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Two Valuable Articles

We are fortunate in being able to publish in this issue an article on "The Demand for Mining Tools in the Straits Settlements," by H. L. Geisele, whose interesting article on "Mining in Siberia," in our December last issue, has been referred to above by our readers. We expect that the present paper will be of service in pointing out a profitable field for American manufacturers of mining machinery who are looking for foreign markets.

A writer in Harper's Weekly recently described the general trend of the newly discovered zinc and lead fields of Northern Arkansas, and presented it with a few illustrations of scenes in the district, which we reproduce in this issue with Professor R. C. Craven Walton's article on the geological features of the district. The map we published was prepared by the Geological Survey under the direction of the field work in the sections described.

Third Decade Changes.
With its next issue, this journal will enter upon its Third Decade. Advantage will be taken of the occasion to inaugurate a few more or less radical changes. First of all, the title will be shortened to THE MINING AND METALLURGICAL JOURNAL, which it is hoped readers will regard as an improvement. The page will be reduced to the standard size of 9 x 12 inches, more than an additional number of pages being added to make up for the difference. The tendency of technical journalism is toward a smaller and standard page. One of the merits of the new size is that it will result in the paper reaching subscribers in better condition. There will be a slight change in the color of the cover. Instead of tinfoil, as formerly, the cover, though of the same general character, will be a little lighter in hue, which ought to give the perusal a brighter and more attractive appearance. Appropriately enough, the shade of the new cover is what is technically known in the paper trade as gold.

Michigan and Montana Copper Profits.
The Boston News Bureau, which always has an eye open for any combination of figures of interest to the copper world, has collected tables showing the dividends of the leading Michigan and Montana copper mines for 1909. The divvies of the various copper mines have been published recently, and these appear to have exceeded expectations. The table is of importance, particularly to the people of the mining districts of Michigan and Montana, where the copper industry is a very important factor. The table shows an increase in dividends of $5,450,000 as against $5,000,000 for the Calumet & Hecla. The latter, however, paid seven percent interest on the total made up by all the Lake Superior companies during the past twenty-two years.

A Successful Base-Measuring Apparatus.

A base-measuring apparatus which has been in use in connection with the summer school work of the civil engineering department of the Massachusetts Institute of Technology for a few years has recently been tested by the Coast and Geodetic Survey in Washington. Such satisfactory results have already been obtained and others assured that the apparatus is one of the most valuable and practical devices for the present and future.

Mr. Hammond's Report.

In another column of this issue we publish Mr. John Hays Hammond's report in full, covering his examination of the Independence mine at Grizzle Creek. Nothing that has occurred in the mining world in a long time has caused as much discussion as has this report of Mr. Hammond. The meeting four years ago of the Venture Corporation, the company which purchased the mine from Mr. Stratton, appears to have been a most exciting and stormy one. The stockholders of the company were disturbed with the whole matter for after vigorously paying their respects to the directors, they passed a vote of no confidence in the management. 'Gracious!' and 'scandalous!' were some of the terms applied to the conduct of the directors, who were accused of concealing some facts from the shareholders in relation to the mine.

Mr. Hammond, who has been in New York for a few days, was some little time ago, after his preliminary report, asked to take the position of consulting engineer for the mine. He stipulated that the shareholders must first be made acquainted with the condition of the affairs at the mine as he found them, and that he would advise the directors to stop this work. He also states that he has accepted the offer, and will proceed at once to the mine to ascertain the condition of things before recommending any course of action.

The connection of the company with a man of Mr. Hammond's reputation and ability makes it probable that he will endeavor to secure a better understanding between the management and the shareholders. His report may be regarded as the standard for the future, and will doubtless be studied with great care by all those interested in the mine.

Mr. Hammond's report is one of the most valuable and practical devices for the present and future. It is a most valuable and practical device for the present and future.
Stratton's Independence.

Full Text of John Hays Hammond's Report on the Condition of the Well-Known Cripple Creek Mine—Mr. Hammond Recommends a Reduction in Dividends to $488,000.

John Hays Hammond, the eminent mining engineer, has been in New York for a few days, at the Waldorf-Astoria. We are now able to publish the full text of Mr. Hammond's report on the condition of Stratton's Independence mine at Cripple Creek, which he is about to present to the various mining interests, as follows:

**Deaver, Colo., Nov. 29, 1909.**

The chairman and board of directors of Stratton's Independence, Limited, London, England, gentlemen—I called you on the 23rd last, the results of my examination of your property. It is exceedingly difficult to arrive at an approximate value of the present ore reserves, on account of the lack of system in the mining operations during the last several months, but as the result of an extensive sampling of the property, I have come to the conclusion that there are above the tenth level (lowest level of the mine) about 12,000 tons, having a gross value of $2,900,000, and from which, at a net yield of $1,000,000 will be obtained. This estimate is based on the condition of the mine as of July 1, 1909, and it will take about a year to extract this ore. The accompanying longitudinal sections will show the stops and unstoped portions of the three principal veins from which the bulk of the ore has been obtained, and with which the remaining ore reserves chiefly occur.

From these sections it will be seen that there remains a large extent of unstoped ground, but unforms a part of the mine is not payable, as is indicated by my estimate of the ore reserves. Mining operations have been confined to an area of about 30 acres in the northeastern portion of the property. This area lies within the recognized mineral belt within which the Portland and other large producing mines are situated.

The richness of this area is attested by the gross yield of $3,250,000 extracted within a depth of 900 feet from the surface. The high grade of the ore is proved by the fact that above sixty-five per cent of the gross yield is estimated to have been profit. The richness of this belt is further evidenced by the fact that the grade made by the Antelope Gold Mining Co., whose property adjoins yours on the north, within this belt good ore bodies occur, both in the adamsite-brecia and granite. In this area, your property includes eighty acres situated almost entirely outside the recognized mineral zone above referred to. The explorations thus far on your property and on that of the adjoining territory have failed to establish a existence of a belt of payable ore passing into the section embraced within the remaining eighty acres. Explorations in this region have, however, been totally inadequate to disprove the occurrence of payable ore bodies within the territory in question.

The unworked tract lies almost entirely within the granite area, and until recently a strong predilection has existed among the miners of the district against granite as an ore-bearing country rock. The results of recent developments in the Cripple Creek district, however, have demonstrated the fallacy of this theory, inasmuch as some of the most promising mining districts in operation lie within the granite area. This is a geological characteristic of more than academic interest, since the indications are that future exploitation upon your property, both lateral and in depth, will depend upon the discovery of payable ore bodies occurring in the granite formation.

To predict the existence of payable ore in deposits of this nature on geological data alone is not justifiable, but the results of my examination of the conditions on ore deposits in the Cripple Creek district lead me to believe that there is a possibility of existence of payable ore bodies in the granite area as well as elsewhere, although the nature of the deposit is proven to be of a character that may be classed as a uranium deposit. The advantage of this deposit is that the time spent in exploring the reports of their engineers, that they had $13,000,000 worth of ore in sight, and that the bottom of the shaft was still in good ore, directed the company to set to work with the same enthusiasm. The bankers were willing to take the shares, but they insisted as a precautionary measure that Mr. Hammond should examine the mine and submit a report to their directors before they would buy the shares. Mr. Hammond had had no previous connection with the Independence mine, notwithstanding the erroneous report that he had been concerned in its original sale to the English company. Mr. Hammond made his examination in October, as a result of which he cabled the company that the ore reserves had been greatly over-estimated. The immediate effect of this message was a fall in the value of the shares from 33 to 31. Mr. Hammond, a few days after sending this despatch by cable, forwarded his formal report, already given in this article.

It seems that there was much history in the case back to the manage statements that have been printed in newspapers; and after a reading of all that has been published, one does not wonder that the English stockholders have lost confidence in their directors.

In their report for the fourteen months succeeding the incorporation of the company and ending on June 30 of the current year, the directors say that the revenue account of the mine shows the sale of ore at 10 cents per pound, an average amount of $16,104 was included for ore in stock, making a total of $15,080,000 as the gross value of the output for the fourteen months. After all expenses were deducted, the net amount available for dividends was $436,756, of which $242,592 represents the four quarterly dividends at the rate of forty per cent a year, paid to June 14 last. From the surplus which accrued to June 30 a final distribution of $16,000 was received by the shareholders on August 30, making a total of $466,669 paid in dividends for the first fourteen months'

working. The directors' report seems to show that none of the London bankers as to the actual value of Independence is of the same origin than that of our directors themselves, for they state that they had intended to hold the general meeting about the end of August, but on the representations of some shareholders, they approached Mr. Hammond, who was then in America, with a view to his making an examination of the mine. Unfortunately he was, by the illness of a relative, prevented from proceeding with his work, and for the month of September. On his arrival in London an offer was made to him of a seat on the board, owing to the vacancy created by the death of the late chairman. This offer, owing to his continuous absence from London, he was unable to accept. He has the impression that he should associate himself with the company as an advisory engineer, it having already been arranged between him and Mr. Richaud that the latter would then become general manager of the company instead of consulting engineer. Mr. Hammond returned to America early in September, in the first place to examine another mine, so that his inspection of the Independence was not begun until October. In the meantime Mr. Shipman, the new manager, acting on instructions from Mr. Richaud, began a sampling of the workings, and discovered that the statements, as furnished by the late manager, and embodied in the monthly reports, were incorrect, and that, therefore, the ore reserves...
were not as stated. He informed Mr. Rickard's representative, and he, in turn, told Mr. Hammond, who was about to commence his examination. These gentlemen decided to proceed with the sampling, and to acquaint Mr. Rickard with the facts on his arrival in Denver. Mr. Rickard learned the situation when he arrived on October 19, and he informed Mr. Baker, who was in America on business not connected with the company. On October 20 the directors received a cablegram from Mr. Rickard advising them of the results of the sampling then taking place that the valuation of the ore reserves made by him in the monthly reports, on the data furnished by the former manager, were seriously over-estimated. The directors assert that this was the first intimation that they had received that there was anything to indicate any change in the condition of the property.

On October 31 the above-mentioned cable was followed by another from Mr. F. W. Baker, an English stockholder then in America, giving further particulars as to the probable condition of the ore reserves, as disclosed by the sampling, so far as it had proceeded. The cable was sent by him after consultation with the company's engineer. As a result of this cable the directors issued a circular on November 1. Mr. Baker and Mr. Rickard left immediately for London, and on their arrival the second circular, of November 17, was issued. Mr. Hammond's cable report, received on the 24th, was immediately published in the London and provincial press, and communicated to the shareholders through the mail on the 26th. With reference to the 126,900 tons of ore mentioned in this report, the directors explain that crude or unsorted ore is referred to, while the production of the mine is always given in shipping ore. After careful consideration of Mr. Hammond's report, the directors came to the conclusion that he would not have recommended the expenditure of such a large proportion of the visible profits in new developments unless he believed in the future prospects of the mine. They have consequently cabled to Mr. Hammond, authorizing him to proceed immediately to carry out the recommendations of his report. The directors add that since the final distribution in respect of profits to the end of June last an interim dividend, at the rate of forty per cent per annum, has been earned and paid for the quarter to September 30. A further interim dividend, this time at the rate of ten per cent per annum, in accordance with Mr. Hammond's recommendation, is proposed to be paid for the quarter to December 31, 1900.

The shareholders passed a vote of lack of confidence in the directors at a meeting of the company held in London on December 7. This meeting, according to the report of it cabled to the American daily papers, was marked by the wilder disorder. The course of the directors was characterized as scandalous and disgraceful. Mr. Rickard was present, and made a personal explanation. A long and animated discussion followed, during which language seems to have been used that was far from complimentary to the directors and others.

The Earl of Chesterfield, who presided, read a cablegram from Mr. Hammond, asking him to announce that Mr. Hammond's connection with the mine dated from after the shortage of ore reserves was discovered. His lordship said that a cable message received from Mr. Rickard, dated October 28, conveyed the first intimation of serious misrepresentation on the part of the old management in regard to the value of ores. This was not published, it was explained, because it was vague and incomplete, but had the directors had any conception of the foreshadowed discrepancy of $12,000,000, as shown in the subsequent report of Mr. Hammond, they declare they would certainly have made Mr. Rickard's statement public.

The Boston News Bureau asserts that the most important item contributing to the present strength of the copper market is the great European demand for the metal. In face of the high prices at which copper has been selling the past year or two, the domestic production has increased but little, while our exports have jumped ahead to record breaking figures.

A Colliery Banking and Screening Arrangement.

The colliery banking and screening arrangement of the Chippington colliery in Northumberland, about fifteen miles north of Newcastle-in-Tyne, England, which has attracted much attention among mining engineers, is described by Mr. John F. O. Reese in a recent issue of the Journal of the British Society of Mining Students.

The erection is supported on cast-iron columns and rolled plate web girders, and enclosed, for the shelter of the workmen, with galvanized corrugated iron plates. The tub roads are arranged so that the tubs run by gravity from the cages over the weighing machine to the tipplers, and after being weighed and tipped, run round a curve to the foot of an incline, where they are caught by a creaper chain, and elevated to a point from which they run back behind the shaft. The tipplers are in line with each other on the road, so that the first tub from each dock passes straight through the first tippler and on to the second, pushing both empty tubs out before it.

With this arrangement the tubs all travel in one direction along the same road, thus avoiding the use of switches, and the danger of the tubs meeting and causing a block, as is sometimes the case when the tipplers are on different roads.

Fig. 1 is a plan of the whole arrangement. The coal, on being discharged from the tub, falls on to a jiggling or shaking screen, with suitable meshes for separating the small from the round coal; the small passes through the meshes of the screen, and the round coal passes on to a cleaning belt, where all the stones, inferior coal, &c., are taken out, after which it passes over the belt end into the truck ready for the market. The small coal, on passing through the meshes of the first screen, drops on to another immediately beneath it, and is again divided into two classes, which are deposited on two conveying belts and carried to their respective trucks ready for the market. The cleaning belts for the round coal are hinged at a point about twelve feet back from the delivery end, and balanced with balance weights, so
that they can be lowered into the truck as may be required, to save the breakage of the coal, and raised as the truck fills up. The whole of the arrange-
ments are driven by one engine, but the gearing is arranged in such a way that the re-
power to any part of the machinery the part affected may be put out of gear without stop-
ning any other part, except of course, the engine itself.

The engines are driven by a concrete pillar on the side of a truck road, brought up to the level of the belting stage, and stout cast-iron stays are fixed to concrete blocks below the jiggling screens, to stop the action of the machinery from setting up vibrations in the structure. The locomotive shunts the truck up into sidings above the pit, from which they are lowered by gravity in the under screens as they are required, and into sidings below the pit when they are loaded. A, the raising; B, weighing machine; C, C, tipplers; D, engine pillar; E, E, round coal belts; F, F, small coal belts; G, creeper chain; H, hoppers to lead stones and waste coal into track below; J, jigg-
ing screens. Driving shafts and belts are shown by parallel lines. Figs. 2 and 3 are side elevations of the screens.

**Demand for Mining Tools in the Straits Settlements.**

By H. L. Geisler.

The demand for all kinds of mining tools, especially boring tools, in the Perak tin mining industry is very large and increasing. Up to the present day the bulk of these tools has been imported chiefly from Great Britain and Germany; it seems that so far no great attention has been paid by American manufacturers to the market offered to them for tools and apparatus in the Straits Set-
tlements. In 1888—the last year for which official statistical returns are available—the imports of machinery alone amounted in value to about $400,000 ($125,000 worth was of American origin. In the previous year, 1887, our machinery exports to the Straits amounted to about $75,000; there was no falling off in require-
ments in 1888, as the imports from Great Britain, Australia, and Belgium largely increased, and the decline in our shipments can only be due to less strenuous efforts than those made in the preceed-
ing year.

It is only about ten years ago that improved boring tools were introduced into the Perak mining districts, but now even the more successful Chinese miners use them to prosper with. These tools are of several different patterns, but consist essentially of iron pipes, which are sunk into the ground, and various shaped implements which are employed to bring up the earth from inside the pipes, the object being to get a sample of the tin-bearing stratum without the trouble and ex-
 pense of sinking a shaft. A complete set of bor-
ing tools is composed of the following articles:

**Tubes.** These are thin wrought iron pipes, usu-
ally in lengths of five and ten feet, their diameter varying from two and one-half inches to six inches. They are furnished with a screw thread at each end, so that they may be screwed into one con-
tinuous length.

**Screw and Driving Head.** The shoe is a short length of iron pipe to screw on to the lower end of the tubes. It has a sharp steel cutting edge, to enable it to sink readily into the earth. The driving head is an iron collar to screw on to the top of the tubes, to protect the screw thread from being injured when working the rods inside the tubes.

**Tub Benders.** Long handled clamps, which are made to grip the outside of the tube by means of a couple of clamping screws, and enable the pipes to be turned round, lifted or lowered. They are also employed in screwing the lengths to-
gether and opening them out again.

**Pipe Tongs.** Like ordinary pipe tongs. They are useful for screwing and unscrewing the tubes, shoe, driving heads, etc.

**Earth Auger.** An implement very like the com-
mon wood auger, but on a large scale, but the cylinder is more closed in, so as to retain the earth. It is rather smaller than the internal diameter of the tubes with which it is to be used and its up-
per part is reduced to a square shank, and has a male screw for attachment to the boring rods.

**Sand Pump.** This is a length of iron pipe, the same diameter as the earth auger, fitted with a steel shoe at the lower end, and above it a valve opening upwards. Sometimes this is a hinge valve, and at others a ball valve. The top of the pipe is left open, and a shank is attached to it. This is also of square iron, and is at its lower end divided into a fork, and the arms of the fork are riveted to the top of the pipe.

**Nose Shell.** A combination of the earth auger and sand pump. It is a sand pump with a shat and below the valve, instead of the shoe.

**Sand Stirrer.** These are like large flattened corkscrews, and their office is to loosen the ground in the hole and prepare it for the sand pump.

**Chokes.** There are many varieties of these. They are used flat, the T, the S, and the X chisels. They are all furnished, like the other tools, with square shanks and male screws.

**Bell Taps.** An implement to let down a hole to catch the top of a tube, which may have been dropped, and bring it up to the surface.

**Spring Dart.** An implement with an arrow-
shaped head, used to recover tubes which have slipped down into a hole. The flakes are hinged, and the springs, which force them out when the instrument gets between the bottom of the tube. It has a male screw for attachment to the boring rods.

**Boring Rods.** These are the rods for operating the tools. They are of square iron, with enlarged joints, furnished with screws at both ends. They range from three-quarters to one and one-half inches in diameter, and are most convenient when in lengths of five and ten feet.

**Red Swivel.** A short length of boring rod with a swivel bow at the upper end and a screw at the lower, to attach the rods to the hook from the pulley. It enables the rods and tools to be turned round while being worked upon and down by the rope.

**Red Tilters.** Are long-handled screw clamps, to revolve the rods in the hole, screw and unscrew them, etc.

**Red Keys.** These are round, long-handed span-
ers, fitting the square rods and shanks of the tools. They have a point at one end which serves to turn the clamping screws of the rod till-
ers. They are used for turning, screwing and uns-
crowning the rods and tools and for handling them when in the hole.

**Spring Hook.** This is a hook with a spring catch to prevent the rod swivel or rod hooks from slipping out of it. It is suspended from one end of the rope which hangs from the pulley on the sheering leg.

**Pulley.** A single sheave iron pulley, large enough to take a one and one-half inch diameter rope. It is hung at the apex of the sheering leg and the pipes, rods and tools are raised and lowered by its aid.

A spanner, to screw up the tube tilters, a small iron scoop to clear out the earth-auger, and an oil-can complete the outfit. In the larger sized sets a single or double purchase which is re-
quired.

I may add that most of the foreign trade in tools and machines is transacted either at Singa-
apore or at Penang. Both cities are the headqua-
ters of large import merchants.

**The Zinc and Lead Fields of Northern Arkansas.**

By Prof. R. Craven Walton.

It is seldom that a section so large and rich, and fraught with such possibilities as the Northern Arkansas zinc and lead fields, has escaped the eye of the prospector and the capital of the inves-
tor for so long a time. The mineral belt of North Arkansas embraces the counties of Marion, Newton, Boone and Sevier. When a small amount of development work was done in this field several years ago, there was incredulity, be- cause of its remoteness from railroads, and because no ore had been shipped. A few years later the White River was utilized for the shipment of the lead and zinc ores in barges. After a full smelter test the St. Louis and Carondelet compa-

nies and the Mineral Point, Wiis, worked offered $12 a ton in excess of the price paid for ore from other zinc fields.

In these counties there are immense deposits of the following ores and minerals: 1. Zinc group—
(1) Sphalerite (zinc blende), (2) Smithsonite (car-
eralogists, and mining experts that this is the greatest zinc field in the world, the Joplin district not excepted, and all that is needed is the advent of railroads, so that the ore on the dumps and in sight can be placed on the market.

Beginning with the Ozark county, Mo., deposits there is a gradual change in the character and mode of occurrence of the ores as we pass to the southwest. The Ozark group of mines, up to the present, consists altogether of carbonates. Passing to the southwest into Marion, Boone, and Newton counties, Arkansas, we enter the great White River zinc field and the Buffalo River district, and in this field, while in the upper lens there is a large quantity of carbonate of zinc, zinc sulphide predominates. The accompanying map will offer a fair understanding of this region.

The zinc ores of the Northwest Arkansas field occur in the disseminated, brecciated, laminated and mass forms, both in limestone and sand. The heaviest deposits, however, are in the dolomite limestone of the Silurian period. The minerals throughout these counties are exposed in many places on the sides of the mountains and in the beds of the creeks.

The mountainside ore, however, is not a surface ore. It is an exposure of ore due to the process of erosion. Nature has done more mining in Northwest Arkansas than thousands of men could do in hundreds of years with the improved machinery of today at their command.

Much work has been done during the past year, but by far the most satisfactory has been in the way of deep mining and drilling. A number of shafts have been sunk to the depth from sixty to one hundred feet, and all penetrate heavy bodies of blende (zinc sulphide) and some of these show paying qualities of galena. Among the representative shafts are the following: In Marion county—the Bear Hill, Clear Jack, Pilot Rock and Ruby in the Dold City district; the Keystone and White River in the Jimmy's and Sister's creek districts and the White Eagle and Monte Cristo in the Rush group. In Newton county, the Panther Creek, Granby, Kansas City and Glory. Among the heavy-producing mines are the following: The Morning Star, Dyson, McIntosh, Red Cloud, Kaler, Bonanza and White River.

Conservative estimates place the tonnage of ore along the survey of the St. Louis & North Arkansas Railway at the mines in Marion and Eastern Boone counties as 9,000 tons on the dumps and 50,000 tons in sight. The railway is graded to within three miles of Harrison and the work is being pushed as rapidly as possible. The Missouri Pacific has its surveying corps in the field with a view of extending its line from Cushman via White River.

The government will rapidly convert the White River into a possible water route, capable of navigation the year round. For that purpose Congress has appropriated $1,000,000.

The Granite Rocks of Butte.

By Walter Harvey Weed.

(From the U. S. Geological Survey's Journal of Geology.)

In the western mountainous part of Montana there are several extensive areas of granite rocks, which are commonly surrounded by sedimentary beds and in part covered by later volcanic rocks. The largest of these granite masses forms a mountainous area having no commanding summits, but consisting of the continental water parting separating the waters of the Atlantic from those tributary to the Pacific Ocean. This district is largely drained by the Boulder River, and as the mountains have no other name, they too are sometimes called by this name, for which reason it will be used to designate the intrusive mass of granite itself. Unmistakable evidences of intrusions are common about its borders, and as the rock cuts and metamorphoses fossiliferous carboniferous rocks and what are believed to be cretaceous rocks as well, and is overlaid by neocene sediments, its age is shown within these limits.

The Boulder batholith is a body of granite rock, in part covered by later lavas, but continuously exposed from the Highland Mountains (sixteen miles south of Butte) to the vicinity of Helena, a distance of fifty miles. North and south direction and twenty-four miles from east to west. The intrusive nature of the mass is very strikingly shown at the northern and southern limits, and also at Elkton on the east. At these places the granite rocks have produced very marked contact metamorphism, and cut across the ends of the overturned sedimentary series. Near its border the granite also includes in its mass fragments of the other rocks. There is no suggestion of a laccolithic uplift, for although near Helena, and probably elsewhere, the granite rocks extend outward under the sedimentary rocks, and the latter in certain places form a thin cover over the intrusion, yet the strata dip toward the intrusion conformably to a great antclinal uplift wholly independent of the batholith.
be regarded not only as facies of the same magma, but as parts of one mass. The very basic rocks all occur at the margins, yet there are variations within the main body of the batholith which are clearly distinguishable types, yet cannot be discriminated in mapping. This difficulty has been experienced by these geologists working in the Sierra Nevada, where, as a result of the great variety of rock types, some of the diagnostic minerals have been mapped as granodiorite, "although, as a rule, gabro, even when genetically related to granodiorite proper, has been separated." Where detailed mapping is possible, the mapping map is not possible, this difficulty of separating parts of a single intrusive body in which the rock-types grade into one another can only be met by an arbitrary one of the name of the prevailing rock-type for the entire mass, as has commonly been done heretofore, or by using a generic term like granodiorite to embrace all coarsely granular rocks.

The prevailing rock of the batholith is a normal hornblende-granite which is very generally sheeted, forming picturesque crags and shoulder groups. It is characterized by the presence of an undifferentiated assemblage of feldspar, plagioclase, hornblende, biotite, and quartz. In the more basic rocks, the amphibole is more abundant, and in the more felsic rocks, the biotite is more abundant. In all cases, the plagioclase is the most abundant mineral, forming a large part of the rock.

The Plagioclase.

The plagioclase is mainly of the labradoritic or andesine type, but in some places it grades into the olivine or peridotitic types. In the more basic rocks, it is more common, forming a large part of the rock.

The Biotite.

The biotite is mainly of the green variety, but in some places it grades into the pale brown variety. It is generally found in association with the hornblende, forming a large part of the rock.

The Hornblende.

The hornblende is mainly of the diopside type, but in some places it grades into the labradorite or andesine type. It is generally found in association with the biotite, forming a large part of the rock.

The quartz.

The quartz is generally found in association with the feldspar, forming a large part of the rock.

The feldspar.

The feldspar is mainly of the orthoclase type, but in some places it grades into the labradorite or andesine type. It is generally found in association with the quartz, forming a large part of the rock.

The Strong Copper Market.

For the first ten months of the current calendar year the production of copper in the United States amounted to 223,387 tons, an increase of less than four per cent over the same ten months of 1895, comparing with a normal yearly increase of ten per cent. During this period the cost of copper from this country amounted to $128,581 tons, an increase of fifty per cent over the same period last year. During these ten months we shipped abroad sixty-three per cent of the total output, averaging about 7,300 tons a month, and fluctuates little either way from this figure. It is noteworthy that in face of the strong copper market, the mines abroad are no more able to increase their output than the American mines, as the European production for the first ten months of 1890 is actually the smallest for the same period since 1886.

These facts are naturally most gratifying to holders of stock in the big American copper properties. In another column we present a comparison of the dividend payments of the leading Michigan and Montana mines. Below is a table presenting the figures in greater detail. As usual, table is greatly enriched and retains its head by a margin which none of its rivals seem likely to overcome. The total dividends paid this year by the Lake Superior companies was $9,978, and the total amount of money paid was $13,256,119. Following are the figures:
The Los Angeles-Salt Lake Railroad.

Articles of incorporation for the company which will build a railroad from Salt Lake City, Utah, to Los Angeles, Cal., have been filed at Salt Lake City. Of the nominal capital of $25,000,000, the sum of $6,000,000 has been covered, it is said on conservative estimates. The corporate name of the company is the Los Angeles & Salt Lake Railway Co. Although the full details of the scheme have not been announced, and nothing has been made public in regard to the methods of financing the company, it is interesting to note, as Bradstreet’s points out, that W. A. Clark, the Montana millionaire copper mine owner and candidate for the representation of that State in the United States Senate, is the president of the new company, and that a number of prominent politicians and business men in both the East and West are associated with him in the direction and management.

It is, however, also worthy of observation that among the names which figure in the list of directors are no representatives of any prominent railroad corporations, so that it is impossible to deduce anything directly from the personnel of the concern about its origin or affiliations with other companies. It is stated that the Los Angeles Terminal Railway, which has constructed about fifty miles of line in and about the city of Los Angeles, with wharves and warehouses on the Pacific, is to be acquired, and will form part of the new system.

The total distance to be covered between Salt Lake City and Los Angeles is upwards of 1,000 miles, so that the new road, if built, will be of no inconsiderable length. Considerable portions of the road, if the line is constructed as a direct route between the two points, would pass through sections of the territory in Southern Nevada, and will also be a good deal of mountain work along the new line, although it is stated that the engineers who have made the preliminary surveys have discovered low-grade passes, and that it will compare favorably as to grades with the other railroads extending from the western slopes of the Rockies to the Pacific Coast. It will, however, naturally be several years before the road can be completed and become a factor in the transcontinental and Pacific Coast railroad problems.

The construction of a line from Salt Lake City to either San Francisco or Los Angeles is also being a new project. The Union Pacific already possesses, as part of its Oregon Short Line system, a line of road extending southward from Salt Lake to Frisho, Utah, a distance of several hundred miles, while a further extension of this road has been built to Uvada, near the southwestern corner of the State of Utah. It has frequently been suggested that this line might be extended so as to give the Union Pacific system an outlet to the Pacific Coast independent of its connection west of Ogden, Utah, with the Central Pacific and the other lines of the Southern Pacific system. Reports that such a move has been contemplated by the Union Pacific have, however, been uniformly denied, and at present the management of that company is to all appearances in such firm accord with the interests in control of Southern Pacific that it would be unlikely to undertake such a new construction. The Union Pacific, however, would bring it into competition with the different railroad properties of the latter company. Some suggestions have been heard that the Los Angeles & Salt Lake Railway may represent a further extension of a system to be created out of the union of those natural allies, the Denver & Rio Grande and the Rio Grande Western, for the purpose of affording the two latter roads a direct and independent cottonwood to the Pacific Coast. If this should happen, however, seems hardly probable that such an expensive piece of railroad building would be undertaken, if the capitalists who stand sponsors for the new enterprise have the backing and are expected to turn the road, when completed, over to some of the larger systems, such as the Atchison, Topeka & Santa Fe, or the Southern Pacific, the idea long thought, was heading toward the Pacific Coast.

California Miners’ Convention.

The California State Miners’ Association held its ninth annual convention in San Francisco on November 19, 20 and 21. The meetings were of unusual interest and of much benefit to all present, and are likely to result in great improvement to the mining interests of California. The first session was opened with a message of welcome by the Mayor of the city. At the various sessions a number of important reports were read, among of the United States concerning the location of mining claims so that the locator shall be accorded a reasonable time in which to mark his surface boundary, etc., was endorsed. Much attention was paid to the question of remedying the abuses of the land and mining laws by wholesale attempts to secure as agricultural lands large tracts of public lands that are unquestionably mineral in character. The resolutions favored the proposition that where a contest takes place between a miner and a claim to a mining claim, the burden of proof shall be placed upon the miner. State legislation relative to the consolidation of small mines was favored, the demand for a Cabinet Department of Mines and Mining was endorsed, and a number of other resolutions were included in the list, among them one asking for an investigation of the State’s water resources with suggestions as to the best methods of improving and developing them.

The proceedings closed with the following election of officers: President, E. C. Voorhies, Amador county; first vice-president, Fred Zeller, Nevada county; second vice-president, Lew E. Aubury, Los Angeles county; secretary, E. H. Benjamin, Alameda county; treasurer, S. J. Hendy, San Francisco.

Activity in the Cinnabar Belt.

Dr. Wm. B. Phillips, the well-known mining engineer, is making good progress in connection with the mineral survey of Texas, which he has undertaken on behalf of the University of that State. He will make his headquarters at Austin, Texas, though he is likely to be traveling through the State much of his time. In a private letter received from Dr. Phillips, he refers to the activity in the Cinnabar Belt in these words: “It is reported here, on what appears to be reliable authority, that 1,200 tons of Cinnabar Belt ore sold recently for $180,000. I know there is considerable interest shown in that district. Two furnaces are already said to be in operation. The district is from 80 to 100 miles from the Rio Grande, south of Marfa and Alpine, stations on the Southern Pacific Railway, some 500 miles southeast of El Paso.”

Copper in California.

A writer in the Boston News Bureau has directed public attention to the fact that although California has been explored for copper properties from north to south over a period of many years, the result of such exploration has not to date produce any copper in the case of the Pinnacle Copper producing states. East of San Francisco a Mr. Harmon of Chicago has developed a small copper property at Camp Seco, and upon the present price for copper is understood to be making a little money. Twelve or thirteen miles from here the Ames estate of Boston has sunk a small fortune in a place called Copperopolis. Although this property has been under inspection and development for many years, no continuous bodies of copper ore have been found of sufficient size to warrant, upon a corridor base, the erection of any plant, although if the present copper market continues to hold, it is a promising prospect. No work of consequence is being done upon it at the present time.

Another California copper prospect is in Shasta county at Copper City, and is known as the Daily Herald property of Mr. D. J. Hall. This is a state of development and has no smelter or railroad as yet.

The only other copper property known in California is that of the Mendocino Consolidated Co., Ltd., which is owned in England, and which is operating in Shasta county about ten miles west of the Bally Hill property. This company has the only developed copper mine of consequence in
New Discovery of Coal in Central Asia

A Russian contemporary is responsible for the statement that large deposits of bituminous coal have recently been discovered in the immediate neighborhood of Ust-Kurgan, about thirty-two versts (21.2 miles) from the station of New-Magel-ehan. It is reported that the field covers an area of about twenty-five square miles and that the coal is of first class quality and better than the Donets coal. A company, chiefly composed of President Andreyev, has been formed for the purpose of exploiting the deposits, and it is said that the Russian Government is supporting the new organization in every respect. It is said that the Government even went so far as to give binding assurance of its most cordial aid to the effect that the coal would be used on the Government railway lines in Transcaucasia, in place of the petroleum fuel now used. The military authorities have already placed an order for 830,000 tons (5,090,000 cwt) of coal. The production, we are further informed, is to be regulated according to requirements, though the company hopes to be able to ship its coal as far as up to the Volga river. There is little doubt that some day Central Asia will become a valuable coal market itself, especially if Russian continues to push on its railway extensions at such a feverish speed as has been the case of late of late few years. It is also reported that 4,000 Kirghises have already been secured, and work on a large scale will soon be started. The Kirghises of the Astrakhan steers are said to be willing and good laborers, and will work at from 45 to 60 rubles (5.25 to 22.5 cents) a day.

New-Magelhan, where the deposits are said to be situated, lies between Turkistan and East Turkestan, in the southeast of Bokhara. The Transcapian railway is now in operation as far as Samarkand, whilst the extension from Samarkand to Turkestan and further north is under way of construction, so that proper means of transportation for the coal will soon be available.

COAL.

Last year's production has been 2,000,000 tons, being an increase of 800,000 tons over that of the preceding year. The average yield per acre is said to be between 500 and 600 tons. The remarkable yields of some of the mines at Croydon, one of which alone has, during the past twelve months, produced coal of a value of £45,000, has attracted considerable attention of speculators and investors, while the discovery of the Hamilton, which, within the short period of its existence has been credited with the production of 10,000 cwt of coal, shows that there is still scope for the prospector in the little known waterbeds of the Peninsular. The success of derrigging operations in the neighboring colonies has caused many miles of our rivers and creeks to be appropriated with the view of testing them by the latest methods of gold mining. The prospectors and miners who have visited some of the proposed scenes of operations have expressed themselves favorably respecting the prospects of success, and before the close of the current year it may be expected that if not more, dredges will actually be at work.

SILVER.

Of minerals other than gold the actual production has been small, and gives little idea of the latent wealth of the colony. Thus the total yield of silver, 14,000 cwt, valued at £15,000, came from two small mines, one in the Stanhope and the other in the Ravenswood district. But the galena lodes of the Burketown mineral field are shown by the recently published report by Mr. Cameron and Mr. Cameron of the geological survey to be most worthy of the trial which they will doubtless receive when reasonable means of carriage to the coast are provided.

TIN.

Thirteen hundred tons of tin, valued at £27,000, represent the year's production of that metal, but a great expansion of this industry may certainly be looked for. The tin-bearing area of Queensland is larger than that of any other of the Australian colonies; new ground is constantly being opened up, and many of the mines have passed into the hands of those who are willing and able to work them in the manner in which they can be worked profitably.

WOLFRAM.

Of the rarer minerals the colony appears to have a fair share. Wolfram especially is abundant and of high quality, and last year the wolfram mine at the Hodgkinson field yielded 250 tons, valued at £10,000.

OPAL.

Although gems and precious stones of various kinds are known to exist in the colony, the search
Progress in Coal Mining.

A Century's Improvements in Machinery and Methods—A Look at the Future—The Present's Greatest Need—Men Who Are MASTERS OF THEIR BUSINESS.

By G. C. Kellogg.

I have not been able to ascertain when the first engine was used at the mines for pumping, neither have I been able to learn when coal was first hoisted by steam, but I am safe in saying that it was before 1828. Watt and Watt were making engines in 1774 and the first Watt engine was built to replace a Newcomen at the Cornwall copper mines. I must mention the great man, Watt, who built these engines out of the mines. This engine was a large beam reaching from the surface to the bottom of the shaft with steps fixed upon it at measured intervals, and along the side of the beam a series of platforms was erected, also at measured intervals. As the beam was lifted up and down by the engine on the surface the men stepped from step to platform and vice versa until they were huddled at the top of the shaft. There was later an improvement on this single-rod man engine by adding another beam, making what was termed a double-rod man engine. In this case the men stopped from one platform to the other by means of an arrangement which was carried down into the mine by means of a current of water falling down a box, the fire basket, the plain furnace and the elaborate double-rod furnaces with side spaces and spoutdrift; the steam jet and compressed air jet; the cage ventilator, the steam displacement machine with its armature and walking beam and the plain machine with its whole and epicycloidal teeth; the Lammelle sixedrum; the Cook ventilator with its eccentric cylindrical drums, and the Roto rotary air compressing machine. The centrifugal ventilators followed the Nernst, Rammel, Waddell, Schleie and Gimbou types, with their straight radial blades, straight inclined blades and the curved blades. And last of all came the grec Capel fan with Wm. Clifford in the background. He had better keep his eye out for the duplex Murphy which I had nearly forgotten. Pilling informs us that the earliest means used for renewing the air in mines was by diffusely placing a piece of cloth at the entrance of the mine. Fans and air pumps were in general use in Agricol's time and are described at length by that author. Some of these appliances were capable of keeping the mine alive for miles long, clear of foul air, so the ancestors were not so slow as some of our natural ventilators of to-day.

OLD METHODS OF DRAINAGE.

As to drainage, the first means of disposing of water was the old method of throwing it into the earth. One of the first parallel improvements that was in all probability followed by the baller, barrel and pipe, water box and siphon. The elevator buckets followed, then the scat pump, horse pump, walking beam pump, direct acting steam pump and the air compressor.

The underground haulage was first by baskets, next by sledges, then trains, and finally the pit wagon of the present day. The sledges and trains were pushed and pulled by hand. These were in turn replaced by the pony, horse or mule; the gravity plane, the endless chain, the endless rope, the belt type, the steam hoist and the electric motor, the low pressure compressed air locomotive, and finally the high pressure compressed air locomotive, working under a pressure of 600 pounds to the square inch. The pick and shovel, the shovel and pit small and bar are being rapidly replaced by the rope driving mining machine, the compressed air and the electric mining machine of the pneumatic, rotary bar and chain type. The canvas curtain and the wood trap door are rapidly being displaced by the overcast and the automatic trap door.

The sallow candle, the steel mill, the oil lamp and the tin can are signal lamps have given way to the Davy, the Limet, the Marsey and the Wolf lamp with its igniter and magnetic lock. The electric light has taken the place of other lights for fixed illumination. In the engineering department we find the ancient compass in its various forms, viz.: box, hanging, Jacob's staff or tripod, replaced by the engineer's transit, Y-level and steel tape. The former haphazard custom of driving headings anywhere and on any course is replaced by those runs on given courses with the ever-increasing claim of achieving certain expected results; and at some date those expected results are being gotten. The tendency now is to try and get all the coal that can be gotten out at profit not of to-day, or this month, but with reference to the whole term of the mining operations.

THE "ALL AROUND MAN."

Until very recently the future was never considered at all, and the man that could make a blanket was the man that was looked for. Now this is all changed, and if a man makes a phenomenal showing it is investigated to see if it is not at the expense of the future operations. The idea of the coal mine of today is not to dig a coal mine to be a Jack-of-all-trades. He not only was supposed to be capable of conducting the operations, but to be able to make a survey of his mine, to be able to look after the accounts, and if necessary erect the engines, pumps, boilers, etc. This question of engineering brings to my mind a remarkable piece of engineering work that was performed near Newcastle, Pa., when I was a small lad.

Charles Herbert, a well-known mining superintendent then new, had charge of a mine, and an air shaft was needed there. In order to locate the shaft, he determined to take a survey of the mine workings selected for its site, a survey was necessary, and this was the way the survey was made: An old box compass was procured from some obscure source and taken to the mine, where it was carefully laid on the ground midway between selected points, and carefully leveled up with slack and coal dust, then a string was stretched from point to point across the diagonal plane and note made of the number of degrees the string cut. This operation was carried on course after course until the survey was completed. I have been assured by people whose veracity cannot be impugned, that the survey proved to be fairly correct. Of course the operations under ground were repeated on the surface.

This is now all changed, and a man is no longer valued for the number of things he can do, but for the number of things he can do at one time. Just when the present advanced systems of methods of mining were first put in practice I cannot learn; in fact, I believe no one can really do so; but I am inclined to think that the present popular opinion is that the large coal mine officials of a century or more ago were not so ignorant as present popular opinion has it. Very large quantities of coal were mined several centuries ago, and under the most adverse conditions, too, as they necessarily had considerable
The Origin of Coal.

A Fellow of the Geological Society has contributed to the 'Monthly Journal of London a valuable paper summarizing a number of opinions on the formation of coal. He writes as follows:

While the public have beenorrowing and the coalowners rejoicing in the high price of coal, while the alarmists have been prophesying the imminent exhaustion of English coalsfields, the geologist and the botanist, meeting together on common ground, cannot but see the secret of the coal illustrative of the way in which graminaceous vegetation became coal and formed the coal seams.

The botanists brouch the fact of the coal having been formed by the plant remains, which were subsequently covered with sediment and lithified. The geologists have been seeking for the evidence of this, and have found it in the coal seams, which consist of carbonaceous material, and in the coal itself, which is a mixture of organic and inorganic matter.

The theory of the formation of coal is based on the idea that the coal was formed by the decay of the vegetable matter contained in the coal seams, and that the coal was formed by the action of the heat and pressure on the vegetable matter, which was subsequently lithified.

The evidence for this theory is conclusive, and the theory is supported by the fact that the coal seams are found in the same strata as the plant remains, and that the coal is found in the same layers as the plant remains.

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a large level plain, a second deposit of coal would be formed under present climatic conditions. Such a plain would be situated in a rainy—but not necessarily in a desert—district on the plain's surface. It would be surrounded by lofty ranges of mountains, giving birth to rivers from time to time carrying detritus into the plain beneath. The plain would be known to many hundred feet in depth. They are not likely more nor less than an insignificant deposit of coal formed of modern plants under modern conditions. If the Bog of Allen were subjected to a slow and constant rainfall, it is no reason to doubt that the underlying moss would in the course of ages become consolidated into coal.

**Latest Mining Decisions.**

Specially Prepared for The Mining and Metallurgical Journal.

If the operator of a coal mine employs an examiner holding a certificate from the state board of examiners authorizing him to act as such, and the examinee of the mine is at the time required by law, it will constitute a compliance, so far as the operator is concerned, with the provisions of sections 4, c. 93, 2 Statt. & C. Ann. St. 2713, requiring inspection of mines to determine their condition. (Daily Valley Coal Co. vs. Hill, 87 Ill. App. 3d. 424.)

An acceptance of reservation contained in a lease of coal mining property indicates an assent to the terms of the reservation, includes, prima facie, all those substances otherwise fully and properly included in the lease except such as have a use and value of their own, either for the purpose of sale, or for other purposes independent of the use of the coal bed as a coal deposit. (Welsh v. Crompton, 68 Law J. Ch. 569 (1890).) 2 Ch. 128, 91 Law T. (N. S.) 165, 47 Wkyl Rep. (Eng.) 694.

Hurd v. St. 35, § 44, provides that every laborer or miner who shall perform labor in opening and developing any coal mine, including sinking shafts, tunneling, clearing stopes and drifts, mining coal, and the like, shall have a lien on all the property of the mine and the property of each laborer. Held, where a bill was filed to have a lien declared against the property of a mining company, and it was nowhere averred in the bill that the work and labor performed were in "opening and developing" a coal mine, no lien could be had. Borders v. Uzo, 88 Ill. App. (111.) 631.

The title to the underlying coal having passed to the operator, he would have the exclusive right to the coal as a leasehold interest, and he may, like the owner of any other thing having a use and value of its own, sell the coal. (Welsh v. Crompton, 68 Law J. Ch. 569 (1890).) 2 Ch. 128, 91 Law T. (N. S.) 165, 47 Wkyl Rep. (Eng.) 694.

**TRADE NEWS.**

Theo. Altenderer & Sons, 945 Ridge Ave., Philadelphia, Pa., have just issued a new catalogue describing their draughting instruments.

The Colorado Iron Works Co. of Denver, Colo., has received an order from the El Paso branch of the St. Louis & San Francisco Co. for a ten-stamp mill to be erected in Mexico.

The Wedge Pipe Works of Denver, Colo., report an order of $469,000 for fifteen years and a half of pipe for placer mining and water power works.

Dredge No. 366,523, Stirling, has put on the market for $600,000 to $600,000. A large addition to the factory has been made.

The directors of the Ludlow-Saylor Wire Co. of St. Louis, will meet in January for the purpose of making contracts for the sale of the company's products. The price of 1.50, 000, 000 to $600,000. A large addition to the factory has been made.

The American Impulse Wheel Co. has filed in the New York courts a petition for the dissolution of the company, and Edward M. Burchard of 120 Broadway, New York City, has been appointed as receiver for the company.

The American Bridge Co. has secured a retail order for seven buildings from the Sterling White Lead Co. of New Kensington, Pa. It is also furnishing the Rio Grande Western Railway thirty-six plate girder spans from its Chicago plant.

A plant consisting of fifteen large buildings of the most modern type, and the necessary machinery, fuel and other heavy chemicals, securing its raw materials from Cuba and the West Indies, will be installed.

It is reported that the Crucible Steel Company of America will erect a $1,000,000 plant next spring at Muskegon, Mich., and will be able to produce large quantities of ingot, steel bars and imported steel.

The Department of the Interior has ordered a probe well on the Macoura, Colorado, in the vicinity of the proposed canal at Grand Lake, Colorado, and the work will have a railroad frontage of $2,000,000.

The American Steel & Wire Co. of Detroit, Mich., has just sent out its new catalogue No. 116 describing its "A C B" high-speed vertical and horizontal drilling machines. The large size of the print matter concerning any of its lines will be furnished upon request.

The $29,000,000 plan of the Graselli Chemical Co. of Cleveland, O., has just been completed at a cost of $1,000,000, a few miles from Birmingham, Ala. The company is the largest in the United States and one of the leading users of oil and other heavy chemicals, securing its raw materials from Cuba and the West Indies.

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CONSTRUCTION AND DEVELOPMENT NEWS.

The Big Vein Coal Co. at Shaw, Va., will develop coal mines and construct a narrow gauge railway. A. H. Kibbe and W. H. Hill are the officers.

A. R. Thomas of Chattanooga, Tenn., has purchased coal property on Lookout Mountain, and has organized a company for development work.

The Knoxville Zinc Mining & Smelting Co. is considering the erection of a large smelting plant at Knoxville, Tenn. It will sink a new shaft at its mine.

The Coal Co. & Coke Co., authorized capital $100,000, has been organized. Michael Crouse, G. C. Cronin, Richard Seavorn, and others are the officers.

L. D. Ellett is manager for the Proctor Coal Co. of Knoxville, Tenn., which has recently purchased the mines of the Indian Mountain and Jellico Coal Co. at an undisclosed price.

A mine of magnesite and magnetic iron ore has been discovered by Granville Beall at Calhoun Falls, S. C., and arrangements are being made to establish an operation of machinery.

Otto A. Kohlsbass has leased the leasehold of the Imperial Coal Co. at Knoxville, Tenn., and has organized a company capitalized at $100,000 to operate the coal bed.

The Texas & Pacific Coal Co., of which Edgar L. Marion of St. Louis is president, is about to increase its capital stock to raise money for the development of its coal mines at Thrasher, Texas.

Correspondence

ARIZONA.

[From Our Special Correspondent.]

TUCSON, Ariz., Dec. 8, 1900.

A smelter in or near Tucson will not only be a paying proposition or investment to the projectors, but will be the means of starting work on many claims that are now laying dormant.

The Mining Co., a group of claims owned by Austin & McBride five miles from Tucson, is attracting notice because of the immense size of ore to the city. They intend to develop their property, which contains over a million tons of ore, having heavy bodies of ore, averaging from three per cent to eighty per cent copper, with some silver and lead. They believe that these properties will develop into rich paying mines as the work progresses.

A party of miners has gone to Arizona to commence work on the War Eagle mine, seventy-seven miles southwest of Gila Bend, Maricopa county.

W. A. Hanson, who is working for Crockett & Williams on the Reward mine, twenty-seven miles southwest of Casa Grande, reports work progressing very favorably.

MICHIGAN.

[From Our Special Correspondent.]

COPPER MINE DISCOVERED.

No. 2 shaft of the Winona is showing strongly in copper, and the information is that the mine has been much disturbed at the Winona, the Wyanot and the South will be the same.

The mining districts are becoming somewhat more regular at the Winona.

The Department of the Interior has sent a special engineer to the district, and the work is being done very well.

New shaft of the Winona is to be opened, and the mine is being worked up to the surface.

The claims on the Winona are very rich, and there is a good chance that a large amount of ore will be discovered.

General News

ALASKA.

Reports keep coming down to Washington of fabulous discoveries of gold in Alaska. Most of the reports contain all that is known of the claims, and in addition, many others say the "richest quartz ledge ever known," or something of the kind. It is not possible, however, for experienced mining men to distinguish between the well-founded reports and those which are mere groundless tales.

In the Gleaner district a ledge of copper ore has been discovered near the town of Haines. Samples of the ore have been shown by David Von Cramer, who says that the ledge is about 25 feet wide, and contains a streak of wonderfully rich ore.

A. G. Preston of White Horse brings news that the mining district is becoming more important, and that the ore is now of a much richer quality than before. The district contains many rich veins which have not yet been discovered.

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ARIZONA.

The Commonwealth Mining Co. at Pearce, has its new stamp mill nearly ready for operation. A steam shovel is being brought in, and will be extended down below water level. Work is still going on in the mine itself, at old shaft No. 477 feet, and although it was known that rich ore could be found below that depth, sinking was considered too expensive and a pumping plant will be installed to handle the water met in sinking the shaft deeper.

The Wolcott mine is a property in South Pass which seems to be promising. In tumbling cars running six square men and the sulphides running from ten per cent to sixty per cent in copper, carrying from fifty to 150 ounces per ton to $35 per ton. A steam hoist and pump will soon be installed.

Report comes from Tucson that the Great Western copper mine recently opened one of the finest ore reefs ever seen in that vicinity. The ores are carrying considerable glance and is about fifteen feet wide, with a high average in copper, besides some gold and silver.

CALIFORNIA.

An unconfirmed report from the Eagle Mountains in Riverside county states that a ledge of gold ore eighty feet thick, running from $15 to $17 per ton has been found in the Iron Chief mine.

Nineteen four-horse teams are busy filling cars at Ferris, Riverside county, with an earthen used at the Colton cement works. This particular kind of cement may be found about one mile from Ferris along the line of the Southern California Railroad.

Enormous iron is being cut crosswise in the Lincoln mine in Amador county showing rich quartz veins, and a cleanup is in progress. A cleanup of the mill recently netted $4,672.

The Taylor Mountain coal mines in Sonoma county have had a disappointing season. Colonel A. C. Hammond of San Francisco is looking after the work, which will comprise a tunnel, which will cut some of the principal veins in a blocking process.

The future of the Rand mining district never looked brighter than at present. The mines generally are producing well, and the business outlook is good. The Yellow Aster Mining Co. has let its contract for the 100-ton stamp mill, and it is specified that the mill must be pounding ore by March 1st. The contract is for $600,000. Sufficient water is already developed to run it, 75,000 having been put into water development in the past month. The new mill will add to the bullion production of the Rand district, $400,000 per month, reckoning at the same rate as the thirty stamps are now running.

The new mill at the Clio mine, near Jacksonville, is about five miles in front of the new shaft, and instead of twelve hours a day it will soon be running twenty-four hours. The ore is 76 per cent copper, and the iron is 60 per cent and the ore is getting very rich near the surface, running up to 50 per cent. The indications now are that this will be true of the largest producer in the state. It is on the same lead as the plumwood which turned up $44,000 in September with a ten-stamp mill.

At the Longwellow mine at Big Oak Flat, Tuolumne county, the flotation plant is running successfully. Reports of the addition of ten stamps to the mill are made.

The work of erecting the Huntington mill for the Parker Mining Co., sixty-five miles down the Colorado river from Needles, on the California border, is now in progress. A force of men is working in the mines located four miles south of the town of Parker, taking from 200 to 300 tons of gold ore.

A force of men is also working on the road from the mines to the mill, over which the ore will be hauled. The work is being very lively. The camp here this winter.

Stubs & Bowers have had five tons of ore from their mine, the Jennie B., located in the slate range, inched at the Red Dog mill near Kendallville, in the Ashland district, and the ore is richer than much of good grade.

W. J. Cope, who is interested in the Carpet Tack mine, about twenty miles southwest of the Tuolumne county, is about to open the H. E. gravel mine at the head of French Gulch.

N. S. Lewis and Fred. Shafter of Killeenfield, San Bernardino county, report the opening of some fine copper properties in their section. There have been some remarkably high assays from this portion of the country, and although nothing of very great permanency has been found in the past, it is an indication of the richness of the country.

The Confidence mine near Sencra, Tuolumne county, has been working on a large scale. A force of men have been employed.

An examination of the Mariposa mine near Mariposa, was made by D. D. Ludlow.

It is expected the granite quarry on the old Sheffield property, near Bear Valley, will be put in operation, as outside capital has taken hold of the proposition.

At a depth of sixty-four feet some high-grade ore is being taken out of the Fairview mine near Cisco, Placer county.

The new mill on the Brown Bear mine at Deadwood, Trinity county, has been started. It is a company proposition, and is expected to be run on from the old workings. The lower tunnel is being run as rapidly as possible and expects to strike the main vein this fall.

Black Nugget, Dry Fork Creek, twenty miles from Havre started in last spring, will produce considerable gold. Pay dirt is from six inches to three feet in depth.

COLORADO.

Gold properties in the East Mancos district, Montezuma county, have been purchased by James Doyle of the Portland mine, Cripple Creek district. No great showing has yet been made in that district.

The Superfine mine at Ward, Boulder county, is attracting considerable attention. A company backed by Indians men was organized last spring, and a forty-stamp mill was organized which will have a shaft driven. Machinery has been installed, and development work is progressing rapidly. The mill will be made until next spring.

The Leadville district records a daily output of ores amounting to 2,500 tons. Besides the iron, lead, silver and gold products a considerable tonnage of zinc, bismuth, and manganese is recorded.

The bismuth is sent direct to London.

A Boston company is working on an old mine twelve miles from the town of La Veta, on the east slope of the West Spanish Peak. This mine was prospected to some extent seven years ago. A vein of gray copper in the Bull’s Eye shows assays of $760 per ton. When the property was first prospected, about one hundred tons were shipped to Pueblo, netting about $90 per ton. Five companies are now working in the Spanish Peak district, and a mine in the Letters district will be set up next year.

Good reports are received from the New York and Brooklyn in the Red Mountain district where a strike was recently made. One assay shows 10 ounces of silver, 2 ounces of lead, 1 ounce of copper and 1 ounce of zinc. The mine is controlled by the mine.

A fourteen-inch streak of ore carrying iron, yellow, and galena, shows the market is containing some galena, has been located on the Anaconda claim in the Georgetown district.

IDAHO.

A chlorination plant will soon be erected at the Iowa mill, Quartzburg, by the War Eagle Co.

Developments on the property of the North Star mine, near Arco, are most promising, large bodies of ore and rich gold being found.

The tunnel on the War Eagle property is now down over 2,700 feet, and still deepening at the rate of ten feet a day. It is expected that the tunnel will cut the first lode about May 1st.

MEXICO.

On January 1st, the reduction and concentrating plant of the Union Mining Co., operating several rich mines in the Pinoso district, will be completed, and the concentrates of the Cerro del Tigre will be ready about the same time.

A valuable mining property near Montezuma, Chihuahua, has been obtained by a railroad company.

A railroad, connecting the Astec, Carbonate, and San Pedro mines located near the Mitre Mountain near Monterey, with the smelters of that city, is soon to be built. An immense tonnage of ore is assured.

Large bodies of carbonate and galena lead ore is being mined on a large scale near the Mitre Mountain district.

A valuable activity is reported in the San Pedro mining district. The El Carmen, the Ovelia, and the San Salvador, all owned by a mining company, are reducing and concentrating.

The Chihuahua Malutos mill is at present in operation, the properties of the Sonora, about 200 miles from Quayman, is producing quantities of ore. This mine was recently inspected by a company from Pennsylvania capitalists. A party of New York capitalists are interested in the property and are now on a visit to it. The property is the largest in Mexico, being a grant from the Federal Government and is located in the Sonora district.

The concentrating plant is in operation. The capacity of this plant is to be increased to 250 tons.

A mill from the west coast, which has a capacity of 294 ounces a ton, has been built in the Bonito mine, in the Parral district, Chihuahua.

MICHIGAN.

Captain W. A. Dunn of Houghton is said to have secured an option on the Belt mines which had a disastrous experience in 1884, when owned by an English corporation. The experts who represented the Englishmen at that time reported the property as better than the Calumet & Hecla mine, and on the strength of the reports signed by the experts, the English corporation put $130,000 into the venture. After the expenditure of vast sums for improvements and machinery, it was found, when the mill started, that the mines could not produce even 200 tons a month, and the Englishmen gave up their job in disgust.

A new company has been formed by the Michigan-Detroit syndicate which will make another effort to operate the mines.

A portion of the 7th a fire was discovered in the coal shed of the Calumet & Hecla at the Lake Linden smelters. It is said that the fire was started by a Argentine mine, last evening about 1 - 600 tons of coal loaded in the storage, the company clerk at Houghton. The corporate existence of the old company will expire April 29, 1901. In a few months less than thirty years, the company has paid dividends of $70,000,000, and by the time the present dividend is paid, the coal company will have paid out $1,600,000 more, in all likelihood the largest sum ever paid in dividends by any mine in the world. The sum of $70,000,000 by the Calumet & Hecla and Virginia from the Comstock lode, silver, is the largest record at this time.

It is reported that the No. 5 shaft, the great shaft of the Tamarack, will reach the Calumet lode by Christmas. At present neither the shaft, nor any of the crosscuts started therefrom, have reached the Calumet vein, but every indication in the world is that the Calumet will be a fine lode. The newly occupying of the No. 5 shaft in as rich ground as has ever been opened upon the Calumet & Hecla or the Tamarack. In fact, the lode in its richest part at this point should contain about 700,000 pounds of copper and two sections of the mine, should give a net result of more than three times its present apparent size of the rock. The Nos. 3 and 4 shafts of Tamarack are still in ground as "rich as mud."
The fire which has been burning for several weeks in the Bell mine of the Amconda Company property, Montana, that started and nearly escaped death by asphyxiation. It was then said that the fire has eaten its way into the surface workings, and was getting beyond the control of the men.

OREGON

John L. Rand of Baker City has a bond on a section of the Greenhorn district in which a body of coal is reported to be located. The Sunriter Forwarding Co. has taken a contract for shipping the ore during the coming winter and early next spring to the rail road. The surface ore runs $67 in silver, $13 in gold, and is high enough in silver to make the mine running for two years.

James M. Pangloss, manager of the Gold Hill mine north of Baker City, says that development work is progressing well on that property, and that values are increasing with depth.

SOUTH DAKOTA

Report comes from Casper that the Omaha Mining Co. of Omaha, has leased the North Star mine 100 feet deeper, which will make the shaft 400 feet in depth. At the 300-foot level the ore body is seven feet wide, averaging about $18 a ton.

The miles north of Casper, on Spring Creek, a promising strike of copper ore has been made. A ledge of the ore body has been tapped, which will carry about seven per cent in copper. The ledge seems to be a flaser vein. The Copper Butte mining district is 10 miles west of Casper, the shaft is sunk on the vein the ore continues in depth, large reduction works will be erected. The underground workings are reported to be in good condition.

The Homestead, a new mine being operated by the Chicago Mica Co. of Chicago and the Sibley-Bondian Mica Co. of New York City, the last named company has contracted for the entire output of the New York mine, mine owned by C. B. Dow of Sioux City, Iowa, and located eight miles west of Casper. The mine of the Black Hills is not usually clear, and is, therefore, a very good investment for windows and similar purposes, but has the advantage of being free from iron, and its bright golden value has commercial work, and as it is estimated that ninety-five per cent of the mica mined in the world is used in the electrical industries. It will be seen that the clodliness of the South Dakota product is not a very serious disadvantage. The New York mines produces many blocks of mica which are of unusual size. A New York expert who visited the mine and inspected the products of the mica, and told the miners that the Black Hills have enough mica to supply one-half the world's demand.

It is said in Casper that plans are under way for the purchase of the St. Elmo stamp mill and other mining machinery. The buyers are also in the persons of financiers who are also figuring on buying the Clara Belle mine, are the most likely purchasers. The Clara Belle mine has just opened up a ledge of ore at the 100-foot level, which will compare well with the Horsa, towel at the 600 feet in depth, and fifty feet long.

Northwest of Deadwood a valuable deposit of asbestos has been discovered, which is shown to be of unusually fine fibre. The deposit is about three feet thick, and three from ten to twelve inches long have been taken out. The asbestos has withstood several fire tests and other methods of examination to determine its mercurable qualities.

UTAH

It is reported that Milan Packard, manager of the Star Consolidated, now controls 36,000 shares of the North Star mine, the same number of shares as all the other owners. Mr. Packard recently secured an option on the mining claims for $250,000. The mine is said to be a valuable one, and it is believed that more ore is exposed now than at any previous time in the mine's history.

The Anchor Mining Co. of Park City has issued $100,000 worth of 3,000,000 pounds of lead, 155,000 ounces of silver, 250 ounces of gold and 3,800 ounces of copper in the past ten months.

WEST VIRGINIA

Thirty-three coal operators in the Fairmont field have formed a company under the name of the Fainmont Coal and Mining Co. The new company will handle the entire out-

put of the Fainmont region and will be able to fill large orders on short notice. One of the objects of the company is to fill orders for coal loading a ship in a single day where it would have taken two weeks before.

On Nov. 22 negotiations closed whereby 25,000 or 30,000 acres of coal land in the counties of Wyoming and Union, owned by the Humble Oil & Refining Co. of Texas, have been disposed of to the New York and Pennsylvania capitalists, and with it, the control of the entire railroad to the railroad to the coal fields. The Braxton Coal Co., has been formed, and will operate the coal and commercial lines of railroad at once. The subscribed capital of the Braxton Coal Co. is $3,000,000.

The Big Vein Coal Co. will open up a new mine at Shaw, seven miles from Pinedale, and will build one mile of railroad to the West Virginian Central. This is the same coal as found in the Elk Garden field.

The Dickey-Gibson Coal Co. has opened mines at Franklin and made its first shipment of coal. It will increase its force as rapidly as possible and can provide room for additional miners.

Gocke & Co. are opening up new mines at Harrison, Preston, and are putting in some fine new machinery. The Arona mines, 15 miles from Coolidge, are now running a force of about 50 men.

J. V. Thompson, of Unioneot, Pa., had 7,000 acres of coal land in the county this summer and has paid the money for it, aggregating $160,000. The coal will be developed at once. The coal will be developed at once. The Allegheny Mining Co., a part of the Davis Coal & Coke Co., has recently purchased 1,500 acres of coal land in the new Pittsburgh coal field, adjoining another large tract of land owned by them. The price was $60,000.

An important purchase of coal land in the Randolph county is owned by farmers who have entered into agreement not to sell their coal lands for less than $1,500 an acre. This is about ten times as much as the coal companies usually pay for land, but as the land is of a good quality and can rarely be induced to sell it for $200 an acre.

BRITISH COLUMBIA

It is now the largest copper mine on Texas Island ranks among the best properties in the Province. The smelter has been enlarged to 115 tons a day and is running successfully with a net output of $5,000 a month. Five years ago the present owners bought the mine for $50,000, and at its present rate of production the mine is paying six per cent on $1,000,000. The general average of the output has been taken out is $20 a ton, copper, gold and silver.

The Rossland mines are now showing a total output average of about $6,000 a month. A report recently made amounting to $10,000 of ore of the Great Northern company at Howse Sound, has been confirmed by London experts representing the Valmont Syndicate of Great Britain who have offered to purchase the property for $2,000,000 or more, but the owners are not as likely to sell as they were at one time.

IRON AND STEEL

BIG STEEL WAR THREATENED: The latest move of the Carnegie, according to reports from Washington, will be the starting of an independent movement against the American Sheet Steel Co. It is alleged to be the plan of the Carnegie to license branches of the American Sheet Steel Co. from that combination and to start an opposing company to the American Sheet Steel Co., with much wire making the commercial advantage. The point at issue, according to reports is that the Carnegie will have the backing of the Carnegie capital in organizing a new steel plant.

DOMINION STEEL COMPANY: The Dominion Iron & Steel Co. now claims to be able to produce pig iron at tidewater cheaper than it can be produced in any other part of the world. The company is organized to develop the iron and coal fields of Oklahoma and Nova Scotia, using coal from the Dominion Coal Co. and ore from extensive mines in Newfoundland. The company, of a capital of from 250 to 400 tons daily; ten basic open hearth steel furnaces, of a capacity of about 1,000 tons of steel daily. The company does not propose to extend the steel beyond the billet stage, but may later add a plate and rail mill. The plant when complete will cost $10,000,000, and will be built in two years.

TROUBLE IN PITTSBURGH: Pittsburgh despatches report that the steelworkers are on strike and there is a possibility that it may be disrupted. The trouble is in regard to the wage-reduction, carried out by the employers in Pittsburgh, New York representatives of the Steel Workers' Union have stated that there is no need to surrender to the steel employers, and they have no knowledge of the matter, nor of the report that a meeting will be held in this city to determine the policy of the representative of the traffic department of the National Steel Co. says, however, that all has been rumored recently that the rates on billets from the Pittsburgh district to New York were likely to be slightly reduced. It is believed that the latest rumor from Pittsburgh came from this source.

THE REPORTED CRAMP CONSOLIDATION: Charles W. Grant, has been-interviewed with reference to the reported efforts of Vickers Sons & Maxim of England to form a business union with the American Steel & Wire Company and the Steel Works. Mr. Cramp says that for many years he has tried to extend the facilities of his plant so that the community of parts could be made complete, including hull, machinery, equipment, guns, and other things combined. In his own particular view he has often consulted other companies, including the Carnegie, the Bethlehem Steel Co., and the Pittsburgh Steel Co. The COMPETITIVE STRENGTH of the industry and union of forces is made practically necessary, Mr. Cramp says, by the competition which makes it impossible for the companies to make a profit on the sales of the several shipyards direct to battle, except for their quotas of officers and men.

SUIT AGAINST ENSILY FORNACES: The Associated Steel & Wire Co. has filed a suit in the United States Court, at Birmingham, Ala., against the Alabama Steel & Wire Co., seeking to enjoin the latter from the further use of the McGilvery and Nash patent for the treatment of metals which it has charged the defendant companies have infringed upon the Ensley plant. The complainants further ask for the damages suffered and a final claim for $100,000 damages. By many it is suspected that the suit was not brought for the ultimate acquisition of the Ensley plant, which has cut considerable figure in the manufacturers' world, but for the South West. The Ensley plant is now operating on double turn and selling its entire output. It was made for the purpose of the sale of the Ensley plant, which has been considerable, but the complainants have since positively stated that the plant is not on the market.

IRON AND STEEL IN TURKEY: Consul Hughes, of Bogazk, under date of December 22, 1900, sends the following translation from the Neue Wiener Tagblatt: Though in nearly all the Turkish provinces iron ore is to be found, there are no blast furnaces nor manufacturing workshops, and the finished products have fallen short of the most limited description. Import into Turkey, both iron and steel, is consequently of considerable importance, especially the iron, annually, valued at 18,500,000 francs (51,756,500). Imports at Constantinople alone are, on an average, 1,000 tons, worth 7,690,000 francs per annum. Chief supplies were sent from Sweden and the Baltic States, and, as Turkey is at the same time all other trade with Turkey, sends only about 6,000 tons per annum. Turkey imports iron mostly from England, being by far the most profitable, and the feeble business. In the most limited description, from England, but in the German business an improvement has been noticed. The centres of steel and iron business with Turkey, but they have long been compelled to give way to more successful competitors; and Belgium firms. Quite recently, however, efforts have been made to recover the lost ground, but they have not been of any weight hitherto, but her works have been trying hard to extend their trade with the Turkish market. The heavy railways and engineering requirements, iron bars and girders are the principal articles taken. The coa
COAL AND COKE

ANTHRACITE COAL PRODUCTION: The tonnage of anthracite coal for the year to December 31, 1900, has been estimated at 51,778,738, for the corresponding period last year, a shortage of 2,151,106 tons. The total tonnage for 1899 amounted to 53,929,856 tons, and 55,668,528 tons was mined in December to equal the output last year.

ITALIAN DEMAND FOR COAL PITCH: The Bureau of Foreign Commerce has received a letter from Mr. Charles H. M. Burleigh of Rome, dated Nov. 6, 1900, asking to be put in communication with some responsible firms in this country, as he wasuru to have coal pitch from this country, to be used in the manufacturing of patent fuel. Considerable business, he says, can be transacted if connections are made with the proper parties.

COAL SALES AT GIBRALTAR IN OCTOBER: Consul Sprague writes from Gibraltar that the price for Cardiff coal rules at 36c. ($1.34) per ton, and the price for coal for the present year will cease next month, and there is every probability of its being increased. Many railways in Spain are already negotiating with their associates in England for an important advance in price. A considerable amount of the American coal of the Collingham, imported last September, yet remains on hand, and the customers of the Union Coal Co. that imported it will only accept half their wants in this coal and insist upon receiving the balance in Varese.

AMERICAN COAL FOR RUSSIA: The London Daily Mail of a recent date says: Coal is scarce in London, and, in fact, a little he has near at hand that America is being called on to supply. The demand for coal and fuel of all kinds is said to be very heavy. St. Petersburg, still increases every day, and prices rise accordingly; coal may be purchased duty free until July next, and there seems every likelihood of an indefinite prolongation of this free trade, as the government has allowed coal to be re-exports from new colliery companies. In July last the British steamer Acconac came laden at Cronstadt the first cargo of coal ever landed there. 32,714 tons of coal was landed by the Chesapeake & Ohio Coal Agency Co. The use of peat fuel is occupying the attention of the Russian Government, and many suggestions of a new anthracite "deal" that actual conditions in the trade are the best basis for improvement in the market prices for anthracite. The November figures of production show that the output of anthracite has reached normal proportions, for the first time since the panic years. The estimated production for November is 5,751,750 tons, as compared with 4,453,900 tons for December last year, and 4,688,850 tons. It is significant as bearing upon the financial results of the operations in the anthracite districts, that the actual prices are from sixty to seventy-five cents per ton higher than last year's figures. The output of anthracite in October was 8,291,969 tons. DEMAND FOR COAL IN ODESSA: Consul Heerman has sent from Odessa a copy of a letter from the Mayor of that city, asking for certain information regarding the properties and prices of anthracite in the United States. That the supply at Odessa is a serious one, says Mr. Heerman, will be seen by the statement in the Mayor's letter that the price of coal is a still further increases in the event of the price of coal, the town authorities will purchase and sell it to the residents, at prices fixed by cost price. The Consul at Odessa, while the coal is the essential means of making frontier and Sevastopol, as well as Odessa, are largely dependent upon foreign coal. The Russian fleet on the Black Sea ports and the Black Sea and all southern railways are customers for the best qualities of foreign coal, and there is no reason why the United States should establish a permanent trade in this article. In view of the importance of the question under consideration, Mr. Heerman has said to our consul at Odessa that our business men who propose to engage in furnishing coal to Russia should send competent and reliable men to study the requirements of the trade. He believes that coal amounting to from 800,000 to 1,000,000 tons could be sold each year.

MEXICO'S COAL DEMAND: The usual activity in industrial circles, with the exception of the demand for coal, has not been produced a demand for coal which is the Mexican miners and manufacturers are supplied with coal. The mining of the only coal mines in operation are the Huntington mines on the line of the Mexican International Railroad. The Mexican Coal & Coke Co. is the operator. The smelters in Monterey for some time received most of their fuel from the above-mentioned mines, the price advanced in that country, they had to look to the United States, and for eight years or so since, they have been receiving coal from Alabama and West Virginia. Now they are confronted with the possibility that the railroads may not be able to furnish cars enough to supply the coal they need, and it is believed that if the mines in the Coahuila district are not more extensively developed, many plants will have to shut down.

Results of the Coal Strike.
The results of the big anthracite coal strike as they affected the miners are shown in an article by Henry Loomis Nelson in a New York newspaper. Mr. Nelson takes the case of a miner who among 1,100 coal miners that walked out in a month, using five logs of powder. This miner receives under the settlement forty-two cents a day, and if he would have received under a single ten per cent increase; $7.20 less than what he would have received under the first demands of the union; and $4.65 more than he received under the old scale, a very substantial increase, but only a little more than half of the demand which was made for him. The strike has cost this miner $50, so that with this increased pay, he will be nearly a year in making up his loss. The increase in the total cost of mining anthracite coal by reason of the settlement will be nearly $5,569,000 a year, on the basis of last year's production, and the increase cost per ton at the mine amount to two cents per ton. If the organization had permitted the anthracite miners to deal with their own employers, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton. The settlement, involving all its demands upon the operators, the cost of mining would have been increased at least five cents per ton.
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