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The foreign market has lately taken a considerable quantity of spelter from our smelters, with much benefit to the prices, which showed signs recently of a sharp decline, but have now recovered. In the month of June there was exported 3,556 short tons of spelter, and for the half-year ending with June the shipments were 15,879 short tons. Last year the exports for the first half of the year were 6,366 tons; the increase this year being 9,513 tons, or 149.4 per cent. There was also a gain in exports of zinc ore, which reached this year a total of 19,179 short tons. Last year only 6,889 tons were sent abroad; so that the gain is 12,290 tons, or 178.4 per cent. At present the exports seem quite likely to gain steadily. The spelter production in Europe is not increasing, so that any large demand must be met by sales from this country.

The total value of the exports of steel and iron from the United States, including all machinery, except agricultural machines and tools, is reported by the Bureau of Statistics for the fiscal year ending June 30th, 1900, at \$121,858,344, which compares with \$93,716,031 in 1899 and \$70,406,885 in 1898. The gain last year was \$28,142,313, or 30.3 per cent., as compared with the preceding year, and \$51,451,559, of 73.8 per cent., over 1898. A considerable part of the increase over 1899, however, was in the higher values of the exports. The quantities of the leading articles of export are given below, in long tons:

Table with 3 columns: Article, 1899, 1900, Changes. Pig iron 299,146, 160,674, D. 138,472. Bar iron and steel 43,494, 40,986, D. 2,508. Wire rods, steel 25,220, 11,599, D. 13,621. Steel rails 268,109, 341,646, I. 75,537. Iron and steel plates 57,052, 42,619, D. 14,433. Structural iron and steel 49,069, 56,265, I. 7,196. Wire 86,069, 105,747, I. 9,678. Nails 39,590, 50,831, I. 11,241.

The decreases can be explained chiefly by the large home demand which absorbed the production and by the high prices which put many products above the export limit for at least part of the year. In steel rails, structural material, nails and wire we have an established trade, and those articles showed large increases last year.

The New York mining law is probably soon to be tested in the courts. The Saranac Lake Mining Company of Saranac Lake, Franklin County, has been granted permission by the State Land Board to commence condemnation proceedings to acquire the right to enter upon the lands of Robert S. Smith, in the town of St. Armand, Essex County, which borders on the Franklin County line, for the purpose of mining gold and silver. This is the first application of the character granted in the State. The company has acquired the rights of Edward Debbins, who, on May 12th last, filed with the Secretary of State a certificate, as provided for by law, of the discovery of a mine on this property. Smith, the owner of the land, refuses to sell it or permit the mine to be worked. The company appealed to the land board for permission for the condemnation of the land. The State law is a peculiar one and was fully discussed in our columns at the time of its passage by Dr. R. W. Raymond, whose articles appeared in our issues of December 15th, 22d, and 29th, 1894. It is somewhat remarkable that, while a number of applications for mining rights were filed years ago, this should be the first to come to an actual trial. The result will be looked for with interest legally, though we have no expectation that any actual results will be obtained by mining for gold and silver in the Adirondacks.

The Whitaker Wright group of British Columbia Companies in London has been again increased by the flotation of the Kootenay Mining Company, Limited. This is the third subsidiary company issued by Mr. Whitaker Wright during the last few weeks. First we had the Le Roi No. 2, then the Rossland Great Western, and now the Kootenay Mining Company. This company has been formed to take over the remaining properties of the British America Corporation in the Rossland District. They are the Columbia, Kootenay, Tip Top, Copper Jack and South Kootenay Junction, of which the first two are the best known. The capital of this company is £400,000, and the purchase price is £350,000, payable as far as possible in cash, and £50,000 to be devoted to working capital. There will no doubt be plenty of dealings in these shares among professional speculators, and the movements will have little to do with the actual value of the properties. It is appalling to think of the capitalization of the various claims near Rossland, belonging to the Whitaker Wright group. We have before us the prospectus of the second company above referred to, the Rossland Great Western. It is after the usual style of these documents, but even the meager statements given are sufficient to show that the valuation placed on the properties is vastly excessive. There are successful mines in the Rossland District and there are large ore deposits, which may be successfully worked hereafter, but the Rossland ores are, as a rule, of low grade, and will have to be worked economically to yield a moderate profit. There is no possible basis for such capitalizations as have been put upon them—\$2,250,000 in one case and \$2,500,000 each in two.

others—making \$7,250,000 for three groups of undeveloped claims whose values are still to be tested. There is no probability that they will ever earn respectable dividends on this enormous amount, and the valuation is for the vendors' and promoters' benefit, the public being expected to take care of itself.

#### THE COST OF SMELTING ZINC ORE.

A correspondent in Great Britain criticises the statement in "The Mineral Industry," Volume II, page 627, to the effect that "It is desirable for smelters to secure the richest ore possible, since the cost of production is thereby reduced correspondingly," the purpose of that statement being to show an advantage which American smelters have over the European in the possession of a much higher grade of ore. Our correspondent points out that the same returning charge being deducted from a rich ore as a poor ore, for example a 50 per cent. ore compared with a 25 per cent. ore, the smelter gets double the allowance per ton of metal in the poor ore as in the rich ore, and consequently his profit ought to be twice as great. This raises a rather complicated question which it is difficult to answer categorically. Our correspondent is in error, however, in assuming that the cost of smelting a ton of poor ore is the same as for a ton of rich ore.

Assuming that the ore is blende, the lower it is in grade, the less is the loss of weight in roasting, and the greater the bulk of the ore because of the higher percentage of gangue of low specific gravity. Consequently the lower the grade of the ore, the less of it can be put in the same volume of retorts, and the greater the cost of smelting, even if the percentage of iron and other injurious impurities have not increased with the decrease in the zinc tenor of the ore. Moreover, the percentage of zinc recovered will go down also with the grade of the ore. The increased cost and loss have to be covered by a higher smelting charge.

Although the smelting charge comes out of the miner, it is a mistake to consider the smelter as independent of the miner, their interests being allied in obtaining the maximum profit on the zinc contained in the ore won from the ground by the miner, though they may be keen competitors as to the division of that profit. It is, therefore, contrary to the interests of both that fuel and labor should be wasted on worthless gangue, and the question should resolve itself into a balance of costs and losses; that is, whether the greater loss of mineral in making a high-grade concentrate is offset by the saving in freight and smelting, or vice versa. The company which operates both mines and smelting works has to settle that question, and although the independent smelter is not confronted directly by it, we fancy that in the long run his business adjusts itself on the same basis.

#### PIG IRON PRODUCTION IN 1900.

We have now the complete figures for the pig iron production of the United States for the six months ending June 30th, as collected by the American Iron and Steel Association. These figures, we may note, exceed by only about 8,000 tons, or 0.1 per cent., those of our estimate, which is based on the weekly capacity of the furnaces in blast. The total production for the half-year was the largest ever recorded in a similar period; it was 7,642,569 long tons, showing an increase of 1,353,402 tons, or 21.5 per cent., as compared with the first half of 1899; and an increase of 311,031 tons, or 4.2 per cent., over the second half of last year. The output for the half-year was greater by 985,281 tons than the production for the entire year 1894.

The production, classified according to descriptions of iron, is shown in the accompanying table. The figures are in long tons.

	—1899.—				—1900.—	
	First Half.	Second Half.	First Half.	Second Half.	Tons.	P.c.
Foundry and forge irons.....	1,913,375	30.4	2,299,749	31.3	2,451,208	32.1
Bessemer pig .....	3,788,907	60.2	4,413,871	60.2	4,461,391	58.4
Basic pig .....	482,389	7.7	502,644	6.9	581,868	7.6
Spiegel and ferro.....	104,496	1.7	115,272	1.6	148,102	1.9
Totals .....	6,289,167	100.0	7,331,536	100.0	7,642,569	100.0

The only point of especial interest in this table, beyond the large gain over previous half-years, is the relative increase in foundry and forge irons. In the first half of 1899 pig iron intended for conversion into steel constituted 69.6 per cent. of the total; in the second half of that year the proportion fell to 68.7 per cent.; while in the first half of 1900 there was a further fall to 67.9 per cent. This tends to show that foundry and forge irons are somewhat more than holding their own, and the products made from them are still meeting the competition of steel. The proportion of basic pig to the total shows an increase this year, though that of Bessemer pig decreased.

By the older classification, according to fuel used, we find that during the half-year 990,667 tons of iron were made with anthracite coal, or mixed anthracite and coke; 6,459,714 tons with bituminous coal and coke—chiefly coke; 167,146 tons with charcoal, and 25,042 tons with

mixed charcoal and coke. Very few furnaces now burn anthracite coal alone, nearly all the so-called anthracite furnaces using some proportion of coke mixed with the coal.

The production of the quantity of pig iron shown required the supply of approximately 14,500,000 tons of iron ore; and mining has been active all over the country. The greater part of the increased supplies was furnished by the Lake Superior region; but work in the Alabama and Tennessee mines was extensively pushed, while the New Jersey and Pennsylvania mines were also worked largely. The Lake Superior mines proved equal to the demands upon them, and it is shown that they can continue to supply a very large part of the iron ore needed for a long time to come.

Notwithstanding the great production, we find that the increase in unsold stocks of iron, though large by comparison, was actually small. These stocks amounted on January 1st to 68,309 tons, and on June 30th they were 342,907 tons. This is really a very small reserve stock, amounting only to about eight days' output of the furnaces. This shows that the consumption kept up very close to the production; while the exports—74,750 tons—were not sufficient to make any material difference.

The number of furnaces in blast on June 30th was 283, and the mean for the half-year was 281, showing an average output of 27,198 tons per furnace. It is safe to say that nearly all the active furnaces were run up to their full capacity, and that nearly all the stacks able to run were in blast. The effect of the large furnaces built in recent years is shown very plainly in the high average production.

If the activity of the early part of the year had continued unchecked the pig iron output of 1900 would probably have approached the enormous quantity of 15,500,000 tons. Since June 30th, however, a number of furnaces have gone out of blast, and production is decreasing. Enough furnaces remain active to ensure a very large total for the year, which will probably equal, if it does not exceed, that of 1899.

#### WITWATERSRAND MINES DURING THE WAR.

The letter from our correspondent in Johannesburg, which is published on another page, gives a fair idea of the condition of affairs on the Witwatersrand under the British military occupation. It disposes also of the idea, which seems to have been held by many persons, that mining operations could be resumed as soon as the Boer forces withdrew. Probably no one who understood the circumstances really entertained this belief; but the desire to resume production at the earliest possible time, and to begin once more to secure some returns on the enormous amount of capital which has been locked up for nearly a year is naturally very strong. It is not surprising that managers and employes alike should wish to get back to the Rand and to work; but from all appearances they will still have to wait through what appears to them a long and tedious time.

Johannesburg and all the mining district of which it is the center are still as closely ruled by martial law as when the country was held by the Boer forces. It is British martial law, but none the less military power and military necessities are supreme, and must continue to be so until a much nearer approach to final pacification of the country is made than is yet apparent. It must be remembered that Johannesburg is the base of supplies for what must be considered as a very large army even in these days. All these supplies must be brought at present from the ports of Cape Colony, a distance of more than 700 miles, over a single-track railroad of limited capacity. To this will soon be added the line from Durban in Natal, on which the destruction done by the war is now being repaired. It is fully occupied now with freight necessary for the army, and is wholly unable to carry in addition the supplies necessary for the mines or for the great number of civilians who are ready to return to the Witwatersrand as soon as the opportunity is given them. The Transvaal has never been in a condition to support a large population from its own agricultural resources, and is now naturally less able to do so than ever. It is not surprising that the military authorities have forbidden operations in the mines at present, except the pumping and other work necessary for the preservation of property from injury and decay. For these purposes the men who remained in Johannesburg during the war are quite sufficient in number. Until the end of the present military operations is in sight it is not likely that any considerable number of persons outside of the managers and engineers will be permitted to return.

This condition of affairs, however, will not continue many months, in all probability. October has been provisionally set as the time when the Witwatersrand will be thrown open. That is not very far away, and though the time may have to be postponed for a month or two, the close of the year may see the district once more the scene of active work. When the time does come, it is certain that the activity will be very great. While it does not appear that much intentional damage

has been done to mines or mills, there has been much inevitable deterioration from disuse and from careless or ignorant handling. This damage will have to be made good as soon as possible. The mine storehouses also are bare of supplies and must be filled. Even now, with the reduced civilian population, our correspondent notes a shortage of many of the necessaries and all the luxuries of life; and when the mine employees return the demand will be enormously increased.

In this trade activity our American manufacturers and supply houses ought to find their opportunity. There is every reason why they should have a large share in it, if they take proper measures to secure it. To do so they ought to make their preparations at once and to see that they are properly represented in good season. We have no doubt that some of them are ready and others ought to understand how important it is that they should be on hand, since there is in prospect, not only the heavy immediate trade, but a large and growing future business. In any work done to secure this, the "Engineering and Mining Journal" will be ready to give all possible aid.

We may be permitted to call attention to the fact that in our columns during the past six months we have given the only direct and reliable correspondence from the Witwatersrand mines which has been published in any country. The endeavor in this correspondence has been to give the facts and show the actual condition of affairs during the war period, avoiding all political bias. The record is an interesting one and will, we believe, prove of historical value hereafter.

NEW PUBLICATIONS.

"The Inidkil System. A Decimal System of Weights and Measures for English-Speaking People." By A. Lincoln Hyde. Cleveland, Ohio: Published by the Author. Pamphlet, 12 pages.

The writer of this pamphlet recognizes the confusion and lack of system in our present measures and weights and seeks to establish a new system having some rational relationship among its various parts. He seems to assume some sort of magic virtue in the inch, and upon it he bases all his work. He makes also the indefensible assertion that all the efforts to introduce the metric system in this country and Great Britain have "ignominiously failed." On this assumption he founds the claim of his proposed weights and measures. These are an attempt at compromise which, will, find very few advocates, we think. Mr. Hyde's "inidkil system," in fact, would involve in its adoption all the expense and inconvenience which are urged as objections to a change, without giving us any of the advantages which the use of the metric system would secure.

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

"Eighth Annual Report of the Bureau of Industrial Statistics of Maryland, for the Year 1899." Jefferson D. Wade, Chief of Bureau. Baltimore: State Printers. Pages, 168.

"The Russian Empire and the Trans-Siberian Railway." Prepared by the Bureau of Statistics of the Treasury Department. Washington: Government Printing Office. Pages, 102; with map.

"Coal Trade of the United States and the World's Coal Supply and Trade." Prepared by the Bureau of Statistics, Treasury Department. Washington: Government Printing Office. Pages, 116; with diagrams.

"The Official Manual of the Cripple Creek District, Colorado." Colorado Springs, Colo.: Compiled and published by Fred. Hills. Pages, 496; with maps and illustrations. Price, \$5.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials will only be published when so requested.

Letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

The Merced Mines.

Sir,—Some four years ago I took occasion through your valuable journal to contradict an article which had been written condemning the Merced Gold Mining Company's properties and mines at Coulterville, in Mariposa County, California. Claiming, as I did, at that time, that with a proper expenditure of money under capable management their mines would prove to be of great value, it is with great pleasure that I can now state my former prophecy is to-day a fact. In the Mary Harrison Mine this company has developed a body of ore which is not only of great dimensions, but also of a high grade, and as they have acquired all the water rights and rights of way they desire, we will soon hear of steady returns.

Mariposa County is once more coming to the front as a mining county and splendid developments are being made in several of the mines on the old Fremont Grant.

Melones Mine, Cal., July 24, 1900.

W. C. Ralston.

Prospecting Flat Placer Deposits.

Sir: With reference to the interesting article by Mr. Robert Nye on "The Testing of Flat Placer Deposits," in your issue of July 14th, it may be of interest to remark that considerable prospecting with the diamond drill has been done for tin alluvial in the Malay Peninsula,

but the results have not been generally satisfactory. The method has been described by Sir Frank Swettenham, Resident General of the Federated Malay States, in his book "About Perak" (Singapore, 1893), as follows: "It might naturally be thought that careful boring would show readily where the tin is, how thick the wash dirt, and how extensive its area. Theoretically this is so; practically the opening of the ground alone gives certainty. The boring tools will not show tin where there is none, but in this water-charged gravelly soil the instrument, in passing through a thin layer of wash dirt, often carries down with it to a considerable distance the stones and heavy particles of ore, so that when the tube is withdrawn it shows traces of tin through a much greater depth than that of the actual tin-bearing stratum. Companies founded on the results given by boring tools have had occasion to regret the hopes built on the performance of this instrument. No doubt careful handling will do much, and the reverse is largely responsible for unreliable results, but the fact remains that boring alone is not a perfect test of the ground."

London, Eng., July 25, 1900.

Frank Owen.

A Cheap Method of Converting Matte.

Sir: This method is not one which involves any radical change in principal, but is simply an adaptation of existing processes, by which the total cost will be considerably lessened. The ordinary Bessemer converter is used with a few alterations. The converters should be mounted on cars made to run along by hand, also to turn on their axis by worm and toothed wheel (by hand). When lying in a horizontal position the tuyeres should be on the upper side, about 4 in. below the blast box; a hole is made through which the mixture of slag and matte from the furnace can be run in. By means of a wedge-shaped brick this hole can be closed when required; as most copper blast furnaces are made to discharge both ends two converters are necessary.

The converter is now run up to the tap-hole in the horizontal position, and these acts as a forehearth or settling car for matte, the matte and slag being run in through the special hole before mentioned. The slag being discharged over the tip of the converter. When matte shows at the tip the tap-hole is closed in the usual way, the brick is to be placed in the hole and fastened down, the converter turned to the upright position and the charge blown, the fumes from which will enter the chamber by a bonnet and ordinary tubing. While this is going on the other converter is being charged at the other tap-hole, thus making the process continuous.

The advantages claimed are:

1. Matte does not require re-smelting.
2. No transportation, the work being done in one place.
3. Practically the ordinary blast furnace gang can do all the work, thus saving the cost of an extra gang specially for the convertor.
4. The first outlay is small, the process thus recommending itself to small smelters.

John H. Rodda.

Concepcion del Oro, Mex., July 26th, 1900.

TYPHOID FEVER IN MINING CAMPS.

In view of the prevalence of typhoid fever at Cape Nome and other Alaskan districts, the following letter of the United States Surgeon-General (hitherto unpublished) possesses a timely interest. Dr. Sternberg's letter is a report made to the Secretary of War, and is as follows:

"I have the honor to return herewith the communications from the Director of the Geological Survey and the Secretary of the Interior, requesting the Surgeon-General of the Army to prepare directions or suggestions for the use of surveying parties in Alaska looking to their protection from typhoid fever while engaged in that district. Since the special conditions of field work in Alaska under the Geological Survey are unknown to me, I can comply with this request only in the most general terms. In doing so, however, I desire to state that the best way of protecting the party, of detecting the presence of the fever and of dealing with it when present is to have among its members a medical man who has had some experience of the disease.

"The infection of typhoid fever is not exhaled from the lungs or skin of an affected individual. It is therefore not transmitted directly from the sick to the well. It is contained in the solid and liquid excreta of the patient. If this knowledge is kept constantly in view and turned to practical account by cleanliness and disinfection, persons who are susceptible to the disease may escape infection even when they are in attendance on the sick. Thus, if the discharges from an infected individual are disinfected immediately on their passage, there will be no subsequent danger from them in the pit or sewer to which they may be consigned. On the other hand, if this is not done the discharges may become dangerous to many, even to those at a distance from the locality. If thrown or deposited on the ground they may be washed by a rainfall into some water supply or they may become dried up and converted into dust and in this form be inhaled into the lungs or deposited on food or drink. If consigned to a pit or earth closet they may become a local focus of infection; flies may convey this infection to articles of food in kitchens and mess rooms in the vicinity. If disposed of by a sewerage system river water below the outfall of the system will become dangerous.

"In a locality where typhoid fever is prevalent the use of all surface waters and of that derived from shallow wells should be prohibited unless the quantity drawn for use is sterilized by boiling, distillation or efficient filtration. Old camping grounds should be avoided lest the dust of the surface, the sinks or the water supply be affected.

"Typhoid fever has a period of incubation of 10 to 20 days during which the sinks, even in a new and unpolluted camp, may become infected in the absence of any recognized case of the disease. Besides this, it is possible for a person to be affected with this fever while the symptoms are so slightly marked as to give rise to no suspicion of its presence. Hence the necessity for the utmost care in preserving the surface of the camp ground from contamination and of keeping the sinks disinfected, preferably with freshly burned lime. These sinks should be dug on the opposite side of camp from the kitchens and mess rooms and on a lower level than the water supply,

"All cases of feverishness, headache, dullness of mind and loss of appetite lasting for more than a day or two should be regarded with suspicion, particularly if associated with a tendency to diarrhoea, tension of the abdomen and tenderness and gurgling on pressure 2 or 3 in. above the groin on the right side. A patient suffering from typhoid fever should, if possible, be transferred to some hospital for care and treatment by trained nurses and competent medical men. This is needful not only in the interest of the patient, but also in that of his comrades, who would otherwise have to nurse him during his illness. The danger of infection incurred by untrained nurses and others in familiar contact with the sick man is very great. The precautions to be taken to minimize the danger can be indicated only in a general way. An intimate familiarity with them is needful for their efficiency.

"1. All discharges, faecal and urinary, should be immediately disinfected. The disinfectants suitable for this purpose are a 5 per cent. solution of carbolic acid in water, or a milk of lime prepared by slaking one part of quicklime and then rubbing up with 8 parts of water.

"2. The bed-pan, after use, should be thoroughly cleaned and disinfected with one of the above solutions before it is again used.

"3. The patient, his clothing, bedding and surroundings should be kept free from excremental taint. This involves much labor if the passages are frequent and involuntary. Soiled clothes or bed-linen must be removed immediately and soaked for an hour in a solution of corrosive sublimate (mercuric chloride), 6 grains to a gallon of water, before being sent to the laundry. If the floor or any part of the room or its furniture becomes stained, the stained parts must be cleaned thoroughly and disinfected; and the person of the patient must be kept clean and free from infected matter. Dry and undisinfected stains on bedding or elsewhere in the room suggest the danger of an atmosphere infected by dust from the dry excreta.

"4. A service of cups, spoons, etc., should be kept for the use of the patient and every article of this service should be washed separately from those of the general mess.

"5. When the hands of the nurse are soiled during his ministrations on the patient they should be permitted to touch nothing which is not thereafter submitted to disinfection. When all is done and the patient and his surroundings are for the time being clean the hands should then be thoroughly scrubbed and disinfected. A solution of chlorinated lime or of corrosive sublimate may be used for the person of the patient and the hands of the nurse. The hands should always be disinfected before eating, and the nurse should never eat in the sick room nor drink water which has been kept in it."

In the Surgeon-General's last annual report further information on this subject is given.

#### THE ANALYSIS OF CHROME AND TUNGSTEN STEELS.\*

By A. G. McKenna.

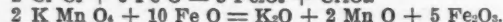
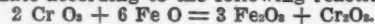
The writer has had occasion during the past few years to make complete analysis on several hundred samples of steel, containing both chromium and tungsten, and has found the following methods very satisfactory, accurate results being obtained without excessive care or unusual precautions.

The steel is usually too hard to be drilled, and is broken up in a steel mortar until no single piece is larger than a grain of rice. For the determination of sulphur, silicon, tungsten, manganese and chrome, 5 grains are weighed into a 500 c.c. evolution flask, so arranged that the gases evolved on the addition of 30 c.c. hot water and 30 c.c. concentrated hydrochloric acid shall be absorbed by an ammoniacal cadmium chloride solution contained in a large test tube. The solution is made as rapidly as possible by the application of heat; as there seems to be evidence that with some irons lower results are obtained by the evolution method when cold acid is used. When the steel has dissolved the solution is boiled for a minute or two until no more hydrogen remains in the flask, being displaced by steam. The sulphur is then determined by titration with iodine in the usual manner, using starch solution as an indicator. By adding a few grains of zinc chloride to the starch solution it can be kept indefinitely without spoiling. The solution in the evolution flask is transferred to a 500 c.c. Erlenmeyer flask, 10 c.c. of strong HNO<sub>3</sub> added and evaporated to dryness on a hot plate, taken up with 15 c.c. strong HCl evaporated again to dryness, taken up in 20 c.c. strong HCl, diluted with hot water to about 100 c.c., boiled and filtered. All the silica and tungstic acid will be on the filter paper; after washing thoroughly with a 5 per cent. HNO<sub>3</sub> solution the residue is ignited in a weighed platinum crucible W<sub>2</sub>O<sub>3</sub> + SiO<sub>2</sub> and weighed. A few drops of HF<sub>1</sub> are now added and the crucible is heated to a bright red for 5 minutes to volatilize silica. The loss is silica which is calculated to silicon; the residue in the crucible is tungstic acid, which is calculated to tungsten. This residue generally contains a trace of iron oxide which can be easily determined by fusing the residue, after weight has been taken, with sodium carbonate and filtering off the oxide of iron after solution in hot water.

The filtrate from the tungstic acid and silica is again transferred to an Erlenmeyer flask and evaporated to low bulk, 50 c.c. of concentrated HNO<sub>3</sub> are now added and the solution boiled until no more fumes come off, showing that all hydrochloric acid has been removed. Enough concentrated HNO<sub>3</sub> is added to make the volume 200 c.c. and the solution again heated. When it has reached the boiling point, 10 grams of potassium chlorate are added and the solution boiled down to 75 c.c. in order to remove all chlorine.

The manganese will now be completely precipitated as MnO<sub>2</sub> and the chromium will be converted to chromic acid.

The solution is filtered on an asbestos plug while hot, and washed a few times with freshly boiled concentrated nitric acid. In the filtrate chromium is determined by titration with ferrous sulphate and permanganate according to the following reactions:



\*Paper read before the Chemical Section of the Engineers' Society of Western Pennsylvania.

If the solution is diluted to about 500 c.c. and cooled to about 20° centigrade before titration, there is not the slightest danger of interference by the nitric acid. The MnO<sub>2</sub> on the asbestos plug is dissolved by hot hydrochloric acid and a pinch of potassium nitrite. It is brought to a boil to drive off chlorine and the traces of iron precipitated by ammonia and ammonium acetate; the basic precipitate is dissolved and reprecipitated to free from traces of manganese. In the filtrate manganese is precipitated by bromine in a strongly ammoniacal solution, filtered, ignited and weighed as Mn<sub>2</sub>O<sub>4</sub>.

For the determination of phosphorus, 5 grams is weighed into a porcelain dish and 60 c.c. of dilute nitric acid added. If the steel contains more than 1 per cent. of chromium it will probably be found necessary to add HCl from time to time to secure solution. Solution must be complete before allowing the evaporation to go too far, or it will be found almost impossible to dissolve the last particles of steel.

The solution is baked as usual in phosphorus determinations, 20 c.c. HCl added and again taken to dryness taken up in 20 c.c. HCl again, diluted and filtered from tungsten and silicon, which may be ignited and weighed as a check on the first determination. To the hydrochloric acid solution 35 c.c. strong ammonia is added, then sufficient strong nitric to redissolve the hydrate of iron; 100 c.c. molybdate solution, made according to Wood's formula as given by Blair, is added to the flask, which is then shaken for a few minutes to ensure complete precipitation of the phosphorus. After standing for an hour the yellow precipitate is filtered on a dried weighed paper, washed with dilute 1 per cent. nitric acid, dried for an hour and weighed as phospho molybdate, containing 1.63 per cent. phosphorus.

For carbon, 1.5 grams are dissolved in 100 c.c. of a 33 per cent. copper and potassium chloride solution. After standing half an hour 5 c.c. HCl is added to hasten solution. When all the precipitated copper has washed a few times with hot water, then dried and burnt in a platinum filter tube using suction to hasten filtration. The carbon on the plug is washed a few times with hot water then dried and burnt in a platinum tube with a stream of oxygen. The CO<sub>2</sub> is absorbed by BaCO<sub>3</sub> in a barium hydrate solution contained in a ten-bulb absorption tube, filtered, washed well with freshly boiled distilled water, ignited and weighed as BaCO<sub>3</sub> containing 6.09 per cent. carbon.

#### INTERNATIONAL CONGRESS OF BORING ENGINEERS.

The Fourteenth International Congress of Boring Engineers and boring technologists, and the seventh general meeting of the Union of boring technologists, will take place at Frankfort-on-Main, Germany, September 5th-8th, next. The meetings held hitherto have proved how the art of boring has been developed. Interesting lectures will be delivered on questions of geology, mining and deep boring, on the water supply by drainage levels in the Taunus Mountains, on the principles of new systems of boring, a new appliance for determining dip and strike in bore cores, electric drilling engines, etc. The members will meet in the Palmengarten, and will dine and lunch in the Zoological garden. Excursions will take place up the Rhine, and to the beautiful surroundings of Frankfort. Gentlemen desirous of taking any part in the above-mentioned meetings are requested to address their applications to Herr Alexandre Askensay, Frankfort-on-Main, Bockenheim Anlage 3.

The papers to be read include the following:

"The Greatest Depths Attained in Boring, and the Results Obtained." By Dr. E. Naumann.

"Mine Drainage in the Taunus." By Alb. von Reinach.

"The Principles of Two Methods of Boring. A New Friction Coupling for Boring Plant." By Waelaw Wolski.

"The Crosiar Apparatus for Determining the Slope of Strata in Boring Cores." By H. Crosiar.

"The Improved Lange Electric Rock Drill." By P. Lange.

"Report of the Committee on Screw-threads and Proposals for Adopting a Standard Gauge." By W. Wolski.

Oberbergrath Tecklenburg, Darmstadt, Germany, will be glad to receive offers to read further papers.

MINERAL IMPORTS AND EXPORTS OF SPAIN.—For the five months ending May 31st imports of fuel into Spain were 723,924 tons coal and 98,259 tons coke. Imports of metals included 1,953 tons pig iron, 2,273 tons wrought iron, 25,300 tons steel and 1,231 tons tin-plates. Exports of minerals are given by the "Revista Minera" as below, in metric tons:

	1899.	1900.	Changes.
Iron ore .....	3,614,992	3,409,050	D. 205,942
Copper ore .....	405,086	460,508	I. 55,422
Lead ore .....	3,763	1,344	D. 2,419
Zinc ore .....	33,382	29,088	D. 4,294
Salt .....	127,620	86,587	D. 41,033

Exports of metals were 13,570 tons pig iron (17,014 tons, 1899); 11,845 tons copper (11,382 tons, 1899); 65,390 tons lead, against 65,727 tons last year.

THE OHIO GEOLOGICAL SURVEY.—The Ohio Geological Survey has been reorganized by the new State geologist, Edward Orton, Jr., and is now as follows: Edward Orton, Jr., State geologist, economic work in Cement and Clay Industries; Charles S. Prosser, assistant geologist, Stratigraphical and Areal Geology; John A. Bownocker, assistant geologist, economic work in Oil and Gas; Nathaniel W. Lord, consulting chemist, Economic Value of Ohio Coals; C. Newton Brown, special assistant, Uses of Portland Cement; Albert V. Bleininger, assistant, Manufacture of Portland Cement; Ralph W. Nauss, assistant in chemical laboratory. This summer Professor Orton and two assistants are fitting up apparatus for testing cements, and he will spend some time in the field in Ohio and in visiting the leading cement works of other States. Professor Bownocker is studying the occurrence of oil and natural gas in eastern Ohio; and Professor Prosser is carrying on some stratigraphical field work in the Devonian and Carboniferous systems.

IRON LINING FOR COLLIERY SHAFTS.\*

By M. E. Cleve.

The sinking of shafts through water-bearing strata, where an impervious lining is required, is a frequent operation at the collieries of the Nord and the Pas-de-Calais, in France, and in some parts of Belgium. It is also required at some of the minette iron ore mines in Lorraine and the Briey Basin. When the shafts are of considerable depth and the quantity of water large, it has been found advantageous to line them with cast iron rather than with timber or masonry. The shafts at the collieries of the Nord are generally circular in section. As long as they were 3 m. or 4 m. in diameter it was possible to make the lining in rings cast in a single piece; but now that shafts are made 5 m. and even more in diameter, it has been found better to make the lining rings in sections. The note describes the method of construction adopted by

and the nature of the ground through which the shaft is sunk. The maximum thickness thus far used is 50 mm., while 25 mm. is the minimum; it is difficult to secure good castings with less. For the lower rings in deep shafts it is sometimes advisable to further strengthen the segments by casting them with additional ribs or gussets to stiffen the flanges. These are put in as shown in Fig. 4.

In a deep shaft it is best to interpose at intervals trusses; these are generally put in at each tenth or eleventh ring. These trusses are of cast iron, 250 mm. in depth, of the form shown in Fig. 3, and they project beyond the outer surface of the rings. Their object is to strengthen the structure, and to prevent the water from the upper levels from filtering in between the rock and the shaft lining. These trusses are made in 8 segments each, like the rings. Wooden rings or trusses are substituted sometimes for the iron ones, or used with them, as it is found that they serve better to stop the water, besides giving a certain elasticity to the structure.

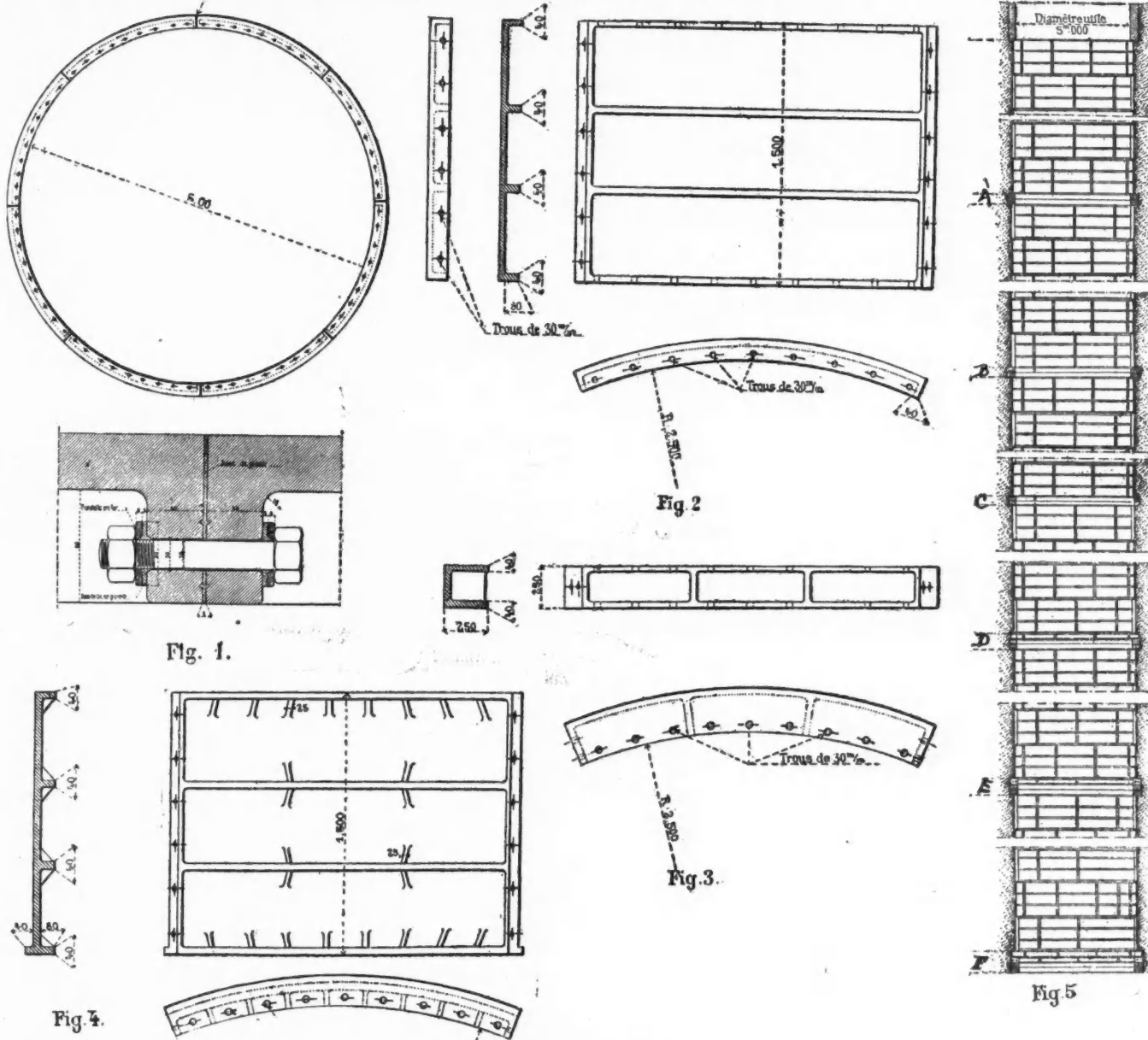


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

IRON LINING FOR COLLIERY SHAFTS.

the Societe Metallurgique de Gorcy, which has been used at a number of collieries.

The lining rings used are of cast iron and of varying thickness, according to their position. These rings, as a rule, are 1.500 m. in height. Each is made in eight segments, joined by bolts, the joints being made tight by lead packing 3 mm. in thickness. The bolts used to connect two sections are 6 in number, of 28 mm. diameter. Fig. 1 shows a completed ring with an enlarged section of the joint and bolt. The flanges at each end and side of the section through which the bolts pass are 80 mm. in depth and 40 mm. in thickness. In addition to these flanges each section has two interior ribs of the same depth and thickness to strengthen and stiffen it. The form and position of these ribs are shown in Fig. 2. The flanges of the section are all finished to gauge and the bolt holes drilled to a template, so that the sections are interchangeable. The flanges have also small depressions made at regular intervals, the object of which is to hold the lead packing in place. The sections are put together in the shop and each complete ring is tested to a pressure which varies according to the specifications made by the different collieries.

The only variable dimension in the rings is the thickness. This is determined by the depth of the shaft, the estimated quantity of water

In Fig. 5 is shown a section of a shaft 100 m. deep. Here there are 11 rings of 1.500 m. each between two trusses. At A, at B, and at C, two trusses of wood are used; at D and at E two trusses of wood and one of iron; at F two of wood and two of iron. A shaft 100 m. deep would require 66 rings of 1.500 m. depth and 4 iron trusses, besides 12 timber trusses or packing rings. In a shaft of this depth the first 11 rings from the surface down would be made 30 mm. thick; the second 35 mm.; the third 40 mm.; the fourth 45 mm.; the fifth 50 mm., and the sixth 55 mm.

In casting the segments great care is taken to make them of uniform thickness, in order that they may contract and expand evenly. In testing the rings and sections at the works, each is weighed, and all which vary over 2.5 per cent. in either direction from the correct or theoretical weight are rejected. In calculating the theoretical weight the standard taken is 7,200 kgs. to the cubic meter of iron.

In constructing these shaft linings at the Gorcy Works, each ring is put together and tested with a hydraulic press before it is shipped to the colliery. The pressure which they are expected to stand varies from 10 kgs. per square centimeter for the rings nearest the surface to 20 kgs. for the lowest ring. Every segment showing weakness or "sweating" of water through the iron is rejected.

These shaft linings have met with much approval both in France and

\*Note presented to the Societe des Ingenieurs Civils de France.

Belgium. They cost less than masonry or even timber, and can be put down in less time. In fact the saving in sinking a shaft is considerable. They are durable and strong, having resisted the greatest pressures from water and water-bearing strata to which they have yet been subjected in any colliery. The guides for the hoisting cage, as usually fitted, are simple, consisting of channel irons bolted to the lining. It is also easy, by means of the flanges, to provide for the support of air and steam pipes or other fittings necessary in the shafts.

#### THE TRANSVAAL MINING INDUSTRY DURING THE WAR.—XI.\*

Special Correspondence of the Engineering and Mining Journal.

(Continued from Page 65.)

We are still under martial law; but it is now British martial law and not that of the South African Republic. Everything is regulated by the military authorities. Not only the mines, banks and similar institutions, but the daily trade, the marketmen, grocers, etc. As to the latter, the farmers and market gardeners within a radius of 15 miles are allowed to come in and trade. The storekeepers have to charge according to a schedule of prices made by the military police. There is a scarcity of some articles, such as canned goods, flour and the like, many of which come from America. At present all transportation is under military authority, and of course the material for the army must take the first place, other freight having to take its chances. So long as this state of affairs continues there can be no general resumption of work.

So far as the mines are concerned at this date (June 20th) there is very little to be reported; there is now positively no gold production, according to the "Restrictions as to Mining" issued by the military governor, as given below. The mines, which have been pumping all the time, keep pumping yet. The managers of other mines, who are already here or have arrived, are starting in also to pump the water from their shafts. To obtain pumps and other appliances the iron and brass foundry of the Robinson Gold Mining Company now keeps a staff of workmen, and is prepared to undertake foundry work.

Some of the managers arrived with the troops under Lord Roberts, among them Mr. George Farrar, who is identified with the East Rand Proprietary Mines, who has now 16 to 20 men, mostly carpenters, at work pumping and fixing up. At the Simmer and Jack there are about 60 men at work. On the whole there have been 120 to 150 men put to work quite recently for pumping and repair work. Flumes and laundries have to be provided for to lead off the water from the shafts, etc. There will be a steadily increasing force of men at work for some months before the mines can work, and of course there will be much more to attend to with the machinery and surface works. No men can yet come into the country on account of the condition of the railroads.

I hear from well-informed parties that it has been decided thus far that nobody shall be permitted to enter the country before October next. Our friends, now scattered all over Europe and the United States, who are now anxious to return, and those who desire to follow in their wake, will find that there is plenty of time yet, and that they will do better to content themselves at home a little longer than to be tied up at the expensive South African ports. Those of us who are yet here are more anxious to see first the bread-stuffs, the tinned meats and other American food products pour into this famishing land, so that there will be larger and cheaper rations for them and us here before we are pleased to welcome them back.

Capt. W. M. James, so well known in America, consulting mining engineer for the A. Goertz group of mines, is now at his post again on the Rand.

I referred in a recent letter to the legal tender given to the notes of the National Bank. One of the earlier proclamations issued not only deprived these notes of their legal tender quality but ordered that they should have no currency at all, and prohibited their receipt or payment for any purpose.

You will see from these facts which I have submitted that Johannesburg is not yet in a condition in which business can be transacted; and in fact it is not even a comfortable place to live in. The fact that no one should come here yet cannot be impressed too strongly on those who are outside.

I give you herewith some extracts from the orders and proclamations in the official "Gazette," which will furnish a fair index to the present state of affairs. In these the substance of each is given, omitting only the formal precludes, etc.

##### Restrictions as to Mining.

1. All work on and in gold mines within the limits of the military jurisdiction shall forthwith be entirely stopped, subject to the following exceptions: 1. Necessary pumping for preserving the mines.
2. Any process, subsequent to and exclusive of milling for treatment of or dealing with products of crushing that may be in hand at the date hereof may be carried on to completion.
2. All persons in possession of any unwrought gold of any description are required forthwith to deposit the same at one of the following banks in Johannesburg: 1. The Standard Bank of South Africa, Limited; 2. the Bank of Africa, Limited; 3. the African Banking Corporation; 4. the Natal Bank, Limited; 5. the Robinson Bank, Limited. And any person found in possession of raw gold after three days from date hereof will be severely punished under martial law.
3. All raw gold recovered by completion of processes referred to in Clause I, sub-section 2, of this proclamation, shall as soon as recovered be deposited by the responsible manager of the company recovering the same with one or other of the above mentioned banks.
4. Except for the purpose of depositing unwrought gold at one of the aforementioned banks (for which a special permit must be obtained),

the transport of specie and raw gold is absolutely forbidden. All gold, specie and raw gold found in transit without a special permit will be forfeited, and any person found in possession of the same will be dealt with under martial law.

5. The transport of coal in quantities of more than one ton, and for other than household use, is hereby forbidden, except under special permit.

6. Special permits for the various purposes referred to above can be obtained at the offices of the Military Commissioner of Police.

##### Mine Police.

The corps of special police for the mines is duly authorized to continue, until further notice, police supervision on the mines of the Witwatersrand gold-fields, under the same regulations as heretofore; and further, the officers of the said corps of special police for the mines hold provisional authority of police officers for the town of Johannesburg and its suburbs as well. The officers in charge are: Commandant, Major Hodgkinson, North Stafford Regiment; members of the committee of management, Captains Edouard Boucher, Louis Sauvier, Edouard Hirsch, Adolph Epler, George Hesse (treasurer), Adolph Wagner and Amandus Brakhan (chairman of financial affairs). Lieutenant W. Vogts is secretary-adjutant to the commandant.

##### State Mine Department.

Mr. W. Wybergh is appointed to take over the direction of all mining departments, which have hitherto been under the control of the State mining engineer and the mining commissioners of the various districts of the Witwatersrand. Representatives of the various mining companies are requested to assist Mr. Wybergh in every way in their power and afford him all information he may require. Mr. Wybergh will be the official medium of communication between the military governor and the representatives of the mining industry.

##### Banks.

The following banks shall alone be permitted to carry on the business of bankers within the town of Johannesburg and the district: The African Banking Corporation, Limited, the Bank of Africa, Limited, La Banque Francaise de l'Afrique du Sud, Natal Bank, Limited, De Nederlandsche Bank en Crediet Vereeniging, Z. A., the Robinson South African Banking Company, Limited, the Standard Bank of South Africa, Limited; and then only subject to the following terms and conditions:

1. Banking hours to be from 10 A. M. to 12 noon, daily, Sundays excepted.
2. Payments must be received in specie only for credit of current accounts or on fixed deposits.
3. Checks must be paid across the counter in specie only.
4. No customer will be allowed to draw any amount beyond the sum of £20 weekly, and no checks for any greater amount are to be honored without the written authority of the military governor.
5. Imperial Army checks and the checks of military officers exceeding the limit in the last preceding condition may be cashed without the authority of the military governor.
6. No other class of banking business of any nature or kind so ever is permitted.
7. No transfers of current accounts, balances or fixed deposits shall in the case of any customers be made from one account to another.
8. No transfers of accounts from any bank shall be permitted, whether to a branch of the same bank or to a different bank.
9. No securities nor articles deposited for safe custody with any bank shall be released or removed or handed over by the bank with which the same may be deposited without authority in writing from the military governor.
10. No advances shall be made to customers or any other person whatsoever.
- 11.—No banks not mentioned in the military governor's notice, entitled "Restrictions as to Mining," will be permitted to receive unwrought gold.
12. In every application to the military governor for a special authority under clause 4 the drawer must state the purpose to which the proceeds of the check or checks for which the authority is desired are to be applied.

The control of the banks is placed with Mr. Emrys Evans, financial adviser to the field marshal commanding.

On June 11th the National Bank was permitted to resume business on the same terms as the other banks were allowed, according to the proclamation above noted.

##### Passes for Natives.

The provisions of the pass law of the South African Republic were, pending further arrangements, continued in force, and all natives required to be provided with passes as heretofore. The regulations now made are as follows:

1. No natives are allowed either in the town and suburbs or on the mines unless provided with passes. Natives employed on the mines are strictly prohibited from entering the town and suburbs unless provided with a special pass by the police.
2. No pass will be issued to natives unless they are in the employment of Europeans.
3. The employer is responsible for obtaining passes for his native employees. Residents in the townships and suburbs must exhibit the district pass when applying for a monthly pass. In the case of mines the certificate of the responsible employer that he holds the district pass is sufficient.
4. Natives who are employed as caretakers or in other similar positions in the towns and suburbs whose employers are absent must, before applying for a pass, obtain a certificate from the officer commanding the police in their district.
5. Mine managers and other large employers of natives upon the mines can obtain books of passes by application to the officer commanding the special mine police of their respective districts. This applies for the present to all mines in whatever district of the Witwatersrand they may be situated until proper pass offices can be opened in the outlying districts.
6. In all other respects the pass law of the South African Republic will remain in force.

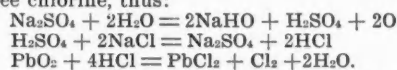
\*Previous papers in this series have appeared in the "Engineering and Mining Journal," March 10th, 1900, page 287; March 17th, page 317; March 24th, page 347; March 31st, page 377; April 7th, page 436; April 28th, page 496; May 5th, page 531; May 26th, page 616; June 2d, page 677; July 21st, 1900, page 65.

## ANODES FOR ELECTROLYTIC ALKALI PROCESSES.

Written for the Engineering and Mining Journal by A. T. Weightman.

In the early days of the electrolytic production of the alkalis and chlorines, inventors seemed to regard the whole solution of the problem as resting with the life of the positive electrode. The reason of this is not far to seek. The demand for carbons of good electrical conductivity and mechanical constitution was very limited, even for arc lamp purposes, and the large sizes, such as were then used in electrolytic cells, were almost unknown, excepting for experimental purposes. As a natural consequence the price asked was so high that the economical production of the alkalis and chlorine was regarded as prohibitive unless an anode could be produced with a long life. In consequence of this a great deal of work was expended in trying to produce an anode which should fall between the somewhat confined limits. These limits are: (1) That the anode should have good electrical conductivity, (2) that it should be unattacked by the products of electrolysis. Under the first head the limits can be drawn at the metals (including carbon) and other alloys, and to a small extent some of the mineral sulphides and oxides, etc. Taking the further restrictions imposed under the second head, we are reduced to platinum and metals of that group, their alloys, and carbon in its various forms. The first of these was regarded as too expensive and the latter as not being sufficiently long-lived, and matters were for some time brought almost to a standstill while attempts were being made to produce an anode which would not deteriorate appreciably with continued use.

FitzGerald (English Patent 1,246 of 1890) introduced a substance which he called "lithanode," consisting of peroxide of lead pressed into plates and hardened by a special process. It was found, however, that lithanode, although quite unattacked by chlorine or oxygen, soon deteriorated when small quantities of hydrochloric acid were present. In the commercial salt generally used, however, there are invariably small quantities of sulphates present which liberate sulphuric acid at the anode during electrolysis. This, in the presence of a soluble chloride, sets free hydrochloric acid, which attacks the lithanode, forming lead chloride and free chlorine, thus:



Lithanode is a fairly good electrical conductor and is used a good deal in the manufacture of storage batteries.

Hoeftner (English Patent 9,079 of 1891) claimed the use of "ferrosilicon with or without carbon, native silicon, boron, tungsten, chrome and their compounds with iron with or without an admixture of carbon." A silicious melt is exposed to an electric current at a temperature rather below that of cast iron. Two electrodes are then placed in this and a direct current sent through, a carbon rod being used as the anode and an iron rod as the cathode. The latter is then covered with a silicious coating which is said to conduct well and to be unattacked by the products of electrolysis. Liveing (English Patents 3,743 and 3,744 of 1893) ignites carbon in a current of chlorine to remove hydrocarbons. Parker & Robinson (English Patent 6,007 of 1892) took out a patent for the use of phosphide of chromium. No case is on record, however, where any of these anodes have been permanently adopted. Many claims were made for manufacturing carbons containing various admixtures of inactive substances, but in most cases the admixture was a purely mechanical one, the patentees evidently having overlooked the fact that the disintegration of carbon electrodes is distinctly due to chemical and not mechanical action. Of course, the mixture not being a chemical mixture, had the individual chemical reactions of its constituents still unaltered.

It was not until the reasons for the deterioration of the carbon began to be studied, or at least realized, that possible remedies could be found.

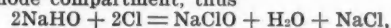
If a carbon plate is placed as an anode in a solution of, say, pure hydrochloric acid so that it becomes impossible for anything else than chlorine to be evolved at the anode, very little deterioration is noticed. On the other hand, if the same plate is placed as an anode in a solution of pure sulphuric acid so that nothing but oxygen can be evolved, the carbon wears away to a considerable extent, the larger part of it falling to the bottom of the vessel as a black mud, but some being evolved with the oxygen as carbon dioxide and some still further combining with the various elements present to form some highly complex organic substances which were studied as early as 1883 by Bartoli & Pappasogli ("Journal of the Chemical Society," 1883, page 592). They state that a compound which they term mellogen  $\text{C}_{17}\text{H}_6\text{O}_4$  is formed, together with traces of benzo-carboxylic acid, mellic acid  $\text{C}_{12}\text{H}_6\text{O}_2$ , pyro-mellic acid  $\text{C}_{10}\text{H}_4\text{O}_4$ .

Coehn, in the "Zeitschrift für Electrochemie," published the result of his researches on the reactions of carbon when used as an anode in an oxygen evolving solution. These were carried out with the object of constructing a primary battery for the production of electrical energy direct from coke, and he was therefore more particularly concerned with the oxidizing reactions as distinct from the oxidizing plus the disintegrating effect with which we are at present concerned.

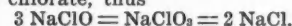
It was at the time when the disintegration of the carbon was looked upon as a necessary evil that several patents were taken out to overcome the difficulty in a different way, namely, by considering how to construct the carbons in as cheap a way as possible so as to reduce the cost of anode renewals to a minimum. Holland and Richardson were conspicuous in this movement, and their method was finally adopted by the Electro Chemical Company of St. Helens, Lancashire. Crude retort carbon blocks were taken, one side was roughly leveled and a groove cut in them on that side. These were placed back to back and a core of lead cast in the middle, each piece of carbon gripped and electrically connected with each other piece by means of the lead which had been cast into the groove. They were then trimmed of all superfluous lead and any exposed surfaces of metal were protected from chemical action by means of insulating varnish. When the carbon

blocks were worn out the anode was melted down and the lead used over again. A somewhat similar method was adopted by Connor and used by the Parent Electrolytic Company at Farnworth, Lancashire, in the Hargreaves-Bird process.

It was not, however, until the reasons for this disintegration were fully realized that the remedy was looked for in another direction, namely, at the cathode. As previously stated, the chief cause of disintegration is not due to the chlorine evolved, but to the oxygen, and to reduce the wear of the carbon the essential point is to keep down the evolution of oxygen at the anode. This may be produced from several causes, namely, the presence of caustic soda, sodium hypochlorite, sodium chlorate and perchlorate, all the oxy-chlor acids and sulphuric acid and sulphates which are occasionally present as impurities. These are formed by the secondary or rather tertiary reactions which take place in the cell. For instance, hypochlorite of sodium is formed when caustic soda, by reasons of imperfections of the cell, gets into the anode compartment, thus



which, under certain conditions of temperature, etc., may be transformed into sodium chlorate, thus



It will therefore be seen that the production of these compounds not only represents a direct loss of chlorine and caustic soda and a consequent lowering of efficiency, but also produces serious effects as to the life of the anode. The loss is therefore twofold, and avoiding the production of these undesirable products has therefore a twofold advantage. For the means and methods adopted for arriving at this result largely constitute the success or otherwise of any special type of cell.

Causes which Vary the Disintegration of Carbon.

The chief cause of disintegration is, as above pointed out, the presence of oxygen yielding compounds. Some very curious effects are produced with varying quantities of oxygen and chlorine. When pure oxygen is being evolved the anode wears away steadily at its surface, the carbon falling to the bottom of the vessel as a fine powder and the wear of the carbon being fairly evenly distributed over its whole surface. When about 10 to 50 per cent. of chlorine is evolved and 90 to 50 per cent. of oxygen, the carbon shows a curious tendency to disintegrate, particularly at the surface of the solution. This is more particularly marked when about 10 per cent. of chlorine is being evolved, gradually diminishing in effect until about 50 per cent. of chlorine is reached, after which point the carbon will wear away steadily in proportion to the amount of oxygen present. All these effects, of course, vary greatly with the different qualities of carbons used.

The important part which current density plays in the life of carbon anodes is not generally recognized, the wear being considerably greater at high current densities than at low. From this it will be seen how important it is to have the current density as low as possible, or in other words, to have as large a surface as convenient. The current should also be evenly distributed over the surface or the evil effect of high current density will be in evidence at some places and not at others, and will consequently wear away quicker in those places. In this way an irregular shaped anode with numerous projecting points will always tend to wear away until the surfaces are more or less flat, since the higher points are nearer the cathode, and consequently work at a higher current density than the recesses. The wear of the anodes also increases with increase of temperature, and this is one of the objections which has been raised in the use of steam coils, etc., for heating the electrolyte.

Graphite anodes and carbon with graphitized surfaces have been used with some success, although Bartoli & Pappasogli state that when oxygen is being evolved, graphitic acid  $\text{C}_6\text{H}_6\text{O}_2$  is formed. The Castner-Kellner process both at Widnes and Niagara has used a form of graphitized carbon the surface of which is produced by imbedding ordinary carbon in carbon dust and sending a current of 300 to 50 amperes per square inch through the carbons until they are brought up to a white heat, and then allowed to cool slowly. They lose about 5 per cent. in weight and are much harder, slightly increased in bulk and of less electrical resistance.

The manufacture under the Castner patent seems to have been now abandoned, chiefly owing to the expense of the electric roasting. The Mattheson Alkali Works, Niagara Falls, the Castner-Kellner Alkali Company of England and the Deutsche Solvay Works of Germany, all of whom operate under the Castner patents and who formerly made use of electrodes as prepared under the Castner patent, now have their goods manufactured by the Acheson Graphite Company of Niagara Falls under Mr. Acheson's patents. Mr. E. G. Acheson has shown that amorphous carbon is not converted into graphitic carbon by heat alone, but that it is essential for the amorphous carbon to pass through a chemical cycle which is best produced under the influence of a high temperature. In practice as now conducted by the Acheson Graphite Company at Niagara Falls, the amorphous carbon as obtained in coke is mixed with tar and some suitable metal or metallic oxide and the mass formed into the desired shape and after a preliminary baking is subjected to the highest temperature attainable in the electric furnace and the heat prolonged for sufficient time to permit of chemical reaction between the contained metallic elements and the carbon, carbides being formed, which are immediately destroyed with the volatilization of the metal and the liberation of carbon in a fine graphitic form. Gerard & Street (German patent 78,926) graphitize the surface of carbons by heating with an electric arc. Lyte (English Patent 7,594 of 1893) used carbons with metal cores.

Testing Carbon Electrodes.

Since the laws which govern the deterioration of carbon anodes are so little understood, it becomes extremely difficult to foretell their suitability or otherwise from their chemical analysis or physical properties, and it is therefore advisable to put them to a direct test under conditions as close as possible to those under which they will be placed in practice. To do this take small rods of the various different makes of carbons it is proposed to use, about 6 by 1 by 1 in., and suspend each of them in a beaker or other suitable vessel containing

about a 10 per cent. solution of sulphuric acid. Use as a negative electrode a hollow cylinder of lead which shall be so placed in the vessel that whole surfaces of the carbon shall be about equidistant from the negative electrode. Connect these up in series making the carbons positive, and send a current through the whole series of such a strength that the current density shall be approximately the same as will be used in practice. Pass the current through for 10 or 12 hours, the carbons having been carefully weighed before the experiment; then remove the carbons, wash and very thoroughly dry, and then weigh again. The carbons which have lost least in weight will invariably be found to be those which will give best results in practice.

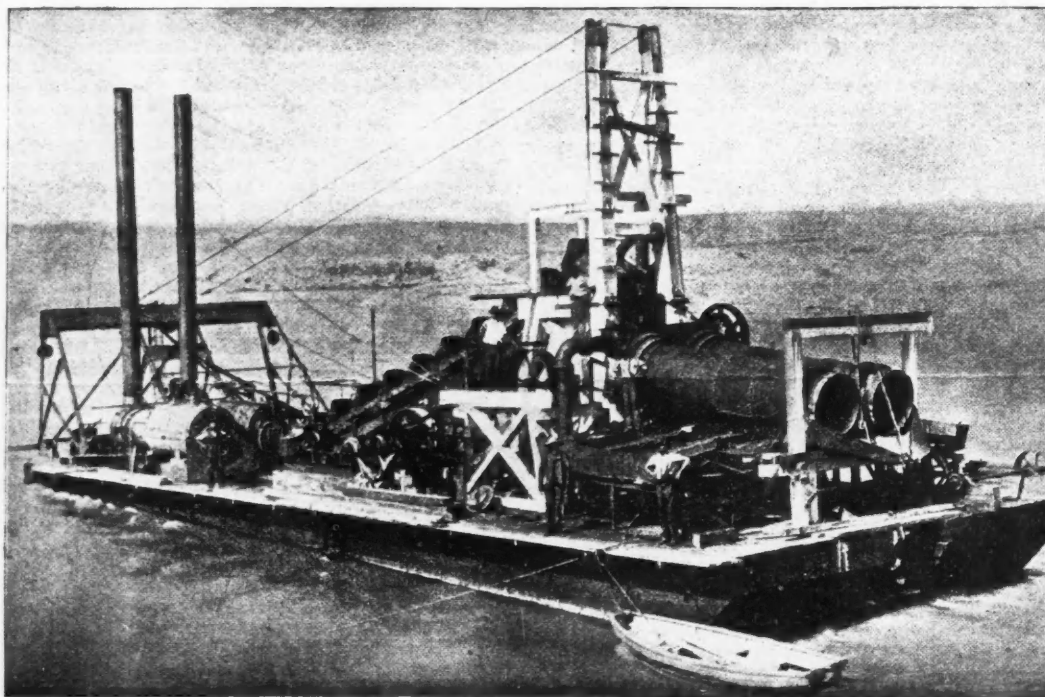
#### The Use of Platinum and Its Alloys.

The great objection to the use of platinum is its high initial cost, but it has the great advantage of being almost entirely unattacked by either chlorine or oxygen and entirely so when alloyed with about 10 per cent. of iridium. Numerous patents which have been taken out have largely been with a view to economizing the metal and so reducing its high initial cost. Attempts were first made to deposit platinum on the surfaces of copper and other baser metals, but it is well known that metals are deposited in their crystalline form; the coating was therefore more or less porous and did not effectually protect the underlying metal. Another attempt was instead of depositing platinum on copper to deposit copper on platinum, which enabled the platinum to be rolled out to a very thin foil, the necessary mechanical strength and electrical conductivity being obtained from the copper backing. The exposed copper surfaces were effectually protected by means of insulating varnish or two sheets were placed back to back and some inactive material run in between. Hereaus (English Patent 1,144 of

#### GOLD DREDGING IN NEW ZEALAND.

Written for the Engineering and Mining Journal by P. G. Morgan.

In order that the reader may understand the conditions which have led to the development of the gold dredging industry in New Zealand, I shall first of all refer to the genesis of the alluvial deposits so worked. The greater part of Central Otago, the birthplace and home of the gold dredge, is at present covered by metamorphic rocks, consisting principally of mica-schist traversed by numerous laminae or thin layers of quartz. These schists are probably of Silurian age. Northeast and southwest they are flanked by younger rocks of Carboniferous and Devonian ages. It is more than likely that these and still younger rocks at one time covered the schistose area, but the whole series of younger rocks has since been removed by denudation. At any rate, the whole surface of Otago has been carved and plowed down again and again by the action of water and ice. Consequently, there have been formed extensive alluvial deposits of Tertiary age, composed of layers of clay, sand and coarse gravel, with here and there an occasional seam of lignite, which finds a use in supplying the modern dredge with fuel. These deposits are all more or less auriferous, and some, by reason of repeated concentration of the gold, are very rich. Owing to the long-continued denudation which has taken place since the formation of the early alluvial beds, some of them, now the mere remnants of former extensive deposits, are found on the tops of hills and even mountains. These deposits cannot, of course, be dredged, and need not here be further referred to. Other gold bearing deposits are found in the form of river and lake terraces, hundreds of feet above the present



EARNSCLOUGH DREDGE, MOLYNGUX RIVER, NEW ZEALAND.

1896) uses platinum tubes filled up with lead and joined together with thin platinum sheets. Kellner (English Patent 22,207 of 1895) uses platinum tubes with lateral rib-like projections and a core of some baser metal. Le Sueur has recently introduced a platinum-iridium electrode with some success, which has been working for some time at the works of the Electro Chemical Company, Rumford Falls, Me., and at Berlin Falls, N. H. Very fine platinum iridium wire containing 10 per cent. iridium is cut into 8-in. lengths, which are rolled down flat with the exception of a short piece at each end. These are then cut in half and the unrolled ends bunched together and fused into a glass tube so that the ends just project through the inside of the tube. The flattened pieces are then spread out radially and for the purpose of preserving them from injury during handling, are fastened on to a paper disc by means of sealing wax. When these have been fitted in position in the cell, connection is made with the main conductor by placing a drop of mercury in the bottom of the tubes so as to make contact with the platinum strips and an iron rod on the top of this reaching to the top of the tube, where contact is made by means of mercury cups and copper cross pieces. A large number of these electrodes are placed in each cell, each electrode costing about 75c. The advantages claimed are (1) the even distribution of the current, using a minimum quantity of platinum, (2) the facility which is offered for the evolution of the chlorine gas and so avoiding the excessive polarization and insulating effect introduced by the film of gas on the surface of the metal.

Platinum electrodes are almost exclusively used in the manufacture of chlorate of potash, since the large quantities of hypochlorite present renders the use of carbon quite prohibitive, owing to the fact that these products evolve oxygen under electrolysis.

**ENAMEL FOR METALS.**—An enamel for metals, easily fusible and thus requiring but little heat, is made from 12 parts of red lead, 4 parts of borax, and 4 parts of silica.

Terraces of this kind may also be passed by as unsuited for dredging. A third variety of deposit occupies old river and lake beds, often to a great depth, or occurs along one or both banks of a modern stream or river. Ground of this class occupies extensive low-lying areas more or less suitable for working by a dredge in many parts of Otago, particularly in the basins of the Molyneux and Mataura rivers. Next we have the modern river beds themselves, which may be considered to form a kind of deep lead, only that the lead is here covered by water instead of basalt or other solid igneous rock. In Otago the chief dredging river is the Molyneux, with its two branches, the Kawarau and the Clutha, and its tributaries, the Shotover, Manuherika, Tuapeka, etc. To avoid confusion, it may be as well to explain that the Kawarau, flowing from the west, and the Clutha, flowing from the north, join at Cromwell to form the main stream, called indifferently the Clutha or the Molyneux, which then flows in a general southerly direction to its mouth. On the west coast the principal dredging rivers are the Buller and the Grey.

Taking the Molyneux as the type of a dredging river, we find that in some parts of its course it runs through rocky gorges where the wash-dirt lies on a hard rock bottom, while in other parts it runs through river flats and old filled-in lakes where the wash-dirt lies on a "false bottom" of clay, or occasionally of cemented pebbles.

Still another class of dredging deposit is found on or near various parts of the coast of the South Island, particularly in the neighborhood of Greymouth, in the form of ancient or modern auriferous sea beaches. The gold, which is associated with much black sand (iron-sand) is, however, very fine, and therefore not easily saved, at any rate by the present appliances used on dredges.

The gold won by the Otago dredges has an average value at the banks of about £3 17s. (\$18.48) per ounce, which corresponds to a fineness of 950 to 960. Somewhere about 4s. or \$1 per ounce is deducted by the banks from the mint value for gold duty and other expenses. As compared with the fine gold occurring in the black sand deposits of the



West Coast and in the quartz of the Ohinemuri District, the bulk of the gold obtained by the Otago dredges may be considered as coarse, easily saved gold. It is safe to say that by far the greater part of the really fine gold in the wash-dirt is not saved by the appliances at present employed.

**Early History of Dredging.**—During the early sixties the Molyneux River and its tributaries were explored to their sources by prospectors. The beaches and banks of the Molyneux were found to be highly auriferous in many places, and were worked by cradling, and later on by hydraulicking, with excellent results. The river bed, however, though evidently rich, could not be worked on account of the depth of the water and the phenomenal rapidity of the current. When the river was low, as is always the case during winter, rich wash-dirt was obtained on the exposed beaches, and lifted out with long-handled shovels or scoops from the shallow places near the shore. Here and there a little wing damming was practiced with success.

**The Spoon Dredge.**—The problem of how to obtain the gold from the bed of the river leads to the history of the early attempts at dredging. The first dredging appliance was the spoon, a primitive kind of apparatus consisting essentially of an ox-hide bag fixed on an iron ring with a cutting edge to which was firmly bolted a long pole. The contrivance was dropped into the river from a boat, firmly pressed into the wash-dirt by means of the pole, and pulled toward the shore by a rope fastened to the iron ring and passing round a hand-winch on the beach. The gravel thus obtained was passed through a cradle.

Before long the mode of working was improved by placing the whole of the appliances on a large punt, so that the dredged material was lifted on board and there cradled. Thus about 1865 was the first type of dredge—the spoon dredge—evolved.

A number of these dredges were built on the Molyneux River, especially about Alexandra, the present center of the dredging industry, and for a time paid very well. They were worked entirely by manual labor, 5 or 6 men forming the shift. The spoon dredge had not a very long vogue, for in a few years the river became so silted up with unprofitable tailings from the hydraulicking of its banks that it ceased

some excellent returns from a claim on the Shotover, a tributary of the Kawarau River. A number of public companies were quickly floated to work claims on the Shotover and Kawarau. Some 20 steam dredges were built at an average cost of about £3,500 (\$17,500), but on the whole they did not give satisfactory results; and once more gold dredging seemed about to collapse.

The failure of the Shotover dredges was due to several causes. Some of the claims were too poor, and in others the ground was unsuitable for dredging. It is now evident also that dredgemen had at that time not enough knowledge and experience to work a dredge successfully under adverse conditions. Subsequently many of the Shotover dredges were sold to small private companies and floated down to various points on the Molyneux River, particularly about Alexandra and Clyde. Under their new owners, all, or nearly all, were very successful, and thus was laid, in great measure, the foundation of the present dredging boom.

**The Suction Dredge.**—About 1890 the bucket dredge seemed to have a formidable rival in the suction dredge, which was introduced into New Zealand by Mr. H. Welman and others. A number of these dredges were built in various parts of the South Island, particularly on auriferous sea beaches, which, consisting as they did of fine sand, appeared to be especially adapted for working by dredges of this type. The idea of the suction dredge was to lift the auriferous sand and gravel by means of a powerful centrifugal pump, provided with a movable suction pipe. It was thought that it would be particularly effective in cleaning up the hollows and crevices of an uneven rock bottom. Though used with good results in harbor dredging, the suction dredges proved an almost complete failure under the different conditions of gold dredging. They could not deal with heavy stones, nor with hard or cemented wash. All kinds of cutters were tried for loosening hard wash, but nothing could be made that would do the work properly, and stand the wear and tear. They were continually coming to a stop through stones jamming in the pipes, or through the pumps getting out of order. Another disadvantage was the excessive power required to work them. On the sea beaches one or two



RELATIVE SIZE OF DREDGE BUCKETS.

to pay. In any case, the spoon dredge was able to work only the richer and shallower parts of the river bed, so that its disappearance is not a matter of regret.

A steam spoon dredge was built about 1870, but though successful for a time, it was finally abandoned for the same reason that applied to the hand spoon dredges.

Grab dredges of the type often seen in harbors do not seem to have been tried as gold dredgers in New Zealand.

**The Current Wheel Dredge.**—For some years after the abandonment of the spoon dredge it would seem that little or no dredging was done on the Molyneux River. About 1880, bucket and ladder dredges began to be introduced. The early bucket dredges were nearly all worked by paddle wheels driven by the swift current. The wash-dirt was treated on tables covered with baize or coarse plush, a grizzly being used to separate the large stones from the finer stuff. Water for washing the dirt was lifted from the river by means of buckets fitted on the paddle-wheels. A number of these current wheelers were built, and on the whole they paid very well. They could, however, work only where the current was strong, and were not powerful enough to dredge deep ground, so that at present they have been either discarded or converted into steam dredges. The Molyneux River, it may here be mentioned, is throughout its course a very rapid river, the current in many parts running at the rate of 7 or 8 miles an hour.

**Early Steam Bucket Dredges.**—About 1882 the first steam bucket and ladder dredges were introduced. The first was an old current wheel dredge which had been fitted up with steam machinery. The next was a very elaborate dredge for those days, built by Kincaid & McQueen, a Dunedin foundry firm, for a public company. This dredge had an iron hull, with two chains of buckets, one on each side, which discharged the dirt into two revolving perforated cylinders, the fine dirt and gold being washed through the holes by a stream of water into sluice-boxes lined with matting.

This dredge was at first not very successful, one serious defect being the alternate action of the two bucket ladders, which caused her to roll. Another defect was the sharp bow, which made the dredge almost unmanageable in a rapid current. These faults were remedied by fitting a wooden pontoon on each side of the dredge. The dredge has since had a remarkably successful career, on the whole, having obtained in 16 years some \$300,000 worth of gold. About 1891 she was altered to a single ladder dredge. The reader will find a brief description of this dredge in Prof. Le Neve Foster's book on "Ore and Stone Mining," page 175.

For some years steam dredging languished, but about 1889 it took a fresh start owing to the success of Sew Hoy's dredge, which obtained

promised well for a time, but in one case the dredge got blocked time after time by storms filling the paddocks in which the dredge worked with blown sand, while in others the appliances used failed to save the gold, which was invariably fine and associated with much iron-sand. In a very few years after their introduction they became a thing of the past. One suction dredge has, however, been recently built, but no reports are yet at hand regarding results. It is possible, therefore, that the suction principle will receive another trial in localities where the wash is suitable. It may be introduced, too, on bucket dredges which are working on rock bottoms, in order to help in cleaning up the hollows and crevices.

**The Bucket Dredge.**—After the failure of the suction dredge, the bucket dredge had matters all its own way, though for a few years little progress seemed to be made. The introduction, however, of one improvement after another in the design and construction of the dredges and the accumulation of experience by practical dredgemen, has led to great strides in recent years. The most notable point is the introduction into dredge design of the elevator, which consists of an endless chain of buckets revolving round tumblers, and stacking the rough part of the tailings behind the dredge to a height of 20 to 50 ft. The elevator frame projects over the stern of the dredge at an angle of about 35° to the horizontal. By means of the elevator, dredges are now able to attack banks 30 ft. or more above water level. Thus many alluvial flats which yield the water necessary to float a dredge only at some depth below the surface can now be successfully worked, and this contrivance has enlarged by many times the field open to the dredge. The introduction of the elevator to dredging design is due to Walter Cutten, a well-known Dunedin mining engineer, who in 1894 designed and erected one for the Enterprise dredge, near Alexandra. The device proved immediately successful in enabling dredges to work high banks without becoming blocked. The first elevators were short, but some of 90 ft. in length are now at work and a dredge under construction is to have one 140 ft. in length, stacking the tailings to a height of 80 ft. behind the dredge. Elevators 200 ft. long are talked of, and may be built in the near future.

**The Modern Dredge.**—The following is a general description of the present type of New Zealand dredge and the method of working. It may be stated that as regards the dredging parts of the machinery the gold dredge is similar to the ordinary harbor bucket dredge and consists of the simple addition of some one of the various gold-saving appliances. The hull of this dredge machine consists in New Zealand of two strong pontoons, usually of wood, sometimes of steel. For the planking and deck gear kauri is commonly employed, for the frames Australian hardwood. The length varies from 60 to 110 ft.; width,

including well, from 20 to 30 ft.; depth, 6 to 7.5 ft. The usual draft of water is 4 to 5 ft. The pontoons are strongly braced together at bow and stern and have an open well hole between for the buckets to work in, extending from the bow about two-thirds of the distance toward the stern. The width of the well is about 5 ft. In order to guard against the danger of a hole being made by a stone too large to pass the well, iron plates may be fixed on the exposed parts near the bow. It has not been thought worth while to adopt watertight partitions. The bucket ladder or frame is a massive steel structure supporting the upper part of the endless belt or chain which carries the buckets. At its upper end it swings on a shaft, so that its lower end can be raised or lowered as required. The shaft carrying the upper part of the ladder is supported by a strong wooden frame, sometimes called the poppet-heads. The same frame carries, a little higher up, a strong four-sided tumbler revolved on a massive shaft by gearing. The poppet-heads, moreover, help to support the elevator by means of strong wire ropes passing from the top of the frame to the end of the elevator. At the lower end of the ladder is a five-sided tumbler, which is raised or lowered, together with the ladder, by means of a block and tackle supported by a strong wooden or iron frame, the gantry, over the bow of the boat. The distance between the tumbler centers varies from 40 to 75 ft., according to the size of the dredge. Each link of the bucket belt or chain consists of four strong bars, which may weigh as much as 80 lbs. each. It is supported on the ladder by rollers, which are generally made too slight and too small. The lower or underneath part of the bucket chain is allowed a certain amount of sag, so as to bring perhaps three buckets on the bottom at once. The buckets are usually about 40 in number. Their capacity varies from 2.5 to 6.5 cu. ft., the present tendency being to adopt the larger size. It is not certain, however, that buckets beyond 4 or 5 cu. ft. are any great advantage, as the larger the buckets the heavier they and the other parts of the dredging machinery have to be, and consequently, besides the increased first cost, the greater the time and expense involved in making repairs. The bucket lips are made of hard steel, preferably manganese steel, and are leveled to a cutting edge. Besides the buckets, there are usually on the belt two or three pairs of strong grab hooks for the purpose of bringing up stones too large for the buckets to lift. They aid also in loosening hard or cemented wash. Each pair consists of two massive curved iron arms or horns, projecting about as far from the belt as the buckets themselves. When a large stone is seen coming up the bucket belt is stopped when the stone is a foot or two above the deck. It is then levered on to the deck and disposed of by rolling it over the side of the dredge. When dredging deep ground there is danger of the stone rolling back into the hole being excavated by the buckets. In this case the stones are broken up before being heaved overboard. Occasionally some of the buckets are provided with prongs or cutters projecting beyond the lips for the purpose of loosening hard wash, and thus lessening the work to be done by the buckets. The use of these cutters is not very advisable, however, as the stirring up of the wash has a tendency to cause the gold to settle below the level of the bucket lip. The lower tumbler should be made massive and strong, so that it need not be repaired or renewed for a long time. In modern dredges a number of precautions are taken in case of accident to the lower part of the bucket ladder. If the supporting rope passing through the pulleys breaks, two auxiliary ropes loosely tacked up the sides of the ladder can be used for raising the lower end. If the hangers of the upper pulley break, there are strong chains provided to take the weight and prevent the ladder falling any distance.

The height of the upper four-sided tumbler above the deck varies from 15 to 20 ft., a height which gives a sufficient fall for the revolving screen and the tables. A recent improvement is to have the four corners made removable, so that when worn by the bucket chain passing over them they may be replaced by duplicates.

The depth of ground dredged may be as much as 55 ft. below water level. Banks 30 ft. or more in height have also been worked by dredges provided with an elevator, so that it is possible for a dredge to be working over 80 ft. of wash-dirt, though in practice 40 or 50 ft. has never been exceeded. In the future dredges to work to a depth of 60 ft. or more may be built, and it is certain that longer elevators will be made and banks worked much higher than 30 ft. It may here be noted that the buckets work best when the ladder is at an angle of 45°.

(To be Continued.)

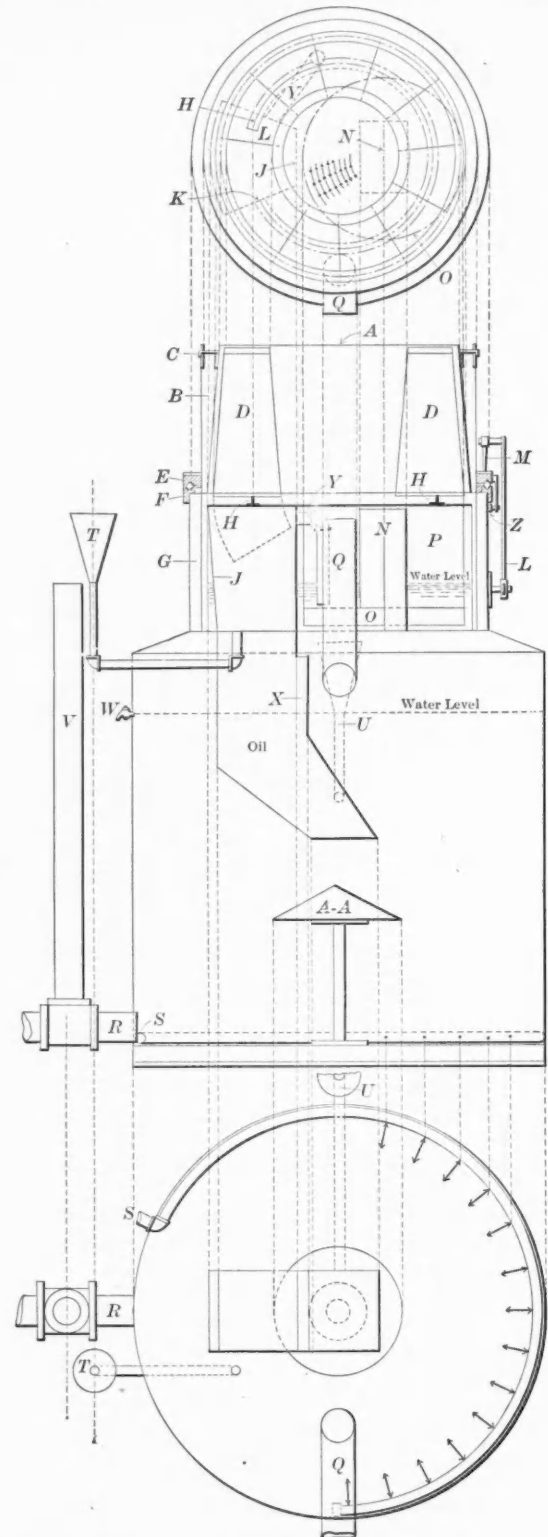
#### THE FRANCFORT ACETYLENE GENERATOR.

This generator does away with the inconveniences of the ordinary water carbide machines, it is claimed, and has great simplicity and efficiency. By referring to the drawing the principle of this generator will be readily understood. The lid or cover marked A is removed and the compartments marked D are filled with carbide. This carbide need not be treated in any way beforehand and the ordinary commercial size is used. Another advantage is that it need not be weighed as each compartment will hold only a certain quantity. After filling the lid A is replaced and is made air-tight by a seal completely surrounding it.

At the bottom of each carbide compartment marked D there is hinged a door which is kept closed by a circular T iron guide marked H which is cut off at the points I and K by the chute J, thus allowing the door to drop down from the chute and so discharge the carbide into the water compartment. The top part of the generator, which contains the carbide compartment, revolves concentrically in a liquid seal over the lower part of the generator by means of the angular ball-bearing ratchet arrangement E and F, which is operated by the descent of the gas-holder, through the bell-crank and pawl L and M.

Carbide falls through the chute J, which has an off-set so as to carry its extremity immediately over the conical spreader AA, which is situated in the center of the lower part of the generator. Before this carbide comes in contact with the water held in the lower part of the generator it goes through a stratum of oil which, besides cutting off

the indirect contact of the water in the lower part of the generator with the carbide in the upper part, prevents the carbide from generating gas until it has actually been scattered by the spreader AA and reached the bottom of the generator. The generation of gas which starts gradually after the carbide has actually reached the bottom of the water tank is offset by the spreader AA, thus preventing any gas from going out through the chute, as, of course, gas will rise in a perpendicular line from the extremity of the spreader; and in case any small bubbles of gas should enter the chute, they will readily find an



THE FRANCFORT ACETYLENE SYSTEM.

outlet from the point X or through the relief pipe Y, which will discharge any gas that may collect in the chute J into the washing chamber P. The gas generated finds its outlet from the lower part of the generator through the rectangular box N, which is provided with a large perforated disk O. This disk subdivides the gas generated into small bubbles which are thoroughly washed by passing through a liquid stratum of convenient height. This gas then collects in chamber P, from which it finds its outlet to the gas-holder by means of the pipe O. This liquid also acts as a check valve which will allow the gas to pass from the generator to the gas-holder, but will not allow it to work back from the holder when the generator is being washed out and re-charged, thus doing away with the need of any positive

valve between the generator and gas holder. The funnel T enables the operator to keep the water level in the washing chamber constant. The stand-pipe V acts as an automatic overflow in case the water level in the lower part of the generator should be too high. The pipe R easily drains the hydrate of lime out of the water tank. The pipe S washes the bottom of the generator and also fills it with water by means of a valve. The faucet W enables the operator to determine the right height of the water level in generator tank.

In this generator the two liquid seals D and G cannot be submitted to a pressure higher than 4 in., while they are 12 in. long, thus leaving a safety margin of 8 in.

This type of generator is made and is being introduced by the Power Specialty Company, of New York.

THE WHITE CLAYS OF SOUTHEASTERN PENNSYLVANIA.

Written for the Engineering and Mining Journal by T. C. Hopkins.

In the South Mountains and along the Great Valley areas of Southeastern Pennsylvania are vast quantities of white and parti-colored clays which are destined to be of much greater commercial importance than they have been in the past. The clays are closely related in color, composition and general appearance to the commercial residual kaolins, and might pass in the market as kaolin, as that term is commonly used, and in fact some of the product is marketed as such. They carry a higher percentage of finely divided free silica than the ordinary kaolin. The crude kaolin from the pegmatite dikes contains considerable free silica, but most of it is in coarse fragments or grains, which are removed in the refining process. The white clays in question have the silica in such a finely divided state that it can be separated from the kaolin base only with the greatest difficulty. Associated with the white clays are some that are black from carbonaceous matter, some that are red and yellow from iron oxide, and some parti-colored, white and red, from iron stain.

Composition.—The following analyses indicate the chemical nature of the clays. It may be noticed that they are high in silica at the expense of alumina. The only coloring constituent, iron oxide, is as low as the average commercial kaolins. The alkalis are about the same as the kaolins, the most marked difference being the excess of free silica, and that this can be largely eliminated in the refining process is shown by No. 8, which is a sample of the highest grade paper clay, and has been refined more carefully than any of the others.

Analyses of White Clays and the Original Slates.

	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	H <sub>2</sub> O	Fe <sub>2</sub> O <sub>3</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	Total
1. Crude white clay, Upper Mill, Pa.	9.44	84.05	2.18	0.28	0.23	1.35	2.37	0.28	100.18
2. Refined white clay, Upper Mill, Pa.	17.30	73.80	4.69	0.35	...	1.18	2.49	0.20	100.01
3. Mixed white clay, Mt. Holly, Pa.	17.43	73.30	4.68	0.37	0.02	1.28	2.99	0.17	100.24
4. Whiteland white clay, Chester Co., Pa.	31.29	51.90	8.90	tr.	tr.	1.52	4.01	2.99	.....
5. Conshohocken, Pa., parti-colored clay	26.96	59.83	9.56	1.98	0.11	0.50	0.94	0.24	100.12
6. Barren Hill gray clay	26.12	60.37	5.42	0.69	0.05	1.93	5.74	0.29	100.61

Rational Analyses of Pennsylvania White Clays.

	Sand.	Field spar.	Anhydrous clay.	Water.	Total.
7. Jno. Allen's white clay, South Mt., Pa.	37.17	0.54	50.75	5.54	100.00
8. Philadelphia Clay Co., South Mt., Pa.	10.96	0.19	84.47	4.38	100.00
9. Mr. Hoopes, South Mt., Pa.	51.30	2.66	42.16	3.88	100.00
10. White clay, Latimore, Pa.	45.52	1.31	49.77	3.40	100.00
11. Damonite slate, Latimore, Pa.	50.16	1.19	46.35	2.30	100.00
12. Conshohocken parti-colored clay	30.46	1.62	59.90	8.02	100.00

The analyses were made in the chemical laboratory of the Pennsylvania State College. The anhydrous clay was determined by difference between the sum of the other substances and one hundred.

Origin.—The clays are the direct decomposition product of hydromica slates, which occur interstratified in the limestones of Ordovician age, and the limestones, quartzites and talcose slates of Cambrian age. As these intercalated slates vary greatly in thickness, there is a corresponding variation in the extent of the clay deposits. That the clays are derived from the slates is shown by the frequent occurrence of fragments of undecomposed slate mixed in the clay, and in several openings an intimate gradation from the typical clay through varying mixtures of clay and slate into the unaltered slates. The slates are not always white, nor are they always free from iron, hence there are many of the clay deposits stained with iron oxide. Furthermore, these slate beds, or the clays resulting from them, serve as places for the accumulation of large quantities of iron ore, which frequently stains the clays with which it comes in immediate contact. The intimate association of the white clays and the iron ores has been noted for many years, and the discovery of one is used as an indication of the presence of the other.

As the rocks enclosing the clays disintegrate, the clay deposits may become more or less distorted from their original position. Thus on a steep hillside the clay may creep down the slope a long distance from the original outcrop. Where it is underlain by limestone it may run down into caverns or cavities formed by the inequalities in the dissolution of the limestone.

Uses.—These clays have been used for quite a variety of purposes. The better grades have been used to some extent in the manufacture of chinaware, for which they are eminently suited owing to the freedom from coloring materials.

They stand intermediate between the kaolin and the ball clay of the potter, being more plastic than the former and less so than the latter. A large proportion of the best grade of the white clay goes to the paper manufacturers as a filler for paper, for which purpose it gives good satisfaction, and there is a growing demand in this line. It makes an excellent material for kalsomining, almost the entire product of one company being so used. Large quantities are used by one company in the manufacture of high-grade white building brick, and some of it is used in the manufacture of white encaustic floor tiling and as a body in the colored tiles. In the Schuylkill Valley it is used at one point for making stove linings and fire brick; at several points for making sewer

pipe and terra cotta ware, and a deposit which was used for several years in the manufacture of fire brick is now being reopened for making paving brick. It can, in fact, be used for any purpose where a moderately refractory medium plastic white or colored clay is used. It must be kept in mind, however, that the quality is subject to local variation as in all clay deposits.

Distribution and Development.—The clays occur widely distributed in the South Mountains and in nearly all the limestone valleys of Southeastern and Central Pennsylvania, but the most productive localities so far developed are: The South Mountain in Cumberland County; the vicinity of Mertztown in Berks County; and Ore Hill, near Roaring Springs, in Blair County. In the first locality there is a large brick and clay refining plant at Mt. Holly, two refining plants and a brick factory on Mountain Creek, between Pine Grove Furnace and Mt. Holly, an encaustic tile factory at Aspers, and a small refining plant at Latimore, both on the south side of the mountains. There are numerous clay pits in this area, some close to and others more or less remote from the works. The more productive pits are at Upper Mill Station, on the Harrisburg & Gettysburg Railroad, and at Cranes Siding, Henry Clay and Laurel Stations on the Hunters Run & Slate Belt Railroad. Clay deposits have been opened near Shippenberg at several points along the base of the mountain near Scotland, on the north side of the mountain, two miles west of Mt. Holly, in the vicinity of Latimore, and in Dogwood Hollow, west of Dillsbury. Nearly all the old ore pits in this region show the presence of white clay.

A half mile south of Mertztown, in Berks County, is a large clay pit and refining plant at the pit which has been in operation since July, 1874. At present they employ 15 men and ship refined clay at the rate of one car-load per day. The bulk of the product is used in the manufacture of paper.

At Maple Grove, southeast of Mertztown, is a large deposit of white clay which is mined from subterranean galleries, and after a preliminary washing at the mine is hauled to the refining plant at Hancock Station on the Philadelphia & Reading Railroad, where it is prepared for kalsomining. This plant has been in operation since 1891.

There are many other deposits of white clay exposed at many of the old ore pits in Berks and Lehigh counties, notably at Ironton, Klimes Corners, Friedensville, and west of Kutztown. On Neversink Mountain, at Reading, a deposit of white clay has been opened, but not marketed. At Montello, a few miles west of Reading, a deposit of white clay was opened several years ago and used for making fire brick. It was reopened on an enlarged scale in 1899 for material for the manufacture of white paving brick.

White clay occurs at several points along the north side of the Little Chester Valley. The most productive point where it has been opened is north of Glen Loch Station, where the clay has been refined and marketed as kaolin.

On the north side of the Schuylkill River, north of Conshohocken, clays of a somewhat similar character to those described above have been mined and used for more than 50 years. The Conshohocken clays differ from the others described in that they, in part at least, have been worked over by water since the disintegration of the original slates, and in the upper portions of the deposits the clay is associated with more or less sand and gravel. They are more plastic than those in the other localities and are nearly all colored, some black, some red and some variegated. The black clays have been used for refractory purposes and the colored ones for terra cotta.

At Ore Hill, near Roaring Springs, in Blair County, there is an extensive deposit of white clay associated with the iron ores, both of which have been mined extensively for many years. The clay occurs associated with sandstone and limestone of Ordovician age, and closely resembles those of the Lehigh Valley and South Mountain areas. The rocks at this point are deeply disintegrated and the original slate does not appear in the exposure, but the occurrence in the clay of the thin quartzite lenses, characteristic of the slates of the southern areas, is strong evidence of their similarity in origin. The Ore Hill white clay is refined and widely shipped to potters and tile manufacturers.

Similar clays occur at various points in the Nittany Valley through Huntingdon and Center counties, but so far as known not in commercial quantities.

These clay deposits are destined to greater commercial development in the near future, as there is an increased demand for material of this kind in the paper and pottery trades as well as in the manufacture of high-grade ornamental building brick and terra cotta ware. They have the advantage of being within easy access of the great industrial cities, Philadelphia, New York and Baltimore.

RECENT DECISIONS AFFECTING THE MINING INDUSTRIES.

Specially Reported for the Engineering and Mining Journal.

RIGHT TO REJECT MATERIAL FOR DEFECTS.—In an action for the price of a second-hand cable sold to be used on an incline to let cars down into a coal mine, the seller knew the nature of the buyer's work, and that the cable used by it ran over wheels through sheaves or blocks. On the receipt of the cable the buyer refused to accept it, saying it was of too poor quality, that he could not use it, and that the outside wire was broken on all the outer coils visible. The seller then guaranteed it for a year, whereupon it was accepted, subject to its condition after examination; the seller stating that it was 7,600 ft. long, of which only about 600 ft. was poor, leaving 7,000 ft. of good rope—the amount needed. It afterward appeared that 1,500 ft. was of the grade of the 600 ft. admitted to be worthless. The buyer's witness stated that the number of broken wires was so great as to make it exceedingly dangerous to place the cable on the incline, owing to the probability of its catching on the blocks in the sheaves. The court held that there was being the amount of good rope stipulated for, and the seller knowing the kind of rope needed, and the rope not being fitted for the purpose intended, the buyer was justified in refusing to accept.—Gregson vs. New Soddy Coal Company (54 Southwestern Reporter, 113); Court of Chancery Appeals of Tennessee.

PIG IRON PRODUCTION OF THE UNITED STATES IN 1900.

The American Iron and Steel Association has received from the manufacturers complete statistics of the production of all kinds of pig iron in the United States in the first half of 1900; also complete statistics of the stocks of pig iron which were on hand and for sale on June 30th, 1900.

The total production of pig iron in the first half of 1900 was 7,642,569 gross tons, against 6,289,167 tons in the first half of 1899 and 7,331,536 tons in the second half. The increased production in the first half of 1900 over the second half of 1899 was 311,033 tons. The production in the second half of 1899 and the first half of 1900 aggregated 14,974,105 tons, or almost 15,000,000 tons. The enormous production of the first half of 1900 will not be continued in the second half, as demand has slackened. A check in production began in June, when some furnaces were banked and others were blown out.

The production of Bessemer pig iron in the first half of 1900 was 4,461,391 gross tons, against 3,788,907 tons in the first half of 1899 and 4,413,871 tons in the second half.

The production of basic pig iron in the first half of 1900, all made with coke or mixed anthracite coal and coke as fuel, was 581,868 gross tons, against 482,389 tons in the first half of 1899 and 502,644 tons in the second half.

The production of charcoal pig iron in the first half of 1900 was 167,146 gross tons, against 128,485 tons in the first half of 1899 and 156,281 tons in the second half. In addition there were produced in the first six months of this year 25,042 tons of pig iron with mixed charcoal and coke.

The production of spiegeleisen and ferromanganese in the first half of 1900 was 148,102 gross tons, against 104,496 tons in the first half of 1899 and 115,272 tons in the second half.

The whole number of furnaces in blast on June 30th, 1900, was 283,

A NEW DESIGN FOR A COMPOUND DUPLEX PRESSURE PUMP.

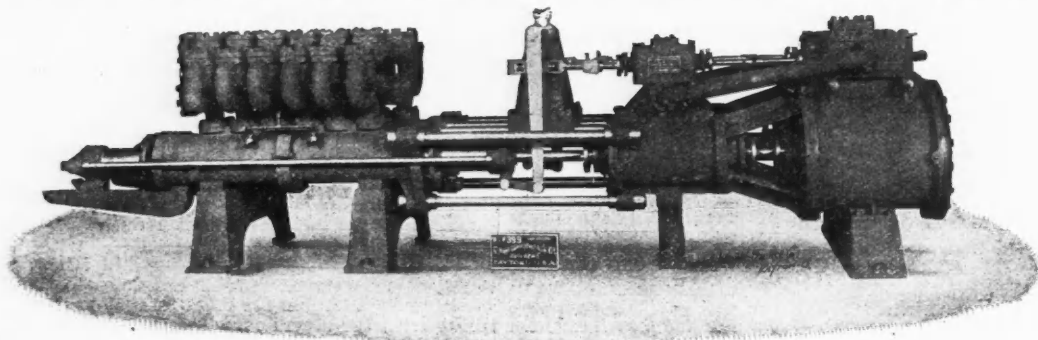
The illustration given herewith shows a compound duplex pressure pump to develop a maximum pressure of 700 lbs. per square inch. The liquid end is of the end-packed trombone style, the cylinders being made of special metal; mounted thereupon are separate chambers for the location of the valves. The chambers are also constructed of special metal and designed with a view of facilitating quick access for the inspection of the valves. The valves are of the hydraulic pattern, made of steel, and guided from below. An extension piece is provided for supporting the water plunger, and an approved adjustment device provided therefor. The water end is mounted on heavy supporting columns. An engine of the transposed cylinder type is furnished, giving free access to all steam pistons without dismantling the pump. The outside valve adjustment is a feature of this design. This pump has been designed and is made by the Stilwell-Bierce & Smith-Vaile Company of Dayton, Ohio.

ABSTRACTS OF OFFICIAL REPORTS.

Portland Mining Company, Colorado.

This company's report for 1899 shows that the receipts for the year were from the mine \$1,960,487; rents, etc., \$11,891; total, \$1,972,378. The payments on ore, mine and equipment accounts were \$835,235; general and other expenses, \$266,236; total, \$1,101,471, leaving a net profit of \$870,907. The production of ore was 38,548 net tons, containing 97,428 oz. gold and 6,701 oz. silver, the gross value being \$1,951,219, or \$50.62 per ton. The treatment charges were \$311,908, or \$8.09 per ton; freight, \$103,026, or \$2.67 per ton; making a total of \$414,934, or \$10.76 per ton, and leaving a net value of \$1,536,285, or \$39.86 per ton.

The president's report says: "The principal work done during the year was the exploring for new veins in the upper levels in practically virgin territory, and the management has been rewarded for its labor by open-



COMPOUND DUPLEX PRESSURE PUMP.

against 289 on December 31st, 1899. The number out of blast on June 30th was 128, against 125 on December 31st, 1899.

The production according to fuel used was as follows:

	1899.		1900.
	1st half.	2d half.	1st half.
Anthracite .....	682,027	917,525	990,667
Charcoal .....	128,485	156,281	167,146
Bituminous .....	5,478,655	6,257,730	6,459,714
Charcoal and coke.....	—	—	25,042
Total .....	6,289,167	7,331,536	7,642,569

The production included under the head of anthracite is not strictly anthracite iron, as nearly all the furnaces so classed use some proportion of coke.

The total production by States is given in the table below:

	1899.		1900.
	1st half.	2d half.	1st half.
Massachusetts .....	978	1,498	1,554
Connecticut .....	4,390	5,739	5,179
New York .....	96,869	167,477	193,460
New Jersey .....	57,930	69,668	101,074
Pennsylvania .....	3,047,998	3,510,880	3,493,842
Maryland .....	101,715	132,762	153,667
Virginia .....	163,896	201,595	272,749
North Carolina and Georgia.....	3,397	14,438	14,171
Alabama .....	517,087	566,818	605,977
Texas .....	3,643	2,160	7,662
West Virginia .....	98,138	89,720	90,358
Kentucky .....	54,020	64,999	45,757
Tennessee .....	142,137	204,029	187,694
Ohio .....	1,075,033	1,303,179	1,464,208
Illinois .....	705,623	736,389	712,473
Michigan .....	65,117	69,328	79,262
Wisconsin and Minnesota.....	83,357	119,818	128,547
Missouri and Colorado.....	67,839	71,041	84,935
Total .....	6,289,167	7,331,536	7,642,569

The statistics of unsold stocks of pig iron do not include pig iron sold and not removed from the furnace bank, or pig iron in the hands of creditors, or pig iron manufactured by rolling-mill owners for their own use, or pig iron in the hands of consumers. The stocks which were unsold in the hands of manufacturers or their agents on June 30th, 1900, amounted to 338,053 tons, against 63,429 tons on December 31st, 1899.

Included in the stocks of unsold pig iron on June 30th were 946 tons in the yards of the American Pig Iron Storage Warrant Company which were yet under the control of the makers, the part in these yards not under their control amounting to 4,854 tons, which quantity, added to the 338,053 tons above mentioned, makes a total of 342,907 tons which were on the market at that date, against a similar total of 68,309 tons on December 31st, 1899. The total stocks in warrant yards on June 30th amounted to 5,800 tons.

ing up very large ore bodies on the 400, 500 and 600 ft. levels—which goes to prove that the company's territory has hardly been prospected. Also the completion of the main station at the 900 ft. level; also the large pumping station; the driving of the north drift to cut the Anna Lee ore body and the rich veins known to exist in that section of the company's territory; also a cross-cut run to the east, a little north of the main shaft, to cut the large phonolite ore body which has been opened in the upper levels; a cross-cut has been run east, south of shaft, to cut the Diamond vein, also No. 2 or east vein. Shaft No. 2 that was started last year has attained the depth of 560 ft. One station is at the depth of 162 ft., is what is known as the Tunnel Level. The other is cut at the depth of 512 ft., and what would be known as 400 ft. level Burns. A cross-cut is being run from this level to the west. That will cut all the veins that were opened up on the 500 ft. level Burns. The shaft house is equipped with a fine lot of machinery, good for 900 ft. Shaft No. 3 was started the latter part of the year, and has attained the depth of 30 ft. A small hoisting plant is being installed, and as soon as ready will push shaft down as rapidly as possible. All of the above shafts are three compartments, and of the same size. A tunnel has been run from the yard, at a level with the collar of the Burns shaft, to No. 2 shaft, the depth attained at that point being 162 ft., where a station is cut. The tunnel will be continued to No. 3 shaft, and will attain a depth of about 275 ft. at that point. This will allow the ore mined from No. 2 and No. 3 shafts to be brought to the ore house and railroads at the Burns shaft, thus avoiding the expense of hauling the ore down, and the timbers up, that are used at the No. 2 and No. 3 shafts. One of the most serious obstacles the management had to contend with the past year was the enormous flow of water encountered at the 900 ft. level, Burns shaft. It was not before August that the large Knowles triple-expansion pump was started; it handled the large flow very easily, so that at the present time the water has entirely disappeared, the mine being practically dry. During the first six months of the year the average number of gallons pumped was 50,000,000 per month; for the year, 37,000,000 gallons per month at a monthly cost of \$6,500. The amount fairly represents the saving in mine expense between the present time and that of one year ago.

"By the tabulated statement of the general superintendent it can be seen that the amount of development work done during the existence of the company amounts to 66,224 ft. During the past year 21,062 ft. was done—a little more than one-third the entire amount."

IRON ORE IMPORTS OF GREAT BRITAIN.—The imports of iron ore into Great Britain for the six months ending June 30th were 3,350,577 long tons, of which 2,967,236 tons, or 88.5 per cent., were from Spain. The total shows a decrease of 287,931 tons, or 7.9 per cent., as compared with 1899.

MINERAL COLLECTORS' AND PROSPECTORS' COLUMN.

(We shall be pleased to receive specimens of ores and minerals, and to describe and classify them, as far as possible. We shall be pleased to receive descriptions of minerals and correspondence relating to them. Photographs of unusual specimens, crystals, nuggets and the like will be reproduced whenever possible. Specimens should be of moderate size and should be sent prepaid. We cannot undertake to return them. If analyses are wanted we will turn specimens over to a competent assayer, should our correspondent instruct us to do so and send the necessary money.—Editor E. & M. J.)

185.—W. S. S.—Graphite.—Albite.—The samples of graphite you send are much like those found in many places in the Adirondacks. The large pieces are of good quality, but the value of the deposit would depend on the size of the vein and the cheapness with which the prepared graphite could be put on the market. The graphite in disseminated small patches in a greenish rock may be of good quality, but such rock is absolutely valueless as a source of graphite, owing to the cost of mining and separation. No. 2. The greenish-white crystals showing a pearly luster on cleavage faces are feldspar, probably the variety known as albite. The specimens resemble calcite, but are harder and do not effervesce with acids.

186.—Macbeth.—China Clay.—The samples you send are apparently a leached eruptive rock, possibly a rhyolite. Decomposition of the silicates has not gone far enough, however, to change the rock to a china clay. True kaolin is lighter, whiter and feels somewhat like fine flour. Your rock might be useful for making some kinds of brick or for certain kinds of pottery. It is not kaolin, however, and its value for brick making or for pottery must be determined by experiment. In any event it is not likely that a bed of such rock in Idaho would pay to work. Best imported china clay is worth \$17 per long ton at New York, common American china clay \$8 per ton.

187.—Carnotite.—In the "American Journal of Science" W. F. Hillebrand and F. Leslie Ransome describe at length the occurrence of this supposed new vanadium mineral in Colorado and the vanadium minerals with which it is associated, and give in detail the results of analyses of its composition. The mineral occurs as a canary-yellow substance without definite crystalline form, occurring in a sandstone in bunches or pockets or along bedding planes in the sandstone. The deposits examined are at Placerville, in San Miguel County, and in the Paradox and Red Creek Valleys in Montrose County. It is thought that the deposits may be due to causes favoring local concentration of the mineral, which may occur in minute quantities through the whole bed of sandstone. In the Paradox Valley region some of the deposits examined were apparently of very limited extent, being essentially superficial, the streaks or bunches of mineral growing smaller and disappearing within perhaps 20 ft. of surface. Analyses show the substance to be of very complex composition and vanadium to be present in different forms, pentavalent and trivalent, one readily soluble in cold dilute nitric acid, the other soluble with difficulty. The mineral carries apparently 20 to 21 per cent.  $V_2O_5$ , and 59 to 61.5 per cent.  $UO_3$ ; also 4.5 to 8.5 per cent  $K_2O$ . Other compounds present are  $P_2O_5$ ,  $CaO$ ,  $BaO$ ,  $MgO$ ,  $NaO$  and  $H_2O$ . Attempts to calculate an empirical formula show wide discrepancies. The authors conclude that "the body called carnotite is probably a mixture of minerals of which analysis fails to reveal the exact nature. Instead of being the pure uranyl-potassium vanadate, it is to a large extent made up of calcium and barium compounds. Intimately mixed with, and entirely obscured by it, is an amorphous substance—a silicate or mixture of silicates—containing vanadium in the trivalent state, probably replacing aluminum.

"The deposits of carnotite, though distributed over a wide area of country, are, for the most part, if not altogether, very superficial in character and of recent origin.

"The green coloring and cementing material of certain sandstones near Placerville, Colo., is a crypto-crystalline aluminovanadopotassium silicate resembling roscoelite, but with the percentage proportions of  $Al_2O_3$  and  $V_2O_5$  reversed. It constitutes over 25 per cent. of the sandstone at times, and contains nearly 13 per cent. of  $V_2O_5$ , the latter amounting in the maximum case observed to 3.5 per cent. of the sandstone.

"As yet these highly vanadiferous sandstones have been found only at Placerville, where it is intended to work them for vanadium. Carnotite is associated with them in only trifling amount."

188.—R. D. S.—Mica.—The sample of mica from Pennsylvania which you send is of very little value. It is biotite and contains too much iron to be used for electrical work, while altogether too full of ribs and flaws to make it possible to yield sheets of commercial size. The mica mined on a large scale is muscovite, which is much lighter colored than your sample. It is unlikely that your biotite changes to muscovite with depth, and consequently you would not find a workable deposit by sinking.

QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert. Nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Zinc White Production.—Can you tell us whether the process for the production of zinc-white from such ores as franklinite and willemite, as carried on by the New Jersey Zinc Company and others, is a commercial success?—S. V.

Answer.—We are informed that the process to which you refer is successful, both technically and commercially. That it is carried out on a large scale, without intermission, is a sufficient proof.

Bertrand-Thiel Steel Process.—Can you tell me anything about this process, to which I have seen frequent references?—P. F. J.

Answer.—The Bertrand-Thiel process is an open-hearth process of making steel, the chief peculiarity of which consists in the use of two furnaces. The conversion of the iron is partly effected in the first and the molten metal is then transferred to the second, where the process is completed. The process was first used in Bohemia. It has been much observed and written about, but its use has not yet extended beyond the works where it was first tried.

See the "Engineering and Mining Journal," June 12th, 1897, page 600; also "The Mineral Industry," Volume VIII., pages 378-80.

Uses of Copper.—Kindly inform me for what copper is principally used, and what the probability of aluminum superseding it in those uses.—T. D. H.

Answer.—The uses of copper are too well known and too numerous to be given in the space at our command.

As to the substitution of aluminum for copper, we have frequently referred to the subject in the "Engineering and Mining Journal." Aluminum has been used recently in several places as an electric conductor in place of copper, and serves very well for that purpose. It will serve as a substitute for copper in almost all electrical work. The trouble is, however, that the supply of aluminum is not sufficient at present to make it a possible substitute for copper to any extent; nor does any early large increase in production seem probable.

Power Transmission by Compressed Air.—We should like to know what you consider the limit, as to distance, compressed air can be carried from compressor to drills, at the same time giving good working results.—D. D.

Answer.—No limit has been reached thus far. Thus, at the Chapin Mine in Michigan, air is transmitted about 4 miles. At the Mont Cenis Tunnel air has been sent from the compressor nearly 5 miles. At other places power has been transmitted for 2½ miles without difficulty. The main points are to reduce friction in the pipes as much as possible, as that is the chief source of losses in transmission. The pipes should be large enough for the air to move freely; they should have butt-joints, and sharp bends should be avoided.

We do not say anything of the relative cost of compressed air and other means of transmitting power. You do not ask the question, and that is another subject. But there is practically no limit to the distance to which power can be transmitted by compressed air.

Precipitating Gold from Cyanide Solution.—Can you inform me if the electrolytic method of recovering gold from cyanide solutions has been discarded at any place where used on the Rand or elsewhere and the Zinc recovering process substituted?—Protos.

Answer.—The electrolytic process has been dropped after trial by at least one mine on the Witwatersrand, the May Consolidated, and zinc recovery substituted. In poor solutions a lead-zinc couple is now frequently used. Louis Janin, Jr., in "The Mineral Industry," Volume VIII., says: "The Siemens-Halske method to a certain measure has been superseded by the Betty-Carter process, which is nothing more than a zinc-lead couple formed by immersing zinc in a lead acetate solution, coupled with strengthening the solution in cyanide before entering the zinc boxes. . . . There has been considerable discussion concerning this process. Wm. Bettel points out that the methods are not new and that the clean-up from the electrolytic precipitation is much more easily managed than from the zinc-lead method."

The article just quoted will give you much further information on this point.

Value of Silver-Lead Ores.—Would you kindly state the value of the following ores: 1st ore, silver is 2.7 oz. per ton, lead 18 per cent. and zinc 34.48 per cent; silica is about 1.7 per cent,  $Al_2O_3 + Fe_2O_3$  about 4 per cent. The ore seems to be galena and carbonate of zinc and small amounts of blende. 2d ore, silver is 0.4 oz. per ton, lead, 56.2 per cent.—F. J. P.

Answer.—You can readily ascertain the value of the contents of the ores, as shown by assay, by taking the value of the metals as shown in the market columns of the "Engineering and Mining Journal." The actual value of the ores is quite another matter, and depends on the cost of treatment, which could only be determined after a knowledge of all the contents of the ore, its location and other essential points. Lead-zinc ores are not generally sought for by smelters, and the custom is to make a much higher treatment charge where zinc is present. Possibly some separation of the lead and zinc could be made by concentration; but that again would depend on the nature of the ore.

In short, the question of the value of an ore is a complex one, and can be settled only after a thorough acquaintance with all the facts in the case.

PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

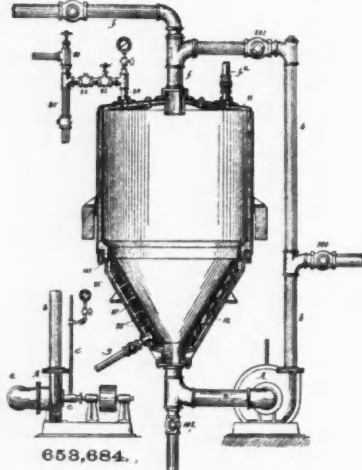
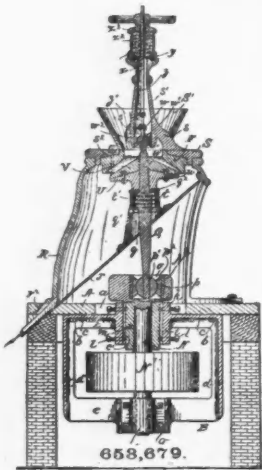
The following is a list of the patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending July 17th, 1900.

- 653,679. MACHINE FOR CRUSHING ORES, ETC. Smith W. Kimble, New York, N. Y. In a crushing machine, a muller, a shaft for the muller, a mortar co-operating with the muller, a yielding support for the shaft, and means for actuating the shaft to impart movement to the muller.
- 653,756. PAIR AND SHEET FURNACE. Jeremiah E. Reeves, Canal Dover, Ohio. The combination in a reheating-furnace, of a fire-chamber,

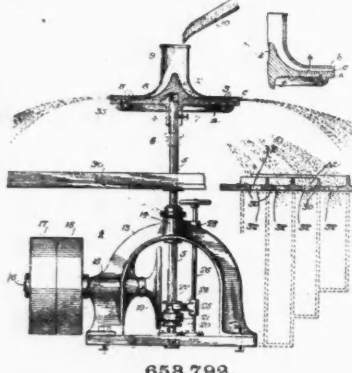
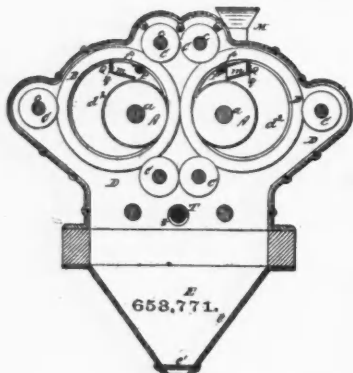
an elevated pair-chamber communicating therewith, an elevated sheet-chamber directly communicating with the pair-chamber, the floor of the sheet-heating chamber downwardly inclined toward and terminating adjacent to the pair-heating chamber.

- 653,684. **METALLURGICAL FILTER.** Frederic H. Long, Chicago, Ill., assignor to Ross J. Beatty, trustee, Muncie, Ind. The combination with the closed vessel having a filter-septum and an outlet-port



for the filtrate beyond such septum, of the wash-water pipe connected in hydrostatic column with said vessel and suitable means for establishing a forced circulation of the vessel contents.

- 653,704. **METAL-BENDING MACHINE.** John T. Scott, Charles G. Hightower, and Frank E. Neitzel, San Francisco, Cal. The combination with the bed-plates of an arm swinging thereon, a former secured to the bed-plate, a forming-roller carried by the swinging arm.
- 653,771. **STONE OR ORE CRUSHER.** Albutis C. Hilsinger, Killawog, N. Y., assignor to Calvin Amory Stevens, New York, N. Y. The combination of two revoluble attrition-rings mounted on guide-rolls and in peripheral contact with each other, and opposed internal crushing-rolls in said attrition-rings, the journals of the opposed crushing-rolls being supported in bearings which are connected with springs which tend constantly to force the peripheries of the rolls into contact with the interior surfaces of the rings.
- 653,792. **CENTRIFUGAL ORE-SEPARATOR.** Arthur Dasconaguerre, Mexico, Mexico. A centrifugal ore separator and concentrator, comprising revolving working surface, having central deflecting portion and a plane outer portion, in which are sunken tangentially-disposed grooves thereby forming plane lands on said outer portion between said grooves; and a hood, having an inlet, and disposed in proximity to said working surface, but out of contact therewith,



and conforming in its proximate side, substantially to the profile of said working surface, and thereby forming a centrifugal air passage above the walls of the grooves for the blast of air induced by the tangentially-disposed grooves.

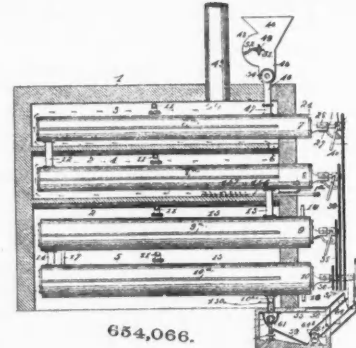
- 653,793. **REGENERATIVE GAS-FURNACE.** Eugene Derval, Paris, France. The combination of a gas-producer, placed directly below one of the retorts of the furnace, a combustion-chamber placed behind the gas-generator, and a wall separating the combustion-chamber and gas-producer, said wall being provided at its upper part with one or more openings which allow the gas to pass into the combustion-chamber so as to heat strongly the lowest extremity of the retorts.
- 653,819. **MUFFLE FURNACE OR OVEN.** Louis H. W. Regout, Maestricht, Netherlands. An annular muffle-furnace comprising an annular rotatory support with means for rotating the same, a heating-chamber at one portion of the annular muffle-furnace arranged below the support, a muffle above the heating-chamber, a preliminary-heating section of the furnace and a cooling-section.
- 653,823. **COMBUSTION-CRUCIBLE.** Porter W. Shimer, Easton, Pa. A crucible-stopper provided with means for the circulation through it of a cooling medium and with means for circulating air or the like through the crucible.
- 653,859. **PACKING FOR AIR-COMPRESSOR OR OTHER TANDEM CYLINDERS.** Milton Bulkley, Oakland, Cal. A packing for air-compressor and other tandem cylinders, having a common piston-rod, said packing consisting of a sleeve fitted upon said piston-rod, and secured in the head of one cylinder, a packing-seat in the head of the other cylinder, and through which the piston-rod passes into said cylinder, a packing-cap fitted upon the sleeve, a double gland fitted upon the end of the sleeve between the seat and cap, and adapted to enter both, and means for setting up the cap, to bind the double gland between it and the seat, and compress their respective packings.
- 653,891. **FURNACE FOR KILNS.** Frederick R. Sellman, St. Louis, Mo. The combination with walls which converge toward the lower portion, of grate-bars arranged in said lower portion, vaporizing-pans arranged in the lower front portion of said furnace, a supply-pipe for furnishing liquid to said pans, means for admitting air to support slow combustion in said furnace, and a charging-door in the upper portion of the furnace through which fuel is fed.

- 653,933. **ELECTRODE FOR ELECTROLYZING APPARATUS.** Rene Moitz, Lille, France. The combination, with a carrier-plate provided with a supply-channel and a discharge-channel, each extending entirely across said plate, and a plurality of grooves extending from one of said channels to the other, of an electrode applied to said carrier-plate between said channels.

- 654,019. **COAL-DUMPING APPARATUS.** John M. Phillips and John J. Fleming, Pittsburg, Pa., assignors to said John M. Phillips. In an apparatus for dumping the contents of cars the combination with a tilting-platform or tippel of crossover-rails and mechanism operated by the tilting platform for moving said crossover-rails laterally throughout their entire lengths while the rails are maintained parallel.

- 654,054. **PROCESS OF HARDENING AND DRAW-TEMPERING STEEL.** Gustave Delay, Le Locle, Switzerland. The process of hardening and draw-tempering steel, consisting in heating the same while mingled with charcoal-dust and protected from the air, introducing the same while heated and without exposure to the air into a mineral-oil bath, and then removing from the oil-bath and drawing the temper of the steel by heating the steel while covered by a paste of charcoal-dust and mineral oil, cooling, removing the steel from the paste and then washing in petroleum or benzine.

- 654,066. **RETORT FURNACE.** Robert E. Lauck, Kansas City, Mo. A retort having its front end projecting through the furnace-wall, and comprising a casing having an inlet-port near one end and an outlet-port at the other, and provided with an internal comb, a per-



forated partition at the front end of the comb and furnace, a non-conductor of heat filling the casing forward of the partition, and a shaft journaled in the casing and extending through the partition, and provided with a skeleton spiral conveyor, the teeth of which pass between those of the comb.

- 654,080. **PLATE-STRAIGHTENING MACHINE.** David Townsend, Philadelphia, Pa. The combination in a plate-straightening machine, of housings, boxes mounted in said housings, a series of upper and lower straightening-rolls mounted in the boxes, means for driving the lower set of rolls, means for adjusting each of the upper rolls, and independent counterbalance mechanism for each end of each upper roll.
- 654,103. **ATTACHMENT FOR INSTRUMENTS OF PRECISION.** Carl O. F. Schrottko, Berlin, Germany, assignor to the Siemens & Halske Electric Company of America, Chicago, Ill. The combination, with a shaft carrying an oscillating or rotating part, of bearings between which said shaft is mounted to have a slight end play therein, and means for causing the longitudinal vibratory movement of the shaft whereby the sensitiveness of the instrument is increased.

#### GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy.

Week Ending June 16th, 1900.

- 12,242 of 1899. **BRONZE POWDER.** L. Ott, Roth, Bavaria. Making bronze and other metallic powder from granulated metal, by alternately stamping, pickling and annealing it.
- 14,644 of 1899. **SALT BLOCKS.** Matray Freres, Paris. The production of salt in blocks, by fusing and casting.
- 15,331 of 1899. **SPRING CASE.** B. F. Cocker, Sheffield. Improved spring cases for enclosing the springs used for tightening and supporting the guide ropes of colliery cages.
- 20,384 of 1899. **BORATE TREATMENT.** C. C. Moore, Liverpool. Treating crude borates suspended in water, with chlorine, or producing boracic acid and chlorates, and afterward regenerating the chlorine.
- 21,372 of 1899. **MELTING FURNACE.** W. Mayer, Dumbarton. An improved form of furnace for heating and melting all kinds of metal.
- 7,689 of 1900. **ROCK DRILL.** W. C. Stephens, Carn Brea. Detailed improvements in the inventor's percussive rock drill described in Patent 1,674 of 1896.

Week Ending June 23d, 1900.

- 11,894 of 1899. **ROASTING FURNACE.** W. Smelthurst, Dolgelly. A form of roasting and calcining furnace made with a hearth travelling on trucks.
- 13,429 of 1899. **LIME-ALKALI PHOSPHATE.** F. Hasslacher, Frankfort-am-Main, Germany. Production of a double phosphate of lime and alkali, by treating tribasic phosphate of lime with an alkaline phosphate and carbon.
- 14,376 of 1899. **CUPOLA.** W. Littleton, London. A cupola furnace for melting slags, etc., with air blast, arranged so as to economize fuel.
- 15,247 of 1899. **ROCK BREAKER.** J. Broadbent, Staleybridge. Detailed improvements in the actuating mechanism of jaw rock breakers.
- 16,154 of 1899. **COKE OVEN.** E. Coppee, Brussels, Belgium. An arrangement of coke ovens which will allow them to be used for recovering by-products or otherwise, according to circumstances.
- 16,780 of 1899. **POTASH SALT MANUFACTURE.** J. G. A. Rhodin, Manchester. The production of soluble potash salts from feldspar by heating the spar with lime and common salt and dissolving the potash out with acid.
- 1,474 of 1900. **CASTING ALUMINUM.** J. Schiele and J. B. Boisselot, Cureghem, Belgium. Casting aluminum on iron which has been first treated with turpentine and copaiba balsam.
- 3,749 of 1900. **ARTIFICIAL STONE.** A. C. F. Tharup and S. F. Dohlmann, Copenhagen, Denmark. Manufacture of an artificial stone from magnesite and sand mixed with solution of chloride of magnesium.
- 5,496 of 1900. **ELECTROLYTIC TREATMENT OF TIN.** E. Quintaine, Paris, France. The use of a salt of ammonia and tin as a bath for the electro-deposition of pure tin.
- 6,802 of 1900. **DIAMOND CUTTING.** E. F. Offenbacher, Redwitz, Germany. A method of mounting diamonds in steel for cutting stone, etc.

**PERSONAL.**

Mr. Louis Janin, Jr., is on a visit to Massachusetts on professional business.

Mr. W. S. Stratton recently gave \$25,000 to the State School of Mines, Golden, Colo.

Mr. F. F. Sharpless, mining engineer, is now in Southern Arizona on professional business.

Judge Stephen F. Balliet of Des Moines, Ia., who is interested in mining properties in California and Oregon, is in San Francisco.

Mr. John D. Burgess, of Tucson, is to act as manager of the mines of the Golden Rule Copper Company, of New York, in Pinal County, Ariz.

Mr. Winthrop S. Fisk of Boston, Mass., is on a visit to Boston. He has been opening placer deposits near Sinaloa, Mex., for the Boston & Sinaloa Mining Company.

Prof. Christy of the School of Mines of the University of California has made a geological and mineralogical examination of the Peavine Mining District, Washoe County, Nev.

Mr. C. D. Hoyt, assistant assayer of the United States Assay Office, Helena, Mont., goes to Philadelphia to take a similar position in the mint. Mr. C. Hillman, second assistant melter, succeeds Mr. Hoyt.

Mr. F. W. Hickey, who has been foreman of the Santa Ysabel Mine in Tuolumne County, Cal., has resigned his position to accept a similar one with the Boston Quicksilver Mining Company in Napa County.

Capt. J. R. De La Mar and Mr. Hartwig Cohen have been in Shasta County, Cal., inspecting the Bully Hill copper property. They will visit the Gold Mountain mines in San Bernardino County owned by Capt. De La Mar.

Mr. A. D. Henderson has been succeeded in the superintendency of the properties of the El Dorado Water and Deep Gravel Mining Company's properties in El Dorado County, Cal., by Mr. J. Leigh Rowley, of England.

Mr. T. H. Simmons, formerly superintendent of the W. Y. O. D. and Empire mines, Grass Valley, Cal., has been appointed manager of some mines being operated in South Africa by the London Exploration Company. It is said that the position carries with it a salary of \$18,000 a year.

Mr. H. H. Rogers, who, it is said, will hereafter devote much of his time to the affairs of the Amalgamated Copper Company, has gone with assistant treasurer F. P. Addicks and Mr. Broughton for a trip of several weeks to Butte and the northwestern country to overlook the Amalgamated Company's interests.

Mr. P. J. Cirkel, who has charge of the extensive mining interests of J. E. Searles, of New York, was in Butte, Mont., last week. Mr. Cirkel has arranged for placing electric power to operate the mines of the Cornucopia group in Union County, Oregon, and will visit the Yellow Jacket and other mines controlled by Mr. Searles.

Mr. Fred. P. Spaulding, of Bethlehem, Pa., has been appointed professor of civil engineering at the University of Missouri. Prof. Spaulding graduated from Lehigh University in 1880. He was instructor at Cornell University for 7 years and later returned to Lehigh University for 2 years as instructor. He then entered the field of practical engineering.

**OBITUARY.**

Charles P. Brown, professor of mining and metallurgy at the Nevada State University, died in Reno recently. He had been suffering for about a week with typhoid fever. Deceased was one of the youngest men in the faculty and was much esteemed.

Prof. Ulrich, director of the Otago School of Mines, died on May 26th. The professor, while gathering geological specimens on a steep hillside, slipped and fell down the hill a distance of 100 ft., receiving injuries which proved fatal within a few hours. The deceased was a mineralogist and petrologist of European reputation. He had brought the Otago School of Mines to a high degree of efficiency and his loss will be severely felt by that institution.

News of the death of Robert Floorman, well known in the Black Hills, is reported from Nome, Alaska. He came to Deadwood, S. D., in 1876, and until 1895 was instrumental in organizing a number of large companies to work mines in the Black Hills. He left the Hills for British Columbia, where he mined successfully until he went to the Klondike. A few months ago he took his family to Cape Nome and there died of pneumonia. The remains have been sent to Seattle for burial.

John Abendroth, once a member of the firm of

Abendroth Brothers of New York, died July 22d at White Plains, N. Y., in his 76th year. He was born in Germany and came to this country when a young man. With his brothers, William P. and Augustus Abendroth, he formed the firm of Abendroth Brothers for the manufacture of boilers, cast iron pipe, etc., at Port Chester, N. Y., but withdrew from that firm in 1874 on account of failing health. Mr. Abendroth was at one time the senior member of the firm of Abendroth & Root, manufacturers of riveted pipe and tubular boilers, with works in Jersey City, N. J., and offices in New York City, but retired from business several years ago. He leaves a widow, 2 sons and a daughter.

**SOCIETIES AND TECHNICAL SCHOOLS.**

Agricultural and Mechanical College of Texas.—This institution at College Station, Tex., has issued its 24th annual catalogue for the session of 1900-1901. The total number of students enrolled last year was 396. The college offers courses in agriculture, horticulture, mechanical engineering, chemistry and civil engineering. The necessary expenses of a student for a 9 months' session are estimated at \$140.

American Institute of Electrical Engineers.—The programme of the functions in London and Paris to which members of the society are invited is as follows: London.—By courtesy of the Institution of Electrical Engineers: Sunday, August 12th, trip up the Thames by rail to a convenient point, thence by electric launches, returning by same route after lunch. Monday, August 13th, dinner in the evening. Monday and Tuesday, visits will be arranged to works, etc., in the vicinity of London. Wednesday, August 15th, special train to Paris. Paris.—Thursday, August 16th, joint meeting by courtesy of Commissioner Peck in the U. S. Pavilion. Subject for discussion: "The Relative Advantages of Alternate and Continuous Currents for a General Supply of Electricity, Especially with Regard to Other Interests." The special point which the British Committee would like to have discussed is: How far will interference with other undertakings, rather than ordinary commercial and industrial conditions, be the factor which will determine whether continuous or alternating currents shall be employed?

Members are requested to register at the Institution of Electrical Engineers, 28 Victoria Street, Westminster, S. W., and send Continental address to McGraw Publishing Company, Palace of Electricity, Exposition, Paris.

**INDUSTRIAL NOTES.**

The Means-Fulton Iron Works will move its plant from Birmingham, Ala., to North Birmingham, 4 miles out. The company has begun work on a large plant at its side to do the heaviest kind of work.

The American Engineering Works, of Chicago, has received from its Australian agents an order from the Government of West Australia for a large number of steel cars, 20 cu. ft. capacity, equipped with Anaconda wheels and axles.

The Bethlehem Steel Company recently received a contract from the Russian Government for 2,000 tons of Krupp armor for 3 new Russian vessels "Alexander III.," "Orobino" and "Orel." The contract requires that the armor be delivered in 15 months.

The Richmond Locomotive Works recently received from the Finland State Railways an order for 12 16 by 24-in. 10-wheeled passenger locomotives. The contract price of this order aggregates upward of \$160,000. This is the third order for engines received by the Richmond Works from the Finland State Railways.

The Weber Gas and Gasoline Engine Company of Kansas City, Mo., reports the sale of a large hoisting plant to F. J. Mott of Denver to be placed on his property at Iron, Colo. Two car loads of gasoline engines have been received at the Denver headquarters of the company; also 2 cars at the Salt Lake office.

The Boston representatives of the Ingersoll-Sergeant Drill Company have sent to the Newfoundland Copper Constructing Company at Nipper's Harbor, N. F., a mining machinery outfit, comprising an air compressor, rock drills and the usual auxiliary equipment. Another order was for 3 compressors from a Barre, Vt., quarry.

Furnace B of the Edgar Thomson works of the Carnegie Steel Company, Braddock, Pa., has been blown out preparatory to being rebuilt. This stack is the oldest one at the plant, and has been making ferro-manganese and spegeleisen during the past few years, having a capacity of about 300 tons a day. This will be increased to 500 tons when rebuilt.

The Republic Iron and Steel Company is rushing work on its third blast furnace at Thomas, Ala., to complete it this year. The furnace will have the largest capacity of any in the State

when completed. The company is also constructing 400 new coke ovens at Thomas. Coal mines, limestone quarries and ore mines belonging to this company in Alabama are being enlarged.

Messrs. Charles H. Besly & Company, of Chicago, Ill., report that their general business is still good and that they are receiving many orders for Helmet oil and are now making shipments to Colorado, Dakota, Montana, California and other Western points. The firm has just received orders for 2 complete shop equipments to go to India, including lathes, chucks, drills, screw plates. Gardner die stocks, Helmet oil, etc., and is receiving many orders for Gardner grinders.

The meeting of the stockholders of the Pratt & Whitney Company for the purpose of acting on the proposition of the Niles-Bement-Pond Company for reorganization of the concern did not result in the accomplishment of anything, and the meeting was adjourned until August 16th. There was scarcely any opposition to the reorganization scheme, but only 16,910 shares, including 10,412 preferred and 6,498 common, were represented out of the total capital stock of 27,500 shares.

The M. C. Bullock Manufacturing Company of Chicago, Ill., states that it has just sold a diamond drill to the Government of Chile and another to the Government of Nova Scotia. Within 30 days the firm has sent diamond drills to Turkey, Japan, Spain, Chile and various parts of the United States. It also shipped a compressor and rock drill plant to the Sea of Azof, 2 mine ventilators to West Virginia, hoisting plants to the Black Hills, S. D., Mesabi Range, Minn., and the Illinois coal fields; a Willans engine to Massachusetts.

V. A. Kajevnikoff, Chief Engineer of the Mechanical Department of the Chinese Eastern Railroad, recently placed an order with the Hazard Wire Rope Company, of Wilkes-Barre, Pa., for \$3,500 worth of wire rope; with the Pedrick & Ayer Company, of Philadelphia, for a large traveling head-shaping machine, complete, with 2 tables; with the Crane Company, of Chicago, for several thousand feet of steam pipe and fittings; with the Laidlaw-Dunn-Gordon Company, of Cincinnati, O., for 4 car-loads of pumps, and with the Frank M. Pierce Engineering Company, of New York City, for 6 60-H. P. internally fired tubular portable boilers for the Rand Drill Company's air compressors and drill plants, recently mentioned in this column.

**TRADE CATALOGUES.**

The Insoloid Fuse Company of Denver, Colo., is sending out printed matter calling attention to the superior safety of "Insoloid" fuse as compared with ordinary double taped fuse, and its value in firing wet holes.

The Ericsson Telephone Company is sending out from its New York office descriptive pamphlets giving interesting information about various points relating to the Ericsson system. No. 4 tells about Ericsson metallic switchboards.

The Finlayson automatic aerial wire rope tramway for transporting coal, ore, timber, dirt, etc., is described in circulars sent out by the manufacturers, A. Leschen & Sons Rope Company, of St. Louis, Mo. This tramway, it is claimed, can be operated by 1 man, loads and unloads automatically and has a perfect grip clip.

Users of concrete can find interesting information in a 20-page pamphlet published by the Ransome & Smith Company of Brooklyn, N. Y., which describes Ransome's patent concrete mixers. These mixers are of 2 types, the drum and the continuous mixer. The drum mixer, which is described at length, is stated to be so built that it can be set up and put at work within 5 minutes of its arrival at any point. This mill is built in several sizes. With the 12 horse mill, it is claimed, 8 men can accurately measure, mix and deliver at side of mill material for 175 cu. yds. of concrete per day of 10 hours.

The California Portland Cement Company issues what it calls "a handbook of useful information for cement users." This is an attractive 34-page pamphlet telling about the company's Portland cement works near Colton, Cal., which are stated to have a capacity of 300 bbls. of cement, or 500 bbls. of lime, daily. Neat half-tone cuts show how the company's cement has been used in tunnel work, for the foundations of engines, in the construction of mills and other buildings, for making cement pipe, etc. The pamphlet will be found of interest by cement users, for it contains information about the proportion in concrete mixtures for various purposes, the amount of material needed, etc.

**MACHINERY AND SUPPLIES WANTED.**

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods of any kind, and shall be pleased to furnish them information, catalogues, etc.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, and have no pecuniary interest in buying and selling goods of any kind.

### GENERAL MINING NEWS.

#### ALABAMA.

##### Franklin County.

The Sloss-Sheffield Steel and Iron Company has purchased the brown iron ore lands worked by the Messrs. Adler Brothers, in the neighborhood of Russellville, in the northwestern part of the State. Russellville is not far from Sheffield and Florence, where the Sloss Company has some furnaces, and the ore is used at these works. It is reported that the company paid \$250,000 for the lands.

#### ALASKA.

United States Consul McCook at Dawson, N. W. T., says: "Favorable reports have been received here concerning Forty Mile mining camp. The Tanana district is creating quite a stir and dividing honors with the Koyukuk country. Men who have come from the Tanana claim they can get from 10 to 30c. of pay dirt to the pan, and, as they are working in summer diggings with only from 2 to 3 ft. to bed rock, it is as good as \$1 a pan where one has to go 25 ft. to bed rock. Many who left here with horses to take them overland from Fort Yukon to the Koyukuk found it hard work to cross the low, marshy country in that section, and, hearing of the good prospects in the Tanana, changed their course and went to the new find, which is about 125 miles from Circle City, directly south. Great dissatisfaction was expressed at Dawson this spring after the wash-up by miners who worked for men who leased mining claims from the owners. The laymen sign contracts to work so many feet of the claim during the season, the owner to receive 50% of the gold coming out of the claim, the lessee agreeing that all men working the property will be employed under a written contract, by which the men promise not to hold the claim in any way liable for their wages. It unfortunately has turned out in hundreds of cases that the cost of working the claims has taken more than 50% of the output, the lessees' share. The men employed on the claims have thus been deprived of the wages they expected. Laymen on rich claims do very well, but the majority of Klondike claims cannot be worked on a 50% basis with the current rate of wages."

##### Cape Nome.

The United States Treasury Department has caused a letter from a trustworthy correspondent to be published which gives the following particulars of the goldfields: "The only place where any gold is being taken out is between the beach and the tundra. There men are only making day's wages of from \$7 to \$10 a day.

"This place is only about ¼ of a mile long, and it is all taken up by about 500 men. It is now nearly all worked out. I, with thousands of others, had been led to believe that after a winter or after any storm the beach would be just as good as it was originally. That is not so. When once worked out, the beach there is done for. While at Nome I talked with men who had come from points as far as 50 miles below the camp. They told me they had found nothing, and they were going further north. I talked, too, with men who had come from points far up the beach, but they declared there was nothing up there, and they were going down the beach. So it seems that the whole stretch is nearly all worked out.

"Now, concerning the creeks, Anvil Creek is the richest. There is no wood in Nome, as there is in the Klondike, and coal is \$60 a ton on the beach, while the cost of re-freighting it over to the Anvil Creek is 12c. a pound. You can figure how rich the ground must be to stand such costs.

"No one estimates that more than 300 hands are at work on Anvil Creek, with as many more each on Snow, Glacier and Dexter Creeks, a total of perhaps 1,500 men. When I left on June 20th 20,000 men were in the district and the only work was in unloading or putting up new buildings. The former task kept about 500 men busy and the building employed about 300. Between 500 and 1,000 were arriving daily.

"There are far more destitute people at Nome than people on the outside know of. I know that the "San Blas" had steerage bunks numbered up to 390, and over 100 were in the cabin, while there were also about 20 stowaways. On the "Aberdeen" they told me that they had about 20 stowaways and no doubt every boat had a great many stowaways. I spoke to dozens of men, and they told me that they had no food, but expect to go to work when they reach Nome.

"A meal costs from \$1 to \$1.50, coffee and pie or three crullers 25c., a bed from \$2 to \$3, or

when you furnish your own blankets, from \$1 to \$1.50. Canned goods are 50c. a can, bread 25c. a loaf, fresh meats from 75c. to \$1 a lb., and other things in proportion. For water, the cost was 25c. for 4 buckets, and wood was nearly all gone except at a point several miles down the beach. Even the little to be found there was half rotten and water-soaked. Coal oil is \$7 a case, and lumber \$150 for dry and \$125 for green per 1,000. The water wells I saw were from 12 to 15 ft. deep and are sure to be contaminated by all of these people being huddled together. When I left there were tents 20 deep and about 3 miles long. There are no inducements for the steamship companies to send their vessels back again for a 'busted' mob. The way to tell a good camp is by the gold in circulation. In 8 days I saw only 1 man pay for a purchase with dust. When I asked him about it he said it was from the Klondike."

#### ARIZONA.

##### Cochise County.

Commonwealth.—The plans for the new mill at Pearce to replace the one destroyed by fire some weeks ago are now well under way, and R. A. F. Penrose, manager of the property, is in Denver, Colo., giving his personal attention to the preparation of the drafts. Men are at work clearing away the ruins and as soon as the specifications are finished the work on the machinery will commence, though it is not expected that it will be completed under 6 months. Few changes will be made in the construction of the mill, as it had been partially reconstructed only a short time before the fire.

##### Penal County.

(From an Occasional Correspondent.)

Golden Rule Copper Company.—This company is being organized in New York City and Yonkers, N. Y. According to statements of J. D. Burgess, who is to act as manager of the company's interests in Arizona, the property is situated on the north slope of the Santa Catalina Mountains. The development done shows a wide quartz vein carrying copper sulphides showing gold and silver values. The company contemplates opening the vein and putting up a concentrating plant.

Ray Copper Mines.—This company has temporarily closed down its plant near Riverside owing to the failure of the gasoline engines to give the power required to run the mill. Development work at the mine has been temporarily suspended as there is sufficient ground opened up, it is said, to run the present mill several years. It will probably only be a short time before the company is able to replace the engines.

#### CALIFORNIA.

##### Amador County.

(From Our Special Correspondent.)

In the vicinity of Jackson and Amador City there is considerable activity in mining. At the Oneida the water is out of the old shaft and the mill is rapidly nearing completion. Sinking still continues at the Peerless, the shaft now being down 330 ft. with a strong vein of good ore in the bottom. Work still progresses at the Argonaut notwithstanding the litigation with the Kennedy Company. Low grade ore is being milled at the Keystone at a profit. The ore shoots are extensive and the management can look forward to regular dividends. The underground work at the Bunker Hill is expected to develop good ore bodies.

##### Butte County.

(From Our Special Correspondent.)

Golden Trout.—The 3 compartment shaft at this mine on the South Fork of the Feather River, 4 miles from Lumpton, is down 125 ft. A ditch is to be built from the river, which will carry 2,000 miners' inches of water to be used to run the quartz mill, the sawmill and other machinery. More stamps are to be added soon.

##### Calaveras County.

(From Our Special Correspondent.)

Angels.—In the shaft below the 700-ft. level, an 18-in. vein of extremely rich ore has been struck. The property adjoins the Utica Mine on the north.

Golden Gate.—The shaft at this mine near Angels Camp, is down 75 ft. on a good ledge, said to mill \$11 per ton free gold and to carry high-grade sulphurets.

##### El Dorado County.

(From Our Special Correspondent.)

Omo.—The force of 8 men employed at this mine east from Fairplay, has been increased and work has started on a new tunnel near the level of the river that will tap the ledge at a depth of 1,200 ft. The vein in No. 3 tunnel will average about 5 ft. wide. The 10-stamp mill is crushing ore from this tunnel.

Ribbon Rock.—Sinking has been discontinued temporarily at this mine 2½ miles south from Placerville, but the drifts are being run from the 200-ft. level, both north and south on the ledge. The south drift is in 50 ft. and the north 20 ft., the entire face of the drifts being in good milling ore.

##### Kern County.

(From Our Special Correspondent.)

Randsburg District.—The Buckboard Mine will have a 10-stamp mill and a pipe line from Cuddeback Lake to the mine. The drift on the 300-ft. has opened up a good ore body.

##### Mono County.

(From Our Special Correspondent.)

Dunderberg.—At this mine at Coleville, 12 miles south from Bridgeport, a large vein of high-grade ore is said to have been developed. The property, which is opened up by a long tunnel and several hundred feet of drifts, is owned by an English company.

##### Nevada County.

(From Our Special Correspondent.)

The cyanide works at Pine Grove, used to work the Wilson tailings, has made the final clean-up and closed down. The plant is to be removed to Grass Valley, where the company has a lot of low-grade ore.

Champion Consolidated Gold Mining Company.—This company has begun to build a new sand plant below its mine on Deer Creek to work the mill tailings. These plants at other mines in this district have proved very successful.

Lone Star.—This mine, together with the Franklin and Goose-Neck mines, all of Willow Valley district, are being developed by Haskins & Eldridge, mining men, who recently returned from Mexico.

##### Placer County.

(From Our Special Correspondent.)

Mammoth Bar.—The working force of 30 men employed at this placer mine on Middle Fork of the American River, 5 miles east from Auburn, is to be increased to 60 men as soon as room can be made for them. The property is worked by hydraulic elevators. Electric lights are used at night.

Polar Star.—This drift and placer mine in Dutch Flat is tied up by an enjoinder suit brought by the County of Sutter, and an injunction has been issued by Judge Davis of Marysville, although the owner has complied with the law in regard to restraining dams and the Debris Commission has given a permit to hydraulic.

##### Shasta County.

(From Our Special Correspondent.)

The new bridge across the Sacramento River is now open for traffic, and from present indications is destined to be well patronized. The bridge is built on the Pratt truss pattern, with a 120-ft. span, and two 90-ft. end spans.

Bully Hill.—A strike is reported at these mines. A large body of copper ore being encountered in the lower tunnel, which is in 1,100 ft. This tunnel is 300 ft. below the other works and will open up an immense ore body.

Mountain Copper Company, Limited.—It is reported that this company is about to begin experiments with crude oil instead of wood as fuel at the smelters and the Ropp roasters.

Oro Fino.—A contract has been let to extend the 300-ft. tunnel 100 ft. further to the shaft, where a connection will be made 240 ft. below the surface. This property near Shasta, is owned by Behrens & Livesay.

##### Siskiyou County.

(From Our Special Correspondent.)

Greenhorn Blue Gravel No. 2.—Work on this drift mine south from Yreka is to start up again on a large scale. A larger pump will be installed.

##### Trinity County.

(From Our Special Correspondent.)

Loftus.—M. Cronin of Sacramento has purchased a ½ interest in this mine near Abrams, from T. J. Loftus. They are making preparations to put in 2 Huntington mills at once.

##### Tuolumne County.

(From Our Special Correspondent.)

Accident.—Work on this claim at Big Oak Flat, being the west extension of the Longfellow, has been resumed. Pay ore will probably be encountered very soon.

Blue & White Star.—These mines on the North Fork are being developed by a tunnel which is now in the mountain about 275 ft. The vein is said to average 10 ft. wide, carrying ore averaging \$9 per ton. The management intends to erect a mill soon.

Consolidated Eureka.—At this quartz mine at Carters stoping is being carried on between the 1,500 and 1,400-ft. levels of the Deadhorse claim. Fair grade ore is sent to the mill.

Gerrymander.—In the tunnel at this mine near Sonora, a 2½-ft. ledge of good ore has been uncovered. This tunnel is 500 ft. north of the old shaft.

Grizzly.—At this mine on the East Lode, the shaft is being sunk by contract from the 700 to the 800-ft. levels. The drift run from the 700-ft. encountered the old Grizzly shoot. The ore continues good.

Hampton.—A tunnel is being run 240 ft. to



crosscut the ledge at a depth of 300 ft. The mine is near Jeffersonville.

**Spring Gulch.**—The Arendt Brothers, who have 14 men employed, are working this property 2½ miles southeast from Carters, between Big Canyon and the North Fork of the Tuolumne River. The 6-stamp mill is crushing about 12 tons of ore per day. T. W. Willett is superintendent.

**Sunnyside.**—On the mountain slope on this property located one mile south from Marlow Diggings, a crosscut tunnel has been driven 175 ft. in giving about the same amount of backs. The drift now being run on the ledge shows 3 ft. of ore, which will average \$10 per ton free gold, besides 2% fair grade sulphurets. Baker Brothers of Carters are the owners.

#### COLORADO.

##### Boulder County.

**Bonanza.**—Sutton & Rose, who are working this mine under bond and lease, have had considerable difficulty in getting the water out of the shaft and are now driving the west drift on the 110-ft. level.

**Mogul Tunnel.**—This tunnel, at Eldora, is being driven steadily forward, and is now in almost 3,600 ft. J. A. Gillilan is manager.

**Revenge.**—This Eldora mine is working 2 shifts, and about a ton a day of high-grade ore is sacked. George Ticehurst and J. A. L. Campbell, of New York, visited the mine a few days ago.

**Terror.**—In the 120-ft. drift of this mine telluride ore, showing streaks of sylvanite, is being taken out.

**Village Belle.**—Two sets of leasers are working in this Eldora mine. Another shipment of ore has been made.

##### Gilpin County.

**Cook Gold Mining Company.**—This company has ordered an electric locomotor to haul ore cars from the Cook Mine through Bobtail and Bates Hill tunnels to the new 80-stamp mill at Black Hawk. The locomotor will have a capacity of 25 tons, and will be delivered some time in August. This will be the first electric locomotor introduced in the mines in the northern part of the State. A 25-ton machine has been in use for some time in the Revenue Tunnel of the Caroline Mining Company of Ouray. The big Camp Bird Mine of Ouray will introduce a 50-ton machine at an early day, and the Big Five combination at Ward, and the Mogul Tunnel at Eldora, Boulder County, are contemplating the introduction of electric haulage.

##### Lake County.

(From Our Special Correspondent.)

**Zinc Shipments.**—Jacobson & Company, of New York, make another zinc shipment this week of 1,500 tons of zinc ore and concentrates to Europe. Most of the stuff comes from the Maid & Henrietta.

**Benton Mining Company.**—T. S. Wood controls this company, which has begun operations in Adelaide Park and on the Park claim. A drift shows encouraging indications.

**Capitol Hill Mining Company.**—This new incorporation is to operate the down-town territory west of Harrison avenue and known as the Neusitz Placer. C. W. Dennison is at the head of the enterprise.

**Dinero.**—This property, in charge of C. E. Mulloy, is the biggest producer in the St. Kevin section at present. Six sets of lessees are at work. In the past the property paid dividends of \$800,000.

**Elva Elma.**—This Breece Hill property is to be developed by a company headed by Frank Williams. The new shaft is to be sunk to contact. Some excellent finds have been made in the old workings.

**Fortune.**—The big new plant of machinery will be in position August 5th. The shaft is now down 670 ft. and some very good ore is taken out. The present operators have a lease on the Fortune and Penfield mines, with a \$50,000 bond.

**Home Extension Company.**—This new concern going after the extension of the Home Mining Company ore shoots started work. A fine plant of machinery is to be purchased to take the place of the one put in for temporary use. Most of the stock of the company is held in Boston, but 60,000 shares at 25c. a share were sold here last week.

**Home Mining Company.**—Sinking the Penrose shaft 80 to 100 ft. is progressing satisfactorily. Shipments for the present will come from the Starr & Bon Air claims.

**Maid of Erin Silver Mines Company.**—Twenty-eight sets of sub-lessees are operating this territory and have increased shipments to 325 tons a day, the heaviest output in the history of the Leasing Company. A large portion of this is zinciferous ore.

**New Monarch Combination.**—Important new work is under way on all 3 claims of the company, while 75 tons a day of copper sulphides are coming from the Winnie shaft.

**Rose Bud.**—The operators of this Empire Gulch property report a strike of high-grade carbonate ore. The shaft is down 70 ft.

**Silver Moon.**—At 70 ft. in the new shaft a feeder to the main vein has been encountered which assays 1 oz. in gold and 28 oz. silver.

San Juan County.

(From Our Special Correspondent.)

**Big Ten.**—Russell & Airy have encountered a rich streak of petzite ore in a barren quartz vein at a depth of 165 ft.

**Crooke Tramway.**—The route for this tramway, to connect the North Star Mine with the railroad, is being surveyed and work will begin soon.

**Irene.**—Leasers shipped 24 tons of ore recently carrying 155 oz. silver, 13% copper and 21% lead.

**Little Annie.**—Lee & Paul have opened up a 2-ft. vein, carrying high values in gold and silver.

**Silver Lake.**—One of the new Heine safety boilers has been received for the Silver Lake power plant near Silverton, and 2 more will arrive shortly.

San Miguel County.

According to reports there is more activity in all the districts of this county than for years. In Gold King basin there are now more than 200 men at work, the greater number being employed by the Bessie, Gold King, Alta and Four Metals property. The same conditions are observable in Turkey Creek and Prospect basins, where large numbers of men are employed. The Suffolk properties give employment to about 25 men, and an increase in the mill now pending will result in a large increase of this force.

Teller County—Cripple Creek.

(From Our Special Correspondent.)

**The Eagle Ore Sampling Works,** between the Midland Terminal and the Florence & Cripple Creek railroad tracks, near Goldfield, will be ready to treat ore in a few days.

**Anaconda.**—The news of the reorganization of this company is welcome here. It has a capitalization of 2,000,000 shares, at \$1 a share, par value. Part of the new stock will be exchanged for old and part will probably go toward satisfying the company's debts. The officers are: Adolphus Zang, president; J. T. Milliken, vice-president; T. J. Campbell, secretary and manager; A. E. Carleton, treasurer; W. B. Milliken, D. Rubidge and Geo. Stahl, directors.

**Blue Chimes.**—W. S. Stratton has purchased this claim in Poverty Gulch and the Lonely Fractions on Bull Hill, from the Big Four Gold Mining Company; also the O. K. and New Zealand lodes, and portions of the Zenobia, Mollie McGuire, Favorite and Hidden Treasure lodes on Bull Hill; the purchase price being \$255,000.

**Bull Hill & Straub Mountain.**—The injunction suit between the stockholders and directors of the Bull Hill & Straub Mountain Company will likely be settled in a few days. The Woods Investment Company has purchased a controlling interest in the property.

**Cripple Creek Mining and Development Company.**—Mr. Stratton and others have organized this company, with a capital of \$10,000,000, to mine and operate in the Cripple Creek district.

The idea has gained prevalence that Geo. Milton's suit against Stratton's Independence Company (Limited) will not amount to much.

**First Chance.**—Heavy sulphide ore has been discovered on this claim on Mineral Hill. This is of interest, as nearly all the ore in the district is telluride.

**Independence Town and Mining Company.**—A compromise has been effected between this company and the Wilson Creek Mining and Milling Company, and a new company formed, known as the Independence Consolidated Gold Mining Company, in which shares were allotted the various interested parties. It is the intention of the new company to develop the property, which consists of about 47 acres of valuable ground.

Tremont County.

**Rocky Mountain Smelting and Refining Company.**—Howard Paschal of Chicago, formerly a prominent Butte attorney, is promoting this company of Chicago and Denver men, which is building a smeltery at Florence. The plant at first will consist of 2 furnaces, with a united capacity of from 550 to 600 tons of ore daily, but machinery, dust chambers and power will be installed for a plant of twice that size. The officers of the company are: Charles Foster of Ohio, president; William E. Johnston of Denver, Colo., 1st vice-president; A. H. Danforth, 2d vice-president; W. Kopfer, secretary; W. K. Johnson of Chicago, manager; Robert Billings, general ore purchasing agent; George E. Ross-Lewin of Cripple Creek, treasurer; Dr. Franklin R. Carpenter, consulting engineer and metallurgist, and Howard Paschal, keeper of records. The general offices will be in Denver, with a branch office in Florence.

#### IDAHO.

##### Custer County.

**Brown Bear.**—The sale of this group of copper-gold claims in the Blackbird district, 60 miles north of Challis, is reported. The Brown Bear vein is said to be 150 ft. wide, and developed to a depth of 200 ft., and a 150-ft. crosscut at the bottom of the shaft is said to show an average value of over \$15 in gold and copper. The gangue of the vein is impregnated with heavy sulphide and native copper. The property, it is reported, was sold for \$37,000 cash. The deal was put through by F. S. Wright, of Salmon City.

##### Idaho County.

**Big Buffalo.**—Charles Sweeney, of Spokane, who is a partner in the Buffalo Hump syndicate, has purchased a 5-drill compressor for the Big Buffalo Mine at Buffalo, from the Rand Drill Company and two 40-H. P. boilers. The plant will also be used in the development of the syndicate's other Buffalo Hump property, the Vesuvius. It is expected that the plant will be in operation within 25 days.

##### Owyhee County.

**Baxter Gulch Bonanza.**—This claim is being worked under bond by J. H. Hutchinson, who has men running a 400-ft. cross-cut tunnel to cut the Great Republic lode. The tunnel is now in 200 ft. Lewis Sorensen is in charge.

**De La Mar Mining Company.**—According to the detailed monthly report of manager D. B. Huntley the total amount of ore milled in June was 4,059 tons, which assayed \$9.81 gold and \$1.25 silver; the tailings assaying \$2.08 gold and 66c. silver. The cyanide product of the mill was \$34,110. The tailings plant treated 5,079 tons that assayed \$4.61 gold and \$1.32 silver before treatment and 83c. gold and 63c. silver after treatment, the cyanide product being \$22,530. The cost of operating the tailings plant was \$7,350. The estimated profit for the month is \$20,166.

**Red Jacket.**—This claim, near Silver City, is being opened by Sonneman & Branscombe, of Spokane. Some good ore is reported found.

##### Shoshone County.

**Thrasher & Company** have had their tailings plant near Wallace in partial operation to find what alterations are necessary. The most serious fault yet found is that the screens are too coarse. Two vanners are installed. Only 2 men will be needed to run the plant continuously and aside from their labor the running expense will be light, as there is no outlay except keeping the flume and tanks in repair.

**Morning Mining Company.**—The machinery for this company's air-compressor at the mouth of Grouse Gulch, near Mullan, is being delivered. The plant will be driven by 3 Pelton wheels, two 11-ft. and one 32-ft., the latter being the largest wheel of its class ever made, it is claimed. The 3 wheels will all be on the same shaft, the large one driven by the water from Boulder Creek and the smaller ones by the South Fork and Grouse Creek. The capacity of the plant will be 100 drills, and the compressed air will be converted to the mine by a pipe line 2½ miles long. For the present it will be carried over the mountain to the mine, although eventually it will enter the mine through the new 2-mile tunnel which is being driven from the mill level. A branch line will also furnish air for the tunnel during the time required to complete it.

#### MARYLAND.

The miners' strike in the Georges Creek district, on since April, during which the miners have lost \$1,000,000 in wages and the railroad companies nearly \$3,000,000 in freight traffic, was practically broken on August 1st. More than 1,200 men have gone to work and operations have been resumed in every mine in the region.

#### MICHIGAN.

##### Copper—Houghton County.

**Baltic.**—Captain Thomas Rawlins has resigned his position at this mine.

**Calumet & Hecla.**—A contract to build a large sand wheel has been awarded to the Messrs. Robert Poole & Son Company of Baltimore, Md. The wheel will be 65 ft. in diameter, and will revolve on a steel axle 5 ft. in diameter. Forming a part of the 30-ft. face of the wheel will be buckets to lift the sand and water.

The company has bought all the pine lands owned by the Shell Lake Lumber Company in Chippewa and Bruce counties, for \$650,000 cash. The deal includes a mill plant and docks at Shell Lake.

**Elm River.**—A new lode, about 1,000 ft. east of the Winona lode, has been located on this property.

**Franklin.**—It is stated that the sludge mill of T. G. Mays in operation on the Franklin sands has secured concentrates assaying 55% copper by passing the sands through the mill twice.

**Iron Mountain.**—This company recently let a

contract for 3,000,000 ft. of hemlock timber to John Phillips of Allouez.

**Tamarack.**—This company has begun work on a new steel rock and shaft house for No. 5 shaft adjoining the Whiting shaft of the Calumet & Hecla. It is expected the lode will be reached this coming fall. The dimensions of the rock house will be about 104 ft. by 62 ft. Eight huge rock crushers will be installed, which are to be run by a tandem compound Corliss condensing engine built by the Nordberg Manufacturing Company.

**Wolverine.**—This mine has received a cargo of 1,200 tons of coal.

#### Copper—Ontonagon County.

**Halliwell.**—A diamond drill is to be set up at this mine, in the Porcupine Mountain district. Last season this company did considerable exploring, exposing 2 veins, known as the Mass and the Butler veins, both containing considerable copper. The property is on sections 27 and 28, T. 51, R. 42, almost within a stone's throw of Lake Superior.

**Mass Consolidated.**—The contract for the construction of the stamp mill at Ogura, on Keeweenaw Bay, was let to the Wisconsin Bridge and Iron Works. The mill will accommodate 2 stamps, only one of which will be installed and will measure about 90 by 200 ft.

#### Iron—Marquette Range.

**Riverside.**—The Oliver Iron Company has decided to begin sinking at this mine, 6 miles west from Republic. Ever since work has resumed there some months ago operations were confined to installing new machinery, clearing up the workings and exploring underground. Two diamond drills have been operated there the past 3 or 4 months, which are to be removed. Both shafts are to be sunk; one is now 156 ft. deep and the other 211 ft. The old drifts do not show up enough ore to warrant further development without sinking.

#### MINNESOTA.

(From Our Special Correspondent.)

The State has come to the conclusion that the Duluth & Iron Range road has dallied over the selection of its land grant, and has given it till September 1st to clean up its selections. The road has delayed a long time, and has in some cases been able to select lands much more to its satisfaction than before developments had shown the value of surrounding lots.

There has been a drop in miners' wages and unskilled men now average about \$1.75, and miners to correspond. At this the pay is better than for years, the past few months excepted. There will be employment this winter to most all the men likely to be in the region.

Shipments will show an increase over last year to August 1st of about 1,100,000 tons from Minnesota mines. The Duluth & Iron Range is about 250,000 tons ahead of last year, with a total of 1,850,000 tons. The Duluth, Missabe & Northern has not shipped so much as during June, when it made a record-breaking movement of 607,000 tons. There is plenty of lake tonnage, in spite of the idleness of the Rockefeller fleet.

Explorations are now under way on the Mesabi as follows: By E. J. Longyear, 12 drills; E. F. Sweeney, 6; Cole & McDonald, 15; Chandler Iron Company, 9; and Minnesota Iron Company, several more. Six of the Chandler drills are in 58-20; several of the contract and Minnesota company drills are in 59-14.

#### Iron—Mesabi Range.

(From Our Special Correspondent.)

Geo. C. Howe, who has been exploring for a year or more in the n w of the n w of section 25, T. 58, R. 17, has decided to open a mine there. He has a lease on a favorable royalty and minimum from Pettit & Robinson, of Minneapolis, and has shown up about 1,500,000 tons of good coarse ore, chiefly Bessemer. A station called Bender has been established at the mine, which is half-way between Weimar and McKinley.

In the same neighborhood as the Howe, E. C. Garlick, of Cleveland, has been exploring for a long time, and has found ore. Some of the members of the Bivabik Mining Company are interested with him. A little more than 2 miles southwest of the Howe location G. A. St. Clair has begun work and will ship ore this year. His property is close to the Genoa in section 33, T. 58, R. 17.

Messrs. Fay, Chisholm and Mitchell have opened a find of coarse Bessemer ore in section 28, T. 58, R. 20, which they have under lease.

The village of Sharon is being built on the south part of the mining location of the Sharon Steel Company in T. 58, R. 19, surrounded by some of the finest ore bodies of the range.

**American Mining Company.**—This company has begun stripping part of its Sauntry ore body, ½ mile southeast of the present opening, and will mine there by steam shovel. The ore is higher in iron and lower in phosphorus than where shipments have been made. All stripping will be done by the company.

**Chandler Iron Company.**—This company has been working a 160-acre tract on sections 22, 23 and 27, T. 58, R. 20, owned by P. H. Rahilly of Lake City, and has opened a fine ore body. It has about 15,000,000 tons of a Bessemer ore, coarse and granular, under some 100 ft. of surface, and will be one of the best mines of the range. The original lessees from Rahilly get \$150,000 as a bonus. The lease is for 35 years, at 20c. a ton royalty, and 100,000 tons minimum output. The Duluth & Iron Range will probably be extended to the location, though it is 15 miles away and on 2 other roads.

**Clark Iron Company.**—At this mine the shaft is but 72 ft. deep, and from No. 1 are crosscuts running 110 and 80 ft., with 5 drifts from these latter varying from 20 to 300 ft. The mine is rapidly being opened into a large property.

**Colonial Mining Company.**—This company will ship about 150,000 tons this year from the Kanawha and Hale, and the associated Roberts will ship 50,000 more. Colonial has sent out 75,000 tons already.

**Fay.**—Fire last week destroyed all the surface improvements but the shaft-house. The mine will ship nothing this year.

**Malta Iron Company.**—This company has commenced shipments from stockpile.

**Minnesota Iron Company.**—This company is sinking a shaft at the new finds in T. 59, R. 14. The company has been extending the explorations of Moon, Vivian et al. there, and has found much more ore than they showed up.

Other explorations in the same sections, by Kinney, Shannon and others, are discovering ore of good quality, both chemically and physically.

#### MISSOURI.

##### Jasper County.

(From Our Special Correspondent.)

**Joplin Ore Market.**—There was a great improvement in the ore market last week over the previous week and a large quantity of high-grade zinc ore sold for \$28 per ton, while all lower grade ores were in demand at much better prices. There is no surplus ore on hand, all the ore bins having been cleaned out by the buyers. The Edgar Zinc Company and the Illinois Zinc Company were the heaviest purchasers, picking up all the ore they could get at the advanced prices. The indications are favorable for a continuation of good prices and it is believed that there will be a further advance. Lead was unchanged, selling at \$21.75 per 1,000 lbs. all the week. Following is the turn-in by camps of the Joplin district for the week ending Saturday, July 28, 1900:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin.....	1,936,840	417,350	\$35,899
Galena.....	1,722,280	132,950	24,421
Cartersville.....	1,130,680	320,690	21,671
Carthage.....	293,080	.....	3,298
Oronogo.....	806,850	5,620	11,120
Webb City.....	345,830	54,290	5,494
Belleville.....	409,640	5,730	5,653
Aurora.....	900,210	18,940	9,850
Central City.....	113,660	2,870	1,427
Neck City.....	2 6,030	.....	3,051
South Jackson.....	123,490	8,060	1,637
Alba.....	12,000	.....	1,425
Granby.....	334,170	10,200	4,100
Cave Springs.....	65,900	.....	824
Springfield.....	88,000	.....	.....
District total.....	8,874,470	982,760	\$134,047
Total 30 weeks....	281,711,050	32,684,770	\$4,538,470

During the corresponding week last year top grade zinc ore sold for \$45 per ton and lead at \$27.50 per 1,000 lbs. The lead sales were less than last week by 95,850 lbs., the zinc sales greater by 2,894,870 lbs. and the value greater by \$118,963. For the corresponding 30 weeks of last year the lead sales were less than this year by 5,615,360 lbs., the zinc sales greater by 23,840,010 lbs., and the value greater by \$1,745,555. As compared with the previous week the sales show an increase of 1,077,300 lbs. of zinc and 96,800 lbs. of lead and \$19,920 in value.

Transactions in mines and mineral lands continue light, but the Zinc-Lead Company of America has completed the last of its preliminary work of organization and have some of the finest properties in the district signed up for its \$8,000,000 company. Mr. W. Morgan Robbins, the consulting engineer of the company, left Saturday night for Chicago and the east to confer with the fiscal agents of the company. It is said that two of the largest trust companies in the country will finance the new organization.

#### MONTANA.

##### Broadwater County.

C. K. Cole, of Helena; William Ulm, James Anderson and Thomas Hudson, of Toston, owners of some lignite mines, have bonded them to a company, of which Samuel Gebo, of Carbon County, is the organizer and general manager. This company is to sink on the large vein of lignite 500 ft., and run levels 1,000 ft. A steam hoist, boiler and pump are in use. The old shaft is down on the incline some 200 ft. and has about 35 ft. of water in the bottom. As soon as this water is pumped out about 12 men will be put

at work. James Anderson is superintendent in charge of the work.

**Diamond R.**—At this Neihart mill the work of concentrating the Moulton dump goes on and over 10 cars of concentrates have been shipped to the smelter. Bins for concentrates are being erected at the side of the Montana Central track sufficiently large to allow the concentrates to dry before shipment. An additional Wilfley table has been put in the mill, making 8 in all. The company is considering the addition of machinery. The hoist is being fitted up with a view to opening the mine. It is said that a railway will be run from the lower tunnel of the Broadwater to the concentrator. The railway will be about 4,000 ft. long.

##### Flathead County.

According to newspaper reports, H. T. Vaughan and Henry Greenwell of Libby, while running a tunnel through a gravel bar on Libby Creek to develop a quartz ledge which they owned on the hillside, discovered the bed of an old channel, which upon investigation proved to be very rich in gold. Several large nuggets were taken from the ground, and from tests made it is estimated that the ground assayed about \$1 per cu. yd.

##### Choteau County.

**Mission Peak Mining Company.**—This Grafton, N. D., company was organized by H. W. Dickey, E. G. Bjornby, J. L. Torkelson, Olaf Peterson and H. O. Christianson of Kalispell, and John H. Frame and N. J. Johnson of Grafton, N. D., to do a general mining and milling business in the Little Rockies. The company has taken up its bond on the Gold Bug and Gold Boy group of free milling gold mines and is preparing to work them by putting in a stamp mill and working the tailings by cyanide process. A large bed of lignite coal within 6 miles of their mill site will be opened for fuel. The company also proposes to dam Rock Creek Canyon at a convenient point above Landusky for water supply. The mines are developed by about 1,400 ft. of shaft and tunnel and show up free milling ore of comparatively low grade, with occasional narrow strings of rich rock. The only other mine actively worked at Landusky is the Alabama group, owned by Higgins & Bielenberg of Deer Lodge, who are working 15 to 20 men.

##### Gallatin County.

**Chestnut.**—This mine, owned by Johnson & McCarthy, is at present producing from 125 to 150 tons of coal per day, a large portion of which is taken by the Montana Ore Purchasing Company. The mine is worked through a tunnel, but work will start soon on a double compartment shaft, a distance of 250 ft. This shaft will be sunk on the vein, and will greatly facilitate in working the property.

##### Lewis & Clarke County.

**Peck Concentrator.**—This plant at East Helena recently contracted to treat 40,000 tons of ore from a Butte mine, it is said.

##### Meagher County.

**North Pacific.**—This mine near Copperopolis is owned by W. W. McDowell. In the stopes men are drifting in opposite directions on the 310 level and have a continuous shoot of copper glance ore 2 ft. thick for 60 or 70 ft. Teams are transporting this to Martinsdale, from whence it is shipped to Butte and thence to Anaconda. In the meantime the work of sinking the main shaft from 350 to 550 ft. is progressing.

##### Madison County.

**Lake Shore Mining Company.**—This company, of which E. L. Shafner of Cleveland, O., is president, is opening a body of free milling gold ore at the head of the north fork of Wisconsin Creek. An air compressor and machine drills have recently been purchased and are being erected at the mine.

##### Silver Bow County.

**Anaconda.**—This company has entirely done away with the old wooden ore cars for hauling ore from Butte to Anaconda, putting in large steel cars. The old cars had a capacity of 30 tons each and about 65 were used in a train, carrying a total of 1,980 tons. Now 55 steel cars will form a train, carrying a total of 2,750 tons of ore. The cars were made especially for the company at Pittsburg, Pa. They are light, yet very strong.

**Gagnon.**—This mine, at Butte, has closed down. The Butte papers give varying reasons, owing to the present condition of Montana politics. One paper asserts the shut-down is a political move, another that much needed repairs, which have for some time been contemplated in the shaft, have necessitated the temporary suspension of work. The shaft is being retimbered and many other improvements will be made. The shaft is now down over 1,800 ft. and has been giving employment to nearly 300 men. The superintendent, William Word, states that the suspension of work will not affect the smelter, there being now several thousand tons of ore stored at the Colorado smelter.

**Sioux Chief.**—At this mine, near Butte, a new Ingersoll & Sergeant 5-drill air compressor has

been installed and a new 80-H. P. boiler. A No. 9 Cameron pump has been placed in the 300-ft. level and pumps on an average 100 gals. per minute. The Chief shaft is down over 300 ft., but will not go down further until the management has explored the ground at the depth attained. B. I. Baldwin, the foreman, has 17 men at work.

**Smokehouse.**—Work on this lode in the heart of the city of Butte has stopped until more powerful machinery is put in. The location is one of the oldest in Butte, but indications were so poor that little development work was done until last year. James Murray, Pat Mullins, W. McWhite and John Noyes incorporated in Spokane a stock company under the name of the Smokehouse Copper Mining Company, securing also the Destroying Angel and Copper Bottom claims adjoining. In all the company owns nearly 55 acres, the owners being paid in stock of the company. The 4 incorporators took individual option on all the stock and sold the option to Alex Tarbet of Salt Lake, and Mrs. Lulu Largy of Butte. The consideration was \$300,000, \$25,000 being paid down, \$50,000 to be paid down March 1st, \$50,000 June 1st and the balance on December 1st this year. Bernard Noon is trustee, the stock being held by him in escrow. The work has been pushed as rapidly as possible, but water has hampered progress. An electric pump has proved inadequate. The shaft is below the 200-ft. level and will continue to at least the 500-ft. level.

The lead cut at the 200-ft. level is said to resemble the vein of the Blue Jay. W. W. Wishon, superintendent, is also superintendent of the Speculator and Ramsdell-Parrot mines. Cyrus Bell is foreman. There has only been room to employ 25 men so far. Alex Tarbet has just ordered a 50-H. P. plant.

#### NEW HAMPSHIRE.

##### Grafton County.

**Newfound Mica Mining Company.**—This company recently organized at Bristol with Chas. F. Rice as manager, is working a "vein" of mica about 30 ft. wide. The vein filling is largely feldspar and smoky quartz with some beryl and a small vein of iron pyrite that is said to carry gold. The company is producing 1,000 to 2,000 lbs. of mica in the rough per day.

This is stated to yield about 6% of sheets cut 2 by 3 in. or larger. About 15 or 20% of the mica is suitable for cutting segments and washers for electrical work. The waste mica is said to sell for \$18@25 per ton; the sheet mica is stated to bring 35c.@6¢ per lb., according to size of sheets.

#### NEW MEXICO.

##### Donna Ana County.

**Bruce Profit** has struck a large lead of fine galena just east of the post-office at Organ.

**Modoc.**—Thousands of tons of concentrating ores are on the dump at this mine at Organ. Mundell & Casad are drilling down the gulch about 3,500 ft. below the mine, where, if sufficient water is developed, the company will erect the mill and connect it with their mine by a cable tram.

**Torpedo.**—In this mine at Organ, 5 ft. of ore has been struck in a drift. Ore bins are being built at the south shaft.

##### Grant County.

**New Mexico Development Company.**—This company has decided to shut down the Bragaw Potter properties at Hanover, as the development work has shown the property to be not as good as expected.

##### Lincoln County.

**Old Abe.**—This mine at White Oaks is reported to be shipping some very high grade gold ore from a pocket recently struck.

##### Santa Fe County.

**Santa Fe Copper Company.**—The new smelter of this company above San Pedro is taking form and work is progressing satisfactorily. It will be ready to blow in shortly after the first of September. The company is building a road to shorten the distance to the mines. The company will employ about 300 men after the smelter is blown in.

#### NEW YORK.

##### Livingston County.

**Retsof Salt Company.**—The miners at this company's salt mine near Genesee recently organized a union and are now out on a strike for higher wages and recognition of the union.

#### OREGON.

##### Baker County.

Of the mines about Sumpter and Baker City the Golconda is putting in 10 more stamps and the Columbia has just closed a contract with the Risdon Iron Works of San Francisco for 10 additional stamps, which will soon be shipped.

**Bunker Hill.**—Capt. C. H. Thompson, recently sold 2/3 of this group, which is the extension of the Golconda, for \$50,000, and a 1/3 interest in the stock. Arrangements have been made to put on an air compressor and hoisting plant and

men will soon be developing the property. John F. Penhale and associates from Montreal were among the purchasers. Captain Thompson was instrumental in bringing about the consolidation consisting of this and the Gold Boy group, consisting of 7 claims which join the Bonanza Mine. F. J. Conroy and some Pittsburg capitalists, who are heavily interested in this district, are associated with Captain Thompson in this enterprise. A contract has been let to run a 200-ft. tunnel and three 8-hour shifts will be employed. Captain Thompson's headquarters are in Baker City.

**California.**—E. F. Warner and D. L. Killen, of Spokane, have bonded this mine in Cable Cove, which is the oldest location in the district. It was located and worked 23 years ago, and ore was shipped from it running \$80 per ton in gold. Owing to partnership disputes it shut down 2 years ago. Warner & Killen have a bond for one year and have let a contract to drive a tunnel 700 ft. to cut the vein.

**Columbia.**—This mine, one of the big producers of the Cable Cove District, recently closed a contract with the Risdon Iron Works of San Francisco for 14 more Johnson concentrators and 10 more stamps. This will give the Columbia a battery of 20 stamps and 16 concentrators.

**Ibex.**—J. J. Hennessy and his partner, John Halberg, of Port Clifton, have purchased the south extension of the Ibex property owned by Simcoe Chapman and some Detroit people. They have run a tunnel 150 ft. and tapped the lead at 85 ft. deep, showing 12 ft. of ore, which runs from \$1 to \$12 per ton.

**Red Boy.**—This mine has the foundations for the new shaft-house and hoisting plant ready to accommodate a main building 45 by 200 ft., besides leaving room for smaller buildings and a shaft 7 by 17 ft., with 3 compartments. The engines, hoists, pumps, air compressors and complete equipment have been purchased of Fraser & Chalmers in Chicago and will soon be in place on the ground. The 20 stamps and the cyanide plant are handling about 60 tons of \$13 ore every 24 hours. The new shaft will be sunk 1,500 ft.

##### Union County.

**Cornucopia.**—P. J. Cirkel, mine manager for J. E. Searles, of New York City, is to put in electric power at this mine. A flume 1 mile long has been built to convey the water to operate 500-H. P. Pelton wheels, which will furnish power for 4 electric motors to run air compressors, the mill and electric hoist. A cyanide plant is also being installed to reduce the tailings. The electric plant is furnished by the General Electric Company and is now on the ground. Mr. Cirkel will visit the Yellow Jacket and other mines belonging to the Searles interest en route to the Cornucopia mines.

#### PENNSYLVANIA.

##### Anthracite Coal.

**Labor Troubles.**—The situation at the Delaware & Hudson mines about Scranton and at Olyphant, where a shutdown has resulted by reason of a strike of the runners and drivers, shows no change. The officials of the Delaware & Hudson have laid off all workmen not on strike other than those absolutely needed to look after the breaker and mines and keep the fans running. It is also stated that the company, fearing it cannot fill several large orders, has turned them over to the Delaware, Lackawanna & Western Company, and rush orders have been given by the latter to get the Cayuga, Holden and other breakers undergoing repairs into immediate operation. The company's mines about Wilkes Barre continue in full operation.

**Delaware, Lackawanna & Western.**—The miners employed by this company about Scranton and in the Wyoming Valley have, it is stated, started to form an organization that shall be independent of the United Mine Workers, the union to contain only actual employees of the company. This action is stated to be due to two causes. The anthracite mining companies, though always ready to deal directly with their men in any dispute about wages, have steadily refused to have dealings with outside parties, particularly with men from the soft coal regions, who are ignorant of conditions in the anthracite fields. Again, the miners themselves are reported distrustful of the intentions of the United Mine Workers, the officials of this organization being miners of soft coal. A strike in the anthracite fields would give another opportunity for soft coal to replace anthracite. Hence the men feel that independent action is more likely to bring them satisfactory results.

**Jermyn & Company.**—The strike in progress at this company's 2 collieries at Rendham near Scranton has been settled and work has been resumed. About 900 men and boys are employed at the 2 plants.

**Philadelphia & Reading Coal, Iron and Railroad Company.**—This company is tearing down its old Locust Gap breaker at Ashland, which was built in 1872 and rebuilt in 1876.

Miners from the anthracite region are still leaving for the bituminous fields in the western part of the State.

#### Bituminous Coal.

**John Kerr, of Greensburg,** has bought 50,000 acres of land in the south end of Washington County and a part of Green County. The purchase is reported to be made for the Monongahela River Coal and Coke Company and the price paid for the land is put at \$1,000,000.

**The Harbison-Walker Company, of Pittsburg,** has purchased the tract of coal underlying the Bentley estate, at Courtney, 3 miles below Monongahela. A pit mouth is being located and the plans for the works marked out. The company expect to employ between 75 and 100 men at once, and mine later 500 tons of coal per day for its own use.

**Continental Coke Company.**—This company is at work on its No. 1 plant. This will be the third works of the company on its large tract of coal lands, No. 2 plant being located 2 miles west and No. 3 west of Walnut Hill. Each of the three works will comprise 400 ovens and be thoroughly equipped.

**Shamrock Coal Company.**—This company has been organized with A. C. Gruber, of Williamsport, Md., as president and treasurer, to develop a tract of 185 acres in Somerset County, on the Somerset & Cambria branch of the Baltimore & Ohio, 50 miles above Cumberland. The company is working an 8-ft. vein.

(From Our Special Correspondent.)

A train of 26 cars of coke was recently shipped from Lemont over the Baltimore & Ohio Railroad to Sparrows Point, Md., destined for Germany. It was a special order and is the first coke the H. C. Frick Coke Company has sent to Germany for several years. The price was higher than the quoted prices ruling the coke market in the United States, but the coke is said to be the finest ever produced in the Connellsville region.

A great many farmers living in Fayette County have realized the mistake they made in selling their coal land years ago. An acre of good coal land is supposed to make 12,000 tons of coke. With coke selling at \$2 a ton, this would amount to \$24,000. While the cost of mining, manufacturing and shipping is necessarily large, there is still a large profit.

**Plummer.**—There is very little coal left in this mine at Davidson works. The Frick company has only a few men working there now, and gets all the coal for the ovens from Davidson shaft.

**Stuart Coal and Coke Company.**—This company will open its new mines on the Somerset & Cambria Railroad, and will call the new town, which is about 1 mile from Dull station, Sturart.

**Washington Coal and Coke Company.**—This company has now 1,000 men on its pay-rolls. They ship 200 cars of coal and coke daily. Star Junction is one of the model plants of the Connellsville region.

#### SOUTH DAKOTA.

##### Custer County.

(From Our Special Correspondent.)

**Black Hills Porcelain, Clay and Marble Company.**—B. R. Noble, of Yale, president, Fred Wellington secretary and treasurer, of Detroit, and 4 other Michigan men are at Custer. The Burlington Railway Company has sent surveyors to run a railway line from Custer to the quarries, 5 miles. This road will possibly be continued to the Spokane Mine, Iron Mountain and thence to Keystone. An expert on lithograph stone is to take charge of the company's quarries west of Custer.

**Chillecot.**—Milwaukee people are working this property east of Custer. The vein is 18 in. wide.

**Daily.**—This mica mine, west of Custer, has been sold to Grady & Dickinson, of Custer, and a steam plant is being installed. A good quality of mica is shown in the old workings.

**Mayflower.**—A shaft is being sunk on the Mayflower claim by F. C. Graydon, manager of the Chicago Mica Company.

**Newark.**—George Jackson, of Deadwood, is developing this old mine west of Custer. A shaft is being sunk on a 4-ft. quartz vein.

**North Star.**—This old mine is being developed by the North Star Mining Company, of Omaha, Neb. The shaft, now 270 ft. deep, will be sunk to the 300-ft. and a crosscut run to the vein. The North Star is close to the old Penobscot Mine, which, it is reported, has been sold to Denver parties.

##### Lawrence County.

(From Our Special Correspondent.)

**Hardin.**—James Hardin, one of the principal promoters of the Hardin mining companies in Two Bit, has left for Chicago to consolidate the 5 Hardin companies in one strong company. During the Two Bit boom, several thousand acres of farming land were purchased on Red Water, a few miles north of Deadwood. The company proposes to erect smelting works and a cyanide plant there and treat ore from Two Bit camp. The Original Hardin Mine is shipping steadily to the Deadwood smelter.

**Detroit & Deadwood Company.**—The new cyanide plant on Annie creek, at the head of Spearfish canyon, is ready to treat ore.

**Homestake Company.**—The company has hung up a number of stamps on account of the scarcity of water. The water supply of the company is drawn by the people of Lead and Deadwood for domestic purposes. The company is rushing work on its ditch from the headwaters of Spearfish Creek.

**Reddy.**—Shipments of ore are being made from this mine in the North Lead District, owned by B. E. Salmon & Son, of Lead.

Pennington County.

(From Our Special Correspondent.)

**Benedict.**—The owners of this mine, in Hornblende Camp, are erecting a mill. A steam hoist is up and a shaft will be sunk 300 ft. James Cochran, at old Myersville, is running a 30-ton Huntington Mill 10 hours per day. He has a 100-ft. vein of free milling ore, 15 ft. of which carries about \$10 per ton gold.

The new electro-chlorination plant at Mystic, erected by Prof. F. H. Long, of Chicago, is running on ore from mines around the plant and from the Bald Mountain District, in Lawrence County.

**Sherman Placer.**—J. C. Sherman, associated with New York City people, is working a placer mine on Rapid River, 7 miles below Pactola. He employs 50 men. It is 30 ft. to bedrock. A steam shovel is being put in. The gravel is now hoisted to the sluice-box by an endless chain. It is said to carry about 50c. per cu. yd. The company owns about 6,000 ft. of river bed.

UTAH.

(From Our Special Correspondent.)

**Bullion and Ore Shipments.**—During the week of July 28th there were sent forward from the different smelteries 16 cars, or 745,579 lbs., lead-silver bullion; 8 cars, or 417,985 lbs., copper bullion. In the same week there were shipped from the different camps for treatment at smelteries outside of the State, 86 cars, or 3,263,480 lbs., lead, gold and silver ores and 16 cars, or 664,600 lbs., copper ore.

**Bingham Copper and Gold Smeltery.**—The excavation is finished, as is the masonry. There will be 3 stacks and the minimum capacity will be 300 tons ore per diem. The structural steel is arriving and Manager Nutting says the plant will certainly be in commission before the close of the year.

**Marketing Cyaniding Products.**—It is an open secret that the Salt Lake branch of the Argentine plant of the American Smelting and Refining Company, which makes a specialty of handling the product from cyaniding mills throughout the inter-mountain region, will shortly be closed. Outside of the Mercur, about 2,000 ozs. gold are contained in the cyanides marketed each month at Salt Lake, and the American Smelting and Refining Company has decided that the business does not warrant maintaining the Argentine branch. Several concerns are figuring for this business.

Juab County.

(From Our Special Correspondent.)

**Tintic Shipments.**—In the week ending July 27th there were sent out from the 3 rail points of the district 1 bar of bullion, 95 cars of ore and 5 cars of concentrate, credited as follows: Centennial-Eureka, 29 cars; Mammoth, 1 bar bullion, 17 cars ore; Gemini, 9 cars; Grand Central, 8 cars; Bullion-Beck, 7 cars; Swansea, 6 cars; Ajax, 4 cars; South Swansea, 4 cars; Godiva, 3 cars; Tlatic Iron, 3 cars; Carissa, 2 cars; Alaska, 1 car; Showers, 1 car; Sunbeam, 1 car. Eureka Hill sent out 5 cars of concentrates.

**Ajax.**—Shaft is down to 900 station. Ore shipments are maintained on the basis of past few months.

**Alaska.**—In past fortnight 2 cars of ore were marketed, which showed paying values in silver and copper. Superintendent Talbert expects to make larger shipments soon.

**Centennial-Eureka.**—A strike started a few days ago over the mine boarding house, presided over by a Chinaman. Superintendent Allen discharged 4 men for boisterous conduct and 50 others refused to go to work. The next day more men quit and a general protest was made at the price charged for board, \$1 per diem, and the lack of accommodations. Sympathy of the town is with the men. Matters, probably, will be adjusted shortly.

**Lilly.**—J. W. McIntosh has just secured a year's lease and it is reported that operations will begin at once. The property has been tied up by litigation and the announcement that this is settled is good news.

Salt Lake County.

(From Our Special Correspondent.)

**Boston Consolidated.**—A report is current that the concentrating plant for the copper porphyry is soon to be built. At the Salt Lake office it is said nothing is known on this head. On the Old Stewart ground 3% copper is being opened.

**Fortune.**—The mill is turning out a good smelter product of 21% lead, 11 ozs. silver and 60c. gold, with about 25% excess iron. There is a large tonnage of crude material.

**Last Chance.**—It is said that a sale is consummated to Chicago parties for \$75,000 and that C. J. Hodge will be here early in August, when the property will be turned over to the new owners.

Summit County.

(From Our Special Correspondent.)

**Daly-West.**—Shipments are not crowded in the hope that lead will soon rule higher, but exploration goes ahead and the reserves are being augmented.

**Ontario.**—An inquirer asks if there is any reason at the mines for stopping the dividend. Apparently not. The Marsac Mill is affording 60,000 ozs. fine silver each month, while the ore shipments to the smelters aggregate 500 tons or over per month.

**Park City Shipments.**—In the week ending July 28th the total smelter products sent from the camp was 3,305,040 lbs., which was made up as follows: Silver King, crude, 1,063,600 lbs., concentrates 271,230 lbs.; Daly-West, crude, 453,460 lbs., concentrates 805,940 lbs.; Anchor, concentrates, 407,710 lbs.; Ontario, crude, 303,100 lbs.

Tooele County.

**Consolidated Mercur.**—The new company will begin its career August 1st. It is planned to treat 900 tons daily at the De La Mar mill and the Mercur plant at Manning will probably run on tails for a considerable period. The office of the company will be at the De La Mar quarters at Salt Lake, and Mr. Cohn will be the manager-in-chief.

**Chloride Point.**—Mill is reported as doing cleaner work than at any time in its career. In fact, the outlook appears brighter than for several months.

**Daisy.**—The last hope of the receiver doing anything for the shareholders is dissipated. Next in order is foreclosure proceedings and the sale of the property.

**Sunshine.**—A surprise was caused by the action of C. H. Jacobs in having a receiver appointed, on the averment that company interests were jeopardized by the Overland management. It is alleged that some of the best ore put through Overland Mill was mined from Sunshine territory. Some of the claims against Sunshine are said to be illegal. A move is on foot to start operations.

WYOMING.

Carbon County.

**Black Eagle and Black Tiger.**—These groups were recently bought by Chicago companies. The vein widens from 2½ ft. from where first encountered to more than 5 ft. in the bottom of the shaft. Good assays in gold have been taken from the Tiger vein, as well as considerable in copper.

**Boston-Wyoming Smelter, Power and Light Company.**—This company, which proposes to erect a smelter at Grand Encampment, has contracted for 2 pipe lines from the north and south forks of Grand Encampment Creek. These lines will bring water sufficient not only for supplying the smelter, but for domestic use in the town. One line will be 2½-3 miles long, with a fall of 196 ft., and the other 1½ miles long, with a fall of 153 ft.

**Kurtz-Chatterton.**—This tunnel is now in about 1,600 ft. and has cut 6 veins, with a large amount of high-grade ore in sight. The Crescent group, adjoining the Kurtz-Chatterton on the east, has opened 2 of the Kurtz veins by trenching. A shaft is to be sunk 100 ft. and crosscuts driven so that both veins can be worked through the shaft.

**Newsboy.**—This mine is pushing work and has opened the vein for a distance of 4,500 ft., with 6 prospect shafts sunk to depths of from 10 to 20 ft., and the Morning Star, which endlines with the Newsboy, has opened the same vein for a distance of 600 ft.

**Rudefeha.**—This Encampment mine is sending out an average of a carload per day from Wolcott station, on the Denver & Rio Grande Railroad, which runs from 30 to 35% pure copper.

Work on the smelter buildings will begin soon. A site of 55 acres has been secured on the east side of town. The smelter will be modeled after the plant at Argo, Colo. It is expected that the smelter will be ready some time in November.

## FOREIGN MINING NEWS.

AUSTRALASIA.

New South Wales.

**Broken Hill Proprietary Company.**—The statements for the half-year ending June 30th show a profit of £96,191 (\$480,955); net assets, £428,211 (\$2,141,055); credit balance, £573,654 (\$2,868,270). There has been expended in construction during this period £31,725 (\$158,625). The continued reduced output was due largely to the non-delivery

of the briquetting machines until the end of April.

New Zealand.

(From Our Special Correspondent.)

The value of the gold exported from New Zealand during May was £110,860 (\$554,330), which is an increase of £10,699 (\$53,495) over the corresponding month of 1899. The total returns for the first 5 months of 1900 show, however, a decrease in value of £28,757 (\$143,785) as compared with the same period of 1899.

**Hauraki Goldfield.**—During the 4 weeks ending July 5th the value of the output of this field was £50,712 (\$253,560), an increase of £12,862 (\$64,310) over the previous month. The largest producers were: Waihi, £21,244 (\$106,220) from 8,004 tons; Waitekauri, £9,081 (\$45,405) from 3,111 tons; N. Z. Crown, £5,788 (\$28,940) from 2,772 tons; N. Z. Talisman, £2,897 (\$14,485) from 870 tons; Kauri Freehold, £2,512 (\$12,560) from 1,707 tons; Tararu Creek, £1,530 (\$7,650) from 1,850 tons; May Queen, £1,219 (\$6,095) from 808 tons; Whangamata Corporation, £1,041 (\$5,205) from 750 tons.

**Hauraki Goldfield.**—During the 4 weeks ending June 7th the output of this field was £37,850 (\$189,250), which is a decrease on the previous month's yield and much below the average. The principal contributors were: Waihi, with £21,545 (\$107,725) from 7,444 tons; N. Z. Crown, £5,996 (\$29,980) from 2,927 tons; N. Z. Talisman, £2,640 (\$13,200) from 793 tons; Kauri Freehold, £1,680 (\$8,400) from 1,916 tons; May Queen, £1,073 (\$5,365) from 562 tons.

**Dredging.**—During the 4 weeks ending May 28th the published returns of the Otago dredges show that 3,742 oz. of gold were won by 31 dredges, a weekly average of 30 oz. per dredge.

**Otago Dredging Field.**—During the 4 weeks ending June 25th the returns have shown an upward tendency, owing to the Molyneux River beginning to fall to its winter level. During the month, however, the river was still on an average 2 ft. above the normal winter level. The published returns show that 4,872 oz. of gold were obtained, the weekly average per dredge being 38 oz. The Junction Electric Dredge at Cromwell was the largest producer, winning in two consecutive weeks 428½ oz. and 336 oz.

The figures given exhibit dredging in rather too favorable a light, for poor returns are sometimes not published and a number of dredges are always laid up for repairs. On the other hand, many privately owned dredges with lucrative returns do not publish their results.

**West Coast Goldfield.**—During April the Progress Mines Company treated 4,732 tons by battery amalgamation and chlorination of the concentrates for £7,994 (\$39,970). This is the only mine in New Zealand using any form of the chlorination process.

CANADA.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

**Progress of Boundary Division.**—According to official statistics there were expended in the mineral development of the Boundary Creek district since it was opened up the sum of \$4,040,000, and in railway construction by the Canadian Pacific Railway Company the sum of \$7,000,000. Building improvements not included in the foregoing were made to the extent of \$375,000. Statistics as to mining machinery and cost are wanting. The amount of development work done in the various camps comprising the district is given as follows: Deadwood, 15,500 ft.; Greenwood, 15,500 ft.; Summit, 5,800 ft.; Wellington, 6,000 ft.; Central, 7,400 ft.; Long Lake, 2,400 ft.; Smith, 1,600 ft.; Skylark & Prudence, 2,000 ft. Prospecting and miscellaneous, 5,000 ft. Total, 61,200 ft. The quantity of ore shipped to smelters from these camps were 15,000 tons valued at \$375,000.

**Rossland Ore Shipments.**—For the 6 months and 26 days ending July 26th the output of ore from Rossland mines and shipped to smelters amounted to 85,000 tons.

**Centre Star.**—The work of setting up the machinery of the new 40-drill compressor is nearly complete. The surface has been much improved of late in appearance. Everything is now looking well.

**I. X. L.**—The management has entered into a contract with the owners of the Midnight by which a tunnel is to be run through a portion of that claim. This tunnel will intercept the main ledge below tunnel No. 3. When this is completed a winze will be sunk.

**Le Roi.**—The new shaft is completed, except a portion of the timbering. It is to be deepened 100 ft. to the 900-ft. The management is shipping from 4,000 to 4,500 tons weekly.

**Rathmullen.**—The reorganized company has been registered as the Rathmullen Mines, Limited, with a capital of \$750,000, being 3,000,000 shares at 25c. each. Under the reconstruction holders of shares in the old company are entitled to claim as a right an allotment of share in the new company with 25c. credited as paid thereon for each share held in the old company. The transfer is limited to August 10th. L. H. Moffatt has been appointed liquidator.

EUROPE.

Great Britain.

Smelting Corporation, Limited.—The following circular to shareholders was issued from the London office, under date of July 14th: "The directors have much pleasure in reporting to the shareholders that their process for treating mixed sulphide ores of lead, zinc, silver, etc., is now in complete operation at the Stanlow Works, Ellesmere Port. The process makes a full and satisfactory separation of the zinc from the lead, silver, gold, etc., and the recovery of metals, especially in silver and lead, promises to exceed the original estimates. On the ore already smelted the recovery of lead and silver is higher than was realized at the works at Llansamlet. The recovery of zinc has already reached upward of 60% and is improving; the directors have every reason to believe that the 70% originally promised will shortly be attained.

"In starting new works of nearly every description some initial mechanical difficulties are invariably experienced before all the various parts of the plant work satisfactorily. This has been the case at Ellesmere Port, but the difficulties have been purely mechanical, and not such as to affect the soundness of the process. Owing to this, and to the very great rise in the value of coal and all other smelting materials, the working costs have hitherto been in excess of the estimates made at the beginning of 1898; but as important savings are being effected in sundry directions, your directors believe that eventually the working costs will exceed but little, if at all, the original estimates. The rise of £3 a ton in the price of lead during the last 12 months has greatly increased the value of the corporation's stock of ore, the benefits of which are being received in the weekly sales.

"The directors have no hesitation in assuring the shareholders that the important and difficult problem of treating mixed sulphide ores which has created so much interest in metallurgical circles for years past, has been completely and satisfactorily solved by the process which is owned by the Smelting Corporation. During the last few weeks an enquiry has been received from a well-known and experienced smelter in the United States as to the directors' willingness to sell or lease the patent for that country, where large deposits of rich sulphide ores have long been awaiting a satisfactory process for their successful treatment. Since the shareholders' meeting in December, the United Alkali Company have satisfied themselves that the electrolytic process is completely successful, and plant for testing it on a commercial scale is now being proceeded with. In one way or other this should prove a valuable asset of the corporation."

MEXICO.

San Luis Potosi.

La Paz.—A terrible disaster is reported at this mine in the town of Matabuela, south of the city of Monterey. Fire broke out and many of the miners were entombed and either burned to death or suffocated. The fire raged fiercely for several hours. Eleven bodies have been taken out, and others are known to be in the pit. It is thought the loss of life will reach 30. When the fire was discovered Ramon Gomez, the foreman, boldly descended the shaft and went into the burning chamber for the purpose of aiding the unfortunate miners. He was overcome by smoke and perished. His body has been recovered.

Sinaloa.

(From an Occasional Correspondent.)

Boston & Sinaloa Mining Company.—This company, in which Boston capital is interested, has opened its placer ground near Sinaloa and is ready for work after the rainy season. The ground is a creek bottom and cannot be worked while the rains are on. The gravel is stated to carry high values, some patches of ground near being reported to go as high as \$25 per cu. yd. The ground will be worked by pumps. Timber for sluices is brought from San Francisco and packed inland on mules 100 miles, making it cost \$100 per M. at the mines. The climate for 9 months in this district is good, during the other 3 months the weather is hot and wet. W. S. Fisk has charge of operations for the Boston & Sinaloa Company.

SOUTH AMERICA.

British Guiana.

The gold mined in June, on which royalty was paid, was 9,487 oz., which compares with 10,290 oz. last year; showing a decrease of 803 oz., or 7.8%, this year.

COAL TRADE REVIEW.

New York. August 3.  
Anthracite.

The anthracite trade shows no change of moment anywhere. The official figures for the June output are 4,676,850 tons. The July output prob-

ably exceeded the estimated \$3,500,000 tons considerably. This tonnage is heavy for the season, but the prospect of possible labor troubles at the collieries just when fall buying is starting is a good reason for the companies maintaining a liberal output and preparing for any emergency.

Trade at the head of the Lakes and in Chicago territory continues quiet. The docks at Superior and Duluth are well filled, receipts to date being the heaviest recorded for any year yet, while the movement of coal to interior towns is very light. In Chicago territory there is little improvement yet, though the volume of business is probably nearly if not quite as good as a year ago. At the lower lake ports there is very little change in conditions. That "midsummer dullness" with which the coal dealer is so familiar still prevails along the Atlantic seaboard. Trade at New York may have a little firmer tone than for the last few weeks, but at Boston and Philadelphia there is little doing. What coal is changing hands is at practically the prices prevailing before July 1st.

The probabilities of a general strike at the collieries increase. Much depends on the action taken by the miners at the Hazleton convention on August 13th. It is evident that there will be strong influences brought to bear to get the labor organizers to advocate radical measures.

The list prices for free-burning anthracite f. o. b. New York Harbor are egg, \$3.75; broken and nut, \$4.

Notes of the Week.

The Schuylkill Coal Exchange states that its drawn-to-return rate for stove coal sold in July was \$2.41 and the rate of wages for the last half of July and first half of August is consequently 3% below the \$2.50 basis.

Bituminous.

The Atlantic seaboard soft coal trade is, if anything, in better shape than a week ago. There is an increasing demand for the higher-grade coals and this demand for good coal has an effect on prices for the poorer grades. Big consumers, such as railroads, are storing quantities of coal where they can pick it up at prices to suit them. This buying for storage so far has been principally at points beyond Cape Cod. Along Long Island Sound trade is fair; at New York Harbor generally quiet, though active in spots. All-rail trade shows a small demand.

The Georges Creek strike is apparently about at an end. On August 2d about 60% of the men employed at the various mines had returned to work on the basis of the terms offered by the operators and it is now believed that the region will be working to full capacity next week. Operators are reported to anticipate a good demand for Georges Creek coal during the balance of the year at full prices. The strike has lasted since April 11th.

Transportation from mines to tide is slow. Car supply at the collieries is not good. The railroads are throwing further restrictions around shippers at tidewater points and are carrying on an active crusade against dilatory shippers, watching shipments closely.

In the coastwise vessel market vessels are in good supply, with coal rather scarce. We quote current rates from Philadelphia as follows: Boston, Salem and Portland, 65@70c.; Providence, New Bedford and the Sound, 60@65c.; Bath, 70c.; Portsmouth and Bangor, 75c.; Wareham and Lynn, 80c.; Gardner, 80c. and towages; Newburyport, 80@85c.; Dover, \$1 and towages; Saco, 90c. and towages.

We quote Clearfield coal at \$2.35 and \$2.65 f. o. b. New York Harbor ports; other standard grades at \$2.25@2.50 at farther lower ports.

Notes of the Week.

According to a dispatch from Newport News, Va., within a short time over 40,000 tons of New River coal will be exported from there for use in foreign countries. The Chesapeake & Ohio Railroad has in sight, under contract, 10 steamships, all of which will take large cargoes of coal for foreign consumption—in mills, on railroads or aboard warships. The British steamship 'Chumleigh' will sail for Alexandria, Egypt, with 6,200 tons, the largest foreign cargo of coal ever shipped out of the Virginia Capes. Other ships will follow in short order for various foreign ports, some going as far as China.

Birmingham, Ala. July 30.

(From Our Special Correspondent.)

The output at the coal mines in Alabama continues at a very high mark. All the companies operating mines have orders on hand for their product and a fairly good price is still being obtained.

The Republic Iron and Steel Company is enlarging the mines at Warner, in Jefferson County, and employment is being given to a large number of men applying there now. The veins of coal being worked at Warner are large and the miners are to be given steady employment right along. It is the intention of the company to increase the output at its mines both at Warner and at Sayreton, a few miles from War-

ner, so that it will not be necessary to purchase a single ton of coal for its own use. This company has three furnaces at Thomas, a large number of coke ovens at the same place and rolling mills in Birmingham and at Gate City. The Tennessee Coal, Iron and Railroad Company is increasing its production in coal also. The mines at Henry Ellen, in the northern part of the county, which were leased to the McNamara Brothers, are now being worked by the company itself. All of the Tennessee Company mines at Pratt City, Blue Creek and Blocton are being worked to their fullest capacities. The Sloss-Sheffield Steel and Iron Company, the Alabama Consolidated Iron Company, the Woodward Iron Company and other large concerns which use great quantities of coal and have mines of their own, are leaving nothing undone to increase their capacity of producing.

Chicago. July 31.

(From Our Special Correspondent.)

Anthracite Coal.—There has been but little demand for anthracite coal during the week, sales having been few and the aggregate tonnage about as small as any week so far this year. The usual mid-summer dullness is on and this year aggravated somewhat by the recent advance all around of 25c. per ton in hard coal. The receipts of anthracite coal via lake and rail are fairly large, but are smaller than last year. Chestnut coal appears to be again rather a scarce article. Circular prices are: Grate, \$5.25; egg, stove and nut, \$5.50.

Bituminous coal is not in much demand just now, most concerns having stocked up. Some coal for railroad use is being sold from week to week and manufacturing lines are buying in a small way. The receipts of soft coal are again very much heavier than sales and the recent stiffening in soft coal prices is not maintained.

Cleveland, O. July 31.

(From Our Special Correspondent.)

The movement of coal is slower up the lakes now that it has been at any time this season. The shippers have been held back by the condition of the docks in the upper lake region and what coal is now going is moved very largely by the contract tonnage. This keeps the movement down. The Northern railroads, it seems, have not been giving the consignees at the upper ports the amount of rolling stock that is necessary with which to move the coal away from the docks, with the result that they are getting badly congested. The condition prevails on both Lake Michigan and Lake Superior. The movement to Lake Superior has been a little heavier than to Lake Michigan, if anything. So far no change has been made in the carrying rates, although it is more than likely that before the end of the week the Lake Superior rate will have dropped 5c. The market, therefore, is very weak and the vessel owners are petitioners for cargoes, while the shippers dictate terms. The movement of coal from the mines to the lakes has been fairly heavy this week.

Pittsburg. Aug. 1.

(From Our Special Correspondent.)

Coal.—All the mines in the district continue in full operation and there is no complaint of a shortage of cars. The supply is keeping up well and but for a lack of miners more coal would be shipped. The Pittsburg & Baltimore Coal Company is about to develop its 3,000-acre coal tract in Westmoreland County adjoining the Pittsburg District. The contest with the Pennsylvania Company over the ownership of the Youghiogeny Railroad has been settled by the Pennsylvania Company agreeing to allow the Baltimore & Ohio Railroad Company to extend the Herminie & Hempfield branch to the Youghiogeny Railroad. This will give the coal company an outlet for its coal. Tipples are to be built and improvements made that will cost about \$100,000. It is expected that the daily output will be 2,000 tons before the close of the year. A rise in the rivers permitted the Monongahela River Consolidated Coal and Coke Company to ship 1,500,000 bu. of coal to the Southern markets during the week. A number of tow-boats with empties returned from the South and there is a good supply of empty coal boats and barges at the mines. There is still about 10,000,000 bu. of coal loaded and ready to go out on the next rise.

Connellsville Coke.—There was a drop in both production and shipment of Connellsville coke during the week. The price of furnace coke remains at \$2 a ton and producers declare it will go no lower. A consumer was in the market this week offering \$1.75 a ton and claims he will be able to get coke at that price within a week. Foundry coke is quoted at \$2.25@2.50. The production last week was 165,468 tons, a decrease of 3,593 tons compared with the previous week. Of the 20,420 ovens in the region, 16,106 were active and 4,314 idle. The shipments aggregated 7,816 cars, distributed as follows: To Pittsburg and river tipples, 2,847 cars; to points west of Pittsburg, 3,732 cars; to points east of Connellsville, 1,237 cars. This was a decrease of 864 cars compared with the preceding week.

SLATE TRADE REVIEW.

New York. August 3.

The orders are small and in many cases are being booked at a discount from the schedule below. Labor troubles in building lines curtail purchases, especially of roofing slate, though the mill stock people also complain. Prices on the whole are unsettled and one cannot say when they will reach rock bottom. Middlemen meet keen opposition by producers, who, owing to the cut prices, are in many instances seeking orders themselves to save commissions. On the other hand, production is far less than last year and stocks are comparatively small, notably in the desirable sizes of roofing slate.

The exports of slate through the ports of New York in the six months ending June 30th were as below, comparison being made with last year:

Table with columns for Month, Roofing (Sq. Yds., Value, Mfrs.), and Mfrs. (Value). Rows include January through June and Totals.

The roofing slate shipments show a decrease of 55,171 squares, or 63%, from last year, and the mill stock \$8,796, or 16%.

The distribution of these exports is as follows:

Table with columns for Countries, 1899, 1900, and Changes. Rows include United Kingdom, Australasia, Denmark, Germany, Norway, Belgium, India, Africa, South America, W. I. C. Am. & Mex., and All other.

Totals \$469,595 \$299,894 D. \$259,701

The heaviest falling off is noted in the exports to Great Britain, amounting to 64%.

The list of prices per square for No. 1 slate standard brand f. o. b. at quarries in carload lots, is given below:

Table with columns for Size, Inches, Monson or Br'ville, Bangor, Bangor Ribbon, Alb'n, of Jackson, Bangor, Lehigh, Peach Bottom, Sen Gr'n, Unf'd & Green, and Red.

A square of slate is 100 sq. ft. as laid on the roof.

IRON MARKET REVIEW.

NEW YORK, Aug. 3, 1900

Pig Iron Production and Furnaces in Blast.

Table with columns for Fuel used, Week ending (Aug. 4, 1899, Aug. 3, 1900), and From (Jan., '99, Jan., '00). Rows include An'racite & Coke, Charcoal, and Totals.

The iron market is still a declining one, though there are signs that prices are getting near the bottom. The Chicago conference of steel makers resulted in nothing, as might have been expected, considering all the varying interests involved. Another conference is to be held in New York, but it will probably have the same result—or rather lack of result.

Meantime buying is improving, as manufacturers' stocks of raw material get low. There is a large business in sight, though buyers naturally take now only what they are obliged to have, and do not want to place any contracts ahead.

Export inquiries continue numerous and some business is resulting, with the prospect of more. There is a good deal of talk about steel rail prices. The rail men, however, have evidently

made up their minds not to talk about future prices until they have worked off the large orders now on hand.

Birmingham, Ala. July 30.

(From Our Special Correspondent.)

The quietness which has prevailed in the pig iron market in this district for the last four weeks now, continues. The furnacemen are, however, sanguine that these conditions cannot prevail much longer. The local demand is somewhat quieter. The export movement continues fairly well, but it is far from making up for the loss in the domestic and local markets. The steel plant at Ensley is quiet and other plants in the local district are either running on short orders or are quiet altogether.

The fires in the Trussville Furnace are banked and because of litigation now on it is possible this furnace will blow out. All other furnaces, with the exception of one of the Alice furnaces, belonging to the Tennessee Coal, Iron and Railroad Company, located in the city, are in full blast and the output is keeping up well. There is an accumulation of iron, but so far none of it is going to the Warrant yards. The litigation started by the Trussville Furnace, Mining and Manufacturing Company, through its agent, H. W. Perry, against Rogers, Brown & Co., of Cincinnati, will prove of much interest in the iron world. According to the claim of the Furnace Company, Rogers, Brown & Co. contracted to take the output of the furnace until January 1st, 1901, up to 100 tons per day. The firm desires to cancel the order, claiming that the Furnace Company had previously broken the contract in not supplying the different grades in proportion. The Furnace Company began the litigation by garnishment process and about \$75,000 worth of iron belonging to Rogers, Brown & Company in various parts of the State was tied up on a claim of damages to the amount of \$100,000. Failing to make the required amount of bond, the garnishments were released a few days afterward and the suit will have to take its regular course.

The following quotations are given: No. 1 foundry, \$15; No. 2 foundry, \$14@14.50; No. 3 foundry, \$13.50@14; No. 4 foundry, \$13; gray forge, \$12.50; No. 1 soft, \$15; No. 2 soft, \$14@14.50.

Chicago. July 31.

(From Our Special Correspondent.)

Pig Iron.—Possible labor troubles in foundries and the fact that this is mid-summer has had a tendency toward lessening demand for pig iron, the sales of iron during the week having been wholly in small lots. Iron for resale purposes is gradually growing smaller in quantity and it is likely that such iron will be entirely out of the market in a few weeks. Very little inquiry for delivery ahead is being received, a few contracts having been closed for small quantities as far ahead as September. The tendency is to wait and evidently consumers anticipate a further decrease in prices. Prevailing quotations are: Lake Superior charcoal, \$22@23; local coke foundry No. 1, \$18.50@19; No. 2, \$17.50@18; No. 3, \$17@17.50; local Scotch foundry No. 1, \$18.50@19; No. 2, \$17.50@18; No. 3, \$17@17.50; Southern coke No. 1, \$18.10@18.85; No. 2, \$17.60@18.35; No. 3, \$16.60@17.35; Southern No. 1 soft, \$18.10@18.35; No. 2 soft, \$17.60@18.35; Jackson County silverites, \$26.35@27.35; malleable Bessemer, \$19@20; coke Bessemer, \$21@21.50.

Cleveland, O. July 31.

(From Our Special Correspondent.)

Iron Ore.—The transportation market is very weak just now. Heretofore a differential has existed between Buffalo and Cleveland, but now boats are being placed for both ports at the same rate. The Cleveland rate has not been lowered, but the change is a reduction on Buffalo. Most of the stuff that is being brought down the lakes is carried by contract tonnage, although there are a few cargoes that are placed now and then from Escanaba and Marquette. On these old rates have been applied but the owners sought the cargoes rather than the cargoes hunting the boats. Since the price of ore has been established on delivery for the last half of this year the business in sales has increased slightly. Offsetting this is the fact that a number of furnaces are going out of blast, but this condition will not affect the amount of ore that is to be brought down the lakes, to any extent. The shippers and the sales agents are looking for a brisk fall business.

Pig Iron.—Business is picking up steadily. Sales have been made in new quarters this week showing that some of the foundries which had iron have run short and must supply their needs. There is a tendency also to do business for the future. Some inquiries have been made on stuff to be shipped the latter part of the year. The increased demand for finished material is making an increased demand for pig iron, but the mills are selling some from stock now, as they are slightly ahead on their pig iron. Small furnaces which were blown in when the price was high find that they cannot live when pig iron

is selling at \$16.50 and \$16, such as Nos. 1 and 2 now are. They are therefore closing down.

Finished Materials.—This has been a very busy week with the mills. The sales in all grades have been heavy, especially in beams and channels. The price quoted is 1.90c., which is the figure agreed upon recently, and the business is so heavy that the mills do not look for any effort to be made to break them. The trade seems to think that the market has settled at that figure and is doing business both for present needs and for the future. The sales this week have been heavy. On angles there is a slightly different story. The price has held firm at 1.80c. The mills outside of the agreement have quoted a lower price than that made by the standard mills, but the others have ignored it. On plates and bars, and especially the latter, there was a break in the price. Plates are quoted as low as 1.15c. and bars have gone as low as 1c. The standard mills, however, refused to do business on that basis, hence the sales have been limited. Billets are being quoted at \$21.50, but it is said that sales have been made at a much lower figure than that.

Philadelphia. August 2.

(From Our Special Correspondent.)

Pig Iron.—The little improvement in buying that has been noticed since Monday is due to the covering of absolute necessities. There is no further weakness in the better grades of iron, but the poorer brands are offered at 25c. less. The market is both dull and weak. Large ordering is not thought of. The chief inquiry is for No. 2 and Forge. The prospective lockout by the Republic Iron and Steel Company in order to sustain the old wage scale means a long idleness of from 36 to 40 mills. In view of this possibility, forge iron makers were asked to-day for bottom prices on forge for immediate delivery. About \$15 is the price for good iron No. 2, and \$16 is asked; for No. 1 \$18 is wanted.

Billets.—Some business has been closed this week in billets, but the buyers refuse to give any information. The Bessemer Company, of Danville, decided virtually on Monday to go out of business by authorizing the board of directors to sell all or part of the plant. Billets are supposed to be worth \$22, but less money will buy them.

Bars.—The action announced by the Republic Iron and Steel Company means fight. The eastern mills will promptly take advantage of the situation. Already two or three inquiries are received. Buyers are in no shape to stand a cut-off of bar iron. Quotations are 1.25@1.35c. Some interesting developments are near at hand.

Skelp.—There is skelp selling somewhere, but our eastern mill managers have not been able to get their share.

Sheets.—The stores have begun to do a fair business and mill managers say their capacity will be kept busy this fall, but that prices will be in buyers' favor. All sheet mill products will be in moderate request. Some export business is under consideration.

Merchant Steel.—The enlarging consumption in the West and the reported placing of a few large orders at Pittsburg has aroused some large consumers in the East.

Plates.—Plates are weak, owing to rather sharp competition for what little business is offering. The small shop and boiler plate demand will be active. Tank plates are steadier. The opinion is gaining ground that the plate mills are close to bottom prices.

Structural Material.—The managers give a very good account of business taken from day to day, and also speak favorably of export possibilities. The bridge builders have a very large amount of railroad work on hand, much of which will not be done until mid-winter in the Northwest, when they will have ice for a foundation.

Steel Rails.—This branch of the steel trade is very foggy and steel rail makers are unusually non-committal. The mills have so much high-priced business on hand that they can afford to be indifferent to what those prospective buyers do who think that rails ought to be lower. Until this high-priced work is nearly cleared up it is not likely the rail makers will listen to reason.

Old Rails.—Old rail supplies are not as large as they were with new rails at \$35. Buyers are not disposed to buy at present.

Scrap.—Heavy steel scrap and railroad scrap are stronger under orders from certain large buyers to fill up their scrap yards.

Pittsburg. August 1.

(From Our Special Correspondent.)

The expectations of an improved iron and steel market were not realized, the Chicago meeting not having brought about the desired result. The leading steel interests and representatives of the Bessemer Furnace Association met and discussed the situation for two days, but nothing was accomplished. The proposition of the steel interests that the association furnaces be closed for a period of one month in order to curtail production was opposed by the furnacemen. It is reported that they were will-

ing to suspend operations provided the steel companies closed a like number of furnaces. As an agreement could not be reached at this meeting the market continues to be an open one. Prices this week are not quite as firm and sales in some of the finished lines were made at bottom figures. Arrangements are now being made which will likely be completed this week that will bring the iron and steel interests together again next week. It is announced that a meeting is to be held in New York and that plans to hold the market will be proposed. The Standard Oil Company has placed an order with Jones & Laughlins, Limited, for 5,000 tons of tank plate. The price is said to be about \$100,000. The Carnegie Company has secured a contract with the Russian Government for 1,000 tons of armor plate at \$560 a ton, to be delivered within the next 14 months. Russia owns an armor plate plant of its own which cost \$10,000,000, yet this is the fourth order it has placed with the Carnegie Company. All the independent iron concerns in the Pittsburgh District have signed the Amalgamated Association wage scale and are in full operation this week. It is believed that the Republic Iron and Steel Company and the American Steel Hoop Company, the two combinations that are resisting the demands of the workers' organization, will ask for a conference and make another effort to adjust the scale. The conference committee of the Amalgamated Association has been given discretionary power in the tin-plate scale and there seems to be no doubt that with some concessions on the part of the workers a satisfactory agreement can be reached. The bi-monthly examination of the sales sheets of the American Sheet Steel Company were made during the week and it was found that the average of the sales for May and June did not exceed 3c. This is the base of the scale and as the average selling price is not higher the wages of the workers will remain unchanged during the month of July and August. An average is taken under the agreement of the sales of Nos. 26, 27 and 28 gauges. The result of the examination would indicate that while the combination is quoting sheets above the 3c. figure that some sales have been made at a lower rate. Not more than 25% of the sheet mills of the country are in operation and stocks are going down.

It is reported to-day, but I have not been able to confirm the report, that the American Steel Hoop Company has cut the price of bars to 90c. a hundred and that Jones & Laughlins have made a further cut to 87 1/2c.

Pig Iron.—Prices are weaker and only a few small sales were made. Bessemer pig iron is quoted this week at \$16.50@17, Pittsburgh; No. 2 foundry at \$15.50@16; gray forge at \$14.50@15.

Steel.—Only a few small sales of Bessemer steel billets are recorded this week. They were for immediate delivery and the price named was \$19 at the maker's mill. It is reported, but not authentically, that Bessemer billets could be had as low as \$17. Open-heart billets are quoted at \$20. Steel bars are 1@1.10c., and tank plate 1.10@1.15c.

Sheets.—There is no change in quotations this week. The American Sheet Steel Company has made no announcement of a departure from last week's figures, which were 3.10c. for No. 27 and 3.20c. for No. 28 gauge.

Ferro-manganese.—Prices remain the same as last week—\$5 for large lots and \$100 for small quantities.

New York. August 2.

The local iron market is growing steadier, but prices are not settled yet. In foreign trade we note shipments of \$35,000 worth of iron pipe, \$27,000 of steel rails, \$11,072 worth of engines and boilers and \$10,000 worth of bridge material for Japan; shipments of \$43,000 worth of railroad material, \$15,000 worth of agricultural implements and \$10,000 worth of pumping machinery to South Africa; shipments of \$25,000 of electrical machinery, \$10,000 worth of railroad supplies and \$15,000 worth of manufactured iron to Argentina and shipments of \$25,000 worth of bridge material to Mexico.

Pig Iron.—Local business continues very light. There is increasing inquiry from abroad, with the prospect of heavy export sales when cotton shipments begin. We quote for Northern irons, tidewater delivery: No. 1 X foundry, \$17.25 @ \$17.50; No. 2 X, \$16 @ \$16.50; No. 2 plain, \$16 @ \$15.50; gray forge, \$14 @ \$14.75. For Southern irons on dock, New York: No. 1 foundry, \$18.75 @ \$19.25 No. 2, \$17.50 @ \$18; No. 3, \$16 @ \$16.50; No. 1 soft, \$18.75 @ \$19.25; No. 2, \$17.50 @ \$18.

Bar Iron.—Demand remains rather light and the market is hardly firm yet. Common bars are quoted at 1.30c. for large lots on dock; refined bars, 1.40c.

Plates.—Eastern mills continue to stand pat at about 1.35c. Western Pennsylvania mills are after tonnage in the East and have named some pretty low prices. Buying is pretty active for this season of the year. We quote for large lots at tidewater: Tank, 1/2-in. and heavier, 1.35c.; tank, 3/16-in., 1.45c.; shell, 1.50c.; flange, 1.60c.; marine, 2.10c.; universals, 1.35c.

Structural Material.—Prices are firmly held and demand holds up well. We quote in large lots at tidewater: Beams, 2.10c.; channels, 2.10c.; angles, 2c.; tees, 2.15c.; zebs, 2.10c.

Steel Rails and Rail Fastenings.—Prices at Eastern mills are still unchanged. Mills will dispose of work in hand before naming new prices. We continue to quote: \$35 f. o. b. Eastern mills. Smaller rails are quoted: 12-lb., \$40; 16-lb., \$40; 20-lb., \$40; 30-lb. to 40-lb., \$38; \$40-lb. to standard, \$36, with the usual advance for small orders. We quote angle bars, 2.20c.; fish plates, 2.15c.; spikes, 2.20c.; bolts, 3.20c.

METAL MARKET.

NEW YORK. Aug. 4.

Gold and Silver.

Gold and Silver Exports and Imports At all United States ports in June and year.

Table with columns: Metal, June (1899, 1900), Year (1899, 1900). Rows include GOLD, SILVER, Exports, Imports, Excess.

This statement includes the exports and imports at all United States ports, the figures being furnished by the Treasury Department.

Gold and Silver Exports and Imports, New York For the week ending August 3d, 1900, and for years from January 1st, 1900, 1899, 1898, 1897.

Table with columns: Pe-riod, Gold (Exports, Imports), Silver (Exports, Imports), Total Excess, Exp. or Imp. Rows include We'k, 1900., 1899., 1898., 1897.

Gold exports went to the West Indies; silver chiefly to London. Gold imports were in small parcels from various ports; silver imports were from the West Indies and Mexico.

The United States Assay Office in New York reports the total receipts of silver at 67,000 oz. for the week. Total since January 1st, 2,897,000 oz.

Average Prices of Silver per oz. Troy.

Table with columns: Month, 1900 (Lond'n, N.Y.), 1899 (Lond'n, N.Y.), 1898 (Lond'n, N.Y.). Rows include January through December and Year.

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

Average Prices of Metals per lb., New York.

Table with columns: Month, COPPER, TIN, LEAD, SPELTER (1900, 1899). Rows include Jan through Dec and Year.

Commencing with March 17th, the prices given in the table for copper are the averages for electrolytic copper; this is the case for both 1899 and 1900. The average price for Lake copper for the year 1899 was 16.6c. For January, 1900, the average price of Lake copper was 16.33c.; for February, 16.08c.; for March, 16.55c.; for April, 16.94c.; for May, 16.55c.; for June, 16c.; for July, 16.16c.

Prices of Foreign Coins.

Table with columns: Mexican dollars, Penuvian soles, Victoria sovereigns, Twenty francs, Twenty marks, Spanish 25 pesetas. Rows include Bid, Asked prices.

Financial Notes of the Week.

Business continues dull and there is little change to be reported. Money is easy, but no further shipments of gold are reported this week, the demand from France and Germany being less pressing.

Owing to French orders the silver market advanced to 28 1/4d. At that figure demand was

Imports and Exports of Metals.

Large table with columns: Port, Week, Aug. 1 (Expts, Impts), Year 1900 (Expts, Impts). Rows include New York, Baltimore, Philadelphia, and Total United States.

Total United States, \$5

Table with columns: Articles, June, 1900 (Expts, Impts), Year, 1900 (Expts, Impts). Rows include Antimony, Copper, Iron, Lead, Manganese, Nickel, Zinc, etc.

\*New York Metal Exchange returns. †By our Special Correspondent. ‡Not specified. §Monthly returns, Treasury Department. ¶Report of Mr. John Stanton, 1 Week July 27th. \*\*Week, July 24th. Exports include domestic and foreign metals.

Import Duties on Metals.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, 1/4c. a lb. Lead, 1 1/2c. a lb. on lead in ores; 2 1/2c. per lb. on pigs, bars, etc.; 2 1/2c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1 1/2c. per lb. on pigs and bars, 2c. on sheets, etc. Copper, tin and platinum are free of duty.

satisfied and the price then fell to 27 15/16d. The market is steady at the decline.

Government revenue in July, the first month of the fiscal year, was: Customs, \$19,802,271; internal revenue, \$27,560,688; miscellaneous, \$2,592,199; total, \$49,955,158. The expenditures were \$53,979,649, showing a deficit of \$4,024,491. This was due to the heavy interest payments required.

The statement of the United States Treasury on Wednesday, August 1st, shows balances in excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week:

Table with columns: July 24, August 1, Changes. Rows: Gold, Silver, Legal tenders, Treas. notes, etc., Totals.

Treasury deposits with national banks amounted to \$96,625,488, showing an increase of \$1,048,900 for the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending July 28th, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

Table with columns: 1898, 1899, 1900. Rows: Loans and discounts, Deposits, Circulation, Reserve, Specie, Legal tenders, Total reserve, Legal requirements.

Balance, surplus... \$41,904,475 \$10,811,125 \$27,535,975

Changes for the week, this year, were increases of \$3,247,800 in loans and discounts, \$5,667,700 in deposits, \$1,032,300 in circulation, \$3,015,800 in specie, \$1,855,200 in legal tenders, and \$3,454,075 in surplus reserve.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding date last year:

Table with columns: 1899, 1900. Rows: Banks, N.Y. Ass'n, England, France, Germany, Spain, Aus-Hun, Neth'lds, Belgium, Italy, Russia.

The returns of the Associated Banks of New York are of date July 28th and the others are of date July 27th, as reported by the Commercial and Financial Chronicle cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to July 19th, 1900, are reported by Messrs. Pixley & Abell's circular as follows:

Table with columns: 1899, 1900, Changes. Rows: India, China, The Straits, Totals.

Arrivals for the week, this year, were £173,000 in bar silver from New York, and £20,000 from the West Indies. Shipments were £6,500 in bar silver to Hong Kong.

Indian exchange has been weaker, only 25 lakhs of Council bills having been taken, at an average of 15.94d. per rupee. Sales of silver for Indian account continue large.

The following statement from the Bureau of the Mint shows the coinage executed at the Mints of the United States during the month of July, 1900, the first month of the fiscal year:

Table with columns: Denomination, Pieces, Value. Rows: Double eagle, Total gold, Standard dollars, Half dollars, Quarter dollars, Dimes, Total silver, One-cent pieces, Total minor, Total coinage.

The total coinage in July, 1899, was 4,682,150 pieces, valued at \$6,864,880.

Other Metals.

Daily Prices of Metals in New York.

Table with columns: July-Aug., Sterling Exchange, Silver (Fine oz. U.S., London, Pence, Lake, cts. @ lb., Electrolytic @ lb., London @ ton), Copper (Tin, cts. @ lb., Lead, cts. @ lb.), Spelter (N. Y. cts. @ lb., St. L. cts. @ lb.).

London quotations are per long ton (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The market continues firm. There has been quite some business done this week, both for domestic consumption and for export. The European demand is most urgent, manufacturers on the other side being very poorly covered; consumption both here and abroad continues good. Producers generally appear to have little copper to spare for this and next month's shipment. We quote Lake copper at 16 1/2 @ 16 1/4 c.; electrolytic copper in cakes, wirebars and ingots at 16 1/2 @ 16 1/4 c.; in cathodes at 15 1/2 @ 16 c.; casting copper nominal at 16c.

The market for speculative sorts in London has shown a decided improvement during this week. While it closed last week at £72 17s. 6d. for spot, £73 2s. 6d. for three months, it opened 2s. 6d. higher on Monday, and on Wednesday advanced to £73 17s. 6d. for spot, and the same price for futures. On Thursday it was £74 5s. for spot, £74 7s. 6d. for three months, and it closes at £73 17s. 6d. for spot, £74 for three months.

Our cables report the statistics for the second half of July as showing an increase in the stocks of 900 tons.

Refined and manufactured sorts we quote: English tough, £77 10s. @ £78 10s.; best selected, £78 @ £79; strong sheets, £85 @ £86; India sheets, £83 @ £84; yellow metal, 7d.

Tin.—The market has been quiet this week and the business done has been of a retail character. The larger arrivals have greatly relieved the scarcity of spot and the premium for this delivery has been considerably reduced. Spot metal is now selling at 32 1/2 c., August delivery at 32c., September delivery at 31 1/2 c.

The London market has fluctuated considerably this week. At the close last week it was £144 for spot, £138 5s. for three months; it opened this week at £144 10s. for spot, £139 for three months; declined on Tuesday to £142 10s. for spot, £136 10s. for three months. On Wednesday it was £142 15s. for spot, £137 15s. for three months and on Thursday rose again to £144 5s. for spot, £138 for three months. It closes at £145 for spot, £137 10s. for three months.

Statistics for the month of July show an increase in the visible supply of 400 tons.

Imports of tin into the United States in June were 4,126,528 lbs. For the six months ending June 30th the exports were: From East Indies, 19,088,034 lbs.; Australasia, 369,738 lbs.; Great Britain and Holland, 17,481,703 lbs.; other countries, 277,814 lbs.; total, 37,217,289 lbs. In 1899 the total was 38,316,837 lbs., showing a decrease of 1,099,548 lbs., or 2.9%, this year.

Visible supplies of tin on August 1st are reported as below, in long tons, of 2,240 lbs.:

Table with columns: Store, Afloat, Totals. Rows: London, Holland, U. S., exc. Pac. ports, Totals.

The total is greater by 1,653 tons than that reported July 1st, but less by 2,150 tons than on August 1st, 1899.

Lead.—The market has again experienced a sharp advance of 1/4c., and we now quote New York at 4.20 @ 4.25c., St. Louis 4.15 @ 4.20c.

The European market is also higher, Spanish lead being quoted at £18, English lead at 2s. 6d. higher.

Imports of lead into the United States for the six months ending June 30th, and re-exports of foreign lead, are reported by the Bureau of Statistics of the Treasury Department as below, in pounds:

Table with columns: Imports, 1899, 1900. Rows: Lead in ores and bullion, Lead, metallic, Total imports, Exports of foreign lead, Excess of imports.

Of the lead imported this year, 12,618,446 lbs.

(12.6%) came from Canada; 85,867,420 lbs. (85.6%) from Mexico, and the balance from other countries. The total imports show an increase of 421,877 lbs., or 0.4%, and the exports an increase of 15,709,426 lbs., or 19.5%, for the half year.

Spelter.—There is no change in the market. A fair business is doing from day to day at about last prices. We quote St. Louis 4 1/4, New York 4 1/4c.

The foreign market for good ordinaries is quoted at £19 10s.; specials 5s. higher.

Exports of spelter or metallic zinc from the United States in the six months ending June 30th were 31,757,848 lbs., which compares with 12,731,326 lbs. in 1899; showing an increase of 19,026,522 lbs., or 149.4%, this year. Exports of zinc ore for the half-year were 19,179 tons, against 6,889 tons in 1899; an increase of 12,290 tons, or 178.4%, this year.

Antimony.—There is no change. We quote Cookson's 10 1/2 c.; Hallett's 9 1/2 c.; U. S. Star, 9 1/2 c.

Imports of metallic antimony and regulus into the United States for the fiscal year ending June 30th were 3,538,751 lbs., against 2,316,728 lbs. in 1899. Imports of antimony ore were 5,707,112 lbs. against 3,020,016 lbs. in the preceding year.

Nickel.—The price continues firm at 50 @ 60c. per lb., according to size and terms of order.

Exports of nickel, nickel oxide and matte from the United States for the fiscal year ending June 30th were 5,317,677 lbs., against 4,907,722 lbs. in 1899; an increase of 409,955 lbs., or 8.4%, last year.

Platinum.—Consumption is good and prices are strong. For ingot platinum in large quantities \$18.20 per Troy oz. is quoted in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 72c. per gram, showing an increase of 1 1/2 c.

Imports of platinum into the United States for the fiscal year ending June 30th were 7,767 lbs., against 6,357 lbs. in 1899; an increase of 1,410 lbs., or 22.2%, this year.

Quicksilver.—The New York quotation is unchanged at \$51 per flask for large lots; for small orders \$52.50 @ \$54 is asked. San Francisco quotations are \$51.50 @ \$52 for local deliveries, and \$46.50 @ \$47 for export. The London price has been reduced 5s., and is now £9 5s. per flask, with the same figure quoted from second hands.

Quicksilver receipts at San Francisco in June were 1,758 flasks; for the six months ending June 30th they were 11,211 flasks, against 11,513 last year. This does not represent the entire California production, as considerable shipments are made direct from the mines. Shipments from San Francisco by sea were 4,638 flasks, against 5,483 flasks last year. The shipments this year were as follows in detail: China, 1,000; Mexico, 2,716; Central America, 800; Australia, 100; Siberia, 3; Washington, 5; British Columbia, 9 flasks.

Exports of quicksilver from all United States ports for the six months ending June 30th were 510,472 lbs., against 664,397 lbs. in 1899. The decrease was 153,925 lbs., or 23.2%, this year.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

Table with columns: Per lb., Per lb. Rows: Aluminum, No. 1, 99% ingots, No. 2, 90% ingots, Rolled sheets, Alum-bronze, Nickel-alum, Bis muth, Chromium (over 99%), Copper, red oxide, Ferro-Molyb'dum (50%), Ferro-Titanium (10%), Ferro-Titanium (20%), Ferro-Tungsten (37%), Magnesium, Manganese (over 99%), Mangan's Cop. (2% Mn) 32c, Mangan's Cop. (3% Mn) 38c, Molybdenum (Best), Phosphorus, Tungsten (Best).

Variations in prices depend chiefly on the size of the order.

LATE NEWS.

The latest advices from the Nome District in Alaska are brought by the steamer "Senator," which reached Seattle August 2d, having left Nome City July 23d. The steamer brought down \$175,000 in gold and 375 passengers, the large number indicating that many must be anxious to get away. They report that the situation in the district had not changed materially since last advices. The camp remained overcrowded, and many newcomers were unable to find work or locations. Gen. Randall, who is in command in the district, has given notice that it will be impossible for him to return any more stranded men at Government expense, the chief reason being that many had imposed on the authorities, obtaining free passage when they were able to pay, and it is very difficult to discriminate.

The smallpox epidemic in the camp is reported to be subsiding. Only a few new cases had occurred, and a system of quarantine and strict isolation of the sick had been organized.

United States District Judge Noyes is making arrangements to hold a session of court at Nome City. A large number of cases are ready to come before the court relating to claims and mining rights.



CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 150.)

New York. Aug. 3.

The imports and exports of chemicals, etc., at all United States ports in June were as below:

Table with columns: Articles, June (Imports, Exports), Year, 1900 (Imports, Exports). Rows include Bleaching Powder, Caustic Soda, Sal Soda, Soda Ash, Chlorate of Potash, Copper Sulphate, Nitrate of Soda, Muriate of Potash, Phosphate rock, Pyrites, Brimstone, and Sulphur.

Heavy chemical imports show a decrease as compared with May, but most other imports are larger. Exports in most the list were less.

Heavy Chemicals.—With the exception of some 1901 business in domestic high test caustic soda, the market is quiet. These sales were made at \$1.85 per 100 lbs. f. o. b. works.

Table with columns: Articles, Domestic (F.o.b. Works, In New York), Foreign (In New York). Rows include Alkali, Caustic Soda, Sal Soda, Bicarb. Soda, Bleach, and Chlor. Pot. Cryst. powder.

Acids.—A better demand for acetic acid is noted. Sulphuric and muriatic are quiet, while blue vitriol is dull and erratic.

Quotations as below are for large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified. Acetic, No. 8 in lbs. \$1.62 1/2. Blue Vitriol, 4.50 @ 4.75. Aqua Fortis, 36, 3.62 1/2.

Brimstone.—New York arrivals this week were 1,500 tons. Market firm, owing to higher ocean freight rates. On spot best unmixed seconds are quoted at \$22 @ \$22.25 per ton.

Pyrites.—Deliveries are smaller and no Spanish imports are noted at this port this week. Prices are nominally unchanged, as follows: Mineral City, Va., lump ore, \$4.75 per long ton.

Fertilizing Chemicals.—Leading ammoniates are firm, and in the West packers ask full prices. Fish scrap is scarce, and wet is sold up, while the catch so far is reported light.

Nitrate of Soda.—Firmer, and freights are higher, as the United States Government has chartered all the available tonnage for its requirements in Chinese waters.

were 16,812 bags at New York and 26,675 bags at Philadelphia.

Concerning the situation on the coast, Messrs. Jackson Brothers, of Valparaiso, Chile, advise us, under date of June 16th, that after almost two months of inanimation, the nitrate market has shown slight symptoms of recovery during the last few days.

Messrs. Mortimer & Wisner in their monthly statement of nitrate of soda dated New York, Aug. 1st, give the following statistics:

Table with columns: 1900, 1899, 1898. Rows include Imp. into Atlantic ports from West Coast S. A., Stock in store and afloat, Vis. supply to Nov. 15, 1900, Deliveries in July, Deliveries since Jan. 1 to date, Total yearly deliveries, Prices current, Aug. 1.

Sulphur.—United States imports in July are reported at 4,246 bags, against 1,974 bags last year. Expected arrivals are estimated at 5,957 bags.

Phosphates.—The demand from superphosphate manufacturers is moderate. Sales of Florida high grade rock are reported c. i. f. good United Kingdom ports for this year's shipment at 7 1/2 d. per unit.

Table with columns: Phosphates, Per Ton F. o. b., C. i. f. U'n'd Kingdom or No Sea Ports (Unit, Long ton). Rows include Fla. hard rock, Fla. land pebble, Fla. Peace River, Tenn. rock 78% export, Tenn. 75% domestic, Tenn. 72%, So. Car. rock, So. Car. rock, Algerian rock, Algerian rock, Christmas Is.

\* Fernandez. † Mt. Pleasant. ‡ At mines. § On vessels, Ashley River.

from Coosaw to Dublin, Ireland, at 19s. The ruling high freight rates curtail charters.

phates from Norfolk, Va., to London will likely amount to 1,600 tons.

In the producing districts of Florida severe wet weather is necessitating the closing down of many plants. In the hard rock region it is estimated only about 30 or 35 plants are working out of a total of 85 on January 1st.

Notes of the Week.

Imports of sulphur into Great Britain for the six months ending June 30th were 11,588 tons, against 10,861 tons last year.

Liverpool. July 25.

(Special Report of Joseph P. Brunner & Co.)

In chemicals business is not brisk, while at the same time quotations are well maintained in most cases.

Soda ash is in fair request at usual varying prices as to market. We quote spot range for tierces about as follows: Leblanc ash, 48%, £4 15s. @ £5; 58%, £5 5s. @ £5 10s.

Bleaching powder continues to drag and quotations are nominal at about £6 @ £6 10s. per ton net cash for hardwood packages, as to market.

Sulphate of ammonia is rather dearer at £11 7s. 6d. @ £11 10s. per ton, less 2 1/2% for good gray 24 @ 25%, in double bags f. o. b. here.

Messina, Sicily. July 1.

(Special Report of Emil Fog & Sons.)

Brimstone.—While no fresh orders were coming in, the volume of shipments, upon old contracts, was well kept up in June, imparting considerable firmness to values.

The exports of brimstone in June amounted to 28,898 tons, as against 23,784 tons in the same month last year.

MINING STOCKS.

Complete quotations will be found on pages 147 and 148 of mining stocks listed and dealt in at:

Table with columns: Location, Price. Rows include Boston, Colorado Springs, Denver, New York, Philadelphia, Salt Lake, San Francisco, Spokane, Toronto, Montreal, London, Mexico, Paris.

New York. August 3.

The market is listless. In the copper section few sales are reported. Amalgamated is unchanged and dull.

Standard Consolidated of California rose to \$4.30, and Quicksilver common sold at \$1.50. Kingston & Pembroke of Ontario went at 20c.



STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Amalgamated, Anaconda, and others with columns for location, par value, and dates from July 27 to August 2.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Adven's Cons, Aetna, and others with columns for par value, number of shares, and dates from July 26 to August 1.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing companies like Am. Sm. & Ref., Am. S. & W. Con., and others with columns for par value and dates from July 27 to August 1.

SALT LAKE CITY, UTAH.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alice, and others with columns for shares, par value, bid, and asked prices.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Am. Alkali, Bethlehem Iron, and others with columns for par value and dates from July 26 to August 1.

TORONTO, ONT.

Table of stock quotations for Toronto, Ont., listing companies like Ontario, Golden Star, and others with columns for par value and dates from July 13 to July 19.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal., listing companies like Belcher, Best & Belcher, and others with columns for par value and dates from July 26 to August 1.

SPOKANE, WASH.

Table of stock quotations for Spokane, Wash., listing companies like Butte & Boston, Morning Glory, and others with columns for par value and dates from July 26 to July 27.

CALIFORNIA OIL STOCKS.

Table of California oil stock quotations, listing companies like Blue Goose, Buc horn, and others with columns for number of shares, par value, and dates from July 19 to July 27.

California and Producers Oil Exchanges. Total sales, 1,045 shares.

Total shares sold, 156,648. \*Ex-dividend.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing various companies and their prices from July 21 to July 27.

Colorado Springs Mining Stock Exchange. Total sales, 2,37,277 shares.

MONTREAL, CANADA.

Table of stock quotations for Montreal, Canada, listing various companies and their prices.

\* Montreal Stock Exchange.

MEXICO.

Table of stock quotations for Mexico, listing various companies and their prices.

DENVER, COLO.

Table of stock quotations for Denver, Colo., listing various companies and their prices.

\* Official Quotations Denver Stock Exchange. Total sales, 24,910 shares.

PARIS.

July 10.

Table of stock quotations for Paris, listing various companies and their prices.

LONDON.

July 20.

Table of stock quotations for London, listing various companies and their prices.

\* Ex-dividend.

DIVIDEND-PAYING MINES.

Table with columns: Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid, Total to Date, Latest Date, Latest Amt.), Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid, Total to Date, Latest Date, Latest Amt.).

G., Gold. S., Silver. L., Lead. C., Copper. Z., Zinc. Q., Quicksilver. I., Iron. This table is corrected up to July 31. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

Table with multiple columns listing various chemicals and minerals such as Abrasives, Borax, Magnesium-Carb., Salt, Acids, Clay, Oils, and Rare Elements. Each entry includes a description, unit of measure, and price.

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to June 9. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.