughout the mill the concentrates are removed by sluicing through launders, being collected in tanks which are discharged by means of Blaisdell excavators, but the concentrates from the Wilfleys and vanners are collected in two tanks, 28 ft. in diameter and 6 ft. deep, in which they are allowed to accumulate until the tank is full, the water draining off in the meantime. Beneath these tanks is placed a track so that cars may be run under them and the concentrates discharged directly into the cars. The tanks are filled and discharged alternately. The overflow water from the mill is taken to slime ponds for final settling.

Comparison with Other Mills

The contemporaneous design and construction of three large mills for the concentration of similar ore naturally invites comparisons. The radical differences between those of the Boston Consolidated and Utah Copper Company have been pointed out in a previous article. The Steptoe mill is in general similar to that of the Utah Copper Company. This is not surprising inasmuch as both of these are Guggenheim companies and the same engineers have been consulted to some extent in each case. In the design of the Steptoe mill the plans of the Utah mill were available. However, they were by no means servilely followed. In comparing the two mills it will be observed that in the Steptoe provision is made for more careful screening, the reduction of the ore by rolls is more gradual, and Huntington mills are employed as regrinders instead of Chilean mills, all of which are commendable modifications. Another detail which will meet with approval is the greater care that is being bestowed upon providing the slime tables with a thick pulp. It is a general fault in ore dressing to use too much water, which is generally manifest where water is in abundant supply. At the Utah mill many of the vanners appeared to be receiving pulp that was too thin and to be doing inferior work. Another difference between the Utah and Steptoe mills is the matter of slime tables. Both use Wilfleys and vanners, but in the Utah mill the vanners predominate and in the Steptoe mill the Wilfleys. The means for handling the concentrates, i.e., loading from the main collecting bins, appear to be distinctly the better at the Utah mill.

The Steptoe mill is considerably more compact than the Utah mill. The latter is 600x600 ft. in area for a capacity of 6000 tons of ore per day, or 60 sq.ft. per ton of ore. The Steptoe mill is 567x338 ft. for 4000 tons capacity or about 48 sq.ft. per ton of ore. It is estimated that the Utah mill will require 1 h.p. per ton of ore, while the engineers for the Steptoe mill estimate only 0.6 h.p. Although the Ely ore is more easily crushed it is hard to understand so great a difference in the estimates and it will be highly interesting to obtain the results of practice in this particular. In both mills the driving is by electric motors operated by current from a central station.



THE MACHINE SHOP

The Smelting Works

The Steptoe smelting works is distinctly a reverberatory plant, although it will have naturally a blast furnace for resmelting converter slag and such lump ore as may come to the works. So far as present developments at Ely go, however, the supply of lump ore is not likely to be large. The design of the plant is due especially to Walter G. Perkins, who is also in charge of the construction, and it will be observed from the following description that while he has conformed strictly to the lines of approved copper smelting practice he has proceeded upon more rational considerations than some of the recent large smelting works display. The leading features in this respect are the complete separation of the various departments; the drafting of each group of furnaces through independent flues and chimneys, which is surely preferable to leading the flues of a large works to a single chimney; and the simplification of the transportation of ore and material among the various departments. In all of these respects the Steptoe smelter will doubtless be the best exemplification of good smelting practice in the United States.

Roasting Furnaces

The matter of desulphurizing the ore was a leading consideration in the delay in the construction of the Steptoe smelter. As I have pointed out in a previous article a change of far reaching importance in the preliminary treatment of fine sulphide ore is impending in the introduction of sintering processes. Such an introduction was contemplated in the Steptoe works and construction was delayed awaiting the development of a certain process, but finally it was decided to go ahead on the old lines, i.e., with simple roasting furnaces.

There will be sixteen 18-ft. McDougall furnaces, which will give a roasting capacity of about 640 tons per 24 hours, the ore being burned down to about 7.5 per cent. sulphur. The necessary lime flux will be mixed with the ore before roasting and the hot calcines will be trammed directly to the reverberatory smelting furnaces. However, there will be a brick and steel storage bin of 1500 tons capacity, which will act as a governor, receiving the surplus of calcines if the roasting furnaces are running ahead of the smelting furnaces, and delivering ore if the latter are not sufficiently supplied directly. The McDougall furnaces discharge their smoke into a double flue, each part of which is 300 sq.ft. in cross-section and 500 ft. in length. At the end of the flues there is a brick chimney 250 ft. in hight and 18 ft. in inside diameter.

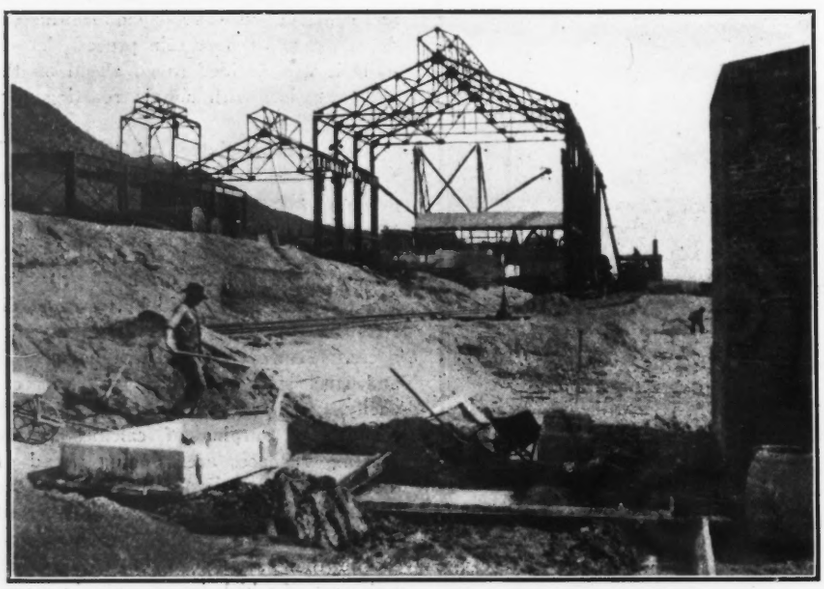
Reverberatory Furnaces

There are three reverberatory smelting furnaces, each 19x112 ft., each provided with two 400-h.p. boilers arranged in parallel, of course with suitable by-passes. This is preferable to the tandem arrangement which obtains in many plants. The grates of the furnaces are 8x19 ft., with a hight of 3 ft. from the grate to the top of the fire-bridge. From the grates the ashes will be sluiced to the cinder plant where the unburned coal will be recovered. Each furnace has two charge-hoppers, each with three holes, for ore, and one hopper with four holes for coal. The matte will be tapped into ladles on cars for conveyance to the converting department, and the slag will be granulated and sluiced away. The smoke of the rever-

beratories enters a flue of 300 sq.ft. section and 200 ft. length and then doubles back through a dust-settling chamber of 1000 sq.ft. section and 200 ft. length and finally escapes through a brick chimney 15 ft. in diameter and 300 ft. in hight.

Converting Department

This comprises three converters, 96 x 150 in., electrically operated, each converter stand being provided with three bowls. Silicious ore from Tonopah and elsewhere will be used for converter lining. The molten matte from the reverberatory furnaces is brought to the converting department in ladles on a track behind and above the converters in such a way that it can be charged into the converters through a chute while the converters remain in blowing position. Silicious ore is charged in the same way. The converters blow into a flue of 100 sq.ft. section and 200 ft. length which terminates with a chimney 100 ft. in hight and 10 ft. in diameter inside. The blister copper is poured from the converters into a casting machine of the conveyer type which delivers the pigs to a cooling tank and thence to the loading platform. Above the latter there are air hoists on a monorail system for handling the pigs. The slag also is poured into a casting machine which delivers to a bin whence it is taken to the blast furnace. The slag skulls go to a plant at the end of the converter department, where they are crushed by a 12x24-in. Blake breaker and thence go to the blast furnaces.



THE POWER HOUSE

Blast Furnace

There will be one blast furnace 42 in. by 20 ft., which is so designed that it may be enlarged to 48 in. by 80 ft. if desired. The blast furnace is set 13 ft. above the ground level, affording ample room for the matte settler, etc., below the level of the hearth. The hight of the furnace from tuyeres to charge flow is 16 ft. It is expected to smelt with a charge-column of about 10 ft. and 24 to 30 oz. blast pressure. The charging will be done from cars tipped by compressed air as at the Washroe smelter. The jackets of this furnace are unique. Each is provided with its own blast box and independent air and water connections, so that a jacket may be removed by breaking only three simple connections. Each jacket has four tuyeres. The ore bins from which the charge for the blast furnace is made up is of timber construction and 6000 tons capacity.

Power Plant—Machine Shop, etc.

The power plant is equipped with eight 400-h.p. Babcock & Wilcox boilers; one No. 10 Connersville blower, directly connected with a compound condensing Corliss engine for operating the blast furnace; one blowing engine of 6000 cu.ft. capacity and one of 12,000 cu.ft. capacity, both cross-compound, two 750-kw. and two 1000-kw. generating sets for the development of power required in the works, including the concentrator, and for transmission to the mines. The generating sets are of the alternating-current system and will develop current at 600 volts, which voltage will be used in the works. For transmission to the mines it will of course step up.

There are excellently well equipped machine shop, carpenter shop, store houses and other accessory departments, which are larger than would be required for the mill and smelter alone inasmuch as they will also serve as repair shops for the rolling stock of the Nevada Northern railway. The machine shop is a large handsome building of concrete blocks filling the panels of a steel frame. The administration buildings, which are architecturally of a pleasing design, are arranged in a semi-circle, facing west, with the general office in the middle and mess-house and dwellings for the superintendents on either side. A large assay office and chemical laboratory stands directly behind the office building.

In the general lay-out of the plant excellent advantage has been taken of a good natural location. There is a large trestle in bringing the railway from the mines over a ravine into the works, but in the works themselves there is comparatively little trackage on trestles. The concentrates go from the mill to the top of the roasting furnaces; the latter are at such a level that the calcines can be run out directly over the reverberatories; and the matte from the latter is taken out on tracks which are above the level of the converters. All the tracks in the works are of standard gage. The haulage of ore and material is done by small steam locomotives, it having been desired to eliminate the nuisance and danger of the overhead wires of an electric system. Washoe, Garfield and Steptoe, the three great, modern, reverberatory copper-smelting plants exemplify different systems of tramming in the works, the first using compressed-air locomotives, the second electric, and the third steam.

The plans for the Steptoe smelter contemplate the eventual installation of 32 roasting furnaces and six reverberatories, but the half of that number which are now being erected will in connection with the blast furnace give easily a capacity for the smelting of 1000 tons of charge per day, and that will be amply sufficient to handle the immediate offerings of the mines. Some day there may be a direct line of railway from Tonopah and Goldfield to Ely and the latter may become a great custom-smelting center.

Mica in Shantung, China

According to a recent consular report, a mineral property in Shantung, which the Germans have looked into, but not attempted to work as yet, is a deposit of mica. This mica is reported to be rather cloudy, but the sheets obtainable are of unusually large size and do very well for stove windows and similar uses. This mica supply is said to be very large, and would be a paying proposition if it were not so far removed from all means of transportation. Should the Germans build the proposed railway extension into the district this deposit would be worked.

Deposits of bitumen are said to extend all along the coast of Venezuela from the gulf of Paria to Colombia in the form of superficial lakes similar to La Brea but much more shallow.

"Silica" and "Insoluble" in Smelter Analysis

By E. Kneeland*

Several years ago, while I was in the ore business in Mexico, an ore was being shipped to a custom smelter which ore I handled as the shipper's representative. An approximate analysis of the ore was as follows: silver, 35 oz. per ton; silica, 48 to 55 per cent.; iron, 12 per cent.; lime, 12 per cent. The ore also contained alumina, zinc and a little sulphur. The lime was present as fluorspar.

According to the shipper's contract with the smelting company, the silica, determined by the fusion method, was to be penalized at the rate of 20c. per unit, as silica was an undesirable element at the plant in question. It was also stipulated, that on those lots of ore assaying less than 50 per cent. silica, the smelting company was to deduct $1.50 per ton from the treatment rate.

Insoluble Residue

As in nearly all the contracts that this smelting company had with its shippers, it was the insoluble residue that was penalized. The chemist at the smelting works was in the habit of running "insolubles" on all his ore samples and saving the insoluble residues of those few ores upon which fusion silicas were required, which residues he fused with alkali carbonates and carried through the regular process for determining the silica by fusion. In this way his routine was not interfered with, and this practice also served to protect platinum ware from the damaging effects that certain elements, thus eliminated, might have.

For those unfamiliar with a "smelter insoluble," I will give a brief description of the method in which it is perpetrated: Weigh out 0.5 gram ore; place in a casserole of convenient size; add aqua regia, evaporate to dryness and bake on the hot plate to render insoluble as great a portion of the ore as possible. Cool, moisten with water and take up in hydrochloric acid. Boil, dilute, filter and wash with hot water; dry, ignite and weigh the residue. The lime and iron, which are usually "pay elements" for the shipper, are determined in the filtrates from these insolubles.

In order to facilitate liquidations, the same method of making insolubles had to be adopted in my laboratory and for a while all went well, until there arose a necessity for the repetition of the silica determination on one of the lots of the ore. Now, since there was nothing in this particular ore which would damage platinum ware, to save time I fused the ore direct without previous treatment with acids. I dissolved the fused mass in hot water and a little hydrochloric acid, evaporated gently to dryness and proceeded in the usual manner to determine the silica by fusion. To my surprise I obtained a fusion silica which was 4.5 per cent. in excess of the insoluble residue, which I had formerly obtained on the same ore, and 7.5 per cent. in excess of the silica by fusion, which I had previously obtained by fusion of this insoluble. Suspecting an error the work was repeated and verified.

Silicon Volatilized

It then dawned upon me that both the smelter chemist and myself (I was representing the shippers, and under the circumstances was not after high silica results) had been overlooking the fact that the lime in this ore was present as fluorspar, and that in determining the insoluble by the prescribed smelter method, the fluorspar would be decomposed by the aqua regia, and the fluorine thus liberated would combine with some excess acid and silicon forming hydrofluosilicic acid. The silica thus combined was volatilized as a tetra-fluoride of silicon by the subsequent evaporation and baking. The fusion silica result, obtained by fusing this insoluble, would in turn be 3 per cent. lower than the insoluble.

As no doubt a little silica was dissipated, even when the silica was determined by direct fusion of this ore and the gentle evaporation with weak acid, the silica result on this lot of ore would have been still further augmented if determined by a method adapted to the determination of silica in ores containing fluorine. However, I will deal only with what actually took place.

I doubt if the chemist, who was employed by the smelting company at the time of these occurrences, was ever aware that this ore contained fluorspar and by this oversight our shipper gained $1.50 per ton in reduced penalty for silica and as this 7.5 per cent. error would invariably bring the reported silica contents of the ore below the 50 per cent. mark, the shipper made an additional gain of $1.50 per ton in the treatment rate. This error made a total gain to the shipper of $3 per ton and since about 1000 tons per month, of this ore, was delivered to the smelter, the plant lost $3000 per month through this one little leak.

Importance of Chemist's Work

The ore came from the Parral district in Mexico. Had the smelter chemist been on the alert and had he had sufficient knowledge to detect immediately the fact that this ore contained fluorine the plant in question would have saved thousands of dollars. This is only one of many instances in which I have seen an inexperienced man turned loose in a smelter laboratory to throw away a company's money. Still a great many custom reduction plant managers think if they can get a man who can only make the simple determinations, he is good enough for the position of plant chemist.

*Metallurgical engineer, Houghton, Mich.

A New Tunnel Through the Rockies

Special Correspondence

The Continental Tunnel Company, with a bond issue of $5,000,000, has been organized in Denver, and 35 per cent. of the money now needed, which is estimated at $3,000,000, has been subscribed, for the purpose of building a six-mile tunnel through the main range of the Rocky mountains, so that the trains of the "Moffat road" may pass through them at an elevation above tide water of 9000 ft., instead of over them, as at present, at an altitude of 11,600 ft., thus shortening the distance across the range 24 hours, and eliminating all the costly methods of keeping the line open in winter at that great hight above sea level, such as snow plows, snow sheds, gangs of shovellers, and so on.

This is an independent company, inspired and formed by the untiring and brilliant efforts of Herbert George, a journalist of Denver, who by his sensible letters to the daily press showed the capitalists of Denver how great a benetfi such a gateway would be, and how shortsighted was their behavior hitherto in not only standing aloof and refusing to help, but in many cases opposing the projector and builder of the Denver, Northwestern & Pacific Railway in his plucky fight against competing lines.

The chairman of the executive committee of the tunnel company is Col. D. C. Dodge, the veteran railway construction engineer and builder. He has been associated with Gen. W. J. Palmer in all his railway construction work, beginning with the Denver & Rio Grande, then the Mexican National, and later, and last, as the projector and builder of the Rio Grande Western to Salt Lake. Thomas F. Walsh, whom everyone knows as a broad-minded and public-spirited man, is president of the tunnel company. Mr. George is general manager, and H. A. Sumner, chief engineer of the Moffat road, is also chief engineer of the tunnel company.

When the bonds are retired, the Continental Tunnel Company will cease to exist, and the tunnel will become the property of the "Moffat road," the cost being charged up to construction account. The work of driving the tunnel will probably be let to contractors. The bonds will be 10 year, 6 per cent., the principal and interest being guaranteed by the Denver, Northwestern & Pacific Railway Company, which interest is in the form of rental for the use of the tunnel.

The production of pig iron in Germany for the month of August beat the record for any one month. The total output amounted to 1,117,545 tons.

Air Hammer Drills

By J. T. Glidden

The considerable saving in labor and time, and the reduction of working costs which result from the use of hand air hammer drills in mining operations, makes information as to their construction, maintenance and use appropriate. It is to be understood that drills of this character have a restricted field in mining operations and they cannot hope to supersede large machine drills, nor can they be economically used on very heavy work. Their best field is in small stopes where it is impossible or inconvenient to set up a full-sized machine, for cutting hitches for timbers or similar work. The remarkable advantage which these drills possess over the tiresome and expensive method of single jacking, makes air hammer drill installations advisable in all mines where compressed air is available. Their field is further limited by the fact that they are not adapted to drilling holes much over 24 or perhaps 30 in. deep. Two reasons for this are (a) the small diameter of the piston results in a comparatively small total pressure on the piston and if too great a proportion of this pressure is required to move a heavy drill rod, the blow will necessarily be weak; (b) it is very difficult for a miner to hold the weight of the drill and long bit in drilling an upper when no support for the drill is provided.

In their construction, air hammer drills are extremely simple, the only moving part being a piston which is made of tool steel and acts as a hammer, striking upon the drill head. There is no valve mechanism to get out of order. The necessary rotation of the drill may be given by hand, or as is now the case, by a side lever which stands out at right angles to the axis of the drill and operates on a ratchet, giving the desired rotation which prevents fitchures and insures round holes. The simplest form of air hammer drills weighs on an average 20 lb. exclusive of the bit. In order for the drill to penetrate the rock, the reaction to the blow must be provided by the man operating the drill. Cases have been known where with a high air pressure at the working face, the drill runner was too light a man and was constantly thrown back from the rock as he was unable to hold the drill against the rock. One means of avoiding this difficulty is the use of an air feed or a supporting column which can be readily attached to the drilling outfit.

In the case of the air feed, the air pressure is used to feed forward the drill and the same air then operates the hammer. This air-feed cylinder in general weighs from 35 to 40 lb., making the total weight of the outfit, drill plus feed cylinder, 55 to 60 lb. In some instances, supporting columns are provided for air hammer drills. These seldom weigh over 70 to 75 lb. and the drills are attached to them in a manner analogous to that used in large machine drills. This supporting column, however, is not very common in mines where air hammer drills are used to supplement the work of regular machines, but is more likely to be found in use by leasers who have no machines or in mines provided with a small compressor but having no machine drills.

The weight of drills and accessories as given above are averages for standard sizes, but upon request, special weights of hand air drills for particularly heavy work such as shaft sinking are supplied by manufacturers. The drill steel provided by some concerns is hollow so that air may be conducted to the bottom of the hole and blow out cuttings, which is an important advantage in the case of holes that will not clear themselves.

As to the matter of installation and maintenance, it is claimed that a compressor large enough to run one 2¾-in. standard drill will run four air hammer drills, and a compressor that will run one 3¾-in. standard drill will run five to six air hammer drills. In general, an air hammer drill requires only about one-third the air which is necessary for a 2½-in. standard machine drill. In the modern type of air hammer drills, the wearing part, which is the moving cylinder, is provided with a steel bushing so that when wear takes place, all that is necessary is to put in a new bushing and no time need be lost for extensive repairs such as frequently happen in the case of large machine drills.

In a review of the advantages of air hammer drills it should be borne in mind that this is a strictly one-man affair and thus the saving of the wages of a helper in those cases where an air hammer drill can be used to do the work of two men single- or double-jacking, will very shortly pay for its initial cost. While these drills are not suitable for deep holes or heavy work, they are of great advantage in breaking up large masses of rock shot from deep holes, cutting hitches, putting in pop holes and all similar work. The employment of drills of this type in stoping is gradually extending, since they can work in any place where a man can worm himself and by using them a much narrower stope can be carried than with a machine drill.

The principal talc deposits of Brazil are in the State of San Paulo. Three grades of stone are produced and are furnished at Rio de Janeiro ready for crushing at $25.50@37.25 per ton. Much of the product is taken by American and European talcum powder manufacturers.

Production of Tungsten in 1906

In a recent press bulletin the U. S. Geological Survey says that the rise in the price of tungsten during 1905 continued during 1906, and the production was stimulated accordingly. There was, however, a very great discrepancy in the prices paid for ore in various places, as there is almost sure to be when an article is produced spasmodically in widely separated and often little known localities while at the same time the market is limited and the isolated small producers have slight chance to become acquainted with buyers and market conditions. Prices during the year ranged from $5 to $9 per unit for the contained tungsten trioxide. The market for tungsten ores is expanding and seems now to be almost as sure as the market for copper or other staple ores. Firms requiring large quantities of tungsten have had difficulty in obtaining sufficient supplies to guarantee future deliveries.

The greatest producing locality in 1906 was Boulder county, Colo., but tungsten mining was carried on also in California, Arizona, Montana, New Mexico and Washington. The Boulder county ore is wolframite, but the deposits in California are chiefly scheelite. No production of tungsten was reported from the deposits in Alaska, Connecticut, Oregon, or Idaho, but considerable development work was done at Osceola, Nev. New deposits of scheelite have also been found at Murray, Idaho, where it is hoped that production will soon begin.

Experiments have produced a remarkable incandescent lamp, the filament of which is made of metallic tungsten. The tungsten lamp promises to be as useful as any, if not the most useful of all, but only a few lamps of this type have yet been put on the market, as a number of details connected with the manufacture remain to be worked out. The lamp gives a brilliant white light of very pleasing quality, and possesses a distinct advantage in that, if properly made, it does not blacken the globe.

Large quantities of sodium tungstate are manufactured, much of which is used in fireproofing cloth for curtains, drapery, etc., and as a mordant in dyeing. Tungsten salts are also extensively used in silk manufacture, being added to the silk with the dye to give more apparent weight to the fabric.

The introduction of electric in place of mule haulage in the workings of an English mine is reported to have not only reduced the cost of working, but also to have rendered possible an increase in output of from 1400 to 2000 tons daily. Two 15-ton electric locomotives are in use, each provided with two motors, with controllers at either end.

Transvaal Report on Rope and Safety Catches

Opinion of Prominent Mining Men in the Transvaal on Safety Catches for Mine Hoists. Requirements for Such Devices and How Met

BY EUSTACE M. WESTON*

The Rope and Safety Catch Commission appointed by the Transvaal Government just made its report public. The commission consisted of many men whose names are known all over the world as authorities on this subject, and needless to say, its report is an extremely valuable one. I can at present deal only with that portion relating to safety catches.

The Requirements of Safety Catches

The commission were enabled to carry out a number of valuable tests of promising devices at the Marcus shaft on the Langlaagte mine, Johannesburg. The commission united in the opinion that the truly reliable safety catch must fulfill the following conditions:

1. The instantaneous release of tension in the rope at the time of its fracture must immediately be taken advantage of through the medium of some spring connection to operate, by one means or another, the retarding agency. The releasing of a weight without any spring impulse is not likely to be effective, as it is difficult to attempt to disturb in this way the natural zero relative motion of all the moving masses.

2. The movement of the spring can be best utilized to create a small relative motion of the draw-bar of the cage.

3. The motion of the draw-bar should be utilized to work the brake mechanism in such non-reversible manner that, once the brake is in action, it will require an actual raising of the cage, or a rope pull equivalent to it, to release it in the slightest degree.

4. The tension of the spring should be as small as possible, certainly not more than half the weight of the empty cage, so that the catches shall not be brought into action when not required owing to the pulsations of the hoisting rope.

5. In view of the instantaneous nature of the operation, and the small force at disposal to effect it, the weight of the actual moving parts should be reduced to a minimum.

6. The force necessary to produce any retardation in a pulling body must be at least equal to the weight of the body itself. If this force is equal only to the weight of the body, then no retardation occurs; the force of gravity is exactly neutralized; and the body continues in uniform motion downward with the velocity it possessed at the instant of the application of the force. It is therefore necessary to supply something more than this, if the body is to be stopped. The difference between the catching force supplied by the safety catch and the weight of the loaded cage is the amount available for retardation. On the amount of this difference and on the suddenness of its creation depends the shock to the occupants of the cage, also the braking distance; this latter being influenced also by the velocity of the cage, the relation being directly as the square of the velocity. The retarding action of a good safety catch

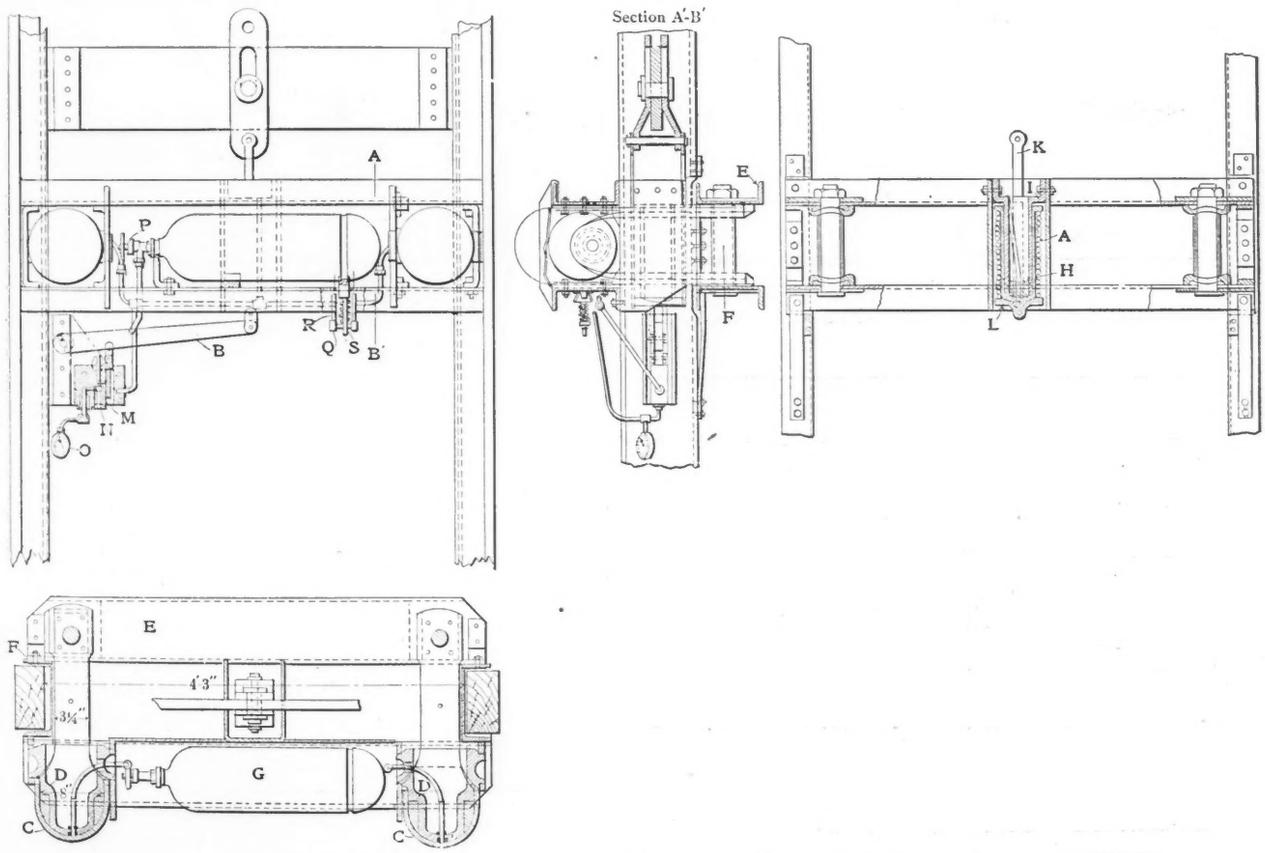


FIG. I. K. SCHWEDER'S SAFETY CATCH FOR 14,000 POUND BRAKE RESISTANCE

*Manager, Rand Collieries, Ltd. (Gold Section), Brakpan, Transvaal.

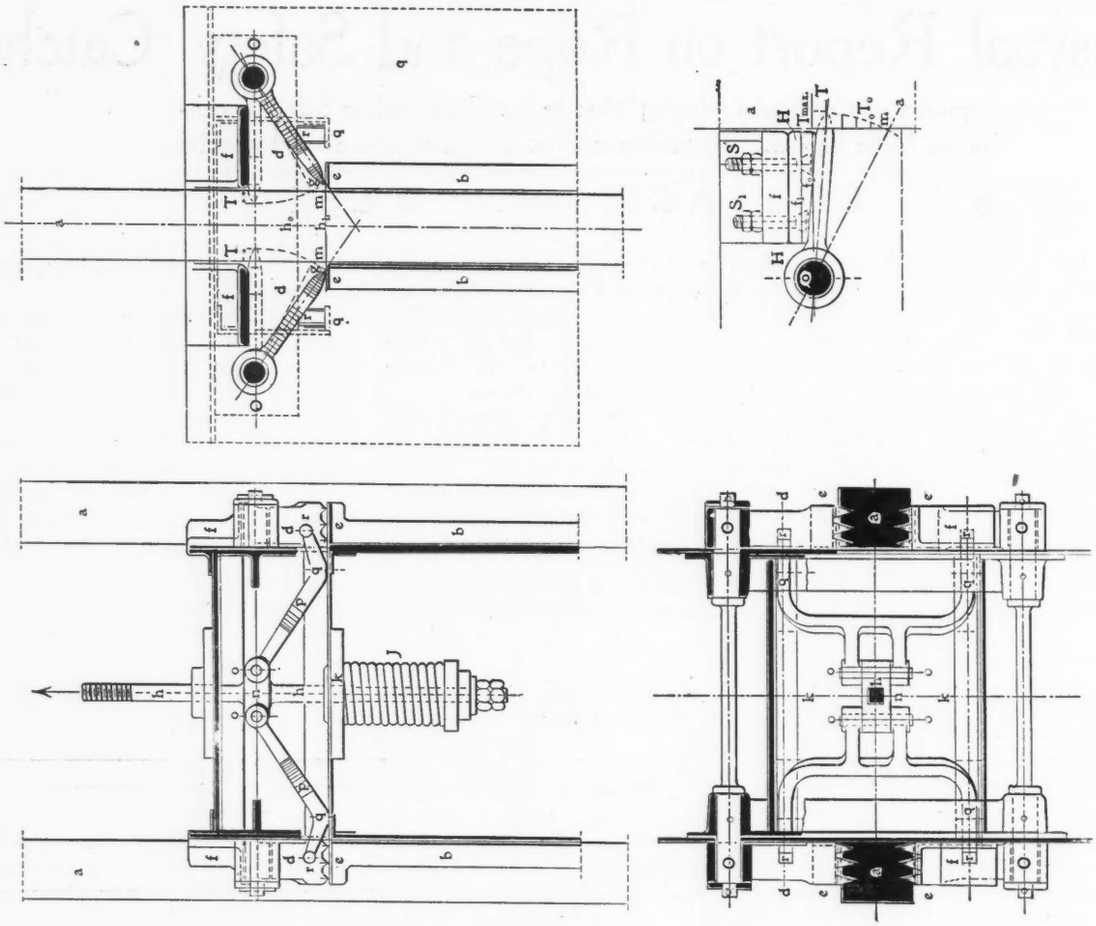


FIG. 3. UNDEUTSCH SAFETY CATCH

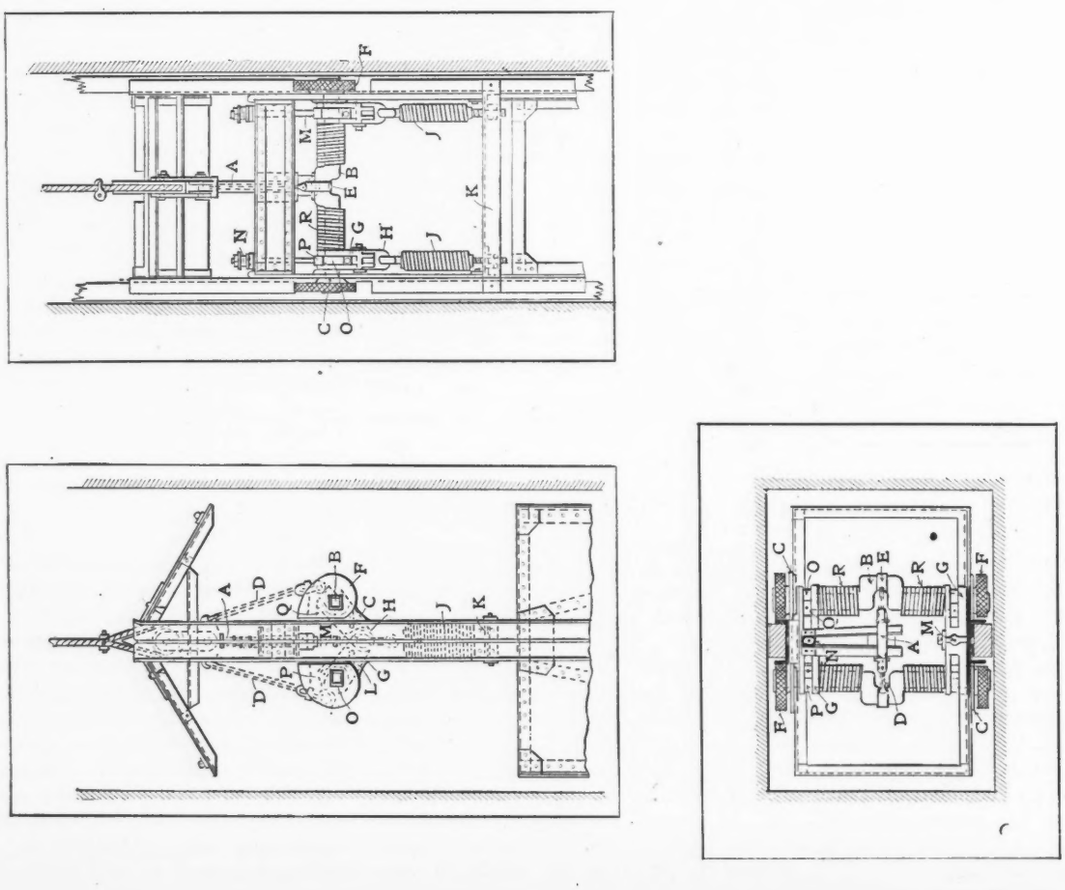


FIG. 2. JENSEN'S SAFETY CATCH

should therefore conform to these principles, and secure the arrest of the cage, even on the downward journey, without injury to the occupants.

7. The retarding force, whether produced by deformation and friction with wooden guides, or by friction on steel guides, should be, within practical limits, independent of the amount of reduction in size due to wear that the guides have previously sustained.

8. The direction of application of the retarding force should be such that the guides and their supporting framework are maintained in position.

9. The safety catch having stopped the cage should maintain it in position until it is again lifted.

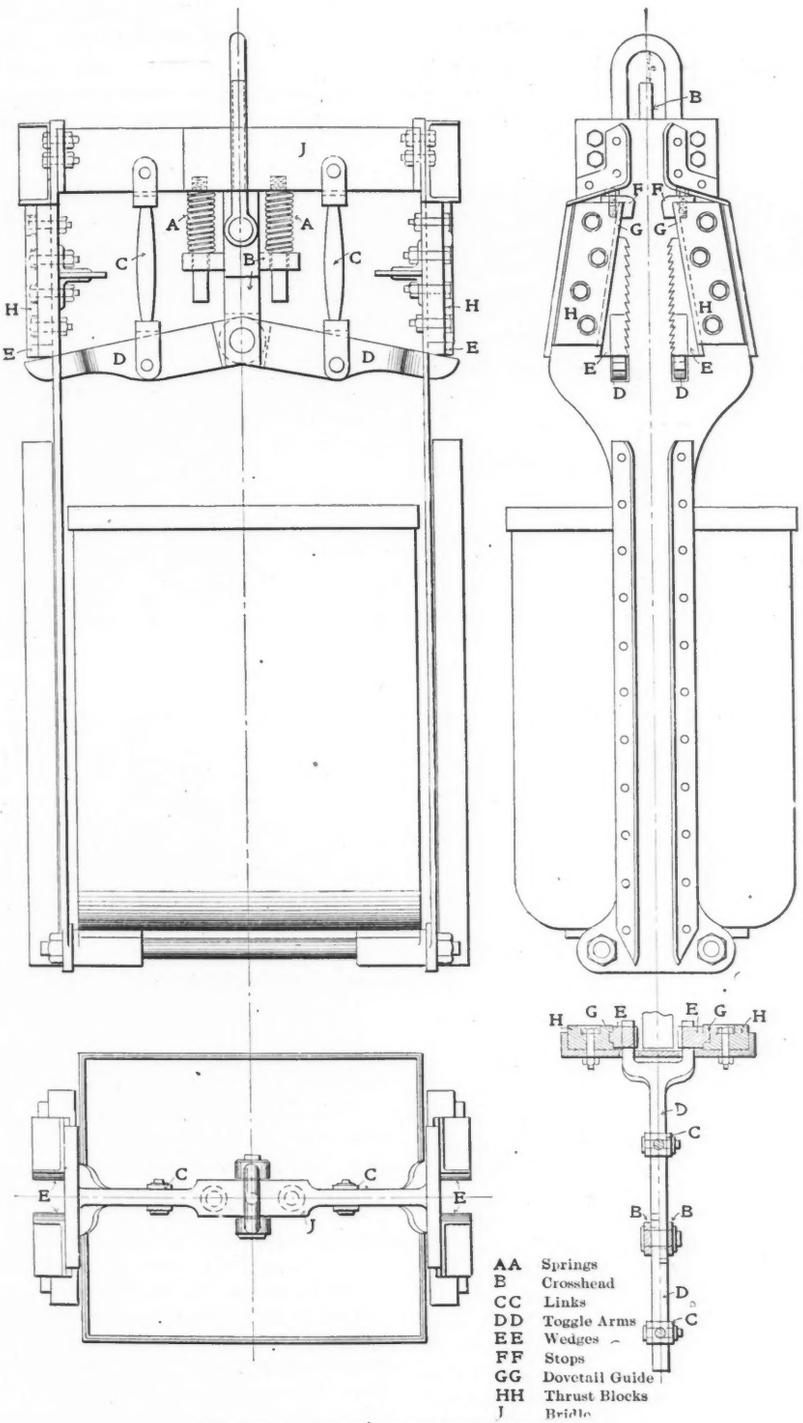


FIG. 4. J. A. GARVIN'S PATENT SAFETY CLUTCH

10. The safety catch should be equally reliable whether the rope breaks on the ascending or descending trip.

11. The mechanism should be capable of ready examination and designed with due consideration to the severe working conditions it has to meet in mining practice.

Safe Braking Distances

With regard to condition 6 the commission remarks that what a safe braking distance is has not yet been determined. A shock-meter used, however, showed that both the Garvin and the Undeutsch safety catches are adjustable as far as the shock is concerned, and are not likely to cause serious injury to persons. This is the case, provided that the distance between guides does not vary appreciably in width down the shaft. In the case of the Undeutsch catch this difficulty is very well provided against by the shape and arrangement of the knives. The Garvin device, it is judged, fails in this respect, and it is declared to be unsatisfactory until an automatic adjustment of the penetration of the wedges is provided for. This can be done; but even then a very wide guide would cause a dangerous shock. The Schweder catch produces a catching pressure that is independent of the width of the guides, and the braking distances can be regulated by proper design. Owing to leakage of gas (this catch being operated by pressure of liquefied carbonic acid), this catch requires some additions and alterations before it complies satisfactorily with condition No. 9.

Reliability of Catches

With regard to condition 10 no special trials were made; but the commission considers it proved that any good catch would meet this condition. The commission considers it established that it is possible to design a satisfactory safety catch for vertical shafts. Though the commission does not consider that any catch tried meets entirely the requirements of such an appliance, it states that the following gave the best results:

For vertical shafts with wooden guides the Undeutsch, and the Schweder; for vertical shafts with steel guides, the Schweder. For incline shafts with steel rails, none at present; but early trials of suitable designs are advised.

Finally the commission considers that no catch should be placed on the permitted list for use in Transvaal mines that has not been tested for reliability by the Government at a Government testing station. Jensen's catch was favorably considered, but not tested, as working drawings did not come to hand in time.

Garvin's Safety Catch

Fig. 4 is a drawing of Garvin's safety catch. When the winding rope breaks, the springs *A A* expand and in so doing force down the crosshead *B* to which the toggle arms *D D* are attached; the toggle arms are slung by the links *C C*, and their outer ends, owing to the downward movement of the crosshead *B*, are thereby made to push up the wedges *E E* which then come into action on the guides. The amount of penetration of the teeth of the

wedges *E E* is adjustable by means of the stops *F F*.

Jensen's Safety Catch

Fig. 2 shows Jensen's safety catch. When the winding rope breaks the springs *R* pull the draw-bolt and rope down by turning the crank, and thereby cause the cams to grip the guides. As the cams turn and press more closely against the guides, the distance between the shafts is increased, and consequently, the links *G* and the springs *J* are lifted. This increases the tension in the springs and, to a much larger degree, the tension in the links *G*, because the increase of the top angle formed by the center lines of the links increases the component forces in the direction of the links. In this way the crank-shafts can turn round until the cams press sufficiently hard against the guides to cause a resistance which is greater than the dead weight of the cage and the load. The shafts continue to rotate and at the same time to move outward in the slots until the heel *P* on the collars *O* prevents any further motion by striking against the set-screws *L* in the links. The pressure then remains constant.

Schweder's Safety Catch

Fig. 1 is K. Schweder's safety catch. The spring *A* is compressed as long as the cage is suspended from the rope, and the disk *L* is hard against the bottom end of the cylinder *H*. The lever *B* is then in its top position, as is also the piston-valve *M*; i.e., the carbonic acid gas from *G* is cut off by the valves *M* and *N*. If the rope breaks the spring *A* will expand, the lever *B* comes down, the piston-valve *M* and the disk valve *N* are accordingly forced down; the gas is now freely admitted into the cylinders *C C* and *H*, and will push out the two cylinders *C C* and press the shoes *F* against the runners, thus causing friction and gradually braking the cage until all energy is absorbed and the cage brought to a rest. The gas has, meanwhile forced down the cylinder *H*, compressing the spring *A* and preventing the rope-tail from unlocking the safety device. Should the safety device act when not wanted, if the cage comes to rest on the shaft bottom or on the keys, the pull of the engine would, through the rope and draw bolt-*K*, lift up the cylinder *H* and force the gas into the tube *G* until the piston valve *M* is in the position shown and the gas is free to exhaust.

Undeutsch's Safety Catch

Fig. 3 is Professor H. Undeutsch's safety catch. It acts as follows: The spring *b* simply pulls the drawbar down a short distance on the breakage of the rope. This operates the lifting levers *o p q r*, which are hinged at *o* and connected to the draw-bar, while the other end *r* simply rests below the catches *d*. The latter are lifted through a very small distance to the point *m*, where they enter the wood of the guides and the further penetration is due to the weight of the falling cage. It will be noted that any subsequent catching of the broken rope in the shaft cannot affect the action of the device. The simplicity and light weight of their design are evident at once.

The St. Croix Safety Catch

Another safety catch on novel lines has been privately tried at the Cinderella Deep. It is the invention of Mr. St. Croix. A detachable crosshead is carried over the cage, connected by a catch and also by two ropes wound on a drum having a braking attachment. The crosshead has catches designed to act suddenly. When the rope breaks, the crosshead is at once arrested. and the cage goes on until the braking tension on the two ropes gradually stops it. The results of trials have been very good indeed, and the weight of the apparatus is not excessive.

The Rio Tinto Company

The directors present a brief interim report upon the company's operations during the current year. The deliveries of pyrites in the United Kingdom have again been rather below those of former years; the Continental consumption is, however, higher than that of 1905 or 1906. The copper contents of pyrites shipped to all markets has been about the same. The consumption of non-cupreous sulphur ore is in excess of the previous year. The great and unprecedented drought in Spain has been a serious anxiety and it was only by taking extraordinary measures that the company was able to continue all its operations. The rainy season has now commenced and there is enough water for four months' consumption in the reservoirs. An additional reservoir is also in course of construction. The output of copper suffered somewhat from the scarcity of water, though much less than might have been expected, and it is now hoped the year's output of fine copper at the mines will not fall short of 1906 by more than from one to two thousand tons.

The price of copper was very high during the first few months of the year. In May and June, however, a crisis in financial affairs in America disorganized business generally and consumers have since then not been purchasing as freely as formerly, a severe fall in the price of copper being the consequence. This company's output is, however, fairly well sold in advance, and the fall in the price of the metal will probably in itself have the effect of preventing any general over-production in the future. The directors have declared a dividend for the six months ended June 30 last of 2s. 6d. per share, less income tax, on the 5 per cent. preference shares, and an interim dividend of 47s. 6d. per share, free of income tax, on the ordinary shares, both payable Nov. 1 next.

Iron Mining on the Western Menominee Range

Special Correspondence

The annual report of the mine inspector of Iron county, Michigan, which includes the Crystal Falls, Iron River and some other districts of the Menominee range, shows that one man was killed in the mines during the year for each 83,500 tons of ore mined, or one man for every 100 men working. In almost every case the fatality resulted from carelessness of the man killed or that of some comrade. They were caused either by stepping off a ladderway; trying a missed hole; riding up a shaft on the crossheads of skips and being hit by timbers; not looking out for falling objects, and barring off loose rock, taking no precautions for getting out of the way. No accident reported was due to unsafe appliances or incomplete passageways.

The report states that for every man working in mines or prospects, mining or doing deadwork, in the year, three tons of ore per day were won. This is an excellent showing for a district of small underground mines, many of which are difficult of operation. There was not one mine in the district that produced as much as 400,000 tons, and only 8 of the 22 active mines produced more than 100,000 tons each. There are no less than 10 elaborate explorations under way in the district, in all of which the showing of ore is good, and any of them may develop into an important mine.

Tin Mining in the Malay Peninsula

According to a Straits Settlements newspaper the projected railway from Hongkong will be likely to traverse the rich mineral regions of Siamese Malaya. Lang Suan has a tin supply that cannot be exhausted in a hundred years to come, while the same may be said of Renang. There are 70 mines in the region of Lang Suan, most of which are worked by natives, but the European concessions in the latter place, as well as in Renang, are exceptionally encouraging and already are giving excellent returns. There is no lack of capital, even the natives making themselves better acquainted with modern machinery and bringing it into use.

The French Government has adopted a method of treating macadamized roads with hot coal tar thinned with about 10 per cent. of oil. The cost is about 4c. per sq. yd.

Electrically Driven Air Compressors

By Andrew Floyd Bushnell

The use of electric energy in modern and up-to-date mining is rapidly growing. Many of the new and larger companies are using electric power to drive all their machinery, while others are using part steam and part electricity. Electrically operated compressors have been in use in Butte, Mont., for the last six years. The Neversweat mine, owned by the Amalgamated Copper Company, and the Original mine, owned by W. A. Clark, were the first plants where electric motors were used to drive compressors. It was considered to be somewhat of an experiment at that time, but now every company in this district, having mines of any consequence, either uses or is preparing to use such equipment.

The Saving from Electric Power

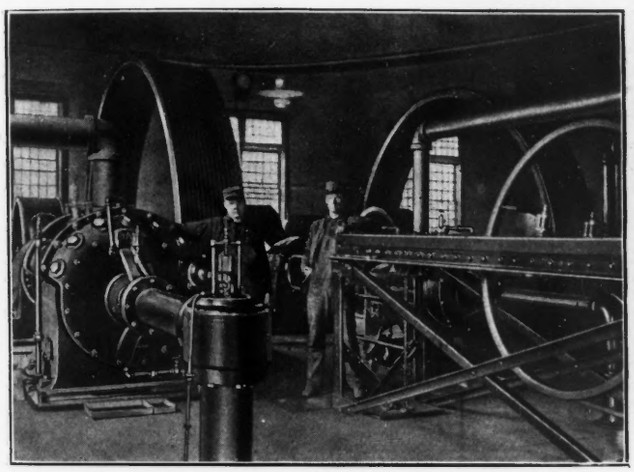
There are two chief reasons why electric power for compressors is preferable to steam. The cost of producing, under certain conditions, is about half that of steam and the efficiency is 15 per cent. greater. Two motors in the compressor-room at the Original mine effect a saving, in coal bills, of $1000 per month, according to a statement by the company's electrician.

An authoritative statement from the Amalgamated Copper Company shows that where it costs $100 yearly to produce 1 h.p. by steam, electric power will cost only $50. The numerous mines controlled by the Amalgamated company use approximately 7000 h.p. yearly in compressing air. Not all these mines have discontinued the use of steam, but they will in time, and when that is done, the Amalgamated company will save approximately $350,000 per annum. William Hosking, electrician for the Leonard mine, states that a machine-drill will accomplish much more in a day when operated by air from an electrically driven compressor. This power can always be depended on, as it seldom varies more than 1 or 2 per cent.

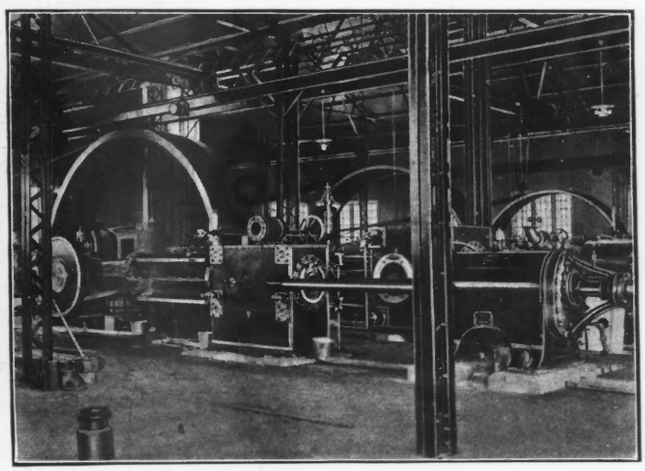
The power for driving the compressors at the Leonard mine comes from Cañon Ferry, a distance of 100 miles northeast of Butte. The Missouri River and Power Company has its power plant at Hauser lake, near Helena., Mont., on the Missouri river. This concern started in business about seven years ago.

Power Plant at Leonard Mine

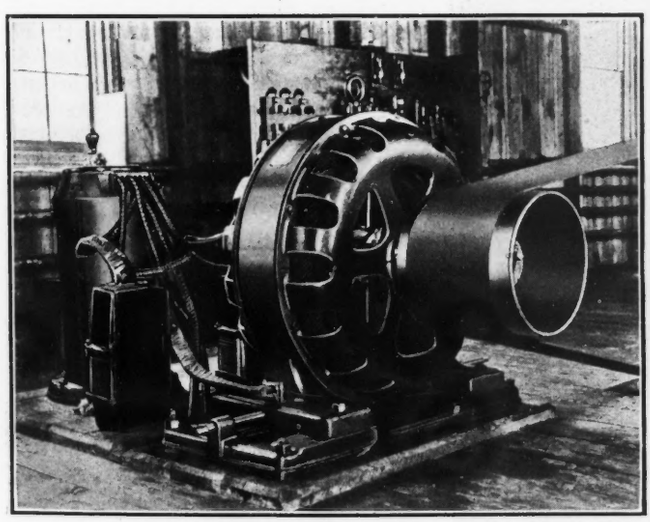
During the past year the Boston & Montana Copper and Silver Company has constructed, at the Leonard mine, a building for three compressors. One compressor, an Ingersoll-Sergeant, driven by a 600-h.p. General Electric motor, has been running for seven months. This compressor is cross-compounded and has an automatic cut-off on the low-pressure side. The motor has been running night and day, furnishing 680-h.p., since the plant was started. The other two compressors, which started recently, are of Nordberg make and are driven by two 600-h.p. Westinghouse motors. The capacity of these Nordberg compressors is 4000 cu.ft. free air per minute at a pressure of 100 lb. per sq.in.,; they are also supplied with au-

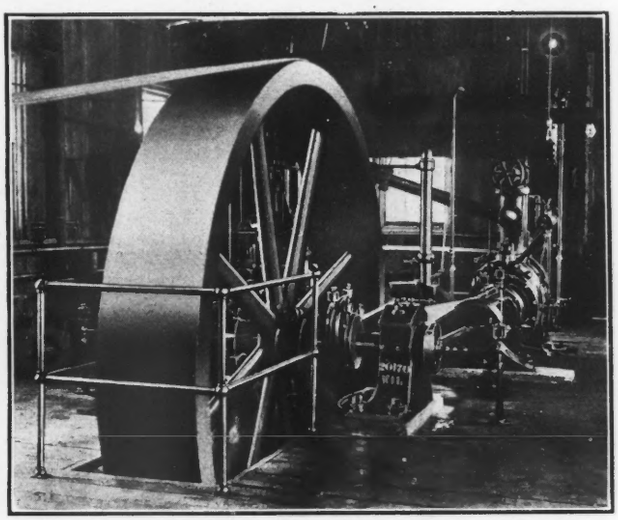


COMPRESSOR PLANT AT ORIGINAL MINE



INGERSOLL-SERGEANT COMPRESSORS AT BILL MINE





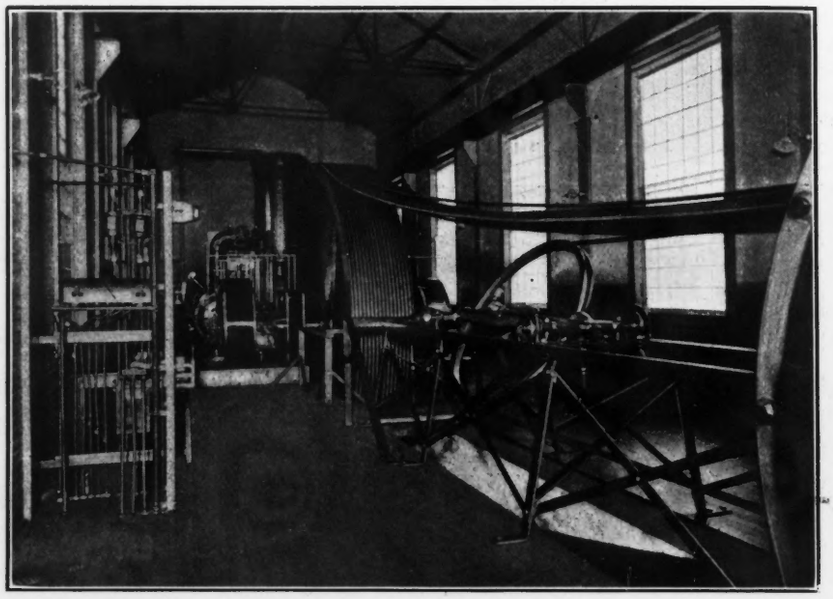
MOTOR AND COMPRESSOR AT GRANITE MOUNTAIN MINE

tomatic cut-offs. These compressors are of a type known as variable capacity, which is an exclusive Nordberg feature. The pressure is maintained uniformly under all variations of demand and enables the compressor to operate at a reduced capacity without a material loss of efficiency. In many instances air consumption varies greatly, but the compressor must run at a constant speed, owing to the nature of the driving power. In such cases the value of this device is evident.

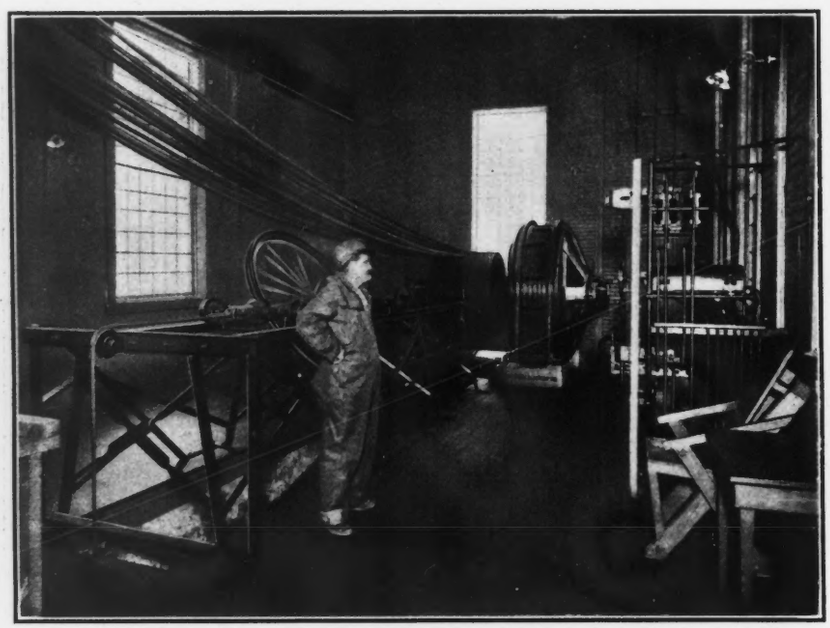
The Leonard compressor building is 147x86 ft., one frame making the entire span. There is a 20-ton crane for handling machinery in the building. The electrical wiring consists of Gross-Hines conduits; as they enter the building the power mains are supplied with six 600-amp. wall switches for fire protection. The mains for carrying power to the new Leonard power-house are cables of 1,250,000 circular mils capacity. The Leonard switchboard is equipped with all Westinghouse latest improved instruments and is automatically handled electrically. There are two Ingersoll-Sergeant compressors at the Original mine, which also furnish air for the Gagnon and West Stewart mines. Two 500-h.p. General Electric induction motors, 2000 volts, are installed. The fly-wheels make 87 r.p.m. and the air pressure varies from 80 to 90 lb. per sq.in. motor; it makes 47 r.p.m. This machine has been running five years. The three steam-driven compressors at the Neversweat are duplex, single stage, 30¼x60 in. The Rarus has two electrical compressors, 39x24x48 in. One compressor at the Corra is of the same capacity as those at the Rarus; the other is 23¼x40¼x48 in. They were all made by the Ingersoll-Sergeant company.

The most up-to-date plant at Butte is at the Bell mine, where four large Ingersoll-Sergeant compressors are installed. These machines are 38¼x24¼x48 in. and the fly-wheels make 60 r.p.m. Except where otherwise stated the compressors of the Amalgamated Copper Company are driven by 600-h.p. General Electric or Westinghouse motors.

The Bell compressor plant, complete, cost $250,000. The building is 100x130 ft., and the foundation consists of 20-ft. concrete walls. The compressors are supported by massive cement pillars. The compressor plants of all the large Butte mines are so arranged that should one meet with an accident, the mine affected can be supplied with air from another plant. The steam plants are always kept in running order in case any accident should befall the power plant.



NORDBERG COMPRESSOR AND SWITCHBOARD AT SPECULATOR MINE



MOTOR-DRIVE AT SPECULATOR MINE

Other Plants at Butte

The largest air-compressor plant in Butte is at the Neversweat mine. This comprises five large machines. There are two electrically driven Ingersoll-Sergeant compressors. One, 50¼x30¼x60 in. and 44 r.p.m. is driven by three 300-h.p. motors and has been running 2½ years. The other electric-compressor is 30¼x60 in., single stage, and is driven by an 800-h.p.

Non-corrosive Pipe and Hose

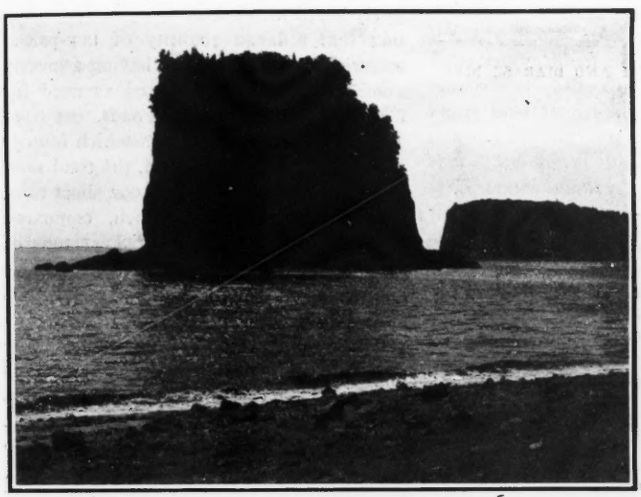
A new type of metallic tubing and hose has recently been introduced which is of interest because of its non-corrosive properties. This last feature makes the tubing useful in mines where acid waters are to be dealt with and also in chemical laboratories. The construction of this hose makes it flexible as well as resistant to corrosion. The tubing is built up around a core of spirally twisted strips of pliable steel or copper. The edges of these strips are bent into interlocking lips in such a fashion that the joint formed by two such strips can be packed with asbestos or rubber.

The resistance to corrosion is attained by expanding a thin lead pipe into the core, thus giving it additional strength and if desired, an external lead sheath can be applied in the same manner. Tests on this tubing show it to be able to withstand a pressure of 500 lb. per sq.in. The pipe is manufactured by the New York Flexible Metallic Hose and Tubing Company, of New York City.

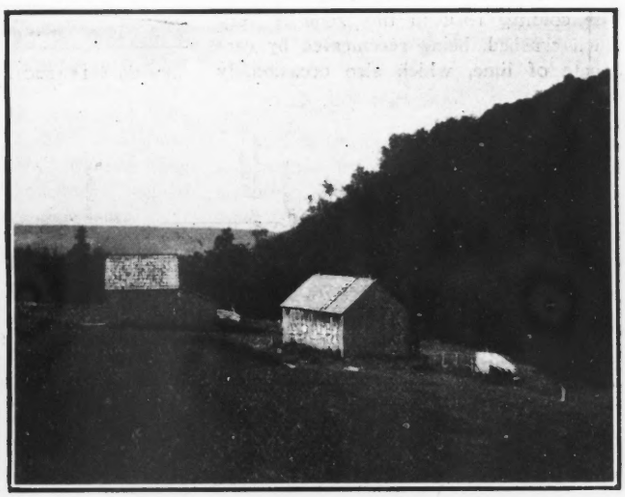
Barytes Deposits at Five Islands, Nova Scotia

By W. Spencer Hutchinson*

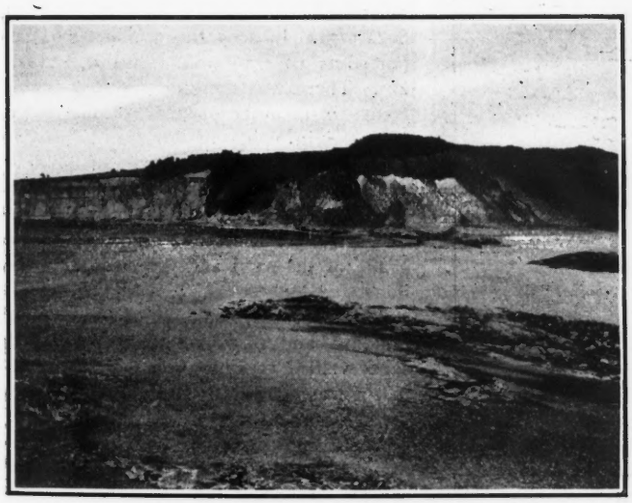
The Five Islands district is in Colchester county, Nova Scotia, on the shore of Minas bay, an arm of the Bay of Fundy. It is 16 miles by wagon road to Parrsboro, the nearest railway station which connects, by the Cumberland railway, with the main line of the Intercolonial railway at Spring Hill Junction. The name of the place comes from a chain of islands which lie off shore, remnants of a point of land eroded by the sea. The geological structure is still revealed on the mainland in the range of hills extending along the shore. These are chiefly of soft reddish volcanic ash loosely cemented, but with a great dike of black diabase forming a central rib, and with the ash partly capped by a flow sheet of diabase. This is shown in the accompanying photographs and sketches. The erosion of the soft ash and the breaking of the diabase dike have formed the islands. The first island is not wholly robbed of the ash flanking the dike, but on the second, Diamond Isle, nothing remains but precipitous cliffs of diabase. Parallel to the range of volcanic rocks and about four miles north of it, is another range composed of carboniferous slates and limestones, in which the barytes deposits have been found. The flat between is occupied by the marshes and flats at the mouth of East river and by the gravel plain on the banks of Bass river. The principal barytes deposits have been found in the sedimentary rocks, and the most extensive workings are on Bass river about three miles from the Government wharf at Five Islands.



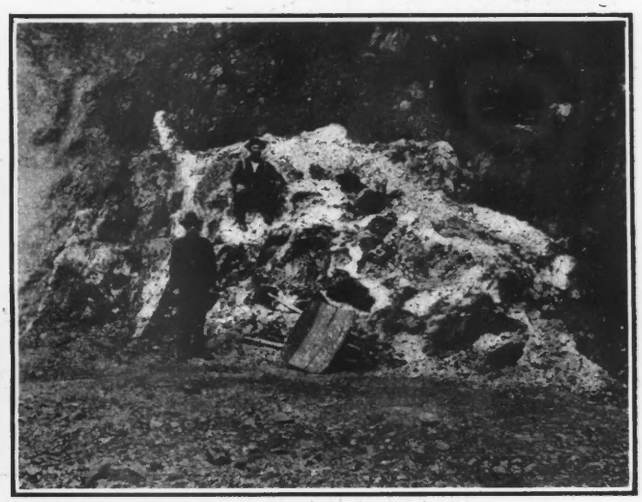
DIAMOND ISLE, FIVE ISLANDS, N. S.



BASS RIVER GORGE



THE LIGHT COLORED PORTION IS VOLCANIC ASH; THE DARK STRATUM IS DIABASE (SEE KEY)



BARYTES IN SLATE IN OPEN CUT

Early Workings

The mines were first opened for barytes in 1866 and from that date until 1871 the production is said to have been at the rate of 2000 or 3000 tons annually. Disagreement between owners of undivided interests in the property resulted in the closing down of the mines and the titles eventually came into very bad shape. Although the mines were idle for 35 years, their valuable character was known and attempts to clear the titles were made by various parties, without success, until taken up by A. R. Bayne, of Boston, who is now reopening the mines and will shortly begin shipment. Much of the old work was by lessees and was done as cheaply as possible without proper development and the mineral was gouged out wherever found. Shafts were sunk on top of the hill and tunnels driven from the face of the bluff which rises 250 ft. above the river. The old shafts are now caved, but two of the tunnels were reopened last year. Although caved at the entrance they were found otherwise in remarkably good condition, due apparently to the cementing action of the lime carbonate in the ground water, and sev-

*Consulting mining engineer, 101 Milk street, Boston, Mass.

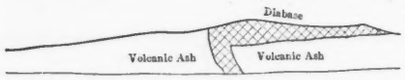
eral hundred feet of tunnels and drifts are now open.

Occurrence and Character of Veins

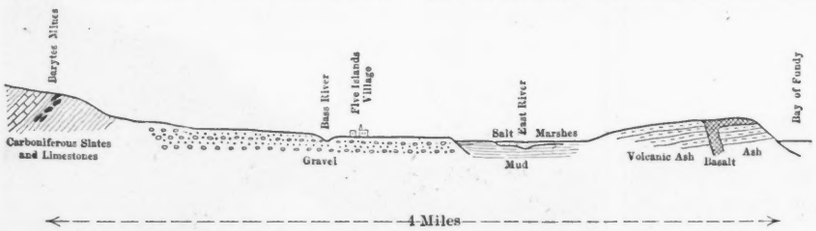
The Bass river barytes is crystalline and only slightly yellow on the outer surface and cleavage faces, while many specimens are pure white. The barytes occurs in veins in crushed and metamorphosed slates. The position of the old workings indicates that the principal bodies of barytes were found in a zone, perhaps 70 ft. in width, extending in a general northwest course from the river. The country rock in this zone is very much crushed, being recemented by carbonate of lime, which also occasionally lines cavities in the vein and forms beautiful crystals of dog-tooth spar. The veins of barytes have well defined walls, but hold no regular course or position. They show widths from a few inches to 4 ft., with pocket-like masses sometimes 10 or 15 ft. in width. At one point an open cut exposes a large but very irregular mass in black slate. This seems to fill the voids in a faulted and broken zone in the slate, with large and small irregular fragments of slate inclosed in the mineral. It is shown by accompanying photographs.

The analysis of a general sample taken from the bin at the mine gave the following results: Loss on ignition, 0.18 per cent.; SiO_2, 0.95; FeS_2, 0.07; Al_2O_3, 0.02; CaO, 0.02; MgO, 0.22; $BaSO_4$, 98.54; total, 100. The loss on ignition probably represents, besides moisture and combined water, organic matter and sulphur. The total amount of metallic iron present is 0.032 per cent. The magnesia probably occurs in the mineral in the form of talc, a hydrated silicate of magnesia. The analysis shows the remarkable purity of the barytes and specially selected specimens are almost pure barium sulphate.

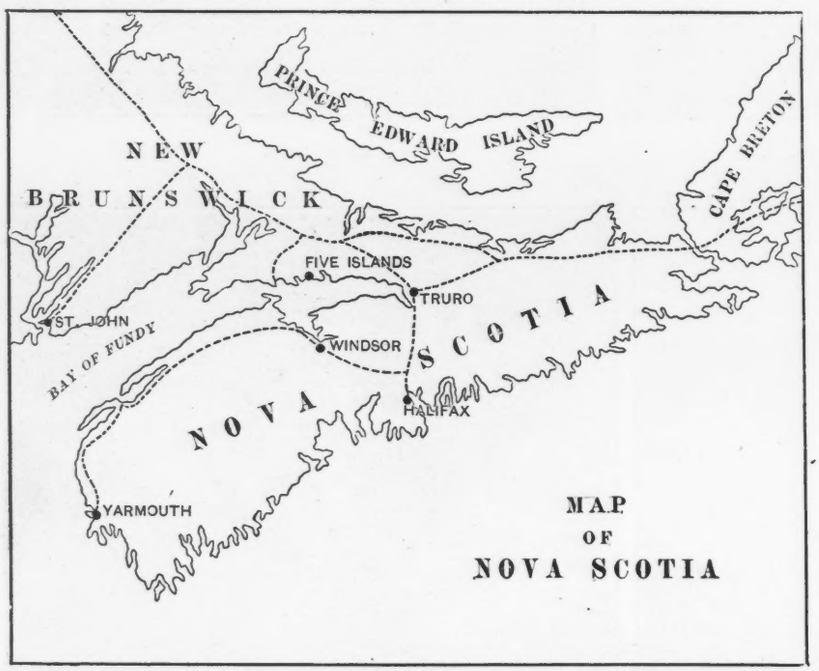
There is another deposit of barytes on East river about five miles northeast of the village. This vein is in chlorite rock, and an open cut and tunnel exposes it for a length of 50 ft. on the bluff above the river. One wall is regular and well-defined, but the other wall is generally broken and shows fragments of country rock inclosed in the mineral. This barytes is grayish white and wholly free from yellow stains. Both mineral and country rock break freely on cleavage faces and joints which will greatly aid in the profitable mining of the barytes.



KEY TO VOLCANIC ASH AND DIABASE DIKE



GEOLOGICAL CROSS-SECTION AT FIVE ISLANDS, NOVA SCOTIA



THE BARYTES DEPOSITS AT FIVE ISLANDS, NOVA SCOTIA

The Production of Sand and Gravel

The sand and gravel production reported to the statistical branch of the United States Geological Survey in 1906 amounted to 32,032,002 short tons, valued at $12,698,208; in 1905 the production reported was 23,204,967 short tons, valued at $11,223,645; there was therefore in 1906 an increase in quantity of 9,727,035 short tons, and in value of $1,474,563. The large increase in quantity and comparatively small increase in value is due to the fact that a large quantity of low-priced material, especially gravel having a merely nominal value, was reported as used for filling by contractors, railroads, etc.

Exclusive of gravel, from which a large part of the sand is screened, the total sand reported in 1906 was 24,501,992 short tons, valued at $10,067,668, which, compared with the production of 18,728,111 tons of sand, valued at $9,422,988 in 1905, shows an increase in quantity of 5,719,881 tons and in value of $644,680.

Glass sand which, on account of the purity of the material required, commands the highest average price, increased in production from 1,060,334 short tons, valued at $1,107,730, in 1905, to 1,089,430 short tons, valued at $1,208,788, in 1906, an increase in quantity of 29,096 short tons and in value of $101,058.

The molding sand reported in 1906 amounted to 3,371,103 tons, valued at $2,063,151. In 1905 this product was reported as 3,084,098 tons, valued at $2,102,423. There was therefore in 1906 an increase in quantity of 287,005 tons and a decrease in value of $39,272. This includes sand used for all kinds of molding—brass, steel, iron, brick, pig bed, etc. The price of this sand varies from 30c. to over $1.50 per short ton, according to the grade of the sand and the class of work done.

The most universal use of sand is for building, and 14,388,378 tons of building sand, valued at $5,166,532, were reported in 1906, as compared with 10,127,750 tons, valued at $4,284,740 in 1905, an increase of 4,260,628 tons in quantity and of $881,792 in value. This total includes sand for concrete building, mortar sand, and sand for rough and fine plastering, and the value per ton varies from 25c. to $1. The greater part of this material is dredged from the sea beaches on Long Island and from the Delaware, Ohio, Tennesse, Mississippi, and Missouri rivers, and is obtained very cheaply.

It is reported that a contract has been placed by the San Pedro, Salt Lake & Los Angeles Railway for a total of 10,000,000 bbl. of oil for locomotive fuel to be delivered over a period of five years. The average price of the oil is said to be 41c. per bbl., the railroad company undertaking to transport the oil from the wells.

Gold Mining in Colombia

By Juan de la C. Posada*

The Republic of Colombia at one time ranked first among the gold-producing countries of the world. Shortly after the Spaniards took possession, they began mining operations all over the auriferous rivers and in the outcroppings of the veins where the gold could be washed by the *batea*. When the gangue was not completely disintegrated, and the ore was rich in free gold, they resorted to hand crushing. No mills were known until 1825, when two Cornish wooden stamp mills were erected. In round numbers the Spaniards secured more than $400,000,000 in gold by washing without milling.

Enterprise of Early Miners

The work these early miners did is really wonderful. Among forbidding and wild surroundings, in hot and unhealthy places, full of poisonous snakes, jaguars, mosquitos and a thousand other natural enemies, without roads, far from all sources of supplies, and with African slave negroes as the only working force, they accomplished wonders. The lives lost in the primitive mining days of Colombia, the crimes that must have been committed in those solitudes, and the hardships endured by the Spaniards, speak volumes for the endurance of the Latin race. Even now the only successful work in real placer mining is done by the natives. I hear people talk of the lack of energy of South Americans. I should like to show such people the Porce river, for instance, during the mining season. It would give them a chance to learn a few things.

Inviting Failure

There are many cases of failure among foreign companies due to no other reason than that the managers do not know the conditions of the country and the way of profitably working the mines, and that the climate does not agree with them. Foreigners go there with the idea of doing things in their own way without taking advantage of the knowledge of the natives, and the results are too often disastrous.

Large sums of money have been invested in recent years without returns, especially by Americans, because it has been done in a reckless way. Few true engineers have been sent to study the properties, and extravagant plants have been ordered to be operated by men without knowledge of the country and the conditions prevailing in the mines. Frequently the men in charge are what Americans call "practical men," who know how to drink white rum and little more. Among the English companies there are fewer blunders, because they send better managers and make use of the experience of native engineers.

Quartz Milling

When quartz mining began, with the introduction of the Cornish mills, great fortunes were made by working the outcroppings of the large number of veins which are found in the country, especially in the departments of Antioquia, Canea and Tolima. Thousands of these light and primitive stamps have been and are still working, turning out the bulk of the country's gold production. These stamps weigh only about 400 or 500 lb., drop from 30 to 70 times a minute, and crush through a coarse screen about a half ton per stamp in 24 hours. The gold is collected on blankets, and when the pyrites obtained with the gold is rich, which is commonly the case, the old *arrastra* is used for recrushing.

The usual extraction by this treatment is not above 50 per cent., and commonly only about 30 or 40 per cent. I know this by actual experience at a large number of mines. The value of the ore from the veins which can be worked by this process is generally not less than $16 per ton. Taking 40 per cent as an average extraction, it appears that the tailings going to waste all over the country are $10 or more per ton.

It is difficult to calculate the gold produced in Colombia now from the working of the veins alone, but it is certainly close to $3,500,000 per year. Losing say 60 per cent. the mills throw away into the creeks and rivers more than $5,500,000 gold every year. I know from experience that the cyanide process is adapted to a great number of ores in Colombia, and I do not see why a large development of the mining industry will not come in the near future. A first essential, however, is to have competent and sufficient men for investigation and for working the process.

Smelting

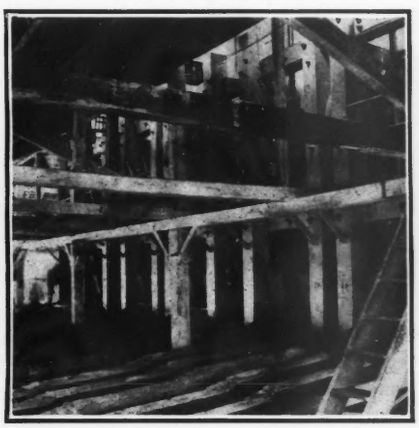
There is only one smelter for the precious metals in Colombia, viz., the Zancudo Smelting Works in Antioquia. It is managed entirely by natives, and it serves a single silver-gold property. For other mines it is of very little use by reason of the lack of transportation. Other smelting works cannot easily be constructed, because coal is found only in a few places, usually far from the mines, and the country is too mountainous for cheap railway construction. Besides, the mines are not as yet in condition to produce large amounts of material, and lead and copper ores are not abundant in the silver-gold districts for use as collectors for the precious metals.

In spite of the lack of railways and roads for the transportation of machinery, a number of companies are doing well and introducing modern methods and plants. The transportation drawback is so great that in the case of a new mining camp, which I have been developing for a Colombian company, about 75 tons of machinery had to be sectionalized under 400 lb. and transported on mule back for a distance of 80 miles, and the actual cost for freight was more than $10,000.

A Modern Colombian Plant

This plant consists of twelve 1000-lb. stamps with single four-discharge mor-

LA CONSTANCIA MINE



INTERIOR OF CONSTANCIA MILL

CLOUDS LYING OVER "PORCE"

*Mining engineer, Medellin, Colombia.

tars. Each stamp crushes from four to six tons of hard silicious ore per day through a 40-mesh screen. There is an electric installation of German manufacture for pumping, hoisting and lighting on the surface and underground. The pumps are of the turbine type, and can raise from 500 to 700 liters of water per minute to a hight of 80 m. with the expenditure of about 14 kw. of power. The dynamos are three-phase revolving-pole machines, and the motors are of the induction type. The hoist is a double-drum, three-speed machine. All the machinery was erected by natives, and is in successful operation under the same management. All the machinery is run by impulse wheels cast in Antioquian foundries.

The vein on which this mine is located can be traced for a remarkably long distance. It was worked by the ancients in the soft outcroppings with great profit, and is almost vertical and more than 12 ft. wide.

Other Operations

An English company has been successfully working extensive properties for more than 40 years in another district in Antioquia, and is now completing a 500-h.p. electric plant. The smelting works described in a preceding paragraph belongs to a Colombian company, and in a period of less than 35 years has produced a gross output of more than $10,000,000. In another district an English company is working a silver property, and the rich ore and the concentrates are shipped to Swansea.

This shows that mining in Colombia is not insignificant. If money has been lost there in mining ventures it is because the investors have not realized that before purchasing machinery it is necessary to open the mines in the proper way, using not foreign engineers exclusively, but in coöperation with the natives of the country.

Petroleum Competition in China

Consul W. T. Gracey, of Tsingtau, reports that Borneo and Sumatra oil is entering the market all over the Far East and displacing the American product, which so long enjoyed a monopoly. The Asiatic Oil Company is installing a modern plant at that Chinese port by which to handle oil in bulk, which will be cheaper than their competitors' method of selling in tins.

According to the report of the chief inspector of explosives of India, during 1906 there were 13 gunpowder accidents, causing 21 deaths and injury to 28 persons. Dynamite caused death and injury to two persons, and fireworks caused four deaths and injury to 14 persons. This is a remarkable showing for a country containing 300,000,000 people.

West Australian Mining Progress

Special Correspondence

An interesting estimate of the probable life of the Great Boulder Proprietary mine was recently published in the *British Australasian*, which has raised considerable criticism. At the end of 1906 the reserves of ore amounted to 548,490 tons; this, at present rate of output, was a supply for four years. It is assumed that the mine will continue this output for 10 years. In the face of recent developments in the lowest levels, and the anticipations now fairly drawn therefrom, and in view of the probability of working to a depth of 4000 ft., and the constant increase of the ore reserves, there is every reason to believe that the life of the mine will continue for many more years.

The bottom level (1350 ft.) in the Kalgurli mine is opening up splendidly. The full width of the lode has not yet been determined, but for the last 20 or 30 ft. driven in the formation it is over full width of the drive, the ore being a telluride of high grade.

Other Districts

At Coolgardie great excitement was caused recently by the rich crushing obtained by a party of tributers working on Bayleys mines; 60 tons yielded 779 oz. gold. This makes 1100 oz. obtained by this party since the recent sale of the old mine. The floating of a new company is now proceeding in London.

At Laverton, mining matters are much livelier. The Lancefield is still hampered by the question of ore treatment. The old Augusta mine continues to yield good returns to the small syndicate that purchased it three years ago when the old company gave it up. The work of development, etc., is being carried out by practical members of the syndicate in an efficient manner. In the 80-ft. winze from the 400-ft. level the reef varies from 4 ft. to 9½ ft. in width, and is of high grade. In the stope off the south drive the ore was worth 37 dwt. per ton, and shows 10 ft. wide. About 20,000 tons of high-grade ore are now blocked out and ready for stoping. The syndicate has divided the sum of £17,000 in dividends during the past two years.

On the Murchison fields mining is healthy. At Meekatharra, the Fenian, the Halcyon Extended, and the Batavia leases look very promising. The district State battery crushed during August 681 tons from various leases, for return of 1588 oz.

At Day Dawn, the Great Fingall has not been looking so well, as at lowest lovel the values fall off. This company has just concluded purchase of some leases near which contain a large low-grade body of ore, and will be easily treated at the mills. It is proposed to erect an aërial tramway to convey the ore to the mill.

The Pilbarra tin output for July was 78.80 tons, valued at £7648.

Copper

The Phillips river gold and copper fields are steadily progressing. The Puzzler lease has a lode 30 ft. wide, worth in bulk 8 per cent., while a portion of the formation carries 10 per cent. copper. Rich ore is being raised at West river from a lode 8 ft. wide. A parcel of selected ore from there sent to Wallaroo smelters returned 33 per cent. copper and a bulk parcel treated at a local smelter returned 25 per cent.

Good ore is being obtained in the Flag mine at Cundip. A fine block of ore has been sent to Perth for exhibit, and contains about 50 per cent copper.

The Sons of Gwalia copper mine at Northampton is looking well. It is situated alongside the railway station within the township. The company has a length of lode aggregating nearly three miles, in three payable formations which have been proved by shafts sunk all along the line.

The Anaconda mine at Murrin Murrin is keeping its smelters fully going from the mine, other neighboring mines having to send their ore away for treatment. A new find of copper is reported at York, in the center of an important agricultural district.

Other Mines

Latest reports from the far northwest fields near Derby are hopeful; many payable formations are now being worked, but present cost of cartage to the port is a drawback. Work has also been much hampered by the prevalence of malarial fever. The Government geologist is visiting the northwest fields, specially to report on the immense iron deposits at Yampi Sound.

Dividends paid by 15 West Australian companies during the eight months to the end of August amounted to £1,147,897 in all.

Miners in India

According to the report of the chief inspector of mines of India for 1906-7 the average number of miners working underground during the year was 48,508. The report says that Indians with some knowledge of mining, but better acquainted with agriculture, are finding their way to the South Africa mines in increasing numbers. This is accounted for by the inducements that are held out in the way of higher pay, shorter hours of work, and better and more liberal domestic accomomodations. Upward of 2300 such emigrants were employed last year in the Natal coal mines.

The only active chromite mines in the United States are in California, where two mines furnish a small product, used crude, for lining copper furnaces.

The Causes of the Panic

The New York *Evening Post* of Oct. 26 summarizes the causes leading to the financial panic of Oct. 17-26 as follows:

After a crisis in the markets, there is always abundance of authoritative information as to why any crisis whatever should have come. Opinions in cases of this sort will differ, because panics are psychological. But in any case, the inquiry remains as to just what caused such events as this week's early bank disasters, and the train of events that followed them.

First and foremost, stands the long-discussed scarcity of capital, wherein demands on the world's credit resources had outstripped supply. Such a situation meant either that new plans involving large use of money must be laid aside, or else that capital already lodged in older enterprises must be withdrawn. But its withdrawal left many older undertakings, and the banks whose funds were invested in them, in a more or less awkward situation.

Second, and as a corollary, must be cited the waste of credit during many years; by our "boomers" and promoters of 1901 and 1902, by the suspicious personages who bought up banks on margin, and built up their "chain," and by the infatuated financiers who threw us in debt to Europe during 1906 by hundreds of millions of dollars, for the purpose, chiefly, of putting up the price of stocks. The very much larger part of the community who had learned to live on borrowed money, have their part to answer for.

Third, such episodes as the life insurance practices, and the looting of the New York street railways, whose inevitable exposure shook the confidence of the ignorant man in the American financier and broker. If there are those who say, that the exposure of these wrongdoings made the trouble, and that hence the exposers are to blame, they are men who would denounce policemen for thrusting on our innocent mind knowledge that thieves exist.

Fourth in the list of responsibility stand the inadequate State laws for restriction of trust company investments, and the folly with which the presidents of these institutions have resisted propositions of reform during half a dozen years. Were they alone the sufferers from this week's events, one would be tempted to suggest that they had got their punishment.

If a final cause for the present week's phenomena were sought, it might perhaps be found in the recklessness with which newspaper headlines started the serious run last Wednesday morning, and the dastardly use of newspaper advertising columns, the ensuing day, by the notorious Boston tipster. Things like these, from which we turn with contempt in ordinary days, are often formidable engines of destruction at such times as these.

The Bituminous Miners' Agreement

The movement to revive the interstate agreement for bituminous coal miners will probably take shape this week at the meeting which began at Indianapolis on Oct. 29. This meeting is a preliminary one only, and the first steps toward it were taken by the officers of the United Mine Workers; though the subject had been discussed by operators, especially in Indiana and Ohio. The bituminous mines of the West since last spring have been working under independent district agreements, all of which will expire April 1, 1908. There will be present at this conference representatives from the operators' associations in Ohio, Indiana and Illinois; whether the Pittsburg district operators will join them is still uncertain, though some delegates were probably sent.

Though not directly connected with this movement, some importance attaches to the meeting of the Association of Commissioners and Secretaries of Coal Operators' Associations, held in Chicago last week. The associations represented were those of Illinois, Indiana, Iowa, West Virginia, East Tennessee, Southwest Kentucky and the Southwestern Interstate Association. The meeting re-elected Herman Justi president; T. W. Davis, vice-president; C. L. Scroggs, secretary. The following declaration of purposes was adopted, or rather re-affirmed:

1. Unrestricted right to hire, and right to discharge restricted only by specific contract provisions.

2. A definition of the eight-hour-day as applying to all classes of labor under the eight-hour agreement.

3 A declaration as to what constitutes emergency or necessary work during suspension of mining, and an agreement that men shall do such work at all times regardless of labor disputes or expiration of contracts.

4. A declaration favoring that a monetary consideration be assessed against any local union for any violation of agreement resulting in the shut down of any mine or mines.

5. The establishment of a court of last resort within the coal mining industry.

The following resolution with regard to wage agreements was also adopted:

"It is the sense of this meeting that the coal operators of all bituminous interests whose contracts expire on March 31, 1908, should meet together not later than Jan. 1, 1908, for the purpose of deciding the policy to be pursued regarding future contracts with the miners; and further that the presidents of the respective coal operators' associations should confer by correspondence or otherwise with a view to arranging such meeting."

Diamonds in the Original Matrix

Interest in the genesis of diamonds and in the possibility of having found new information as to sources from which the stones are derived was recently revived at a meeting of the British Society for the Advancement of Science. The occasion of the discussion was an exhibit of a diamond in its original matrix, the specimen having been discovered by H. R. Pike, near Inverell, Australia. With a view of determining the character of the mother rock, a couple of slices of it were ground down to thin sections and examined. It was found that the rock was entirely different composition from any other known diamond matrix. The stone in question was discovered while driving a tunnel through a dike of igneous rock. The specimen was most critically examined by the chief scientific authorities on diamonds and all were satisfied as to the absolute genuineness of the discovery.

This particular instance is not the only case where diamond in its matrix has been found in Australia. E. F. Pittman, Government Geologist, has reported the occurrence of diamonds in a probable matrix at the Ruby Hill mine, between Bingara and Tamworth, New South Wales. In this last case, however, there is a slight doubt as to whether the diamonds are really in the original rock. They were found imbedded in igneous rocks coming from a region where volcanic breccia and igneous boulders are traversed by various systems of dikes, and the specimen found was in such a weathered piece of rock that it is not entirely certain as to whether the original matrix was found or not. Reference may also be made to the discovery of a diamond in its matrix in Arkansas, mentioned in the JOURNAL of Aug. 10, 1907.

Foreign Corporations in Colorado

The United States Circuit Court of Appeals at St. Paul, Minn., Oct. 25, decided that the Colorado statute prohibiting any foreign corporation from prosecuting or defending a suit in that State unless it has paid an annual license fee of 2c. for each $1000 of capital stock, is unconstitutional as to any corporation engaged in interstate commerce. The court adds that the statute governs intra-state commerce only. The decision was rendered in a suit brought by the United States Rubber Company, a New Jersey corporation, against a Colorado shoe firm. The court holds that the New Jersey corporation is engaged in interstate commerce, which cannot be hampered by any State.

The Fuel Situation in the Northwest

Car Shortage and Scarcity of Labor Create an Alarming Condition Which is Likely to Cause Another Coal Famine

BY FLOYD W. PARSONS

The most serious problem that confronts the people living in the Northwestern States is the question of a sufficient fuel supply. The coal famine that occurred last winter reached such proportions and caused so much physical suffering in addition to the curtailment of industrial activity that the attention of the entire country was directed to this region, and much concern has been evinced as to the outcome of the existing conditions.

On the ranches and the more isolated settlements the inhabitants were compelled to destroy fences and out-houses to furnish fuel for heating and cooking purposes. In some of the larger towns the citizens secured coal by strenuous means, using shot guns to prevent the railroad companies from hauling cars of coal through the town limits. Conditions almost as severe prevailed at the mines and smelters, so that the operating companies were unable to work full time.

After the severe experience of last year, it was expected that proper efforts would be made to prevent any scarcity of fuel this winter, but at this early date it is evident that if there is a sufficient coal supply this year it will be due more to the curtailment of mining and smelting operations than to any betterment in transportation facilities, or the laying in of a large surplus supply.

The Territory and the Coalfields

The region generally referred to as the Northwest comprises the States of North Dakota, South Dakota, Nebraska, Montana, Wyoming and Idaho; the fuel famine last winter, however, was also severely felt in Kansas, Utah and Nevada. The general map which accompanies this article shows the various coalfields of the Western United States, and the districts from which the Northwest draws its fuel.

The largest coalfield in the Rocky mountain region is that territory lying in North and South Dakota and extending into eastern Montana and Wyoming. The beds found in this district contain a lignite that is fairly useful for domestic and steam purposes, but will not stand storage or transportation in a satisfactory manner. Coal is mined principally at Newcastle, and at Sheridan, Wyoming, both districts lying on the route of the Burlington railway. Coal operations are also carried on south of Billings and near Livingston, Montana, on the lines of the same road. All of this coal now goes to supply the local and western Montana demand. The coal output from the Rock Springs and Diamondville districts, on the Union Pacific in southwest Wyoming, also goes north and west and furnishes much of the fuel used by the copper mines of Montana and Utah; in fact, the Diamondville mines are controlled by the Amalgamated Copper Company and its subsidiaries.

Southwest of Great Salt Lake in Utah a fair quality of coal is produced by the Utah Fuel Company at Castle Gate on the lines of the Denver & Rio Grande railway. None of this coal is shipped east, the entire production being used in Utah and other western fields. The districts already mentioned furnish practically the entire coal supply for the Northwest, as all the coal mined by the Colorado operators is shipped south and east. The coal mined by the Colorado Fuel and Iron Company west of the Rockies on the Rio Grande railway is used locally at Leadville and other Colorado mining centers. Indian Territory coal goes to Texas, and Kansas coal finds a ready local market.

Causes of Coal Shortage

There has been much discussion of the main causes of the annual coal famine in the Northwest, and numerous explanations have been advanced. Looking at the subject in a general way, it is evident that the mines now operating have a possible output capable of satisfactorily supplying the entire demand. It is true, however, that none of the companies is producing its maximum output, which condition is due, first, to the inadequate facilities for transportation, and, second, the deficient supply of labor.

Transportation Problem

Not only in the Northwest is the problem of transportation of uppermost importance, but throughout all parts of our country the question of car shortage is continually discussed. I do not hesitate to say that no large railroad in the United States today is able to handle promptly all the freight that originates on its lines. From all industries, we hear the same cry, "Give us cars." On some roads the officials are almost desperate and have ceased bluffing, being most willing to acknowledge their inability to properly handle their freight.

A careful examination of the question, however, reveals the fact that it is not always a shortage of cars. A Western coal operator had been unable to ship any coal from one of his mines for several days; he finally complained to the general traffic manager of the road, and was assured that there were 1100 available cars on that particular division. Further investigation showed the whole trouble to be the lack of motive power.

Are the Railways to Blame?

At certain frequent times the different railroad systems attempt to practice unusual economy and cut down expenses to a minimum. The curtailment on each road follows the ideas of the head of the system, so in one case an order may be given to do no more heavy repairing on engines and rolling stock; this plan results in a saving of many thousands of dollars annually, but when business picks up suddenly, as it always does, the road that has economized in this way is wholly unable to properly move its tonnage. One road in the West today is in this precise condition, and is becoming more incapacitated every day.

Other managers curtail in the use of stationery and various departments of the business without in any way impairing the capacity of the operating end of the road. When the rush of business comes on a railroad managed in this way it is ready and in fit condition to take care of its increased business.

The vital point to consider, however, is the rate at which shipping has recently increased. Most roads are today actually carrying twice the tonnage they handled a few years ago. Taking as examples a few of the railroads in Colorado (and conditions are similar elsewhere), a few figures will throw some light on the subject.

Beet Sugar and Freight Cars

In showing the great industrial growth of the West, and as a consequence, the increased demands on transportation lines, it is only necessary to select and briefly examine the progress of one or two common industries. In 1900 there was practically no beet-sugar industry at all; in 1906, Colorado mills shipped 3,600,000 bags of beet sugar, and this year will show a production of at least 4,000,000 bags. If we allow 500 bags to a car (which is a maximum) it is evident that the railroads must furnish 8000 cars annually to carry the finished product. The sugar is made in October, November, December and January; but the work of bringing in supplies and hauling the raw beets to the mills extends over the entire

year. As an example of the tremendous demands made on the railroads by this one industry, I may state that on September 16 the Colorado & Southern railroad placed 250 wooden dump cars at the disposal of the two large operating sugar companies. Since the tonnage of refined sugar is but 15 per cent. of the total tonnage of raw beets, it is easy to compute the tremendous quantity of beets that must be brought to the mills. The sugar produced goes to Indian Territory, Oklahoma, Texas and Missouri river points; but since 50 per cent. is carried by the Union Pacific and Burlington railways, the cars employed reduce the number of available cars for western service. Of the remaining 50 per cent. of beet-sugar tonnage, the Colorado & Southern hauls 30 per cent. and the Sante Fe about 20 per cent.

Cement Industry Tonnages

Another industry that is growing with great rapidity is the cement business. In 1905 the United States produced 40,000,000 barrels; in 1906, 51,000,000, while this year will show a production of 60,000,000 barrels. An investigation shows that if all the factories that are now being built are completed and producing by Jan. 1, 1909, the country's cement production will be about 100,000,000 barrels. Since an average railroad car will carry only 150 barrels, it is evident that this year's production will require 400,000 cars to transport it.

In Colorado alone one company produces 800,000 barrels which requires more than 5000 cars each year. This same company uses 300 tons of coal each day to run its plant.

When it is considered that nearly all industries throughout the West are expanding in a manner proportionate to the manufacture of beet sugar and cement, it is evident that the best managed railroads must have difficulty in keeping pace with the growth of traffic. Within a year one railroad will be called upon to carry 1100 carloads of canned goods from three

FIG. 1 THE WESTERN, SOUTHWESTERN AND ROCKY MOUNTAIN COALFIELDS.

factories, one of which is completed and shipping. Then there are the lumber, stock, and numerous other industries, all of which need cars and motive power, as well as the coal industry.

Labor Problems

The scarcity of labor in the West is more pronounced at present than at any time during recent years. This condition has resulted in advancing wages until in some localities the workmen practically fix their own rate of pay. In San Francisco (where conditions, of course, are abnormal) the commonest laborer such as a hod-carrier receives $8 per day, while bricklayers are paid as high as $12 per day. In Colorado, Montana and Utah, conditions are not so severe, but the deficiency of men is forcing employers to pay unusual wages.

The president of one large coal company recently sent an agent to California to secure several hundred Japanese for work in the mines. The report to the president of the company stated that no labor could be secured. It also said that in one county alone there were 8000 Japanese picking raisins and receiving from $6 to $8 per day. Many men are drawn from the mines into the cement and beet sugar industries because the pay is nearly as good and the work less disagreeable and dangerous.

The laborers employed in the beet fields are principally Russians, Japanese and Mexicans. The work is done on the contract system, each man contracting to care for a certain number of acres at so much per acre. In doing the work, which consists principally of removing weeds, the whole family is put to work and can often earn $100 or more per month.

The farmers who raise beets independently are paid $5 per ton. The yield per acre averages about 20 tons.

The miners in the coal mines of Colorado can make from $3.50 to $4.50 per day. In Wyoming and Montana the miners are organized and are seeking to draw laborers from the Colorado mines; in fact, it is not difficult for any miner in southern Colorado to secure free transportation to the Wyoming fields.

The general labor situation may be judged from the fact that one Union Pacific coal mine with a capacity of 9000 tons daily is now producing 3000 tons. The Union Pacific coal goes east and conditions here made it necessary for this system to buy 25,000 tons of Australian coal to be used on the engines of the Southern Pacific railroad between Salt Lake City and Reno, Nevada.

The search for laborers throughout the entire West is keen and, although less pronounced in the beet-sugar industry, there is one mill at present needing 60 men, and other plants are proportionately short. The curtailment in the copper industry has thrown several thousand men out of employment, and some of these may drift to the coalfields and help relieve the situation.

Although the necessity for laborers and skilled workmen has forced the wages of these men to abnormal hights, the same rate of increase in the pay of other classes of workmen has not taken place. At many mines the foreman does not receive any more than some of the carpenters and miners who work for him, and in some cases not as much. Clerks and office men receive no more than they did five years ago, and the wages of street car employees, mail carriers, etc., have not been advanced like the wages paid laborers and skilled mechanics.

No matter, however, what the details of the situation suggest, the labor problem is the most important consideration the West faces. The recession in mining has not extended to many other industries; nor has the money situation afforded any relief to the labor situation by placing workmen on the market. The railroads in the West will have to expend at least $4,000,000,000 on equipment, extension and improvements in the next few years, and this condition is only typical of the situation in other industries. It is, therefore, difficult to see where the men necessary to carry on the new improvements are to be drawn from.

Needs of the Railroads

It is evident from the foregoing general discussion that many things are responsible for the scarcity of fuel throughout the entire Northwest and that the fault cannot be accredited to any one condition. The railroads are undoubtedly trying to do their part in relieving the situation, and in but few cases is the trouble due to inefficiency of management.

The Santa Fe railroad west of Albuquerque, New Mexico, showed a 40 per cent. increase in tonnage for the fiscal year ending June 30, 1907. A similar increase in business took place on all western roads. New equipment is being secured as speedily as possible. and every effort is being made to handle the increased tonnage. Take for example the Colorado & Southern lines. During the past 15 months, this road has purchased 53 freight locomotives, 10 switching locomotives, 13 passenger locomotives, 2276 freight cars and 26 passenger cars. This road alone handles 6000 carloads of potatoes annually, while the Union Pacific hauls an equal tonnage of this same product. In July of this year, the Denver & Rio Grande railroad handled a mine output of 628,000 tons as compared with 557,000 tons the same month last year, and a similar increase was registered in every other branch of the business.

Is it any wonder then that coal in Nevada, California and other Western States is selling for from $14 to $20 per ton? Colorado coke of good quality can be delivered at the mines and smelters of Arizona and northern Mexico for $8 or $9 per ton, but these same operators found it necessary recently to purchase more than 2000 cars of Connellsville coke at a price of from $12 to $18 per ton, at their mines, and wait several months for delivery. At the same time the largest two Colorado coal companies could not secure cars and labor sufficient to enable them to operate half their ovens. The Western fuel situation is at present alarming, and few authorities care to suggest a remedy or speculate as to the outcome.

Coal in China

The commissioner of customs at Tientsin states, in his report for 1906, that the mines of the Chinese Engineering and Mining Company, while no longer the only source of coal supply in North China, continue to occupy the first place. The total output of these mines in 1906 amounted to 958,675 tons, as compared with 851,523 tons during 1905. Of this quantity the railways took 136,077 tons as locomotive fuel; the supply of bunker coal to steamers required 48,320 tons; the local market at Tientsin and the immediate vicinity consumed 201,155 tons; 43,184 tons were sent into Manchuria by rail, and the sales made locally at the mines and at various stations along the railway, exclusive of Tientsin, amounted to 302,882 tons. The exports by steamer to Shanghai, Ningpo, Chinkiang and Hankow were 102,615 tons; to the northern ports —Chefoo, Newchwang, Tsingtau and Lungkow — 51,298 tons were shipped. Every effort is now being made to increase the output, and, with that end in view, there has been a heavy expenditure on new plant during the past year.

The mines of the Peking Syndicate in Northern Hannan have encountered obstacles and set-backs which have greatly delayed their development. Nevertheless, there is from these mines a regular production of a very good quality of anthracite coal, which, besides supplying the consumption of the locomotives on the Tao-Ching Railway, is largely used as household fuel at Tientsin. Another mine, which is already a regular producer and of which great hopes are entertained, is the Tsingking mine in Shansi. This mine produces both bituminous and anthracite coal of good quality, and, besides supplying fuel for the Shansi Railway and coke for the Government mints, furnishes household fuel to a considerable extent to Tientsin residents, and is seeking larger markets.

The action of an injector is due to the transfer of the momentum of a jet of steam moving with a high velocity to a hollow cone of water, drawn into the tubes by the partial vacuum caused by condensation.

First-aid Organization of the Lehigh Valley Coal Company

By M. S. Hachita*

First-aid corps have been inaugurated at all the collieries of the Lehigh Valley Coal Company. Dr. Lathrop, of Hazleton, has been appointed as consulting surgeon in charge of the work. A circular letter has been sent out by the general manager of the company to all the colliery officials. The letter is as follows:

"With an earnest desire to alleviate the sufferings of those of its employees who are unfortunate enough to meet with injuries while at work, the Lehigh Valley Coal Company undertakes the organization and equipment of corps for the administration of first aid to the injured. Such an effort cannot hope to be successful unless it receives the heartiest interest and support not only of the officers of the company and members of the corps, but of each and every one of the employees for whose benefit it is carried on. The company therefore urges the earnest cooperation of its entire organization in this work.

"One or more corps of men shall be organized at each colliery for the purpose of aiding and caring for injured persons, to be known as the Lehigh Valley Coal Company First-aid Corps.

"Each corps shall consist of a steward and a sufficient number of assistants to cover the various sections of the colliery operations, both inside and outside. They shall be selected by the colliery foreman from those volunteering for the service, with a view to properly distributing the force underground as well as on the surface, so that some of the members will be reasonably available at all times. Under ordinary conditions a corps of not more than six men would be sufficient for the surface, and one or more corps of six men each (depending upon the territory to be covered) for the inside and they should be made up of men interested in the work and who can be depended upon in times of emergency. Changes in the personnel of the stewards and the members of the corps will be made from time to time as the welfare of the organization may require.

"Each member of the corps will be provided with a copy of the 'First-aid Manual' and a small emergency first-aid package, which he will be expected to keep with or near him while on duty. He will also be provided with a suitable badge or button indicating his membership. Stretchers, blankets, and other necessary equipment will be provided and kept at accessible stations.

"The members of the corps will be instructed from time to time by surgeons and others experienced in administering first aid to the injured. They will be expected to familiarize themselves as thoroughly as possible with the manual and with the practical carrying out of the instructions contained therein and given them by their instructors. Meetings should be held at reasonable intervals for the purpose of practice drills, discussion of instructions and otherwise maintaining the corps at a high state of efficiency.

"Competitive drills between various collieries and regions will be arranged for in the course of time.

"Dr. Walter Lathrop, superintendent of the Hazleton State hospital, will act as consulting surgeon in charge of this work.

S. D. Warriner,
General Manager."

*Engineer, Lehigh Valley Coal Company, Wilkes-Barre, Penn.

Inflammability of Mixtures of Coal Dust and Air

In London *Engineering* (Sept. 6, 1907) is a brief account of the experiments made by Professor Phillips Bedson before Section B of the British Association at its recent meeting. In investigating explosions in brown-coal briquet works, Professor Bedson explained, Holzwart and Ernst von Meyer had projected about a gram of the dust through the spark-gap of the two platinum electrodes. In conjunction with Mr. Widdas, Professor Bedson first used a similar arrangement, and then fitted glass tubes, 1.5 in. in diam., into opposite sides of a tin box, up to 9 in. cube, which was provided with a hole in the bottom and top, so that a gas flame would burn inside the box. The dust—previously passed through a sieve with 100 meshes to the inch for the demonstrations, because freshly prepared dust was far more inflammable than old settled dust—was placed in the one glass tube and blown into the box by means of a bellows, producing an air current under measured pressure. Some dusts would inflame under these conditions, flour and powdered aluminum flashed up violently, but coal varied considerably.

To arrive at more comparable results, Professor Bedson then enlarged his box, raised his quantity of dust to 2 grams and more, and ignited it by means of a spiral wire, suspended in the box and heated by a measured current. In some cases he employed a glass globe or box, closed on the outlet side, in which explosions could be watched; and to test the propagation of inflammable waves he connected two of his boxes in series. It was demonstrated that road dust and charcoal dust were not directly inflammable, nor was the "dant" of the Durham coal-seams, which had particularly been suspected by colliers; fine coal-screen dust did not prove bad. The most inflammable coals seemed to be those which contain much volatile gas. The amount of moisture in the coal was of little influence as long as the dust was not absolutely wet; otherwise, moisture only raised the temperature of the ignition point.

The Absence of Safety Lamps in Swansea Coal Mines

A large number of collieries in the Swansea district of South Wales continue to use naked lights. Most of these mines are fairly free from firedamp and from dangerous deposits of coal dust. However, during 1906, no fewer than 28 explosions occurred. Four of these produced fatal results, although the total loss of life was only eight. W. N. Atkinson, the Government inspector, says that for years past the efforts of the inspectors have been directed to induce the owners of these mines to introduce safety lamps, and the use of safety lamps is gradually increasing, but at a very slow rate. The miners prefer to use naked lights in spite of the risk, and demand an increase of wages when safety lamps are substituted, and this is probably the principal reason for which the owners resist the change.

In many parts of the Swansea district, even where safety lamps are used, the discipline is so lax that the lamps do not afford such full protection as they do in districts where better discipline is maintained. In this way explosions caused by illegally opened lamps, or by matches illegally taken into the mines, are of too frequent occurrence. These are both illegal practices which it is largely within the power of the owners and managers to prevent, and the means of doing so are well known, viz., the adoption for safety lamps of locks incapable of being opened without detection, or of such a nature that they cannot be opened by the miners (magnetic or pneumatic locks); stricter supervision by officials; and occasional unexpected searches for pipes, matches, or means for unlocking lamps.

Another matter connected with explosions, which requires consideration, especially in the case of dusty mines, is the construction of the safety lamps used. The lamp most largely used in South Wales is of the Clanny type, with single gauze and metal shield. This is admittedly one of the least secure forms of lamp used in Great Britain, and it seems strange that in South Wales, where so many devastating explosions have occurred, its use should be so general.

The floor of the weighing house is usually placed on a level with the weighing platform, but an elevation of the weighing-house floor at least 5 ft. above the scale platform enables the weighmaster to see if the car is properly loaded, as well as the size and kind of coal in the load.

Colliery Notes, Observations and Comments

Practical Hints Gathered from Experience and from the Study of Problems Peculiar to Bituminous and Anthracite Coal Mining

DEVELOPMENT AND MANAGEMENT

The consumption of coke in Austria-Hungary in 1906 was, in round figures 2,000,000 metric tons. There were 1,700,000 tons made in the country, of which 300,000 tons were exported, while the imports were 600,000 tons.

The pumps of the anthracite mines of Pennsylvania are estimated to have an aggregate capacity of more than 500,000,000 gal. of water per day, or 2500 gal. per ton of coal hoisted, about 9 tons of water raised per ton of coal hoisted.

In operating a coal-cutting machine the bits must always be kept in good condition, otherwise the machine will not operate properly and economically. They should always be set to cut a kerf of at least 4¼ in., so that the cutter head may have ample space to pass in and out.

The consumption of coal yearly in different countries per head of population is computed by W. Kestraner as follows: Great Britain, 4680 kg.; United States, 4050; Germany, 3140; Belgium 2980; Austria-Hungary, 1370; France, 1190 kg. The consumption is, of course greatest in the countries where manufacturing is on a more extensive scale.

Vesta No. 4, at California, Penn., owned by the Jones & Laughlin Steel Company, in one month recently produced 174,338 tons of coal. The largest daily output was 7225 tons. The vein averages 6 ft. in thickness. In the mine there are 85 miles of stationary track and 24 miles of movable track running into the rooms. There are 28 electric locomotives used for haulage.

The production of coal in Austria-Hungary in 1906 was: Bituminous, 13,500,000 metric tons; brown coal, or lignite, 24,200,000; total, 37,700,000 tons. About 900,000 tons of bituminous and 7,200,000 tons of brown coal were exported, while 7,500,000 tons of bituminous were imported. The consumption was therefore, in round figures, 37,100,000 tons, of which 17,000,000 tons were brown coal.

It has been estimated that from the beginning of the coal-mining industry in the United States up to the close of the year 1902 the total amount of coal produced was about 4,860,000,000 short tons. This aggregate of fuel would make a pyramid as high as Pike's Peak, and with a base 1.14 miles square. Or a layer one foot in thickness might be spread over an area equivalent to that of Rhode Island and Connecticut. A cube formed of the coal would be 1.05 miles in each of its three dimensions.

Director Tanaka, of the Bureau of Mines, at Tokio, states that the coal mines at Fuchung, east of Mukden, are very rich, their value being estimated at $150,000,000 to $250,000,000. From recent borings made by the Japanese it appears that in one part of the district the bed of coal is 100 ft. thick and of good quality. Analysis shows that inferior Manchurian coal is superior to the finest quality of Japanese product.

One of the advantages of wooden pipe lines over cast-iron or steel pipe is in the reduced trouble from frost. Cast-iron or steel mains must be laid below the maximum frost line unless at all times a high velocity of flow in the pipe is to be maintained. In a large part of the United States the maximum frost line extends to a depth of from 5 to 7 ft. A wooden pipe can be laid one foot under ground without fear of its being damaged by the water freezing inside the pipe.

Recent tests have shown that a storage-battery locomotive is an ideal motive power for use with narrow-gage cars, as it will run around curves of 12-ft. radius as easily as a wagon turns a corner. No trolley wires are necessary, as the power is furnished by a storage battery which can be recharged at night or when the locomotive is idle during the day. There are no fire risks and the locomotive can run on any track, permanent or temporary. Every wheel is a driver, thus every pound of weight to give draw-bar pull is utilized.

In operating a coal-cutting machine by electricity the most economical means for transmitting power from the feed wire in the entry to the machine is a cable which is carried about the mine with the machine. This cable is usually 250 ft. long, sometimes longer, and is wound upon a convenient reel. The cable should be of the twin type, two wires being laid side by side, thoroughly insulated from one another and securely bound together. At the ends of each cable two hooks should be attached for making contact with the wire in the entry. The cable is carried up into the room on the reel with the machine.

The heating and insulating properties of any steam-pipe covering are reduced to a minimum when wet, because water is a conductor of heat. Ordinary coverings made wholly or in part of organic materials are subjected to decay if they become wet or are attacked by an acid and their power of insulation is decreased. Whatever the covering used to obtain a steady insulation, it must be protected from external moisture wherever the pipes run in mines. The usual practice in the anthracite field is to employ an asbestos roofing material to fit over the various sectional coverings, with a waterproof composition to seal the laps and joints.

No single set of rules can be rigidly adhered to in planning an electric haulage plant; each equipment should be treated as a special problem. When the grade is over 4 per cent. some other means of mechanical haulage should be considered. Either the third-rail system or rope haulage might be used to advantage. Where the grade is not over 4 per cent. it should be borne in mind that the expense of installing and maintaining an electric haulage is comparatively slight when compared with the results obtained, because of its simplicity, its flexibility, the low cost of extension, repairs and the quickness and unexpensiveness of making changes in the transmission circuits.

Steel bands are, in the opinion of some engineers, better for binding wooden stave piping than steel or copper wire. The bands are too wide to sink into the wood and all excessive pressure is taken up by the elastic steel, and if this pressure is not beyond the tensile strength and elastic limit, the pipe will retain its form regardless of uneven pressure. Whereas when wire binding is used in pipes subjected to an uneven pressure of 50 lb. or greater, leaks are apt to appear along the longitudinal seams. When the pressure is high the wire is forced into the face of the wood; when the pressure is lower the tension of the wire relaxes and leaks appear.

Manila hoisting ropes are subjected to hard usage because of the small diameter of the pulleys over which they are usually run and the heavy load in proportion to their strength. A rope that is too small wears out rapidly. No definite rule can be given for the amount of coal that can be hoisted with a rope, as it depends upon the quality of the fiber, the method of laying the rope, the diameter and condition of the sheaves, the kind of weather in which the rope is used and the load in proportion to the strength of the rope. Experience has shown that the economical working load on a 1⅛-in. manilla hoisting rope is 500 lb.; on the 1¾-in. rope it is 600 lb.; on the 1⅜-in. rope it is 750 lb.; on the 1½-in. rope it is 900 lb.; and on the 1¾-in. rope it is 1250 lb.

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Contents

Undercurrents in Copper

The recent decline in the copper market brought about many transactions of an unusual character. The position of many American producers, having large stocks of unsold metal on hand, which the financial situation at New York made it difficult to carry, led to the transfer of considerable quantities of the metal to Europe for financial purposes. A considerable part of the exportation in October was of this character. Of course, this constitutes no absorption of the stocks of accumulated metal, but simply a removal of them from one place to another.

Another set of transactions was of a similar character. The price at which producers were willing to sell electrolytically refined copper declined to close terms with the speculative price for "standard" on the London Metal Exchange, and even went lower than the latter. As is well known, the regulation contract for "standard" permits the delivery of electrolytic copper against sales of "standard" at a premium of one pound sterling over the price of "standard." American producers took advantage of this situation by selling "standard" in the London market and shipping abroad electrolytic copper to make deliveries, these sales having been made largely under the three months' option. This again constitutes no absorption of the metal for consumption, but simply a transferal from one set of hands to another.

However, this has had a speculative effect upon the market, because traders who had undertaken to carry rather large quantities of electrolytic were disposed to assist in an upward movement, while the bears who had been operating for a further decline, seeing a tendency of the market to go against them, became ready to bid for further supplies of electrolytic copper with which to cover their short contracts. The advance in the market during the last week is explained partly in the above way, but also there has been a greatly increased demand for consumption, especially in Europe. It is hoped that the domestic manufacturers, observing that the market has resiliency under speculative and other influences, will now make up their minds that it is time for them to manifest themselves. Indeed, they have already done so to some extent, but the rapidity of the advance has been too pyrotechnical in character to stimulate great confidence in the stability of the market at the new level, and although they may recognize that the price of copper has been very cheap indeed it is thought to be dangerous to make large purchases until justified by an increased demand for ultimate consumption. Evidently the domestic market is still under the shadow of the adverse financial situation.

The End of the Panic

The recent financial panic was brought about by a multiplicity of causes, which are excellently summarized in an article from the *Evening Post* of last Saturday, which is reproduced elsewhere in this issue; but broadly speaking, the scare of depositors in banks and trust companies was psychological. Financial difficulties are not yet straightened out, and probably will not be for a considerable time to come, but undoubtedly the panic is over. This happy result has been effected by the broad-minded policy of the leaders of high finance, in the real meaning of that term, aided by the intelligent and powerful cooperation of the Secretary of the Treasury.

The issuing of clearing house certificates, the announcement by the savings banks that they would require the full legal notice as to withdrawal of deposits, the decision of banks and trust companies on which runs have been made to pay off depositors only by checks so far as possible, the reduction in the prices for commodities and stocks which have stimulated large sales in Europe, and induced the importation of a large amount of gold, the restraint put upon the speculators in stocks, through the brokerage houses, preventing short selling, preventing purchases upon margins and putting the bulk of the business in the New York Stock Exchange upon a strictly cash basis, have contributed to the relief of the stringency in money.

There have been large losses during the recent disturbance, suffered on the one hand by innocent persons to whom commiseration may be extended, but on the other hand, by reckless speculators who deserve no pity. On the contrary, there is general congratulation over the elimination of these. The bursting of the tension which for several years they have put upon commerce and industry will eventually be to the general good. There is

hope that our financial operations may now be restored to a sounder basis. The reduction in the volume of transactions on the New York Stock Exchange, since short selling and marginal transactions have been eliminated, speaks loudly in favor of permanency for such a policy.

The Barnes-King Affair

In our recent remarks respecting the Barnes-King Development Company we recommended that judgment be suspended until all the facts should be known. The desirability of such moderation is well exemplified by the straightforward letter of R. B. Lamb, one of the engineers referred to in the matter. Mr. Lamb has been out in the field on engineering work and his attention was not directed to the articles in the newspapers until he reached New York a few days ago. There are generally two sides to a dispute. Surely all mining engineers who are anxious to uphold the reputation of their profession will be pleased by the statement as to his connection with the Barnes-King company, which Mr. Lamb now makes. As to whether Mr. Lamb was correct in continuing his connection with the company, holding the opinions that he did, is another question altogether.

We take advantage of this opportunity to emphasize again the reprehensible, indeed almost criminal, action of some careless newspaper correspondents in besmirching the names of honest professional men by direct charges and miserable innuendoes in connection with this matter. This mischief is the result of irresponsible gossip in local newspapers. The introduction of Mr. Weed's name in the matter did not originate in the recent report of Messrs. Gillie and Goodale. They had not seen the report which Mr. Weed made of his geological study in behalf of clients not connected with the Barnes-King company or the promoters thereof (referred to by Mr. Weed in his letter in the JOURNAL of Oct. 19), and were unacquainted with its contents; and if they had any impression that the report was favorable, such impression was based on imperfect data and was dissipated by information received from another source before this matter was taken up in the newspapers. As to the statements with respect to Mr. Weed in certain newspapers it is a question if they be not open to an action for libel.

Pyritic Smelting

The renewed discussion upon that ever-interesting subject—pyritic smelting—which has lately been going on in our columns, induced by an article of Mr. Beardsley upon certain negative results which he had experienced with the method, is developing interesting and valuable accounts of recent practice and the presentation of new and important ideas. The particular case cited by Mr. Beardsley, viz., the smelting of a nickel-copper ore, is in itself of no great consequence, because the occurrence of such ore is rather uncommon, but in commenting on his report other metallurgists have transferred the discussion to the broader field.

The contribution of Lewis T. Wright, general manager and engineer, of the Mountain Copper Company, is especially deserving of careful consideration. Mr. Wright takes up the subject on the same scientific lines that he has done in previous contributions, putting great emphasis on the thermo-chemical consideration. We think that all metallurgists may profitably cast their thoughts in the same direction. The future of the progress in metallurgy lies largely in the study of physical chemistry, of which thermo-chemistry is one of the older branches. Many failures in metallurgy would have been avoided if it had become known from a scientific analysis of the problem that the reaction to be effected in reality required more energy in one form or another, perhaps heat, perhaps pressure, than was carelessly estimated and provided for. Practical problems in manipulation must always be worked out, frequently with trials and tribulations, but it is essential in the first place to know that the scientific basis is correct.

GEORGE WESTINGHOUSE, through his great industrial companies, is among those who have suffered during the financial panic. The troubles of the companies have been due purely to the shortage of money and the disturbance of the usual facilities of credit, not to any considerable diminution of their business, mismanagement or unworthy enterprises in the field of speculation. Everyone looks with regret at the necessary interruption of the regular control of their business, while Mr. Westinghouse personally has the sincere sympathy of all who recognize his great gifts and the benefit which his inventions have bestowed upon human welfare. In this expression of sympathy and appreciation for one who has always been a builder, never a destroyer, the engineering profession heartily joins—with the hope that present difficulties may be early and satisfactorily adjusted.

SINCE THE RECEIPT of the communication from our correspondent at Cananea, which is printed elsewhere in this issue, we have learned that the suspension of operations by the Greene-Cananea company, which was anticipated October 23, has been put into effect upon telegraphic orders from the head office. The reason for this drastic and regrettable move has not been made public, but probably it is because the property has not been operated profitably at the recent price for copper. However, it would appear that operations could have been temporarily adjusted to a smaller scale, mining the richer ore, and thereby avoiding the demoralization which inevitably results from a complete suspension of work and disbanding of the organization. Development work will be continued in the Cananea Central mine.

WE ARE AUTHORIZED to state that the recent report in the *Mining and Scientific Press* that Mr. Hammond has resigned his position as advisory engineer to the Guggenheims, and that A. C. Beatty will shortly sever his connection with them, is incorrect. Mr. Hammond has not resigned and Mr. Beatty has no present intention of severing his existing connection. Their contracts expire several months from now, and whether they will or will not be renewed is the private business of the persons directly concerned, but it may be said that renewal is under consideration. It is true that Mr. Hammond will go to California for a couple of months; not, however, on account of his health, but especially to accompany his family, and also to look over some enterprises in which he is largely interested.

EVEN IN THE PRICE of gold there are fluctuations, although in this case they are extremely small. On Oct. 28, American bankers secured about $5,000,000 in bars received from South Africa that day, paying for them 78s. ½d. per oz., which was 2¼d. above the price ruling during the previous week. The price quoted for gold bars Oct. 26 was the highest since September, 1906.

Views, Suggestions and Experiences of Readers

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal, and Inquiries for Information

CORRESPONDENCE AND DISCUSSION

Negative Results in Pyrite Smelting

In the JOURNAL of August 24 there is an account of some attempts made by G. F. Beardsley to smelt Sudbury crude copper-nickel ore which unfortunately did not succeed, and the case is described as a "Negative Result in Pyritic Smelting." Mr. Beardsley has had a long experience in the smelting of crude pyrite ores and his failure so to treat the copper-nickel ores of Sudbury will certainly be regarded as discouraging to future success in that direction. It is never well to be discouraged even by repeated failure if on scientific grounds it would seem that success should be merited.

In the case described Mr. Beardsley has evidently been disposed to consider the failure as inevitably due to an idiosyncrasy of the ore, that is, to the facile manner in which it is supposed a certain mineral is melted out from the rest of the ore by the process known as liquation.

This appeal to the principle of liquation does not, I believe, find support in the evidence offered. If a small amount of the mineral pentlandite (and it is this nickel-bearing mineral that is placed under suspicion as the culprit) had gone so far as to save further trouble and had come down like a good coon from the tree on being aimed at I cannot see what was to hinder the smelting of the balance of the ore with proper fluxing and fuel. But it is readily seen that the pentlandite did not come down alone but was accompanied by a much larger amount of pyrrhotite, also presumably by the process of liquation, and one would naturally wonder, if the small quantity of pentlandite and so much more of the pyrrhotite had come down as matte when the furnace was hot and had been carefully groomed, so to speak, for the test, why the balance of the pyrrhotite should have been so recalcitrant. But speculation in this direction, which would be interesting if indispensable to an understanding of the matter, is not found to be needed because we find that even this supposed process of liquation would only continue for about half an hour or so and during the period when the furnace was hot from its previous charges of roasted ore and 13 per cent. of coke and that the matte fall would then slack off in quantity and all smelting, liquation and otherwise, would practically cease.

The fact that the slag stream also grew colder and smaller until a freeze-up was imminent suggests to me that there was something wrong with the temperature of the furnace, not enough heat to liquate the mineral sulphides which had at the first moment of charging shown such good will, not enough to keep the slag hot and fluid.

LACK OF HEAT

It is obvious that a certain amount of heat must be generated to produce the temperature which will keep the whole charge above the critical working temperature at which the matte and slag will be formed and will flow freely from the spout. The circumstances as described do seem to me to suggest lack of temperature so strongly that one is immediately urged to inquire whether the combustible and heat-producing elements were present in sufficient quantity to maintain the required working temperature.

Is it sure that, from experience with the nickel left out, an ore of the composition of the subject of the trial would have given no trouble with 6 per cent. of coke and with such additional burden of slag and limestone as described? The particulars given by Mr. Beardsley are scarcely full enough, excepting in the case of the crude ore, slag and limestone charge working with 6 per cent. coke, to make it worth while to apply the test of a trial heat balance sheet to the case; not even in the case of the slag runs; but a rough trial balance can be hazarded and I believe that such a trial balance would suggest whether or not there was enough heat or whether in that respect Mr. Beardsley was sailing too close to the wind and with too little working margin for safety.

We are told that four attempts were made to run the ore by adding to it up to one-third of its weight in slag and one-tenth of its weight in limestone and that this increase in flux necessitated raising the coke to 6 per cent. We have also an analysis of the crude ore. Why should we take it for granted that 6 per cent. of coke was sufficient to smelt such a charge? Is there any such general fundamental principle established? It would be worth while to test that point even with such rough means as we possess.

HEAT BALANCE

The matte is described as 12 to 15 per cent. copper and nickel. On segregating the constituents of 100 parts of ore as they might be expected to appear in the products we have, disregarding fuel dust and moisture contained by the charge, the following:

COMPOSITION IN PARTS PER 100 OF CHARGE AND PRODUCTS.

	Ore.	Matte.	Gases.	Slag.
SiO_2	10.1	0.2		9.9
Fe	44.7	23.0		21.7
Al_2O_3	6.85	0.55		6.3
CaO	1.2			1.2
MgO	1.1			1.1
S	27.5	11.0	15.7	0.8
Cu	1.77	1.57		0.2
Ni	5.62	5.42		0.2
Difference	1.16			
Diff. and oxygen.		4.26		
Oxygen for the Fe				7.1
	100.00	46.0		48.5

The slag-forming constituents suggest a slag of extreme basicity, containing about 20 per cent. SiO_2, and I do not gather from the description that any other silica was provided than that contained in the slag added to the charge which might have contained say 33 per cent. of SiO_2, but this would still leave the final slag low in SiO_2.

The charge as described is: Crude ore, 70; slag, 23; limestone 7 per cent. The slag that will be made per 100 lb. of charge will be: From the ore, $70 \times 0.485 = 33.95$; from the slag added to the charge 23; CaO from the limestone, 7×0.56, 3.92; total, 60.87 lb. The matte fall per 100 lb. of charge is: $70 \times 0.46 = 32.3$ pounds.

What are the heat-producing opportunities of the case? What are the heat losses in the escaping gases, in the liquid slag and matte, in the decomposition of the moisture in the blast, and the evaporation of that in the charge and decomposition of the limestone, the loss of heat in the cooling water and by radiation from the furnace? These losses amount to something of importance. Are they less than the heat income by such an amount as to leave a reasonable factor of safety? Let us examine this all-important point. I will try to make the trial balance sheet as closely as I can from the data furnished and use the large calorie which contains 1000 of the small calories.

There will be as major heat producer the 6 per cent. of coke. I will assume this to be 83 per cent. effective carbon and the carbon to give 8.08 cal. per lb. We have then for 100 lb. of the charge $8.08 \times 0.83 \times 6 = 40.24$ cal. For calculating the heat furnished by the small amount of iron sulphide oxidized, it will be convenient to do so on the basis of its sulphur. The heat of oxidation of FeS is thus stated: $Fes + 3O = FeO + SO_2 = -23.8 + 66.4 + 71 = 113.6$; or, 32 lb. of sulphur give 113.6 cal., that will be 3.55 cal. per lb. of sulphur.

It is not probable that more than 15.7

lb. of sulphur with its accompanying iron was oxidized per 100 lb. of ore, or: 15.7 $\times 0.7 = 10.99$ lb. per 100 lb. of charge. The heat value of this is: $10.99 \times 3.55 = 39.01$ cal.

For the heat of formation of the iron silicate I will take the number 0.189 cal. per lb. of iron oxidized in the smelting process. There are probably not more than 24.7 lb. of iron per ton of. ore so oxidized or $24.7 \times 0.7 = 17.29$ lb. per 100 lb. of the charge. This would furnish 17.29×0.189 or 3.29 cal. for the combination of the iron and silica of 100 lb. of the charge. Summarizing these we have the following heat productions per 100 lb. of charge:

CALORIES PRODUCED BY CONSTITUENTS OF 100-LB. CHARGE.

Coke	40.72
Iron sulphide	39.01
Combination FeO and SiO_2	3.27
Total	83.00

At first sight this amount seems to me to be very close to the minimum likely to be required and not sufficient to furnish any margin of safety. In short, my experience tells me that this quantity of heat could hardly be sufficient for such a charge, unless the temperature of the escaping gases at the moment of their emerging from the change was extraordinarily low.

For the heat expenditure it will be, from absence of information, necessary to make some assumptions, but one must use one's judgment in such cases to the best of one's ability. We have the following important item of heat expenditure: the escaping gases.

Heat Lost

The quantity of air employed is not given. I will assume it to be 2.43 lb. per lb. of charge. It might have, but should not have been, less than that, and we are told that blast was plentiful. The temperature of the escaping gases is not given; but I will take it to be 300 deg. C. which will, I think, not be too high. In order not to have to make a laborious calculation for an assumed case, I will make an estimate based on a case of pyrite smelting mentioned in an article in the *Mining and Scientific Press* of Sept. 29, 1906, p. 389, where the temperature of the escaping gases was 800 deg. C., and adjust for the difference in temperature assuming that their quantity and composition were practically the same. This estimate will then be for 100 lb. of charge: 14.7 cal. for the heat lost in escaping gases.

For the heat in the slag I will take a temperature of 1250 deg. C. and the total heat including the latent heat of fusion at that temperature to be 0.46 cal. per lb. of slag. Since 60.9 lb. of slag had to flow out of the furnaces per 100 lb. of charge, we have $60.9 \times 0.46 = 28.01$ cal. for the heat carried away by the slag.

The matte fall is assumed to be 28.7 lb. per 100 lb. of charge and I will take the total heat per pound of matte to be 0.33 cal. at the temperature of 1250 deg. C. The matte carries out, therefore, per 100 lb. of charge: $28.7 \times 0.33 = 9.47$ cal.

The heat in the cooling water, I will estimate from a case I measured when the furnace was taking 12.5 lb. of charge per square foot of hearth area per minute and the heat lost in the cooling water equalled 9.5 cal. per 100 lb. of charge. In Mr. Beardsley's case the furnace was running more slowly. I will take the maximum cited by him, viz., about 9 lb. per square foot per minute and adjust accordingly to a loss of 12 cal. per 100 lb. of charge.

The water or moisture in the charge I will assume as being 3.5 per cent. This will require 2.1 cal. per 100 lb. of charge for its vaporization. To decompose the limestone we shall want 7×0.451 or 3.26 cal. To decompose the water in the blast I will assume an ordinary condition of 7.3 cal. There will be some heat lost by radiation and other sources not mentioned. I think we can reasonably account for the following losses:

HEAT LOSS IN CALORIES PER 100 LB. OF CHARGE.

Escaping gases	14.7
Slag	27.8
Matte	9.5
Cooling water	10.0
Evaporation of moisture	2.1
Decomposition of limestone	3.3
Decomposition of water in blast	7.3
Radiation	10.0
Total	84.7

To furnish this we have accounted for only 83 cal.

It would seem to me from the above estimate of heat expenditure, which is, in my opinion, rather likely to be too low than too high because the heat in the escaping gases and the cooling water and radiation is likely to have been higher, the latter two because of the slack running of the furnace, that too much was expected from the heat affording constituents of the charge. If the crude ore had been gradually substituted for the wasted ore, adjusting the fluxing to the grade of matte and even adding some slag and reducing the coke according to the running of the furnace, it might have been possible to run the charge adjusted to give a 30 per cent. SiO_2 slag with 8 or 9 per cent. of coke, and the crude ore charges without the slag with less.

Other Losses

There is still another way of looking at this matter. The roasted ore charges required 13 per cent. of coke. This is rather a large quantity and indicates either a low grade of coke or necessarily high degree of working temperature on account of the nickel and physical constitution of the ore. If that quantity was used we may take it for granted that it was required, and this practical requirement proved in practice is crucial in such a discussion. The make-up of the roasted ore charges is not given, but we can judge of the amount of sulphur as sulphide there that could have been on the charge available as fuel within the limits of the line of reasoning I am about to follow. I am going to assume that the roasted ore charge to make 30 to 35 per cent. matte contained 15 per cent. of sulphur and that two-thirds of this sulphur was oxidized and that the balance of one-third went to the matte and slag. I will assume that the unroasted or crude ore charge contained some flux because Mr. Beardsley, in the case of the slag runs, speaks of "increase of flux" and that the sulphur in this crude ore charge was 25 per cent., of which say two-fifths was required for the matte and the small quantity always going with the slag, leaving three-fifths of the sulphur of the charge to be oxidized.

We now inquire whether this difference in the make-up of charge of 5 per cent. oxidizable sulphur from what we know of the thermal relations of the sulphur of iron sulphide and the carbon of coke, will be in any way approximate to the practical difference of 9½ per cent. of coke employed. The trials assumed that the crude-ore charge would run with 9½ per cent. less coke than the normal roasted-ore charge. I am going to assume, as the most favorable case for the line of argument, viz., that this difference of 9½ per cent. of coke might be compensated for by the additional sulphide, that the whole of the sulphur in the iron sulphide of the roasted ore charge was oxidized by the solid oxygen of the Fe_2O_3 in the roasted-ore charge according to the thermo-chemical equation,

$$FeS + 3\ Fe_2O_3 = 7\ FeO + SO_2\ [+ 23.8 + 3\ (199.4) - 7\ (66.4) - 71] = 85.2 \text{ cal.},$$

or that one pound of the sulphur oxidized furnished 2.66 cal. and that, in the case of the crude ore charge, the sulphide was oxidized by the blast by the equation previously quoted that afforded 3.55 cal. per pound of sulphur oxidized.

We have then the following relations per 100 lb. of charge: In the crude-ore charges, 9½ lb. coke @ 6.71 = 63.75 cal. less, and the difference between 15 lb. sulphur @ 3.55 = 53.25 cal., in the case of the crude ore, and 10 lb. sulphur @ 2.66 = 26.6 cal., in the case of the roasted ore, a difference of 26.65 cal. more in the crude-ore charges from the sulphide. That is to say, 63.75 cal. are taken off and 26.65 cal. are put on the furnace.

The substitution of crude ore for roasted ore and at the same time the reduction of coke equal to 63.75 cal. per 100 lb. of charge furnished when the most extreme view one could take of the heating value of the additional sulphide in the crude-ore charge would not account for one-half of the 63.75 cal. so removed from the furnace, will, I believe, fully explain its behavior.

It is possible to look at the thermics of these matters broadly because the margins of safety we must make use of in

practice must also be broad. I do not think we would be doing justice to the furnace to assume that the extra heat from the higher oxidation of sulphur in the case of the crude ore, or any conceivable less heat requirements in that case would enable it to do its work with a reduction of the coke fuel so radical and to the extent of 63.75 cal. per 100 lb. of charge.

The only conclusion I can draw from the trials is that not enough fuel was present to hold the furnace up to a working temperature. LEWIS T. WRIGHT.

San Francisco, Oct. 8, 1907.

Coal Production in China

The last volume of "The Mineral Industry" shows an oversight in the failure to credit China with some coal production. There should be accessible statistics of the product of the Chinese Engineering and Mining Company of Tong-Shan, and of the amount used by the Hang Yang Iron Works, but this is only a drop in the bucket for the real coal product of China. From my extensive journeys in Northern China and from what I have heard I feel sure the total product of China cannot be less than 20,000,000 tons. The Shansi province alone produces five to 10 million tons, more likely the larger amount. Probably the total coal production of China is 25,000,000 tons per annum. W. H. SHOCKLEY.

Tonopah, Nev., Oct. 18, 1907.

[We shall be glad if some of our readers in China will contribute further information on this subject.—EDITOR.]

The Barnes-King Development Company

I wish to point out that I had absolutely no connection with the Barnes-King property prior to the flotation of the Barnes-King Development Company, nor did I make a report of any kind on the property previous to Dec. 22, 1906. I further wish to state emphatically that I made no reports to aid or in any way to assist in its flotation, and that the company was formed before I left to inspect the property for the first time. I was not engaged as an examining expert for either the promoters or the company itself to place a valuation upon the mine. A copy of William Word's report was shown to me, and I was asked to give the company my services as consulting engineer. I consented to do so, and gave the greater part of my time to its affairs for the first six months. I was instructed to forward my reports to the president of the company, and to receive from him directions as to the policy to be adopted regarding operations.

I made a preliminary report, dated Dec. 22, 1906, after an inspection of the property. This report was merely one referring to the existing conditions of the property as they appeared at that time and did not go into the matter of value except in a casual way. I was never at any time so favorably impressed with the assay value of the property as others appeared to be.

In January of the present year I advised that the property was very low grade, and on April 3 I presented a report giving measurements and assays, which showed that I estimated 29,324 tons showing a gross value of $121,798. This was all the ore I estimated blocked out above $3. This report was sent to the president of the company accompanied by assay maps. There is a great quantity of ore which will assay under $3 and the engineering problem is to make this ore pay.

The president was continuously in full possession of all facts regarding the property. Assay sheets were mailed regularly to New York, together with cost sheets and full financial statements, and it is difficult for me to understand why the directors appear to have been so much in the dark regarding the value of the mine.

All I can say is that all information was sent regularly from the mine and was in the hands of the president, and financial accounts of the mine went also regularly to the treasurer. The policy and the work carried out was that directed and authorized by the president of the company. The conditions at the mine, however, did not satisfy me and in May I requested to be relieved of my responsibility, and frequently made further applications from that time on. It is absolutely untrue that my resignation was requested by the board or the president, and it was not until the stockholders' meeting in August that I succeeded in being notified that I could be relieved of a position which was very distasteful to me on account of the low-grade nature of the mines. I desired to see another property taken up in order to relieve stockholders who had invested in the Barnes-King Development Company, and it was for this purpose that I remained in the company's service longer than I intended. When I found that this plan could not be put into effect, I absolutely refused to act further as its engineer.

I had no control whatever or any interest in the company's financial affairs, and did not know their condition. My connection with the property was purely professional, and I was in a position in respect to the mine similar to that of a doctor to a sick patient who has little hope of recovery, but who still needs attention. I was never invited to attend a meeting of the directors, but had to transact all my business with the president directly, and to him I tendered all of the engineering advice that the company was entitled to.

Professional considerations require that an engineer report to or receive instructions only from such officers or persons as he is directed to report to. Personally, I feel that it is not my part to discuss this matter further, but I merely desire to point out my relation with the company, which has been misunderstood. My professional work is open to criticism by anyone, as both engineer and layman are entitled to an expression of opinion on the work already done, but I must allow the public to form their own conclusions regarding the present state of the company's affairs. About its promotion I know absolutely nothing, but believe the mine was purchased in good faith. R. B. LAMB.

New York, Oct. 23, 1907.

Giroux Consolidated Mines Company

Being one of the original associates, as well as the first man to pass upon the Giroux Consolidated Mines Company's holdings at Ely, Nev. (May 10, 1900), I have read with interest the article on the copper mines of Ely in the issue of the JOURNAL of Oct. 12, and the editorial of Sept. 28, 1907, concerning certain attacks upon the policies and the method of operation of the mines. I am pleased to see the greatest of the world's mining publications take a fair and unbiased view of us. This company has always followed the policy: "Never explain; your friends do not require it and your enemies will not believe you."

To make a long story short regarding the water question: The "Detroit Copper Company" of Morenci, Ariz., belonging to the great Phelps-Dodge organization and under the direction of the ablest and most practical of mining engineers, has a water pipe line which carries from the pumps to a greater hight and a greater distance than will be required of the Giroux company's line. The company also has a railroad paralleling the water line. This has been established for a number of years and evidently the engineers find it cheaper to deliver water to ore than haul ore to water, taking into consideration the amount needed for domestic use, for which a line must be built in any event.

The Giroux company's holdings of water are ample for any demand that may be made upon it; it is not necessary to say how much or where it is. I can state that all matters of importance in the operation of the company's mines are thought out carefully by men who have put in 30 years in opening up and operating successful mines.

J. A. SNEDAKER.

Denver, Colo., Oct. 22, 1907.

Personal

Mining and metallurgical engineers are invited to keep THE ENGINEERING AND MINING JOURNAL informed of their movements and appointments.

H. W. Hardinge is in the Cobalt district Canada, investigating new mining properties.

J. B. Tomlinson, consulting mining engineer, of El Paso, Texas, is visiting New York on professional business.

J. D. Kendall, consulting mining engineer, has removed his office to Friars House, New Broad street, London, England.

Robert T. Hill, mining geologist, of New York, has returned from Ontario where he has been examining mines.

John Wright, of Grand Junction, Colo., has taken the management of the McClellan Mining Company at Georgetown, Colorado.

Herbert Harris, of Silver Plume, Colo., has been appointed manager of the Nashotah Mines Company at Silver Plume.

Robert Linton, of Atwater, Linton & Atwater has returned to Helena, Mont., after an examination of properties in Nevada.

Norman S. Richmond, inventor of the Richmond electric mine signal, has been in the Lake Superior copper district on business.

James A. Shinn has been appointed manager of the Mammoth property, Big Evans gulch, in the Leadville district, Colorado.

H. Clark, of Goldfield, Nev., has been making a trip to Routt and Grand counties, Colorado, for the purpose of examining mines.

Charles R. Devlin, member of Parliament for Nicolet, has been appointed Minister of Colonization, Mines and Fisheries for Quebec.

Archibald Campbell, of Detroit, Mich., recently visited the Manitou Lake gold region, of Ontario, to inspect some mining properties.

H. H. Newcomb, of Boston, Mass., recently made an examination of the Laurentian gold mine, Manitou lake, Ont., in which he has an extensive interest.

George D. Moulton, of Boston, Mass., secretary of the Atlantic Mining and Milling Company, has been looking after interests in Clear Creek and Summit counties, Colorado.

R. F. Stupart, director of the Toronto Observatory, has been elected a member of the International Meteorological Committee in place of Dr. Von Bezold, of Germany, recently deceased.

William J. Penhallegon has resigned from the superintendency of the Manitou Mining Company and the Frontenac Copper Company, both subsidiary companies of the Calumet & Hecla Company, to accept the position of assistant general manager of the Tennessee Coal, Iron and Railroad Company. He will have charge of the coal-mining division, with headquarters at Birmingham, Alabama.

Obituary

William Page, superintendent of the Knight's Island Mining Company, near Valdez, Alaska, was killed Oct. 8, by an explosion of dynamite. He was 45 years old, and for a number of years was foreman of the St. Lawrence mine, at Butte, Mont., leaving there to go to Alaska.

Capt. Henry Shields, one of the pioneer miners of the Menominee range, died from the effects of ptomaine poisoning at his home in Iron Mountain. He was for many years night captain of the Ludington mine, but of recent years he has been engaged in exploratory work in Missouri, Wisconsin and in the Southwestern States. He is survived by a wife and seven children.

Percy H. Joll, of the Allis-Chalmers Company's London staff, died at his home in London, Oct. 13. Mr. Joll was formerly in the service of Fraser & Chalmers, of Chicago, and afterward with the Allis-Chalmers Company, and had a wide acquaintance and many friends in the United States, Mexico and Europe. He was greatly valued for his character, ability and social qualities.

Industrial

The American Shipbuilding Company during the year ended June 30 last built 25 vessels for the lake trade. The total carrying capacity, on 19 ft. draft, was 234,000 tons, an average of 9360 tons. On June 30 it had contracts for 39 vessels.

The J. R. Alsing Company, organized in 1869, and incorporated in 1885, has changed its name to the J. R. Alsing Engineering Company, and increased its capital from $20,000 to $100,000. The officers will remain the same as in the old company.

The Great Western Smelting and Refining Company is about to award contracts for the construction of a new plant at Iowa street and Forty-first avenue Chicago. The plant will comprise a main building, 130x408 ft., foundry 60x60 ft., smelter 50x400 ft., and a refining plant 40x360 ft.

The Los Angeles Steel Company, Los Angeles, Cal., engineer and contractor, which was recently incorporated, will not build a factory at the present time, but will carry on a general engineering and contracting business in all kinds of structural steel and iron in California, Nevada, Arizona and New Mexico. George W. Harding is manager.

Societies and Technical Schools

Tri-State Mining Association—The interest of all mining men in the Wisconsin zinc-lead district was centered last week in the meeting of the Tri-State Mining Association, which convened in Platteville, Wis., Oct. 25. The association elected the following officers: Mayor James Dolan, of Platteville, president; Geo. Girling, of Mineral Point, secretary; W. E. Lewis, of Platteville, treasurer. Three vice-presidents were elected, one each from Wisconsin, Illinois and Iowa, and an executive committee consisting of five members was chosen. Papers were read on various phases of zinc mining. The subjects included "Smelting by the Electric Furnace;" Geology and Good Roads;" "Commercial Uses and Possibilities of Lead and Zinc;" "By-products Peculiar to the Wisconsin-Illinois-Iowa Field;" "Publicity and Financial Problems." The next meeting will be held at Dubuque, Iowa, on Nov. 22, next.

Trade Catalogs

Receipt is acknowledged of the following trade catalogs and circulars:

Harrison Safety Boiler Works, Philadelphia, Penn. Heating Boiler Feed Water. Pp. 12, illustrated, paper, 6x9 in.

Owosso Manufacturing Company, Owosso, Michigan. Owosso Snow Shovels. Pp. 14, illustrated, paper, 6x8 in.; 1907.

Construction News

Black Hawk, Colorado—The Fifty Gold Mines Corporation is arranging for the installation of an electrical plant. O. B. Thompson, Black Hawk, Colo., is manager.

Central City, Colorado—Electric plant is to be installed at the Powers mine, to operate hoist, pumps and compressor. W. L., Jamison, Central City, Colo., is manager.

Georgetown, Colorado—A 50-ton cyanide plant and a wire-rope tramway 1000 ft. long are to be put up at the Bellevue-Hudson property. J. Mitchell, Denver, Colo., is lessee.

Hahn's Peak, Colorado—The Hahn's Peak company will arrange for the installation of a five-stamp mill and an air-compressor plant. H. O. Granberg, Oshkosh, Wis., is secretary and treasurer of the company.

Vigo County, Indiana—The Saline Illinois Coal Company is preparing to open new coal mines and build tipples. Machinery and materials will be needed; also a power plant. A. M. Higgins and R. J. Fuller, Terre Haute, Ind., are directors.

Special Correspondence from Mining Centers

News of the Industry Reported by Special Representatives at Denver, Salt Lake City, San Francisco and London

REVIEWS OF IMPORTANT EVENTS

San Francisco

Oct. 24—The troubles of some of the Nevada banks, which have been holding certain mining shares as securities, while not affecting any banks in this city, have caused consternation among the mining stock promoters and brokers, and have had a rather disastrous effect on the local market for Nevada mining shares. Since the failure of the Sullivan Trust Company, the San Francisco banks have been very conservative in the matter of loaning money on Nevada mining shares, and in fact have considered the responsibility of the men rather than the value of the shares themselves. The Nevada institutions which have closed their doors profess to be able to pay all depositors, when time is given to realize on collateral.

Orders from Boston have closed down the Balaklala Copper Company at Coram, Shasta county. The big smelter, almost completed, will go no further at present, and all the men have been discharged. It had been expected that the new smelting plant would start up before the first of the year, but that event will now wait improvement in the copper market. The Balaklala company has spent nearly $1,500,000 in building a smelter and opening up its mine. The smelter is so nearly completed that it could be finished and running in less than 60 days. Even now the bunkers are full of ore, and a great quantity of coke is piled up in the yards. The furnaces are in place, the machinery is in the power house, the McDougall roasters are up, slag tracks are laid—only a few finishing touches remain to be done here and there. Thus far no difference is manifest at the copper camps of Keswick, Kennett and Ingot in the same county.

The Snow Point gravel mine, seven miles above Moore's Flat, Nevada county, was recently bonded to C. M. Wilson, of the Fairview mine at Relief hill. In the middle of this gravel claim he has come across a quartz vein giving high assays. It has been located independently under the name of the Jumbo. The claim may be operated for the present by open cuts.

On the Tejon ranch, Kern county, near Lancaster and the Los Angeles county line, promising surface indications of oil have been found. The land is all the property of Truxton Beale, his father receiving it from an old Mexican grant. The supposed oil land is on rolling hills, sloping south and east to the Mojave desert.

Thomas Vinton is making preparations to re-open and work the old Cherokee gravel mine in Butte county, famous as a producer during the hydraulic mining days and subsequently worked as a drift mine. In the same county, the old Spring valley quartz mine, near Cherokee, will be ready for a crushing of ore when the Great Western Power Company can furnish power. In eastern Butte county, near Enterprise, a number of quartz mines are being re-opened. There is an abundance of water in that part of the county.

The Dredge Miners' Union at Oroville is taking a stand for high wages, the winchmen wanting $3.50 per day and oilers $3. The dredge companies state that their heavy investments will prevent the payment of higher wages, but on the other hand there are comparatively few winchmen and their services are in great demand. The old gold dredge near Trinity Center, Trinity county, is being dismantled and a new and larger boat is to be provided, the old one being too light for the machinery.

The Noble-Electric Steel Company has been organized, with $1,000,000 capital stock, to engage at Heroult, Shasta county, in mining, extracting and smelting iron ores and in manufacturing and selling steel. The electric process is to be used. The directors of the new company are W. H. Noble, of San Francisco; C. D. Morgan, of Oakland; E. V. D. Johnson, of Redding; Ernest E. Need, of Mill valley, and Ed. Whaley, of San Francisco.

The people who have been trying to save the gold in the ocean-beach sands at Shakespeare beach, below Venice in the Los Angeles county seacoast, have given up the venture, as the gold was too fine to be readily saved. Some new process was tried but was apparently not successful.

The Bear Tooth Gold and Copper Mining Company has been re-incorporated to take the place of the old company organized to develop copper claims at Burris in the New river section of Trinity county. Under the old company considerable development had been done of the group of claims originally owned by Mr. Burris, enough to show that the property can be made a producer with a little more work. On the mines there are already a quartz mill, saw mill and a wire-rope tramway from mine to the mill, a stretch of 1400 ft., with other improvements.

The miners there hope the new State highway will take the Trinity river route. With the route by way of the Trinity river chosen by State Engineer Nat Ellery, it is promised Eureka will profit, along with the mining men. If the State road takes the Trinity river route, and Humboldt county will contribute to a fund for the reduction of the grades between Korbel and Willow creek, it will be possible to put freight into La Grange, which is six miles from Weaverville, as cheaply from Eureka as from Redding.

Mildred island, on the San Joaquin river, which was purchased some months ago by the Mildred Island Commercial Company for the express purpose of being cut up into convenient squares of peat, transported to Oakland and turned into fuel, has been sold to satisfy the creditors. The island is now under cultivation and will produce a large crop. It was the intention of the Commercial Company to mix the peat with a heavy oil and produce a first-class fuel, but the proposition failed to come up to expectations and the funds soon became exhausted. A factory was established at Stege in Alameda county, but is now closed down. It was found that the peat carried a large amount of moisture and the cost of getting rid of this was excessive, so the experiment failed.

At Nevada City a new company is to be organized to be known as the Lecompton Consolidated Mining Company. F. E. Ware has bonded the Lecompton, Treadwell, Freedom, and Daybreak mines for Kansas City men and a central shaft will be sunk to develop them all.

A number of Nevada mining men are about to make investments in Sierra county, particularly about Sierra City and Gold Lake. They have been inspecting the Butte Saddle, Roman, Hilda, William Tell, Pride & Willetts and other mines. That section has been a profitable one in the past, but has suffered from lack of capital.

The two Chinamen, who ran a laundry in San Francisco and finally left for the Mohave desert to go into mining, have rather the best of the miners who ran them out of Crackerjack district in San Bernardino county and refused to let them start work in the Funeral creek district. When about discouraged they camped at Wild Rose springs, where they found a vein of scheelite, though they knew nothing of its value. Having been, however, of some assistance to a white man, he told them of the value of their find, sent samples East, and finally the result was they sold their tungsten prospect for $55,000 to Boston men.

Duluth

Oct. 28—The Minnesota tax commission has sent a request to mine operators and explorers asking them to furnish blue prints of explorations, etc., that may be carried on in future. These are desired in order that the commission may be informed of the results of all development work, and be able to place new finds on the tax lists. There has been some talk of asking the courts to adjudge the fairness of the tax commission's valuations of mines, but nothing definite has yet come of it. The suggestion has been made that the Buffalo & Susquehanna mine, which is assessed on the basis of 26,000,000 tons, should be the property on which a test case might be brought. This basis gave the mine a tax assessment of $3,640,000 on a valuation of 14c. a ton. At the last year's tax rate, imposed by the village of Hibbing, where this mine is, there would be a tax payment on the mine of more than $78,000, or about 40c. a ton on its output. The mine was included in the general mortgage of the Buffalo & Susquehanna properties, to secure bonds, on the basis of 26,000,000 tons, but it is doubtful if such an estimate would hold good as anything more than an estimate, and it might be reduced materially for rock inclusions, bodies of lean ore, broken formation, irregular boundary walls, etc. The company wished, however, to return the same tonnage for the tax commission as they had made to their bondholders. It can readily be seen that the Susquehanna mine, paying, say, 40c. per ton tax on its annual output, or half that under a decreased tax rate, would scarcely be able to make money except in occasional and exceptionally prosperous years, and that the tax charge would sap the life of the mine.

Toronto

Oct. 25—The charge against Law & Co. mining brokers of Toronto, of violating the Ontario Companies Act by selling stock in the Highland Mary mine without supplying a prospectus furnishing full information concerning the company, came up before Police Magistrate Denison on Oct. 24. J. W. Seymour Corley appeared as Crown prosecuter on behalf of the Attorney General. The defendants did not appear, and it was stated that Mr. Law could not be personally summoned as he is supposed to be at Larder Lake. The hearing was accordingly adjourned until Oct. 30.

The International Mining Company, of Boston, has entered the Kent county (Ontario) oil and gas field, having purchased the extensive interests of the Norton, Church & Bowlby Company which holds some of the best leases. The International Company is arranging for development operations on a large scale, and expects to open at least two wells every month. The capital interested is wholly American and the president is the Hon. Sidney O. Bigney, of Attleboro, Mass.

Cananea, Mexico

Oct. 23—Like all the other camps controlled by the Amalgamated, Cananea has begun to curtail and the general atmosphere of the camp is very blue. About 1500 men have already been laid off, in groups of 500. It is stated semi-officially that troops are expected and that on their arrival a complete shutdown of the Greene-Cananea properties, including concentrator and smelter, will be made, except that small percentage of the plant necessary to be kept in operation according to the Mexican law. Orders for $74,000 worth of supplies are said to have been canceled by wire this week and $100,000 has been added to the fire protection.

The Democrata smelter, surrounded by Greene property, is completing a new stack, dust flue and furnace and the old furnace is turning out matte.

The Western-Cananea, which has been shipping ore to the Greene smelter, until the latter ceased treating custom ores recently, has since been shipping chalcopyrite to El Paso. These shipments will be discontinued.

London

Oct. 19—A few months ago I mentioned that R. A. Varden had been sent out from London to examine the Avino mines, Durango, Mexico, and to act as a sort of referee between Ralph Nichols and J. Gordon Hardy, whose reports disagreed so vitally. Mr. Varden's report is now to hand. Taking it broadly, Mr. Varden backs up Mr. Nichols, though owing to the recent fall in the price of copper his figures for the metallic contents of the ore reserves come out a good deal lower than those of Mr. Nichols. The latter has scored a point over Mr. Hardy by mining and shipping high-grade ore, the existence of which Mr. Hardy doubted. In fact Mr. Nichols has kept the mine going by shipping 2236 tons of ore which realized £15,569, and both he and Mr. Varden are of opinion that there is enough of this ore to keep them going for some time longer. Mr. Varden has also studied the method of treatment of the ore. In times gone by almost every method has been proposed and tried by one engineer or another, water concentration, lixiviation, etc., but none of them worked. Mr. Varden proposes to try the Elmore vacuum process, and the directors have placed an order for a plant capable of treating 30 to 40 tons per day. He happens to have a particularly intimate knowledge of this process, so that his advice may be accepted cheerfully.

The Lake View Consols mine in West Australia continues to make a small profit out of the low-grade ore, and developments point to the mine lasting on this basis for some time yet. During the 12 months ended June 30 last, 136,174 tons of ore and 1365 tons of old tailings were milled, yielding gold to the value of £167,681 from the ore and £1115 from the tailings. The extraction of gold was almost exactly $6 per ton. The expenses on working account were £143,173, and on extra development £4661. The working costs per ton of ore treated were $5.10. The reserves of ore on June 30 were 158,321 tons, averaging $6.75 assay value, as against 136,174 tons a year ago of assay value of $7.45. It will be seen, therefore, that development during the year has opened up larger bodies than were treated, but that the estimated contents are rather less than a year ago.

There was a net profit of £21,593 on the year's working and £17,492 is being distributed as dividend, being at the rate of 5 per cent. The company has reserves of capital in hand, amounting to over £100,000, and already owns interests in several other undertakings. The policy is eventually to make the company into a sort of trust or promoting company. The most recent acquisition is a four-sevenths interest in the Eclipse lease, belonging to the Golden Links company, also in West Australia. It should be mentioned that Lake View Consols is one of the Bewick-Moreing companies, though it is governed by F. A. Govett, a London stockbroker, quite independent of the firm.

A good deal is heard in chemical circles in England of the starting of new chemical works on a large scale at Plumbley, near Northwich, Cheshire. Ivan Levinstein, of Manchester, is the moving spirit and supporting him are the firm of Kynoch's the explosive and ammunition makers, the Chamberlains, Nettlefolds and others. The works are to be on the salt lands, a few miles to the east of Northwich. There are a good many interests to be settled with or squared before such works can be built and operated. For one thing it is impossible to get wharfage on the river Weaver, which is the natural outlet; and for another, the local authorities will put onerous penalties on pollution of the rivers and the atmosphere. As is well known, Brunner, Mond & Co. have their works at Northwich, and they have just opened new works at Lostock Gralam, which is half way between Northwich and Plumbley. If it may be said without offense, Brunner, Mond & Co. are more or less masters of the situation in the Northwich neighborhood, and their opposition to the Plumbley scheme is, to put it mildly, decidedly active. Some people in the chemical trade regard the Plumbley venture as a raid on established preserves, not seriously undertaken as a matter of business, but with a view of getting Brunner, Mond & Co. to buy out the new company.

Mining News from All Parts of the World

New Enterprises, Installations of New Machinery, Development of Mines and Transfers of Property Reported by Special Correspondents

THE CURRENT HISTORY OF MINING

Alabama

Last week a petition was filed in the Federal court at Birmingham by the Birmingham Iron and Coal Company, the Sayre Mining and Manufacturing Company and the Star Cahaba Coal Mining Company against the Southern Steel Company asking that that company be declared a bankrupt and receivers be appointed. E. T. Schuler, vice-president of the company, announced that the company was abundantly solvent and expressed the desire that the court instruct the receivers to continue the plants in operation. Judge O. R. Hundley named Sterling A. Wood, of Birmingham, as special master, and J. O. Thompson, Edgar Adler and Augustus Benners as receivers and instructed them to borrow the money to keep the plants in full operation. The Southern Steel Company has steel plants at Gadsden and Ensley, Ala., manufacturing rod, wire and nails, furnaces at Chattanooga, Tenn.; Gadsden, Ala.; Trussville, Ala., and at Rising Fawn, Ga.; coal mines, ore mines, limestone quarries, coke ovens, about 14 miles of railway and equipment and other property in Alabama. It is capitalized at $25,000,000, and Moses Taylor, of New York, is president.

JEFFDRSON COUNTY

Woodward Iron Company—The improvements undertaken by this company are nearly completed. On Jan. 1 its new 300-ton furnace will be ready to blow in and the extension of the water works to Possum Valley creek in order to provide for the increased requirements will soon be completed. Electric hauling has been substituted for mules in the mines.

Arizona

YAVAPAI COUNTY

Humboldt Smelter—A despatch from Prescott states that the works ceased operations at midnight Oct. 25 upon instructions from New York. Stringency of the money market is given as the reason for the shut-down.

California

BUTTE COUNTY

Butte Creek Consolidated Gold Dredging Company—This company has been organized to dredge gold-bearing ground on Butte creek. L. L. Bowen, H. C. Norris, W. L. Krug, E. C. Proctor and A. L. Culver, of Los Angeles, are the incorporators.

CALAVERAS COUNTY

Welch—This mine near Copperopolis is being unwatered for examination by prospective purchasers.

Mountain Top—This copper mine, which has been idle for over 35 years has been unwatered and in the bottom of the shaft a 6-ft. vein of good ore has been found. Byron Rowe is superintendent.

EL DORADO COUNTY

Crusader—Hill & Frick are putting machinery on this mine near Placerville. A mill is projected.

INYO COUNTY

Contact—In this mine at Skidoo a blind lead of good ore has been found near the shaft. The ore is honeycombed quartz carrying free gold.

LASSEN COUNTY

Galena—San Francisco men are about to open galena deposits near Purdy station. There is considerable silver with the lead, but no gold.

MODOC COUNTY

Fort Bidwell Consolidated—At this property in Hoag district, they are working on a ledge which they have now traced through three locations. The ore yields free gold. There is as yet no mill in the district.

MONO COUNTY

Masonic Mountain Gold Mining Company—Extensive development work is about to be done on the True Friend claim of this company at Masonic. A mill will be put up in the spring. A shaft-house and hoist are being erected.

ORANGE COUNTY

Western Zinc Company—This company, at Silverado Cañon, is now shipping good ore to San Francisco for treatment. Another shaft is being sunk at the mine.

NEVADA COUNTY

Nevada County Midas Mining Company—This company has acquired the Morning Star mine at Randolph Flat, and expects to equip the property with machinery at once.

PLACER COUNTY

Bowman—In this section of the country Clinton Cirby has bought the Russell Dunn place and will prospect the ledges there.

El Dorado—At this gravel mine, at Last Chance, the tunnel along the cement gravel is in 4000 ft. The gravel lead has been struck in an upraise 1600 ft. from the mouth of the tunnel.

PLUMAS COUNTY

Mayfield—This claim at the head of Nelson creek has been bonded to W. T. Bernheim, including the Red Ravine, Gold Run and Fairbanks, there being 230 acres in all.

RIVERSIDE COUNTY

Crescent—This company has recently purchased the Blackbird group of five claims in Eagle district. A contract has been let to develop water on the property.

SHASTA COUNTY

Balaklala Mining County—The new aërial tramway from the mines of this company to Coram has been satisfactorily tested. A number of men have been discharged pending the completion of the smelter at Coram.

SISKIYOU COUNTY

Golden Eagle—Five stamps are being added to the mill of this company at Fort Jones.

TUOLUMNE COUNTY

Coast Development Company—The Rappahanock mine of this company has been sold at sheriff's sale to the plaintiff in an action against the company.

Colorado

CLEAR CREEK COUNTY

Bellevue-Hudson—D. J. Williams, of Lawson, and J. Mitchell, of Denver, have taken a lease on the dumps of this property near Georgetown, and are arranging for the erection of a 50-ton mill with cyanide process, also for an aërial tramway 1000 ft. in length.

Red Elephant—Braddock, Penn., people have taken an option on a large group of claims near Lawson. W. L. Shaffer. Idaho Springs, Colo., has been appointed manager.

GILPIN COUNTY

Great Mammoth—This vein has been cut at a depth of 1500 ft. in a lateral from the Newhouse tunnel, and shows several feet of high-grade smelting ore and con-

centrating ores. Indiana people are interested as the Gauntlet Gold Mining Company, with L. D. Hobson, Central City, as general manager.

Hearne Gold and Copper Mining Company—Colorado capital is interested in a strike on the Anchor property in Willis gulch, gray copper and lead ores having been opened up in the 200-ft. level. H. W. Kane, Central City, Colo., is manager, and additional machinery is to be purchased.

Santa Loreta—Rhode Island capitalists are interested in a good strike in the slope above the 200-ft. level in their Hillhouse mine, the ores carrying values in gold, silver and copper. J. W. Tuckfield, Central City, Colo., is superintendent.

ROUTT COUNTY

Hahn's Peak Mining and Milling Company—Wisconsin men are interested in the purchase of the Conundrum tunnel property at Hahn's Peak, paying $10,000 for the property; they will arrange for the installation of a plant of machinery.

Florida

POLK COUNTY

Medulla Mining Company—This company is preparing to mine phosphate on a large scale by hydraulicking. Three 750-horse-power turbine engines have been ordered and it is expected to obtain a flow of 4000 gal. per minute at a pressure of 175 lb.

Kentucky

HOPKINS COUNTY

The dispute over the wage scale for coal mining in this district seems to have a prospect of settlement. At a meeting held in Indianapolis last week, the executive board of the United Mine Workers took action on a proposed scale, which will probably be adopted.

Michigan

COPPER

Calumet & Hecla—The structural steel on the new recrushing mill at Lake Linden has been put in place and an electric crane facilitates the assembling of machinery. At the power plant the General Electric Company is assembling a new 2000-kw. generator. At the main mine all the rock houses have been remodeled to take care of the large steel rock cars, which will go into commission as soon as the work of changing to the standard gage has been finished.

Ojibway—Work has been started at the new No. 1 shaft. From the appearance of the ground passed through in sinking No. 2 shaft it is expected that the ledge will be reached at a depth of about 60 ft. This shaft is being sunk about 1200 ft. north of No. 2 shaft. The latter is down about 30 ft. in the formation and fair quality of copper-bearing rock is being cut. The concrete work from the ledge to the surface has been finished and the erection of a shaft house has begun. An air compressor is being assembled.

Gratiot—This subsidiary company of the Calumet & Hecla Mining Company has No. 1 shaft down nearly 400 ft. Drifting is being carried on at two levels and a third drift will be started as soon as the 400-ft. level is reached. Four drills are at work. No. 2 shaft is down 475 ft. and five drills are at work, one drifting at each of the three levels and two sinking.

Minnesota

It has been reported that labor organizers are busy among the miners of the Lake Superior regions and are agitating a new union to include the miners of northern Minnesota, Wisconsin and Michigan which may be known as the Lake Superior Federations of Miners.

Missouri

JOPLIN DISTRICT

A bureau of information for the benefit of visitors to the approaching mining congress will be maintained at the Joplin Commercial club.

Decatur Mining and Milling Company—A rich strike has been made at Preston, four miles northeast of Alba. The ore is in sheet formation. This strike is the farthest north of any in the district.

Glass Lead and Zinc Company—The two shafts of this company in the Webb City sheet-ground district are nearly to ore and work in the mill will soon be started.

Halton & Coyne—Wiggington & Milton, mill contractors, of Webb City, have the contract for the new mill for the Emma Gordon and have started work.

Old Times Lead and Zinc Company—Another development in Joplin's new sheet-ground district is the rich strike made on the Black Cat lease west of Chitwood. Thirteen drill holes were put down and all showed rich sheet ore.

Nevada

NYE COUNTY—BULLFROG

Ali Baba—It is proposed to re-open this mine and to carry the 250-ft. shaft down to the 600-ft. level. As soon as a new power hoist is in position three shifts of men will begin shaft sinking and lateral work on the 250-ft. level.

National Bank—Good ore is being broken in the drift on the eastern vein on the 400-ft. level. From a raise on the 200-ft. level a drift has been started to develop an ore shoot from which good assays have been obtained.

Mayflower—Ore is showing over the breast of the south drift on the 400-ft. level. The north drift also continues in good ore.

Hayseed—The crosscut at the 100-ft. level has encountered the big east vein, which at the surface yields pannings of free gold. Some blocks of ground will probably be let to lessees.

Denver—The ore shoot on the 456-ft. level has been proved for a distance of 100 ft. The winze which has been sunk below the fourth tunnel is down 200 ft. and is in ore. About 50 tons have been placed on the dump to await treatment at one of the local mills.

Tecopa Consolidated—Work is in progress on all the levels from 100 to the 500-ft. The ore shipped averages about 76 tons per day.

NYE COUNTY—MANHATTAN

Gold Crest—Directors and prominent shareholders of the company visited the mine to determine the best mode of development. Extensive work will be begun shortly.

Thanksgiving—The big ledge passed through by the shaft is 14 ft. wide. A cross ledge cut in the 236-ft. level is smaller, but carries higher grade ore. The ore in this ledge carries tellurides.

NYE COUNTY—TONOPAH

Extension—The face of the north crosscut on the 1050-ft. level is out 650 ft. and stoping is being carried on at all levels from the 270 to 600 ft. down. Weekly shipments are going forward.

Home—A meeting of the directors was held in Tonopah recently. A definite scheme for resuming development was outlined by the company's engineer and adopted by the board. Work will be resumed on the mine and also upon the company's claims in the Manhattan district.

Jim Butler—Assays of ore from the lower levels continue to improve. The usual amount of ore is being extracted. A new compressor plant has been erected to drive power drills. The plant will be driven by electric power.

Midway—Large bodies of ore of milling grade are being opened up for stoping. The company's mill, which has not been yielding satisfactory returns, has been closed to secure more efficient extraction. The ore carries a large amount of sulphide of silver and it has been found necessary to find a suitable process for leaching the tailings from the mill.

Montana—The Montana-Tonopah mill has been running to its full capacity and the 40 stamps have crushed an average of 180 tons per day.

Nevada Alpine—The mine at Lone mountain has made a shipment of 30 tons

of high-grade ore and another carload will go forward next week.

WHITE PINE COUNTY

Giroux—This company has accepted the concentrating mill built for it under contract by the Traylor Engineering Company, of New York. The mill was found to meet all requirements for tonnage capacity and rate of recovery. The mill was intended to save 80 per cent. of the mineral, but is reported to be exceeding that figure. The concentrate averages about 23 per cent. copper.

New Jersey

SUSSEX COUNTY

Atlas Cement Company—This company is opening a large limestone quarry on the Rutherford farm, near Hardystonville. The engines, boilers, derricks and other machinery are being placed, and the overburden is being removed. A spur line from the Lehigh & Hudson River road has been built.

Pennsylvania

BITUMINOUS COAL

Dunkirk Gas Coal Company—This new company has bought the properties of the Dunkirk Coal Company and the Braznell Gas Coal Company, each operating large mines on the Pigeon Creek branch of the Pittsburg, Virginia & Charleston railroad. The transaction involves the retirement from business, after many years of active life, of Benjamin Braznell, of Braddock, whom many call the dean of coal operations in Pittsburg.

Du Bois No. 1—The Buffalo & Susquehanna Coal Mining Company has nearly completed the installation of an electric haulage plant to replace the endless-rope system, which is now inadequate, the main headings now reaching 1½ miles from the shaft. The mine is in Clearfield county.

Sagamore—The Buffalo & Susquehanna Coal Mining Company is now installing a fan at each of its eight mines at Sagamore, in Jefferson county. The development of these new drift openings has now progressed so far as to render furnace ventilation inadequate. The $1,000,000 power plant at these mines is nearly completed, but will not be required to go into full operation for some months. The mines now afford an output of 2500 tons per day.

Tyler—The Cascade Coal and Coke Company has abandoned the workings on the southern part of its property and is opening a new drift, No. 8, which will give access to a large territory of untouched coal at the center and north of its land. Electric motor haulage is being installed. The property is in Clearfield county.

COKE

Peoples' Coal Company—This company has sold its property, including 2000 acres of coal land in Westmoreland county, to W. J. Rainey and associates, of Pittsburg. It is understood that a large coke plant will be established on the property.

South Dakota

LAWRENCE COUNTY

Arkota—The main shaft is 200 ft. deep and sinking has ceased until a hoist, pump and air compressor are installed. In a second shaft a good prospect in gold is showing up.

Bear Lodge—A 50-ft. shaft is being sunk by Dr. M. J. Scott, of Omaha, and L. R. Davis, of Sundance and associates. Free milling gold ore in a vein that is widening with depth, has been encountered.

Carbonate Camp—Plans are under way to resume operations on several of the properties that have been idle for 20 years. Indications point to high-grade gold bodies lying under the silver ledges. Deeper mining is planned on the Spanish R. and other former high-grade silver properties.

Bear Gulch—Two deals are now in progress to develop the gold ledges with Eastern capital and later to do some extensive tin mining.

Garfield Mining Company—This new company was reorganized from the stockholders of the old Lockport Mining Company whose ground is situated near Lead The new officers are: President, James McQuillen; vice-president, A. H. Lundin; secretary-treasurer, C. J. Searle.

Horseshoe—This mine is being recpened and an electric hoist installed.

Mogul—This company's mill at Pluma is putting through about 300 tons of ore per day and is cleaning up fortnightly.

Reliance Mining Company—The new mill is being operated and its capacity will shortly be increased to 150 tons per day by the addtion of a new Huntington.

PENNINGTON COUNTY

Black Warrior—Hugh McLellan has resigned from the Mariposa to take charge of his own ground near Mystic and will develop a recent find of gold ore.

Castle Creek—Thomas Ormsby and associates are putting through a deal with eastern capital for the purchase of several miles of ground for placer mining along Castle and Rapid creeks. Heavy machinery will be installed.

Downie-Wright—A new device in placer mining has been installed on the Battle creek ground near Keystone. The black sands are to be run over concentrating tables. The plan is to re-treat the Holy Terror tailings.

Hymalula—E. E. Bennett and associates are preparing to install steam machinery for deeper mining on their claims near Mystic.

J. R.—Large pumps have been installed and as soon as the mine is dry, work will be resumed by Superintendent Crocker.

Keystone—Beds of fine rubies have been found near here in the old placers and several prospectors are engaged in developing them.

United Worthy—Ernest Haase has put a force of men to work to develop his copper and gold property north of Keystone. Two tunnels, 50 and 20 ft. long, are to be continued, principally on account of the copper showing.

Eagle Mountain—Colonel Clark has commenced work on his copper property near Keystone. A new air compressor and hoist have been installed.

Tennessee

Tennessee Copper Company—The acid works in connection with the smeltery of this company are practically completed, but probably they will not be put in operation before November.

PUTNAM COUNTY

Monterey Coal and Coke Company—This company is pushing work on its property near Monterey, which includes 1500 acres of coal land. The main entry is in 300 ft. and a number of buildings have been erected. The machinery is being installed as fast as it arrives, and it is expected that regular shipments will be begun by February next. Charles H. Treat, of Washington, D. C., is president; J. T. Wilder, of Knoxville, Tenn., vice-president and general manager.

Utah

BEAVER COUNTY

Cactus—The Newhouse Mines and Smelters Corporation, operating this copper mine, has curtailed its production more than one-half. The mill is to be operated one shift a day indefinitely and a small force is to be engaged in sinking the shaft below the tunnel adit to the 800 level and to explore the 700 and 800 levels. The company produced a little more than 1,000,000 lb. of copper in September.

JUAB COUNTY

Tintic Ore Shipments—Shipments last week amounted to 143 carloads, the contributing mines and amounts being: Beck Tunnel, 7; Colorado, 9; May Day, 6; Eagle & Blue Bell, 6; Yankee Consolidated, 4; Uncle Sam, 4; Eureka Hill, 2; Gemini, 5; Centennial Eureka, 55; Bullion Beck, 5; Scranton, 8; Tintic Iron, 1; Grand Central, 7; Mammoth, 9; Ajax, 2; Carisa, 3; Lower Mammoth, 9; other mines, 3 cars.

Colorado—A second cave has been en-

countered in this Tintic mine about 50 ft. south and west of the first one. The character of the ore of the two is similar.

Mammoth—This company has been shipping some high-grade gold ore. One carload recently brought the company, it has been learned from good authority, considerably more than $100,000. The ore was selected from a rich shoot recently encountered.

TOOELE COUNTY

Honerine—The shareholders are scheduled to meet in annual session shortly, at which time the matter of adjusting the finances of the company will be considered. The property has been closed for about two months.

Southport—This company is conducting a vigorous campaign of development.

New Stockton—Work is progressing on the installation of additional mill equipment.

West Virginia

Judge Dayton, in the United States District court, has issued an injunction against the United Mine Workers and their agents. The order restrains the officials from organizing or interfering in any way with about 1000 non-union miners employed by the Hitchman Coal Company, the Glendale Coal Company and the Richland Coal Company, operating in the Wheeling district. It is regarded as the most sweeping injunction ever entered against a labor organization.

Wisconsin

GOGEBIC RANGE—IRON

Montreal—The new steel-lined shaft, east of the present workings, has reached a depth of 170 ft. Sinking is progressing at the rate of 70 ft. per month and the steel construction is laid close behind the drilling operations. Considerable difficulty was encountered with quicksand earlier in the sinking, but this danger has now been passed.

Canada

ONTARIO—COBALT DISTRICT

Ore Shipments—Shipments of ore for the week ending Oct. 19 were as follows: Drummond, 64,830 lb.; Kerr Lake (Jacobs), 59,950; La Rose, 281,710; McKinley-Darragh, 266,260; O'Brien, 64,575; total, 737,325 lb. A large proportion of the shipments were sent to the smelters in Denver, Colo.

Foster—A contract has been let to the Cobalt Concentrators, Ltd., for the erection of a concentrator on the property.

Nipissing—Surface work will be discontinued during the winter and drifting and crosscutting carried on extensively underground. The large cobalt vein on the Temiskaming & Hudson Bay property has been traced on the northern lot of the Nipissing.

Temiskaming & Hudson Bay—An important strike was made recently at a depth of 100 ft. on the vein discovered last March. At this point it is 10 in. wide, showing solid native silver.

Trethewey — A financial statement, issued for presentation at the annual meeting of shareholders, covering the period from June 13, 1906, to Aug. 31, 1907, shows revenue from all sources $249,262; operating and other expenses, $124,739, and surplus, $124,522. Two dividends amounting to $75,636 have been paid. During the year 814 tons of ore have been shipped, from which the net receipts were $221,161. It is estimated that 100 tons of ore in the new stope will net $200,000. Recently a large orebody was disclosed at a depth of 50 ft., which showed values of from 3000 to 4000 oz. silver to the ton.

HASTINGS COUNTY

Deloro Smelter — Prof. Willett G. Miller and T. W. Gibson, deputy minister of mines, have returned to Toronto from a trip of inspection to the smelter at Deloro, near Marmora, which is being refitted to treat Cobalt ore. It will have a capacity of between 15 and 20 tons per day and is expected to be ready for operation in about a month. The Deloro plant is in charge of Messrs. Kirkegaard, Wright and Kirkpatrick.

PORTAGE BAY DISTRICT

Charrette Location — A calcite-silver vein 2 in. wide has been discovered at a depth of 25 ft. The vein at the surface was red quartz.

Sargesson Location—A vein several feet in width has been found on the surface and traced for a considerable distance. Assays are said to show 2000 oz. silver to the ton. A steam plant has been ordered.

BRITISH COLUMBIA—VANCOUVER ISLAND

Britannia—The smelter at Crofton has been closed down, the reason given being the failure of water supply, owing to the very dry fall. At the Britannia mine, Howe Sound, the working force has been reduced, as the smelter is not handling copper ore. Development work will be continued.

Mexico

CHIHUAHUA

A wagon road is to be built from Guanacevi to Rosario, the terminus of the Parral branch of the Mexican Central railroad. The expense will be about $25,000, and will be borne by the owners of mines in the district.

San Miguel—The tramway across the Batopilas river to the mill at San Antonio has been completed and is delivering 100 tons of ore per day.

Providencia—This property north of La Luz in the Palmilla district has been bonded to W. W. Robinson, treasurer of the Buena Ventura Mining Company, and the first payment has been made.

DURANGO

Penoles Mining Company—The mines at Ojuela are shipping 500 tons per day, some of the low-grade sulphides going to Torreon for treatment. The capacity of the Mapimi smelting works is to be enlarged to 2000 tons per day.

GUANAJUATO

Peregrina—The mill has resumed full operation with its 120 stamps. Owing to the unusually dry season this and several other properties were compelled to reduce operations. Recent rains have replenished the water supply.

Alcalar—This mine in the Nayal district has resumed operations and is daily shipping ore to the mills at Guanajuato.

Catilles—The firm, Shewell & Fulton, has bought this mine and also La Fraqua, it is said for American capitalists.

Providencia Mining and Milling Company—The mine of this company at Tajo Dolores is being unwatered. Material has been ordered for a 60-stamp mill and cyanide plant.

OAXACA

Veronica—A rich strike of silver and gold ore has been made at this mine in Taviche at about 250 ft. in following old workings.

Zapote—Silver ore of shipping grade has been struck at a depth of 60 ft. in a new shaft at the eastern edge of the property at Taviche.

Africa

WEST AFRICA

Gold production in September is reported at 24,613 oz. bullion. For the nine months ended Sept. 30 the total was 157,178 oz. bullion in 1906, and 216,679 oz. in 1907; an increase of 59,501 oz. The bullion reported in 1907 was valued at 4,207,589, equal to 203,560 oz. fine gold.

New Caledonia

Exports of ores from New Caledonia for July and the seven months ended July 31 are reported by the *Bulletin du Commerce*, of Noumea, as follows, in metric tons:

	July.	Seven Mos.
Nickel ore	3,370	63,532
Cobalt ore	167	2,052
Chrome ore	6,755	21,466
Iron ore	16	30

The July exports included 160 tons nickel ore and 6247 tons chrome ore for the United States.

Metal, Mineral, Coal and Stock Markets

Current Prices, Market Conditions and Commercial Statistics of the Metals, Minerals and Mining Stocks

QUOTATIONS FROM IMPORTANT CENTERS

Coal Trade Review

New York, Oct. 30—The coal trade in the West is generally in good condition, though there is increasing complaint of car shortage. The demand for coal at the large consuming points is good, and mines are generally working as near full time as their car supply will permit. The financial troubles have not yet affected the coal markets to any extent.

Interests in the West is centered on the conference which began in Indianapolis Oct. 29. While it is not expected that any definite action will or can be taken, the results of the conference may have an important effect on the agreements for next year.

In the East the bituminous trade is less active and there is a perceptible halt, which may become more pronounced if matters do not improve. The coastwise trade is active, in view of approaching winter, with its ice blockades at the New England ports.

The anthracite market is steady, with no material change, except some decrease in the demand for steam coal. Coastwise business is good, for the same reasons as with bituminous coal.

Coal Traffic Notes

Shipments of coal and coke originating on the Pennsylvania Railroad Company's lines east of Pittsburg for the year to Oct. 19 were as follows, in short tons:

	1906.	1907.	Changes.
Anthracite.....	3,518,659	4,552,056	I. 1,033,397
Bituminous.....	25,542,786	31,264,996	I. 5,722,210
Coke.....	10,114,822	11,243,846	I. 1,129,024
Total.....	39,176,267	47,060,898	I. 7,884,631

The total increase this year was 20 per cent.

The Pittsburg Coal Company reports its production for the nine months ended Sept. 30 as follows, in short tons:

	1906.	1907.	Changes.
Pittsburg Dis.....	13,176,489	13 302.634	I. 126,145
Hocking Dis.....	1,122,562	1,018,481	D. 104,081
Total coal.....	14,299,051	14,321,115	I. 22,064
Coke made	321 142	382,205	I. 61,063

The coke is all made in the Pittsburg district. The increase in coal mined this year was 0.2 per cent.; in coke made, 19 per cent.

Shipments of Broad Top coal over the Huntingdon & Broad Top Railroad for the year to Oct. 26 were 834,490 tons.

Shipments of bituminous coal and coke over various railroads in western Pennsylvania and West Virginia for the eight months ended Aug. 31 are reported as follows, in short tons:

	Coal.	Coke.	Total.
Balt. & Ohio.....	17,451,173	3,851,858	21,303,031
Buff., Roch. & Pitts.	4,707,362	418,692	5,126,054
Penn. lines, N.Y.Cen.	5,465,229	53,787	5,519,016
Pitts. & L. Erie.....	7,205,062	3,569,925	10,774,987
Norfolk & Western..	8,040,621	1,728,667	9,769,288
Total.....	42,869,447	9,622,929	52,492,376
Total, 1905.....	38,938,838	8,859,881	47,798,719

The total increase this year was 4,693,657 tons, or 9.8 per cent. In addition to the tonnage given above, the Baltimore & Ohio carried 572,481 tons of anthracite in 1906, and 643,638 tons in 1907; an increase this year of 71,157 tons.

The coal tonnage over the roads in the Ohio Coal Traffic Association for the eight months ended Aug. 31 was as follows, in short tons:

	1906.	1907.	Changes.
Hocking Valley.....	2,497,612	2,569,057	I. 71,445
Toledo & Ohio Cent..	1,093,878	1,178,522	I. 84,644
Baltimore & Ohio ...	1,127,305	1,486 006	I. 358,701
Wheeling & L. Erie..	1,329,847	2,290,975	I. 961,128
Cleve., Lorain & Wh.	1,284,078	1,914.995	I. 630,917
Zanesville & Western	717,706	1,071,431	I. 353,725
Toledo Div., Pen Co.	1,461,887	1,563,345	I. 101,458
L. Erie, Alliance & Wh.	403,547	810,544	I. 406,997
Marietta, Col. & Clev.	5,785	18,626	I. 12,841
Total.....	9,921,645	12,903,501	I.2,981,856

The total shows an increase this year of 30.1 per cent.

New York

Anthracite

Oct. 30—The demand for prepared sizes is more active for stove and chestnut sizes than egg. Small steam sizes are reported to be inactive and in light demand. Prices are quoted as follows: Broken, $4.75; egg, stove and chestnut, $5; pea, $3.25; buckwheat No. 1, $2.75; buckwheat No. 2 or rice, $2.15@2.25; barley $1.75, all f.o.b. New York harbor.

Bituminous

The strong demand for bituminous coal continues and large shipments have been going to the far East. However, the last cargoes are now being shipped to the shoal-water ports.

The local market is not as strong, owing, in a large measure, to the financial conditions of the past week. These have brought about a decided decrease in demand and prices in the harbor have fallen off temporarily from 10 to 15c. Just now fair grades of steam coal bring $2.80@2.85 f.o.b. New York harbor shipping ports.

The far East is calling for all the coal that can be delivered before the close of navigation. Certain captains of vessels are beginning to insist upon the ice clause in bills of lading for Maine ports. Considerable coal is being shipped to points along the Sound.

The condition at the mines is one of activity hampered by a lack of cars. Producers are sending forward all the coal that they possibly can, but shipments are delayed at various points. The slowness in handling cars at Norfolk and Newport News still continues. Transportation, however, is fairly good, cars running through on about schedule time.

In the Coastwise vessel market light draft vessels have been scarce, but are now in better supply. A number have recently been chartered to such points as Hallowell and Biddeford at about $2 from New York. Freight rates are quoted as follows: from Philadelphia to Boston, Salem and Portland, 90@95c.; to Portsmouth, $1@1.10; Newburyport and Lynn, $1.25@1.30; Saco and Bangor, $1.50; Augusta, $2.25 per ton.

Birmingham

Oct. 28—No change is reported in coal affairs in Alabama. The dullness in the iron market does not frighten the coal operators. It is stated that there will be active conditions in the coal market all through the winter. While the wages of the coal miners are based on the selling price of iron, the present quotations must break $5 yet before there is a drop of 5c. per ton in the miners' wages.

Chicago

Oct. 28—The coal market continues strong in nearly every line, the only weakness being in certain eastern coals that have been somewhat scarce, but are now in large supply. Sales are heavy and demurrage coal continues to be small. Illinois and Indiana lump and egg bring $2.25@2.65; run-of-mine, $1.75@2.50 and screenings $1.10@1.50. There is not much complaint about transportation of western coals, though car shortage is apparent.

Eastern coals are somewhat weaker. Larger shipments and better railroad service are responsible for the increased supply. Smokeless is quiet at $4.30 for lump and $3.30 for run-of-mine. Hocking holds up to $3.50; Youghiogheny and Pittsburg are in good demand at unchanged prices. In the anthracite market the great need is for chestnut.

Cleveland

Oct. 29—The local coal market opened strong this week, with Ohio coals generally 5c. above last week. The reason for higher prices is car shortage, which is preventing shippers from getting coal to local points in sufficient quantity to fill contracts. The following prices are quoted on No. 8 Ohio grades: Slack, 80c.; mine-run, $1.25; ¾-in. lump, $1.35. These prices are expected to hold, and dealers are anticipating an increase next week. Retail dealers advanced prices here last week 10c. a ton.

Coke continues steady. Furnace is quoted at $2.90@3 at ovens, and foundry, $3.25@3.50. Some sales for first-half delivery are reported at $3.25 for foundry.

Pittsburg

Oct. 29—The demand for coal continues in excess of production. Many mines are idle this week on account of a scarcity of railroad cars. Not more than 60 per cent. of the cars required were furnished today and it is believed the supply will be less before the end of the week. Prices are firm on the basis of $1.40@1.50 for mine-run coal at mine. Slack remains around 80c. There was a rise in the rivers, but it was not sufficient to permit the shipping of coal; several large tows of empty boats and barges came in and were sent to the pools. All the river coal mines are in full operation, and there will be a heavy shipment on the next rise.

Connellsville Coke—Prices are firmer this week, not due, however, to an increased demand, but to the fact that production is being curtailed. Several independent producers have already shut down a number of ovens and the H. C. Frick Coke Company has arranged to close 1000 ovens on Nov. 1. Standard Connellsville furnace coke is quoted at $2.75@2.90 and foundry coke at $3.25@3.50. The *Courier* in its weekly report gives the production in both fields at 426,598 tons. The shipments amounted to 14,291 cars, distributed as follows: To Pittsburg, 4966 cars; to points west of Connellsville, 8448 cars; to points east of Connellsville, 877 cars.

Foreign Coal Trade

The coal bunkered or sold for consumption on steamships in foreign trade at United States ports for the eight months ended Aug. 31 was 3,779,112 tons. Added to the exports, previously reported, this makes a total of 12,382,196 tons of coal sold for consumption beyond the limits of the United States.

Imports and exports of fuel in Belgium for the eight months ended Aug. 31 were, in metric tons:

Imports:	1906.	1907.	Changes.
Coal	3,484,876	3,512,983	I. 28,107
Coke	238,575	240,233	I. 1,658
Total	3,723,451	3,753,216	I. 29,765
Exports:			
Coal	3,325,607	3,098,895	D. 226,712
Coke	571,400	573,358	I. 1,958
Total	3,897,007	3,672,253	D. 224,754

Imports were chiefly from Germany and Great Britain; exports were largely to France and Holland.

Iron Trade Review

New York, Oct. 30—Dullness and extreme conservatism have characterized the iron and steel markets—conditions which were to be expected, in view of the financial position. In pig iron the only sales have been of small lots for early delivery. At the same time, there has been no movement to stop production, and no furnaces have gone out of blast, unless for repairs and similar causes. In finished material new orders also have been very small, and usually for lots needed to fill out contracts under execution. In several cases material has been offered at concessions, but without bringing much business so far. The markets are simply waiting to see what the results will be, and no one is prepared to enter into new engagements just now.

A contract for 15,000 tons of steel rails for early delivery for Japan has been awarded to the United States Steel Products Company—the export branch of the Steel Corporation—at $30 per ton, delivered at Yokohama. It is understood that about 30,000 tons more for Japan will soon be placed. The German Steel Syndicate recently took contracts for 20,000 tons of rails for Japan.

The Prussian State railroad contract for rails for 1908 has been taken at 111 marks per metric ton, delivered; equal to $26.84 per long ton.

A singular transaction recently noted is the arrival at New York of 2500 tons of basic pig iron from China. This iron was made at the Hanyang works, on the Yangtse river, about 600 miles from its mouth.

United States Steel Corporation—The statement for the quarter ended Sept. 30 shows a decrease in net earnings, after deducting operating expenses, of $1.699,420 from the June quarter, but an increase of $5,689,661 over the September quarter of last year. The income statement for the quarter may be summed up as follows:

Net earnings for the quarter	$43,804,285
Sinking funds, subsidiary co's	$ 589,358
Depreciation and improvements	7,519,822
Interest and sinking funds	6,936,962
Total charges	$15,046,142
Surplus for the quarter	$28,758,143

Appropriations from this surplus were: Dividend on preferred stock, 1¾ per cent., $6,304,919; on common stock, ½ per cent., $2,541,513; new construction, $15,000,000; total, $23,846,432, leaving an undivided balance of $4,911,711 for the quarter. Unfilled orders on the books Sept. 30 reached a total of 6,425,008 tons of material, against 7,603,878 tons on June 30, and 7,936,884 tons on Sept. 30 of last year. Export business is now at the rate of 1,000,000 tons per year

Baltimore

Oct. 30—Imports for the week included 407 tons of ferromanganese. One cargo of 5500 tons manganese ore was received from Brazil, and one of 7000 tons from India, making 12,500 tons in all. A shipment of 14,426 sacks of copper ore was received from Callao, Peru. Arrivals of iron ore were 12,000 tons from Cuba.

Birmingham

Oct. 28—The iron make in Alabama is being kept up and the product is being shipped out about as rapidly as it is being manufactured. There is no new business being placed in this district to speak of; a few orders of from one to three and four carloads of iron at a time being bought for delivery during the next two months. It is stated by the iron men that quotations are being held up in this section, No. 2 foundry, for this year's delivery, being quoted at $18@18.50 per ton. A report was current the past week that iron had been sold as low as $17 per ton.

Chicago

Oct. 28—The pig-iron market is quiet under the stress of general conservatism in business. Furnace agents say prices will not decline, but lack of buying is everywhere evident. There is a continuance of the small-lot, quick-delivery business at $22.50 for Northern No. 2 and $18 Birmingham for Southern No. 2 ($22.35 Chicago).

Future business is off, inquiries and sales for next year's business being practically unknown. Consumption of iron continues to be heavy.

Coke remains at $5.90 for first-class Connellsville, with the market somewhat weaker, due to larger supplies.

Cleveland

Oct. 28—Demand for tonnage in other lines than iron ore is not very heavy, and vessels are leaving light for upper lake ports to load. Local vesselmen are sticking to ore pretty closely and most of them are well up on their contracts. Most of the big steel barges will be dropped next month. There is some wild tonnage now on the market.

Foundries report a better inquiry for pig iron and while there is little demand for 1908 iron, deliveries are well sold up to December. The following prices are

quoted for the rest of the year; Bessemer $22.90; No. 1 foundry Northern, $21.50@22; No. 2, $21@21.50; No. 3, $20@21; No. 2 Southern, $21.75@22; gray forge, $20@20.50, Cleveland.

Philadelphia

Oct. 30—Very little pig iron has been sold during the past week; if there is any iron entitled to be regarded as active it is basic. This is due to a drop in prices, and a number of large consumers have already made considerable purchases. A few good sales of forge have just been closed. Foundry shows no sign of life. It is on the down grade, and a number of large consumers in the East are in correspondence with Southern makers, and if the Southern furnace people will accept the views of buyers there will be probably a good deal of business to report. Bessemer pig is dull and business is in abeyance.

Steel Billets—There has been a sharp decline in bessemer billets consequent upon free offerings. Quotations today are $28 for bessemer and $29 for open-hearth.

Bars—Bar iron has gone off a trifle. There is no disposition to buy heavily; even some of the larger consumers are purchasing only small lots.

Sheets—The sheet mills are running about as usual and the local representatives report conditions about the same. There is no decline in consumption.

Pipes and Tubes—All kinds of pipe are in excellent demand. Tubes are strong in small lots, but users are well supplied.

Merchant Steel—Rather more business is being done in merchant steel. Prices show less variation in this branch than any other.

Plates—In a general way the situation in plate is satisfactory, although the new business for the past week is insignificant. This may lead to a shading of prices, as the larger mills are more anxious to secure long running contracts.

Structural Material—The volume of business done in structural material shows a decided falling off. The card rate of 1.70c. basis appears to have been departed from excepting in unimportant small transactions. It is stated that a great deal of projected work has been suspended.

Steel Rails—The steel-rail situation hangs fire, and there is very little to say. Some business is coming from Mexico, Cuba and South America. Traction rails are being contracted for every week and this business is all right.

Scrap—The scrap market has toned up a little, but prices have not improved. Certain large buyers of scrap are in the market at present and are talking about buying, but they are doing nothing. The dealers are keeping a close watch and will be ready to meet any demand that may arise.

Pittsburg

Oct. 29—The iron and steel markets were not materially disturbed by the embarrassment of the Westinghouse Electric and Manufacturing Company and the Westinghouse Machine Company. A tight money market, and not a lack of business, seems to have been the chief cause of the trouble. Other manufacturing interests are conducted on different terms and therefore are not affected. The markets continue extremely dull and there is absolutely no new business of any consequence. Strong efforts are being made to maintain prices for the rest of the year, but it is doubtful if they will be successful. Some surprise was occasioned today by a rumor that the Carnegie Steel Company is cutting prices on steel bars. The report was not officially confirmed and may not be true. Iron bars are lower and it is reported that sales were made during the week at 1.60c., or $2 a ton below the recent minimum quotation. Re-rolling rail mills are cutting the price of light rails. This has at last forced the Carnegie Steel Company to order a reduction of $3 a ton in 16- to 45-lb. sections and $2 a ton in sections of 12 lb. and less. About 1000 tons of light rails have been booked at the low price.

Sheet prices are still being cut, but no shading is noted in tin-plate prices, the reason evidently being that there is no demand for tin-plate. The American Sheet and Tin Plate Company put on nine additional tin mills yesterday and this week is operating 83 of its 242 mills.

There has been a number of reports of closing of steel mills, principally by the Carnegie Steel Company, but so far no material curtailment of production has actually taken place. There is, however, a general slowing up and it would not be surprising if a number of iron and steel plants are closed early in November.

Pig Iron—There is no change in pig iron, except that it appears to be much weaker. Sales of basic iron reported last week at $19.25@19.50, Valley furnaces, are said to have been exaggerated. This is indicated by the refusal of an independent steel interest to take 1000 tons at $19; it is holding out for a lower price. Bessemer pig remains nominally at $22, Valley furnaces, but there have been no transactions for several weeks. No. 2 foundry is quoted nominally at $19.50, Valley furnaces, and it is probable that some sales will be made later in the week at that figure. Gray forge is not in demand and is quoted at about $19.65, Pittsburg.

Steel—Low prices are being named for billets and it is believed $28 can be shaded on bessemer billets and $29.50 on open-hearth. Plates are firm at 1.70c., but it is believed a concession of $2 a ton from the price of 1.60c. on steel bars can be obtained on new business.

Sheets—Black sheets are still being cut $2 a ton by independent interests, but quotations remain at 2.60c. and galvanized sheets are fairly strong at 3.75c. for No. 28 gage.

Ferro-Manganese—Prices have declined and quotations for prompt ferro are $55@55.50 per ton.

Metal Market

NEW YORK, Oct. 30.

Gold and Silver Exports and Imports

At all United States Ports in Sept. and year.

Metal.	Exports.	Imports.	Excess.
Gold:			
Sept. 1907..	$ 1,503,836	$ 2,734,086	Imp. $ 1,230,250
" 1906..	1,178,922	31,431,038	" 29,152,116
Year 1907..	49,879,813	30,837,287	Exp. 19,042,526
" 1906..	35,789,962	111,776,017	Imp. 75,986,055
Silver:			
Sept. 1907..	6,048,457	3,789,113	Exp. 2,259,344
" 1906..	3,594,311	3,262,559	" 331,752
Year 1907..	47,970,793	34,454,571	" 13,516,222
" 1906..	45,441,339	32,994,069	" 12,447,270

These statements cover the total movement of gold and silver to and from the United States. These figures are furnished by the Bureau of Statistics of the Department of Commerce and Labor.

Gold and Silver Movement, New York

For week ending Oct. 26 and years from Jan. 1

Period.	Gold.		Silver.	
	Exports.	Imports.	Exports.	Imports.
Week.....	$1,697,514	$ 394,264	$ 997,154	$ 229,437
1907.....	34,208,544	8,654,748	43,386,062	2,519,442
1906.....	6,022,183	92,208,039	44,651,975	1,849,210
1905.....	34,425,278	10,380,977	29,006,228	3,796,466

Export for the week, both gold and silver, were chiefly to London. Imports for the week were from the West Indies and Mexico.

Specie holdings of the leading banks of the world, Oct. 26, are reported as below, in dollars:

	Gold.	Silver.	Total.
Ass'd New York	.....	.....	$196,426,000
England.....	$173,866,570	.....	173,866,570
France.....	577,008,770	$157,856,165	737,864,935
Germany.....	158,245,000	43,850,000	202,095,000
Spain.....	77,890,000	127,725,000	205,615,000
Netherlands....	33,165,000	25,575,000	58,740,000
Belgium.....	16,206,665	8,103,335	24,310,000
Italy.....	177,825,000	23,839,000	201,664,000
Russia.....	621,845,000	27,670,000	649,515,000
Aust.-Hungary.	226,490,000	58,860,000	285,350,000
Sweden.....	21,220,000	.....	21,220,000

The banks of England and Sweden report gold only. The New York banks do not separate gold and silver in their reports. The European statements are from the cables to the *Commercial and Financial Chronicle* of New York.

The foreign commerce of the United States for the nine months ended Sept. 30 is reported as follows by the Bureau of Statistics of the Department of Commerce and Industry:

	1906.	1907.
Exports, merch'dise..	$1,237,834,424	$1,331,621,655
Imports, " ..	948,267,117	1,108,134,988
Excess, exports.....	$289,567,307	$223,486,667
Add excess of exports, silver.....		13,516,222
Add excess of exports, gold.....		19,042,526
Total export balance.....		$256,045,415

The gold and silver movement in detail is given in the table at the head of this column.

Silver Market

SILVER AND STERLING EXCHANGE.

Oct.	Sterling Exchange.	Silver. New York, Cents.	Silver. London, Pence.	Oct.	Sterling Exchange.	Silver. New York, Cents.	Silver. London, Pence.
24	4.8485	61⅜	28⅜	28	4.8250	60½	28⅛
25	4.8400	61	28¼	29	4.8250	59¾	27⅞
26	4.8200	60¼	28	30	4.8400	59⅛	27 7/16

New York quotations are for fine silver, per ounce Troy. London prices are for sterling silver, 0.925 fine.

Shipments of silver from London to the East are reported by Messrs. Pixley & Abell as follows, for the year to Oct. 17:

	1906.	1907.	Changes.
India	£ 12,937,796	£9,741,954	D. £ 3,195,842
China	430,700	68,400	D. 362,300
Straits	1,750	625,950	I. 624,200
Total	£ 13,370,246	£10,436,304	D. £ 2,933,942

Receipts for the week were £184,000 in bars and £15,000 in Mexican dollars; £199,000, all from New York. Exports were £10,000 in coin to Australia; £39,600 to India; £5000 in bars and £63,400 in Mexican dollars to Hong Kong; £118,000 in all.

Indian Exchange has been slightly easier, owing to bad reports as to rain and crop prospects. The Council bills offered in London brought an average of 15.96d. per rupee. Buying of silver for India has been light.

Prices of Foreign Coins

	Bid.	Asked.
Mexican dollars	$0.46¼	$0.52
Peruvian soles and Chilean	0.40	0.46
Victoria sovereigns	4.83	4.86
Twenty francs	3.87	3.92
Spanish 25 pesetas	4.78	4.80

Other Metals

Oct.	Copper. Lake, Cts. per lb.	Copper. Electrolytic, Cts. per lb.	Copper. London, £ per ton.	Tin. Cts. per lb.	Lead. Cts. per lb.	Spelter. New York, Cts. per lb.	Spelter. St. Louis, Cts. per lb.
24	11⅞ @12⅛	11¾ @12	56¾	30¾	4.75	5.40 @5 45	5 25 @5.30
25	12¼ @12⅜	12 @12¼	58⅛	31½	4.75	5.37½ @5.42½	5.22½ @5 27½
26	12¼ @12⅜	12 @12¼	.....	32	4.75	5.35 @5 40	5.20 @5 25
28	13 @14	12¾ @13¼	61¼	32¼	4.75	5.35 @5.40	5 20 @5.25
29	14 @14⅛	13¾ @14	64	32¾	4.75	5.30 @5.35	5.15 @5.20
30	14 @14¼	13¾ @14¼	63	32	4.75	5.30 @5.35	5.15 @5.20

London quotations are per long ton (2240 lb.) standard copper, which is now the equivalent of the former g.m.b's. The New York quotations for electroytic copper are for cakes, ingots or wirebars, and represent the bulk of the transactions made with consumers, basis, New York, cash. The price of cathodes is 0.125c. below that of electroiytic. The lead prices are those quoted by the American Smelting and Refining Company for near-by shipments of desilverized lead in 50-ton lots, or larger. The quotations on spelter are for ordinary western brands: special brands command a premium.

Copper—As early as last Thursday signs of reaction in the market became evident and on Friday a strong upward movement began, European and Chinese buyers coming into the market for large quantities, which speedily acquired a great impetus. Immense transactions have taken place, amounting in the aggregate probably to upward of 60,000,000 lb., and under the circumstances prices advanced by leaps and bounds. The range of prices realized by the same dealers in one day and by different dealers at the same time has been wide, while a few spasmodic and comparatively small sales have been made at prices above those realized for the great bulk of the transactions, this indicating the excited condition of the market.

The sales have been chiefly for export; although there have been increased sales for domestic account the buyers on this side have not figured in the market to so great an extent as might have been were it not for the money stringency. Of the sales for export, a part have been of speculative character, but a good part have been directly to consumers, and the increase in the latter business is an encouraging feature.

At the close the market is strong at 14 @14¾ for Lake copper; 13¾@14¼ for electrolytic in ingots, cakes and wirebars. Business in casting copper has been done during the week at an average of 12¾ and closes at 13¾@14c.

In London a large business was done, a considerable short account being driven to cover. Prices reached £66 on Tuesday and close at £63 for spot, £63 for three months.

Refined and manufactured sorts we quote: English tough, £60; best selected, £67; strong sheets, £72.

Exports of copper from New York during the week were 4112 tons. Our special correspondent gives exports from Baltimore for the week at 241 long tons of copper.

The announcement has been made that beginning with Nov. 1 the old rate of wages of $3.50 per day will be put into effect at Butte. This is a reduction of 12½ per cent. from the rate which has been in effect since the price for copper was 18c. and over. The reduction will have an important effect in lowering the cost of production at Butte. The action of the Butte companies will doubtless be followed by those in other districts where a similar advance was made.

Copper Sheets and Wire—The base price for copper sheets is 20c. per lb.; of wire, 16c. per pound.

Tin—The market in London has again fluctuated considerably, being by turns strong and weak. The visible supplies of this metal are so small that the market can be easily manipulated. Quotations are cabled at the close as weak at £145 for spot,, £146 5s. for futures.

Hardly anything has been done in this market where buyers are rather reluctant to anticipate their wants. The fluctuations of the London market are also not designed to inspire confidence among consumers here, who are continuing to buy their immediate requirements only. The market for spot delivery closes at 32c.

Exports of tin from the Straits are reported as follows for the eight months ended Aug. 31, in long tons:

	1906.	1907.	Changes.
United States	9,334	8,329	D. 1.005
Great Britain	23,604	23,556	D. 48
Other Europe	5,021	5,615	I. 594
China and India	847	1,267	I. 420
Total	38,806	38,767	D. 39

The total was practically the same in both years, the decrease being only 0.1 per cent.

Lead—The price of the American Smelting and Refining Company for desilverized remains unchanged at 4.75c. New York and 4.67½c. St. Louis. Outside brands continue to be offered at 4:55@ 4.60c., New York, and 4.40@4.45c., St. Louis. Even at these prices it appears to be difficult to effect transactions.

The European market for lead has been quieter and at the close Spanish lead is quoted at £18, English lead at £18 2s. 6d.

St. Louis Lead Market—The John Wahl Commission Company reports as follows: Lead is dull. Missouri brands are freely offered at 4.42½c., and are only lightly salable.

Spelter—The market is very quiet. But little business has been done and this at somewhat lower prices. We quote St. Louis 5.15@5.20, New York 5.30@5.35c.

The London market is unchanged, closing at £21 15s. for good ordinaries, £22 for specials.

The recent report of the Broken Hill Proprietary Company, of New South Wales, states that the company had already delivered, up to June 30 last 131,957 tons zinc concentrates, containing approximately 52,782 tons metallic zinc. Sales for future delivery still unfilled were 194,273 tons concentrates, containing 77,709 tons spelter. The contracts call for the delivery of 54,273 tons concentrates in 1907; 70,000 in 1908, and 70,000 in 1909. Payment is made at time of delivery on *pro forma* invoices, but the actual price is only fixed at the average price of spelter during the year following that of delivery.

Zinc Sheets—The base price is $7.50 per 100 lb.—less discount of 8 per cent.—f.o.b. cars at Lasalle and Peru. The freight rate to New York is 27.50c. per 100 lb.

The movement of zinc ores and products in Germany for eight months ended Aug. 31 was, in metric tons:

	Imports. 1906.	Imports. 1907.	Exports. 1906.	Exports. 1907.
Spelter	24,363	20,415	41,787	40,873
Zinc sheets	48	80	10,601	12,741
Zinc scrap	1,443	717	3,076	4,750
Zinc dust	.....	646	.....	1,462
Zinc oxide	.....	4,058	.....	12,636
Lithophone	1,079	1,436	5,154	6,105
Zinc ore	119,214	115,398	28,907	21,703

The only large increase in exports was that in zinc oxide.

Antimony—The market remains dull and no business is reported. Abroad the situation is the same and buyers are not in evidence. Quotations at New York are nominally as follows: Cookson's, 11½; Hallett's, 10@10¼c.; ordinary brands, 9¼@10c.

Nickel—For large lots, New York, the chief producer quotes 45@50c. per lb., according to size and terms of order. For small quantities, 50@65c., same delivery.

Quicksilver—New York price is $40.50 per flask for lots of 100 flasks or over; smaller orders, $41@45. San Francisco quotations, $37.50@39 per flask for domestic orders; $36@37 for export. London quotation is £7 15s. per flask.

Platinum—The market is inclined to be reactionary and prices have fallen off slightly. Scrap especialy has declined in the price offered by dealers. Prices are: Hard metal, $29; ordinary, $26.50; scrap, $20 per troy ounce.

Missouri Ore Market

Joplin, Mo., Oct. 26—The highest price paid for zinc was $46 per ton; the assay base ranging from $43 to $41, weakening at the close of the week. The average price is $40.92. The highest price for lead is $55, a half-dollar lower, medium grades remaining from $51 to $54, with the average $51.60 per ton.

Zinc buying was light during the week, the agents giving more attention to securing cars to load out the heavy purchases of the two preceding weeks.

Following are the shipments of zinc and lead from the various camps for the week ending Oct. 26:

	Zinc, lb.	Lead, lb.	Value.
Webb City-Carterville	3,645,970	640,740	$93,224
Joplin	2,750,990	286,480	66,594
Duenweg	919,260	149,900	23,201
Galena	825,820	121,860	20,097
Alba-Neck City	808,780	.....	17,793
Badger	774,430	.....	17,037
Prosperity	358 900	70,640	9,373
Spurgeon	391,580	91,310	8,171
Granby	610,000	30,000	7,800
Aurora	311,380	15,880	6,624
Oronogo	212,120	.....	4,248
Zincite	159,080	2,940	3,575
Sarcoxie	166,540	.....	3,414
Carthage	97,060	.....	2,135
Cave Springs	87 600	.....	1,800
Sherwood	20 840	29,350	1,196
Carl Junction	44,550	6,950	1,135
Miami, Okla.	.....	31,520	725
Seneca	44,320	.....	399
Totals	12,228,220	1,477,570	$288,541
43 weeks	493,822,180	73,710,800	$13,858,337

Zinc value, the week, $250,328; 43 weeks, $11,178,031
Lead value, the week, 38,213; 43 weeks, $2,689,306

Average prices for ore in the district, by months, are shown in the following table:

ZINC ORE AT JOPLIN. Month.	1906.	1907.	LEAD ORE AT JOPLIN. Month.	1906.	1907.
January	47.38	45.84	January	75.20	83.53
February	47.37	47.11	February	72.83	84.58
March	42.68	48.66	March	73.73	82.75
April	44.63	48.24	April	75.13	79.76
May	40.51	45.98	May	78.40	79.56
June	43.83	44.82	June	80.96	73.66
July	43.25	45.79	July	74.31	58.18
August	43.56	43.22	August	75.36	59.54
September	42.58	40.11	September	79.64	53.52
October	41.55	40.01	October	79.84	52.01
November	44.13	.....	November	81.98	.....
December	43.68	.....	December	81.89	.....
Year	43.24	.....	Year	77.40	.....

Wisconsin Ore Market

Platteville, Wis., Oct. 26—Sixty per cent. zinc ore sold this week on a market of $42; the highest price paid on this basis was $44 per ton. Lead ore sold on a basis of $23@24 per thousand for 80 per cent. lead, a decline of $2 from the market of last week.

Shipments from the district were as follows, for the week ended Oct. 26:

Camps.	Zinc ore, lb.	Lead ore, lb.	Sulphur ore, lb.
Platteville	607,680	.....	.....
Hazel Green	534,000	.....	.....
Galena	334,000	.....	.....
Benton	278,190	120,750	.....
Elmo	246,200	.....	.....
Linden	180,000	.....	.....
Mineral Point	144,000	.....	.....
Livingston	105,000	.....	.....
Highland	56,000	.....	.....
Cuba City	.....	88,000	.....
Total for week	2,485,070	208,750	.....
Year to Oct. 26	84,137,517	4,202,490	425,760

No shipments were reported from Rewey or Harker for the week.

Chemicals

New York, Oct. 30—The general chemical market is dull. The feverish condition of the money market and the excitement prevailing in banking circles tends to curtail new business, although contract orders are moving forward quite regularly. The reported break in the price of white arsenic is, we are informed, without foundation.

Copper Sulphate—The market is dull and little business is doing. Outside dealers are now holding the salt at about syndicate prices. Prices are as follows: For carload lots, $5.50 per 100 lb.; smaller quantities sell for $5.75 and up, according to seller and terms of sale.

Nitrate of Soda—The market is quiet as a rule, although some demand is noticed for immediate requirements. Supplies are fair, but there is probably not much surplus in the local market. Prices are as follows: For spot delivery and also for the balance of 1907, 2.37½@2.40c. for 95 per cent.; for 1908, 2.42½c.; for 1909, 2.40c. The price for the 96 per cent. grade, for these deliveries, is 5c. per 100 lb. higher.

Mining Stocks

New York, Oct. 30—The Stock Exchange has been dependent entirely upon money conditions. The bank and trust company troubles have prevented speculation, and trading has been light. What there was showed general depression and a low level of values. On the other hand, the situation has been helped by considerable buying of securities by foreign investors, and the close has been more cheerful, in consequence of the reports that more than $20,000,000 gold has been taken in London for shipment to New York. Probably trading will continue light for some time.

The curb market has been confused and uncertain, with many fluctuations, and generally low prices. Quotations mean little, and will be uncertain until the financial situation clears up a little.

Boston

Oct. 29—Considerable improvement is to be noted in the market for mining shares here. Slight recessions were made from last week's close, but substantial recoveries followed, and tonight's prices are the best for some time, with a better feeling pervading the street. There has been considerable cash buying, especially in odd lots. Copper shares had been sold pretty much to a standstill. The most prominent advance for the week has been Calumet & Hecla, which sold up $85 a share from the week's lowest to $620. The low price was $535, and the close today was $600, or $10 above a week ago. Copper Range, after going $1.50 lower to $44.50, recovered to $52.50, with the close tonight $51.25. North Butte also responded well to the recovery. After settling $3.50 to $30, it shot up to $41.25, with the close today $39.50. Osceola fell $8.25 to $71 early last week, but has since risen $10, and Tamarack, after sliding off $5 to $51, jumped up to $70. Quincy fell $5 to $70, but is now $81, and Wolverine is up from a low at $92.50 to $110. United States Smelting had another weak spell, selling off $5.25 to $24.75, but is back to $29; the preferred closed at $34 tonight. In the cheaper class also most stocks were higher..

The curb has likewise shown an improved tone, with Boston & Corbin the feature. From a closing at $6.50 a week ago it rose to $10.25 today.

San Francisco

Oct. 23—The Listing Committee of the San Francisco Stock and Exchange Board has announced the policy of the board to be that it will list any good property upon application, provided that it is situated in a mineral belt and has good men behind it. By good men it means those who will put the money received from sales of treasury stock into the ground to develop the property, and not in their

pockets. Any leasing company which owns a small piece of ground that is virtually valueless, where the ground is taken solely to enable the corporation to call itself a mining company, will not be listed, but if the ground and men are "good" the committee will list the stock on the board. The facts regarding the property and men are to be found out as far as possible by the committee. The board is investigating companies and intends striking off the lists those which they think may be "wild cats." It is too bad that a policy of this kind was not carried into effect by the board many years ago. If it had been there would be more confidence in mining stocks generally than there is at present.

STOCK QUOTATIONS

NEW YORK	Oct. 29
Name of Comp.	Clg
Alaska Mine	....
Am.Nev.M.&P.Co.	....
Amalgamated	49¾
Anaconda	32½
Balaklala	3¾
British Col. Cop.	4⅞
Buffalo Cobalt	1⅛
Butte & London	¾
Butte Coalition	14⅝
Butte Cop. & Zinc	....
Cobalt Contact	....
Colonial Silver	1
Cum. Ely Mining	5½
Davis Daly	4
Dominion Cop	2
El Rayo	2¼
Foster Cobalt	.63
Furnace Creek	¼
Giroux Mine	3½
Gold Hill	1
Granby, New	....
Greene Gold	⅛
Greene G. & S	⅛
Greenw'r & D.Val.	.75
Guanajuato	2¼
Guggen. Exp.	120
Hanapah	.35
McKinley Dar.	¾
Micmac	3⅛
Mines Co. of Am.	1¾
Mitchell Mining	¾
Mont.Sho. C.(New)	4⅝
Nev. Utah M. & S	2⅜
Newhouse M. & S.	8⅜
Nipissing Mines	6½
Old Hundred	1⅞
Silver Queen	¾
Stewart	⅞
Tennessee Cop'r.	20
Union Copper	⅞
Utah Apex	2⅞
West Columbus	.11

N. Y. INDUSTRIAL	
Am. Agri. Chem.	12
Am. Smelt. & Ref.	66¾
Am. Sm. & Ref., pf.	84
Bethlehem Steel	9½
Colo. Fuel & Iron	14⅞
Federal M.& S., pf.	60
Inter. Salt	10
National Lead	37
National Lead, pf.	....
Pittsburg Coal	....
Republic I. & S.	13½
Republic I.& S.,pf.	53¼
Sloss-Sheffield	30¾
Standard Oil	400
Tenn. C. & I	....
U. S. Red. & Ref.	7
U. S. Steel	23¼
U. S. Steel, pf.	82½
Va. Car. Chem	14
Va. I. Coal & Coke	33½

ST. LOUIS	Oct. 26		
N. of Com.	High.	Low.	
Adams	.25	.20	
Am. Nettie	.03	.02	
Center Cr'k	2.25	1.75	
Cent. C. & C.	67.00	65.00	
C.C. & C. pd.	78.00	75.00	
Cent. Oil	105.00	100.00	
Columbia	3.00	2.00	
Con. Coal	27.00	23.00	
Doe Run	130.00	120.00	
Gra. Bimet.	.30	.25	
St. Joe	14.00	13.00	

BOSTON	Oct. 29
Name of Comp.	Clg.
Adventure	....
Allouez	22
Am. Zinc*	21
Arcadian	3¼
Atlantic	9½
Bingham	6
Boston Con.	12½
Calumet & Ariz	100
Calumet & Hecla	600
Centennial	20
Con. Mercur	....
Copper Range	51¼
Daly-West	10¼
Franklin	7½
Greene—Can	6¾
Isle Royal	14½
La Salle	10
Mass	3¼
Michigan	8½
Mohawk	45
Mont.C.&C.(new)	1¾
Nevada	7¾
North Butte	39½
Old Colony	.50
Old Dominion	22
Osceola	78
Parrot	10
Phoenix	....
Quincy	76
Rhode Island	2¾
Santa Fe	2
Shannon	10
Tamarack	65
Trinity	12
United Cop., com.	7¼
U. S. Oil	....
U. S. Smg. & Ref.	28¼
U.S.Sm.& Re.,pd	34
Utah Copper	34
Victoria	4
Washington	....
Winona	3¼
Wolverine	105
Wyandotte	....

*Ex. Div. †Ex. Rights.

BOSTON CURB	
Ahmeek	..
Ariz. Com	....
Black Mt.	4½
East Butte	4¾
Hancock Con.	5
Keweenaw	....
Majestic	.90
Raven	.84
Shawmut	.18
Superior	....
Superior & Pitts.	9½
Troy Man	.60

LONDON	Oct. 30		
Name of Com.	Clg.		
Dolores	£0	20s	0d
Stratton'sInd.	0	3	0
Camp Bird	0	17	6
Esperanza	1	13	9
Tomboy	1	6	3
El Oro	0	20	7½
Oroville	0	14	0
Somera	..	..	.
Utah Apex	0	11	10½
Ariz.Cop.,pfd.	..	..	.
Ariz.Cop.,def.	..	..	.

Cabled through Hayden, Stone & Co., N. Y.

NEVADA STOCKS. Oct. 30.

Furnished by Weir Bros. & Co., New York.

Name of Comp.	Clg.	Name of Comp.	Clg.
TONOPAH STOCKS		Golden Sceptre	.05
Belmont	1 37½	Homestake King.	.50
Extension	1.12½	Montgomery Mt.	.04
Golden Anchor	.05	Mont. Shoshone C.	4.50
Jim Butler	.40	Original Bullfrog.	.03
MacNamara	.17	Tramp Cons	.19½
Midway	.45	MANHAT'N STOCKS	
Montana	1.35	Manhattan Cons.	.27
North Star	.08	Manhat'n Dexter.	.08
Tonopah & Cal	...	Jumping Jack	.10
Tono'h Mine of N.	7.75	Stray Dog	.10
West End Con	.37	Indian Camp	.05
GOLDFI'D STOCKS		GREENW'R STOCKS	
Adams	.04	Furnace Creek	.20
Atlanta	.24	Greenwater &D.V.	.10
Blue Bell	.08	Green'rCop.M.& S.	.08
Blue Bull	.16	United Greenwa'r	.06
Booth	.16	MISCELLANEOUS	
Columbia Mt.	.17	Golden Boulder	18
Comb. Frac	.80	Hayseed	.30
Cracker Jack	.08	Lee Gold Grotto	.14
Dia'dfield B. B. C.	.15	Nevada Hills	3.50
Goldfield Belmont	.15	Nevada Smelting.	1.00
Goldfield Con.	4.00	Pittsburgh S. Pk.	.80
Goldfield Daisy	.69	Round Mt. Sphinx	.29
Goldfield Mining.	...		
Great Bend	.27		
Jumbo Extension	.70		
Jumbo Mining	...		
Katherine	.06		
Kendall	.10		
Laguna	...		
Lone Star	.08		
Lou Dillon	.06		
May Queen	.07		
Mohawk	...		
Oro	.08		
Red Hill	.22		
Red Top	...		
Roanoke	.10		
Sandstorm	.16		
Silver Pick	.24		
St. Ives	.32		
Triangle	.07		
BULLFROG STOCKS			
Amethyst	.10		
Bullfrog Daisy	...		
Bullfrog Mining	.04		
Bullfrog Nat. B.	.09		
Gibraltar	.10		
Gold Bar	.33		

COLO. SPRINGS Oct. 26

Name of Comp.	Clg.
Acacia	7½
Black Bell	....
C. C. Con	4½
Dante	5¾
Doctor Jack Pot	6¼
Elkton	48
El Paso	37
Findlay	46
Gold Dollar	6½
Gold Sovereign	3⅞
Isabella	24½
Index	....
Jennie Sample	....
Jerry Johnson	....
Mary McKinney	31
Pharmacist	....
Portland	105
Un. Gold Mines	5¼
Vindicator	....
Work	....

New Dividends

Company.	Payable.	Rate.	Amt.
Alaska Mexican	Oct. 28	$0.50	$90,000
Alaska Treadwell	Oct. 28	1.00	200,000
Am. Zinc, Lead & Smg.	Nov. 1	0.50	40,000
Batopilas	Dec. 31	0.12½	56,250
Beck Tunnel	Oct. 15	0.02	20,000
Buffalo Mines, Ltd	Oct. 1	0.03	27,000
Colorado	Oct. 25	0.06	60,000
Dominion Coal	Oct. 1	1.00	150,000
Grand Central	Oct. 15	0.05	12,500
Hecla	Oct. 19	0.02	20,000
May Day	Oct. 24	0.01½	12,000
New River Coal, pfd	Nov. 1	1.50	56,426
N. S. St. & Coal, com	Oct. 15	1.50	74,514
N. S. St. & Coal, pfd	Oct. 15	2.00	20,600
Penn. Steel, pfd	Nov. 1	3.50	588,749
Portland	Oct. 15	0.04	120,000
Rio Tinto, com	Nov. 1	0.60	375,000
Rio Tinto, pfd	Nov. 1	51.40	4,275,000
Uncle Sam	Oct. 19	0.03	15,000
U. S. C. I. Pipe & Fdy., com	Dec. 2	1.00	125,000
U. S. C. I. Pipe & Fdy., pfd	Dec. 2	1.75	218,750
U. S. Smg., Ref. & Mg., com.	Nov. 1	0.87½	304,646
U. S. Smg., Ref. & Mg., pfd.	Nov. 1	0.87½	656,250
Utah (Fish Springs)	Oct. 15	0.03	3,000
Warwick I. & S.	Nov. 15	0.30	43,674

Assessments

Company.	Delinq.	Sale.	Amt.
Alturas, Ida.	Nov. 8	Nov. 29	$0.02
Andes, Nev.	Oct. 30	Nov. 20	0.10
Diamond Creek, Cal.	Oct. 20	Nov. 26	0.02
Dollarhide, Ida.	Nov. 8	Nov. 29	0.02
Emerald, Utah	Dec. 14	Jan. 11	0.01
'49 Gold Placer, Ut.	Nov. 13	Dec. 6	0.02
Herkimer Gravel, C.	Oct. 7	Dec. 28	0.03
Independence, Ida.	Oct. 10	Oct. 30	0.01
La Palma, Mex.	Oct. 26	Nov. 26	0.08
Nevada-Fairview	Sept. 23	Oct. 28	0.02
New Bunker Hill, C.	Oct. 31	Nov. 21	0.05
Occidental Con., N.	Oct. 3	Oct. 28	0.10
Overman, Nev.	Oct. 23	Nov. 13	0.05
Patosi, Nev.	Oct. 29	Nov. 21	0.10
Patterson Creek, Ca.	Oct. 19	Nov. 11	0.01
Pitts. C. M. & M., U.	Nov. 4	Nov. 25	0.01
Posey Canyon, Cal.	Oct. 5	Oct. 26	0.01
Sheba G. & S., Utah.	July 30	Nov. 2	0.10
Trade Dol. Ex., Ida.	Nov. 4	Nov. 20	0.01
Union Con.	Nov. 15	Dec. 6	0.10

Monthly Average Prices of Metals

AVERAGE PRICE OF SILVER

Month.	New York.		London.	
	1906.	1907.	1906.	1907.
January	65.288	68.673	30.113	31.769
February	66.108	68.835	30.464	31.852
March	64.597	67.519	29.854	31.325
April	64.765	65.462	29.984	30.253
May	66.976	65.981	30.968	30.471
June	65.394	67.090	30.185	30.893
July	65.105	68.144	30.113	31.366
August	65.949	68.745	30.529	31.637
September	67.927	67.792	31.483	31.313
October	69.523	.....	32.148	.....
November	70.813	.....	32.671	.....
December	69.050	.....	32.003	.....
Year	66.791	.....	30.868	.....

New York, cents per fine ounce; London, pence per standard ounce.

AVERAGE PRICES OF COPPER

	NEW YORK.				LONDON.	
	Electrolytic		Lake.			
	1906.	1907.	1906.	1907.	1906.	1907.
January	18.310	24.404	18.419	24.825	78.869	106.739
February	17.869	24.869	18.116	25.236	78.147	107.356
March	18.361	25.065	18.641	25.560	81.111	106.594
April	18.375	24.224	18.688	25.260	84.793	98.625
May	18.475	24.048	18.724	25.072	84.867	102.375
June	18.442	22.665	18.719	24.140	83.994	97.272
July	18.190	21.130	18.585	21.923	81.167	95.016
August	18.380	18.356	18.706	19.255	83.864	79.679
September	19.033	15.565	19.328	16.047	87.831	68.375
October	21.203	.....	21.722	.....	97.269	.....
November	21.833	.....	22.398	.....	100.270	.....
December	22.885	.....	23.350	.....	105.226	.....
Year	19.278	.....	19.616	.....	87.282	.....

New York, cents per pound. Electrolytic is for cakes, ingots or wirebars. London, pounds sterling, per long ton, standard copper.

AVERAGE PRICE OF TIN AT NEW YORK

Month.	1906.	1907.	Month.	1906.	1907.
January	36.390	41.548	July	37.275	41.091
February	36.403	42.102	August	40.606	37.667
March	36.662	41.313	September	40.516	36.689
April	38.900	40.938	October	42.852	.....
May	43.313	43.149	November	42.906	.....
June	39.260	42.120	December	42.750	.....
			Av. year	39.819	.....

Prices are in cents per pound.

AVERAGE PRICE OF LEAD

Month.	New York.		London.	
	1906.	1907.	1906.	1907.
January	5.600	6.000	16.850	19.828
February	5.464	6.000	16.031	19.531
March	5.350	6.000	15.922	19.703
April	5.404	6.000	15.959	19.975
May	5.685	6.000	16.725	19.688
June	5.750	5.760	16.813	20.188
July	5.750	5.288	16.525	20.350
August	5.750	5.250	17.109	19.063
September	5.750	4.813	18.266	19.775
October	5.750	.....	19.350	.....
November	5.750	.....	19.281	.....
December	5.900	.....	19.609	.....
Year	5.657	.....	17.370	.....

New York, cents per pound. London, pounds sterling per long ton.

AVERAGE PRICE OF SPELTER

MONTH.	New York.		St. Louis.		London.	
	1906.	1907.	1906.	1907.	1906.	1907.
January	6.487	6.732	6.337	6.582	28.225	27.125
February	6.075	6.814	5.924	6.664	25.844	25.938
March	6.209	6.837	6.056	6.687	24.563	26.094
April	6.078	6.685	5.931	6.535	25.781	25.900
May	5.997	6.441	5.846	6.291	27.000	25.563
June	6.006	6.419	5.948	6.269	27.728	24.469
July	6.006	6.072	5.856	5.922	26.800	23.850
August	6.027	5.701	5.878	5.551	26.938	21.969
September	6.216	5.236	6.056	5.086	27.563	21.050
October	6.222	.....	6.070	.....	28.075	.....
November	6.375	.....	6.225	.....	27.781	.....
December	6.593	.....	6.443	.....	27.938	.....
Year	6.198	.....	6.048	.....	27.020	.....

New York and St. Louis, cents per pound. London in pounds sterling per long ton.

CHEMICALS, MINERALS, RARE EARTHS, ETC.—CURRENT WHOLESALE PRICES.

ABRASIVES—		
Bort, good drill quality, carat		$85.00
Carborundum, f.o.b. Niagara Falls, powd	lb.	.08
Grains	"	.10@.17
Corundum	"	.07@.10
Crushed Steel, f.o.b. Pittsburg	"	.05¾@.06
Emery, in kegs: Turkish flour	"	.01½@.02½
Grains	"	.03½@.04½
Naxos flour	"	.01½@.02½
Grains	"	.03½@.04½
Chester flour	"	.01½
Grains	"	.03½@.04½
Peekskill, f.o.b. Easton, Pa., flour	"	.01½@.01½
Grains, in kegs	"	.02½@.02½
Garnet, per quality	sh ton	25.00@35.00
PumiceStone, Am. Powd.	100 lb.	1.60@2.00
Italian, powdered	"	.01¾@.01½
Lump, per quality	"	.03@.20
Rottenstone, ground	"	.02½@.04½
Lump, per quality	"	.05@.25
Rouge, per quality	"	.05@.30
Steel Emery, f.o.b. Pittsburg	"	.07¼@.07¾
ACIDS—		
Acetic 28%	lb.	.026@.03
Boric	"	.09¾@.10
Hydrofluoric, 30%	"	.02¾@.03
" 48%	"	.06
" 60%	"	.10
Hydrochloric acid, 20°, per lb		1.25@1.50
Nitric acid, 38°	per lb.	4.25@4.62½c.
Sulphuric acid, 50°, bulk, per ton		$12 up.
60°, 100 lb. in carboys		.85@1.12½
60°, bulk, ton		16.00@18.00
66°, 100 lb. in carboys		1.00@1.25
66°, bulk, ton		18.00
Oxalic	"	.08¼@.08¾
ALCOHOL—Grain	gal.	2.46¾
Refined wood, 95@97%	"	.70@.75
ALUM—Lump	100 lb.	$1.75
Ground	"	1.85
Chrome Alum	lb.	.04¼
ALUMINUM—Sulphate, com'l	"	1.25@1.60
AMMONIA—24 deg. lb		.04¼@.05¼
" 26 " "		.04¾@.05¾
AMMONIUM—		
Bromide	lb.	.23
Carbonate	"	.07½@.08
Muriate grain	"	.05¾@.06½
Lump	"	.09½@.09½
Sulphate, 100 lb		3.05@3.10
Sulphocyanide com	"	.30
" " chem. pure	"	.40
ANTIMONY—needle, lump lb		.07@.08
ARSENIC—White	"	.06½@.07¼
Red	"	.07½@.07¾
ASPHALTUM—		
Barbadoes	per ton.	40.00@80.00
West Indies	"	20.00@60.00
Egyptian	lb.	.14@.18
Gilsonite, Utah ordinary	per ton.	35.00
Trinidad	"	30.00@32.50
California	"	23.50@30.00
BARIUM—		
Carb. Lump, 80@90%	lg. ton.	30.00@35.00
Precipitated, 96@98%		31.50@35.00
Powdered, 80@90%	lb.	.02@.02½
Chloride com'l	ton.	38.00@40.00
Nitrate, powdered, in casks	lb.	.05½@.06
Blanc Fixe	per lb.	.02¼
BARYTES—		
Am. Ground	sh. ton.	14.00@21.00
Floated	"	22.00
Foreign floated	"	19.50@22.50
BISMUTH—Sub-nitrate	lb.	1.50
BLEACHING POWDER—35%, 100 lb.		1.25@1.40
BLUE VITRIOL—(copper sulphate), carload, per 100 lb		5.50
BONE ASH	lb.	.02½@.04
BORAX	"	.07½@.08
CALCIUM—Acetate, gray	"	2.50@2.55
Acetate, brown	"	1.60@1.65
Carbide, ton lots f.o.b. Niagara Falls, N. Y., for Jersey City, N. J.	sh. ton.	65.00
Chloride, f.o.b. N. Y.	"	14.75@19.75
CEMENT—		
Portland, Am. 500 lb	bbl.	1.55@1.60
Foreign	"	2.25@2.90
"Rosendale," 300 lb	"	.85
(in sacks)		.65
Slag cement	"	.75@1.25
CHROME ORE—		
New Caledonia 50% ex. ship N. Y.	per lg. ton	17.50@20.00
Bricks, f.o.b. Pittsburg, M.	"	175.00
CLAY, CHINA—Am. common ex-dock, N. Y.	"	8.50@9.00
Foreign	"	11.50@17.50
COBALT—Oxide	lb.	2.50
COPPERAS—Bulk	100 lb.	$0.55
In bbls	"	.65@.75
In bags	"	.60@.70
CRYOLITE	lb.	.06½@.06¾
FELDSPAR—Ground best	sh. ton.	14.00
FIRE BRICK—		
American	per M.	30.00@40.00
Imported	"	30.00@45.00
St. Louis No. 1	"	18.00
" No. 2	"	15.00
Extra	"	20.00@23.00
FIRE CLAY—F. o. b. St. Louis.		
St. Louis, extra quality	per ton	5.00
" ordinary	"	2.50
FLUORSPAR—		
Domestic f.o.b. shipping port:		
Lump	lg. ton.	8.00@10.00
Ground	"	11.50@13.50
Foreign crude ex. dock		8.00@10.00
FULLER'S EARTH—Lump, 100 lb.		.80@.85
Powdered	"	.80@.85
GRAPHITE—		
American, ore, common	lb.	.01@.10
Artificial	"	.06
Ceylon, common pulv	"	.02½@.03½
Best, pulverized	"	.04@.08
German, com. pulv	"	.01½@.01½
Best, pulverized	"	.01½@.02
Italian, pulverized	"	.01@.02
GYPSUM—		
Fertilizer	sh. ton.	7.00
Powdered	sh. ton.	12.00@20.00
INFUSORIAL EARTH—		
Ground Am. best	lb.	.01¾
French	lg. ton.	56.00
German	lb.	.02½@.02¾
LEAD—Acetate (sugar of) brown	lb.	.07¾
Nitrate, com'l	"	.09@.09¼
MAGNESITE—Greece.		
Crude (95%)	lg. ton.	7.00@8.00
Calcined, powdered	sh. ton.	32.50@40.00
Bricks, domes, per qual. f.o.b. Pittsburg	M.	160@200
MAGNESIUM—		
Chloride, com'l	100 lb.	.80@1.00
Sulphate (Epsom salt)	100 lb.	.90@1.00
MANGANESE—		
Crude powdered:		
70@75% binoxide	lb.	.01¼@.01¾
75@85% binoxide	"	.01½@.02
85@90% binoxide	"	.01¾@.05
90@95% binoxide	"	.06½
Ore, 80%-85%	sh. ton.	35.00@60.00
MARBLE—Flour	sh. ton.	9.50@10.00
MINERAL WOOL—		
Slag, ordinary	"	19.00
Selected	"	25.00
Rock, ordinary	"	32.00
Selected	"	40.00
MONAZITE SAND—		
Guar. 97%, with 6% Thorium oxide, nominal	lb.	.08 and up.
NICKEL—		
Oxide, crude, lb. (77%) for fine metal contained		.47
Sulphate, single	lb.	.09@.15
" double	"	.06½@.08
NITRATE OF SODA—100 lb. 95% for '07		2.45
95% for 1908		2.45@2.50
95% for 1909		2.40
96% is 5c higher per 100 lb.		
OZOKERITE—best	lb.	.14@.17
PAINTS AND COLORS—		
Litharge, Am. powdered	"	.07½@.07¾
English glassmakers'	"	.08½@.08¾
Lithopone	"	.03½@.07
Metallic, brown	sh. ton.	16.50@22.00
Red	"	16.00
Ocher, Am. common	"	8.50@9.00
Best	"	16.00
Dutch, washed	lb.	.02½@.03
French, washed	"	.01½@.02½
Paris green, pure, bulk	"	.26
Red lead, American	"	.07½@.07¾
Foreign	"	.08½@.08½
Turpentine, spirits bbl., per gal.		.54@.54½
White lead, Am., dry	lb.	.06¾@.07
American, in oil	"	.07½@.07½
Foreign, in oil	"	.10¼@.10¾
Zinc white, Am. extra dry	"	.05½@.05½
Foreign, red seal, dry	"	.07½@.07¾
Green seal, dry	"	.08½@.08½
PHOSPHATES—Acid	65@67½c per unit	
*Fla., hard rock		10.25@10.50
land pebble 68%		5.75@6.00
†Tenn., 78@80%		6.50@7.00
75%		6.00@6.25
68@72%		4.00@4.25
‡So. Car. land rock		5.75@7.25
" " river rock		
POTTASSIUM—		
Bicarbonate crystal	lb.	$.08½@.09
Powdered or granulated	"	.09@.09½
Bichromate, Am	"	.08½@.09
Scotch	"	.11
Bromide	"	.15@.17
Carbonate (80@85%	"	.03½@.04
Caustic, ordinary	"	.04½@0.5½
Elect. (90%)	"	.05½@.06
Chloride (muriate), 100 lb		1.90
Chlorate, powdered	"	.09½@.09¾
Crystals	"	09@09½
Cyanide (98@99%)	"	.18@.19
Kainite, long ton, bulk, 8.50; bags, 9.50.		
Permanganate	lb.	.10@.10½
Prussiate, yellow	"	.15½@.16
Red	"	.33@.38
Sulphate	100 lb.	2.18½@2.21½
PYRITE—		
Domestic, non-arsenical, furnace size, f.o.b. mines	per unit	11@11½c
Domestic, non-arsenical, fines, per unit, f.o.b. mines		10@10½c.
Imported non-arsenical, furnace size, per unit		.14@.14½
Imported, arsenical, furnace size, per unit		.13@.13½
Imported fines, arsenical, per unit		.08½@.09
" " non-arsenical, per unit		10½@11c.

Pyrite prices are per unit of sulphur. An allowance of 25c. per ton is made when delivered in lump form.

SALT—N. Y. com. fine 280 lb.	bbl.	.72@1.18
N. Y. agricultural	sh. ton.	3.80@4.50
SALTPETER—Crude	100 lb.	4.62½@4.75
Refined, crystals	"	5.00@5.25
SILICA—		
Ground quartz, ord'ry	lg. ton	13.00@15.00
Silex	"	13.00@30.00
Lump Quartz	"	2.50@4.00
Glass sand	"	2.75
SILVER—Nitrate, crystals	oz.	.40@.42
SODIUM—		
Acetate	lb.	.04¾@.05
"Alkali," per 100 lb., 58/48		.80@.87½
Bicarb. soda, per 100 lb		1.20@1.50c.
Soda, caustic, per 100 lb., 76/60		1.75@1.85
" " powdered		.02¾@.03½
Salt cake, per 100 lb		.65@.85
Soda, monohydrate, per lb		1.4@1.75c.
Bichromate	lb.	.07½@.07½
Bromide	"	.15@.17
Chlorate, com'l	"	.09@.09½
Cyanide, ("100% KCN")	"	.18@.19
Hyposulphite, Am	"	1.35 up
German	"	1.60@1.70
Phosphate	100 lb.	1.85@2.00
Prussiate	"	.09@.09½
Sal soda, f.o.b. N. Y	100 lb.	.65@.70
Foreign, f.o.b. N. Y	"	.80@1.00
Silicate, com'l	100 lb.	.75@1.15
Sulphate, com'l, (Glauber's salt)	100 lb.	.50@.60
" " calcined		.65@.85
STRONTIUM—Nitrate	lb.	.08@.08½
SULPHUR—		
Louisiana (prime) to New York, Boston or Portland	lg. ton	19.00@19.50
To Philadelphia or Baltimore	"	19.00@19.50
Roll	100 lb.	1.85@2.15
Flour	" "	2.00@2.40
Flowers, sublimed	" "	2.20@2.60
TERRA ALBA—French & Eng.	100 lb.	.85@1.00
TALC—Domestic	sh. ton.	15.00@25.00
French	"	20.00@25.00
Italian, best	"	35.00@40.00
TIN—Bi-chloride, 50%	lb.	.09¾@.10
Crystals	"	.21 up
Oxide, lb		.41@.43
URANIUM—Oxide	"	3.50
ZINC—		
Chloride solution, com'l 20°	"	.02½
Chloride, granular	"	.04½@.05
Dust	"	.05½@.06
Sulphate	"	.02½@.02½

*F. o. b. Florida or Georgia ports. †F. o. b. Mt. Pleasant. ‡On vessel Ashley River, S. C.

Note—These quotations are for wholesale lots in New York, unless otherwise specified, and are generally subject to the usual trade discounts. Readers of THE ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.

Metal and Mining Companies—U. S.

Name of Company and Location.		Author-ized Capital	Shares. Issued.	Par Val.	Dividends. Total to Date.	Latest. Date.	Amt.
Alaska Mexican, g.	Al'ka	$1,000,000	180,000	$ 5	$1,716,381	Oct. 1907	$ 50
Alaska Treadwell,g.	Al'ka	5,000,000	200,000	25	9,635,000	Oct. 1907	1.00
Alaska United, g.	Al'ka	1,000,000	180,200	5	306,340	Jan. 1907	0.30
Amalgamated, c.	Mont	155,000,000	1,530,879	100	55.177,425	Nov. 1907	1.00
Am.Sm.&Ref.,com.	U. S.	50,000,000	500,000	100	11,625,000	Oct. 1907	2.00
Am. Sm. & Ref. pf.	U. S.	50,000,000	500,000	100	25,338,053	Oct. 1907	1.75
Am. Smelters, pf. A	U. S.	17,000,000	170,000	100	1,940,000	Sept. 1907	1 50
Am. Smelters. pf. B	U. S.	30,000,000	300,000	100	3,375,000	Sept. 1907	1.25
Am.Zinc,Lead&Sm.	Kan.	3,750,000	80 000	25	100,000	Nov. 1907	50
Anaconda,c.	Mont	30,000,000	1,200,000	25	38,450,000	Nov. 1907	1.25
Arizona, c.	Ariz	3,775,000	3,682,520	.....	6,182,361	Apr. 1906	.05
Atlantic, c.	Mich	2,500,000	100,000	25	990,000	Feb. 1905	.02
Bald Butte, g. s.	Mont	250,000	250,000	1	1,354,648	Oct. 1907	.04
Beck Tunnel, g.s.l.	Utah	100,000	1,000,000	0.10	615,000	Oct. 1907	.02
Bingham & N.H.,c.g	Utah	2,000,000	226,000	5	22.600	Sept. 1906	.10
Boston & Montana.	Mont	3,750,000	150,000	25	48,775 000	Nov. 1907	6.00
Bull.Beck.&Cham.g	Utah	1,000,000	100,000	10	2,688,400	Apr. 1907	.10
Bunker Hill & Sull.	Ida	3,000,000	300 000	10	9,606,000	Oct. 1907	.60
Butte Coalition,c.s.	Mont	15,000,000	1,000,000	15	2 300,000	Sept. 1907	.50
Calumet & Arizonac	Ariz	2,500,000	200,000	10	9,000 000	Sept. 1907	5.00
Calumet & Hecla,c.	Mich	2,500,000	100,000	25	104,900,000	Sept. 1907	15.00
Camp Bird, g., s.	Colo	5,500,000	820,000	5	4,276,300	Nov. 1907	.24
Carisa, c.g.	Utah	500,000	500,000	1	55,000	Nov. 1906	.01
Central Eureka, g.	Cal	400,000	398,425	1	778.921	Mar. 1906	.07
Columbus Con. c.	Utah	1,500,000	283,540	5	226,832	Oct. 1907	.20
Combi'tion Co.G'f'd	Nevada	400,000	320,000	1	688,000	Sept. 1906	.15
Con. Mercur, g.	Utah	1,000,000	1,000,000	1	1,205.000	Dec. 1906	.02½
Continental, z. l.	Mo.	550,000	22,000	25	220,000	Oct. 1907	.50
Copper Range Con.	Mich	38,500,000	383.781	100	6,094,020	Oct. 1907	2.00
Creede United, g.	Colo	2,000.000	1,625,000	1	214 053	July 1906	.00½
Cripple Creek Con g	Colo	2,000,000	2,000,000	1	180,000	Mar. 1905	.00½
Daly Judge, g. s. l.	Utah	300 000	300,000	1	225,000	Apr. 1907	.37½
Daly West, g. s. l.	Utah	3,600,000	180,000	20	5,824,000	Sept. 1907	.60
De Lamar, g. s.	Ida	400,000	67,180	5	2,926,370	May 1905	.72
Dillon, g.	Colo	1,250.000	1,250,000	1	21,875	July 1905	.01
Doctor Jack Pot.	Colo	3,000,000	3,000,000	1	268,000	July 1906	.00½
Doe Run, l.	Mo.	10,000,000	59,062	100	1,435,037	Oct. 1907	.50
Elkton Con., g.	Colo	3,000,000	2,500,000	1	1,879 460	June 1907	.01½
El Paso, g.	Colo	2,500,000	2,450,000	1	1,022.750	June 1906	.01
Fed. Sm , com.	Idaho	10,000,000	60.000	100	2,528,750	ept. 1907	3.00
Federal Sm., pf.	Idaho	20,000,000	120,000	100	3,071,250	Sept. 1907	1.75
Findley, g.	Colo	1,250,000	1,250.000	1	325,000	Aug. 1906	.01
Frances-Mohawk g	Nevada	1,000,000	910,000	1	323,000	July 1907	0.10
Gemini-Keystone	Utah	500,000	5,000	100	1.950 000	July 1907	10.00
Gold King Con	Colo.	5 750 370	5,750.370	1	1.407 504	May 1905	.01
Goldfield Con., g.	Nevada	50,000,000	5,000,000	10	500,000	.....	.10
Grand Central, g.	Utah	250,000	250,000	1	1,333,000	Oct. 1907	.05
Gwin Mine, Dev., g.	Cal	1,000,000	100,000	10	35,000	Mar. 1906	.25
Hecla, s l.	Idaho	250 000	1.000.000	0.25	1,440,000	Oct. 1907	.02
Homestake, g.	S. D	21,840,000	218 400	100	22,244,040	Apr. 1907	.50
HornSilver,g.s.c.z.l	Utah	10,000 000	400,000	25	5,642,000	Sept. 1907	.05
Inter'l Nickel. pf.	N. Y.	12.000,000	87,415	100	917,869	Nov. 1907	1.50
Iron Silver	Colo	10,000,000	500,000	20	4,100,000	Oct. 1907	.10
Jamison, g.	Cal	3,900 000	390,000	10	278,470	July 1907	.02
Jerry Johnson.	Cal	2,500,000	2,500,000	1	61,700	Apr. 1906	.03
Kendall, g.	Mont	2,500,000	500 000	5	1,130,000	Aug. 1907	.02
Liberty Bell,g. s.	Colo	700,000	130,551	5	110.857	Jan. 1906	.15
Lightner, g.	Cal	125,000	102,255	1	295 694	Aug. 1906	.05
Lower Mammoth, g	Utah	190,000	190,000	1	42,750	Aug. 1907	.07½
Mammoth, g. s. l.	Utah	10,000 000	400,000	2.50	2,120,000	Oct. 1906	.05
Mary McKinney, g.	Colo	1,500,000	1,304,252	1	801.765	Apr. 1907	.03
May Day, g. s. l.	Utah	800,000	800,000	1	70,010	Oct. 1907	.01
Mohawk, c.	Mich	2,500,000	100,000	25	1,400,000	July 1907	5 00
Mont Ore Purch.	Mont	2,500,000	80,833	25	9 437 274	Jan. 1907	15.00
Nevada Hills, s.g.	Nevada	1,000,000	200,000	5	300,000	Sept. 1907	.10
New Century, z., l.	M	300,000	300 000	1	230,300	Aug. 1907	00½
Newhouse M. & S.c.	Utah	6,000,000	600,000	10	300,000	Aug. 1907	.50
New Idria, q	Cal	500 000	100,000	5	940,000	Oct. 1907	.20
New Jersey Zinc	U. S.	10,000,000	100,000	100	8.400,000	Feb. 1906	3.00
North Butte	Mont	6,000,000	400,000	15	5.000,000	June 1907	2.00
North Star, g.	Cal	2,500,000	250,000	10	1,486,989	Sept. 1907	.20
Old Dominion Cop.	Ariz	7,500,000	281,589	25	280,843	May 1906	.50
Old Gold	Colo	2,101,150	2.101,150	1	10,506	Mar. 1906	.05
Ophir, g. s	Nevada	302,400	100,800	3	1.797,400	July 1904	.25
Osceola, c	Mich	2,500,000	96,150	25	7 035 65	July 1907	7.00
Parrot, c.s.	Mont	2,300,000	229,850	10	6,807.649	Sept. 1907	.25
Pennsylvania. g.	Cal	5.150.000	51,500	100	284,92	July 1906	.10
Pitts. L. & Z., l.z.	Mo	1,000,000	1,000,000	1	20 000	July 1907	.02
P rtland, g.	Colo	3,000,000	3,000.000	1	7,627,080	ct. 1907	.04
Quartette, g. s.	Nevada	1,000,000	100 000	10	375,000	July 1907	.20
Quincy, c	Mich	3,750,000	110,000	25	17,725 446	Sept. 1907	2.50
Rocco Homest'k,l.s.	Nevada	300,000	300,000	1	112 000	Dec. 1905	.02
Sacramento, g, q.	Utah	1.000.000	1,000,000	1	258,000	Nov. 1906	.00½
St. Joseph, l.	Mo.	20,000,000	1,000 000	10	5,408,357	Sept. 1907	.15
Silver Hill, g. s	Nevada	108,000	108 000	1	81 000	June 1907	.05
Silver King, g. s. l †	Utah	3.000,000	150,000	20	11,187,500	July 1907	.83½
Silver King Co't'n.†	Utah	6,250,000	1,250,000	5	187,500	Oct. 1907	.15
Shannon, c.	Ariz	3,000,000	300,000	10	450 000	July 1907	.50
Snowstorm, s. l.	Ida	1,500,000	1,500,000	1	450,000	Sept. 1907	.03
Standard Con., g.s.	Cal	2,000,000	178,600	10	5,139,061	Mar. 1907	.10
Stratton'sIndepend	Colo.	5,500,000	1,000 002	5	4 895.865	Apr 1906	.12½
Swansea, g. s. l	Utah	500,000	100,000	5	329,500	Mar. 1907	.05
Tamarack, c	Mich	1,500,000	60.000	25	9,420,000	July 1907	4.00
Tennessee, c.	Tenn	5,000,000	175,000	25	1,443,750	Aug. 1907	2.00
Tomboy, g. s	Colo	1,750,000	300,000	5	900 000	June 1906	.48
Tonopah of Nev.	Nevada	1,000,000	1,000,000	1	3,500,000	Oct. 1907	.25
Tonopah Belmont.	Nevada	2,000,000	1,295,007	1	518,003	Apr. 1907	.10
Tonopah Ext'nsion	Nevada	1,000,000	928,433	1	278,530	Apr. 1906	.15
Tonopah Midway.	Nevada	1,000.000	1,000.000	1	300,000	Jan. 1907	.05
Uncle Sam, g.s.l.	Utah	500.000	500.000	1	165 000	Oct. 1907	.03
United States, com.	Utah	37,500,000	467,430	50	913,938	Nov. 1907	.87½
United States, pfd.*	Utah	37,500,000	348 167	50	3,937 500	Nov. 1907	.87½
United Cop. com.	Mont	75,000,000	450,000	100	5,962,500	Aug. 1907	1.75
United, c. pf.	Mont	5 000,000	50 000	100	1.500.000	May 1907	3.00
United, z. l., pf.	Mo.-Kan.	500,000	19 556	25	303,006	Oct. 1907	.50
United, (Crip'le C'k)	Colo.	5,000,000	4,009,100	1	280,071	Apr. 1906	.00½
United Verde, c.	Ariz	3,000,000	300,000	10	19,260 322	Sept. 1907	.75
U.S. Red. & Ref. Pf	Colo	4,000.000	39,458	100	1,005,504	Oct. 1907	1.50
Utah, g.(Fish Sp'gs)	Utah	1,000.000	100,000	10	282,000	Oct. 1907	.03
Utah Con., c.	Utah	1,500,000	300,000	5	7,236,000	Oct. 1907	1.00
Victoria, Utah	Utah	250,000	250,000	1	177,500	Mar. 1907	.04
Vindicator Con., g.	Colo	1,500,000	1,500,000	1	1 710,000	Oct. 1907	.03
Wolverine, c.	Mich	1,500,000	60,000	25	4,500,000	Oct. 1907	7.50
Work, g	Colo	1,500,000	1,500,000	1	150.000	Oct. 1907	.01
YankeeCon	Utah	500,000	500,000	1	157,500	Oct. 1907	.03
Yellow Aster, g.	Cal	1,000,000	100,000	10	958,789	Aug. 1907	.20

*Previous to consolidation $1,436,250 were divided. †Amalgamated.

Coal, Iron and Other Industrials—United States.

Name of Company and Location.		Author. ized Capital.	Shares. Issued.	Par Val. $	Dividends. Total to Date.	Latest. Date.	Amt.
Ala. Con., C. & I., pf.	Ala	$2,500,000	24,638	100	$905,265	May 1905	$1.75
Allis-Chalmers, pf.	U S	25,000,000	200,000	100	3.213,750	Feb. 1904	1.75
Amer. Ag. Chem., pf.	U. S	20,000,000	181,530	100	7,920,460	Oct. 1907	3.00
American Cement.	Pa.	2,000,000	200,000	10	1,108,000	July 1907	.40
American Coal.	Md	1,500,000	50,000	25	2,367,500	Sept. 1907	1.25
Associated Oil.	Cal	21,000,000	21,000,000	1	630,000	Aug. 1905	.01
Bethlehem Steel, pf.	Pa.	15,000,000	150,000	100	900.000	Nov. 1906	.75
Cambria Steel	Pa.	50,000,000	900,000	50	8,887,500	Aug. 1907	.75
Caribou Oil.	Cal	100,000	80,000	1	56,000	July 1905	.07
Central C. & C., com	Mo	5,125,000	51,250	100	2,075,625	Oct. 1907	1.50
Central C. & C., pf.	Mo	1,875,000	18,750	100	1,312,502	Oct. 1907	1.25
Central Oil	W. Va.	1,500,000	60,000	25	182,500	May 1904	.25
Claremont Oil.	Cal	500,000	450,000	1	58,500	June 1905	.01
Col. & Hock. C. & I.,pf	Ohio	7,000,000	69,244	100	279,952	Oct. 1907	1.50
Consolidated Coal	Ill.	5,000,000	50,000	100	350,000	July 1904	1.00
Consolidation Coal.	Md	10,250,000	102,500	100	9,262.900	Oct. 1907	1.50
Crucible Steel, pf.	Pa.	25,000,000	250,000	100	2,125,000	June 1907	1.50
Empire S. & I., pf.	N. J	5,000,000	25,000	100	712,500	July 1907	3.00
Fairmont Coal,	W. Va	12,000,000	120,000	100	1,384,000	Feb. 1907	3.00
Four Oil	Cal	500,000	300,000	1	105 406	July 1905	.01
General Chem. Com.	U. S.	12,500,000	74,103	100	1,893.331	Sept. 1907	2.00
General Chem., pf.	U. S.	12,500,000	100,000	100	4,840,178	Oct. 1907	1.50
George's C'k Coal	Md	2,500,000	22,000	100	1,188,000	July 1904	3.00
Imperial Oil	Cal	1,000,000	100,000	100	880,000	July 1905	.20
International Salt.		30,000,000	182,280	100	927,060	Dec. 1906	1.00
Jeff & Cl'f C. & I., com	Pa.	1,500,000	15,000	100	330,000	Aug. 1905	5.00
Jeff. & Cl'f. C. & I.,pf	Pa.	1,500,000	15,000	100	825,500	Aug. 1906	2.50
Kern River Oil.	Cal	2,000,000	20,000	100	39,500	May 1905	.13
Lehigh Coal & Nav.	Pa.	17,378,500	346,901	50	25,614,693	May 1907	2.00
Maryland Coal,pf.	Md	2,000,000	18,850	100	1,592.560	June 1907	4.00
Monon R. Coal, pf.	Pa.	10,000,000	100,000	100	3,504.945	July 1907	3.50
National Carbon, pf.	U. S.	4,500,000	45.000	100	2,047,500	May 1905	1.75
National Lead, com.	N. Y.	15,000,000	149,054	100	2,161 284	Oct. 1907	1.25
National Lead, pf.	N. Y.	15,000,000	149,040	100	16,585.148	Sept. 1907	1.75
Nat'l Steel & Wire,pf	N. Y.	5,000,000	25,778	100	631,561	May 1906	1.75
New Central Coal	Md	1,000,000	50,000	20	350,000	May 1907	.40
New River Coal, pfd	W. Va.	4.000,000	37,617	100	225,702	Nov. 1907	1.50
Pacific Coast Borax.	Cal	2,000,000	19,000	100	2,086,500	Aug. 1905	1.00
Peerless Oil.	al	1,000,000	92,000	10	396,320	May 1905	.14
Penna. Salt.	Pa.	3,000,000	60,000	50	14,738,000	Oct. 1907	3.50
Penna. Steel, pfd.	Pa.	25,000,000	168,214	100	8 204.493	Nov. 1907	3.50
Phila. Gas, com	Pa.	28,953,029	579,061	50	8,484,336	Nov. 1907	.75
Phila. Gas, pf.	Pa.	6 000,000	120,000	50	2,550,000	Sept. 1907	1.25
Pittsburg Coal, pf.	Pa.	32,000,000	297,010	100	11,434.962	Apr. 1905	1.75
Pocahontas Coll., pf.	W. Va.	1,500,000	15,000	100	460 000	May 1907	1.50
Republic I. & S., pfd.	Ill.	25,000,000	204,169	100	5,330,746	Oct. 1907	1.75
Sloss-Sheffield, com.	Ala	7,500,000	75,000	100	9,480,250	....	1.25
Sloss-Sheffield, pf.	Ala	20,000,000	67,000	100	3 411.780	Oct. 1907	1.75
Standard Oil.	U. S.	100,000,000	970,000	100	581,022.905	Sept. 1907	6.00
Tenn. C. & I., com	Tenn	22,553,600	225,536	100	3 583,060	Nov. 1907	1.00
Tenn. C. & I., pf.	Tenn	248,000	2,480	100	390.040	Nov. 1907	2.00
Texas & Pacific Coal.	Texas	2,000,000	20,000	100	1,960,000	June 1907	1.50
Union Oil	Cal.	10,000,000	100,000	100	1,118,766	May 1905	.50
United Metals Selling.		5,000,000	50,000	100	4,500,000	Nov. 1907	7.50
U. S. SteelCorp.,cm.,		508,000,000	5,083,025	100	66 041.541	July 1907	.50
U. S. Steel Corp., pf.	U. S.	360,281,100	3,603,141	100	187.454.724	Aug. 1907	1.75
Va. Carolina Ch., pf.	U. S.	20,000,000	180,000	100	12,540,869	Oct. 1907	2.00
Warwick I. & S.	U. S.	1,500,000	145,581	10	473,138	Nov. 1907	.30
Westmoreland Coal.	Pa.	3,000,000	60,000	50	8,580,000	Oct. 1905	2.50

Canada, Mexico, Central and South America.

Name of Company and Location.		Author-ized Capital.	Shares. Issued.	Par Val. $	Dividends. Total to Date.	Latest. Date.	Amt.
Amistad y Conc'rdia.	Mex	$480,000	9,600	50	$258,064	Jan. 1905	$1.71
Batopilas.	Mex	9,000,000	450,000	20	† 56,250	Dec. 1907	.12½
Buffalo, s.	Ont.	1,000,000	900,000	100	135,000	Oct. 1907	.08
Butters' Salvador, g.	Salv	750,000	150,000	5	600,000	Apr. 1905	.25
Coniagas (Cobalt).	Ont.	1,000 000	1,000,000	1	20 000	July 1907	.02
Consolidated M & S.	B. C.	5,500,000	48,338	100	714,945	Aug. 1907	2.50
Copiapo, c.	Chile	1,125,000	112,500	10	3,000,900	Oct. 1904	1.20½
Crow's Nest Pass	B. C.	3,500,000	140,000	25	2,018 648	July 1907	.62½
Dominion Coal, com.	N. S.	15,000,000	150,000	100	2,400,000	Oct. 1907	1.00
Dominion Coal, pf.	N. S.	3,000,000	30,000	100	‡525.000	Aug 1907	3.00
Dos Estrellas, g. s.	Mex	150,000	3,000	50	1,020,555	July 1905	13.65
El Oro, g. s.	Mex	5,750,000	1,080,000	5	3 823,200	July 1907	.37
Esperanza, s. g.	Mex	2,275,000	455,000	5	6,721.649	July 1907	1.32
Foster Cobalt, s.	Ont.	1,000,000	1,000,000	1	50,000	Jan. 1907	.05
Granby Con.	B. C.	15,000,000	135,000	100	2,968,630	Sept. 1907	3.00
Greene Con. Copper.	Mex	8,640,000	864,000	10	5,814.200	Mar. 1907	.40
Greene Con. Gold.	Mex	5,000,000	500,000	10	300.000	July 1905	.20
GreenGold-Silv'r,pfd	Mex	3,000,000	300,000	10	120 000	Mar. 1907	.40
Guanajuato.	Mex	3,000,000	540,000	5	74,250	Oct. 1906	.07½
Guggenheim Expl.	Mex	17,000,000	105,000	100	3,697,500	Oct. 1907	2.50
Kerr Lake, s.	Ont.	3,000,000	600,000	5	390,000	Oct. 1907	.15
LeRoi No. 2, g.	B. C.	3,000,000	120,000	25	716,400	Feb. 1907	.24
McKinley-Darragh,s.	Ont.	2,500,000	2,000,000	1	100,000	Mar. 1907	.02
Mexican Coal & Coke	Mex	5.000,000	50,000	100	600,000	Dec. 1905	3.00
Mex. Con. M. & S. Co.	Mex	2,500,000	240,000	10	600,000	Aug 1907	.50
Mines Co. of Am.	Mex	2,000,000	2,000,000	1	2,825,000	Oct 1907	.02
N. Y. & Hond. Ros.	C. A.	1,500,000	150,000	10	2,322 000	Sept. 1907	.10
Nipissing, s.	Ont	6,000,000	1,200,000	5	1,320,000	Oct. 1907	.15
North Star.	B. C.	1,500,000	1,300,000	1	351,000	Dec. 1904	1.00
N. S. St. & Coal, com.	N. S.	5,000,000	49,876	100	1,013,042	Oct. 1907	1.50
N. S. St. & Coal, pf.	N. S.	1,030,000	10,300	100	417,150	Oct. 1907	2.00
Penoles*	Mex	250,000	2,500	100	8,263,375	Aug. 1907	20.00
Platanillo	Mex	500,000	206,989	1	5,586	Sept. 1906	.00½
Reco, g. s.l	B. C.	1,000,000	958,000	1	327,082	Apr. 1906	.02
Silver Queen, s.	Ont.	1,500,000	1,500,000	1	120,000	Jan. 1907	.08
Slocan Star.	B. C.	500,000	500,000	1	575,000	Dec. 1904	.05
St. Eugene Con.	B. C.	3,500,000	3,202,000	1	402,120	Oct. 1905	.02
Tezuitlan Copper	Mex	1,000.000	10,000	100	.....	Oct. 1907	2.00
Tiff Cove, c.	N. F.	1,000,000	89,000	2	21,360	Jan. 1905	.48
Tretheway, s	Ont.	1,000,000	1,000,000	1	80,000	Mar. .907	.04
Tyee, c.	B. C.	940.000	180,000	5	136,800	Dec. 1904	.24

*Mexican Currency. †Since reorganization. ‡Since August, 1905.

THE MINING INDEX.

The editors of this paper read all the important publications of the world that relate to mining and the treatment of minerals. This index is published as a reference for all interested and to make it impossible for readers of the ENGINEERING AND MINING JOURNAL to miss any important article published anywhere.

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ASBESTOS

4590—MINING METHODS—Asbestos; Its Mining, Preparation, Markets and Uses. E. Schaff-Regelmann. (Eng. Mag., Oct., 1907; 13 pp.) Conveys an excellent idea of the present extent of asbestos mining in Canada; also deals rather briefly with the methods of preparing and spinning it. The illustrations give a good representation of the importance of this industry. 40c.

ASPHALT

4591—TRINIDAD—Notes on the Geology and Mineral Resources of Trinidad and Barbadoes, B. W. Indies. R. W. Ells. (Ottawa Naturalist, Aug., 1907; 7 pp.) Describes the most important geological formations on this island and gives an account of the large asphalt lake. Some notes on the manjak mines are also included. 20c.

BORAX

4592—CALIFORNIA—Death Valley Borax. O. M. Boyle, Jr. (Cal. Journ. Technology, Sept., 1907; 3 pp.) Explains the conditions now obtaining in borax mining in Death Valley and tells how the Pacific Coast Borax Company tries to discourage prospecting and mining borax, so as to retain its monopoly of the industry. 20c.

BROMINE

4593—PRODUCTION of Salt and Bromine in 1906. A. T. Coons. (Advance Chapter from Mineral Resources of the U. S., Calendar Year 1906; 14½ pp.) Enumerates sources of bromine produced in the United States, gives a review of prices in 1906, and figures of production for a number of years.

CALCIUM CARBIDE

4594—ACETYLENE LIGHTING—N. Goodyear. (Min. and Sci. Press, Oct. 12, 1907; ½ p.) Abstract of an article read before the Illuminating Engineering Society, giving brief information on the production of acetylene from carbide, its storage and use. 20c.

CHROMIUM

4596—PRODUCTION AND STATISTICS—Chromite or Chromic Iron Ore. A. J. Collier. (Advance Chapter from Mineral Resources of the U. S. Calendar Year 1906; 1½ pp.) Very brief report on the mining of chromite in the United States during 1906, and a note on the chromite industry of Canada.

COAL AND COKE

4597—ACCIDENTS—Prevention of Accidents in Mines. P. J. Sievin. (Mines and Minerals, Oct., 1907; 1½ pp.) Considers the various sources of danger in coal mining and comments briefly on their relative importance, giving likely ways in which improvement may be made. 20c.

4598—BRITISH COLUMBIA—A New Coal Field in British Columbia. A. Lakes. (Min. Wld., Oct. 5, 1907; 1½ pp.) Makes very brief mention of some of the features of a coal deposit near Princeton, B. C., at the junction of the Similkameen and Tulameen rivers. 20c.

4599—CAR TIPPLE—An Automatic Side Delivery Car Tipple. M. J. McGill. (Min. Rep., Oct. 3, 1907; 1 p.) Illustrated description of an automatic side delivery car tipple which is in use at the Grass Creek coal mine at Coalville, Utah, and which permits the discarding of mine cars having doors, thus eliminating all waste and leakage due to them. 20c.

4600—COAL ANALYSIS—Some Experiments to Determine the Amount of Volatile Matter in Coal. A. Bement. (Chem. Engr., Sept., 1907; 5½ pp.) Description of experiments made to get a reliable method for determining volatile matter in coal; hydrogen under slight pressure was kept in the crucible in order to avoid trouble from oxygen when it was necessary to continue operations for a long time in order to attain complete volatilization. 40c.

4601—COAL BRIQUETTING in the United States. E. W. Parker. (Paper read before the A. I. M. E., July, 1907; 40 pp.) The author first points out some reasons why coal briquetting has been so slow in developing in the United States; then gives an exhaustive review of all present plants, including detailed information as to plant equipment, construction of machines used, approximate operating costs and results obtained.

4602—COAL HANDLING—Arrangements for Handling Coal Output. F. W. Parsons. (Eng. and Min. Journ., Oct. 19, 1907; 5 pp.)—Describes several mechanical devices now in use for handling coal under various conditions. The features described in detail are transfer truck, chain hoist, self-acting inclined planes, flexible cable car haul, and a bucket conveyer. 20c.

4603—COAL MINING—The Technics of Coal Mining. G. H. Winstanley. (Min. Eng., Oct., 1907; 3 pp.) Continuation of this article which was previously mentioned in this Index, dealing in the present instalment with steam boiler and generating plant for collieries. 20c.

4604—COAL PLANT—A Modern Illinois Coal Plant. (Mines and Minerals, Oct., 1907; 4½ pp.) Description of the surface equipment of this colliery where modern machines and devices allow very economical working. 20c.

4605—COAL STRIPPING—A Novel Coal Stripping Plant. (Mines and Minerals, Oct., 1907; 1 p.) Notes on the somewhat unusual methods adopted in stripping a coal deposit in Danville, Ill., where it was desired to have the stripping go down to the coal in a single cut and take as wide a cut as possible so as to provide the most efficient means of quarrying the coal. 20c.

4606—COALITE. S. W. Parr. (Eng. and Min. Journ., Oct. 19, 1907; 1 p.) Gives preliminary conclusions drawn from experiments on the low heat treatment of bituminous coal, with a view to obtaining a smokeless product to replace anthracite. Deals with changes in calorific power resulting from heating the coal in an atmosphere of nitrogen and the structural changes undergone. 20c.

4607—COKE MANUFACTURE — Orient Coke Co.'s Plant. (Mines and Minerals, Nov., 1907; 1 p.) This Pennsylvania plant is carefully designed with a view to safe and economic operation. The brief account of the works mentions the mine and methods of working, the hoisting and haulage machinery, and the ovens. 20c.

4608—CONVEYERS—Mechanical Conveyers as Applied to Longwall Mining. J. I. Thomas. (Mines and Minerals, Nov., 1907; 3 pp.) Sums up recent progress and outlines the present state of the art of applying mechanical conveying to coal mining, especially longwall mining. Describes some of the methods and apparatus employed at Vintondale, Penn., by the Vinton Colliery Company. 20c.

4609—DRAINAGE TUNNEL—Draining the Panther Creek Basin. H. H. Stoek. (Mines and Minerals, Nov., 1907; 4 pp.) Considers first the geological relations of this coal basin and the connections between the present conditions of the coal workings and the problem of drainage. Concludes with facts relating to the methods of driving and timbering the 13-mile tunnel which will give natural drainage to the basin. 20c.

4610—ENGLAND—The Dover Coalfield in England. Edward Walker. (Eng. and Min. Journ., Oct. 12, 1907; 3 pp.) Traces the history of the discovery and early prospecting of this coal field with some remarks on the character and financial condition of the operating companies. 20c.

4611—EXPLOSIONS—Coal-dust Explosions in Collieries. J. Ashworth. (Cassier's Mag., Oct., 1907; 8 pp.) Sums up the facts established in a hearing on a coal-dust explosion in a watered mine in England. The merits of watering as a preventative of dust explosions are discussed, as well as other protective features, the general conclusion being that watering alone is not sufficient. 40c.

4612—EXPLOSIVES in Coal Mines. E. J. Deason. (Iron and Coal Tr. Rev., Sept. 20, 1907; 3 pp.) Reviews and comments upon present British regulations for the use, handling and storage of explosives and gives an account of the testing plant and methods used at the station at Woolwich, where quality and properties of explosives are determined. 40c.

4613—EXPLOSIVES—Permitted Explosives in British Coal Mines. J. Ashworth. (Eng. and Min. Journ., Sept. 28, 1907; 1 p.) Gives a summary of the facts established by a recent inquiry to determine the suitability of bobbinite as an explosive in coal mines. Discusses also the dangers resulting from pre mature explosions of detonating powders resulting from other shots in the mine—a danger to which black gunpowder is not liable. 20c.

4614—HAULAGE—Construction of Tracks in Coal Mines. M. S. Hachita. (Eng. and Min. Journ., Oct. 5, 1907; 4 pp.) Contains directions for designing the distribution of tracks for coal mines, also for laying them. Notes for laying out frogs and switches are given, including graphic methods for curves. 20.

4615—LIGNITE—A Study of the Lignites of the Northwest. Part I. Moisture and Hygroscopicity. G. B. Frankforter. (Journ. Am. Chem. Soc., Oct., 1907; 8 pp.) Deals almost entirely with the question of moisture in lignites, the best means of determining its amount and the conditions which determine equilibrium in the amount of contained moisture in a given sample of lignite. 60c.

4616—LOW GRADE FUEL—Steam Production from the Cheaper Grades of Anthracite. W. D. Ennis. (Eng. Mag., Oct., 1907; 17 pp.) Considers the mutual relations existing between price and heating value of the small sizes of anthracite as compared with their competitors among bituminous coals, and explains the principles which determine the best type of fuel for a particular case. Also describes steam generating apparatus adapted to these small anthracite sizes. 40c.

4617—LOW GRADE FUEL—The Rational Utilization of Low Grade Fuels, with Special Consideration of the Application of Gas Producers. F. E. Junge. (Proc. A. S. M. E., Mid-Oct., 1907; 23 pp.) Considers some of the economic and technical aspects of the above problem, and deals at length with limitations, advantages, and general applicability of various forms of low grade and by-product fuels.

4618—MICHIGAN—Coal Mining in Michigan. Lee Fraser. (Eng. and Min. Journ., Sept. 28, 1907; 2 pp.) Touches briefly on the geological aspects of these coal measures and gives some notes on the difficulties met with in developing and shaft sinking, and the methods used in mining. 20c.

4619—MINE UNWATERING—The Unwatering of Mines in the Anthracite Region. R. V. Norris. (Eng. Mag., Oct., 1907; 20 pp.) Gives a general outline of the magnitude of the drainage problem in the anthracite region, showing the causes of such an abundance of water in the mines; concludes with a very comprehensive description of all important unwatering equipments and the systems used to remove the water. 20c.

4620—NATAL—A Year of Natal Mining: The Coal Industry. (South African Mines, Aug. 31, 1907; 1 p.) A brief summary of the 1906 report of the Natal Commissioner of Mines, giving information as to the progress of coal mining in this country and the results of government prospecting expeditions. 20c.

4621—PEAT in the United States in 1906. M. R. Campbell. (Advance Chapter from the Mineral Resources of the U. S., Calendar Year 1906; 4 pp.) Brief notes on the experimental work done by industrial concerns during 1906 in the attempt to make peat a commercially valuable fuel, giving a few figures showing the performances of gas producers running on peat. 20c.

4622—PEAT UTILIZATION—The Utilization of Peat for Power Purposes with the Recuperation of By-Products. (Electrochem. and Met. Ind., Oct., 1907; 2 pp.) This article is a compilation from five authoritative papers in German on this subject, and shows the evolution of methods of utilizing peat; also gives notes on present methods which have reached what is practically a commercial stage. 40c.

4623—PENNSYLVANIA MINES in 1906. (Mines and Minerals, Oct., 1907; 2½ pp.) Abstracts from the report of the head of the department of mines of this State, giving emphasis to the most important facts and recommendations therein contained. 20c.

4624—PIT-CAR LOADER—The Mechanical Pit-car Loader. (Mines and Minerals, Nov., 1907; 1½ pp.) Describes the method of operating this device and gives the arrangements necessary to obtain the best results. Considers also the working conditions to which it is best suited. 20c.

4625—REFUGE CHAMBERS — Unterirdische Rettungs- bezw. Fluchtstationen. J. Mayer. (Oest. Zeit. f. B. u. H., Sept. 21, 1907; 2 pp.) Continuation and conclusion of an article previously mentioned in this Index. 20c.

4626—VENTILATING PROBLEMS—Deficiencies in Mine Ventilation. T. A. Mather. (Mines and Minerals, Oct., 1907; 1½ pp.) Enumerates some of the reasons for poor ventilation now existing in mines and the responsibilities and duties of the various people connected with the ventilation in a mine. The article makes no suggestion as to means of remedying matters. 20c.

COPPER

4627—COMMERCIAL SITUATION — Le Cuivre. Sa production et son commerce aux Etats-Unis Son marché en 1907. A. E. Sayous. (Fédération des Industriels et Commerçants Français, Sept., 1907; 58 pp.) A study into the production and trade in copper in the United States and its price during 1907, from a French point of view. The present industrial status of the Amalgamated Copper Company and the New York Sales Agency are the main points treated. 40c.

4628—COMMERCIAL SITUATION of Copper in the United States. James Douglas. (Eng. Mag., Oct., 1907; 13 pp.) Reviews present industrial conditions among the large copper producing centers of this country, and analyzes future possibilities of copper mining in various foreign countries. 40c.

4629—ELECTRO-METALLURGY OF COPPER. J. W. Richards. (Electrochem. and Met. Ind., Oct., 1907; 6½ pp.) Explains the solution of typical problems connected with the electrometallurgy of copper, comprising the treatment of ores and mattes, extraction of the metal from solutions, and the refining of impure copper. 40c.

4630—GERMANY—Operations and Tendencies of Modern Mansfeld. P. A. Wagner and J. S. G. Primrose. (Eng. and Min. Journ., Oct. 12, 1907; 3 pp.) Deals with hoisting equipment, ventilation and drainage systems, the sorting of mineral, its transportation, roasting and smelting processes as carried out at this important German mine. 20c.

4631—IMPURITIES IN COPPER—Zum mikrochemischen Nachweis von Schwefel. Selen und Tellur im Kupfer. F. W. Hinrichsen and O. Bauer. (Oest. Zeit. f. B. u. H., Sept. 28, 1907; 1½ pp.) Gives brief directions for carrying out a few chemical tests to determine the presence of small amounts of sulphur, selenium and tellurium in copper. 40c.

4632—MANUFACTURING—The Cowper Coles Copper Depositing Process. (Iron and Coal Tr. Rev., Sept. 20, 1907; 1 p.) Describes the process of simultaneously refining copper by electrolysis and making finished forms as carried out by an English firm. In order to obtain the requisite speed of deposition which is greater than refining speed, a revolving mandrel is used in connection with the cathode. 40c.

4633—NEVADA—The Copper Mines of Ely, Nevada. W. R. Ingalls. (Eng. and Min. Journ., Oct. 12, 1907; 7½ pp.) A critical survey of the present condition of this camp. Outlines the extent of operations now under way at the principal mines; gives also some idea of the industrial and commercial status of Ely mining companies. 20c.

4634—NEVADA—The Productive and Earning Capacity of Ely. W. R. Ingalls. (Eng. and Min. Journ., Oct. 19, 1907; 4 pp.) Considers the extent of ore reserves in the important mines of this district, the proposed methods of mining, handling, milling and smelting the ore and gives comparative estimates of the cost of producing copper from representative mines. 20c.

4635—QUEENSLAND—Cloncurry Copper Mining District. L. C. Ball. (Queens. Gov. Min. Journ., Aug., 1907; 11 pp.) Continuation of long report on this district, which was previously mentioned in this Index. 60c.

4636—REFINING—Note on the Refining of Copper. D. Saito. (Memoirs, College of Sci. and Eng., Kyoto Imp. Univ., Vol. I., No. 3, 1907; 10 pp.) Studies the efficiency of the refining process used in producing copper at the Beshi works of Japan, the copper from which is noted for its purity. The procedures used in analysis for impurities are given and the distribution of the oxygen is studied.

4637—SILICON ALLOY—Ueber das Siliciumkupfer. M. Phillips. (Metallurgie, Sept. 22, 1907; 4 pp.) Conclusion of an article previously mentioned in this Index, dealing with the methods used in investigating the chemical properties of the alloy and the results thereby obtained. 40c.

4638—SMELTING—Copper Smelting in Utah. R. B. Brinsmade. (Mines and Minerals, Nov., 1907; 5 pp.) A review of general smelting practice at Salt Lake City and vicinity as exemplified by operations at the smelters of the Utah Consolidated, the United States, the Bingham Consolidated and the Yampa. 20c.

4639—SMELTING—Notes on Copper—VIII. A. H. Sexton. (Mechan. Engr., Oct. 12, 1907; 3½ pp.) Further article on this subject, dealing in this instalment with reverberatory and blast furnace smelting of copper ores, and giving principles and directions for making blast furnace calculations. 20c.

4640—SMELTING PLANT—Washoe Reduction Works at Anaconda, Montana. (Mines and Minerals, Oct., 1907; 2½ pp.) Very brief description of the methods of handling material, and the smelting processes used in the above works at Anaconda, Montana. 20c.

4641—UTAH—Mining at Bingham, Utah. R. B. Brinsmade. (Mines and Minerals, Oct., 1907; 3 pp.) Conclusion of an article previously mentioned in this Index. Gives notes on methods of square set timbering in use here, caving and slicing methods, transportation systems, etc. 20c.

DIAMONDS

4642—NATURE OF DIAMOND PIPES—Kimberlite Dikes and Pipes. F. W. Voit. (Min. Journ., Sept. 21, 1907; ½ p.) A summary of the lithological characteristics of diamond pipes and associated dikes and a consideration of the conclusions as to their geological age, which may be drawn from studying them. To be concluded. 20c.

GOLD AND SILVER

4643—ALLUVIAL DEPOSITS—The Occurrence of Alluvials in Hungary and Transylvania, and the Profitableness of Working Them on a Large Scale by Means of Dredges. L. Horvath. (Min. Journ., Sept. 21, 1907; 3 pp.) Conclusion of article which was previously mentioned in this Index. 20c.

4644—ASSAYING—Notes on Routine Mine Sample Assaying. H. Monckton. (Journ., Chem., Met. and Min. Soc. of South Africa, Aug., 1907; 1 p.) Brief note on the use of a bit of copper foil during cupellation of a large batch of gold assays in order that the resulting green stain in certain cupels may assist in identifying assays and prevent confusing them. 60c.

4645—BRITISH COLUMBIA—The Nickel Plate Mine of British Columbia. A Lakes. (Ores and Metals, Oct. 5, 1907; 1½ pp.) A very brief and general description of the location and physical conditions in the vicinity of the Nickel Plate mine. 20c.

4646—CHLORINATION of Gold Ores; Laboratory Tests. A. L. Sweetser. (Paper read before the A. I. M. E., April, 1907; 8½ pp.) Describes a series of experiments to determine the best conditions for the chlorinating of a porphyry ore. Details of the roasting, leaching, tailing treatment, and precipitation of solution are given, together with a tabulated list of all results secured.

4647—EGYPT—The Nile as a Mining River. A. Del Mar. (Min. and Sci. Press, Oct. 12, 1907; 2½ pp.) Mentions old mine workings along the course of this river, where in ancient times gold mining operations were carried on rather extensively. 20c.

4648—MEXICO—Mines of the Taviche District, Oaxaca, Mexico. A. E. Place and H. L. Elton. (Eng. and Min. Journ., Oct. 5, 1907; 1 p.) Describes the vein system and character of the ores of this silver-gold camp. The veins are noteworthy in that they are quite free from faulting. A list of the producing mines of the district is included. 20c.

4649—NEVADA—The Combination Mine. Edgar A. Collins. (Min. and Sci. Press, Sept. 28 and Oct. 5, 1907; 5 pp.) Briefly reviews the story of the discovery and early working of this mine and deals in general with geological and mining conditions in and around the Combination mine; deals also with stoping methods, timbering, the extent of the ore shoots and mining costs. 40c.

4650—NEVADA—The Great Comstock Lode. G. McM. Ross. (Min. and Sci. Press, Oct. 12, 1907; 2 pp.) An interesting review of the discovery of this silver camp, telling of the early mining operations and the development of the Washoe process for extracting the values. Concludes with some notes on the present revival of mining interest. 20c.

4651—NEVADA—The Osceola Gold District of Nevada. (Min. Rep., Oct. 3, 1907; 1½ pp.) Mentions the revival of interest in placer and quartz mining which has recently taken place in this district, and gives brief information about some of the more important groups of mines. 20c.

4652—NOVA SCOTIA—Gold Measures of Tangier, Nova Scotia. G. A. Packard. (Min. and Sci. Press, Oct. 5, 1907; 2 pp.) Notes on the character of the quartz veins in the Tangier district, with descriptions of some of the principal veins and the extent of development work which has been done in this district. 20c.

4653—NOVA SCOTIA—The Development of an Ore Shoot in Nova Scotia. E. Percy Brown. (Can. Min. Journ., Oct. 15, 1907; 2 pp.) Tells some of the principles and methods which have been successful in the exploitation of Nova Scotia ore shoots. 20c.

4654—ORE TREATMENT—Notes on Waihi Ore Treatment. R. Stokes. (Journ. Chem., Met. and Min. Soc. of South Africa, Aug., 1907; 1½ pp.) Discussion by W. R. Dowling and C. E. Deakin of the above paper, which was previously mentioned in this Index. 40c.

4655—ORIGIN OF GOLD in the Rand Banket. J. W. Gregory. (I. M. M., Bull. No. 37, Oct. 10, 1907; 8 pp.) Contributed remarks by W. F. A. Thomae and Ross E. Browne on the above paper, which was previously mentioned in this Index.

4656—PRODUCTION—Prosperity: Its Relation to the Increasing Production of Gold. A. Del Mar. (Eng. Mag., Oct., 1907; 14 pp.) An elaborate and authoritative analysis of the present state of the business and financial world as influenced by the enormous additions which are being made to the gold and silver supplies of the world. 40c.

4657—RAND MINING—The Commercial Aspects of Rand "Profits." G. A. Denny. (Min. Journ., Sept. 21, 1907; ½ p.) Continuation of article previously mentioned in this Index. 20c.

4658—SCREEN ASSAY on the Meyer and Charlton G. M. Under "the New Metallurgy." C. Toombs. (Journ. Chem., Met. and Min. Soc. of South Africa, Aug., 1907; 1½ pp.) Reply of author to the discussion of his paper, which was previously mentioned in this Index. 40c.

4659—TASMANIA—Report on Gold at Port Cygnet and Wheatley's Bay, Huon River. W. H. Twelvetrees. (Gov. Geologist's Office, Launceston, Tasmania, June 22, 1907; 11 pp.) Results of the government geologist's investigations into the possibilities of gold mining in the above localities. The conclusion is that the rock is too low grade to allow profitable exploitation, and that placer workings, containing gold from the eroded country rock, are not particularly promising.

4660—TUBE MILL PRACTICE, Notes on Some Recent Improvements in. K. L. Graham. (Journ., Chem., Met. and Min. Soc. of South Africa, Aug., 1907; 1 p.) Discussion of the above paper, giving some hints on tube mill management taken from the author's experience. Shows that underloading the mill will make the pebbles and ore slip on the lining and that poor grinding will result. 60c.

4661—UTAH—The Mines of American Fork Canyon, Utah. C. W. Higgins. (S. L. Min. Rev., Oct. 15, 1907; 2½ pp.) Gives

some reliable information as to the present activities of this little known mining camp near Park City and Alton in the Wasatch range. It appears that the camp would be fairly promising if more capital and new energy were injected. 20c.

GYPSUM

4662—PLASTER MILL—New Plaster Mill of the American Gypsum Co. (Eng. Rec., Oct. 12, 1907; 1 p.) Tells of the general arrangement, design and construction of this reinforced concrete gypsum mill at Port Clinton, Ohio. The building is of added interest because it has withstood extensive blasting in the gypsum deposits, part of which are directly beneath the mill. 20c.

IRON AND STEEL

4663—ANALYSIS—Ueber die Bestimmung von Wolfram im Stahl bei Gegenwart von Chrom. F. Willy Hinrichsen. (Stahl. u. Eisen, Oct. 2, 1907; 2 pp.) Records the conclusions of the author in a series of investigations to develop an accurate method for the quick determination of tungsten in special steels in the presence of chromium. Gives directions for procedure and tabulates results secured. 40c.

4664—BLAST FURNACE—VIII.—Utilization of Waste Gases. H. Allen. (Iron Tr. Rev., Oct. 10, 1907; 2½ pp.) Deals with methods in use for the necessary cleaning of blast furnace gas, which must be accomplished before it can be used efficiently in stoves, boiler heating or engines. Includes also some notes on the design and efficiency of fans for handling the gas. 20c.

4665—BLOW HOLES in Steel Ingots. E. Von Maltitz. (Paper read before the A. I. M. E., July, 1907; 36 pp.) A study into the nature, causes, means of prevention, and effects of blow holes in steel ingots. The author deals with his own extensive experience in this line and dwells mostly on those features of piping and blow-hole formation which are often lost sight of or neglected in the usual discussion of the subject.

4666—CANADIAN SMELTING—Pig Iron Industry at Port Arthur. (Can. Mfgr., Sept. 20, 1907; 1½ pp.) Gives a general idea of the operations being carried out by the Atikokan Iron Co. of Port Arthur, Ontario. Brief notes as to the character and equipment of the smelting plant are given. 20c.

4667—CASTING PRACTICE — Machine Cast Pigs. C. W. Mason. (Iron Tr. Rev., Oct. 17, 1907; 1 p.) Shows the uniform composition of cast iron which is attained by machine casting instead of sand casting, ladles being used in a manner analogous to mixers in bessemer practice, and gives theories for the cause of the uniformity. 20c.

4668—CHARCOAL IRON PLANT—A By-product Charcoal Iron Plant at Marquette, Mich. (Eng. Rec., Oct. 12, 1907; 1½ pp.) At this charcoal iron-plant, the by-products from the manufacture of the charcoal are recovered by suitable processes, which are briefly described. The iron furnaces which run on charcoal are notable for their long campaigns and the reasons are discussed. 20c.

4669—COMPRESSED AIR—Anwendung der Pressluft im Giessereibetriebe. W. Häntschel. (Eisen Zeit., Sept. 21, 1907; 1½ pp.) Continuation of article previously mentioned in this Index. 20c.

4670—CUPOLA PRACTICE—Melting Iron for Castings. B. Stoughton. (Foundry, Oct., 1907; 5 pp.) A general compilation of information relating to present day cupola practice, telling in a non-technical way the methods of charging and managing the furnace, the way to calculate charges, the chemical changes undergone by the iron, and the fuels used. 20c.

4671 — FOUNDRY—Manufacturing Cast Iron Pipe and Car Wheels. (Can. Mfgr., Sept. 20, 1907; 3½ pp.) The Canadian Iron & Foundry Company's plant at Fort William, Ontario, is the largest of its kind in Canada. An outline of the working methods and descriptions of the arrangement and equipment of the pipe and car-wheel foundries form the largest part of the article. 20c.

4672—FOUNDRY ALLOYS—Special Ferro-alloys for the Foundry. E. Houghton. (Iron and Coal Tr. Rev., Sept. 20, 1907; 1½ pp.) Discusses the uses and relative importance of the various special ferro-alloys used in foundry practice and gives analyses of representative brands. 40c.

4673—GERMANY—Die Eisenindustrie an der Dill.—Zum 300 jährigen Bestehen der "Adolfshütte." C. Dönges. (Stahl u. Eisen, Sept. 18, 1907; 6 pp.) An interesting historical review of the iron smelting industry in the Dill region of Germany, where iron production has been carried on since the year 1445. 40c.

4674—GERMANY—Die Friedrich-Alfred-Hütte zu Rheinhausen. (Stahl u. Eisen, Oct. 9, 1907; 42 pp. with plates.) An extremely thorough description of the Friedrich-Alfred smelter at Rheinhausen, which is one of the largest and best appointed in Germany. Full notes on the deposition, arrangement and equipment of all departments are given. 40c.

4675—GERMANY—The Krupp Works in Germany. J. B. Van Brussel. (Iron Tr. Rev., Oct. 3, 1907; 9½ pp.) Descriptions of equipment and working practice in this famous plant. A remarkable set of photographs gives a good idea of the scope of operations. The particular departments dealt with are the blast furnace, steel mills, and gun and armor plate shops. 20c.

4676—HISTORY—Ueber die Geschichte der Eisenindustrie im Harz. Geyer. (Stahl u. Eisen, Oct. 2, 1907; 6 pp.) Reviews the history of the iron industry in the region around the Harz and traces its growth from period to period. 40c.

4677—HUNGARY—The Forges and Mines of the Hungarian State. (Engineer, Sept. 20, 1907; 3½ pp.) Gives a brief history of the mines and iron works owned and managed by the Hungarian government, and then describes in detail their equipment and the scope of their operations, with a few notes on the labor conditions in the country. 40c.

4678—IRON MINING—Developments on the Menominee Range. (Iron Tr. Rev., Oct. 17, 1907; 3 pp.) Describes present provisions for power production and general exploitation work on this Michigan range. 20c.

4679—MANUFACTURE OF STEEL and Wrought Iron in America. Bradley Stoughton. (Eng. Mag., Oct., 1907; 17 pp.) An account of the metallurgical processes involved in the production of all forms of steel and wrought iron from the ore. The article is for non-technical readers, but condenses very well the whole metallurgy of iron into a short space. 40c.

4680—NORMANDY—Note sur le Minerai de Fer Silurien de Basse-Normandie. E. Heurteau. (Ann. des Mines, T. XI., 6 livr., 1907; 55½ pp.) This article gives information upon the deposits of Silurian iron in Normandy; the particular features treated are the extent of the deposits, their division among the present concessioners, the extent of work accomplished during the past 30 years, the economic conditions affecting the use of the mineral and its recent utilization in smelters in Northern France.

4681—ONTARIO—The Magnetite Mines of the Mineral Range Iron Mining Company, Limited, at Bessemer, Hastings Co., Ontario. (Can. Min. Journ., Oct. 15, 1907; 2½ pp.) Reviews very briefly the character and extent of the iron deposits of the above company, which appears to be in a position to become an important shipper of iron ore. 20c.

4682—PIPING AND SEGREGATION in Steel Ingots. (Bi-monthly Bull. A. I. M. E., Sept., 1907; 4 pp.) Discussion by A. C. Lane of Prof. H. M. Howe's paper on the above subject, which was previously mentioned in this Index.

4683—RUSSIA—Die russische Eisenindustrie und ihre Bedeutung für den Weltmarkt. (Centralblatt der Hütten u. Walzwerke. Sept. 25, 1907; 1½ pp.) Reviews the evolution of the iron industry in Russia and endeavors to determine its probable future position among the chief iron producing countries and iron markets of the world. 20c.

4684—SPECIAL STEELS—Beitrag zum Studium des Systems Eisen-Wolfram. H. Harkort. (Metallurgie, Sept. 22 and Oct. 8, 1907; 25 pp.) A long account of the preparation of iron-tungsten alloys and the investigation of their properties. This instalment is mostly a discussion of the relative merits of the various means for the production of the temperature necessary for making such alloys. 60c.

4685—STEEL ORE DOCK—The First Lake Dock of Steel. D. E. Woodbridge. (Iron Age, Oct. 3, 1907; 2½ pp.) Gives information as to the design, method of anchoring, of placing foundations and of fastening the superstructure of a proposed steel ore-dock of the Duluth & Iron Range railroad at Two Harbors, Minnesota. 20c.

4686—ZINC IN IRON FURNACES—Zinc Oxide in Iron Ores, and the Effect of Zinc in the Iron Blast Furnace. J. J. Porter. (Paper read before the A. I. M. E., July, 1907; 7 pp.) Notes taken from the results of tests during a furnace campaign for the reduction of iron ores contaminated with zinc. Discusses at some length the mechanical, physical and chemical actions of these zinky ores and the difficulties in furnace management resulting therefrom.

LEAD

4687—MEXICO—Reduction at Mapimi. (Am. Min. Rev., Sept. 28, 1907; 1½ pp.) Deals with the operating methods in the sulphide department of the Mapimi lead smelter in Durango, where the Huntington-Heberlein process of desulphurizing is used. This plant is the largest of its kind in Mexico. 20c.

4688—MISSOURI—Zinc and Lead Annual. (Published by J. A. Zook and W. S. Baxter, 1906; 30 pp.) Gives miscellaneous general information as to conditions and mining operations in the lead and zinc fields around Webb City and Carterville. 20c.

4689—WHITE LEAD—Die Bleiweissfabrikation in England nach dem Bischofschen Verfahren. A. Salmony. (Chem. Zeit., Sept. 25 and 28, 1907; 4½ pp.) Comments briefly on several old processes of making white lead, and then describes the apparatus and methods used in England for making this substance by the Bischof process, which requires only 24 hours to produce the lead white from metallic lead and consists in carbonating a hydrated lead oxide. 40c.

MANGANESE

4690—INDIAN MANGANESE INDUSTRY, Prospects of. A. Ghose. (Journ. Soc. of Arts, Aug. 2, 1907; 5 pp.) Reviews conditions in the manganese mining industry in India and considers its future possibilities and the effect of disorganization in the competing Russian mines. 20c.

NICKEL

4691—NEW CALEDONIA—Nickel Mining in New Caledonia. G. M. Colvocoresses. (Eng. and Min. Journ., Sept. 28, 1907; 3½ pp.) Describes the ore formations and the methods now used in mining and shipping the mineral. All mining is from surface deposits and the chief problem is its collection and transportation to a convenient shipping port. Article concludes by a review of labor and general conditions in the island. 20c.

4692—NICKEL DETERMINATION—Die Bestimmung des Nickels als Nickeldicyandiamidin und seine Trennung von Eisen und Aluminium. H. Grossmann and B. Schück. (Chem. Zeit., Sept. 14, 1907; 1½ pp.) Describes modifications of the previously proposed method of estimating nickel as nickel dicyandiamide, whereby the process of analysis is much shortened as compared with the method previously described by these authors; also gives methods of isolating nickel from iron and aluminum solutions. 20c.

4693—SUDBURY DISTRICT—The Sudbury Nickel-Copper Field, Ontario. R. Stokes. (Min. Wld., Sept. 28 and Oct. 5, 1907; 6 pp.) Deals mostly with the historical aspects of the various companies which have entered this field as nickel producers, but gives also information as to geology, smelting methods, and present means of shipping and marketing the mineral. 40c.

4694—VIRGINIA—The Occurrence of Nickel in Virginia. T. L. Watson. (Paper read before the A. I. M. E., July, 1907; 15 pp.) Deals with the occurrence and genesis of the nickel ore at Lick Fork. The pamphlet comprises notes on the geology and petrography with descriptions of the principal varieties of rock, and the mode of occurrence of the ores as shown both by field and microscopic study.

PETROLEUM

4695—ENGLAND—The Bulk Oil Storages in Manchester. (Petrol. Rev., Oct. 12, 1907; 2 pp.) Gives briefly some facts showing the present position of Manchester as an important center for petroleum storage and distribution. 40c.

4696—ITALY—L'Industrie des Hydrocarbures en Italie. E. Camerana. (Communication presented to the Third International Petroleum Congress at Bucharest, 1907; 44 pp. 5 plates.) Collects and condenses many different publications with a view of presenting to the members of the International Petroleum Congress, a review of the present condition of hydro-carbon and petroleum industry in Italy.

4697—LEASING LAND—Revised Regulations for Leasing Indian Lands. (Pac. Min. and Oil Rep., Sept. 20, 1907; 2 pp.) An abstract of the essential features of the revised regulations just promulgated by the Secretary of the Interior dealing with the leasing of Indian lands for the purpose of exploiting petroleum deposits. 20c.

4698—LIQUID FUELS—Technical Aspects of Oil as Fuel.—I. F. E. Junge. (Power, Oct., 1907; 3½ pp.) This article is concerned with the utilization of liquid fuels and the processes of forming combustible mixtures therefrom, and their application in power plants. Consideration is also given to evaporation characteristics of liquid hydrocarbons. 20c.

4699—WEST VIRGINIA—Oil Field on Buffalo Creek, West Virginia. F. W. Brady.

(Mines and Minerals, Nov., 1907; 2½ pp.) This field on Buffalo creek has been under development spasmodically up to the present when systematic operations are under way. Touches briefly on the location of existing wells, their output and gives some interesting information on methods of shooting wells and transporting nitro-glycerine. 20c.

PHOSPHATE ROCK

4700—WESTERN AUSTRALIA—The Phosphatic Deposits near Dandaraga. (W. A. Geol. Surv., Bull. No. 26, 1907; 10 pp., 1 map.) Inquiries into the extent of the phosphate rock deposit at Dandaraga, its mode of occurrence, its mineralogical constituents, and the possibility of its commercial exploitation. The general conclusions indicate that the deposit is extensive, and will stand working.

PRECIOUS STONES

4701—MADAGASCAR—Les Pierres Précieuses a Madagascar. A. Dabren. (Bull. de l'Assn. Amicale des Élèves de l'École Nat. Supérieure des Mines, Aug. and Sept., 1907; 11 pp.) Conclusion of an article describing the deposits of precious stones in this island. The present instalment reviews the occurrences of beryl and tourmaline, district by district, describing their peculiarities and enumerating the important workable deposits.

RARE METALS

4702—STEEL HARDENING METALS—The Production of Nickel, Cobalt, Tungsten, Vanadium, Molybdenum, Titanium, Uranium and Tantalum in 1906. F. L. Hess. (Advance Chapter from Mineral Resources of the U. S., Calendar Year 1906; 25 pp.) Reviews new uses for these metals in special steels and in electric illumination and gives notes on the processess of extracting them from their ores and their subsequent metallurgical and mechanical treatment. Enumerates also the most important places where deposits of these metals exist or are worked.

4703—VANADIUM — The Present Source and Uses of Vanadium. J. Kent Smith. (Paper read before the A. I. M. E., July, 1907; 6 pp.) Gives information as to the nature and extent of exploitation of the recent new discovery of vanadium minerals in South America which is the most important one yet known. Deals also with the properties which vanadium imparts to tool steels.

SALT

4704—PRODUCTION of Salt and Bromine in 1906. A. T. Coons. (Advance Chapter from Mineral Resources of the U. S., Calendar Year 1906; 14½ pp.) Contains reviews of the salt producing industry by States, gives notes on domestic consumption, exports and imports of salt, also world's production. The usual classification of commercial grades with the amount of each grade produced is also included.

SLATE

4705—PRODUCTION of Slate in 1906. A. T. Coons. (Advance Chapter from the Mineral Resources of the U. S., Calendar Year 1906; 7 pp.) Reviews the conditions now prevailing in those States which engage in slate production, and gives information as to prices, value of product, total output, exports and imports.

STONE

4706—STONE INDUSTRY in 1906. A. T. Coons. (Advance Chapter from the Mineral Resources of the U. S., Calendar Year 1906; 39 pp.) Gives the production, exports, imports and general industrial conditions during 1906 in regard to granite, sandstone, marble, limestone and blast furnace flux.

TIN

4707—ALASKA—Geology and Mining of the Tin Deposits of Cape Prince of Wales, Alaska. A. H. Fay. (Paper read before the A. I. M. E., July, 1907; 18½ pp.) Discusses briefly climatic conditions in this region and then gives much information as to the structural and areal geology of the tin district. The extent of prospecting and mining operations is outlined and the economic conditions under which the deposits must be worked are considered.

4708—FEDERATED MALAY STATES—Tin Mining in Ulu Selangor. E. Nightingale. (I. M. M., Bull. No. 37, Oct. 10, 1907; 5½ pp.) Contributed remarks by E. L. Marshall and J. N. Justice on the above paper, which was previously mentioned in this Index.

4709—PRODUCTION of Tin in 1906. F. L. Hess. (Advance Chapter from the Mineral Resources of the U. S., Calendar Year 1906; 11 pp.) Reviews the tin mining operations of 1906 in the various States and gives a summary of tin production from foreign countries. Market conditions in the United States are reviewed and figures as to the world's consumption of tin are given.

4710—SIAM—Tin Mining in Siam. K. Van Dort. (Eng. and Min. Journ., Oct. 19, 1907; 4 pp.) Reviews conditions under which tin mining is now carried out in this country, showing the effect of racial characteristics and lax government regulation upon the development of the industry. Chinese mining methods, labor, climatic and transportation conditions are briefly noted 20c.

TUNGSTEN

4711—CASSITERITE IN TUNGSTEN ORES—The Separation of Tin-oxide from Wolfram. A. Treloar. (Paper read before Instn. Min. and Met., Oct., 1907; 3 pp.) Brief note on the construction of an electromagnet adapted to remove tin-stone from tungsten ore and a comparison of the effects of several acids during the treatment of the separated wolfram to remove the last traces of tin.

ZINC

4712—ASSAY OF ZINC. E. W. Buskett. (Mines and Minerals, Nov., 1907; 1 p.) A thorough discussion of the volumetric method of estimating zinc in a hydrochloric acid solution with a standard solution of potassium ferrocyanide. The reactions, the sources of error and the methods of guarding against them are considered in detail. 20c.

4713—ELECTRIC POWER in the Joplin District. Doss Brittain. (Ores and Metals, Oct. 5, 1907; 2½ pp.) Mentions some of the uses to which electrically operated machinery has been put in this zinc district, giving some details as to the installation costs of a few plants and the work accomplished by them. 20c.

4714—JOPLIN ZINC DISTRICT. R. L. Herrick. (Mines and Minerals, Nov., 1907; 14½ pp.) Describes in some detail the character of the ore deposits in this zinc camp and gives a general description of methods of leasing and protecting, with comprehensive notes on mining and milling practice. 20c.

4715—MILL CONSTRUCTION—Mill Building Progress in the Joplin District. C. L. Watson. (Mines and Minerals, Nov., 1907; 1½ pp.) Traces changes in mill construction in the zinc mills of the Joplin district which have greatly increased capacity and efficiency. 20c.

4716—MISSOURI—Zinc and Lead Annual. (Published by J. A. Zook and W. S. Baxter, 1906; 30 pp.) See under "LEAD."

4717—POWER in a Joplin Zinc Mill. Doss Brittain. (Engineer, Oct. 15, 1907; 1 p.) States the power requirements of a typical lead-zinc mill of the Joplin district and compares the advantages, pro and con, of natural gas and electricity for this purpose. 20c.

4718—SHEET GROUND—Handling "Sheet Ground" in the Joplin District. J. H. Polhemus. (Mines and Minerals, Nov., 1907; 2½ pp.) Gives details of the general mining and milling practice of the American Zinc, Lead and Smelting Company in working its sheet ground properties in the Joplin district. 20c.

4719—TAILING TREATMENT—Tails and Sludge Milling at the Old Judge Mine, Oronogo, Mo. W. D. Glenn. (Mines and Minerals, Nov., 1907; 1 p.) Outlines the customary method used in the Joplin district for treating the large tailing accumulations of the camp, the treatment of which is somewhat difficult, but which can be done profitably. A flow sheet of a typical mill is included. 20c.

4720—TITRATION OF ZINC in Alkaline Solution. E. B. Van Osdel. (Eng. and Min. Journ., Oct. 19, 1907; ½ p.) Gives details of the preparation of the assay and the titration of zinc in alkaline solution in the presence of high iron, which is removed by Low's method. This new procedure calls for the use of ferric chloride in acetic acid on the spot plate in order to perceive the end point without the necessity of acidifying the solution being titrated. 20c.

4721—ZINC MINING AND MILLING—The Yellow Dog Mine and Mill. R. L. Herrick. (Mines and Minerals, Nov., 1907; 3 pp.) An interesting account of the methods of mining and handling ore in the Yellow Dog mine which is one of the most important lead-zinc mines in the sheet ground district, and which had a serious drainage problem to solve before it became a paying producer. 20c.

4722—ZINC OXIDE PRODUCTION—Physical Factors in the Metallurgical Reduction of Zinc Oxide. W. McA. Johnson. (Paper read before A. I. M. E., July, 1907; 7 pp.) Some observations on the effect of physical factors in reducing zinc oxide, such as the fineness of the oxide and the reducing coal, the disposition of these in the retorts, the condition of iron used, the methods of firing the retorts, etc.

4723—ZINC PIGMENTS—Manufacture of Zinc Pigments. E. W. Buskett. (Mines and Minerals, Nov., 1907; 1 p.) Notes briefly the ores most suited for use in the above process and describes the equipment and methods of operating the plant at Coffeyville, Kansas, which is the most complete oxide plant in the West. 20c.

ECONOMIC GEOLOGY—GENERAL

4724—LAPLAND—On Granite and Gneiss: Their Origin, Relations and Occurrence in the Pre-Cambrian Complex of Fenno-Scandia. J. J. Sederholm. (Bull., Commission Geol. de Finlande, No. 23, June, 1907; 110 pp.) Contains a summary in English of the above pamphlet, which discusses the origin of granite and gneiss, and its relation to other Archean problems.

4725—LAPLAND—Zur Geologischen Geschichte des Kilpisjärwi-Sees in Lappland. V. Tanner. (Bull. de la Commission Geologique de Finlande, No. 20, 1907; 23 pp.) Studies geological conditions and the physical features of the district in and around the northwestern part of Lapland.

4726—LEESBERGITE, un nouveau carbonate calcaréo-magnésique. L. Blum. (Annales de la Soc. Geol. de Belg., T. XXXIV. 1907; 2 pp.) Note on the mineralogical features and the chemical composition of Leesbergite, a new calcium-magnesium carbonate discovered in the oölitic minette deposits of Lorraine.

4727—MEXICO—Geologic and Geographic Aspects of Mexico. R. T. Hill. (Min. Wld., Oct. 12 and 19, 1907; ½ p.) Continuation of a series of articles describing the physiographic features of Mexico. The present instalments trace the salient features and relationship of the principal formations of the Sonoran province. 40c.

4728—MINERAL WATERS—The Production of Mineral Waters in 1906. S. Sanford. (Advance chapter from Mineral Resources of the U. S. Calendar Year 1906; 33 pp.) Considers the kinds and classification of mineral waters and gives a general review of trade conditions by States.

4729—QUEBEC—Exploration to the North of the County of Pontiac. J. Obalski. (Dept. of Colonization, Mines and Fisheries, Quebec, 1907; 23 pp.) Gives some detailed observations on the geographical and surface geological features of the district where the same Huronian formation that is developed in the Cobalt district exists. No statement as to the value of the region in minerals is given.

4730—WESTERN AUSTRALIA—The Prospects of Obtaining Artesian Water in the Kimberley District. R. L. Jack. (W. A. Geol. Surv., Bull. No. 25, 1906; 46 pp.) After describing the most important geological formations in some detail, the report takes up the possibilities of artesian water being found as evidenced by extensive field examinations.

4731—WESTERN AUSTRALIA—Third Report on the Geological Features and Mineral Resources of the Pilbara Goldfield. A. G. Maitland. (W. A. Geol. Surv., Bull. No. 23, 1906; 92 pp.) Contains a summary of the general geology of this mining region with notes on economic geology, with reference to deposits of gold, tin, diamonds, iron, tungsten, asbestos and lead.

MINING—GENERAL

4732—ACCURACY IN CALCULATIONS—The Elements of Accuracy and Precision in Engineering Calculations. R. J. McNitt. (Sibley Journ. Eng., Oct., 1907; 5 pp.) Short comment on the advantage of considering the precision of components in calculating results, illustrating the points brought out by solving two typical problems. 40c.

4733—BOHEMIA—Der alte Gold, Silber, und Bleiglanzberbau bei Iglau in Mähren und Deutschbrod in Böhmen. J. Lowag. (Montan Zeit., Sept. 15, 1907; 1½ pp.) A sketch of the gold, silver and lead mining industry in Bohemia, giving in this instalment historical notes on ancient mining, and information upon the geological relations of the regions. To be continued. 20c.

4734—BOREHOLE DEVIATION—Contributed Remarks on the Deviation of Rand Boreholes from the Vertical. J. Kitchin. (I. M. M., Bull. No. 37, Oct. 10, 1907; 4 pp.) Discussion on a paper of the above title giving some additional information on causes which influence the deviation of boreholes from the desired direction.

4735 — CAGE INSTALLATION — Förder-

korb-Anschlussbuhnen. (Centralblatt der Hütten und Walzwerke, Oct. 5, 1907; 1 p.) Some brief notes on the dangers attending the installation of cages in a shaft with a few hints on good methods to use. 20c.

4736—CARE OF EMPLOYEES—The Compound System at the South African Diamond Mines. C. W. Farmer. (Ores and Metals, Oct. 5, 1907; 1 p.) Brief notes on the methods used by the De Beers Consolidated Mines Company for managing and caring for its white and native labor at its diamond mines at Kimberly. 20c.

4737—CENTRAL ASIA—A Journey to Central Asia. A. Adiassewich. (Paper discussed before the Instn. Min. and Met., Oct., 1907; 31 pp.) A very interesting description of Russian Central Asia from a geographical and geological point of view. Special attention is paid to the mineral resources and the causes and factors which have bearing on mining exploitation.

4738—DRILLING—Multiple Arrangement of Drills on the Rand. E. Nichols. (Eng. and Min. Journ., Sept. 28, 1907; 1 p.) The use of three drills on one column allowed a new record of tunnel driving on the Rand to be made. Full details of the number, direction and depth of holes drilled by this system, and the order of drilling them are given. 20c.

4739—EDUCATION—Prof. Christy's Address. R. W. Raymond. (Eng. and Min. Journ., Sept. 28, 1907; 1½ pp.) An address delivered by Prof. Christy at the dedication of the new mining building at the University of California. It points out the advantages of an adequate amount of space and ample facilities for the development of the student of mining engineering. 20c.

4740—EXPLOSIVES—Les Explosifs Modernes. H. Schmerber. (Génie Civ., Sept. 21, 1907; 1½ pp.) Continuation of an article previously mentioned in this Index. This instalment relates to special types of explosives adapted to use in dusty and gaseous mines, giving formulas of several brands and discussing their particular characteristics. 40c.

4741—HOISTING ROPE—Improved Rope Cleaner. (Min. Eng., Oct., 1907; ½ p.) Very brief description of the patent specifications of this device which is adapted to cleaning wire ropes previous to lubricating them, and which also is said to disclose damaged parts of the rope and broken wires. 20c.

4742—HOISTING ROPES—Report of Commission Appointed to Inquire Into and Report Upon the Use of Winding Ropes, Safety Catches and Appliances in Mine Shafts. (Printed at Gov. Printing & Stat. Office, Pretoria, Transvaal, 1907; 119 pp.) Treats of the examination of wire ropes, the best methods of testing them, most suitable factor of safety, best methods of attaching rope to load, the reliability and adaptability of safety catches and appliances in shafts, and general measures which ought to be taken for safety in hoisting.

4743—JAMESTOWN EXPOSITION—Minerals at the Jamestown Exposition. Joseph Struthers. (Eng. and Min. Journ., Oct. 19, 1907; 4½ pp.) Describes the mineral and mining exhibits at this exposition that are noteworthy for novelty in design and excellence of presentation. 20c.

4744—MEXICAN FREIGHT RATES. (Eng. and Min. Journ., Oct. 19, 1907; 1 p.) Gives some details on the new Mexican freight rates which as yet have not been put in practice, but which will have a very serious effect on the mining industry. Many Mexican mines are low grade and worked on a margin of profit so small that the proposed increased freights wipe them out entirely in many cases. 20c.

4745—MEXICO—Characteristics of Some Mexican Mining Regions. Robert T. Hill. (Eng and Min. Journ., Oct. 5, 1907; 5½ pp.) Calls attention to some of the salient features, both physiographical and geological, of the great natural divisions of the southern belt of the Cordilleran country of the United States and Mexico. 20c.

4746—MEXICO—Present Labor Conditions in Mexico. E. A. H. Tays. (Eng. and Min. Journ., Oct. 5, 1907; 3½ pp.) Deals with the characteristics of the Mexican peon, his mode of life and his efficiency as a workman. 20c.

4747—MEXICO—Traveling on the West Coast of Mexico. D. E. Woodbridge. (Eng. and Min. Journ., Oct. 5, 1907; 3½ pp.) Good description of conditions now prevailing in this district of Mexico, with hints to the prospective traveler which will be of considerable service. Some notes on operations of the Boleo Company are given. 20c.

4748—MINE SUBSIDENCE. A. Richardson. (Journ., Chem., Met. and Min. Soc. of South Africa, Aug., 1907; 5 pp.) Author's reply to the discussion of his paper on this subject. Gives additional data on strength of pillars, means of detecting weaknesses in hanging walls, methods of mine filling, etc. 60c.

4749—MINING LAW—Legislative Provisions for Location of Lode Claims in California and Utah. R. S. Morrison. (Ores and Metals, Oct. 5, 1907; ½ p.) Brief excerpts from the Federal and State statutes of California and Utah, with explanations of these provisions, showing how the discoverer of mineral in these States must proceed in order to secure his claims. 20c.

4750—POWER—Gravitational Power in Mines—Suggestions for Its Utilization. (Min. Eng., Otc., 1907; 2 pp.) Shows by calculation how the surplus power of a self-acting incline or the potential energy of water in an upper level and flowing to a lower one, may be utilized with resultant saving in steam consumption. 20c.

4751—PROSPECTING—The Diamond Coredrill in Prospecting. Lewis T. Wright. (Min. and Sci. Press, Oct. 12, 1907; 1½ pp.) Contains valuable information as to rates of drilling under different conditions, speed of drilling, influence of depth of holes, wear of carbons, labor required and costs. The article aims to give engineers who have not used a diamond drill some basis for determining its relative advantages and disadvantages in prospecting work. 20c.

4752—QUEBEC—Mining Operations in the Province of Quebec for the Year 1906. J. Obalski. (Dept. of Colonization, Mines and Fisheries, Quebec, 1907; 59 pp.) A summary of mining progress in this province, giving statistics of production of metals and minerals.

4753—SANTO DOMINGO—Mining Laws and Legislation in Santo Domingo. F. Lynwood Garrison and A. Chalas. (Eng. and Min. Journ., Sept. 28, 1907; 1½ pp.) Brief summaries of the important provisions of the two mining codes of this country under which mineral concessions have been granted. The chief points of the 1904 law are explained. This 1904 code is now abrogated and has not as yet been replaced by a new one. 20c.

4754—SHAFT SINKING by the Freezing Process. S. F. Walker. (Eng. and Min. Journ., Oct. 12, 1907; 4 pp.) Contains an account of the application of this process and explains the methods used in calculating the amount of refrigeration necessary for creating and maintaining an ice wall during sinking operations. 20c.

4755—SHAFT TIMBERING—Retimbering the Kearsage Shaft. Lee Fraser. (Min. and Sci. Press, Oct. 5, 1907; 1½ pp.) The fire in this shaft burned all the timbers and caused much rock to scale off. The dangers attending retimbering were considerable and the article describes the methods by which they were overcome. 20c.

4756—SKIP FASTENING—Attachment between Rope and Sinking Bucket. C. B. Brodigan. (Min. and Sci. Press, Oct. 12, 1907; ½ p.) Brief note on the construction of a modified form of attaching a bucket to the hoisting rope in such a manner as to reduce vibrations the amplitude of which was dangerous. 20c.

4757—TESTING PLANT of the Technologic Division of the U. S. Geological Survey for Testing Explosives, Safety Lamps and Gases. (Mines and Minerals, Nov., 1907; 1½ pp.) Gives plans and other drawings of some of the apparatus which will be installed in the U. S. Geol. Survey laboratory for testing explosives, safety lamps, mine gases ,etc. 20c.

4758—TUNNELS of the Michigan Central Railroad under the Detroit River. (Iron Tr. Rev., Oct. 17, 1907; 3½ pp.) Shows the methods adopted in excavating, handling material, timbering and lining this tunnel. Construction details, plan, profile and completed sections are shown by drawings. 20c.

4759—UNWATERING by Means of an Inclined Skip. Douglas Muir. (Eng. and Min. Journ., Oct. 19, 1907; 1 p.) Tells the methods used in constructing, maintaining and operating an inclined trackway on which an unwatering skip ran. Drawings of temporary and permanent trackways are given. 20c.

4760—UNWATERING PLANT for Lindal Moor Mines. (Engineering, Oct. 11, 1907; 1½ pp.) Gives some particulars of the electrically operated, high-lift, centrifugal pumps used in unwatering these English iron mines where the small dimensions of the available shafts complicated the design of the unwatering plant considerably. 40c.

4761—WATER IN-BREAK—Note sur le Coup d'Eau de la Mine Laura et Vereeniging. (Limbourg Hollandais.) A. Genart. (Revue Univ. des Mines, Aug., 1907; 15 pp.) An interesting description of wailing-off a water in-break at this mine and the use of successive stages of turbine pumps to cope with the flood.

4762—WATER TREATMENT—Electrolytic Treatment of Water for Technical Uses. H. Fieck. (Min. Rep., Oct. 17, 1907; 1 p.) Deals with the experiments made under the direction of the Colorado Commissioner of Mines to determine the practicability of purifying water for technical purposes by electrolysis. This method was considered especially applicable in mining camps where electric energy is abundant and pure water scarce. 20c.

4763—WORKING COSTS of the Mines of the Witwatersrand. Ross E. Browne (Journ. So. African Assn. Engrs., Aug., 1907; 16 pp.) Discussion on the above paper, in which the author proposes and explains some schemes for determining by calculation the proper capital expenditure for a given output, and also for figuring the proper life of mines and the best utilization of labor.

ORE DRESSING

4764—CONVEYING TAILING in Launders. C. W. Van Law. (Min. and Sci. Press, Oct. 12, 1907; ½ p.) Gives brief but valuable data on the conveying of tailings in a pipe line. Shows the proper dilution of pulp necessary to maintain flow on a 2¼ per cent. grade both when grinding with tube mills and when using stamps unassisted by tube mills. 20c.

4765 — ELECTROSTATIC CONCENTRATION—Elektrostatische Aufbereitung. F. Esser. (Metallurgie, Sept. 22, 1907; 6 pp.) The concluding part of an article investigating the suitability of electrostatic methods for ore concentrating. This instalment deals with experiments made upon pyrite-blende ores and pyrite-chalcopyrite ores. The conclusions arrived at are that the amount of iron present and the fineness of the ore treated are the most important factors. 40c.

4766—GRINDING MILL—The Humphrey Quartz Mill. C. E. Humphreys. (Min. Rep., Sept. 26, 1907; 1½ pp.) This article is the inventor's description of the claims of his new grinding mill, which is a device wherein the crushing blows of stamps are used in conjunction with the grinding effect of an arastra. 20c.

4767—MILLING PRACTICE at the Granadeña Mill. S. F. Shaw. (Eng. and Min. Journ., Oct. 5, 1907; 2 pp.) Gives a flow sheet of the mill and describes the flow of pulp through the various stages of the milling process which has to recover values from a complex ore mixture, the greatest value being in the finest concentrates. 20c.

4768—STAMP FEEDING—Notes on Feeders, with a Description of a New Driving Device. D. J. Pepler. (Journ., Chem., Met. and Min. Soc. of South Africa, Aug., 1907; 1½ pp.) Gives some details of the construction and the means of operating a new driving device for Challenge ore feeders. The improvement is designed to ensure regular and positive feeding and to prevent interruptions of feed which result from frequent breaking of the feeding springs in the ordinary Challenge driving mechanism. 60c.

4769—STAMP MILL RECORDS. (Can. Min. Journ., Oct. 1, 1907; 1 p.) E. numerates the points in mill management of which accounts should be kept and points out the advantages of knowing exactly what a mill is accomplishing. The methods devised by the author are explained and sample blanks are shown. 20c.

4770—WASTE DISPOSAL—Dumping Residue at Kalgoorlie. M. W. von Bernewitz. (Min. and Sci. Press, Sept. 21, 1907; 2 pp.) The problem of waste disposal in this district is of great importance and is complicated by the fact that much of the waste may be retreated in the future and so must be kept nearby. The various systems of handling the waste are described and some data on the comparative cost of handling with conveyers, locomotives and horses are given. 20c.

4771—WASTE DISPOSAL—Handling Residue. (Min. and Sci. Press, Oct. 12, 1907; 1 p.) Illustrates and describes how tailings from the South Blocks plant at Broken Hill, New South Wales, are handled by elevators, and tailing stackers and conveyers. 20c.

METALLURGY—GENERAL

4772 — BLOWER PRACTICE — Foundry Blower Practice. W. B. Snow. (Proc., A. S. M. E., Mid-Oct., 1907; 23 pp.) A thorough exposition of the principles governing the moving of air against a resistance and the relation of the design of fan and rotary blowers to these principles; gives also much information on blower performances in cupola work.

4773—BOILING POINTS OF METALS—The Metals in Order of Their Boiling Points,

as Arranged from Moissan's Experiments in the Distillation of Metals and Alloys. O. P. Watts. (Paper read before the Am. Electrochem. Soc., Oct., 1907, advance copy; 12 pp.) Reviews the work of Moissan in volatilizing metals in an electric furnace, commenting on the conditions attending these experiments, and the reliability of the results.

4774 — BRITISH COLUMBIA — Smelting Works of the Consolidated Mining and Smelting Company of Canada, Limited, at Trail, B. C. J. M. Turnbull. (Can. Min. Journ., Oct. 1, 1907; 4 pp.) The smelting works of the above company produce copper matte, smelt lead ores and refine the pig lead. Operating methods and equipment are described in detail. 20c.

4775—CONVERTER HOOD—The Laist & Tanner Movable Converter Hood. L. S. Austin. (Min. and Sci. Press, Sept. 28, 1907; 1 p.) A brief description of this new movable converter hood which is of importance in that it makes working conditions much more agreeable for workmen. 20c.

4776—ELECTRO-METALLURGY—Applied Electro-Metallurgy Up to the End of 1906. J. B. C. Kershaw. (Eng. Mag., Oct., 1907; 15 pp.) An interesting review of the results achieved in recent years in this branch of metallurgy. The substance dealt with in this instalment are aluminum, calcium-carbide, carborundum, copper and copper refining and graphite. 40c.

4777 — GERMAN SMELTING REGULATIONS. (Min. Rep., Oct. 17, 1907; 1 p.) Gives a summary in English of present German smelting regulations and the manner in which atmospheric pollution by smelter fumes is dealt with. 20c.

4778—LEAD SILICATES — Bleioxyd und Kieselsaure. W. Mostowitsch. (Metallurgie, Oct. 8, 1907; 9 pp.) Investigates very carefully the conditions under which the various silicates of lead are formed and inquires into the chemical and physical aspects of the formations of these compounds. 40c.

4779—LIME DETERMINATION—Notes on the Estimation of Caustic Lime. E. H. Croghan. (Journ., Chem., Met. and Min. Soc. of South Africa, Aug., 1907; 5½ pp.) Contains the results of experiments to determine the comparative value of the gravimetric, volumetric and sugar methods of estimating caustic lime in burned limestone to be used in cyanide works. Shows the volumetric sugar process to be sufficiently reliable for practical use. 60c.

4780—PYRITIC SMELTING—Negative Results in Pyritic Smelting. Herbert Lang. (Eng. and Min. Journ., Sept. 28, 1907; 1 p.) Discussion by the author of an article of the same title by Mr. Beardsley. The author considers the principles upon which successful pyritic smelting rests, and especially the factors which affect liquation of the sulphides, pointing out the absolute necessity of having sufficient amount of siliceous flux in order to obtain good results with pyritic smelting. 20c.

4781—PYRITIC SMELTING—Negative Results in Pyritic Smelting. Walter E. Koch. (Eng. and Min. Journ., Oct. 19, 1907; ½ p.) Continuation of discussion on principles of pyritic smelting. The author advocates the use of warm blast and a hot top as a means of avoiding liquation and freezes, and contends that with these flue dust and metal loss will not be excessive. 20c.

4782—SULPHIDE FORMATION — Ueber die Affinität des Schwefels zu einer Reihe von Metallen. E. Schütz. (Metallurgie, Oct. 8, 1907; 8½ pp.) Contains the results of an investigation into the affinity of sulphur for a series of the ordinary metals. Details of experiments, analyses of products, results obtained and conclusions arrived at are given. 40c.

4783—UTAH—Lead and Copper Smelting at Salt Lake—II. W. R. Ingalls. (Eng. and Min. Journ., Sept. 28, 1907; 6½ pp.) A résumé of smelting practice in the large lead and copper smelters in this district. The article includes descriptions of the Huntington-Heberlein process of lime roasting as modified by the smelting managers and reviews many other noteworthy features of the plant equipment. 20c.

4784—WATER-POWER—Les chutes d'eau de la Suede. J. Hellmann. (L'Echo des Mines, Sept. 23, 1907; 1½ pp.) Extracts from a consular report dealing with the number and extent of water-falls in Switzerland applicable to producing electric energy. The subject is of interest in its possible relation to aluminum manufacture and electro-metallurgical industries. 20c.

MINING AND METALLURGICAL MACHINERY

4785 — AERIAL TRAMWAY — An Aerial Electrically Operated Tramway Over Lake Michigan. (West. Elec., Oct. 12, 1907; 1½ pp.) Interesting account of the use of a long aerial tramway over Lake Michigan, operated by electrical means. 20c.

4786—AIR COMPRESSOR—1200 H.P. Air Compressor. (Engineer, Lond., Oct. 11, 1907; 3 pp.) A detailed description of the important features of this large compressor which is to provide air pressure for underground haulage in the Seaham colliery, England. Results of an efficiency test are given. 40c.

4787—ALCOHOL FUEL—Tests of Internal-combustion Engines on Alcohol Fuel. C. E. Lucke and S. M. Woodward. (U. S. Dept. of Agriculture, Sept. 14, 1907; 89 pp.) This is the result of a very complete investigation to determine whether the present kerosene and gasolene engines now on the market can run on alcohol as fuel, also improvements which are desirable in their design in order to render them more suitable to using alcohol.

4788—CENTRIFUGAL PUMPS. E. F. Doty. (Engineer, Oct. 1 and 15, 1907; 3 pp.) Gives some historical information as to centrifugal pumps and then takes up the theory of their action and the relation of this theory to present-day practice in operating them. 20c.

4789—CHAINS—Strength of Chains. N. A. Carle. (Eng. and Min. Journ., Oct. 12, 1907; 1 p.) Gives a graphic diagram of chain strengths and explains its use in finding the breaking strength and thickness of chains. Shows also how to determine the proper factor of safety and the working load. 20c.

4790—COMPRESSED AIR and the Kinetic Theory of Gases. J. H. Hart. (Power, Oct., 1907; 1 p.) Shows how the principles of the kinetic theory of gases are sufficient to explain all the phenomena connected with the compression of air and its subsequent utilization as a source of energy. 20c.

4791—ELECTRIC EQUIPMENT—A New Mine Plant in Germany. B. F. Hirschauer. (Elec. Rev., Sept. 28, 1907; 2½ pp.) An account of the electric-hoisting equipment at the Thierdhall mine, near Brunswick, Germany. The hoist to the surface is in two stages and motors, winding drums, etc., are underground in a gallery at the top of a blind shaft from which cars are trammed along the level to the second shaft. The electric power is supplied from the surface. 20c.

4792—FLUE-GAS ANALYSIS: Its Value. J. W. Hays. (Power, Oct., 1907; 1½ pp.) Instructive article pointing out the relations existing between the percentages of oxygen and carbon dioxide in flue gases and furnace efficiency. Shows also the necessity of proper use and arrangement of apparatus for automatic analysis of flue gases and the importance of exercising judgment in interpreting the results secured. 20c.

4793—GAS ENGINES. T. Geelen. (A. S. C. E., Sept., 1907; 14½ pp.) Continued discussion upon the subject of the best system for cleaning producer or furnace gas to be used in gas engines, and the practical results which have been obtained by methods for removing tar and soot.

4794 — LOCOMOTIVES — Sicherheits-Vorrichtungen zum Umfüllen des Brennstoffs für Benzin und Benzol-Lokomotiven unter Tage. Beyling. (Glückauf, Sept. 21, 1907; 3½ pp.) Descriptions of the new mine locomotives of the Dortmund coal mines which burn benzine and benzol. The improvements allow the storage tanks to be filled underground in perfect safety whereas formerly the tanks had to be hoisted to the surface to be recharged. 40c.

4795—MACHINERY IN MINES—The Mechanical Engineering of the Mine. C. C. Christensen. (Eng. Mag., Oct., 1907; 20 pp.) An interesting general summary of the development of methods and equipment now in use in mining, milling and smelting practice. The article is of historical and non-technical interest rather than containing anything new to mining engineers.

4796 — MAGNETIC MEASUREMENTS — Short Period Magnetographs. Y. Kashiwagi. (Memoirs, College of Sci. and Eng., Kyoto Imp. Univ., Vol. I., No. 3, 1907, 10 pp.) An account of some preliminary experiments on the action of magnetic intensity variometers for recording magnetic disturbances of short duration and occurring at short intervals.

4797 — POWER — Hydro-electric Power Versus Coal in Wales. F. C. Perkins. (Min. Wld., Oct. 5, 1907; ½ p.) Points out briefly that nearness of manufacturing interests to rather cheap coal has hindered the development of hydro-electric plants. Gives some notes on the North Wales Power Plant, one of the most recent installations. 20c.

4798—PRODUCER GAS—Failure of Large Producer Plant at Johannesburg. A. H. Allen. (Engineer, Oct. 15, 1907; 1 p.) A history of the attempts made to run a large electric power plant at Johannesburg on producer gas. Many accidents occurred and there were numerous cases of gas poisoning, so that ultimately the project had to be abandoned at considerable loss. 20c.

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4802—STOPE DRILLS—The Search for a Stope Drill. (So. African Mines, Sept. 14, 1907; 2 pp.) A history of the attempts to find a small stoping drill suited to conditions on the Rand. The various types of drills tested are enumerated and the reasons for failure are suggested. It appears that the best solution of the stoping problem is the use of a very small sized modification of the ordinary machine drill. 20c.

4803 — WINDLASS — A Handy Windlass. F. S. Beckett. (Min. and Sci. Press, Oct. 5, 1907; ½ p.) Illustrated description of this windlass which was made by the writer with the use of only rough carpenter's tools and used by him in sinking a 100-ft. shaft. 20c.

4804—COPPER DETERMINATION — The Electrolytic Determination of Minute Quantities of Copper. E. E. Free. (Paper read before Am. Electrochem. Soc., Oct., 1907; advance copy; 2 pp.) Very brief note on the use of a fine platinum wire cathode in determining electrolytically amounts of copper as small as 0.05 milligram in weight. The lightness of the cathode makes it unnecessary to dissolve the precipitated copper and determine it colorimetrically.

4805—ELECTROANALYSIS—Elektroanalytische Forschungsergebnisse. F. Peters. (Glückauf, Sept. 21 and 28, 1907; 9½ pp.) Continuation of this article on the progress of electrolytic separation methods in inorganic analytical chemistry. Procedures are given for the isolation by electrolysis of manganese, molybdenum, nickel and cobalt, quicksilver, silver and some of the rare metals; also bismuth, zinc and tin, and their compounds. 80c.

4806—MOLYBDIC ACID REDUCTION—The Behavior of Molybdic Acid in the Zinc Reductor. D. L. Randall. (Am. Journ. Sci., Oct., 1907; 4 pp.) Investigates the possibility of controlling the oxidizing of molybdic acid which takes place after the solution issues from the Jones reductor during the volumetric determination of molybdenum or phosphorus. 60c.

4807—MUFFLE FURNACE—Producer Gas-fired Muffle Furnaces. O. Nagel. (Electrochem. and Met. Ind., Oct., 1907; ½ p.) Very brief note on the construction of a muffle-furnace designed to be fired by producer gas whereby the waste heat is used for preheating the air to be used in the producer. 40c.

4809—REACTION INVESTIGATION—Reaction between Carbonic Acid and Lead Acetate in an Aqueous Solution. J. Yamasaki. (Memoirs, College of Sci. and Eng., Kyoto Imp. Univ., Vol. I, No. 3, 1907; 7½ pp.) Studies the factors which affect the precipitation of lead carbonate by means of carbon dioxide in an acetate solution. Succeeds in establishing conditions under which the precipitation of the lead is practically complete.

4810—SILICON DETERMINATION—Electrochemical Methods for the Qualitative and Quantitative Determination of Free Silicon in the Presence of Silica, Silicates, Oxides, Free Carbon and Silicon Carbide. W. R. Mott. (Paper read before the Am. Electrochem. Soc., Oct., 1907, advance copy; 5 pp.) Describes an electrochemical method devised by the author for the qualitative estimation of metallic silicon in the presence of silica and silicates in furnace products.