CHAPTER III.—DEEP MINES.

It is the purpose of this chapter to present a statement of the condition of the deep-mining industry in its various relations as far as it has proved practicable to obtain the information necessary for this object. An ideal canvass of the mines of the country would have led to absolute totals. It is conceivable, for example, that the actual sum-total of supplies consumed in all the mines should have been ascertained; but a moment's reflection will show that such a collection would be wholly impracticable, and, as has been explained in the preface, it was never contemplated. Mines containing less than 300 feet of shafts or galleries, or which had not produced 100 tons of ore, were not included in the examination. At many mines no separate account is kept of supplies consumed. Numerous mines, too, had changed hands during the census year, and the records of the earlier period were scattered or inaccessible, while others were abandoned or temporarily closed. No effort or expenditure would have sufficed to obtain substantially accurate totals on this and some other questions, and even a close approximation would have necessitated an outlay disproportionate to its importance. The tables of supplies are nevertheless both interesting and valuable, and show the total consumption, cost, and price of the principal articles purchased by nearly 600 of the most important mines of the country, the relative quantities of different supplies consumed, and the variations of this relation with the locality and with the kind of mining. The prices of an article of uniform quality, such as candles or quicksilver, in the different regions reported upon indicate the cost of transportation from the nearest large center, and inferences as to the natural resources of the region may be drawn from the prices of wood and salt. Though the table does not give even an approximation to the total cost of the supplies consumed in deep mining, it affords the means of reaching a rough, but for most purposes sufficiently close, estimate for considering the character of the mines from which reports have been received. It is probable that 50 per cent. of the supplies have been accounted for, and that the total expenditure in the deep precious-metal mines is not far from $10,000,000. It is somewhat important to know whether the supplies consumed by mines amounts to $10,000,000 or to $25,000,000 during the census year. Whether the exact sum was a few hundred thousand dollars more or less than ten millions is much less important, and for most purposes is of very little consequence. Similar remarks are applicable to other of the statistical tables presented for the deep mines.

The value of many of the tables is technical rather than economical, and these exhibit the mining practice of the country in a way which it is believed will be more welcome to mining men than any other, viz, as simple statements of facts, grouped according to locality. Technical mining is much the same the world over. Its principles and methods have long since been laid down in excellent treatises in many languages, and such novel features as have been developed in the mines of the far West have been described in Mr. J. D. Hague's admirable memoir, (*a*) in the reports of the mining commissioners, and in the proceedings of the American Institute of Mining Engineers. The details only of the applications of the recognized principles of mining differ with the character of the deposits and local conditions. The nature of the more important of these details will be clear to mining men of all countries from an inspection of the tables. In the chapters on milling and hydraulic mining, which are peculiar to the far West, and on furnace practice, which presents features unusual in other countries, technical discussions will accompany the statistical data, because their meaning would not otherwise be clear even to professional miners, whose experience has not been gathered west of the 100th meridian.

It cannot be too often insisted upon that this volume contains no estimates except where the fact is specifically noted. It would have been easy for those engaged in its preparation to have combined actual returns with special information, supplemented by hearsay, and to have evolved tables which would have presented an extremely satisfactory appearance; but there would have been no way of ascertaining the probable error of such tables, and the work would have lost all value except as an expression of personal opinion. Estimated tables, it is true, might have been published in addition to those founded on actual returns, but even now a great mass of valuable material derived from the schedules must be omitted for want of space, and had double the number of pages been at our disposal there would still have been no room for tables of opinions.

The number of reports upon which the figures are based is always given in the table, and varies with each, because answers to all the questions were obtained at extremely few mines, although each question was answered at a large number. There can be no doubt that some answers were incorrect, but an examination of the schedules, reprinted in the appendix, will show that several questions bear upon almost every point, and that a false or erroneous reply would nearly always lead to a contradiction, while a deliberate design to deceive, though none such

(*a*) *Exploration of the Fortieth Parallel*, vol. III, Mining Industry.

may have existed, was guarded against by refusing to permit mine owners or superintendents to inspect the schedules. Wherever a contradiction was detected the conflicting data were rejected, and if any inconsistencies have escaped unnoticed the chances are that the errors involved, because of the large number of data from which they are derived, have produced no perceptible effect upon the tabulated results.

In preparing the tables the first step was to tabulate the data by mines. It would have been very desirable to publish such of these as involved no confidential information in full, but this would have increased the size of the work to an intolerable extent. They are therefore omitted, except in cases where the meaning of the facts would have been lost by aggregation.

The subjects illustrated by the tables of this chapter will be presented in the following order:

Position and altitude of the mining districts.
Ownership, organization, and value.
Development, its nature and extent.
Machinery and its manipulation.
Labor and wages.
Supplies, their consumption and cost.
Accidents, their causes and results.

POSITION AND ALTITUDE OF THE MINING DISTRICTS.

TABLE I.—DEEP MINES: MINING DISTRICTS, BY STATES OR TERRITORIES AND COUNTIES, WITH AVERAGE ALTITUDES.

State or territory and county.	District.	By districts.		By counties.		By states or territories.	
		Mines reported.	Average altitude.	Mines reported.	Average altitude.	Mines reported.	Average altitude.
		Number.	*Feet.*	*Number.*	*Feet.*	*Number.*	*Feet.*
The United States						803	7,009
ALABAMA.							
Cleburne		1	1,050	1	1,050		
Talladega	Township 19, range 6	1	760	1	760	2	905
ARIZONA.							
Maricopa	Globe	6	5,967				
Do		1	2,400	7	5,457		
Mohave	Hualapai	22	4,711				
Do	Maynard	1	6,800	23	4,802		
Pima	Arivaca	1	4,500				
Do	Dos Cabezas	2	5,950				
Do	Harshaw	3	6,133				
Do	Hartford	1	9,300				
Do	Oro Blanco	5	5,020				
Do	Pima	2	4,000				
Do	Swisshelm	2	5,000				
Do	Tombstone	19	5,042	35	5,229		
Pinal	Globe	4	4,700				
Do	Pioneer	2	3,325				
Do	Near Pioneer	1	4,200				
Do	Turquoise	1	5,600	8	4,406		
Yavapai	Big Bug	1	4,500				
Do	Cherry Creek	1	4,700				
Do	Humbug	1	3,000				
Do	Peck	2	5,650				
Do	Tiger	1	6,500	6	5,000		
Yuma	Castle Dome	1	2,500				
Do	Silver	1	3,000	2	2,750	81	4,968
CALIFORNIA.							
Amador	Amador City	2	1,325				
Do	Jackson	1	1,200				
Do	Plymouth	1	1,300				
Do	Sutter Creek	1	1,250	5	1,280		
Calaveras	Washington	1	2,800	1	2,800		
El Dorado	Springfield	1	1,900	1	1,900		
Fresno	Potter Ridge	1	3,300	1	3,300		
Inyo	Cerro Gordo	1	8,000				
Do	Lookout	1	3,300				
Do	Russ	1	5,400	3	5,567		
Lassen	Hayden Hill	3	6,150	3	6,150		
Los Angeles	Silverado	1	2,500	1	2,500		
Mariposa	Coulterville	1	2,000				
Do	Mariposa Estate	1	1,300	2	1,650		
Mono	Blind Spring	1	6,200				
Do	Bodie	23	8,938				
Do	Indian	1	5,700	25	8,699		
Napa	Calistoga	1	800	1	800		
Nevada	Nevada City	2	2,715	2	2,715		
Placer	Colfax	1	2,400	1	2,400		
Plumas	Genesee Valley	1	3,700				
Do	Indian Valley	4	4,575				
Do	Quartz township	1	6,250				
Do	Seneca	1	3,500	7	4,536		
San Bernardino	Clark	2	5,475	2	5,475		

TABLE I.—DEEP MINES: MINING DISTRICTS, BY STATES OR TERRITORIES AND COUNTIES, ETC.—Continued.

State or territory and county.	District.	By districts.		By counties.		By states or territories.	
		Mines reported.	Average altitude.	Mines reported.	Average altitude.	Mines reported.	Average altitude.
CALIFORNIA—continued.		*Number.*	*Feet.*	*Number.*	*Feet.*	*Number.*	*Feet.*
San Diego	Banner	1	3,081				
Do	Cargo Muchacho	2	200	3	1,160		
Shasta	Pittsburg	1	1,300	1	1,300		
Siskiyou	Quartz Valley	1	3,500				
Do	Sawyer's Bar	1	4,400				
Do	South Fork Salmon	1	3,500	3	3,800		
Tuolumne	Soulsbyville	1	2,850	1	2,850	63	5,447
COLORADO.							
Boulder	Central	3	7,833				
Do	Gold Hill	16	7,447				
Do	Grand Island	7	9,528				
Do	Magnolia	2	6,800				
Do	Sugar Loaf	3	7,450				
Do	Ward	2	9,225	27	8,114		
Chaffee	Chalk Creek	3	11,933				
Do	Free Gold	1	7,000				
Do	Monarch	2	10,150	6	10,517		
Clear Creek	Argentine	1	12,400				
Do	Banner	3	9,275				
Do	Cascade	2	9,225				
Do	Chicago	1	8,500				
Do	Downieville	1	8,500				
Do	Geneva	1	11,000				
Do	Griffith	8	9,356				
Do	Griffith and Queens	1	8,500				
Do	Idaho	8	8,796				
Do	Iowa	1	8,000				
Do	Montana	2	8,250				
Do	Morris	3	8,067				
Do	Seaton	1	9,400				
Do	Spanish Bar	7	8,102				
Do	Trail Run	2	8,550				
Do	Upper Union	3	9,933				
Do	Virginia	3	8,853				
Do	York	1	8,900	40	8,948		
Custer	Hardscrabble	5	7,820				
Do	Verde	1	8,500				
Do		1	9,000	7	8,086		
Gilpin	Enterprise	2	8,500				
Do	Eureka	1	9,000				
Do	Gregory	10	8,330				
Do	Hawkeye	1	8,800				
Do	Mountain House	1	8,500				
Do	Nevada	13	8,965				
Do	Quartz Valley	1	8,650				
Do	Russell	7	8,793	36	8,704		
Gunnison	Ruby	1	10,000				
Do	Tin Cup	1	11,000	2	10,500		
Hinsdale	Galena	6	10,117				
Do	Lake	1	9,000				
Do	Park	1	12,000	8	10,212		
Huerfano	Third	1	10,000	1	10,000		
Lake	California	30	10,822				
Do	Homestake	1	12,500	31	10,876		
La Plata	California	1	8,800	1	8,800		
Ouray	Iron Springs	8	9,988				
Do	Pioneer	3	9,733				
Do	Snellies	6	11,016				
Do	Uncompahgre	6	8,566				
Do	Upper San Miguel	8	11,137	31	10,184		
Park	Buckskin	1	12,000				
Do	Consolidated Montgomery	2	13,550				
Do	Horseshoe	1	13,150				
Do	Mosquito	4	12,044				
Do	Sacramento	1	11,400	9	12,425		
Rio Grande	Summit	1	12,000	1	12,000		
San Juan	Animas	15	10,680				
Do	Eureka	8	11,625				
Do	Uncompaghre	10	11,800	33	11,276		
Summit	Battle Mountain	2	10,000				
Do	Bevan	1	10,000				
Do	Consolidated Ten-mile	3	11,817				
Do	Horn Silver	1	9,800				
Do	McKay	1	10,000	8	10,656	250	9,784
DAKOTA.							
Custer	Cole	2	7,000				
Do	Custer	6	6,253	8	6,440		
Lawrence	Bear Butte	15	6,131				
Do	Lost Placer	2	5,400				
Do	Whitewood	25	5,500	42	5,721		
Pennington	Cross	2	6,300				
Do	Newton Forks	3	5,833	5	6,020	55	5,853

TABLE I.—DEEP MINES: MINING DISTRICTS, BY STATES OR TERRITORIES AND COUNTIES, ETC.—Continued.

State or territory and county.	District.	By districts.		By counties.		By states or territories.	
		Mines reported.	Average altitude.	Mines reported.	Average altitude.	Mines reported.	Average altitude.
		Number.	*Feet.*	*Number.*	*Feet.*	*Number.*	*Feet.*
GEORGIA.							
Cherokee	New Hickory Flat	1	1,005				
Do	Third, section 2	1	1,290	2	1,148		
Forsyth	Third, section 1	1	1,290	1	1,290		
Hall	Ninth	2	1,345				
Do		1	740	3	1,143		
Lincoln		1	590	1	590		
McDuffie	Republican	1	580	1	580		
Meriwether	Lutherville 1281	1	950	1	950	9	1,015
IDAHO.							
Alturas	Bonaparte	1	6,350				
Do	Elk Creek		7,000				
Do	Hardscrabble		5,650				
Do	Middle Boisé	7	6,514				
Do	North Fork	1	8,000				
Do	Queen's River	2	5,825				
Do	Red Warrior	1	5,600				
Do	Rocky Bar, or Bear Creek	2	5,300				
Do	Sawtooth	3	9,200				
Do	Smiley's Basin		8,500				
Do	Wood River		6,500 to 10,000	17	6,788		
Boisé	Banner	2	7,650				
Do	Cañon Creek	2	5,905				
Do	Elkhorn		6,300				
Do	Gambrinus	1	6,500				
Do	Granite	1	7,000				
Do	Mammoth		7,900				
Do	Shaw's Mountain	3	4,733	9	6,090		
Lemhi	Bay Horse	1	9,500				
Do	Yankee Fork	3	8,467	4	8,725		
Owyhee	Carson	7	7,606				
Do	Wagontown	3	6,200	10	7,185	40	6,924
MAINE.							
Hancock	Gouldsboro'	2	42				
Do	Sullivan	4	25				
Do	West Sullivan	1	20	7	29		
Penobscot		1	200	1	200		
Washington	Fifth	1	125	1	125		
York	Acton	1	350	1	350	10	88
MONTANA.							
Beaver Head	Bald Mountain	1	8,000				
Do	Bannack	7	6,428				
Do	Trapper	2	9,650	10	7,230		
Deer Lodge	Flint Creek	5	6,220				
Do	Independence	2	5,800				
Do	McClellan's Gulch	1	7,000				
Do	Silver Creek	2	7,400				
Do	Summit Valley	24	5,906				
Do		1	6,560	35	6,121		
Jefferson	Cataract	2	6,600				
Do	Cedar Plains	1	5,000				
Do	Elkhorn	1	6,000				
Do	Mountain	1	6,000				
Do		2	5,250	7	5,814		
Lewis and Clarke	Ottawa	1	5,000				
Do	Owyhee	1	5,200				
Do	Silver Creek	1	6,500				
Do	Stemple	4	6,000	7	5,814		
Madison	Hot Springs	2	5,550				
Do	Lower Hot Springs	1	5,000				
Do	Mineral Hill	1	7,500				
Do	Red Bluff	1	5,000				
Do	Silver Shower	1	5,000				
Do	Silver Star	3	6,433	9	5,878	68	6,189
NEVADA.							
Elko	Columbia	1	7,000				
Do	Tuscarora	10	6,493	11	6,539		
Esmeralda	Columbus	5	6,445				
Do	Esmeralda	1	7,600				
Do	Oneota	1	9,000				
Do	Wilson	2	7,000	9	6,981		
Eureka	Cortez	1	7,400				
Do	Eureka	15	7,523				
Do	Secret Cañon	1	7,000	17	7,308		
Humboldt	Mount Rose	1	6,000				
Do	Sierra, or Dun Glen	1	6,000				
Do	Winnemucca	1	5,800	3	5,933		
Lander	Battle Mountain	1	6,500				
Do	Lewis	1	7,500				
Do	Reece River	1	7,800	3	7,100		

TABLE I.—DEEP MINES: MINING DISTRICTS, BY STATES OR TERRITORIES AND COUNTIES, ETC.—Continued.

State or territory and county.	District.	BY DISTRICTS.		BY COUNTIES.		BY STATES OR TERRITORIES.	
		Mines reported.	Average altitude.	Mines reported.	Average altitude.	Mines reported.	Average altitude.
		Number.	*Feet.*	*Number.*	*Feet.*	*Number.*	*Feet.*
NEVADA—continued.							
Lincoln	Bristol	2	8,300				
Do	Eldorado	1	1,700				
Do	Ely	2	6,200				
Do	Jack Rabbit	1	7,500	6	6,367		
Nye	Morey	1	8,200				
Do	Tybo	1	6,500				
Do	Union	2	7,550	4	7,450		
Storey	American Flat	1	5,729				
Do	Gold Hill	12	5,803				
Do	Virginia	20	6,105	33	5,984		
Storey and Lyon	(Sutro tunnel)	1	4,483	1	4,483		
White Pine	Cherry Creek	3	7,233				
Do	Ward	1	8,000				
Do	White Pine	2	9,500	6	8,117	93	6,632
NEW HAMPSHIRE.							
Coos	Shelburne	1	1,000	1	1,000		
Grafton	Ammonoosuc	1	700	1	700	2	850
NEW MEXICO.							
Grant	Chloride Flat	2	6,300				
Do	Lone Mountain	1	6,300				
Do	Miembres	3	7,000				
Do	Pinos Altos	5	6,860				
Do	Silver Flat	1	6,300	12	6,709		
Santa Fé	Los Cerrillos	1	6,800	1	6,800	13	6,715
NORTH CAROLINA.							
Davidson	Emmons township	1	745				
Do	Thomasville township	1	600				
Do		2	750	4	711		
Guilford		1	900	1	900		
Mecklenburg	Capp's Hill	1	930				
Do	Sixth	1	785	2	858		
Moore		1	460	1	460		
Nash	Griffith township	1	300	1	300		
Rowan		1	1,050	1	1,050		
Stanley		1	1,200	1	1,200		
Tuston		1	1,075	1	1,075	12	808
OREGON.							
Baker	Burnt River	1	4,425				
Do	Conner Creek	1	3,300				
Do	Rye Valley	1	5,000				
Do	Silver Creek	1	7,500				
Do		1	3,000	5	4,645		
Grant	Granite	2	6,950	2	6,950		
Josephine	Yank	1	2,000	1	2,000	8	4,891
UTAH.							
Beaver	Bradshaw	1	6,600				
Do	San Francisco	4	6,675				
Do	Star	2	5,625	7	6,364		
Juab	Tintic	9	6,222	9	6,222		
Piute	Mount Baldy	1	7,500				
Do	Ohio	1	8,500	2	8,000		
Salt Lake	Big Cottonwood	8	9,944				
Do	Little Cottonwood	9	9,511				
Do	West Mountain	12	6,647	29	8,480		
Summit	Uintah	5	8,460	5	8,460		
Tooele	Camp Floyd	1	7,000				
Do	Ophir	7	8,100				
Do	Rush Valley	2	6,400	10	7,650		
Utah	American Fork	4	9,725				
Do	Silver Lake	2	8,500	6	9,317		
Wasatch	Blue Ledge	1	8,000				
Do	Snake Creek	3	9,633	4	9,225		
Washington	Harrisburg, or Silver Reef	8	3,922	8	3,922	80	7,555
VIRGINIA.							
Culpeper		1	400	1	400		
Fauquier		1	250	1	250		
Louisa	Cochoo township	1	320	1	320		
Stafford	Hartford township	1	225	1	225	4	290
WASHINGTON.							
Yakima	Peshaston	1	2,000	1	2,000	1	2,000
WYOMING.							
Sweetwater	California	6	7,500				
Do	Miner's Delight	3	7,033				
Do	Shoshone	3	7,500	12	7,608	12	7,608

This table shows the distribution of mining districts by states or territories and counties, with their average altitudes, and thus contains both geographical and topographical information. The slightest knowledge of the general altitudes of the different parts of the country in connection with this table shows that in the United States, as throughout the world, the mines are in the mountains. The degree of accuracy of the several altitudes given varies greatly, for while many of them have been determined by actual leveling, others have been ascertained by barometrical observations, while in some remote districts the elevation is merely estimated by comparison with the nearest known points. The various government and railroad surveys, however, have established the altitude of so great a number of points throughout the West that few mines are at great distances from localities of known elevation. Where definite information is lacking, the tendency is to overestimate the altitude.

TABLE II.—DEEP MINES: NUMBER OF MINES, BY ALTITUDES, AND BY STATES AND TERRITORIES.

State or territory.	Total number of mines reported.	Under 1,000 feet.	Over 1,000 and under 2,000.	Over 2,000 and under 3,000.	Over 3,000 and under 4,000.	Over 4,000 and under 5,000.	Over 5,000 and under 6,000.	Over 6,000 and under 7,000.	Over 7,000 and under 8,000.	Over 8,000 and under 9,000.	Over 9,000 and under 10,000.	Over 10,000 and under 11,000.	Over 11,000 and under 12,000.	Over 12,000 and under 13,000.	Over 13,000 and under 14,000.
The United States	803	32	19	10	18	44	122	153	88	105	87	61	32	28	4
Alabama	2	1	1												
Arizona	81			2	5	20	33	11			1				
California	63	3	8	6	8	5	4	5		18	6				
Colorado	250							3	21	56	56	53	29	28	4
Dakota	55						26	26	3						
Georgia	9	4	5												
Idaho	40					2	9	12	9	4	4				
Maine	10	10													
Montana	68					1	27	29	6	2	3				
Nevada	93		1			1	15	46	19	8	3				
New Hampshire	2	1	1												
New Mexico	13							6	7						
North Carolina	12	9	3												
Oregon	8			1	2	1	1	1	2						
Utah	80				3	5	7	14	11	15	14	8	3		
Virginia	4	4													
Washington	1			1											
Wyoming	12								10	2					

A part of the results of Table I are here presented in a more condensed form, in order that they may be more readily appreciated, and it appears that about one-third of the mines of the country lie between 5,000 and 7,000 feet above sea-level. The distribution by level in the different states is characteristic. In California, owing to the considerable number of useful minerals extracted and to the occurrence of deposits in the Coast ranges as well as in the Sierra, mines are pretty evenly distributed from the sea-level to 10,000 feet above it, while in Colorado there are more mines above 12,000 feet than below 8,000 feet, and in Dakota all mines reported lie between 5,000 and 7,000 feet.

TABLE III.—DEEP MINES: HIGHEST, LOWEST, AND MEAN ALTITUDE OF THE MINES, BY STATES AND TERRITORIES.

State or territory.	ALTITUDE OF THE MINES.		
	Highest.	Lowest.	Mean.
	Feet.	*Feet.*	*Feet.*
The United States	13,800	Tide-water.	7,069
Alabama	1,050	760	905
Arizona	9,300	2,400	4,968
California	9,194	200	5,447
Colorado	13,800	6,500	9,784
Dakota	7,000	5,000	5,853
Georgia	1,350	580	1,015
Idaho	10,000	4,500	6,924
Maine	350	Tide-water.	88
Montana	9,800	5,000	6,189
Nevada	9,700	1,700	6,632
New Hampshire	1,000	700	850
New Mexico	7,000	6,300	6,715
North Carolina	1,200	390	803
Oregon	7,500	2,000	4,891
Utah	11,000	3,450	7,555
Virginia	400	225	299
Washington	2,000	2,000	2,000
Wyoming	8,000	7,500	7,608

TABLE IV.—ALTITUDES OF SHAFTS OF THE COMSTOCK MINES IN REFERENCE TO THE SUTRO TUNNEL.

Name.	Altitude above sea-level.	Altitude above mouth of Sutro tunnel.	Altitude above point nearest to the shaft in Sutro tunnel.
	Feet.	*Feet.*	*Feet.*
Bullion	6,307	1,824	1,775.3
Chollar-Potosi	6,226	1,743	1,695.2
Bonner	6,194	1,711	1,663.8
Savage	6,181	1,698	1,663.8
Consolidated Imperial	6,160	1,677	1,626.3
Hale & Norcross	6,157	1,674	1,627.8
Consolidated Virginia	6,156	1,673	1,623.6
Combination	6,133	1,650	1,618.8
Ophir	6,131	1,648	1,597.1
Ward	6,118	1,635	1,584.9
Julia	6,116	1,633	1,585.2
Union	6,068	1,585	1,531.7
Yellow Jacket (new)	6,051	1,568	1,514.1
C. & C	6,038	1,555	1,505.6
Forman	6,038	1,555	1,495.4
Sierra Nevada	6,031	1,548	1,492.6
Utah	5,996	1,513	1,453.4
Belcher	5,981	1,498	1,444.1
Belcher (old)	5,981	1,498	1,444.1
Osbiston	5,966	1,583	1,436.1
Yellow Jacket (old)	5,961	1,478	1,424.1
Crown Point	5,925	1,442	1,388.1
Mint	5,892	1,409	1,363.1
Overman (old)	5,731	1,248	1,192.5

In this table the altitudes refer to the tops of the shafts. In one sense the data are of merely local importance, but the Comstock lode represents so large a portion of the mining interests of the far West that facts concerning it are welcome to a very large number of persons.

TABLE V.—DEEP MINES: AMERICAN OWNERSHIP.

State or territory in which mines are located.	Total number of mines of American ownership reported.	Owned in state or territory where located.	OWNED IN OTHER STATES OR TERRITORIES THAN THOSE IN WHICH THE MINES ARE LOCATED.																							
			Total owned in other states or territories.	New York.	California.	Pennsylvania.	Massachusetts.	Illinois.	Missouri.	Ohio.	Michigan.	Utah.	Maryland.	Indiana.	Iowa.	Colorado.	Kansas.	Minnesota.	Nebraska.	Wisconsin.	Connecticut.	District of Columbia.	Maine.	Tennessee.	Virginia.	Wyoming.
The United States	1,155	789	366	148	105	20	16	15	12	12	5	7	4	3	3	2	2	2	2	2	1	1	1	1	1	1
Alabama	2	2																								
Arizona	71	16	55	23	16	6	1	1	4	1				1				1						1		
California	101	94	7	5			2																			
Colorado	248	146	102	68		3	5	9	5	2	3		2				2		1	1					1	
Dakota	56	34	22	5	9			2	1						2			1		1						1
Georgia	10	7	3				2														1					
Idaho	254	224	30	11	8		1			3		6		1												
Maine	11	11																								
Montana	70	59	11	5		3			1			1		1												
Nevada	97	16	81	9	68	2	1				1															
New Hampshire	3	2	1																				1			
New Mexico	14	10	4	2			2																			
North Carolina	12	3	9	6		1							2													
Oregon	9	8	1		1																					
Utah	179	143	36	11	3	5	2	3	1	6	1				1	2			1							
Virginia	5	1	4	3																		1				
Washington	1	1																								
Wyoming	12	12																								

Of mines owned in the United States:	Per cent.
Owned in the state or territory where located	68.31
Owned in other states or territories than those in which mines are located	31.69

Table V includes only the more important mines; that is, those considered worth reporting upon for other purposes than that of ascertaining the ownership merely. It therefore omits a very large number of mines which have been incorporated in San Francisco, New York, etc., as well as the many prospects owned in the district where

located. For example, of several hundred mines of Nevada owned by corporations, and at one time or another listed on the San Francisco stock exchanges, only 68 appear in the table. It nevertheless embraces a sufficient portion of the mines which have been profitable, or which have held forth sufficient promise to authorize active operations, to fairly represent the distribution of ownership in the several states. It will be observed that New York and California own about 70 per cent. of the mines in other states which are included in the table.

TABLE VI.—DEEP MINES: NATIONALITY OF OWNERSHIP.

State or territory.	Number of mines reported.	OWNERSHIP.					
		American.	Foreign.				
			Total foreign.	English.	Anglo-American.	French.	Dutch.
The United States	1,172	1,155	17	14	1	1	1
Alabama	2	2					
Arizona	71	71					
California	105	101	4	4			
Colorado	251	248	3	3			
Dakota	56	56					
Georgia	10	10					
Idaho	254	254					
Maine	11	11					
Montana	70	70					
Nevada	100	97	3	3			
New Hampshire	3	3					
New Mexico	14	14					
North Carolina	12	12					
Oregon	9	9					
Utah	186	179	7	4	1	1	1
Virginia	5	5					
Washington	1	1					
Wyoming	12	12					

	Per cent.
American ownership	98.55
Foreign ownership	1.45

The amount of American mining property owned outside of the United States is extremely small, and of the foreign owners, as might have been supposed, nearly all are English.

TABLE VII.—DEEP MINES: OWNERSHIP (PERCENTAGES).

State or territory.	AMERICAN OWNERSHIP.			Foreign ownership.
	Total.	Owned in state or territory where located.	Owned in other states or territories than those in which the mines are located.	
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
The United States	98.55	67.32	31.23	1.45
Alabama	100.00	100.00		
Arizona	100.00	22.54	77.46	
California	96.10	89.52	6.67	3.81
Colorado	98.80	58.17	40.63	1.20
Dakota	100.00	60.71	39.29	
Georgia	100.00	70.00	30.00	
Idaho	100.00	88.19	11.81	
Maine	100.00	100.00		
Montana	100.00	84.29	15.71	
Nevada	97.00	16.00	81.00	3.00
New Hampshire	100.00	66.67	33.33	
New Mexico	100.00	71.43	28.57	
North Carolina	100.00	25.00	75.00	
Oregon	100.00	88.89	11.11	
Utah	96.24	76.88	19.36	3.76
Virginia	100.00	20.00	80.00	
Washington	100.00	100.00		
Wyoming	100.00	100.00		

As a rule, the greater number of mines of each state and territory are owned within its limits, Nevada and Arizona furnishing the only exceptions west of the 100th meridian. A smaller portion of California mining property is owned elsewhere than is the case with any other important mining state or territory of the far West, as appears from Table VII. Nevada mines are chiefly owned in California, while those of Arizona and Colorado are largely in the hands of New York capitalists. The proportion of mining property owned in foreign countries is very small in all the states and territories.

DEEP MINES: NATURE OF TITLE.

Fully patented	269
Other titles	451
	720
Partially patented (including patent and purchase, part patent and part discovery, part patented and part patent applied for)	31
Other titles	689
	720
Patented, part patented, or patent applied for	388
Other titles	332
	720
Location (or discovery) and possessory	221
Other titles	499
	720
Fee-simple, warrantee deed, quit-claim deed, or "mineral deed"	27
Other titles	693
	720

TABLE VIII.—DEEP MINES: NATURE OF TITLE, BY STATES AND TERRITORIES.

State or territory.	Number of mines reported.	United States patent.	Part patented.	Patent and purchase.	Part patent and part discovery.	Part patented and part patent applied for.	Patent applied for.	Location (or discovery).	Discovery and purchase.	Purchase.	Purchase and lease.	Fee-simple.	Warrantee deed.	Quit-claim deed.	"Mineral deed."	Lease.	Segregation.	Consolidation.	Surface title by purchase.	Tunnel right under United States mining laws.	Possessory.
The United States	720	269	7	4	11	9	88	209	7	60	3	20	3	2	2	7	3	1	2	1	12
Arizona	60	5					2	49		4											
California	76	37					18	12	1	4											4
Colorado	208	106	4		9	6	38	36		1				1							7
Dakota	11	3				2	4	1		1											
Georgia	9							2				6				1					
Idaho	36							12	1	23											
Maine	9										3	1	1			4					
Montana	60	32				1	8	15	1	1				1		1					
Nevada	88	37	2	4	2			17		19							3	1	2		1
New Hampshire	3							1							2						
New Mexico	13	3					3	7													
North Carolina	11											9	1			1					
Oregon	8	1					1	5												1	
Utah	110	45	1				14	43	4	3											
Virginia	5											4	1								
Washington	1							1													
Wyoming	12							8		4											

The nature of titles in these tables is given as reported to the special experts by the superintendents of the mines, but they are no doubt in some cases inaccurate, many superintendents being either imperfectly acquainted with the histories of the properties which they have in charge, or having a very imperfect knowledge of mining law. The table nevertheless represents pretty closely the character of the tenure of the mines reported on. Had the standard of mines reported upon been lower, a much larger proportion of the titles would have appeared as by right of location, the smaller mines being nearly always held in this way. The preceding analysis exhibits a comparison of titles.

The subject of mining titles is one of great complexity and delicacy, and much too large a share of the profits of the industry in the United States has been expended in litigation over the right to mining property. Such brief remarks as might be in place here, however, are omitted, because the subject will be amply discussed in the volume on mining law.

TABLE IX.—DEEP MINES: CAPITAL STOCK.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	Number of corporations making returns.	Capital stock (nominal).
The United States	422	$2,030,702,550
Arizona	38	196,400,000
California	66	376,901,250
Colorado	126	325,002,300
Dakota	21	118,800,000
Georgia	3	1,510,000
Idaho	13	54,145,000
Maine	11	6,400,000
Montana	9	19,950,000
Nevada	78	759,645,000
New Hampshire	1	500,000
New Mexico	2	2,600,000
North Carolina	6	5,500,000
Oregon	2	5,000,000
Utah	42	156,200,000
Virginia	3	759,000
Washington	1	400,000

This table includes the foreign corporations, the pound sterling being taken at $5 and the franc at 20 cents. The list covers only such mines as came within the standard fixed for this investigation. The total is therefore far smaller than one which would include all the claims which have been placed upon the market by incorporated companies, the practice in the Pacific states being to capitalize almost invariably at $10,000,000, in 100,000 shares of $100 each, without regard to the value or prospective value of the property. Thousands of such companies have been floated in San Francisco. As an interesting comparison, the list of stocks dealt in at the San Francisco exchanges June 1, 1880, is also given, with the amount of nominal capital represented. The difference between the number of actively working Comstock mines and the host of wildcat, idle, and abandoned claims of that district is very marked.

TABLE X.—DEEP MINES: LIST OF MINING STOCKS DEALT IN AT THE SAN FRANCISCO BOARDS AT CLOSE OF CENSUS YEAR.

WASHOE MINES. (a)

Company.	Capital stock.	Company.	Capital stock.	Company.	Capital stock.
Alpha Consolidated	$3,000,000	Georgia	$10,000,000	Orleans	$4,800,000
Alta	10,800,000	Golden Gate	10,000,000	Overman	11,520,000
Amazon Consolidated	6,000,000	Gould & Curry	10,800,000	Patten	5,000,000
American Flat	3,000,000	Green	2,000,000	Peytona	10,000,000
Andes	10,000,000	Hale & Norcross	11,200,000	Phil. Sheridan	10,000,000
Atlantic Consolidated	10,000,000	Hartford	10,500,000	Pioneer	10,000,000
Baltic Consolidated	3,700,000	Insurance	3,000,000	Plutus	12,000,000
Baltimore Consolidated	8,400,000	Joe Scates	10,000,000	Potosi	11,200,000
Belcher	10,400,000	Julia Consolidated	11,000,000	Prospect	10,000,000
Benton Consolidated	10,800,000	Justice	10,500,000	Sabino	10,000,000
Best & Belcher	10,080,000	Keating	10,000,000	Savage	11,200,000
Brilliant	10,000,000	Kentuck	3,000,000	Scorpion	10,000,000
Buckeye	4,800,000	Kossuth	10,800,000	Segregated Belcher	640,000
Bullion	10,000,000	Lady Bryan	10,000,000	Segregated Gold Hill	6,000,000
Caledonia	10,000,000	Lady Washington	10,800,000	Senator	10,800,000
California	54,000,000	Leo	10,000,000	Sierra Nevada	10,000,000
Challenge Consolidated	5,000,000	Leviathan	10,000,000	Silver City	6,310,000
Cherokee	6,000,000	Mackey	10,000,000	Silver Hill	10,800,000
Chollar	11,200,000	Margarita	15,000,000	Solid Silver	10,000,000
Concordia	15,000,000	Mary Ann	10,500,000	South Comstock	10,000,000
Confidence	2,400,000	Maryland	5,400,000	South Justice	10,000,000
Consolidated Imperial	50,000,000	Mexican	10,800,000	South Lady Bryan	10,000,000
Consolidated Dorado	10,000,000	Mides	3,000,000	South Potosi	10,000,000
Consolidated Virginia	54,000,000	Mint	5,000,000	South Utah	10,000,000
Consolidated Washoe	4,000,000	Morisco	10,000,000	Saint Louis	10,800,000
Cosmopolitan	10,000,000	Morning Star	8,000,000	Succor	6,840,000
Crown Point	10,000,000	Mount Hood	10,000,000	Sutro	2,400,000
Crown Point Extension	4,000,000	Mountain View	10,000,000	Thornton	10,000,000
Crown Point Ravine	3,000,000	Nevada	4,000,000	Tolo	10,000,000
Daney	10,800,000	New York	10,000,000	Trojan	10,000,000
Dardanelles	6,000,000	Niagara	6,000,000	Union Consolidated	10,000,000
Dayton	10,000,000	North Bonanza	10,000,000	Utah	2,000,000
De Haro	10,000,000	North Carson	10,000,000	Vancouver	10,000,000
Erie Consolidated	10,000,000	North Consolidated Virginia	10,000,000	Vermont Consolidated	11,000,000
Europa	10,000,000	North Ophir	10,000,000	Vivian	5,000,000
Exchequer	10,000,000	North Sierra Nevada	10,000,000	Ward	11,000,000
Fairfax	10,000,000	North Utah	6,000,000	Warsaw	10,000,000
Flowery	10,000,000	Occidental	4,000,000	Wells Fargo	10,800,000
Franklin	3,000,000	Ophir	10,080,000	Woodville Consolidated	12,000,000
Garber	15,000,000	Original Gold Hill	3,000,000	Yellow Jacket	12,000,000
George Douglass	10,000,000	Original Keystone	10,000,000		

a Capital stock of Bonanza, Chonta, Capital, Little York, Lower Comstock, and Santiago not ascertained.

TABLE X.—DEEP MINES: LIST OF MINING STOCKS, ETC.—Continued.

BODIE MINES. (a)

Company.	Capital stock.	Company.	Capital stock.	Company.	Capital stock.
Addenda	$10,000,000	Double Standard	$5,000,000	Riqueza	$10,000,000
Aurora Tunnel	6,000,000	Dudley	6,400,000	Rough and Ready Consolidated	10,000,000
Bechtel Consolidated	10,000,000	Glyndale Consolidated	10,000,000	Rustler	6,000,000
Belvidere	10,000,000	Goodshaw	10,000,000	Santa Mina	5,000,000
Black Hawk	5,000,000	Ida	6,000,000	South Bodie	10,000,000
Bodie Chief	10,000,000	Jupiter	6,400,000	South Bulwer	10,000,000
Bodie Consolidated	10,000,000	Maybell Consolidated	6,000,000	South Standard	10,000,000
Booker Consolidated	10,000,000	McClinton	6,000,000	Standard Consolidated	10,000,000
Boston Consolidated	10,000,000	Mono	5,000,000	Summit	5,000,000
Bulwer Consolidated	10,000,000	Noonday	6,000,000	Syndicate	10,000,000
Champion	10,000,000	North Noonday	6,000,000	Tioga Consolidated	10,000,000
Chieftain	10,000,000	Orient	10,000,000	University	10,000,000
Concordia	6,000,000	Oro	10,000,000	Vortex	6,000,000
Consolidated Pacific	6,000,000	Queen Bee	10,000,000	West Pacific	10,000,000
Cræsus	5,000,000	Red Cloud Consolidated	5,000,000	White Cloud	6,000,000
Defiance	5,000,000	Richter	5,000,000		

a Capital stock of Klamath company not ascertained.

NEVADA (EXCEPTING WASHOE).

Adams Hill Consolidated	$5,000,000	General Thomas	$5,000,000	Mount Potosi Consolidated	$10,000,000
Albion Consolidated	15,000,000	Gila	10,000,000	Navajo	9,000,000
American Flag	4,000,000	Grand Prize	10,000,000	North Belle Isle	10,000,000
Argenta	10,000,000	Hamburgh	10,000,000	Northern Belle	5,000,000
Atlas	10,000,000	Highbridge	10,000,000	Original Hidden Treasure	2,133,000
Belle Isle	10,000,000	Hillside	10,000,000	Panther	5,000,000
Belmont	5,000,000	Hussey Consolidated	10,000,000	Paradise Valley	10,000,000
Big Prize	10,000,000	Independence	10,000,000	Phœnix	5,000,000
Blue Jacket	10,000,000	Indian Queen	250,000	Pleiades	10,000,000
Columbia Consolidated	5,000,000	Jackson	5,000,000	Raymond & Ely	10,000,000
Consolidated Esmeralda	10,000,000	K. K. Consolidated	5,000,000	Real del Monte	5,000,000
Day	10,000,000	Leopard	5,000,000	Rye Patch Consolidated	3,000,000
DeFrees	10,000,000	Manhattan	5,000,000	Silver Prize	10,000,000
Eagle	6,000,000	Martin White	10,000,000	Star	10,000,000
East Mount Diablo	10,000,000	Meadow Valley	6,000,000	Tuscarora	10,000,000
El Dorado South Consolidated	4,000,000	Metallic	5,000,000	Tybo Consolidated	15,000,000
Endowment	10,000,000	Monitor-Belmont	5,000,000	Wales Consolidated	10,000,000
Eureka Consolidated	5,000,000	Mount Diablo	5,000,000	Young America	6,000,000
Fourth of July	10,000,000				

CALIFORNIA (EXCEPTING BODIE).

Comanche	$5,000,000	Modoc Consolidated	$10,000,000	Oriental Consolidated	$5,000,000
Consolidated Amador	3,000,000	New Coso	10,000,000	South Modoc	10,000,000
Mammoth	10,000,000				

DAKOTA.

Caledonia	$10,000,000	Golden Terra	$10,000,000	Homestake	$10,000,000
Giant and Old Abe	10,000,000				

ARIZONA.

San Xavier	$10,000,000	Silver King	$10,000,000	Tip-Top	$10,000,000

IDAHO.

Florida Hill	$10,000,000	Golden Chariot	$9,000,000		

UTAH.

Leeds	$6,000,000				

SCATTERED.

Consolidated Arizona	$10,000,000	Revenue	$10,000,000	Silver West Consolidated	$5,000,000
Price & Davies	10,000,000				

RECAPITULATION.

Location of mine.	Number of corporations making returns.	Capital stock.
Total	245	$2,175,140,000
Washoe	122	1,187,960,000
Nevada (excepting Washoe)	55	430,383,000
Bodie	47	373,800,000
California (excepting Bodie)	7	53,000,000
Dakota	4	40,000,000
Arizona	3	30,000,000
Idaho	2	19,000,000
Utah	1	6,000,000
Scattered	4	35,000,000

TABLE XI.—DEEP MINES: MARKET VALUATION OF STOCK OF MINING COMPANIES JUNE 1, 1880, IN COMPARISON WITH NOMINAL CAPITAL STOCK.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	Number of corporations making returns.	Capital stock.	Market valuation.
Total	140	$1,019,111,250	$85,641,222
Arizona	11	52,000,000	9,790,000
California	25	195,800,250	8,750,312
Colorado	30	142,100,000	23,925,000
Dakota	13	81,550,000	9,975,000
Georgia	1	10,000	10,000
Idaho	1	10,000,000	550,000
Maine	4	2,300,000	425,000
Montana	2	5,100,000	2,700,000
Nevada	43	509,045,000	20,170,910
New Mexico	1	100,000	125,000
North Carolina	3	2,200,000	320,000
Oregon	2	5,000,000	875,000
Utah	3	13,500,000	7,825,000
Washington	1	400,000	200,000

The data obtained for this table are so scanty that it is valuable merely as a representative example of the differences between nominal capital and market value. So far as the comparison is concerned, an absolutely complete table would scarcely serve any further purpose, the practice as to capitalization varying with the locality of the market rather than with the value of the property. A complete table of the market value, on the other hand, would have possessed considerable interest had it been attainable, but definite conclusions as to the real value of the mines could scarcely have been drawn from it, inasmuch as the quoted market value of stocks is greatly affected by speculation, and is in a measure fictitious, sales of a few shares often being made at prices far exceeding those which could be obtained on any considerable proportion of the entire property. A very large part of the best mines, too, are not upon the market at all, and their owners, even if they desired to sell, could only tell the asking price, not that which could be realized.

Several mines, though quoted in the stock markets during the census year, are not reported in the schedules because they did not come within the prescribed limits or were not actively worked during the year, while many of the mines included in the schedules and belonging to stock companies were not quoted on the stock boards, and consequently do not appear in the table.

TABLE XII.—DEEP MINES: FINANCIAL SHOWING OF MINING COMPANIES WHOSE STOCKS WERE DEALT IN AT THE SAN FRANCISCO BOARDS AT CLOSE OF CENSUS YEAR, FOR THAT AND PREVIOUS YEARS.

Company.	Dividends.		Assessments.		Profit.	Loss.
	No.	Amount.	No.	Amount.		
WASHOE MINES	399	$115,871,100	1,090	$61,715,535	$97,547,430	$43,391,865
Alpha Consolidated			12	330,000		330,000
Alta			17	1,317,600		1,317,600
Amazon Consolidated			6	54,000		54,000
American Flat			7	172,500		172,500
Andes			14	425,000		425,000
Atlantic Consolidated			3	45,000		45,000
Baltimore Consolidated			19	1,015,000		1,015,000
Belcher	38	15,397,200	22	1,990,000	13,407,200	
Benton Consolidated			3	162,000		162,000
Best & Belcher			17	942,590		942,590
Brilliant			4	25,000		25,000
Buckeye			19	332,000		332,000
Bullion			14	3,352,000		3,352,000
Caledonia			31	1,935,000		1,935,000
California	34	31,320,000			31,320,000	
Challenge Consolidated			1	10,000		10,000
Chollar			3	168,000		168,000
Confidence	6	78,000	11	256,320		178,320
Consolidated Imperial			11	1,125,000		1,125,000
Consolidated Dorado			1	50,000		50,000
Consolidated Virginia	51	42,390,000	15	411,200	41,978,800	
Consolidated Washoe			1	8,000		8,000
Cosmopolitan			5	125,000		125,000
Crown Point	50	11,588,000	41	2,373,370	9,214,630	
Crown Point Ravine			6	49,500		49,500
Daney	2	56,000	5	91,800		35,800
Dardanelles			7	390,000		390,000
Dayton			10	750,000		750,000
De Haro			2	25,000		25,000
Erie Consolidated			1	10,000		10,000
Europa			8	126,000		126,000
Exchequer			15	530,000		530,000
Fairfax			2	35,000		35,000
Flowery			3	100,000		100,000
Franklin			4			
George Douglass			3	45,000		45,000
Georgia			1	10,000		10,000
Golden Gate			1	100,000		100,000
Gould & Curry	36	3,826,800	37	3,152,000	674,800	
Green			14			
Hale & Norcross	36	1,508,080	64	3,306,000		1,708,000
Hartford			5	14,700		14,700
Insurance			3	18,000		18,000
Joe Seates			4	95,000		95,000
Julia Consolidated			12	1,229,000		1,229,000
Justice			32	3,230,000		3,230,000
Kentuck	32	1,252,000	13	300,000	952,000	
Kossuth			8	421,200		421,200
Lady Bryan			4	200,000		200,000
Lady Washington			1	21,600		21,600
Lee			1	5,000		5,000
Leviathan			10	315,000		315,000
Mackey			3	35,000		35,000
Mary Ann			1	10,500		10,500
Maryland			1	5,400		5,400
Mexican			11	1,243,000		1,243,000
Midas			2	21,000		21,000
Mint			22	142,500		142,500
Mount Hood			3	35,000		35,000
Mountain View			1	25,000		25,000
Nevada			3	18,000		18,000
New York			22	900,000		900,000
Niagara			5	99,000		99,000
North Bonanza			5	175,000		175,000
North Carson			9	160,000		160,000
North Consolidated Virginia			16	820,000		820,000
North Sierra Nevada			2	10,000		10,000
Occidental			6	112,500		112,500
Ophir	24	1,595,800	35	2,689,400		1,093,600
Original Gold Hill			8	102,000		102,000
Original Keystone			3	125,000		125,000
Overman			45	3,162,800		3,162,800
Patten			2	20,000		20,000
Peytona			2	70,000		70,000
Phil. Sheridan			9	145,000		145,000
Pioneer			2	15,000		15,000
Potosi			3	168,000		168,000
Prospect			6	260,000		260,000
Sabine			2	25,000		25,000
Savage	52	4,460,000	42	4,964,000		504,000
Scorpion			7	122,000		122,000
Segregated Belcher			16	264,000		264,000
Segregated Gold Hill			1	12,000		12,000
Senator			1	10,800		10,800
Sierra Nevada	11	102,500	63	3,850,000		3,747,500

TABLE XII.—DEEP MINES: FINANCIAL SHOWING OF MINING COMPANIES, ETC.—Continued.

Company.	Dividends.		Assessments.		Profit.	Loss.
	No.	Amount.	No.	Amount.		
Silver City			1	$15,775		$15,775
Silver Hill			10	1,620,000		1,620,000
Solid Silver			3	75,000		75,000
South Comstock			6	79,000		79,000
South Utah			4	35,000		35,000
Saint Louis			1	16,200		16,200
Succor	2	$22,800	24	798,000		775,200
Sutro			4	25,680		25,680
Tolo			2	25,000		25,000
Trojan			12	315,000		315,000
Union Consolidated			14	860,000		860,000
Utah			30	1,030,000		1,030,000
Vancouver			3	35,000		35,000
Vermont Consolidated			2	44,000		44,000
Ward			5	198,000		198,000
Wells Fargo			14	264,600		264,600
Woodville Consolidated			6	630,000		630,000
Yellow Jacket	25	2,184,000	37	4,038,000		2,454,000
BODIE MINES	23	1,225,000	160	2,671,500	$1,150,000	2,596,500
Addenda			3	60,000		60,000
Aurora tunnel			4	39,000		39,000
Bechtel Consolidated			4	75,000		75,000
Belvidere			6	93,000		93,000
Black Hawk			8	112,500		112,500
Bodie Consolidated	8	400,000	2	75,000	325,000	
Booker Consolidated			5	130,000		130,000
Bulwer Consolidated			1	30,000		30,000
Champion			6	145,000		145,000
Chieftain			2	15,000		15,000
Concordia			2	15,000		15,000
Consolidated Pacific			1	60,000		60,000
Cræsus			2	7,500		7,500
Defiance			5	70,000		70,000
Double Standard			3	22,500		22,500
Dudley			8	144,000		144,000
Glynndale Consolidated			1	25,000		25,000
Goodshaw			6	105,000		105,000
Ida			1	15,000		15,000
Jupiter			8	134,000		134,000
Maybell Consolidated			4	30,000		30,000
McClinton			5	90,000		90,000
Mono			7	225,000		225,000
Noonday			2	18,000		18,000
North Noonday			2	27,000		27,000
Orient			3	50,000		50,000
Oro			4	32,000		32,000
Queen Bee			6	46,000		46,000
Red Cloud Consolidated			7	105,000		105,000
Richter			3	50,000		50,000
Riqueza			1	5,000		5,000
Rough and Ready Consolidated			1	5,000		5,000
Rustler			1	6,000		6,000
Santa Mina			1	7,500		7,500
South Bodie			3	50,000		50,000
South Bulwer			7	145,000		145,000
South Standard			6	87,500		87,500
Standard Consolidated	15	825,000			825,000	
Summit			5	90,000		90,000
Tioga Consolidated			9	175,000		175,000
University			5	55,000		55,000
NEVADA (excepting Washoe)	187	12,221,499	327	8,613,561	9,745,000	6,137,062
Adams Hill Consolidated			10	99,500		99,500
Albion Consolidated			2	30,000		30,000
American Flag			10	300,000		300,000
Argonta	2	40,000	5	100,000		60,000
Atlas			1	10,000		10,000
Belle Isle	6	300,000	1	30,000	270,000	
Belmont			24	615,000		615,000
Columbia Consolidated			1	25,000		25,000
Day			6	85,000		85,000
DeFrees			10	140,000		140,000
Eagle			14	210,000		210,000
East Mount Diablo			1	10,000		10,000
El Dorado South Consolidated			13	587,500		587,500
Endowment			4	125,000		125,000
Eureka Consolidated	55	4,330,000	2	100,000	4,230,000	
Fourth of July			2	20,000		20,000
General Thomas			5	100,000		100,000
Gila	2	50,000	7	170,000		120,000
Grand Prize	4	400,000	3	225,000	175,000	
Hamburg			7	305,000		305,000
Hillside			3	110,000		110,000
Hussey Consolidated			9	140,000		140,000
Independence	9	225,000	6	135,000	90,000	
Indian Queen	5	102,000	2	12,000	90,000	
Jackson			11	227,500		227,500

TABLE XII.—DEEP MINES; FINANCIAL SHOWING OF MINING COMPANIES, ETC.—Continued.

Company.	Dividends.		Assessments.		Profit.	Loss.
	No.	Amount.	No.	Amount.		
K. K. Consolidated	*4	$50,000	9	$450,00		$400,000
Leopard	6	162,500	13	372,500		210,000
Manhattan	7	400,000	3	150,000	$250,000	
Martin White	3	90,000	6	750,000		660,000
Meadow Valley	17	1,260,000	15	480,000	780,000	
Metallic			2	25,000		25,000
Monitor-Belmont	3	75,000	7	162,500		87,500
Mount Diablo			2	37,500		37,500
Mount Potosi Consolidated			3	50,000		50,000
Navajo			6	155,000		155,000
North Belle Isle			2	25,000		25,000
Northern Belle	31	1,525,000			1,525,000	
Original Hidden Treasure	1	31,999	11	330,061		298,062
Panther			11	87,500		87,500
Paradise Valley			1	25,000		25,000
Phœnix			22			
Pleiades			2	10,000		10,000
Raymond & Ely	23	3,075,000	14	740,000	2,335,000	
Real del Monte			10	355,000		355,000
Rye Patch Consolidated	9	105,000	7	157,500		52,500
Silver Prize			4	65,000		65,000
Star			3	130,000		130,000
Tuscarora			5	50,000		50,000
Young America			10	94,500		94,500
CALIFORNIA (excepting Bodie)	30	584,000	33	1,542,500	486,500	1,445,000
Comanche	4	47,500	3	100,000		52,500
Consolidated Amador	34	486,500			486,500	
Mammoth			4	275,000		275,000
Modoc Consolidated	1	50,000	9	600,000		550,000
New Coso			10	430,000		430,000
Oriental Consolidated			6	112,500		112,500
South Modoc			1	25,000		25,000
DAKOTA	17	510,000	16	840,000	310,000	640,000
Caledonia			7	290,000		290,000
Giant and Old Abe			4	200,000		200,000
Golden Terra			3	150,000		150,000
Homestake	17	510,000	2	200,000	310,000	
ARIZONA	9	450,000	5	195,000	450,000	195,000
San Xavier			1	25,000		25,000
Silver King	9	450,000			450,000	
Tip-Top			4	170,000		170,000
IDAHO	13	500,000	24	890,000		390,000
Florida Hill			2	20,000		20,000
Golden Chariot	13	500,000	22	870,000		370,000
UTAH	7	78,000	1	6,000	72,000	
Leeds	7	78,000	1	6,000	72,000	
SCATTERED			7	111,750		111,750
Revenue			1	50,000		50,000
Silver West Consolidated			6	61,750		61,750

RECAPITULATION.

Location of mine.	Dividends.		Assessments.		Net profit.	Net loss.
	No.	Amount.	No.	Amount.		
Total	694	$131,439,599	1,663	$76,585,846	$58,690,503	$3,236,750
Washoe	399	115,871,100	1,090	61,715,535	54,155,565	
Nevada (excepting Washoe)	187	12,221,499	327	8,613,561	3,607,938	
Bodie	23	1,225,000	160	2,671,500		1,446,500
California (excepting Bodie)	30	584,000	33	1,542,500		958,500
Dakota	17	510,000	16	840,000		330,000
Arizona	9	450,000	5	195,000	255,000	
Idaho	13	500,000	24	890,000		390,000
Utah	7	78,000	1	6,000	72,000	
Scattered			7	111,750		111,750

Total dividends	$131,439,599
Total assessments	76,585,846
Total net profits	54,853,753

ANALYSIS OF FINANCIAL SHOWING OF MINING COMPANIES WHOSE STOCKS WERE DEALT IN AT THE SAN FRANCISCO BOARDS AT CLOSE OF CENSUS YEAR.

Location of mine.	Total number of companies reported.	Number showing excess in amount of dividends over assessments.	Number showing excess in amount of assessments over dividends.	Number which have paid dividends.	Number which have levied assessments.	Number which have paid dividends and levied no assessments.	Number which have levied assessments and paid no dividends.	Number which have paid dividends and levied assessments.
Total	212	21	191	40	207	5	172	35
Washoe	103	6	97	14	102	1	89	13
Nevada (excepting Washoe)	49	9	40	17	48	1	32	16
Bodie	41	2	39	2	40	1	39	1
California (excepting Bodie)	7	1	6	3	6	1	4	2
Dakota	4	1	3	1	4	.....	3	1
Arizona	3	1	2	1	2	1	2	.....
Idaho	2	.....	2	1	2	.....	1	1
Utah	1	1	.....	1	1	.....	.....	1
Scattered	2	.....	2	.....	2	.....	2	.....

This table shows the entire number of dividends and assessments of the respective mines, not merely those paid or levied within the census year, but it includes only those mines the shares of which were on the San Francisco stock boards at the close of the census year, and even of these a very large proportion were merely nominally on the market, being very seldom quoted or even practically abandoned, though not stricken from the lists. The table does not show the whole results of the mining business, or even of all the incorporated companies, many of the best and best known of these, such as the Black Bear, the Idaho, and others, as well as the unincorporated mines, not being publicly dealt in. It does not even show the whole business of the mines named in the table, for when the stock of a mine is watered or segregated, or when it is renamed, its record is often lost. Large numbers of mines have also been dropped from the lists, some of which, such as the Poorman, Golden Chariot, Cedarberg, and others, formerly paid dividends, while many others which have now disappeared from the lists once levied large assessments.

In considering the profits and losses of the mining business, it must be remembered that the brilliant possibilities attending it attract a great number of persons who would enter no less speculative occupation so ill provided with the requisite knowledge. An immense number of mines are opened where no experienced mining man would dream of finding remunerative ore, and mines are also sometimes started with the deliberate purpose of swindling the public, or, with fair prospects, are intentionally mismanaged for the same purpose. In short, the profits of mining as a legitimate industry bear a far higher ratio to the expense than would appear from tables which include the cost of the wild ventures and of the deliberate swindles placed upon the market.

In discussing the profits of the mining industry fallacious arguments are often advanced, though the subject is in reality one of great simplicity. A profitless industry is one which pays nobody, or where the actual costs equal or exceed the actual returns. A mine which pays no dividends, but yields sufficient product to settle its accounts for wages and supplies, is not profitless. Agriculture in many regions does no more than support those engaged in it; yet no one would maintain for a moment that a country capable of supporting a given number of persons by farming, even though they were unable to accumulate a surplus, was not by so much richer than a country capable of affording a livelihood to no one. The wages of miners are among the profits of the mining industry; so, too, is the surplus over actual cost of the industries which depend upon the mines for a market and that of the industries which depend upon the mines for supplies. The loss which would ensue if the mines were to be suddenly wiped out of existence is the exact measure of the profit which is now derived from them. In short, the entire profit of the precious-metal mining industry is the entire product in dollars, plus the increment (if any) of the value of mining property, plus the net profit of manufacturers of supplies used in the mines and of wares of the bullion produced; minus the net cost of supplies, including plant consumed in mining, and minus the shrinkage (if any) of the total value of mining property. The increment and decrement in the value of mining property (plant being counted under the head of supplies) can only be measured by the yield of the mines, which fluctuates greatly, but on the whole increases at an average rate of, say, two millions a year. The gross expenditure for supplies other than plant is, say, ten millions, of which perhaps 25 per cent. may be counted as profit, and a similar sum probably represents the profits on the bullion in the manufacture of wares. If the yearly cost of plant is placed at $8,000,000, which is a very rough but probably fair estimate, the profit and loss account of the precious-metal deep mining industry would stand as follows:

Profit.		Loss.	
Product census year	$62,730,000	Net cost of supplies	$7,500,000
Increment in value of mining property	2,000,000	Net cost of plant	6,000,000
Net profit on plant	2,000,000	Profit	58,230,000
Net profit on other supplies	2,500,000		
Net profit on manufacture of bullion ware	2,500,000		
	71,730,000		71,730,000

In fact, the country is as well off as if, there being no deep precious-metal mines, about $58,000,000 from some foreign source were distributed among the men now employed in mining, in the production of mine supplies, and in the manufacture of wares of bullion, these men, of course, being supposed not to earn any more in industries unconnected with mining than they now do.

The question of profit to owners, as such, of deep-mining property is entirely another matter, and is capable only of extremely rough calculation. If the wages of the miners are estimated at $30,000,000 and the annual cost of plant and other supplies at $18,000,000, about $15,000,000 will be left for dividends, besides the appreciation in the total value of mining property, or a gross profit to investors of about $17,000,000, or about 27 per cent. of the product. This estimate is certainly not accurate, but is believed to be within a couple of millions of the truth. This, however, is not all net profit, for owners of mining property who are not personally engaged in working the mines, and this is of course the larger number, commonly purchase them of prospectors or middle men, or of other investors of their own class. The purchase money is not lost to the country, since it merely changes hands; but as the mines are sooner or later exhausted, this money is eventually lost to the investing class. A mine to be profitable to its owners must pay dividends exceeding the price given for it, and if the property changes hands repeatedly the entire amount of dividends must exceed the highest price ever paid for it, for otherwise it must withdraw from other uses more capital than it yields in return. To ascertain the net profits of the class of investors in the deep precious-metal mines of the country there should therefore be deducted from the gross profit, estimated at $17,000,000, the sum annually expended in purchase at the highest rates. It is utterly impossible to say what this sum is, but it can readily be shown to be a large one. Any estimate of the maximum price at which the mines have changed hands based upon the transactions of the stock boards would be extravagant, because these represent sales of a few shares only; but it seems safe to assume that the actual maximum transfers have been at prices at least equaling the amount of the product of the mines for a single year. If the average life of a mine is ten years, one-tenth of the annual product, or over $6,000,000, would have to be deducted from the annual gross profit to obtain the annual net profit of the deep precious-metal mines to the owners.

DEVELOPMENT, ITS NATURE AND EXTENT.

TABLE XIII.—DEEP MINES: MANNER OF OPENING.

State or territory.	Number of mines reported.	Shaft.	Incline.	Shaft and incline.	Shaft and tunnel.	Shaft, incline, and tunnel.	Shaft and open cut.	Shaft, incline, and open cut.	Shaft, tunnel, and open cut.	Shaft, incline, tunnel, and open cut.	Tunnel.	Tunnel and incline.	Tunnel and open cut.	Incline and open cut.	Incline, tunnel, and open cut.	Open cut.
Total	920	195	86	91	202	40	12	1	12	2	151	49	20	6	3	50
Alabama	2					1					1					
Arizona	61	7	14	15	4	4	1	1			1	12		1		1
California	85	23	17	9	7	1					21	7				
Colorado	251	67	15	15	36	11	3		2		43	3		3		3
Dakota	58	5			17	1	5		9	1	12		7		1	
Georgia	10	1			6	2						1				
Idaho	134	13	3	1	17		2		1	1	32	4	13	1	1	45
Maine	11	6	1	1	2										1	
Montana	69	14	18	12	11		1				6	6		1		
Nevada	104	34	7	22	21	5					10	5				
New Hampshire	3				1							1				1
New Mexico	13	4		2	5	1						1				
North Carolina	12	6	1	2	2	1										
Oregon	9		1		3						4	1				
Utah	80	7	5	11	18	12					19	8				
Virginia	5	2		1	1						1					
Washington	1										1					
Wyoming	12	6	4		1	1										

Opening a mine by a tunnel involves the expenditure of less capital than sinking a shaft does. It is therefore a natural method of prospecting. Before mining machinery had reached the perfection which it has attained during the last few decades it was often the only practicable method of draining and working even large and profitable properties. Of late years, however, this method of opening mines has been less and less practiced all over the world. The cases reported in the table as opened by shaft and tunnel are seldom those where tunnels have been run for drainage, but almost always those which have been opened as prospects by tunnel, a shaft having afterward been sunk; and the figures show that less than a quarter of the whole number of mines are practically worked by tunnels. In Nevada, where mining is carried to greater perfection than in most of the

states, only one-sixth of the mines are worked by tunnels. Had the standard of mines reported upon been lower, the proportion of tunnel mines would have been far greater, and, *per contra*, had the standard been higher there would have been a greater proportion of shaft mines.

In very small mines an incline is sometimes sunk on the dip of the vein for prospecting purposes, but these are usually only temporary. In larger mines, those for example on the Comstock lode, an incline is often run on the dip of the vein from the bottom of a vertical shaft when for any reason it is undesirable to penetrate the foot wall. This method, however, has many inconveniences, and of late many engineers prefer under such circumstances to cross-cut into the hanging country rock to a suitable distance and sink a blind shaft vertically to a lower level. The hoisting in the blind shaft, however, must then be done by a compressed-air engine.

Open cuts, excepting for prospecting purposes, are rare, except in Idaho, where the Custer and other mines show large bodies of quartz exposed by erosion, and therefore capable of this simple method of working.

TABLE XIV.—DEEP MINES: EXTENT OF WORKINGS.

State or territory.	Mines reported.	Total length of shafts and inclines.	Total length of tunnels and galleries.	Total length of winzes and upraises.	Greatest depth of workings (vertical).	Greatest horizontal development.
	Number.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
The United States	885	399,686	1,992,191	222,017	3,027	4,000
Alabama	2	480	1,100	30	60	600
Arizona	61	42,058	76,714	2,900	450	1,110
California	88	63,777	253,911	48,984	1,530	3,764
Colorado	251	86,216	279,818	24,742	1,075	2,400
Dakota	57	4,218	27,166	914	300	1,160
Georgia	9	1,546	4,177	87	138	600
Idaho	84	7,086½	61,976	13,388	900	3,200
Maine	11	1,556	1,587	80	245	500
Montana	68	17,809½	61,459	6,986	700	3,000
Nevada	111	119,547	994,914	100,133	3,027	4,000
New Hampshire	3	435	278	.....	280	250
New Mexico	13	4,133	23,997	358	170	800
North Carolina	12	2,876	4,245	328	332	900
Oregon	9	1,631	12,661	2,067	576	1,200
Utah	88	43,108	178,593	20,446	1,600	2,350
Virginia	5	978	5,241	344	142	1,610
Washington	1	.....	159	.....	40	159
Wyoming	12	2,231	4,195	230	210	1,000

The totals in miles, neglecting fractions, would be as follows:

	Miles.
Total length of shafts and inclines	76
Total length of tunnels and galleries	377
Total length of winzes and upraises	42
Total	495

The heading "tunnels and galleries" includes all horizontal workings, known as adits, tunnels, levels, drifts, cross-cuts, etc. The shafts have from one to five compartments, and these are from 3 by 4 feet to 6 by 7 feet in the clear, or between timbers. The tunnels vary from 3½ by 5½ feet to 12 by 9 feet in the clear, with a correspondingly increased total cross-section of excavation if timbered. The winzes seldom have more than one compartment, and are usually smaller than the main shafts.

The figures given in the tables are all taken from the schedules, except in the case of the Comstock lode, the galleries on the mine maps of which were measured by scale. It is probable that the totals represent three-quarters of the entire length of mine workings in the deep precious-metal mines of the country which were in operation in the census year.

Under "greatest horizontal development" it was intended that data should be collected as to the extreme extent of any one level in the mines; but some of the experts confined their inquiries to the greatest horizontal extent of the workings on the strike of the deposit, which, however, is usually the same thing. In a few cases of shallow mines surface workings are included in statements as to the greatest horizontal development. Taken together, these tables indicate the extent of the mines, all of which it must be remembered have been opened within about 25 years, and most of them within a shorter period.

TABLE XV.—DEEP MINES: MAXIMUM DEPTH OF WORKINGS.

[NOTE.—Mines less than 500 feet in depth from surface omitted.]

CALIFORNIA.

County and district.	Mine.	Greatest vertical depth below surface.
		Feet.
AMADOR.		
Amador City	Keystone Consolidated	728
Do	Original Amador	780
Jackson	Oneida	1,000
Do	Zeile	500
Plymouth	Empire	1,090
CALAVERAS.		
Mokelumne Hill	Gwin	1,200
Washington	Amelia	590
EL DORADO.		
Placerville	Placerville	600
Springfield, or Mud Springs	Springfield	800
INYO.		
Cerro Gordo	Union Consolidated	900
Lookout	Modoc	1,100
MARIPOSA.		
Mariposa Estate	Hite	700
Do	South Hite	500
MONO.		
Blind Spring	Diana	765
Bodie	Addenda	520
Do	Bechtel Consolidated	625
Do	Belvidere	580
Do	Black Hawk	700
Do	Bodie Consolidated	765
Do	Booker Consolidated	500
Do	Champion	600
MONO—continued.		
Bodie	Consolidated Pacific	600
Do	Dudley	500
Do	Goodshaw	600
Do	Jupiter	628
Do	McClinton	630
Do	Noonday	512
Do	North Noonday	512
Do	South Bodie	520
Do	South Bulwer	550
Do	South Standard	550
Do	Standard Consolidated	900
Do	Syndicate	800
Do	Tioga Consolidated	800
Do	University	634
NEVADA.		
Grass Valley	Idaho Quartz	1,150
Do	New York Hill	*a* 1,300
Nevada City	Providence	850
PLACER.		
Colfax	Rising Sun	916
PLUMAS.		
Indian Valley	Green Mountain	1,409
Do	Plumas-National	800
Quartz township	Plumas-Eureka	1,530
SISKIYOU.		
Sawyer's Bar	Klamath	567
South Fork Salmon	Black Bear	515
TUOLUMNE.		
Soulsbyville	Soulsby	630

COLORADO.

County and district.	Mine.	Greatest vertical depth below surface.
BOULDER.		
Gold Hill	American	500
Do	Melvina	500
Grand Island	Caribou	860
Do	Native Silver	520
CLEAR CREEK.		
Downieville	Red Elephant	540
Griffith	Dunderberg	540
Do	Equator	558
CUSTER.		
	Humboldt	620
GILPIN.		
Eureka	Gunnell	840
Gregory	Bobtail	1,040
Do	New York and Colorado	840
Do	United Gregory	920
GILPIN—continued.		
Nevada	California	1,075
Do	Hidden Treasure	966
Do	Kansas	1,034
Do	Kansas lode	740
Do	Kent County	689
Do	Lacrosse	600
Do	Ralls County	530
Do	West Flack	754
OURAY.		
Upper San Miguel	Alta	500
SAN JUAN.		
Animas	Aspen	500
Do	Highland Mary	*b* 800
Do	North Star	*b* 840
Eureka	Bonanza tunnel	*b* 500

IDAHO.

County and district.	Mine.	Greatest vertical depth below surface.
ALTURAS.		
Middle Boisé	Buffalo	518
Do	Buffalo and Atlanta	*b* 900
OWYHEE.		
Carson	Empire	762
Do	War Eagle	785

MONTANA.

County and district.	Mine.	Greatest vertical depth below surface.
BEAVER HEAD.		
Trapper	Hecla Consolidated	*b* 700
DEER LODGE.		
Summit Valley	Alice	500

NEVADA.

County and district.	Mine.	Greatest vertical depth below surface.
ELKO.		
Tuscarora	Argenta	520
Do	Grand Prize	608
Do	Independence	520
ESMERALDA.		
Columbus	Mount Potosi	*b* 500
Do	Northern Belle	*a* 1,900
Do	Victor	600
Esmeralda	Real del Monte	880
EUREKA.		
Eureka	Albion	522
Do	Eureka Consolidated	1,240
Do	Hamburg	859
EUREKA—continued.		
Eureka	Jackson	680
Do	Phœnix	700
Do	Richmond	1,025
LANDER.		
Reese River	Curtis	900
LINCOLN.		
Ely	Meadow Valley	1,200
Do	Raymond & Ely	1,480
NYE.		
Philadelphia	Belmont	500
Union	Great American Rooster	*a* 650

a Measured on dip or incline.

b Greatest depth below surface in tunnel or winze.

TABLE XV.—DEEP MINES: MAXIMUM DEPTH OF WORKINGS.

NEVADA—Continued.

County and district.	Mine.	Greatest vertical depth below surface.	County and district.	Mine.	Greatest vertical depth below surface.
STOREY.		*Feet.*	STOREY—continued.		*Feet.*
American Flat	Baltimore Consolidated	1,450	Virginia	Consolidated Virginia	2,524
Gold Hill	Alta	2,050	Do	Gould & Curry	1,900
Do	Belcher	3,000	Do	Hale & Norcross	2,250
Do	Belcher and Crown Point pump shaft.	3,000	Do	Mexican	2,650
Do	Caledonia	1,900	Do	Mint	1,425
Do	Consolidated Imperial	3,000	Do	Ophir	2,540
Do	Crown Point	3,000	Do	Osbiston shaft	1,960
Do	Forman shaft	*a* 1,255	Do	Potosi	2,500
Do	Justice	1,375	Do	Savage	2,300
Do	New York	1,650	Do	Scorpion	500
Do	Overman	1,900	Do	Sierra Nevada	2,500
Do	Silver Hill	1,600	Do	Union Consolidated	2,500
Do	Yellow Jacket	3,027	Do	Union shaft	2,600
Virginia	Andes	520	Do	Utah	1,350
Do	Best & Belcher	2,300	Do	Ward shaft (Bullion)	2,480
Do	C. N. S. shaft	2,500	WHITE PINE.		
Do	California	2,524	Cherry Creek	Star	540
Do	Chollar	2,500	White Pine	Eberhardt & Aurora	1,100

OREGON.

BAKER.					
Conner Creek	Conner Creek	*b* 576			

UTAH.

JUAB.			SUMMIT.		
Tintic	Eureka Hill	680	Uinta	Ontario	720
Do	Swansea	650	TOOELE.		
SALT LAKE.					
Big Cottonwood	Butte	850	Ophir	Hidden Treasure	1,600
Do	Colboth tunnel	*b* 600	Do	Kearsarge	945
Do	Reed & Benson	*b* 1,000	Do	Queen of the Hill	1,400
Little Cottonwood	City Rock	*b* 700	Rush Valley	Great Basin	840
Do	Emma	500	Do	First National	510
Do	Vallejo	*b* 700	UTAH.		
West Mountain	Last Chance	650			
Do	Tiewaukee	*b* 600	American Fork	Miller	*b* 600
Do	Winnamuck	*b* 750			
Do	Yosemite	600			

a Depth June 1, 1880. Depth May 1, 1881, 1,980 feet. *b* Greatest depth below surface in tunnel or winze.

To give the development data of all the mines would take too much space, but as the depth reached is an interesting and significant feature, this datum is given in Table XV for those mines which have reached 500 feet below the surface. This table is nearly complete so far as mines worked during the census year is concerned, though there are many abandoned shafts which would come within the limits. It will be observed that, except on the Comstock lode, there are no mines over 2,000 feet in depth. Several Comstock mines have reached 3,000 feet, and are among the deepest mines of the world. The Adalbert shaft at Pribram, in Bohemia, is 1,020$\frac{1}{10}$ meters, or 3,350 feet, in depth, and is the deepest vertical shaft in existence. But while mining on the Comstock began in 1859, the Pribram mines were opened in 1527 and have been worked more or less actively ever since.

TABLE XVI.—COMSTOCK MINES: LENGTH OF DRIFTS, CROSS-CUTS, SHAFTS, INCLINES, AND WINZES.

Mine.	Tunnels, drifts, and cross-cuts.	Shafts.	Inclines.	Winzes.	Total.	Mine.	Tunnels, drifts, and cross-cuts.	Shafts.	Inclines.	Winzes.	Total.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*		*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Total	658,994	51,251	28,240	59,742	798,227	Hale & Norcross	26,500	1,788	2,270	3,625	34,183
						Julia	*b* 5,000	1,775		700	7,475
						Justice	26,310	1,199	1,920	3,395	32,824
Alpha	3,625			1,334	4,959	Kentuck	3,340	726		500	4,566
Alta and Benton	7,560	1,500	900	100	10,060	Mexican	10,095			1,435	11,530
Andes	3,000	520			3,520	Mint	6,000	1,425		200	7,625
Baltimore Consolidated	6,600	738	1,100	552	8,990						
Belcher	43,320	2,056	5,700	1,230	52,306	New York	4,000	1,200	820		6,020
						Ophir	39,830	2,553	1,700	4,620	48,703
Best & Belcher	14,400	479		977	15,856	Original Keystone		436			436
Bullion	14,025	3,200	2,600	830	20,655	Overman and Caledonia	50,990	4,145		3,760	58,895
California	28,190	*a* 2,384		3,553	34,127	Savage	41,800	1,906	1,900	2,742	48,348
Chollar-Potosi	56,400	2,899	1,300	4,300	64,899	Scorpion	2,050	500			2,550
Confidence	6,600			580	7,180						
						Sierra Nevada	31,820	2,600	1,900	2,582	38,902
Consolidated Imperial	14,600	1,300	1,100	2,933	19,933	Silver Hill	21,450	444	1,500	867	24,261
Consolidated Virginia	27,975	2,531		2,007	32,513	Sutro tunnel	29,899				29,899
Crown Point	31,195	980	1,800	3,100	37,075	Union Consolidated	9,010	2,604		950	12,564
Exchequer	2,550				2,550	Utah	7,700	1,338	1,230	210	10,568
Gould & Curry	37,650	3,197	500	5,150	46,497	Yellow Jacket	45,420	4,810		7,510	57,749

a C. & C. joint shaft. *b* Estimated.

This table includes only those shafts, galleries, etc., which have been surveyed. In the Comstock mines all important workings are now run by survey and are duly recorded, but in the early days many drifts were not thus laid out, and unimportant galleries are still occasionally run without the assistance of the surveyor, and thus escape plotting. After consultations with the superintendents and surveyors, the unsurveyed workings have been estimated as follows:

	Feet.
Shafts (10 per cent. additional)	5,125
Inclines (10 per cent. additional)	2,824
Winzes (10 per cent. additional)	5,974
Tunnels, drifts, and cross-cuts (25 per cent. additional)	164,748
	178,671
Add total accounted for	798,227
Probable total	976,898

This would be 185 miles and 98 feet.

	Feet.
The average size of drifts is	6 by 7
The average size of single winzes	6 by 7
The average size of double winzes	12 by 7
The average size of shafts (in the clear)	5½ by 15
Area of excavation of the Forman shaft	8½ by 28
Area of excavation of the Combination shaft	9 by 28
Area of excavation of the Yellow Jacket new shaft	9½ by 23
Area of excavation of the Osbiston shaft	8½ by 23
Area of excavation of the old shafts (average)	8 by 20

TABLE XVII.—DEEP MINES: DIMENSIONS OF SOME OF THE LONG TUNNELS OF THE WORLD.

[From data prepared by John D. Barry, M. E.]

Name of tunnel.	Country.	Length.	Width.	Height.
		Feet.	*Feet.*	*Feet.*
Hoosac	United States	24,416	26	22½
Musconetcong	do	4,879	26	21
Sutro (including laterals)	do	29,897	10 to 12	8 to 9
Nesquehoning	do	3,800	16	19
Alleghany	do	4,711	26	19.50
Sandidge	England	16,035		
New Sandidge	do	16,305		
Leeds	do	11,110		
Rilly	France	11,319	24.20	19.2
Nerthe	do	15,220	26.20	24.50
Saint Martin	do	31,826	26.20	18
Blaisy	do	13,452	26.25	26.25
Bildstock	Germany	18,915		
Frejus	France	12,833		
Saint Gothard	Switzerland	48,887		
Dudley Canal	England	11,328		
Huddersfield Canal	do	16,650		
Kennel and Avon Canal	do	13,200		
Pensar Canal	do	11,550		
Thames and Medway	do	11,880	30	38
Thames and Severn Canal	do	12,540	15	15
Sierra Madre	Mexico	63,360		
San Carlos and Union Pacific		13,200		
Severn tunnel	England	23,760		
Wochtestongo	Mexico	21,650	11	13
Ernst August	Germany	71,280		
Georg tunnel	do	56,760		
Joseph II, Schemnitz	do	48,840		
Mont Cenis	France, Italy	40,138		

TABLE XVIII.—DEEP MINES: STEAM HOISTING ENGINES.

ARIZONA.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
MARICOPA.					
Globe	Mack Morris	1	1	12	Horizontal, without fly-wheel; geared. (a)
Do	Silver Nugget	1	1	10	Horizontal.
Do	Stonewall	1	1	12	Horizontal, with fly-wheel; geared.
	Vulture	1	1	30	Horizontal, without fly-wheel; geared 6 to 1. (a)
MOHAVE.					
Hualapai	Keystone	1	1	8	Donkey.
Do	Lone Star	1	.....	10	Horizontal, with fly-wheel.
PIMA.					
Arivaca	Consolidated Arizona	1	.....	20	Horizontal, with fly-wheel; link-motion.
Tombstone	Contention	1	1	20	Horizontal, without fly-wheel; geared. (a)
Do	Empire	1	1	40	Horizontal, without fly-wheel; geared.
Do	Grand Central	1	1	25	Horizontal, without fly-wheel; geared.
Do	Sulphuret	1	1	25	Horizontal, without fly-wheel; geared 2 to 1; coupled.
Do	Toughnut and Goodenough	2	2	30	Horizontal, without fly-wheel; geared; main shaft, 20 horse-power; northwest shaft, 10 horse-power.
Do	Toughnut Extension	1	1	25	Horizontal, with fly-wheel; geared 8 to 1.
PINAL.					
Pioneer	Silver King	1	1	30	Horizontal, without fly-wheel; geared 12 to 1.
YAVAPAI.					
Humbug	Tip-Top	1	1	12	Horizontal, with fly-wheel.
Tiger	Tiger	1	1	60	Horizontal, with fly-wheel; geared 5 to 1.

CALIFORNIA.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
AMADOR.					
Amador City	Keystone Consolidated	2	2	120	One vertical, 80 horse-power; one horizontal, 40 horse-power, coupled, with fly-wheel.
Do	Original Amador	1	1	40	Horizontal, coupled, with fly-wheel.
Jackson	Monte Richard	1	1	25	Horizontal, with fly-wheel.
Do	Oneida	3	3	50	Horizontal, with fly-wheel; coupled.
Do	Zeile	1	1	75	Horizontal, with fly-wheel; coupled.
Plymouth	Empire	2	2	30	Horizontal, with fly-wheel; coupled.
Do	Pacific	2	.....	70	
Sutter Creek	Consolidated Amador	1	1	60	Horizontal, coupled, with fly-wheel.
Volcano	Downs	1	1	40	
CALAVERAS.					
Washington	Amelia	2	2	30	Horizontal, coupled, with fly-wheel.
EL DORADO.					
Placerville	Placerville	1	1	35	Horizontal, coupled, with fly-wheel.
Springfield, or Mud Springs	Springfield	1	1	30	Horizontal, coupled, with fly-wheel.
	Chapparal	1	1	10	
INYO.					
Cerro Gordo	Union Consolidated	2	2	65	Horizontal surface hoisting engine, 40 horse-power; underground engine, 25 horse-power.
Coso	Lucky Jim	1	.....	20	Vertical.
Lookout	Modoc and others	1	1	12	Vertical.
MARIPOSA.					
Hornitos	Washington	2	2	75	Horizontal, coupled, with fly-wheel.
Mariposa Estate	Ferguson	1	1	18	Horizontal, coupled, with fly-wheel.
Do	Mariposa tunnel and Sucredo	1	1	b 30	Horizontal, coupled, with fly-wheel (compressed air).
	Yosemite	1	1	25	
MONO.					
Blind Spring	Diana and Kerrick	1	1	25	Horizontal, coupled, without fly-wheel.
Bodie	Addenda	1	1	20	Horizontal, coupled, with fly-wheel.
Do	Bechtel Consolidated	1	1	b 20	Donkey engine.
Do	Belvidere	1	1	b 60	Horizontal, coupled, without fly-wheel.
Do	Black Hawk	1	1	20	Donkey.
Do	Bodie Consolidated	2	2	30	Horizontal, coupled, without fly-wheel.
Do	Booker Consolidated	1	1	40	Horizontal, coupled, with fly-wheel.
Do	Champion	1	1	25	Horizontal, coupled, with fly-wheel.
Do	Consolidated Pacific	1	1	30	Horizontal, coupled, with fly-wheel.
Do	Defiance	1	1	25	Horizontal, coupled, with fly-wheel.
Do	Dudley	1	1	b 30	Vertical, coupled, with fly-wheel.
Do	Goodshaw	1	1	25	Horizontal, coupled, without fly-wheel.
Do	Jupiter	1	1	25	Horizontal, coupled, with fly-wheel.
Do	McClinton	1	1	25	Horizontal, coupled, without fly-wheel.
Do	Maryland Consolidated	1	1	25	Horizontal, without fly-wheel. (a)
Do	Noonday	1	1	40	Horizontal, coupled, without fly-wheel.
Do	Oro	1	1	55	Vertical, coupled, without fly-wheel.
Do	Queen Bee	1	1	60	Horizontal, coupled, without fly-wheel.
Do	South Bodie	1	1	25	Horizontal, coupled, with fly-wheel.
Do	South Bulwer	1	1	30	Horizontal, coupled, with fly-wheel; geared.

a Believed to be a coupled engine, but some single-cylinder engines, the fly-wheels of which are used as pulleys or gears, may be included.
b Estimated horse-power.

TABLE XVIII.—DEEP MINES: STEAM HOISTING ENGINES.

CALIFORNIA—Continued.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
MONO—continued.					
Bodie	South Standard	1	1	25	Horizontal, without fly-wheel; direct-acting. (a)
Do	Standard Consolidated	2	2	60	Horizontal, coupled, without fly-wheel.
Do	Syndicate	1	1	15	Niles single reel.
Do	Tioga Consolidated	1	1	30	Horizontal, coupled, without fly-wheel.
Do	University	2	2	80	Horizontal, without fly-wheel (compound).
NEVADA.					
Grass Valley	Idaho Quartz	2	2	140	Horizontal, coupled, with fly-wheel.
Do	New York Hill	1	1	25	Horizontal, coupled, with fly-wheel.
Do	Rocky Bar	1	1	25	Horizontal, coupled, with fly-wheel.
Nevada City	Consolidated Wyoming	1	1	20	Horizontal, coupled, with fly-wheel.
Do	Murchie	2	1	65	Horizontal, coupled, with fly-wheel.
Do	Nevada City	1	1	25	Horizontal, coupled, with fly-wheel.
Do	Providence	1	1	30	Horizontal, coupled, with fly-wheel.
PLACER.					
Colfax	Rising Sun	1	1	b 40	Horizontal, coupled, with fly-wheel.
PLUMAS.					
Quartz township	Plumas-Eureka	1	1	12	Horizontal, without fly-wheel.
SISKIYOU.					
South Fork Salmon	Black Bear	1	1	100	Horizontal, coupled, without fly-wheel.
TUOLUMNE.					
Confidence	Confidence	1	1	30	Horizontal, coupled, with fly-wheel.
Soulsbyville	Soulsby	2	2	30	Horizontal, not coupled, with fly-wheel.

COLORADO.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
BOULDER.					
Central	Golden Age	1	1	25	
Do	John Jay	1	1	14	
Do	Smuggler	1	1	15	Vertical, geared.
Gold Hill	American	1	1	15	Portable.
Do	Cold Spring	1	1	15	Engine and boiler on same bed.
Do	Melvina	1	1	12	
Do	Slide	1	1	50	Horizontal, with fly-wheel, friction gear.
Do	Victoria & Lincoln	1	1	20	Horizontal, coupled, with fly-wheel, friction gear.
Grand Island	Boulder County & Trojan	1	1	50	Horizontal, with fly-wheel.
Do	Cariboo	3	1	140	Horizontal, with fly-wheel, friction gear.
Do	Horsefall or '59	1	1	40	Single cylinder, with fly-wheel.
Do	Idaho	1	1	25	Horizontal, coupled, with fly-wheel.
Do	Native Silver	1	1	15	Horizontal.
Do	Poorman	1	1	20	Horizontal, coupled.
Do	Seven-thirty	1	1	20	Horizontal, with fly-wheel.
Magnolia	Keystone	1	1	12	Vertical.
Ward	Nelson	1	1	35	Horizontal, coupled, with fly-wheel.
Do	Niwot	1	1	175	Horizontal, coupled, with fly-wheel.
CLEAR CREEK.					
Downieville	Red Elephant	2	2	40	Horizontal, with fly-wheel.
Genova	Baltic	1	1	25	Horizontal, with fly-wheel; single cylinder, friction gear.
Griffith	Colorado Central Consolidated	2	2	35	One horizontal, coupled, with fly-wheel; one horizontal, not coupled, with fly-wheel; one friction gear, one cog gear.
Do	Consolidated Hercules & Roe	1	1	4	Vertical, not coupled, with fly-wheel; geared.
Do	Dunderberg	2	2	80	Horizontal, coupled, with fly-wheel, one for mine hoisting, one for tramway; both high pressure and geared.
Do	Equator	1	1	20	Horizontal, not coupled, with fly-wheel; friction gear, paper against iron.
Griffith and Queens	Colorado Territory National	2	1	37	Horizontal, with fly-wheel.
Spanish Bar	Hulcill	1	1	35	Horizontal, with fly-wheel, coupled.
Do	Mayflower	2	1	40	One horizontal, with fly-wheel, one vertical, with fly-wheel.
Upper Union	Fred. Rogers	1	1	10	Vertical, coupled, with fly-wheel; geared.
Do	Neith	1	1	4	Vertical, not coupled, with fly-wheel; friction gear.
Do	Pioneer	1	1	6	Vertical, without fly-wheel; friction gear. (a)
Virginia	Specie Payment	1	1	8	Vertical, coupled, with fly-wheel.
Do	White Cloud	1	1	25	Horizontal, with fly-wheel; single cylinder.
York	Clifford	1	1	13	Horizontal, without fly-wheel; portable. (a)
CUSTER.					
Hardscrabble	Bull-Domingo	1	1	60	Horizontal, without fly-wheel. (a)
Do	Song Bird & Gray Eagle	1	1	8	Horizontal, with fly-wheel.
Verde	Verde	1	1	20	Horizontal, with fly-wheel.
	Humboldt	2	2	65	Both horizontal, coupled; one has fly-wheel, other has not.
GILPIN.					
Eureka	Gunnell	2	2	115	Horizontal, not coupled, with fly-wheel.
Gregory	Bobtail	2	2	85	Horizontal, coupled, without fly-wheel.
Do	Empress	1	0	20	Horizontal, not coupled, with fly-wheel.
Do	German	1	1	22	Horizontal, not coupled, with fly-wheel.
Do	New York & Colorado	1	1	60	Horizontal, not coupled, with fly-wheel.

a Believed to be a coupled engine, but some single-cylinder engines, the fly-wheels of which are used as pulleys or gears, may be included. b Estimated horse-power.

TABLE XVIII.—DEEP MINES: STEAM HOISTING ENGINES.

COLORADO—Continued.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
GILPIN—continued.					
Gregory	Smith	1	.....	15	Horizontal, portable.
Do	United Gregory	2	2	152	Horizontal, not coupled, with fly-wheel. One at Briggs shaft, 125 horse-power, runs stamps in addition to hoisting.
Do	Wain	1	1	15	Horizontal, without fly-wheel; portable.
Nevada	American Flag	1	1	35	Horizontal, not coupled, with fly-wheel.
Do	California	1	1	50	Horizontal, coupled, with fly-wheel.
Do	Egyptian	1	1	22	Horizontal, not coupled, with fly-wheel.
Do	Hidden Treasure	1	1	30	Horizontal, not coupled, with fly-wheel.
Do	Jones	1	1	12	Horizontal, not coupled, with fly-wheel.
Do	Kansas	1	1	30	Horizontal, coupled, with fly-wheel.
Do	Kansas lode	1	1	26	Horizontal, not coupled, with fly-wheel.
Do	Kent County	1	1	59	Horizontal, not coupled, with fly-wheel.
Do	Lacrosse	1	1	20	Horizontal, not coupled, without fly-wheel.
Do	Pyrenees	1	1	10	Horizontal, not coupled, with fly-wheel.
Do	Ralls County	1	1	40	Horizontal, not coupled, with fly-wheel.
Do	Sayr-Burroughs	1	1	40	Horizontal, not coupled, with fly-wheel.
Do	West Flack	1	1	25	Horizontal, not coupled, with fly-wheel.
Quartz Valley	Boss	1	1	5	Vertical, with fly-wheel.
Russell	Haseltine	1	1	40	Vertical, without fly-wheel; cylinder 10 by 12. (a)
Do	Leavenworth	1	1	16	Horizontal, with fly-wheel; portable.
Do	Pewabic	2	2	50	Horizontal, with fly-wheel; one portable.
Do	Powers	1	1	10	Horizontal, with fly-wheel; portable.
Do	Wyandotte	1	1	20	Horizontal, not coupled, with fly-wheel.
HINSDALE.					
Galena	Ulay & Ute	2	2	35	Horizontal, coupled.
LAKE.					
California	Adelaide	1	1	25	Horizontal, coupled, with fly-wheel.
Do	Agassiz	1	1	9	Horizontal, coupled, with fly-wheel.
Do	Amie	3	3	49	Two vertical [coupled?], without fly-wheel, one horizontal, with fly-wheel.
Do	Breece Iron	1	1	15	Horizontal, coupled, without fly-wheel.
Do	Catalpa	1	1	25	Vertical, not coupled, with fly-wheel.
Do	Chrysolite	6	5	130	Four vertical, two horizontal, none coupled; all have fly-wheels.
Do	Climax	1	1	15	Vertical, not coupled, with fly-wheel.
Do	Colorado Prince	1	1	10	Vertical, not coupled, with fly-wheel.
Do	Double Decker	1	1	15	Horizontal, not coupled, with fly-wheel.
Do	Dunkin	1	1	7	Vertical, not coupled, with fly-wheel.
Do	Evening Star	2	2	25	Horizontal, without fly-wheel. (a)
Do	Glass-Pendery	2	2	14	Vertical, not coupled, with fly-wheel.
Do	Hibernian	1	1	4	Vertical, without fly-wheel; "baby engine".
Do	Highland Chief	1	1	25	Horizontal, not coupled, with fly-wheel.
Do	Iron	1	1	15	Horizontal, belted to drum.
Do	Leadville Consolidated	2	2	36	One horizontal, one vertical; both have fly-wheel.
Do	Little Chief	5	5	83	Four donkey, one Niles double engine.
Do	Little Pittsburgh	5	5	40	Four vertical, without fly-wheel; one horizontal, with fly-wheel.
Do	Matchless	1	1	30	Horizontal, not coupled, with fly-wheel.
Do	Miner Boy	2	2	25	One horizontal, one vertical, not coupled; both have fly-wheel.
Do	Morning Star	2	2	40	One horizontal, one vertical, not coupled; both have fly-wheel.
Do	Robert E. Lee	2	1	40	Horizontal, double cylinder, without fly-wheel.
Do	Silver Wave	1	1	10	Vertical, with fly-wheel; friction gear.
Do	Virginius	1	1	15	Horizontal, with fly-wheel; single cylinder.
OURAY.					
Uncompahgre	Begola	1	.....	30	Horizontal, single, without fly-wheel. (b)
SAN JUAN.					
Eureka	Adelphi	1	1	5	Vertical, single, without fly-wheel. (b)
SUMMIT.					
Consolidated Ten-mile	Robinson Consolidated	2	2	31	One horizontal, compound friction and clutch gear, with fly-wheel; one "baby" hoist.

DAKOTA.

LAWRENCE.					
Bear Butte	Escondido	1	1	25	Horizontal, not coupled, without fly-wheel. (b)
Whitewood	Homestake	3	3	110	One 60 horse-power, 12-inch diameter by 30-inch stroke (probably with fly-wheel); one coupled engine with 10- by 12-inch cylinders.
Do	Sir Roderick Dhu	2	2	25	One horizontal, 17 horse-power, with fly-wheel; one vertical, 8 horse-power.

a Believed to be a coupled engine, but some single-cylinder engines, the fly-wheels of which are used as pulleys or gears, may be included.
b Fly-wheel doing duty as gearing.

TABLE XVIII.—DEEP MINES: STEAM HOISTING ENGINES.

GEORGIA.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
COBB.					
.....	Kendrick	1	1	12	Horizontal, double cylinder, high pressure, reversible.
FORSYTH.					
Third and Second	Strickland	1	1	12	Horizontal, coupled, without fly-wheel.
HALL.					
Ninth	Harris	1	1	20	Horizontal, single, with fly-wheel.
LINCOLN.					
.....	Magruder	1	1	20	Horizontal, with fly-wheel; single cylinder.
M'DUFFIE.					
Republican	Jennings	1	1	8	Oscillating.
MERIWETHER.					
Lutherville	Wilkes	1	1	40	Horizontal, single, with fly-wheel.

IDAHO.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
ALTURAS.					
Middle Boisé	Buffalo	2	2	25	One horizontal, one vertical; neither has fly-wheel.
BOISÉ.					
Banner	Wolverine	1	1	25	Double-cylinder donkey.
Granite	Gold Hill	2	2	35	Horizontal, without fly-wheel; reels can be run singly, together, or in opposite directions; cylinders set on opposite sides of locomotive boiler.
OWYHEE.					
Carson	Black Jack	1	1	10	Direct-acting vertical donkey engine, with fly-wheel.
Do	Empire	1	1	20	Direct-acting horizontal, with fly-wheel, 15-inch stroke, 64 strokes per minute.
Do	Owyhee	1	1	20	Mounted on horizontal boiler, like portable engine, with fly-wheel.
Do	Potosi	1	1	20	Horizontal, with fly-wheel.
Do	War Eagle	1	1	35	All the machinery now being supplanted by much more powerful.
Wagontown	Golden Rule	1	1	30	Horizontal, with fly-wheel.

MAINE.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
HANCOCK.					
Goldsboro'	Goldsboro'	1	1	30	Horizontal, without fly-wheel. (a)
Sullivan	Ashley	1	1	25	Horizontal, without fly-wheel, coupled.
Do	Milton	2	2	15	Horizontal.
Do	Waukeag	1	1	15	Horizontal, with fly-wheel.
West Sullivan	Sullivan	2	2	18	One double cylinder, horizontal, 10 horse-power; one single cylinder, vertical, 8 horse-power.
.....	Deer Isle	1	1	15	Horizontal, with fly-wheel.
PENOBSCOT.					
.....	Consolidated Hampden	1	1	16	Double cylinder, vertical, without fly-wheel.
WASHINGTON.					
Fifth	Cherryfield	1	1	15	Double cylinder, horizontal, oscillating.
YORK.					
Acton	Acton Consolidated	1	1	25	Horizontal, without fly-wheel. (a)

MONTANA.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
BEAVER HEAD.					
Trapper	Hecla Consolidated	3	3	28	Two double cylinder, 10 horse-power each, without fly-wheel; one single cylinder, 8 horse-power, with fly-wheel.
DEER LODGE.					
Flint Creek	Algonquin	1	.....	80	Horizontal, without fly-wheel. (a)
Do	Speckled Trout	1	1	25	Horizontal, single, with fly-wheel.
Independence	Mountain Boy	1	1	20	Horizontal.
Silver Creek	Penobscot & Snowdrift	1	1	30	Horizontal, single, with fly-wheel.
Summit	National	1	1	20	Horizontal, coupled, with fly-wheel.
Summit Valley	Alice	2	2	170	Horizontal, coupled, without fly-wheel.
Do	Colusa	1	1	35	Horizontal, double cylinder.
Do	Gagnon	1	1	20	Horizontal, with fly-wheel; high pressure, direct acting.
Do	Morning Star	1	1	20	Horizontal.
JEFFERSON.					
Cedar Plains	Keating	1	1	20	Horizontal, with fly-wheel.
LEWIS AND CLARKE.					
Owyhee	Union No. 2	5	5	140	Horizontal, with fly-wheel; two 15 horse-power, two 25 horse-power, one 60 horse-power.

a Believed to be a coupled engine, but some single-cylinder engines, the fly-wheels of which are used as pulleys or gears, may be included.

TABLE XVIII.—DEEP MINES: STEAM HOISTING ENGINES.

NEVADA.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
ELKO.					
Tuscarora	Argenta	1	1	30	Double horizontal donkey engine, without fly-wheel; cylinder 8 by 12 inches.
Do	Catskill	1	1	10	Donkey.
Do	Grand Prize	2	1	40	Horizontal, single cylinder, with fly-wheel.
Do	Independence	1	1	20	Horizontal, single cylinder, with fly-wheel.
Do	Navajo	1	1	16	Horizontal, coupled, with fly-wheel, link-motion; cylinder 8 by 16 inches.
Do	North Belle Isle	1	1	15	Horizontal donkey engine, without fly-wheel; cylinder 6½ by 12 inches.
ESMERALDA.					
Black Mountain	Endowment	1	1	12	Vertical.
Columbus	Equator	1	1	120	Horizontal, with fly-wheel.
Do	Metallic	1	1	120	Horizontal, with fly-wheel.
Do	Monte Diablo	1	1	35	Horizontal, coupled.
Do	Northern Belle	1	1	40	Horizontal, coupled, with fly-wheel.
Esmeralda	Real del Monte	1	1	28	Horizontal, coupled, without fly-wheel; 8-inch cylinder.
Wilson	Wilson or Himalaya	1	1	36	Horizontal, with fly-wheel.
EUREKA.					
Cortez	Garrison	1	.....	*a* 10	Horizontal, coupled, with fly-wheel; 6-inch cylinder, 6-inch stroke.
Eureka	Albion	1	1	70	Double cylinder, 10 by 12 inches.
Do	Dunderberg	1	1	50	Horizontal, single cylinder.
Do	Eureka	4	4	145	
Do	Hamburg	1	1	60	Horizontal, single cylinder; double reel, with clutch on engine shaft.
Do	Hoosac	1	1	24	Horizontal, single cylinder.
Do	Jackson	1	1	50	Horizontal, coupled.
Do	Kit Carson	1	1	8	Vertical, donkey.
Do	Richmond	2	2	250	Horizontal, coupled with fly-wheel.
Secret Cañon	Geddes & Bertrand	1	1	15	Horizontal, single cylinder; double reel, 16-inch stroke, 10½-inch cylinder.
LANDER.					
Battle Mountain	Ætna	3	3	45	Donkey, 6-inch cylinder, 12-inch stroke.
Lewis	Starr & Grove	1	1	15	Donkey.
Reese River	Curtis	3	3	60	One horizontal with fly-wheel; two donkey engines driven by compressed air.
LINCOLN.					
Bristol	Hillside	1	1	24	Horizontal, with fly-wheel; 10-inch cylinder, 20-inch stroke.
Ely	Raymond & Ely	2	2	*a* 150	Horizontal, single cylinder, with fly-wheel.
NYE.					
Morey	Morey	1	1	15	Horizontal, coupled, with fly-wheel.
Philadelphia	Belmont	1	1	25	Horizontal, coupled, with fly-wheel.
Tybo	Tybo	1	1	40	Horizontal, with fly-wheel.
Union	Brooklyn	1	1	16	Horizontal, without fly-wheel. (*b*)
Do	Great American Rooster	1	1	20	Horizontal, coupled.
STOREY.					
American Flat	Baltimore Consolidated	1	.....	*a* 80	Horizontal, with fly-wheel; geared.
Gold Hill	Alta	2	2	150	Horizontal, double cylinder, direct acting, coupled or unclutched at will; brake-wheel acts as fly-wheel. Incline engine underground.
Do	Belcher	2	2	140	Horizontal, coupled, with fly-wheel.
Do	Belcher and Crown Point pump-shaft	1	1	*a* 60	Horizontal, coupled, with fly-wheel, geared; double cylinder, 16-inch diameter by 24-inch stroke.
Do	Consolidated Imperial	2	2	350	One double-cylinder engine in vertical shaft; one single-cylinder incline engine.
Do	Crown Point	3	3	600	Two vertical shaft engines, independent; cylinders 18-inch diameter by 28-inch stroke. One with two reels, one with one. Incline engine, geared, double cylinders, 20-inch diameter by 42-inch stroke.
Do	Forman shaft	1	1	180	Double cylinder, horizontal, coupled, with fly-wheel.
Do	Justice	2	0	*a* 70	One vertical shaft engine, double cylinder, 16-inch diameter by 36-inch stroke. One incline engine, double cylinder, 20-inch diameter by 44-inch stroke.
Do	New York	2	2	280	Horizontal, with fly-wheel. One vertical shaft engine, 80 horse-power. One incline shaft engine, 200 horse-power.
Do	Overman	3	3	270	Two single engines, not coupled; one double-cylinder engine, coupled.
Do	Silver Hill	2	2	160	One double-cylinder horizontal engine, coupled, without fly-wheel; one not coupled, with fly-wheel.
Do	Yellow Jacket	3	3	*c* 2,500	Two horizontal working-compartment engines, 28-inch diameter by 8-foot stroke, 1,000 horse-power each; independent. One pump-compartment engine, 18-inch diameter by 2-foot stroke, 500 horse-power.
Virginia	Andes	1	1	60	Horizontal, coupled, with fly-wheel.
Do	Best & Belcher	1	0	20	Worked through Osbiston shaft.
Do	C. & C. shaft	2	2	*c* 2,200	Horizontal. Main engine, double cylinder, 26-inch diameter by 6-foot stroke, direct acting; pump-compartment engine, 16-inch diameter by 24-inch stroke, geared. Heavy brake-wheels act as fly-wheels.
Do	C. N. S. shaft	3	3	300	Horizontal, coupled, with fly-wheel; all geared.
Do	Gould & Curry	3	3	250	Horizontal, with fly-wheel; single, geared. Two 100 horse-power each, one 50 horse-power.
Do	Hale & Norcross	2	2	180	Horizontal, with fly-wheel; geared 3½ to 1.
Do	Mint	1	1	25	Horizontal, with fly-wheel.
Do	Ophir	3	3	700	Horizontal. Two vertical shaft-engines, 200 horse-power each; one incline engine, 300 horse-power. All geared. Heavy brake-wheels act as fly-wheels.
Do	Original Keystone	1	1	*a* 60	Horizontal, with fly-wheel. Geared.

a Estimated horse-power.
b Believed to be a coupled engine, but some single-cylinder engines, the fly-wheels of which are used as pulleys or gears, may be included.
c As reported at mine.

TABLE XVIII.—DEEP MINES: STEAM HOISTING ENGINES.

NEVADA—Continued.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
STOREY—continued.					
Virginia	Osbiston shaft	1	1	200	Horizontal, with fly-wheel, geared; double cylinder.
Do	Savage	2	2	900	Horizontal, with fly-wheel, coupled. One vertical shaft engine, 300 horse-power; one incline shaft engine, 600 horse-power; both geared, double cylinder, 24-inch diameter by 4 feet stroke.
Do	Scorpion	1	1	40	Horizontal, double cylinder, geared.
Do	Sierra Nevada	1	.....	150	Horizontal, with fly-wheel. Double cylinder, geared 5 to 1.
Do	Union shaft	2	2	*a* 1,600	Horizontal; main engine, double cylinder, 1,200 horse-power. Pump-compartment engine, 400 horse-power. Heavy brake-wheels act as fly-wheels.
Do	Utah	2	2	130	Horizontal. One vertical shaft engine, double cylinder, link motion; geared. One incline engine similar.
Do	Ward shaft (Bullion)	2	.....	250	Horizontal, direct acting, with fly-wheel.
WHITE PINE.					
Cherry Creek	Exchange	1	1	30	Horizontal, single.
Do	Star	1	1	50	Horizontal, single, double reel; friction gear.
Do	Tikup	1	1	10	Horizontal. First engine set up on coast; formerly used in Virginia City. Single cylinder, friction gear. Connection between engine and reel by 10-inch belt.
White Pine	Eberhardt & Aurora	1	1	20	Horizontal, coupled, with fly-wheel, 12-inch diameter by 2 feet stroke.

NEW HAMPSHIRE.

COOS.					
Shelburne	Shelburne	1	1	15	Horizontal, coupled.
GRAFTON.					
Ammonoosuc	Little May	1	1	40	

NEW MEXICO.

GRANT.					
Chloride Flat	Bremen	1	1	20	Horizontal, with fly-wheel.
Silver Flat	Massachusetts and New Mexico	1	1	25	Inclined, coupled, with fly-wheel.

NORTH CAROLINA.

DAVIDSON.					
Emmons township	Silver Valley	1	1	25	Oscillating; double cylinder.
.....	Conrad Hill	1	1	30	Inclined cylinders, coupled, with fly-wheel.
GASTON.					
.....	King's Mountain	1	1	30	Horizontal, coupled, without fly-wheel.
MECKLENBURG.					
Capp's Hill	McGinn	1	1	40	Horizontal, single, with fly-wheel.
Sixth	Rudisill	1	1	15	Horizontal, with fly-wheel.
MOORE.					
.....	Henley Hill	1	1	20	Horizontal, coupled, without fly-wheel.
NASH.					
Griffith township	Mann	1	1	15	Horizontal, single, without fly-wheel. (*b*)
ROWAN.					
.....	Dunn's Mountain	2	2	24	One horizontal, one vertical. Both have fly-wheels; both single cylinder.
STANLEY.					
.....	Crowell	1	1	40	Horizontal, coupled, without fly-wheel.

OREGON.

BAKER.					
Rye Valley	Rye Valley	1	1	40	Horizontal, with fly-wheel.
.....	Virtue	2	2	60	One portable horizontal 10 horse-power, with fly-wheel; one stationary horizontal 50 horse-power, with fly-wheel.

a As reported at mine.

b Fly-wheel doing duty as gearing.

TABLE XVIII.—DEEP MINES: STEAM HOISTING ENGINES.

UTAH.

County and district.	Mine.	Number of hoisting engines.	Number in use.	Total horse-power.	Remarks.
BEAVER.					
San Francisco	Carbonate	1	1	12	Old steamboat engine; double cylinder, rocker valve.
Do	Horn Silver	2	.....	120	Horizontal, without fly-wheel; cylinders, 12 inches diameter by 4 feet stroke; work with clutch or independently.
JUAB.					
Tintic	Locke	1	1	10	Small road engine.
SALT LAKE.					
Big Cottonwood	Antelope & Prince of Wales	2	2	50	One 40 horse-power at surface; one 10 horse-power underground.
Do	Oregon	1	1	8	Vertical.
Little Cottonwood	Flagstaff	1	1	60	Compressed air in tunnel.
Do	Grizzly & Livonia	1	1	12	
Do	Toledo	1	1	*a* 20	Run by compressed air.
West Mountain	Last Chance	1	1	20	
Do	Queen & Bemis	1	.....	40	Horizontal, coupled, with fly-wheel.
Do	The Lead Mine	1	.....	40	Vertical, coupled, without fly-wheel.
Do	Winnamuck group	1	.....	30	Vertical, with link motion.
Do	Yosemite	1	1	35	Horizontal, single.
SUMMIT.					
Uinta	Empire	1	1	60	Coupled, no fly-wheel.
Do	Ontario	2	2	315	Horizontal, coupled, no fly-wheel.
Do	White Pine	1	1	18	Horizontal, without fly-wheel. (*b*)
TOOELE.					
Ophir	Deseret	1	.....	50	
Do	Hidden Treasure	1	1	40	Vertical, with fly-wheel.
Do	Queen of the Hill	1	1	35	Vertical, coupled, without fly-wheel.
Rush Valley	First National	1	1	8	Horizontal, with fly-wheel.
Do	Great Basin	1	1	16	Horizontal, with fly-wheel.
WASATCH.					
Blue Ledge	Hawkeye	1	.....	50	Coupled.
Do	Lady of the Lake	2	2	60	Horizontal, coupled, without fly-wheel.
Snake Creek	Jones Bonanza	1	1	45	Horizontal, coupled, without fly-wheel.
Do	Utah	1	1	40	Vertical, coupled, without fly-wheel.
WASHINGTON.					
Harrisburg, or Silver Reef	Barbee & Walker	1	1	21	Horizontal, with fly-wheel, friction gear.
Do	Christy	1	1	8	Horizontal, coupled, without fly-wheel.
Do	Kinner	1	1	10	Horizontal, with fly-wheel.
Do	Stormont	2	2	28	One horizontal, coupled, with fly-wheel, 21 horse-power; one vertical, coupled, without fly-wheel, 7 horse-power.

VIRGINIA.

CULPEPER.					
.....	Culpeper	1	1	10	Vertical, single, direct acting, without fly-wheel.
FAUQUIER.					
.....	Kelley	1	1	25	Horizontal, geared.
LOUISA.					
Coohoo	Luce Bros	1	1	14	Horizontal, coupled, without fly-wheel.
STAFFORD.					
Hartwood township	Rappahannock	1	1	15	Horizontal, coupled, without fly-wheel.

WYOMING.

SWEETWATER.					
California	Buckeye State	1	1	20	Horizontal, with fly-wheel.
Miner's Delight	Miner's Delight	1	1	40	Horizontal, with fly-wheel.
Do	Segregated Miner's Delight	1	1	50	Horizontal, with fly-wheel.

a Estimated horse-power.
b Believed to be a coupled engine, but some single-cylinder engines, the fly-wheels of which are used as pulleys or gears, may be included.

TABLE XIX.—DEEP MINES: STEAM HOISTING ENGINES.

RECAPITULATION BY COUNTIES.

State or territory and county.	Number of mines reported.	Number of hoisting engines.	Number in use.	Horse-power.
ARIZONA.				
Maricopa	4	4	4	64
Mohave	2	2	1	18
Pima	7	8	7	185
Pinal	1	1	1	30
Yavapai	2	2	2	72
CALIFORNIA.				
Amador	9	14	12	510
Calaveras	1	2	2	30
El Dorado	3	3	3	75
Inyo	3	4	3	97
Mariposa	4	5	5	148
Mono	25	28	28	845
Nevada	7	9	8	330
Placer	1	1	1	a40
Plumas	1	1	1	12
Siskiyou	1	1	1	100
Tuolumne	2	3	3	60
COLORADO.				
Boulder	18	20	18	608
Clear Creek	15	20	18	382
Custer	4	5	5	153
Gilpin	27	31	29	1,024
Hinsdale	1	2	2	35
Lake	24	45	43	702
Ouray	1	1	.....	30
San Juan	1	1	1	5
Summit	1	2	2	31
DAKOTA.				
Lawrence	3	6	6	160
GEORGIA.				
Cobb	1	1	1	12
Forsyth	1	1	1	12
Hall	1	1	1	20
Lincoln	1	1	1	20
McDuffie	1	1	1	8
Meriwether	1	1	1	40
IDAHO.				
Alturas	1	2	2	25
Boisé	2	3	3	60
Owyhee	6	6	6	135
MAINE.				
Hancock	6	8	8	118
Penobscot	1	1	1	16
Washington	1	1	1	15
York	1	1	1	25
MONTANA.				
Beaver Head	1	3	3	28
Deer Lodge	9	10	9	420
Jefferson	1	1	1	20
Lewis and Clarke	1	5	5	140
NEVADA.				
Elko	6	7	6	131
Esmeralda	7	7	7	391
Eureka	10	14	13	682
Lander	3	7	7	120
Lincoln	2	3	3	a174
Nye	5	5	5	116
Storey	28	52	45	12,011
White Pine	4	4	4	110
NEW HAMPSHIRE.				
Coos	1	1	1	15
Grafton	1	1	1	40
NEW MEXICO.				
Grant	2	2	2	45
NORTH CAROLINA.				
Davidson	2	2	2	55
Gaston	1	1	1	30
Mecklenburg	2	2	2	55
Moore	1	1	1	20
Nash	1	1	1	15
Rowan	1	2	2	24
Stanley	1	1	1	40
OREGON.				
Baker	2	3	3	100
UTAH.				
Beaver	2	3	1	132
Juab	1	1	1	10
Salt Lake	10	11	8	315
Summit	3	4	4	393
Tooele	5	5	4	149
Wasatch	4	5	4	195
Washington	4	5	5	67
VIRGINIA.				
Culpeper	1	1	1	10
Fauquier	1	1	1	25
Louisa	1	1	1	14
Stafford	1	1	1	15
WYOMING.				
Sweetwater	3	3	3	110

a Estimated.

TABLE XX.—DEEP MINES: STEAM HOISTING ENGINES.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	Number of mines reported.	Number of hoisting engines.	Number in use.	Horse-power.
Total	320	425	393	22,559
Arizona	16	17	15	369
California	57	71	67	2,247
Colorado	92	127	118	3,060
Dakota	3	6	6	160
Georgia	6	6	6	112
Idaho	9	11	11	220
Maine	9	11	11	174
Montana	12	19	18	608
Nevada	65	99	90	13,785
New Hampshire	2	2	2	55
New Mexico	2	2	2	45
North Carolina	9	10	10	239
Oregon	2	3	3	100
Utah	29	34	27	1,261
Virginia	4	4	4	64
Wyoming	3	3	3	110

MACHINERY AND ITS MANIPULATION.

The practice as to the construction of hoisting engines has greatly changed in this country during the last few years. At the date of Mr. Hague's memoir on mining industries single-cylinder engines, with a heavy fly-wheel acting on the drum through toothed or friction gearing, were almost universal. The data here tabulated show thst engines with two coupled cylinders are now very general, and particularly in those districts where mining has been actively prosecuted for a comparatively long period. Engines of this class are sometimes constructed with a fly-wheel and sometimes without; but when a fly-wheel is employed, it is ordinarily only sufficiently large to equalize minor irregularities of movement or to afford means of applying a brake. A considerable portion of these coupled engines are direct-acting. As has always been the case, a very great majority of the engines are horizontal, though vertical and inclined cylinders are not rare.

The statements of horse-power can only be regarded as rough approximations. As a rule, the mining superintendents do not know whether the horse-power stated is nominal or indicated. The horse-power given is for the number of engines found at the various hoisting works, and not for the number actually in use, and the table does not include idle or abandoned works, with perhaps two or three exceptions. Two main hoisting engines, driven by compressed air (compressed by steam-power), are included in the table.

The data of Table XVIII should be considered in connection with those of Table XV, showing the greatest vertical depths of the mines.

TABLE XXI.—DEEP MINES: NUMBER OF HORSE OR MULE WHIMS OR WHIPS.

State or territory.	Number of mines reported.	Number of whims or whips.
Total	61	70
Arizona	7	7
California	7	7
Colorado	17	24
Georgia	1	1
Montana	10	12
Nevada	9	9
New Mexico	1	1
North Carolina	2	2
Utah	6	6
Wyoming	1	1

This table shows the entire number of whips and whims reported in the schedules and the entire number of mines reported upon where whips and whims were employed. Most of the mines employing these means of hoisting are of sufficient size to be included in the investigation, and more than half of these machines are probably reported.

The simplest form of whip is an overhead sheave and a floor sheave to guide the traction rope. The most perfect form of whim is a somewhat elaborate engine with a friction clutch, brake, etc., and capable of working a mine, if comparatively dry, to a depth of 500 feet. Some of them are operated by two horses or mules, but one-horse whims are more common. The average price is estimated at $500.

TABLE XXII.—DEEP MINES: HOISTING CABLES.

State or territory and county.	Number of mines reported using cables, etc.	Number using steel cables.			Number using hemp or manila rope.	Number using both steel and hemp or manila rope.
		Flat.	Round.	Both flat and round.		
ALABAMA.						
Cleburne	1				1	
ARIZONA.						
Maricopa	5		4		1	
Mohave	2		1		1	
Pima	24		7		15	2
Pinal	5		2		3	
Yavapai	3		3			
Yuma	2				2	
CALIFORNIA.						
Amador	6	2	2		2	
Calaveras	3		2		1	
El Dorado	2	1	1			
Inyo	3	1	1		1	
Lassen	2				2	
CALIFORNIA—continued.						
Mariposa	5		2		3	
Mono	28	2	23		3	
Nevada	7	(a)	5			
Placer	1		1			
Plumas	1	1				
San Diego	1				1	
Siskiyou	2		2			
Tuolumne	4		3		1	
COLORADO.						
Boulder	23		4		19	
Chaffee	2				2	
Clear Creek	22		4		16	2
Custer	4	1	3			
Gilpin	34	1	4		28	1
Hinsdale	1		1			

a One iron, flat, and 1 iron, round.

TABLE XXII.—DEEP MINES: HOISTING CABLES—Continued.

State or territory and county.	Number of mines reported using cables, etc.	Number using steel cables. Flat.	Round.	Both flat and round.	Number using hemp or manila rope.	Number using both steel and hemp or manila rope.
COLORADO—continued.						
Lake	26	1	16		4	5
Ouray	2		1		1	
Park	1				1	
San Juan	2		1		1	
Summit	1		1			
DAKOTA.						
Lawrence	3		1		2	
GEORGIA.						
Cherokee	1				1	
Cobb	1		1			
Forsyth	1		1			
Hall	1		1			
Lincoln	2				2	
McDuffie	1				1	
Meriwether	1		1			
IDAHO.						
Alturas	4		1		3	
Boisé	5		1		3	1
Lemhi	1				1	
Owyhee	9		5		4	
MAINE.						
Hancock	7		3		3	1
Penobscot	1				1	
Washington	1		1			
York	1		1			
MONTANA.						
Beaver Head	1					1
Deer Lodge	23	(a)	9		13	
Jefferson	1				1	
Lewis and Clarke	1		1			
Madison	1					1
NEVADA.						
Elko	9	1	6		2	
Esmeralda	6	2	4			
Eureka	14	5	2		7	
Humboldt	2				2	
Lander	1				1	
Lincoln	3		2	1		
NEVADA—continued.						
Nye	5		4		1	
Storey	28	19	3	6		
White Pine	5		4		1	
NEW HAMPSHIRE.						
Coos	1				1	
NEW MEXICO.						
Grant	2		1		1	
Santa Fé	1				1	
NORTH CAROLINA.						
Davidson	4		(b)		2	1
Gaston	1		1			
Guilford	1				1	
Mecklenburg	2		(c)		1	
Moore	1		1			
Nash	1		1			
Rowan	1				1	
Stanley	1		1			
OREGON.						
Baker	2		1			1
Josephine	1				1	
UTAH.						
Beaver	2	1			1	
Juab	2				2	
Salt Lake	6		4		2	
Summit	4		1	1	1	1
Tooele	5		2		3	
Wasatch	3	(a)	1		1	
Washington	5		4		1	
VIRGINIA.						
Buckingham	1		1			
Culpeper	1		1			
Fauquier	1		1			
Louisa	1				1	
Stafford	1		1			
WYOMING.						
Sweetwater	4		3		1	

a One iron, round. b One iron and rope. c One chain.

TABLE XXIII.—DEEP MINES: HOISTING CABLES.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	Number of mines reported using cables, etc.	Number using steel cables. Flat.	Round.	Both flat and round.	Number using hemp or manila rope.	Number using both steel and hemp or manila rope.	Various.
Total	420	38	171	8	180	17	6
Alabama	1				1		
Arizona	41		17		22	2	
California	65	7	42		14		2
Colorado	118	3	35		72	8	
Dakota	3		1		2		
Georgia	8		4		4		
Idaho	10		7		11	1	
Maine	10		5		4	1	
Montana	27		10		14	2	1
Nevada	73	27	25	7	14		
New Hampshire	1				1		
New Mexico	3		1		2		
North Carolina	12		4		5	1	2
Oregon	3		1		1	1	
Utah	27	1	12	1	11	1	1
Virginia	5		4		1		
Wyoming	4		3		1		

COMSTOCK HOISTING CABLES.

[A partial list, showing weight of load hoisted, average duration, and particulars as to sheaves, etc.]

AMERICAN FLAT DISTRICT.

Baltimore Consolidated.—Flat steel wire cables, 4½ inches by ½ inch. Average load, 5,800 pounds, including weight of double-decked cage. Sheaves, 35 feet high, 7 feet in diameter. When in use, cables were taken off, cleaned, mended if necessary, and tarred once in sixty days.

GOLD HILL DISTRICT.

Alta.—Flat steel wire cables, 5 inches by ½ inch. Average load, including cage, 5,000 pounds. Cables reported to last four years with repairs. Sheaves, 48 feet high, 7 feet in diameter.

Belcher.—Flat steel wire cables, 4 in vertical shaft, each 1,000 feet long, 3½ inches by ½ inch; 2 in incline, each 2,000 feet long, 5 inches by ½ inch. Average load, including cage, 5,300 pounds. Average duration, with repairs, 3 years. Sheaves, 50 feet high, 7 feet in diameter.

Belcher and Crown Point pump shaft.—In hoisting compartment, flat steel wire cable, 5 inches by ⅝ inch, 5,300 feet long; in pump compartment, round steel wire cable, 1 inch in diameter, 1,000 feet long. Average load, including cage, 5 tons. Average duration, with repairs, 4 years. Height of sheaves, 30 feet; diameter, 6 feet.

Caledonia.—Two flat steel wire cables, each 1,700 feet long, 4 inches by ½ inch; 1 round steel wire cable, ¾ inch diameter, 350 feet long. Average load, including cage, 4,900 pounds.

Consolidated Imperial.—On surface reels, flat steel wire cables, 5 inches by ½ inch; on winze engine reels, round steel wire cables, 1 inch in diameter. Average load in vertical shaft, 3 tons, including cage; in incline, 4½ tons, including giraffe. Average duration of cables, with repairs, 3 years. Height of sheaves, 30 feet; diameter, 8 feet.

Crown Point.—Five flat steel wire cables, 5 inches by ½ inch; one round steel wire cable in incline, tapering from 2¼ inches to 1¼ inches in diameter. Average load, including cage, 5,500 pounds. Average duration, with repairs, 4 years. Height of sheaves, 18 feet; diameter, 7 feet.

Forman shaft.—Two flat steel wire cables, one English make and one American, each 3,000 feet long, 6 inches by ⅝ inch. Average load, including cage, 5 tons. Height of sheaves, 50 feet; diameter, 10 feet.

Justice.—Flat steel wire cable, 6 inches by ½ inch. In vertical shaft average load, including cage, 1½ tons; in incline, including giraffe, 9 tons. Average duration, 2 years. Height of sheaves, 40 feet; diameter, 8 feet.

New York.—Two flat steel wire cables in vertical shaft, each 1,600 feet long. One 4 inches by ⅝ inch; one 5 inches by ⅝ inch; one incline cable 5 inches by ⅝ inch, 2,300 feet long. Average load, including cage, 2,500 pounds. Average duration, with repairs, stated at 6 years. Height of sheaves, 45 feet; diameter, 8 feet.

Overman.—Flat steel wire cables; one 5 inches by ½ inch, 1,700 feet long; one 4½ inches by ½ inch, 1,700 feet long; two 4 inches by ½ inch, 350 feet long. Average load, including cage, 4,700 pounds.

Silver Hill.—Flat steel wire cables, one 5 inches by ⅝ inch, and three 4 inches by ½ inch. Average load, including cage, 5,000 pounds. Height of sheaves, 25 and 26 feet; diameter, 5 feet and 6 feet.

Yellow Jacket.—Flat steel wire cables, each 3,700 feet long; two hoisting compartment cables 8 inches by ⅝ inch; pump compartment cable 6 inches by ½ inch. Average load hoisted, including cage, 15,800 pounds. Large double-decked cages, with space for two cars on each floor, weighing 5,000 pounds; weight of four cars, 900 pounds each, 3,600 pounds; weight of four car loads, 1,800 pounds each, 7,200 pounds. Without mending cables lasted 3 years. Height of sheaves to centers, 55 feet; diameter, 15, 12, and 7 feet.

VIRGINIA DISTRICT.

Andes.—Flat steel wire cables, 3½ inches by ½ inch. Average load, including cage, 3,500 pounds. Cables are spliced once in 3 months, and are said to last only 7 months. Height of sheaves, 16 feet; diameter, 5 feet.

Combination shaft (Chollar, Hale & Norcross, Potosi, and Savage).—Flat steel wire cables, 6 inches by ½ inch. Average load, including cage, 5,500 pounds. Average duration, 14 months. Height of sheaves, 50 feet; diameter, 18 feet.

Consolidated Virginia and California joint shaft.—Flat steel wire cables; two in hoisting compartments, 7 inches by ⅝ inch; one in pump compartment, 5½ inches by ½ inch. Average load, including cage, 12,400 pounds. Three-decker cages, weighing 4,000 pounds; three cars, 1,200 pounds each, 3,600 pounds; three car loads, 1,600 pounds each, 4,800 pounds. Average duration, 18 months. Height of sheaves, 45 feet; diameter of hoisting-compartment sheaves, 11 feet; diameter of pump-compartment sheave, 6 feet.

Gould & Curry.—Flat steel wire cables. Average load, 5,600 pounds. Height of sheaves, 30 feet; diameter, 7 feet.

Hale & Norcross.—Flat steel wire cables, 5 inches by ½ inch. Average load in vertical shaft, including cage, 3,000 pounds; in incline, including giraffe, 5,500 pounds. Height of sheaves, 36 feet; diameter, 8 feet. Incline cable lasts only 6 months.

Mint.—Round steel wire cables, one 1-inch diameter, and one ¾-inch diameter, each 1,500 feet long. Average load, 1,800 pounds. Average duration without mending, 3 years. Height of sheaves, 27 feet; diameter, 2 feet.

Ophir.—Two flat steel wire cables, 5 inches by ½ inch, in vertical shaft; round steel wire cable in incline, tapering from 2½ inches to 2 inches. Average load, including cage, 8,600 pounds. Weight of double-decked cage, 3,000 pounds; two cars, 1,200 pounds each, 2,400 pounds; two car loads, 1,600 pounds each, 3,200 pounds. Average duration with repairs, 2 years. Height of sheaves, 30 feet; diameter, 7 feet.

Original Keystone.—Flat steel wire cables, 4 inches by ½ inch. Average load, including cage, 4,000 pounds. Average duration, with repairs, 2 years. Height of sheaves, 40 feet; diameter, 6 feet.

Osbiston shaft (Best & Belcher and Gould & Curry joint shaft).—Two flat steel wire cables, each 2,500 feet long, 5 inches by ½ inch. Average load, including cage, 7,000 pounds. Average duration with repairs, 4 years. Height of sheaves, 30 feet; diameter, 6 feet.

Savage.—Two flat steel wire cables in vertical shaft, each 1,500 feet long, 5½ inches by ⅝ inch. Round steel wire incline cable, 4,000 feet long, 2¼ inches diameter. Average load in vertical shaft, including cage, 3,600 pounds; in incline, including giraffe, 5,000 pounds. Average duration with repairs, 3 years. Height of sheaves, 40 feet; diameter, 6, 8, and 15 feet.

Scorpion.—Round steel wire cables, 1 inch in diameter. Average load, cage, car, and rock, 2,500 pounds; bailing tank and water, 5,000 pounds. Average duration with repairs, 2 years. Height of sheaves, 20 feet; diameter, 5 feet.

Sierra Nevada.—Flat steel wire cables, 5 inches by ½ inch. Average load, 4,500 pounds, including cage weighing 1,500 pounds; car, 1,200 pounds, and rock, 1,800 pounds. Average duration, 4 years. Height of sheaves to centers, 25 feet; diameter, 8 feet.

Union shaft (Mexican, Sierra Nevada, and Union Consolidated joint shaft).—Flat steel wire cables; two in hoisting compartments, 7 inches by ½ inch; one in pump compartment, 5¼ inches by ½ inch. Average load hoisted, 13,500 pounds, including three-decker cage, 4,500 pounds; three cars, 1,200 pounds each, 3,600 pounds; three car-loads, 1,800 pounds each, 5,400 pounds. When bailing, hoist 1,000-gallon iron tank weighing, shell and water, 9,812 pounds. Average duration with repairs, 4 years. Splices are from 75 to 100 feet long. "Cables wear most rapidly at points over sheaves corresponding to distances of stations; the wear is also more rapid when there is an over and under bend on reel and sheave." Height of sheaves to center, 45 feet; diameter, 12 feet.

Utah.—Flat steel wire cables; vertical-shaft cables, 4 inches by ½ inch; incline, 6 inches by ½ inch. Average load in vertical shaft, including cage, 3,500 pounds; in incline, including giraffe, 9,000 pounds. Average duration with repairs: vertical shaft, 5 years; in incline, about 2 years. Height of sheaves, 25 feet; diameter, 6 and 8 feet.

Ward shaft (Bullion Combination).—Flat steel wire cable, 6 inches by ½ inch. Average load, including cage, 6,000 pounds. Average duration with repairs, only 18 months when in constant use. Height of sheaves, 50 feet; diameter, 10 feet; face, 7 inches.

The round steel cable reported in Siskiyou county, California, is used for a tramway at the Klamath mine.

The incline cables on the Comstock are round steel. The Crown Point mine, Gold Hill, Storey county, Nevada, uses two tapered round steel cables in addition to five of flat steel. The tapered cables are 2¼ inches at top and 1¼ inches at bottom. The Ophir mine, Virginia district, Storey county, Nevada, uses a tapered round steel cable in the incline 2¼ inches at top and 2 inches at bottom. These two mines are the only ones reporting tapered cables. While so far as the distribution of the load is concerned tapered cables present a decided advantage, they are much less readily repaired, and cannot be reversed. They were much more frequent a few years ago than they now are.

Hemp or manila ropes are used only in comparatively shallow workings and where moderate quantities of ore are raised. The largest reported in the state of Nevada was 3 inches in diameter, and raised an average load of 2,200 pounds, including weight of cage; the smallest was 1¼ inches in diameter, and raised but 250 pounds. Hemp and manila cables last from three to eighteen months, and average from ten to twelve months.

A dozen years since steel cables were being introduced but slowly. Though their advantages were evident, it was found that they were apt to give out unexpectedly, and without warning. The difficulties of manufacturing a steel wire suitable for the purpose have now been overcome, and there are but few iron cables left. For large cables the flat form is commonly preferred to the round. A heavy round cable must be wound on an enormous drum to escape injury by bending, while the flat rope can be wound on a reel of small width and of no larger diameter than would be suitable for one of the small ropes of which it is composed. The flat rope can also be more readily inspected and repaired. These advantages more than counterbalance the slight additional weight of metal necessary to obtain the same strength as the round cable would possess. The smallest steel cable reported is ⅝ of an inch in diameter, and carries a load of 330 pounds; the largest are those running in the deepest shaft, the "New Yellow Jacket" of Washoe. It is a flat rope ⅝ of an inch thick and 8 inches broad, and carries a load of 15,800 pounds. The average load for steel wire ropes in the state of Nevada, excepting Washoe district, is a ton and a quarter, but on the Comstock it is about three tons. Steel cables last from four months to six years, with an average of two years.

Iron cables are used by the following mines:

New York Hill, Grass valley, Nevada county, California (flat).

Nevada City mine, Nevada City, Nevada county, California (round).

Penobscot & Snowdrift mine, Silver Creek district, Deer Lodge, Montana (round).

Conrad Hill, Davidson county, North Carolina, uses round iron and rope.

Utah mine, Snake Creek district, Wasatch county, Utah (round).

The McGinn mine, Capp's Hill district, Mecklenburg county, North Carolina, is the only one reported using a chain. This was reported in good condition after five years' wear; its load, however, was only 200 pounds.

Mines using hemp or manila rope		180
Mines reported using flat steel cables	38	
Mines reported using round steel cables	171	
Mines reported using both flat and round steel cables	8	
Mines reported using both steel and rope	17	
		234
Mines using flat iron cables	1	
Mines using round iron cables	4	
		5
Mines reported using chain		1
Total		420

The list includes a few windlass cables and several horse whims, but the great majority are those of steam hoisting works. As the best horse whims are capable of hoisting from a depth of 500 feet, the requirements for a cable correspond with those for steam hoisting works using buckets.

DEEP MINES: INSPECTION OF HOISTING CABLES.

ALABAMA.—One report; weekly inspection.

ARIZONA.—Forty-one reports. Eleven mines report inspection; one no inspection. Daily inspection, 8; weekly, 3. No returns from 29 mines using cables.

CALIFORNIA.—Sixty-five reports. Forty-two mines report inspection; two no inspection. Daily, 32; semi-weekly, 4; weekly, 3; irregularly, 2; weekly when cable is new, daily when old, 1. No returns from 21 mines using cables.

COLORADO.—One hundred and eighteen reports. One hundred mines report inspection; two no inspection. Constantly, 7; twice a day, 1; daily, 78; tri-weekly, 1; weekly, 5; irregularly, 8. No returns from 16 mines using cables.

DAKOTA.—Three reports. Each mine reports daily inspection.

GEORGIA.—Eight reports. Four mines report inspection; two no inspection. Irregularly, 3; semi-annually, 1. No returns from 2 mines using cables.

IDAHO.—Nineteen reports. One mine reports constant inspection; three no inspection. No returns from 15 mines using windlass ropes.

MAINE.—Ten reports. Nine mines report inspection. Constantly, 1; twice a day, 1; daily, 7. No returns from 1 mine.

MONTANA.—Twenty-seven reports. Twenty-two mines report daily inspection. No returns from 5 mines.

NEVADA.—Seventy-three reports. Forty-three mines report inspection. Constantly, 7; daily, 31; "every day or two," 1; weekly, 3; occasionally, 1. No returns from 30 mines.

NEW HAMPSHIRE.—One report; inspection not stated.

NEW MEXICO.—Three reports. Two mines report daily inspection. From one mine no statement as to inspection.

NORTH CAROLINA.—Twelve reports. Each mine reports inspection. Daily, 10; weekly, 1; every two months, 1.

OREGON.—Three reports. Two mines report daily inspection, and one mine no inspection.

UTAH.—Twenty-seven reports. Nine mines report inspection; seven no inspection. Daily, 1; irregularly, 7; "seldom," 1. No returns from 11 mines using cables.

VIRGINIA.—Five reports. Daily inspection, 3; weekly, 2.

WYOMING.—Four reports. Constant inspection, 2; daily, 2.

RECAPITULATION.

	Number of mines.
Inspected constantly	18
Inspected twice a day	2
Inspected daily	201
Inspected tri-weekly	1
Inspected "every day or two"	1
Inspected semi-weekly	4
Inspected weekly	18
Inspected weekly when cable is new, daily when old	1
Inspected irregularly, occasionally, or seldom	22
Inspected every two months	1
Inspected semi-annually	1
Total number of mines reporting inspection of any kind	270
Mines reporting no inspection	18
Mines using cables, etc., from which there are no returns	132
Total number reports	420

It is evidently the prevailing practice, at least in theory, to inspect cables daily, though it is not impossible that some mines have exaggerated the vigilance exercised. In large mines a special rope man is generally employed, whose duty it is to keep constant watch of the cables in use, except when actually engaged in repairing spare cables. The instances in which cables are not properly inspected are comparatively few. The miners are sufficiently awake to their own interest in most cases to see that this duty is thoroughly performed, and no mine can afford to acquire the reputation of neglecting the hoisting apparatus. It might at first sight appear to be safer to throw out cables which showed signs of wear and put in fresh ones, and this method is actually practiced to some extent with fiber ropes and small steel cables. With heavy cables, however, such a course would be ruinously expensive, and there would be a strong tendency to delay renewal too long. Flat cables in particular can be easily and thoroughly repaired by splicing in new strands or sections. Cables wear most at certain points, especially where they rest upon the sheave when the cage stands at a station.

TABLE XXIV.—DEEP MINES: MODE OF HOISTING.

State or territory and county.	Number of mines whose mode of hoisting is specified.	Number hoisting with cages.	Number hoisting with buckets or kibbles only.	Number hoisting with skips or giraffes.	Number hoisting by other means.
ALABAMA.					
Cleburne	1		1		
ARIZONA.					
Maricopa	4		4		
Mohave	1		1		
Pima	25	1	24		
Pinal	5	1	4		
Yavapai	3	1	2		
Yuma	2		2		
CALIFORNIA.					
Amador	6		1	5	
Calaveras	3		3		
El Dorado	2	1	1		
Inyo	3	1	1	1	
Lassen	2		2		
Mariposa	5		5		
Mono	24	12	11	1	
Nevada	7		1	5	1
Placer	1		1		
Plumas	1			1	
San Diego	1		1		
Siskiyou	1				1
Tuolumne	2		1	1	
COLORADO.					
Boulder	20	1	17	2	
Chaffee	3		2		1
Clear Creek	22	1	18	2	1
Custer	4	1	2		1
Gilpin	34	1	33		
Hinsdale	1		1		
Lake	26	3	21	2	
Ouray	2	1	1		
Park	1		1		
San Juan	2		2		
Summit	1				1
DAKOTA.					
Lawrence	3	1	2		
GEORGIA.					
Cherokee	1		1		
Cobb	1		1		
Forsyth	1		1		
Hall	1		1		
Lincoln	2		2		
McDuffie	1		1		
Meriwether	1	1			
IDAHO.					
Alturas	4	1	3		
Boisé	5	1	4		
Lemhi	2		2		
Owyhee	8		8		
MAINE.					
Hancock	7	1	6		
Penobscot	1		1		
Washington	1			1	
York	1			1	
MONTANA.					
Beaver Head	1				1
Deer Lodge	23	4	16	1	2
Jefferson	1		1		
Lewis and Clarke	1	1			
Madison	1		1		
NEVADA.					
Elko	9	4	5		
Esmeralda	6	5	1		
Eureka	11	6	5		
Humboldt	2		2		
Lander	3	1	1		1
Lincoln	2		2		
Nye	3	2			1
Storey	26	26			
White Pine	3	1	2		
NEW HAMPSHIRE.					
Coos	1		1		
Grafton	1		1		
NEW MEXICO.					
Grant	2		2		
Santa Fé	1		1		
NORTH CAROLINA.					
Davidson	4		3		1
Gaston	1	1			
Guilford	1		1		
Mecklenburg	2		2		
Moore	1		1		
Nash	1		1		
Rowan	1		1		
Stanley	1		1		
OREGON.					
Baker	1		1		
Josephine	1		1		
UTAH.					
Beaver	2	1	1		
Juab	3		3		
Salt Lake	2		2		
Summit	4	3	1		
Tooele	5		1	1	3
Wasatch	3		2		1
Washington	5	1	3		1
VIRGINIA.					
Buckingham	1	1			
Culpeper	1		1		
Fauquier	1		1		
Louisa	1		1		
Stafford	1		1		
WYOMING.					
Sweetwater	4		4		

TABLE XXV.—DEEP MINES: MODE OF HOISTING.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	Number of mines whose mode of hoisting is specified.	Number hoisting with cages.	Number hoisting with buckets or kibbles only.	Number hoisting with skips or giraffes.	Number hoisting by other means.
Total	399	87	271	24	17
Alabama	1	.....	1	.....	.....
Arizona	40	3	37	.....	.....
California	58	14	28	14	2
Colorado	116	8	98	6	4
Dakota	3	1	2	.....	.....
Georgia	8	1	7	.....	.....
Idaho	19	2	17	.....	.....
Maine	10	1	7	2	.....
Montana	27	5	18	1	3
Nevada	65	45	18	.....	2
New Hampshire	2	.....	2	.....	.....
New Mexico	3	.....	3	.....	.....
North Carolina	12	1	10	.....	1
Oregon	2	.....	2	.....	.....
Utah	24	5	13	1	5
Virginia	5	1	4	.....	.....
Wyoming	4	.....	4	.....	.....

Where cages are used, the shafts are generally two or more compartments in width, so that the table does not give the number of cages, but of mines using cages. In almost all mines of any size windlass buckets are used in winzes. These are not included in the table.

The column headed "Number hoisting with skips or giraffes" includes only those mines using either skips or giraffes as a principal means of hoisting. Of the 24 cases tabulated, 22 use skips alone and 2 use giraffes alone. Besides these, 5 of the mines reported as using cages as a principal means of hoisting use also skips, and 10 of the cage mines use giraffes. So that altogether skips are used in 27 mines and giraffes in 12 mines.

The column headed "Number hoisting by other means" includes 16 mines in which cars are hoisted by windlass, whim, or steam machinery on inclined tracks, and one case, in North Carolina, where wooden boxes, made for the purpose, are used. The cars used on the inclines are either ordinary mine cars standing on a platform, or, when the incline is very steep, the front wheels are of smaller diameter than the hind wheels.

Rawhide buckets are used on account of lightness, flexibility, and freedom from breaking by knocking against timbers, etc.

Safeties against falling are employed in about nine out of ten cases where cages are used in hoisting. The favorite form of safety clutch consists of two pairs of eccentrics provided with teeth and pressed against the guide by springs when the rope is detached, but many other patterns are in use. Safeties against overwinding are constructed on two different principles. In one the attachment between the rope and the cage is effected by a clutch, which is opened when it enters a ring or cone set in the gallows-frame above the shaft. The cage is thus set free, and depends upon the safeties against falling. By the other plan, when the cage reaches a certain level above the top of the shaft it controls a valve, which shuts steam off from the engine, and thus prevents further hoisting. This latter method is evidently the safer of the two, because where the first is employed, if the safeties against falling are out of order, the gravity of the accident is likely to be increased rather than to be diminished by the means used to avoid it. Safeties against overwinding are looked upon with disfavor by some superintendents, who fear anything tending to diminish the responsibility of the engine driver. The objection, however, scarcely seems valid. The great loss of life which has resulted from overwinding indicates the propriety of introducing preventives much more widely than has as yet been done in this country. A great disadvantage of inclines, as compared with vertical shafts, is that the introduction of efficient safeties against falling in inclines is difficult or perhaps impossible.

Safeties sometimes fail to act when needed either because the clutches do not move or because the guides give way, but in a vast majority of cases where the construction is good and the apparatus properly inspected they obviate or greatly mitigate catastrophes.

Mines having:	
Cages with safeties against falling and against overwinding	5
Cages with safeties against falling, but not against overwinding	72
Cages provided with no safeties whatever	8
Cages with no safeties specified	2
	87
Mines having:	
Buckets with safeties against falling, but not against overwinding	2
Buckets with safeties against overwinding, but not against falling	1
Buckets provided with no safeties whatever	268
	271

TABLE XXVI.—DEEP MINES: MODE OF SIGNALING.

State or territory and county.	Number of mines whose mode of signaling is specified.	Wire or rope and gong or bell.	Vocal.	Various.
ARIZONA.				
Maricopa	5	5		
Mohave	2	2		
Pima	25	9	16	
Pinal	5	3	2	
Yavapai	3	3		
Yuma	2	2		
CALIFORNIA.				
Amador	6	6		
Calaveras	3	3		
El Dorado	2	2		
Inyo	2	2		
Lassen	2	2		
Mariposa	5	4	1	
Mono	26	26		
Nevada	7	7		
Placer	1	1		
Plumas	2	1	1	
San Diego	1	1		
Siskiyou	1	1		
Tuolumne	3	3		
COLORADO.				
Boulder	18	15	2	1
Chaffee	2		2	
Clear Creek	22	18	2	2
Custer	4	4		
Gilpin	34	22	2	10
Hinsdale	1	1		
Lake	25	24		1
Ouray	2	2		
Park	1			1
San Juan	4	1	2	1
Summit	1	1		
DAKOTA.				
Lawrence	3	3		
GEORGIA.				
Cherokee	1		1	
Cobb	1	1		
Forsyth	1		1	
Hall	1		1	
Lincoln	2	1	1	
McDuffie	1	1		
Meriwether	1	1		
IDAHO.				
Alturas	13	1	12	
Boisé	7	2	5	
Lemhi	4		4	
Owyhee	9	6	3	
MAINE.				
Hancock	7	6	1	
Penobscot	1	1		
Washington	1	1		
York	1	1		
MONTANA.				
Beaver Head	1	1		
Deer Lodge	22	21		1
Jefferson	1			1
Lewis and Clarke	1	1		
NEVADA.				
Elko	10	6	4	
Esmeralda	6	6		
Eureka	14	14		
Humboldt	2		2	
Lander	1	1		
Lincoln	3	3		
Nye	5	5		
Storey	28	28		
White Pine	4	4		
NEW HAMPSHIRE.				
Coos	1	1		
NEW MEXICO.				
Grant	2	1		1
Santa Fé	1		1	
NORTH CAROLINA.				
Davidson	4	2	2	
Gaston	1	1		
Guilford	1		1	
Mecklenburg	2	2		
Moore	1	1		
Nash	1	1		
Rowan	1	1		
Stanley	1		1	
OREGON.				
Baker	2	2		
Josephine	1		1	
UTAH.				
Beaver	2	1	1	
Juab	2	2		
Salt Lake	5	5		
Summit	4	4		
Tooele	4	4		
Wasatch	3	3		
Washington	5	4		1
VIRGINIA.				
Buckingham	1	1		
Culpeper	1	1		
Fauquier	1	1		
Louisa	1	1		
Stafford	1	1		
WYOMING.				
Sweetwater	5	5		

TABLE XXVII.—DEEP MINES: MODE OF SIGNALING.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	Number of mines, whose mode of signaling is specified.	Wire or rope and gong or bell.	Vocal.	Various.
Total	423	331	72	20
Arizona	42	24	18	.....
California	61	59	2	.....
Colorado	114	88	10	16
Dakota	3	3	.....	.....
Georgia	8	4	4	.....
Idaho	33	9	24	.....
Maine	10	9	1	.....
Montana	25	23	.....	2
Nevada	73	67	6	.....
New Hampshire	1	1	.....	.....
New Mexico	3	1	1	1
North Carolina	12	8	4	.....
Oregon	3	2	1	.....
Utah	25	23	1	1
Virginia	5	5	.....	.....
Wyoming	5	5	.....	.....

The column headed "various" contains the following:

Number of mines using the telephone	3
Number of mines using the telegraph	1
Number of mines using Cornish clappers	9
Number of mines using triangles	4
Number of mines using knockers	3
	20

SIGNALS USED IN ADDITION TO WIRE OR ROPE AND GONG OR BELL.

Several of the mines using wire or rope and gong or bell as a principal means of signaling have also other signals. Among these are:

Telephone	1
Telegraph	2
Speaking-tube	3
Cornish clappers	2
Triangle	1
Shaking rope	2
Rapping on bucket	1
	12

Of the important mines only 72 use vocal signals alone, but in the large number of workings not scheduled signals by voice are generally the only means of communication. The telephone or the telegraph would seem to be the most desirable means of signaling in large mines were it practicable to preserve the insulation of the wires. In most cases where it has been tried, however, difficulties have been experienced from imperfections of insulation. The wires must pass down the shaft, and are subject to mechanical abrasion. Most shafts, too, are wet, and in a very great proportion the water contains more or less sulphuric acid. The batteries, also, introduce a complication which, though not fatal, is undesirable. These disadvantages, however, may be overcome, and experiments are being made on telegraphic methods which, when in good order, permit signals to be sent to the surface from the cage even when this is moving at a maximum velocity. Considerable money and much care would be well expended on such a device if these would suffice to maintain it in a reliable condition.

The commonest means of signaling in mines of considerable size is by a bell-rope, and this method has the advantage of extreme simplicity. In deep shafts, however, it requires much force to ring such a bell, and when the cage is in rapid motion it is extremely difficult to communicate with the surface. A very large proportion of accidents are induced or aggravated by the difficulties of signaling and the imperfections of signaling apparatus.

TABLE XXVIII.—DEEP MINES: MEANS OF HANDLING WATER.

ALABAMA.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
CLEBURNE.			
.....	Houston & Pinson	Hand-pump	1,800

ARIZONA.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
MOHAVE.			
Hualapai	Keystone	Cameron No. 5	
Do	Lone Star	Bail with barrel	
PIMA.			
Arivaca	Consolidated Arizona	Steam force-pump	
Pima	Esperanza	Bail with bucket	
YAVAPAI.			
Humbug	Tip-Top	Bail with tank	
Peck	Peck	Blake steam force-pump	
Tiger	Tiger	Cornish pumping engine	4,500

CALIFORNIA.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
AMADOR.			
Amador City	Keystone Consolidated	Cornish pumping engine at south shaft	14,000
Do	Original Amador	Steam force-pump	
Jackson	Oneida	Bail with bucket	
Do	Zeile	do	
Plymouth	Empire	Bail with skip	
Sutter Creek	Consolidated Amador	Cornish pumping rig driven by hurdy-gurdy wheel	3,500
CALAVERAS.			
Independence	Champion	Cornish pumping rig driven by overshot wheel, water also hoisted in buckets.	
Mokelumne Hill	Gwin	Cornish pumping rig driven by water-power	
Washington	Amelia	Bail with tank; hoisted by independent engine	
EL DORADO.			
Springfield, or Mud Springs	Springfield	Cornish pumping rig and Hooker force-pump; capacity 10,000 gallons per hour each; also bail with tank.	20,000
MARIPOSA.			
Hornitos	Washington	Cornish pumping engine	12,000
Mariposa Estate	Mariposa tunnel and Sucredo	Two Hooker steam force-pumps	
MONO.			
Bodie	Bodie Consolidated	Two Cope & Maxwell steam force-pumps	12,000
Do	Booker Consolidated	Cornish pumping engine	
Do	Champion	Compound Cornish pumping engine	22,500
Do	Dudley	Two Cope & Maxwell steam force-pumps	17,088
Do	Goodshaw	Cope & Maxwell steam force-pump	10,000
Do	Jupiter	do	15,609
Do	Noonday	Three Cope & Maxwell direct-acting steam force-pumps	
Do	South Bodie	Two Hooker steam force-pumps	
Do	South Bulwer	Two Cope & Maxwell steam force-pumps	
Do	Standard Consolidated	Cornish pumping engine	
NEVADA.			
Grass Valley	Idaho	Cornish pumping engine	10,000
Do	New York Hill	do	
Do	Rocky Bar	Cornish pumping rig	
Nevada City	Murchie	Cornish pumping engine	10,000
Do	Nevada City	do	10,000
Do	Providence	do	
PLACER.			
Colfax	Rising Sun	Cornish pumping rig, connected with hoisting engine	30,000
SISKIYOU.			
South Fork Salmon	Black Bear	Two Blake steam force-pumps	1,800
TUOLUMNE.			
Confidence	Confidence	Cornish pumping rig, connected with hoisting engine	7,000
Soulsbyville	Soulsby	do	14,000

COLORADO.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
BOULDER.			
Grand Island	Boulder County and Trojan	One Blake No. 7, one Knowles No. 5, one Knowles No. 2	1,100
Do	Caribou	Three Knowles steam force-pumps	
Do	Native Silver	Deane steam force-pump	1,000
Magnolia	Keystone	Knowles steam force-pump	75
CLEAR CREEK.			
Downieville	Red Elephant	Two Blake and one Knowles steam force-pumps	
Griffith	Colorado Central Consolidated	National steam force-pump	4,800
Griffith and Queens	Colorado Territory National	Blake No. 5 steam force-pump	
Idaho	Champion	Bail with bucket	
Upper Union	Fred. Rogers	Knowles No. 8 steam force-pump	900

TABLE XXVIII.—DEEP MINES: MEANS OF HANDLING WATER.

COLORADO—Continued.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
CLEAR CREEK—continued.			
Upper Union	Pioneer	Cornish pumping rig, driven by mill engine	3,000
York	Clifford	Bail with bucket	
CUSTER.			
Verde	Verde	Rider hot-air pump	400
GILPIN.			
Eureka	Gunnell	Cornish pumping engine	9,000
Gregory	Bobtail	Two Worthington and one Knowles steam force-pumps	30,000
Do	New York and Colorado	Cornish pumping engine	4,000
Do	United Gregory	do	37,230
Do	Wain	Bail with bucket	
Hawkeye	Hard Money	Knowles steam force-pump	900
Nevada	California	Bail with bucket	
Do	Kansas	Cornish pumping engine	9,000
Do	Kansas lode	Bail with iron bucket	
Quartz Valley	Boss	Bail with buckets	
Russell	Haseltine	Cornish pumping engine	11,000
Do	Pewabic	One Knowles, one Cameron steam force-pumps	24,000
Do	Wyandotte	Bail with bucket	
LAKE.			
California	Amie	Knowles No. 8 steam force pump	30,000
Do	Chrysolite	Knowles 4-inch steam force-pump	200
Do	Iron	Knowles No. 2 steam force-pump	
Do	Little Chief	Knowles 4-inch steam force-pump	
Do	Little Pittsburgh	Knowles No. 6 steam force-pump	
Do	Miner Boy	Cornish pumping engine	
Do	Robert E. Lee	Bail with tank	
SUMMIT.			
Consolidated Ten-mile	Robinson Consolidated	One Keystone, 10 horse-power; one Knowles, 6 horse-power	5,000

DAKOTA.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
LAWRENCE.			
Bear Butte	Escondido	One Knowles, 10,500 gallons; one Smith & Briggs, 6,000 gallons	16,500
Whitewood	Homestake	One Knowles No. 3, one Knowles No. 5, one Knowles No. 8; also use a 500-gallon iron bailing tank.	
Do	Sir Roderick Dhu	Knowles steam force-pump	1,750

GEORGIA.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
CHEROKEE.			
Third and Second	Parks	Two steam force-pumps	6,000
COBB.			
	Kendrick	Deane steam force-pump	12,000
FORSYTH.			
Third and Second	Strickland	Deane No. 6 horse-power steam force-pump	12,000
HALL.			
Ninth	Harris	Blake No. 2 steam force-pump	3,200
LINCOLN.			
	Magruder	Cornish pumping rig driven by hoisting engine	
	Sale	Two "ejectors" driven by mill engine	3,900
M'DUFFIE.			
Republican	Jennings	Two Worthington steam force-pumps	
MERIWETHER.			
Lutherville	Wilkes	Cornish pumping rig driven by hoisting engine	

IDAHO.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
ALTURAS.			
Middle Boisé	Buffalo	Bail with tank	
BOISÉ.			
Banner	Crown Point and Wolverine	Knowles No. 4½ steam force-pump; also two-man hand-pump	2,084
Granite	Gold Hill	Stevens & Condict, Hooker, and Knowles steam force-pumps, at 100 feet, 250 feet, and 400 feet stations, respectively.	75,000
OWYHEE.			
Carson	Clearbrook Consolidated	Bail with bucket	
Do	Empire	do	
Do	Owyhee	do	
Do	Potosi	do	
Wagontown	Tremont Consolidated	Hooker No. 3 steam force-pump	700

TABLE XXVIII.—DEEP MINES: MEANS OF HANDLING WATER.

MAINE.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
HANCOCK.			
Goldsboro'	Goldsboro'	Knowles steam force-pump	9,600
Sullivan	Ashley	Knowles No. 3 steam force-pump	
Do	Milton	Knowles No. 4 steam force-pump	
Do	Waukeag	Knowles steam force-pump	
West Sullivan	Sullivan	One Knowles No. 5 and one Knowles No. 6 steam force-pumps	
	Deer Isle	Knowles No. 3 steam force-pump	1,500
PENOBSCOT.			
	Consolidated Hampden	Blake No. 4 steam force-pump	5,000
WASHINGTON.			
Fifth	Cherryfield	Knowles No. 3 steam force-pump	2,250
YORK.			
Acton	Acton Consolidated	Cornish pumping engine	

MONTANA.

DEER LODGE.			
Flint Creek	Algonquin	Two Knowles steam force-pumps	12,000
Do	Speckled Trout	One vertical Knowles; one horizontal Knowles	1,200
Independence	Mountain Boy	One Knowles, vertical No. 7	10,000
Silver Creek	Penobscot and Snowdrift	One Worthington and one Knowles	12,000
Summit Valley	Alice	Knowles steam force-pump, 350 horse-power	72,000
Do	Colusa	Knowles No. 6 steam force-pump	
Do	Gagnon	Four Knowles steam force-pumps	15,000
Do	Morning Star	Knowles vertical No. 4	2,000
Do	Star West	Knowles steam force-pump	
LEWIS AND CLARKE.			
Owyhee	Union No. 2	Cornish pumping engine and 6 steam force-pumps	2,000
MADISON.			
Hot Spring	Red Bluff	Bail with bucket	

NEVADA.

ELKO.			
Tuscarora	Argenta	Bail with barrel	
Do	Grand Prize	Cornish pumping engine and two Blake steam force-pumps	21,450
Do	Independence	Bail with barrel	
Do	Navajo	One Knowles and one Hamilton steam force-pump	
Do	North Belle Isle	Bail with barrel	
Do	Silver Star	do	
Do	Tuscarora	Bail with bucket	
ESMERALDA.			
Esmeralda	Real del Monte	Cornish pumping engine, 200 horse-power	39,500
Wilson	Wilson	Cornish pumping engine	
EUREKA.			
Eureka	Eureka Consolidated	Two Hooker and one Garratt steam force-pumps	6,000
LANDER.			
Reese River	Curtis	Five compressed-air donkey pumps	1,000
LINCOLN.			
Ely	Raymond & Ely	Cornish pumping engine	
NYE.			
Philadelphia	Belmont	Cornish pumping engine, 60 horse-power	
Tybo	Tybo Consolidated	One Cameron and one Blake steam force-pump	10,000
Union	Great American Rooster	Two steam force-pumps	
STOREY.			
American Flat	Baltimore Consolidated	Cornish pumping engine	
Gold Hill	Alta	do	30,000
Do	Belcher and Crown Point pump shaft	do	25,200
Do	Caledonia	do	14,100
Do	Consolidated Imperial	do	6,500
Do	Forman shaft	do	11,292
Do	Justice	do	
Do	Overman	One Cameron No. 4; one Blake No. 6	9,000
Do	Silver Hill	Cornish pumping engine	18,000
Do	Yellow Jacket	Cornish pumping engine and four Cope & Maxwell No. 5 force-pumps; also bail with tank.	67,200
Virginia	C. & C. shaft	Cornish pumping engine; also bail with tank	38,400
Do	C. N. S. shaft	Cornish and hydraulic pumping engines; also bail with tank	96,000
Do	Gould & Curry	Knowles steam force-pump	1,200
Do	Hale & Norcross	Cornish pumping engine	19,740
Do	Mint	Bail with tank	

TABLE XXVIII.—DEEP MINES: MEANS OF HANDLING WATER.

NEVADA—Continued.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
STOREY—continued.			
Virginia	Ophir	Cornish pumping engine	21,600
Do	Original Keystone	Steam force-pump; also bail with tank	5,000
Do	Osbiston shaft	Cornish pumping engine	24,000
Do	Savage	do	30,000
Do	Sierra Nevada	do	22,000
Do	Union shaft	Cornish pumping engine and 8 steam-force pumps; also bail with tank	41,580
Do	Utah	Cornish pumping engine	12,300
WHITE PINE.			
Cherry Creek	Star	Two Wilcox steam force-pumps	5,040
NEW MEXICO.			
GRANT.			
Silver Flat	Massachusetts and New Mexico	Daws No. 3 steam force-pump	1,500
NORTH CAROLINA.			
DAVIDSON.			
Emmons township	Silver Valley	Cornish pumping engine and two Knowles steam force-pumps	83,700(?)
	Conrad Hill	Two Knowles steam force-pumps	18,000
	Ethan Allen	Cornish pumping engine	
GASTON.			
	King's Mountain	Cornish pumping engine	17,840
GUILFORD.			
	Fisher and Willis Hill	Deane steam force-pump	8,000
MECKLENBURG.			
Capp's Hill	McGinn	Cornish pumping rig, driven by hoisting engine	9,399
Sixth	Rudisill	Cornish pumping engine	14,400
MOORE.			
	Henly Hill	Cameron steam force-pump	2,400
NASH.			
Griffith township	Mann	Knowles No. 7 steam force-pump	
ROWAN.			
	Dunn's Mountain	Two Knowles steam force-pumps	10,000
OREGON.			
BAKER.			
Rye Valley	Rye Valley	Steam force-pump	8,000
	Virtue	Two Blake and one Cameron steam force-pump	45,000
UTAH.			
BEAVER.			
San Francisco	Carbonate	Bail with bucket	
JUAB.			
Tintic	Elmer Ray	do	
SALT LAKE.			
Little Cottonwood	Emma	One Knowles No. 6, one Knowles No. 7, run by compressed air	No. 6, 6,000
Do	Flagstaff	Knowles No. 4, run by compressed air	
Do	Toledo	One Knowles No. 3 and one Knowles No. 6, run by compressed air	
West Mountain	Last Chance	Knowles No. 7	
Do	Queen & Bemis	Deane No. 9 steam force-pump	
Do	Winnamuck Group	One Blake and one Knowles	
Do	Yosemite	Blake No. 3 and Blake No. 7	
SUMMIT.			
Uintah	Empire	Two Blake and two Worthington steam force-pumps; also 400-gallon bailing tank.	85,500
Do	Ontario	Fourteen steam force-pumps; also 700-gallon bailing tank	102,000
Do	White Pine	Two Knowles No. 6½	
UTAH.			
Silver Lake	Milkmaid	Hand force-pump	375
WASATCH.			
Blue Ledge	Hawkeye	Three steam force-pumps	
Do	Lady of the Lake	One Blake and one Knowles	
Snake Creek	Jones Bonanza	One Blake No. 4 and one Knowles No. 6½	12,600
Do	Utah	One Niagara No. 3 and one Ferry No. 5	15,000

TABLE XXVIII.—DEEP MINES: MEANS OF HANDLING WATER.

UTAH—Continued.

County and district.	Mine.	Means of handling water.	Capacity in gallons per hour.
WASHINGTON.			
Harrisburg, or Silver Reef	Christy	Two Blake No. 5	
Do.	Kinner	Crane No. 3 steam force-pump	1,458
VIRGINIA.			
BUCKINGHAM.			
Curdsville	Morrow	Cornish pumping engine	7,200
FAUQUIER.			
	Kelley	do	3,000
LOUISA.			
Coohoo	Luce Bros	Cornish pumping rig, driven by hoisting engine	3,600
STAFFORD.			
Hartwood township	Rappahannock	Deane No. 9 steam force-pump	
WYOMING.			
SWEETWATER.			
California	Buckeye State	Steam force-pump	500
Miner's Delight	Hartley	Cornish	
Do	Miner's Delight	do	
Do	Segregated Miner's Delight	do	

Three principal methods are employed for extracting water from the mines, namely, Cornish pumps, bailing tanks, and steam (or compressed-air) force-pumps. The two last have the advantage over the first in point of cheapness, but the conveyance of steam to the bottom of the shafts involves waste of fuel, and the liberation of exhaust steam in the mines is very objectionable. Cornish pumps, on the other hand, are not only extremely expensive, but can only be repaired with the loss of considerable time. Tanks which are so constructed as to fill and to discharge automatically will handle an enormous quantity of water, and can be replaced by cages when not needed. They are too simple to get out of order often, and are readily repaired. Some mining engineers prefer them to pumps, and at many mines they are kept in readiness as a substitute for Cornish pumps when the rods of the latter break. An inspection of the table shows that local practice varies greatly as to the means adopted for handling water. Cornish pumps are more frequent in older mining districts than in newer ones, and in larger mines than in smaller ones.

Pumping is, on the whole, a much less important feature of mining engineering in the far West than in the East or in Europe. Mines of above 1,000 feet in depth sometimes need and have no means of disposing of water, and even the Comstock mines have less water to handle than some Belgian mines. In this respect the desert character of a large part of the mining regions of the West is distinctly advantageous.

DEEP MINES: CORNISH PUMPING RIGS.

ARIZONA.

YAVAPAI COUNTY.

TIGER DISTRICT: *Tiger.*—Cornish bob engine, horizontal, with fly-wheel, geared 5 to 1, 60 horse-power. Raises 1,500 gallons per hour, with maximum capacity of 4,500 gallons. Runs 7 hours in 24. Works jackhead pumps by a 350-feet rod. One counterbalance at surface.

CALIFORNIA.

AMADOR COUNTY.

AMADOR CITY DISTRICT: *Keystone Consolidated.*—Cornish pumping rig at south shaft driven by 80 horse-power vertical engine, which also hoists. In summer, pumps 4 hours in 24; in winter, constantly. Capacity, 14,000 gallons per hour. Rod, 1,000 feet. One 8-ton counterbalance at surface.

SUTTER CREEK DISTRICT: *Consolidated Amador.*—Cornish pumping rig driven by an 8-foot hurdy-gurdy wheel using 12 inches of water at 400 feet fall. Runs two-thirds of the time. Capacity, 3,500 gallons. Rod, 450 feet. One 3-ton counterbalance.

CALAVERAS COUNTY.

INDEPENDENCE DISTRICT: *Champion.*—Cornish pumping rig driven by a 40 foot overshot wheel, using 30 inches of water, which also hoists. Rod, 300 feet. Water raised to 300 feet level in buckets and then pumped.

MOKELUMNE HILL DISTRICT: *Gwin.*—Cornish pumping engine. Not in use at date of report. (Work transferred to upper levels. Water in the mine from the fifteenth to ninth level.)

EL DORADO COUNTY.

SPRINGFIELD, OR MUD SPRINGS DISTRICT: *Springfield.*—Cornish pumping rig driven by Morey's hurdy-gurdy, using in summer 24 inches of water (about 21 horse-power); in winter 35 inches (about 30 horse-power), with 400 feet fall. Capacity, 10,000 gallons per hour. Runs constantly. Rod, 410 feet. One 4-ton counterbalance. In winter, a Hooker pump, with a capacity of 10,000 gallons, is also used.

MARIPOSA COUNTY.

HORNITOS DISTRICT: *Washington.*—Cornish pumping engine, 60 horse-power. Runs constantly. Capacity, about 12,000 gallons per hour. Rod, 1,000 feet. Two counterbalances.

MONO COUNTY.

BODIE DISTRICT: *Booker Consolidated.*—Meyer's cut-off Cornish pumping engine, 75 horse-power. Runs constantly. Rod, 500 feet. Two counterbalances weighing 11 tons.

Champion.—Compound Cornish pumping engine. Runs constantly. Capacity, 22,500 gallons per hour. Double-acting, with two rods down to 400 feet and single rod for 200 feet below. One 10-ton counterbalance.

Standard Consolidated.—Cornish pumping engine. Runs constantly.

NEVADA COUNTY.

GRASS VALLEY DISTRICT: *Idaho.*—Cornish pumping engine, 110 horse-power. Runs constantly. Capacity, about 10,000 gallons per hour. Rod, 1,300 feet. Seven bobs, with counterbalances, weighing together 14 tons.

New York Hill.—Cornish pumping engine, 80 horse-power. Runs constantly, with varying length of stroke and speed. Rod, 1,300 feet. Two counterbalances, 2 tons each.

Rocky Bar.—Cornish pumping rig driven by water-power. Jackhead pumps operated by 400 feet of rod. One counterbalance.

NEVADA CITY DISTRICT: *Murchie.*—Cornish pumping engine, 30 horse-power. Runs constantly. Capacity, 7,000 to 10,000 gallons per hour. Rod, 250 feet. One 2-ton counterbalance.

Nevada City.—Cornish pumping engine, 25 horse-power. Runs constantly. Capacity, 6,000 to 10,000 gallons per hour. Rod, 350 feet. One 2-ton counterbalance.

Providence.—Cornish pumping engine, 30 horse-power. Runs nearly all the time, with varying length of stroke and speed. Rod, 900 feet. One bob.

PLACER COUNTY.

COLFAX DISTRICT: *Rising Sun.*—Cornish pumping rig driven by hoisting engine. Runs constantly. Capacity, about 30,000 gallons. Rod, 900 feet. One 4-ton counterbalance.

TUOLUMNE COUNTY.

CONFIDENCE DISTRICT: *Confidence.*—Cornish pumping rig driven by hoisting engine. Runs two-thirds of the time. Capacity, 6,000 to 7,000 gallons per hour; 500 feet force; 300 feet lift. One 1½-ton counterbalance.

SOULSBYVILLE DISTRICT: *Soulsby.*—Cornish pumping rig driven by hoisting engine. Runs half the time. Capacity, about 14,000 gallons per hour. Water and auxiliary steam-power. Rod, 460 feet. Two counterbalances.

COLORADO.

CLEAR CREEK COUNTY.

UPPER UNION DISTRICT: *Pioneer.*—Cornish pumping rig driven by mill engine. Pump runs 3 hours per day. Capacity, 3,600 gallons per hour. One Cornish plunger pump, 4-inch plunger, 4 feet stroke. Rod, 250 feet. One 800-pound counterbalance.

GILPIN COUNTY.

EUREKA DISTRICT: *Gunnell.*—Cornish pumping engine, 100 horse-power. Runs constantly at less than half capacity. Capacity at 10 strokes per minute, 9,600 gallons per hour. Rod, 800 feet. One 30-ton counterbalance.

GREGORY DISTRICT: *New York and Colorado.*—Cornish pumping rig driven by 60 horse-power engine, which also hoists and runs mill. Capacity, 3,000 to 4,000 gallons per hour. Rod, 800 feet. One counterbalance, 5 or 6 tons.

United Gregory.—Cornish pumping engine, 100 horse-power; horizontal, with fly-wheel. Capacity, 37,230 gallons per hour; raise, 700 feet. Working at one-fifth capacity. Cornish 14-inch pumps, run at 5 feet stroke, 3 strokes per minute. Rod, 700 feet. One 8-ton counterbalance.

NEVADA DISTRICT: *Kansas.*—Horizontal Cornish pumping engine, 40 horse-power. Runs constantly at less than half capacity. Full capacity, 9,000 gallons per hour. Rod, 1,100 feet. Two counterbalances—one at surface weighs 20 tons; one at 600 feet level, 10 tons.

RUSSELL DISTRICT: *Haseltine.*—Horizontal Cornish pumping engine, 12 by 24 inch, 40 horse-power. Runs constantly. Capacity, 11,000 gallons per hour. Rod, 200 feet.

LAKE COUNTY.

CALIFORNIA DISTRICT: *Miner Boy.*—Cornish pumping rig. Not in use. Rod, 175 feet.

GEORGIA.

LINCOLN COUNTY.

[NO DISTRICT.] *Magruder.*—Cornish pumping rig driven by 20 horse-power hoisting engine. Uses about 3 horse-power (99,003.6 ft. lbs.). Runs 3 hours in 24. One Cornish draw and lift and one jackhead pump. Rod, 130 feet (60 feet wood and 70 feet iron). One ½-ton counterbalance.

MERIWETHER COUNTY.

LUTHERVILLE DISTRICT: *Wilkes.*—Cornish pumping rig driven by 40 horse-power hoisting engine, which also runs a mill. Horizontal; 12 by 24 inches; eccentric valve. Runs 18 hours in 24; 6 hours with 3 feet stroke, pumping 2,520 gallons per hour, and 12 hours with a 2-foot stroke, pumping 1,680 gallons per hour. One Cornish pump. Rod, 70 feet. No counterbalances.

MAINE.

YORK COUNTY.

ACTON DISTRICT: *Acton Consolidated.*—Cornish pumping engine, 8 horse-power. Runs constantly. Rod, 160 feet. Two counterbalances weighing one-half ton.

MONTANA.

LEWIS AND CLARKE COUNTY.

OWYHEE DISTRICT: *Union No. 2.*—Horizontal Cornish pumping engine, 60 horse-power; slide valve with link motion. Runs one-tenth of the time. Capacity, 1,500 to 2,000 gallons per hour. Rod, 300 feet. One counterbalance, 3,500 pounds.

NEVADA.

ELKO COUNTY.

TUSCARORA DISTRICT: *Grand Prize.*—Horizontal Cornish pumping engine, 80 horse-power, geared 4 to 1; cylinder 18-inch diameter by 42-inch stroke. Engine makes 32 strokes per minute to 8 strokes of pump rod, working at 60 horse-power. Runs continuously. Can be run at 11 strokes per minute, pumping 21,450 gallons per hour. Rod, 500 feet. One surface bob, with 10 tons ballast. Water raised from 600 feet level to 500 feet level by steam force-pumps, whence it is raised by the Cornish pump.

ESMERALDA COUNTY.

ESMERALDA DISTRICT: *Real del Monte.*—Cornish pumping engine, 200 horse-power. Horizontal, 22 by 48, with very heavy fly-wheel 18 feet in diameter. Runs constantly. Capacity, 39,500 gallons per hour. Rod, 800 feet. One bob at surface, one at 420 feet, and one at 750 feet. Total weight of ballast, over 50 tons; one plunger pump at 420 feet, and one at 650 feet attached to main pump rod.

WILSON DISTRICT: *Wilson or Himalaya.*—Cornish pumping rig driven by direct connection with shaft of a 36 horse-power hoisting engine, which by belt connection also runs the battery. Rod, 195 feet. Water column, 3 inches. One counterbalance, 800 pounds.

LINCOLN COUNTY.

ELY DISTRICT: *Raymond & Ely.*—Cornish pumping engine. Rod, 1,200 feet. Three counterbalances.

NYE COUNTY.

PHILADELPHIA DISTRICT: *Belmont.*—Horizontal Cornish pumping engine, 60 horse-power. Works two 10-inch plunger pumps.

STOREY COUNTY.

AMERICAN FLAT DISTRICT: *Baltimore Consolidated.*—Cornish pumping engine, not in use. Horizontal, 26 by 72 inches, with fly-wheel, geared. When in use, ran 16 to 18 hours in 24. Rod, 1,900 feet. Three bobs, with 25 tons ballast each.

GOLD HILL DISTRICT: *Alta.*—Horizontal Cornish pumping engine, power stated at 500 horse-power; compound, with differential valve gear. Runs constantly. Capacity, 30,000 gallons per hour; double plunger pumps. Rods, 1,900 feet, double, counterbalancing each other.

Belcher & Crown Point pump shaft.—Compound beam Cornish pumping engine. High pressure cylinder, 30 inches diameter by 10 foot stroke; expansion cylinder, 62½ inches diameter by 8 feet stroke; average vacuum, 22 inches; steam, 110 pounds; average number of strokes, 4 per minute. Can be run as slowly as one stroke in 2 minutes, having Davy's differential valve motion. Power stated at 250 horse-power. Runs constantly, except when stopped for repairs, such as breaking of pump rod, etc. Capacity at four strokes per minute, 14,400 gallons per hour; has been run at 8 strokes per minute, pumping 28,800 gallons per hour to surface, but should not exceed 6 strokes, pumping 21,600 gallons per hour to surface; 21 single-acting Cornish plunger pumps. The 11 upper pumps are 14 inches diameter by 8 feet stroke, and the 10 lower ones are 10 inches diameter by 8 feet stroke. Water column, 14 inches diameter. Rod, 900 feet vertical, 14 by 16 inches; 2,667 feet at angle of 35°, 12 by 12 inches, and 784 feet at same angle, 9 by 9 inches; total length, 4,351 feet. Rod made of Oregon pine, bound with iron straps, 10 by 1 inches. Seven balance bobs, with 25 tons ballast each; also one V-bob, making connection between vertical shaft and incline. This engine cost at foundery $250,000.

Caledonia.—Cornish pumping engine. Power stated at 200 horse-power. Horizontal, high pressure, double geared, with Corliss bed. Runs from 12 to 14 hours in 24. Capacity at 5 strokes per minute 14,100 gallons per hour. Cornish plunger pumps, 12 inches diameter by 8 feet stroke. Rod, 1,600 feet long; single joints, 30 feet. Pump stations at intervals of 200 feet. Four counterbalances, averaging 25 tons each.

Consolidated Imperial.—Horizontal Cornish pumping engine, geared 5 to 1. Power stated at 200 horse-power. Runs 22 hours in 24. Capacity, 6,500 gallons per hour to surface—much greater to tunnel level. Cornish plunger pumps. Rod 2,400 feet long (part on incline). Six balance bobs, 15 tons ballast each.

Forman shaft.—Inverted beam, direct-acting, compound Cornish pumping engine. Gravitation jet condenser, with separate air-pump. Power stated at 600 horse-power. Runs constantly at partial capacity, except when stopped for repairs. Averaged 11,292 gallons per hour, including stops, for 3 months, pumping to surface. Full capacity much greater. Rod, 1,250 feet June 1, 1880, 1,980 feet May 1, 1881; extended as shaft is sunk. Four counterbalances, 20 tons each.

Justice.—Horizontal, geared, Cornish pumping engine, with fly-wheel. Cylinder, 24 by 48; not running in census year. Seven Cornish plunger pumps, 12-inch diameter by 8 feet stroke. Rod, upper 400 feet, 14 by 14 inches; 300 feet, 12 by 12 inches; and incline rod 10 by 10 inches, connected by V-bob at bottom of vertical shaft. Two counterbalances, one 20 tons and one 30 tons.

Silver Hill.—Cornish pumping engine, 24-inch diameter by 20-inch stroke, with automatic cut-off. Power stated at 300 horse-power. Runs constantly. Capacity, 18,000 gallons per hour. Rod, 444 feet. One balance bob, with 30 tons ballast.

Yellow Jacket.—Compound Cornish pumping engine. High-pressure cylinder, 31 inches diameter by 12 feet stroke; low pressure cylinder, 62 inches diameter by 12 feet stroke. Uses 100 pounds steam cut-off at half stroke, working at 400 horse-power. Runs constantly at 5 strokes per minute, except when stopped for repairs, and at this speed in the census year raised to the surface 80 gallons per stroke, or 24,000 gallons per hour. Subsequent to connection with Sutro tunnel, raised 1,500 feet to that level, 160 gallons per stroke, or 48,000 gallons per hour. Can be run at seven strokes per minute, giving a capacity of 67,200 gallons per hour. Double line of Cornish plunger pumps. Rod, 3,020 feet long. Ten balance bobs, ballasted with 20 to 22 tons each at even leverage. This engine cost at foundery $230,000.

VIRGINIA DISTRICT: *Consolidated Virginia and California joint shaft.*—Direct-acting compound Cornish pumping engine. High-pressure cylinder, 26 inches diameter by 8 feet stroke; expansion cylinder, 40 inches diameter by 8 feet stroke. Works at 60 horse-power per stroke, 6 to 8 strokes per minute; 360 to 480 horse-power. Capacity very slightly in excess of 480 horse-power. Runs constantly. At 8 strokes per minute, 80 gallons per stroke, raises 38,400 gallons per hour, 950 feet to Sutro tunnel level. Single rod and double line of water column. Rod, 2,520 feet long. Eight balance bobs, with 20 tons ballast each at even leverage.

Combination shaft (Chollar, Potosi, Hale & Norcross, and Savage joint shaft).—Compound Cornish pumping engine, 600 horse-power. Ran constantly during census year. Capacity, 60,000 gallons per hour. Rod, 2,500 feet, 15 inches square. Seven balance bobs, with 30 tons ballast each. In April, 1881, the new hydraulic pump was placed in position. This was guaranteed to have a capacity of 96,000 gallons per hour. Fitted with double-action barrel force-pumps at bottom of shaft, operated by hydraulic pressure, applied at the surface.

Hale & Norcross.—Vertical compound Cornish engine. Power stated at 350 working horse-power. Stops only for repairs. Capacity, 19,740 gallons per hour. Rod, 3,100 feet long, partly on incline; averages 14 inches square. Seven balance bobs, with 20 tons ballast each.

Ophir.—Horizontal Cornish pumping engine, with fly-wheel. Working at 100 horse-power; extreme power stated at 300 horse-power. Runs constantly. At four strokes per minute raises 10,800 gallons per hour, 900 feet lift, to Sutro tunnel level. Extreme capacity, 21,600 gallons. Rod, 1,500 feet vertical and 1,700 feet in incline. Connected by a V-bob. Eight balance bobs, with 20 tons ballast each; six in vertical shaft, and 2 in incline.

Osbiston shaft (Gould & Curry and Best & Belcher joint shaft).—Compound, direct-acting Cornish pumping engine, Davy's differential valve motion, with fly-wheel. Power stated at 500 horse-power. Runs constantly, except when stopped for repairs. Capacity, 24,000 gallons per hour; raises to Sutro tunnel level. Rod, 1,900 feet long, 16 inches square. Seven balance bobs, 17 tons ballast each.

Savage.—Horizontal, low-pressure, direct-acting Cornish pumping engine. Power stated at 450 horse-power. For six months ran 24 hours per day. Capacity, 30,000 gallons per hour; working at 26,500 gallons per hour; raises to Sutro tunnel level. Rod, 2,600 feet long, partly on incline. In vertical shaft rod is 14 inches square; in incline, 12 inches square. Ten balance bobs, with 20 tons ballast each.

Sierra Nevada.—Horizontal Cornish pumping engine, with fly-wheel. Power stated at 175 horse-power. Not used since May, 1880. Capacity, 22,000 gallons per hour. Rod, 1,700 feet. Three balance bobs, with 18 to 20 tons ballast each.

Union shaft (Sierra Nevada, Union Consolidated and Mexican joint shaft).—Compound Cornish pumping engine. High-pressure cylinder, 64 inches diameter by 81 inches stroke; expansion cylinder, 100 inches diameter by 99 inches stroke. Very heavy fly-wheel. Working at 270 horse-power; half capacity. Runs constantly at 4¼ to 4½ strokes per minute. At half capacity raises 41,580 gallons per hour 1,100 feet from sump to 100 feet above Sutro tunnel level. Double line of column. Pumps, 14 inches diameter by 10 feet stroke. Eight balance bobs, ballasted with 18 to 20 tons each at equal leverage.

Utah.—Horizontal, geared, Cornish pumping engine, with fly-wheel. Power stated at 150 horse-power. Runs 9 hours in 24. Capacity, 12,300 gallons per hour. Rod, 2,600 feet long, partly in incline; in vertical shaft, 12 inches square; in incline, 10 inches square. Five balance bobs, ballasted with 14 tons each.

NORTH CAROLINA.

DAVIDSON COUNTY.

EMMONS TOWNSHIP: *Silver Valley.*—Cornish pumping engine, 108 horse-power. Ran constantly during census year. Subsequently discontinued. Capacity, 29,700 gallons per hour. Stated that it can be run 30 strokes per minute. Length of rod, 160 feet. One counterbalance, 1,400 pounds. Two steam force-pumps now used.

[NO DISTRICT.] *Ethan Allen.*—Cornish pumping engine, 15 horse-power. Runs 3 hours per day. Rod, 80 feet.

GASTON COUNTY.

[NO DISTRICT.] *King's Mountain.*—Horizontal Cornish pumping engine, 50 horse-power. Runs constantly. Capacity at full stroke, 15 strokes per minute, 17,846 gallons per hour. Cornish plunger and upper drawing lift pumps. Rod, 325 feet. One 2-ton counterbalance.

MECKLENBURG COUNTY.

CAPP'S HILL DISTRICT: *McGinn.*—Cornish pumping rig, driven by 40 horse-power hoisting engine. Runs constantly. Capacity, 9,399 gallons per hour. One Cornish drawing lift. Rod, 110 feet. One 1,500-pound counterbalance.

SIXTH DISTRICT: *Rudisill.*—Horizontal double-acting Cornish pumping engine, with fly-wheel, 40 horse-power. Runs constantly. One Cornish plunger and up-drawing lift-pump. Rod, 200 feet. One 3-ton counterbalance.

VIRGINIA.

BUCKINGHAM COUNTY

CURDSVILLE DISTRICT: *Morrow.*—Horizontal Cornish pumping engine, with fly-wheel, 20 horse-power. Also hoists and runs mill. Runs constantly. Capacity, 7,200 gallons per hour. Rod, 72 feet. One 1,600-pound counterbalance.

FAUQUIER COUNTY.

[NO DISTRICT.] *Kelley.*—Cornish pumping rig driven by 25 horse-power hoisting engine. Runs constantly on week days and 3 to 3½ hours on Sunday. One Cornish jackhead pump. Capacity, about 3,000 gallons per hour. Rod, 120 feet (about).

LOUISA COUNTY.

COOHOO DISTRICT: *Luce Bros.*—Cornish pumping rig driven by 14 horse-power hoisting engine. Runs constantly. Cornish upper drawing lift. Capacity, 3,600 gallons per hour. Rod, 100 feet. One 800-pound counterbalance.

WYOMING.

SWEETWATER COUNTY.

MINER'S DELIGHT DISTRICT: *Hartley.*—Cornish pumping rig driven by 40 horse-power hoisting engine, which also runs mill.
Miner's Delight.—Cornish pumping rig driven by 40 horse-power hoisting engine. One 8-inch pump.
Segregated Miner's Delight.—Cornish pumping rig driven by 50 horse-power engine. This engine also runs battery and hoists. Pumps constantly.

TABLE XXIX.—DEEP MINES: POWER DRILLS.

State or territory.	Number of mines reported using power drills.	Percussion drills in use.	Diamond drills in use.
Total	65	250	7
Arizona	1	1	.....
California	11	16	.....
Colorado	10	26	.....
Dakota	2	2	1
Idaho	2	2	.....
Maine	4	6	.....
Montana	1	1	.....
Nevada	30	189	6
Utah	2	3	.....
Virginia	2	4	.....

In spite of the numerous improvements made in power drills, their use in the West is still limited. Percussion drills are distinctly advantageous where large tunnels are being driven, and where, consequently, there is ample space to handle them. They are also useful in running mine drifts not much in excess of the ordinary size when for any reason a high rate of progress is called for, but the ordinary work of the mines is usually performed by hand.

Diamond drills are sometimes used in prospecting for ore, but more frequently in exploring ahead of the face of a drift or shaft for water where there is danger of a serious influx.

Considerably more than one-half of the drills reported are in use on the Comstock lode, where the conditions are peculiarly suited to them. Besides the Sutro tunnel, there are many drifts and large shafts where drills have ample space. The heat as well as the large size of the ore-bodies of the lode require a high rate of progress in pushing galleries, and the disastrous floods which have so often occurred demand the precaution of running diamond drills ahead of many workings.

TABLE XXX.—DEEP MINES: AIR COMPRESSORS AND BLOWERS OR FANS.

State or territory.	Number of mines reported.	Number of compressors and blowers.	Number in use.
Total	101	140	125
Arizona	4	4	4
California	24	32	29
Colorado	16	23	17
Dakota	2	4	4
Idaho	2	2	1
Maine	4	4	4
Montana	1	1	1
Nevada	33	53	51
New Mexico	1	1	1
North Carolina	2	2	2
Utah	11	13	10
Virginia	1	1	1

The many varieties of machines for furnishing air for driving machinery or for ventilation in underground workings are grouped under one head. The compressed-air exhaust from machines such as power drills, baby hoists, etc., is an effective ventilating agent as well as a motive power.

The heading "Number of mines reported" means mines coming within the standard reported as having compressors. The total number of compressors, etc., stated is probably between 80 and 90 per cent. of the true total. There are a few in idle (unreported) works of Owyhee county, Idaho, and on the Comstock. Some of the compressors have capacity for driving 50 horse-power winze engines.

Few of the deep precious-metal mines require particularly active ventilation. The force of men employed is smaller than in the mines of base metals, where the value of the ore per ton is smaller and the breasts larger, while there is nothing corresponding to the fire-damp and choke-damp of the coal mines. On the Comstock lode, indeed, the high temperature, while necessitating active ventilation, also promotes it. While the natural ventilation, skillfully adjusted, is sufficient for the workings through which a draft can be made, it is frequently necessary to supply air by mechanical means to the headings of drifts. For this purpose the simpler forms of fans, often constructed on the spot, are generally sufficient.

TABLE XXXI.—DEEP MINES: MISCELLANEOUS ENGINES.

State or territory and county.	Number of mines reported having engines other than for hoisting or pumping.	Number.	Number in use.	Horse-power.
CALIFORNIA.				
Calaveras	1	1	1	15
Inyo	1	1	1	12
Mono	4	4	4	a 35
Nevada	1	2	2	a 20
Siskiyou	1	1	1	4
COLORADO.				
Clear Creek	2	2	1	26
Custer	1	1	1	30
Gilpin	1	1	1	25
Lake	2	2	2	45
Ouray	1	1	1	a 3
San Juan	1	1	1	1
DAKOTA.				
Lawrence	2	7	7	90
GEORGIA.				
Cobb	1	1	1	a 3
Forsyth	1	1	1	a 3
Lincoln	1	1	1	a 3
McDuffie	1	1	1	a 15
Meriwether	1	1	1	60
IDAHO.				
Alturas	1	1	1	15
Boisé	1	1	1	25
MAINE.				
Hancock	1	1	1	a 20
NEVADA.				
Eureka	3	3	3	44
Nye	1	1	1	6
Storey	22	56	54	1,053
White Pine	2	2	2	25
NORTH CAROLINA.				
Davidson	1	1	1	5
Gaston	1	2	2	27
Stanley	1	2	2	27
VIRGINIA.				
Buckingham	1	1	1	a 10

a Estimated.

TABLE XXXII.—DEEP MINES: MISCELLANEOUS ENGINES.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	No. of mines.	Miscellaneous engines.	In use.	Horse-power.
Total	58	100	97	1,647
California	8	9	9	86
Colorado	8	8	7	130
Dakota	2	7	7	90
Georgia	5	5	5	84
Idaho	2	2	2	40
Maine	1	1	1	20
Nevada	28	62	60	1,128
North Carolina	3	5	5	59
Virginia	1	1	1	10

The tables include only the deep mines coming within the standard. Of the 58 mines so reported, 28 are in Nevada, and 22 of these latter, having an aggregate of 1,053 horse-power, are on the Comstock. The tables, except for the Comstock, are probably very deficient, no "other" engines being reported from Montana or Utah. The following classes are included:

Saw and carpenter-shop engines	22
Machine-shop, blacksmith-shop, and foundery engines	14
Steam-hammers	3
Blower engines	32
Compressed-air winze engines	13
Various	14
Unclassified	2
	100

Among the number classed as "various" are traction engines, for hauling cars, timber, etc., uphill to the shafts, small feed-pumps, engine for handling steel-hoisting cable while repairing, etc.

The average rating of "other" engines is 10½ horse-power. They include various types, from small donkey and vertical engines to horizontal engines of considerable power. Among the compressed-air winze engines several are of considerable magnitude, ranging to 50 horse-power for a single underground hoisting rig.

TABLE XXXIII.—DEEP MINES: BOILERS.

State or territory and county.	Number of mines reported having boilers.	Number of boilers.	Number in use.
ARIZONA.			
Maricopa	2	2	2
Mohave	2	2	1
Pima	6	7	7
Pinal	1	1	1
Yavapai	2	2	2
CALIFORNIA.			
Amador	7	19	14
Calaveras	2	3	2
El Dorado	2	3	3
Inyo	2	3	2
Mariposa	1	2	2
Mono	24	35	31
Nevada	7	15	15
Placer	1	2	2
Plumas	1	1	1
Siskiyou	1	2	2
Tuolumne	2	3	3
COLORADO.			
Boulder	15	22	22
Clear Creek	16	20	17
Custer	4	8	8
Gilpin	28	49	42
Hinsdale	1	2	2
Lake	24	50	49
Ouray	1	2	2
San Juan	3	4	4
Summit	1	2	2
DAKOTA.			
Lawrence	5	12	12
GEORGIA.			
Cherokee	1	1	1
Cobb	1	1	1
GEORGIA—continued.			
Forsyth	1	1	1
Hall	1	1	1
Lincoln	2	2	2
McDuffie	1	2	2
Meriwether	1	1	1
IDAHO.			
Alturas	2	2	2
Boisé	2	4	4
Lemhi	1	1	.....
Owyhee	6	6	6
MAINE.			
Hancock	6	9	9
Penobscot	1	1	1
Washington	1	1	1
York	1	1	1
MONTANA.			
Beaver Head	1	2	2
Deer Lodge	10	19	17
Jefferson	1	1	1
Lewis and Clarke	1	7	7
NEVADA.			
Elko	6	11	10
Esmeralda	6	10	10
Eureka	10	17	17
Lander	1	2	2
Lincoln	2	9	9
Nye	5	8	7
Storey	28	187	151
White Pine	4	6	6
NEW HAMPSHIRE.			
Coos	1	1	1
NEW HAMPSHIRE—continued.			
Grafton	1	1	1
NEW MEXICO.			
Grant	2	2	2
NORTH CAROLINA.			
Davidson	4	8	4
Gaston	1	3	1
Guilford	1	1	1
Mecklenburg	2	3	3
Moore	1	1	1
Nash	1	1	1
Rowan	1	4	2
Stanley	1	2	2
OREGON.			
Baker	2	5	5
UTAH.			
Beaver	2	3	1
Juab	1	1	1
Salt Lake	11	14	9
Summit	3	10	17
Tooele	4	4	4
Wasatch	3	5	4
Washington	4	5	5
VIRGINIA.			
Buckingham	1	1	1
Culpeper	1	1	1
Fauquier	1	1	1
Louisa	1	1	1
Stafford	1	1	1
WYOMING.			
Sweetwater	3	5	5

TABLE XXXIV.—DEEP MINES: BOILERS.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	Number of mines reported having boilers.	Number of boilers.	Number in use.
Total	318	679	597
Arizona	13	14	13
California	50	88	77
Colorado	93	159	148
Dakota	5	12	12
Georgia	8	9	9
Idaho	11	13	12
Maine	9	12	12
Montana	18	29	27
Nevada	62	250	212
New Hampshire	2	2	2
New Mexico	2	2	2
North Carolina	12	23	15
Oregon	2	5	5
Utah	28	51	41
Virginia	5	5	5
Wyoming	3	5	5

TABLE XXXV.—DEEP MINES: CHARACTER OF BOILERS.

State or territory.	Total number of boilers reported.	Horizontal boilers.	Vertical boilers.	Character unspecified.
Total	679	546	93	40
Arizona	14	7	5	2
California	88	80	5	3
Colorado	159	92	48	19
Dakota	12	9	2	1
Georgia	9	4	2	3
Idaho	13	10	3	.....
Maine	12	4	8	.....
Montana	29	23	.....	6
Nevada	250	240	8	2
New Hampshire	2	1	1	.....
New Mexico	2	1	1	.....
North Carolina	23	21	2	.....
Oregon	5	5	.....	.....
Utah	51	39	8	4
Virginia	5	5	.....	.....
Wyoming	5	5	.....	.....

These tables include possibly 90 per cent. of the boilers of the actively working mines, but not those of the idle works. There are several such on the Comstock; in the Carson district, Idaho; and in the Tuscarora, Ely, Cornucopia, and other districts in Nevada.

It did not prove practicable to draw any broad distinction except between upright and horizontal boilers from the schedule returns. There are comparatively few simple cylindrical boilers, the great majority being furnished either with flues or with small fire tubes, while there are a few water-tube boilers and a considerable variety of unusual styles. While simplicity of construction is very desirable in the western mining districts, many of them being at great distances from machine-shops, the high price of fuel necessitates economy in its use. But for this fact it is probable that the simpler forms of boiler would greatly predominate over those of the locomotive type. The expense of freight, however, often influences the selection. A locomotive boiler presents much more steam surface in proportion to its weight than those of the egg-end type, thus tending to counterbalance the difference in the original cost.

TABLE XXXVI.—DEEP MINES: COST OF PLANT.

State or territory and county.	Mines reporting cost of plant.	Cost.
	No.	*Dollars.*
ALABAMA.		
Cleburne	1	100
ARIZONA.		
Maricopa	5	33,190
Mohave	1	1,700
Pima	10	45,927
Pinal	2	12,000
Yavapai	2	47,000
CALIFORNIA.		
Amador	5	155,000
Calaveras	2	48,000
El Dorado	2	16,000
Inyo	5	180,500
Mariposa	4	7,100
Mono	24	583,692
Nevada	6	108,000
Placer	1	20,000
Plumas	1	2,500
Siskiyou	3	84,270
Tuolumne	2	38,000
COLORADO.		
Boulder	12	40,300
Clear Creek	21	182,590
Custer	3	10,000
Gilpin	32	269,653
Hinsdale	1	4,000
Lake	22	221,179
Ouray	2	27,000
San Juan	1	15,000
Summit	1	7,000
DAKOTA.		
Lawrence	4	116,975
GEORGIA.	*No.*	*Dollars.*
Cherokee	1	950
Cobb	1	3,000
Forsyth	1	4,500
Hall	1	2,700
Lincoln	2	8,700
McDuffie	1	8,500
Meriwether	1	6,600
IDAHO.		
Alturas	4	37,000
Boisé	3	22,800
Lemhi	2	50,400
Owyhee	2	30,000
MAINE.		
Hancock	4	148,590
Penobscot	1	2,500
Washington	1	2,500
York	1	4,000
MONTANA.		
Beaver Head	1	a 7,000
Deer Lodge	19	130,700
Jefferson	1	6,000
Lewis and Clarke	1	250,000
NEVADA.		
Elko	10	183,750
Esmeralda	9	150,500
Eureka	10	109,600
Lincoln	2	240,774
Nye	4	36,000
Storey	31	6,687,639
White Pine	3	a 22,300
NEW HAMPSHIRE.		
Coos	1	4,000
NEW MEXICO.	*No.*	*Dollars.*
Grant	2	11,000
Santa Fé	1	1,400
NORTH CAROLINA.		
Davidson	4	28,370
Gaston	1	38,000
Guilford	1	1,200
Mecklenburg	2	21,000
Moore	1	2,500
Nash	1	10,000
Rowan	1	30,000
Stanley	1	6,000
OREGON.		
Baker	2	90,000
Josephine	1	200
UTAH.		
Beaver	3	42,050
Juab	5	7,100
Salt Lake	13	237,000
Summit	5	277,750
Tooele	7	57,000
Utah	2	1,500
Wasatch	4	60,000
Washington	5	23,450
VIRGINIA.		
Buckingham	1	8,000
Culpeper	1	1,500
Fauquier	1	3,200
Louisa	1	800
Stafford	1	a 6,000
WYOMING.		
Sweetwater	3	48,000

a Estimated.

TABLE XXXVII.—DEEP MINES: COST OF PLANT.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	Number of mines reporting cost of plant.	Cost.
Total	363	$11,459,609
Alabama	1	100
Arizona	20	139,817
California	55	1,243,062
Colorado	95	776,722
Dakota	4	116,975
Georgia	8	34,350
Idaho	11	140,800
Maine	7	157,500
Montana	22	393,700
Nevada	69	7,439,503
New Hampshire	1	4,000
New Mexico	3	12,400
North Carolina	12	187,070
Oregon	3	90,200
Utah	44	705,850
Virginia	5	19,500
Wyoming	3	48,000

In many cases, especially where mines have been purchased, the cost of plant has not been discriminated from the value of the mine, and the present owners are, in fact, ignorant of the prices originally paid for buildings and machinery. As a consequence, Tables XXXVI and XXXVII are less complete than most of the others. Only 363 mines are returned under this head, reporting a total cost of plant of $11,459,609, or an average of nearly $32,000 each. Considering the number of large mines not reported, it is probable that the total given is not more than one-fifth of the actual total. Among the mines omitted in the table are the following:

ARIZONA.—Several important mines in Tombstone district.

CALIFORNIA.—In Bodie district, Mono county, the Bodie Consolidated, Boston Consolidated, Dudley, Jupiter, Noonday, North Noonday, and others. In Nevada City district, Nevada county, the Murchie mine. Confidence district, in Tuolumne county, the Confidence mine. Also several scattered districts.

COLORADO.—In Boulder county, the Smuggler mine, Central district; the Cold Spring, Melvina, and others, in Gold Hill district; the Boulder County and Trojan, Caribou and Horsefall mines in Grand Island district, and the Niwot mine, Ward district. In Clear Creek county, Downieville district and the Red Elephant mine; the Equator, Griffith district; the Pioneer, Upper Union district; York district and the Clifford mine. In Custer county, the Bull-Domingo, Hardscrabble district. In Gilpin county, the Bobtail, of Gregory district, and the Pewabic, of Russell district. In California district (Leadville), Lake county, the Adelaide, Colorado Prince, Iron, Leadville Consolidated, and other mines. In San Juan county, the Adelphi mine, of Eureka district.

DAKOTA.—The Sir Roderick Dhu and other mines in Whitewood district, Lawrence county.

IDAHO.—The idle plant of Carson, Flint, and South Mountain districts, Owyhee county.

MAINE.—The Goldsboro' mine, Goldsboro' district, and the Ashley mine, Sullivan district, both in Hancock county.

NEW HAMPSHIRE.—The Little May, Ammonoosuc district, Grafton county.

NEVADA.—In Elko county, the various idle works of Cornucopia district. Cortez district and the Garrison mine, Eureka county; and the Eureka Consolidated and Richmond mines, of Eureka district, in the same county. In Lander county, the Ætna mine, of Battle Mountain district; the Starr & Grove mine, of Lewis district, and the Curtis mine (Manhattan Mining Company) in Reese River district. In Lincoln county, the Hillside mine, in Bristol district, and the Raymond & Ely and other mines, in Ely district. In Nye county, the Belmont mine, Philadelphia district. In Storey county, all the idle and abandoned works of the Comstock, with the exception of works which, though idle at the time of report, were in serviceable condition and were liable to be actively operated again. In White Pine county, the Tikup mine, Cherry Creek district, and the Paymaster (Martin White Mining Company), Ward district. The Eberhardt & Aurora mine, White Pine district, in the same county, was also omitted.

WYOMING.—The Hartley mine, Miner's Delight district, Sweetwater county.

LABOR AND WAGES.

TABLE XXXVIII.—DEEP MINES: PERSONNEL.

State or territory.	PERSONNEL.					Number of mines reported.
	Total.	Staff.	Foremen.	Miners.	Surface men.	
The United States	19,147	732	635	13,770	4,010	693
Alabama	17	1	2	7	7	2
Arizona	853	54	42	573	184	52
California	3,159	63	75	2,291	730	87
Colorado	6,120	192	212	4,522	1,194	155
Dakota	960	66	32	604	258	58
Georgia	145	10	10	60	65	10
Idaho	481	35	20	317	59	34
Maine	131	9	12	74	36	8
Montana	1,164	32	61	771	300	67
Nevada	3,550	138	84	2,713	615	88
New Hampshire	26	2	1	21	2	3
New Mexico	215	8	13	150	44	13
North Carolina	520	21	14	309	185	12
Oregon	116	8	6	80	22	9
Utah	1,530	86	42	1,143	259	82
Virginia	105	3	3	73	26	5
Washington	7	.....	1	2	4	1
Wyoming	89	4	5	60	20	7

The present examination could not result in ascertaining the total number of miners employed in the deep precious-metal mines, since only those reaching a certain standard were taken into consideration. Table XXXVIII, therefore, probably represents not more than two-fifths of those who habitually gain their livelihood by mining. Indeed, in considerable areas, especially in most parts of the Great Basin, almost the whole population is either directly or indirectly dependent upon the mines for support. The table, however, serves to illustrate the numerical relations which the different classes of employés bear to one another. The preponderance of the staff over foremen is to be accounted for by the fact that in many comparatively small mines the superintendent acts as foreman, although not participating in the manual labor, while, in large mines, there is often a considerable staff of clerks, assayers, etc., in addition to the superintendent.

TABLE XXXIX.—DEEP MINES: LABOR AND WAGES.

State or territory.	LABOR.			WAGES.		
	Total hours' work during the year.	Number of mines reported.	Average hours' work per mine.	Total amount paid on labor account, exclusive of staff.	Number of mines reported.	Average amount paid for labor per mine.
The United States	51,965,536	656	79,216	$12,261,353	580	$21,140 26
Alabama	11,700	2	5,850	835	2	417 50
Arizona	1,478,687	43	34,388	440,392	43	10,241 67
California	10,087,316	75	134,498	1,854,408	59	31,430 64
Colorado	19,119,099	198	96,561	3,663,827	177	20,699 59
Dakota	1,688 528	55	30,701	576,995	49	11,775 41
Georgia	228,020	10	22,802	16,934	8	2,116 75
Idaho	678,214	30	22,607	254,866	28	9,102 35
Maine	253,000	7	36,143	22,077	4	5,519 25
Montana	2,898,904	59	49,134	804,686	42	19,159 19
Nevada	10,108,855	70	144,412	3,209,476	62	51,765 74
New Hampshire	13,500	1	13,500	4,625	2	2,312 50
New Mexico	363,541	12	30,295	83,955	11	7,632 27
North Carolina	1,131,390	12	94,283	64,367	11	5,851 55
Oregon	208,080	9	23,120	68,069	8	8,508 63
Utah	3,548,134	67	52,957	1,182,971	68	17,396 63
Virginia	144,728	5	28,946	11,310	5	2,262 00
Washington	3,840	1	3,840	1,560	1	1,560 00

The average pay, as deduced from the returns, is 26.7 cents an hour, or, say, $2 67 a day of ten hours. Under "surface men" in Table XXXVIII various classes are included, such as blacksmiths, carpenters, and other mechanics, as well as unskilled laborers, and the average price paid to this class, therefore, varies very greatly. The wages paid to the miners per shift, on the other hand, are pretty regular over extensive areas, as Table XL shows. They are highest in the Great Basin, but lower in Utah than in Idaho, Nevada, and Arizona on account of the presence of Mormon settlements. Mormons seldom become miners, but furnish the mining population with supplies and transportation cheaper than these necessaries can be furnished in the western portion of the basin. The hours of labor vary much more than the wages, though ten hours is the usual day's work. The ordinary length of shift on the Comstock lode, where the work is extremely trying on account of the high temperature, is eight hours, but is often reduced to six hours for men employed in excessively hot places. Eight-hour shifts are in use away from the Comstock in a considerable number of mines where it is desirable, for any reason, to press the work; but it is well understood that the night shift is less efficient than the others. The mines in which the men are called upon to work twelve hours are few in number, and most of them are in the southern states.

In estimating the total amount of wages paid to deep precious-metal miners it must be remembered that very few of them are never out of work. In most camps there is always a large number of men who, though miners by occupation, are temporarily idle. It is not probable that the 50,000 miners (estimated) actually receive more than an average of $2 per day each for 300 days, or in the aggregate $30,000,000 per annum.

TABLE XL.—DEEP MINES: USUAL WAGES PER SHIFT OF MINERS AND FOREMEN.

State or territory.	Miners.	Foremen.
Alabama	$1 00	$1 00
Arizona	4 00	5 00
California	3 25	5 00
Colorado	3 00	5 00
Dakota	3 50	5 50
Georgia	1 00	2 00
Idaho	4 00	5 00
Maine	1 50	2 00
Montana	3 50	5 00
Nevada	4 00	6 50
New Hampshire	1 50	3 00
New Mexico	2 75	4 50
North Carolina	1 00	2 00
Oregon	3 00	4 00
Utah	3 25	5 00
Virginia	1 25	1 25
Washington	2 50	.....
Wyoming	3 00	4 00

The wages given in this table are representative. They were obtained as averages, but the expression of odd cents would complicate the data without serving any useful end.

TABLE XLI.—DEEP MINES: NUMBER OF MEN EMPLOYED IN THE COMSTOCK MINES IN 1880.

Mine.	Total number employed.	Blacksmiths.	Blacksmiths' helpers.	Boiler-makers.	Bosses.	Brakemen.	Bricklayers.	Car-men.	Carpenters.	Cooks.	Engineers.	Firemen.	Foremen.	Fuse-makers.	Harness-makers.	Hostlers.	Laborers.	Lampmen.
Total	2,840	68	27	7	44	6	2	21	93	1	162	80	34	1	1	1	124	2
Alta	74	3	3						1		10	3	3	1				
Andes	13	1							1		2		1				1	
Belcher	95	4	2		5				3		10	3	1				2	
Best & Belcher	50	2							1		4	3	1				4	
Bullion	40	1							1		2	2	1					
Caledonia	17										2							
Consolidated Imperial	75	2			2				2		2	3	1				1	
Consolidated Virginia and California (C. & C. shaft)	351	4	4	2	3	3			7		13	5	1				3	1
Crown Point and Kentuck	30				2						3	1					1	
C. N. S. shaft	65	3						2	2		8	3	2				3	
Forman shaft	57	1	2						3		6	2	1				2	
Gould & Curry	50	2		1	3				2		3	3	1				3	1
Hale & Norcross	66	2							1		7	2	1				2	
Julia	54	2							1		6	3	3				2	
Justice	27				2								1					
Lady Bryan	31	2							1		3		2				3	
Mexican and Union shaft	469	4	4		3	3		13	24		7	4	1				36	
Mint	11										2		1				2	
New York	26	2									3	3					3	
North Bonanza and Flowery	51	2			3				2		3	3					2	
Ophir	360	2	3	3	3				7		15	6	1				8	
Original Keystone	31	2	1		3			2	2		3		1				2	
Osbiston shaft	39	1	1		3			3	2		3	10	1				4	
Overman	46	2		1					1		4	2						
Occidental	17	3							1	1	2		1				1	
Savage	68	2	1		3				2		8	3	1					
Scorpion	46	1							5		4		1				7	
Sierra Nevada	92	6						1	2		2	3					2	
Silver Hill	46	2			3				1		5	3	1				2	
Sutro tunnel	117	3	3		6		2		4		4	2	1		1	1	9	
Utah	67	2	3						1		5	3	2				4	
Ward	39	1							2		4	2	1					
Yellow Jacket	220	4							11		7	3	1				15	

Mine.	Machinists.	Masons.	Mechanics.	Melters.	Millwrights.	Miners.	Molders.	Mule-drivers.	Oilers.	Painters.	Pipemen.	Porters.	Pumpmen.	Ropemen.	Shippers.	Teamsters.	Tinsmiths.	Watchmen.	Wood-passers.	Wood-sawyers.
Total	54	1	4	2	2	1,974	2	9	5	2	1	1	27	28	1	2	1	32	15	3
Alta						44							2	2				1	1	
Andes						7														
Belcher	2					55							2	2				2	2	
Best & Belcher	1					33												1		
Bullion						30								1				2		
Caledonia						12							1					1	1	
Consolidated Imperial	3					57								2						
Consolidated Virginia and California (C. & C. shaft)	5			2		277			3		1	1	2	3	1			5	3	2
Crown Point and Kentuck						22												1		
C. N. S. shaft						36							4	1				1		
Forman shaft	4					35												1		
Gould & Curry	2					26								2				1		
Hale & Norcross	3					47								1						
Julia	1					32							2	1				1		
Justice						20												4		
Lady Bryan						19							1							
Mexican and Union shaft	9	1				348							2	5				3	2	
Mint						6														
New York						15														
North Bonanza and Flowery						32							4							
Ophir	3					297			1				2	2				2	4	1
Original Keystone						15														
Osbiston shaft	1					9												1		
Overman	1					30			1					2				1	1	
Occidental						8														
Savage	3					40							2	1				2		
Scorpion						28														
Sierra Nevada	3					71								1					1	
Silver Hill	1					26							1	1						
Sutro tunnel	4					64		9								2	1	1		
Utah						44							2	1						
Ward						28												1		
Yellow Jacket	8		4		2	161	2			2										

RATE OF WAGES PAID PER SHIFT FOR DIFFERENT CLASSES OF EMPLOYÉS IN THE COMSTOCK MINES IN 1880.

Blacksmiths	$4 00 to $6 00
Blacksmiths' helpers	4 00
Brakemen	4 00 to 4 50
Car-men	4 00 to 4 50
Carpenters	5 00 to 6 50
Engineers	4 00 to 7 00
Firemen	4 00 to 4 50
Foremen	6 00 to 10 00
Laborers and surfacemen	3 50 to 4 00
Machinists	5 00 to 6 00
Miners	4 00 to 4 25
Pumpmen	4 00 to 6 00
Oilers	2 50 to 4 00
Ropemen	4 00 to 5 00
Shift bosses	5 00 to 6 00
Wood-passers and -sawyers	4 00

Table XLI and the foregoing statement are introduced by way of illustration, to show the division of labor more in detail than is practicable in tabulations covering the whole country.

SUPPLIES: THEIR CONSUMPTION AND COST.(a)

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

ALABAMA.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	CLEBURNE.	*Per cord.*	*Per bushel.*	*Per ton.*	*Per ton.*
1					

ARIZONA.

	MARICOPA.				
1	Globe	$4 00 to $5 00			
	MOHAVE.				
2	Cedar Valley	8 00			
3	Hualapai	8 00			
4	Owens	5 50			
	PIMA.				
5	Arivaca	5 00			
6	Tombstone	7 00 to 7 50			
	YAVAPAI.				
7	Big Bug		25 cts.		
8	Humbug	8 50			
	YUMA.				
9	Castle Dome				

CALIFORNIA.

	AMADOR.				
1	Amador City	$6 00			
2	Jackson	6 00			
3	Sutter Creek	6 00			
4	Volcano	3 50			
	CALAVERAS.				
5	Independence				
6	Mokelumne Hill				
	EL DORADO.				
7	Placerville				
8	Springfield	4 25			
	INYO.				
9	Cerro Gordo	8 50	20 cts.		
10	Coso	10 00	25 cts.		
	LASSEN.				
11	Hayden Hill				
	MARIPOSA.				
12	Hornitos	3 50			
13	Mariposa Estate				
	MONO.				
14	Bodie	10 75 to 15 00			
15	Indian	13 00			
	NEVADA.				
16	Grass Valley	4 25			
17	Nevada City	3 87 to 4 50			
	PLACER.				
18	Colfax	5 00			
	PLUMAS.				
19	Genesee Valley				
20	Indian Valley	2 00			
21	Quartz township	4 50			
22	Seneca				
	SAN BERNARDINO.				
23	Clark	8 50			
24	Dry Lake	15 00			
25	Silver Mountain	2 00			
	SAN DIEGO.				
26	Cargo Muchacho	3 00			
27	Pinecate	4 00			
	SHASTA.				
28	Pittsburg	3 50			
	SISKIYOU.				
29	Quartz Valley				
30	Sawyer's Bar	2 75	20 cts.		
31	South Fork Salmon	2 75	20 cts.	$10 96 to $18 00	
	TUOLUMNE.				
32	Confidence	2 50			
33	Jamestown	5 00			
34	Soulsbyville				

a It is evident that the information afforded by the schedules on which these tables are based is in many cases incomplete; but it was not judged best to discard such material as is here given. The variations in price depend largely upon the season at which supplies are bought and upon the amount purchased.

SUPPLIES: THEIR CONSUMPTION AND COST.

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

ALABAMA.

TIMBER.		Iron.	Steel.	Candles.	Nitro-glycerine powders.	Black powder.	Quicksilver.	Salt.	Bluestone.	
Board feet.	Other measure.									
Per M.		*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per ton.*	*Per pound.*	
$5 00 to $10 00				16 cts.						1

ARIZONA.

$45 00			20 cts.	17 to 25 cts.	50 to 80 cts.					1
							40 cts.	$100 00		2
				25 cts.	$1 00		70 cts.	60 00		3
		10 cts.	30 cts.				50 cts.	80 00	15 cts.	4
							42 cts.	60 00	9 cts.	5
50 00 to 55 00			22 cts.	20 to 27½ cts.	70 cts.		43 cts.		13¾ cts.	6
										7
			20 cts.	19 cts.	54 cts.					8
			25 cts.	20 cts.	40 to 75 cts.	60 cts.				9

CALIFORNIA.

$22 50		5 cts.	16 cts.	14 cts.	30 cts.		50 cts.			1
20 00										2
		10 cts.			30 cts.		45 cts.			3
20 00				20 cts.	40 cts.					4
							55 cts.			5
							40 cts.			6
							50 cts.			7
20 00		6 cts.	18 cts.		35 cts.		50 cts.			8
	15 cts. per running foot									9
										10
10 00 to 15 00		9 cts.	25 cts.	25 cts.	75 cts.	20 cts.	40 to 50 cts.			11
							40 cts.			12
30 00		2½ to 6¼ cts.	18 cts.		40 cts.		38 cts.	$50 00	15 cts.	13
42 00 to 50 00		8 to 10 cts.	14 cts.	16 to 22 cts.	36 to 38 cts.		50 cts.	35 00 to 50 00		14
										15
							40 cts.			16
16 00	Round, 18 cts				32 to 33 cts.		40 cts.	7 50		17
16 00 to 18 00					30 cts.					18
	11½ cts. per running foot		18 cts.	17½ cts.	56 cts.					19
20 00 to 30 00		7 cts.	20 cts.	17½ cts.	20 to 75 cts.	8½ cts.	60 cts.			20
90 00		6.15 to 6.9 cts.	7½ to 15 cts.	18¾ cts.	37 cts.		40 cts.			21
20 00		7 cts.	22 cts.	20 cts.	80 cts.	22½ cts.	50 cts.			22
	30 to 50 cts. per piece	8½ to 15 cts.	21 to 23 cts.	20 to 22½ cts.		20 cts.	45 to 50 cts.	50 00	18 cts.	23
45 00										24
35 00										25
							40 cts.			26
24 00										27
							45 cts.	22 00		28
15 00		6½ cts.		23¾ cts.		19 cts.	50 cts.			29
50 00 to 55 00		9 to 10 cts.	20 cts.	25 cts.	50 cts.	18 cts.	40 cts.			30
20 70 to 55 00		4 to 5½ cts.	19 cts.	20½ cts.	46.8 cts.	20 cts.	42 cts.			31
12 00				16 cts.	40 cts.					32
20 00										33
15 00		5 cts.	17 cts.	17 cts.	55 cts.					34

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

COLORADO.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	ARAPAHOE.	*Per cord.*	*Per bushel.*	*Per ton.*	*Per ton.*
1	Argo	$6 00		$4 50	
	BOULDER.				
2	Central	3 00 to 3 25	18 cts.		
3	Gold Hill	3 00 to 3 50			
4	Grand Island	2 00 to 3 50	18 to 20 cts.	25 00	
5	Magnolia	3 00			
6	Sugar-loaf				
7	Ward	2 50			
8				*a* 2 50	$15 00
	CHAFFEE.				
9	Chalk Creek				
10	Monarch				
	CLEAR CREEK.				
11	Argentine	5 00	18 cts.		
12	Banner				
13	Cascade				
14	Griffith	4 50 to 12 50	20 cts.		
15	Idaho				
16	Iowa				
17	Montana				
18	Morris				
19	Mountain				
20	Seaton				
21	Spanish Bar				
22	Trail Run				
23	Upper Union	3 00			
24	Virginia	4 00			
	CUSTER.				
25	Hardscrabble	4 25 to 5 00			
26	Verde	3 00		24 00	
27		3 00		18 00	
	GILPIN.				
28	Enterprise	5 00 to 6 00			
29	Enterprise and Mountain House				
30	Eureka	5 50 to 6 00			
31	Gregory	5 50 to 7 00		5 00 to 12 00	
32	Hawkeye				
33	Mountain House				
34	Nevada	5 50 to 7 00		5 75 to 7 00	
35	Quartz Valley			7 25	
36	Russell	6 00 to 7 00		7 00	
	GUNNISON.				
37	Tin Cup				
	HINSDALE.				
38	Galena	4 00	15 cts.		
39	Lake		15 cts.		
40	Park		28 cts.		
	HUERFANO.				
41	Third	3 00		10 00	
	JEFFERSON.				
42	Golden City			3 50 to 6 50	17 80
	LAKE.				
43	California	5 50 to 7 00	10 to 18 cts.		25 00 to 60 00
	OURAY.				
44	Iron Springs		25 cts.		
45	Pioneer		12 cts.		
46	Snefiles		20 cts.		
47	Uncompahgre	3 25	18 to 25 cts.		
48	Upper San Miguel		20 to 50 cts.	21 00	
	PARK.				
49	Buckskin	8 00	15 cts.		
50	Consolidated Montgomery	8 00			
51	Horseshoe				
52	Mosquito	8 00 to 35 00			
53	Sacramento		15 cts.		38 50
	PUEBLO.				
54	Pueblo			1 75	7 50
	RIO GRANDE.				
55	Summit	2 50	20 cts.		
	SAN JUAN.				
56	Animas	5 00	12 to 25 cts.		
57	Eureka	5 00	25 cts.		
58	Uncompahgre		20 to 28 cts.		

a Lignite.

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

COLORADO.

TIMBER. Board feet.	TIMBER. Other measure.	Iron.	Steel.	Candles.	Nitro-glycerine powders.	Black powder.	Quicksilver.	Salt.	Bluestone.	
Per M.		*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per ton.*	*Per pound.*	
										1
$18 00		3 to 5½ cts.	17 cts.	16¼ cts.		19 cts.	75 cts.			2
18 00		4 cts.	18 cts.		40 cts.		75 cts.			3
16 00 to 20 00		3 to 7 cts.	18 to 21 cts.	17½ to 40 cts.	38 to 40 cts.		75 cts.	$27 00		4
					40 cts.					5
18 00			18 cts.	16 cts.	40 cts.					6
							75 cts.			7
										8
		6½ cts.	20 cts.							9
			30 cts.							10
27 00		7½ cts.	22 cts.	16¼ cts.	40 cts.	18½ cts.				11
20 00		5¾ cts.	20 cts.	15 cts.	40 cts.	16 cts.				12
			22 cts.	20 cts.	18 cts.					13
20 00 to 50 00		5 to 6 cts.	20 cts.	14½ to 20 cts.	40 cts.	18½ cts.	45 cts.	24 00		14
10 00 to 25 00		6 cts.	22 cts.	15 to 20 cts.	40 cts.	14 to 16 cts.	50 cts.			15
10 00			20 cts.	20 cts.	40 cts.					16
15 00		4½ cts.	22 cts.	16 cts.	40 cts.					17
20 00 to 22 00		6 to 7 cts.	20 to 23 cts.	15 to 17 cts.	40 cts.	19 cts.	65 cts.			18
20 00		8 cts.	21 cts.	15 cts.	40 cts.					19
10 00		4½ cts.	14 cts.	14 cts.	36 cts.	15⅝ cts.				20
			20 to 22 cts.	15 cts.	40 cts.					21
15 00 to 25 00		4½ cts.	22 cts.	16 cts.	40 cts.	16 cts.				22
	5 cents per running foot	8 cts.	25 cts.	15 cts.			50 cts.			23
10 00		5 cts.	22 cts.	16 cts.		15 cts.				24
17 00 to 25 00		8¼ to 14 cts.	20 to 22 cts.	14 to 17½ cts.	30 to 45 cts.	15 to 15⅜ cts.	55 cts.	47 50	15½ cts.	25
20 00		6½ cts.	22 cts.	17½ cts.	40 cts.					26
10 00 to 35 00						16 cts.				27
		5 cts.	11 to 14 cts.				50 cts.			28
7 50		5 cts.	18 cts.	17 to 17½ cts.	40 cts.	15 cts.				29
20 00		5 cts.		15 cts.			50 cts.			30
20 00 to 25 00		4½ to 5 cts.	12 to 22½ cts.	15 cts.	40 cts.	16 cts.	50 to 51 cts.			31
25 00		5 cts.	10½ cts.	15 cts.	40 cts.	14 cts.				32
28 00			17 cts.	16 cts.						33
12 50 to 35 00		5 to 5½ cts.	12 to 21 cts.	15 to 17 cts.	40 cts.	14 to 16½ cts.	45 to 50 cts.			34
20 00		5 cts.	22 cts.	15 cts.	40 cts.	15 cts.				35
20 00 to 35 00		4½ cts.	16½ to 21 cts.	15 to 20 cts.	40 cts.					36
30 00		8 cts.	25 cts.	18 cts.	50 cts.	18 cts.				37
20 00		15 cts.	26 cts.	25 cts.	50 cts.	20 cts.				38
			28 cts.	25 cts.	50 cts.	20 cts.				39
75 00		18 cts.	27 cts.	27 cts.	45 cts.	20 cts.				40
50 00		8 cts.	25 cts.			18 cts.				41
										42
10 40		10½ to 11 cts.	17½ to 21½ cts.	16½ to 17½ cts.	42½ to 45 cts.	21½ cts.				43
7 00 to 17 00			25 to 30 cts.	22 to 30 cts.	28 to 85 cts.	20 to 25 cts.				44
10 00			32 cts.	17½ cts.		28 cts.				45
3 75			25 cts.	22½ cts.	50 cts.	20 cts.				46
5 00 to 10 00		12 cts.	21½ to 35 cts.	24½ to 30 cts.	50 to 65 cts.	21 to 25 cts.				47
5 00 to 40 00			25 to 40 cts.	22½ to 30 cts.	28 cts. to $1 00	11 to 30 cts.				48
25 00			22 cts.	18 cts.	50 cts.					49
50 00	$7 50 per cord	12½ cts.	22 cts.	17 cts.	50 cts.	16 to 17 cts.				50
		12 cts.	22 cts.	18 cts.	50 cts.					51
			22 to 25 cts.	18 to 18¾ cts.	50 cts.	16 to 18 cts.				52
		5 cts.	20 cts.	15 cts.	40 cts.	15 cts.				53
										54
		8 to 9 cts.	35 cts.	20 cts.		20 cts.	60 cts.			55
6 00 to 30 00		10 to 17 cts.	16 to 36 cts.	20 to 25 cts.	45 cts. to $1 00	20 to 25 cts.				56
11 00 to 25 00		10 to 17 cts.	23 to 30 cts.	22½ to 35 cts.	40 to 55 cts.	20 to 22 cts.				57
11 00 to 30 00		10 cts.	24 to 30 cts.	23 to 34 cts.	50 cts.	23 cts.				58

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

COLORADO—Continued.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	SUMMIT.	*Per cord.*	*Per bushel.*	*Per ton.*	*Per ton.*
59	Avalanche	$3 00 to $4 00	12½ cts.		
60	Bevan				
61	Consolidated Ten-mile	3 00			
62					

DAKOTA.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	CUSTER.				
1	Cole				
2	Custer				
3	Whitewood	$3 50			
	LAWRENCE.				
4	Bear Butte	2 50 to 4 00			
5	Lost Placer	5 00			
6	Whitewood	3 00 to 5 50			
	PENNINGTON.				
7	Cross				
8	Newton Forks				
9	Rockford				

GEORGIA.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	CHEROKEE.				
1	Hickory Flat				
2	Third and Second	75 cts.			
	FORSYTH.				
3	Third and First	90 cts.			
	HALL.				
4	Ninth				
	LINCOLN.				
5		50 to 80 cts.			
	M'DUFFIE.				
6	Republican	80 cts.			
	MERIWETHER.				
7		90 cts.			

IDAHO.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	ALTURAS.				
1	Bonaparte		22 cts.		
2	Middle Boisé	$3 50	25 to 30 cts.		
3	Queen's River	3 00	20 cts.		
4	Rocky Bar, or Bear Creek		25 cts.		
	BOISÉ.				
5	Banner	3 50	20 cts.		
6	Cañon Creek		25 cts.		
7	Granite	3 80	20 cts.		
8	Shaw's Mountain		12 to 20 cts.		
	LEMHI.				
9	Bay Horse		18 cts.		
10	Yankee Fork		20 cts.		
	OWYHEE.				
11	Carson	6 50 to 7 50	25 to 35 cts.		
12	Wagontown	4 50 to 5 00	25 to 40 cts.		

MAINE.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	HANCOCK.				
1	Sullivan			$4 00	
	PENOBSCOT.				
2	Carmel				
3				6 00	
	WASHINGTON.				
4	Fifth				

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

COLORADO—Continued.

TIMBER.		Iron.	Steel.	Candles.	Nitro-glycerine powders.	Black powder.	Quicksilver.	Salt.	Bluestone.	
Board feet.	Other measure.									
Per M.		*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per ton.*	*Per pound.*	
							47 cts.			59
$30 00			25 cts.	17½ cts.						60
	30 cts. per piece	5 cts.	14 cts.	15 cts.	47½ cts.					61
			24 cts.			20. 8 cts.				62

DAKOTA.

$20 00			25 cts.	20 to 30 cts.	50 cts.	17 to 18 cts.				1
2 00 to 20 00			22 to 25 cts.	18 to 30 cts.	50 to 60 cts.	18 to 20 cts.				2
17 00		8 cts.	20 cts.	18 cts.	45 cts.					3
10 00 to 25 00		8 to 10 cts.	22 to 30 cts.	18 to 30 cts.	45 to 50 cts.	14 to 18 cts.	45 cts.	$80 00		4
19 50 to 20 00		7 to 8 cts.	20 cts.	18 cts.	45 cts.	14 cts.	60 cts.			5
10 00 to 75 00		7 to 11 cts.	12½ to 28 cts.	18 to 20 cts.	45 cts.	14 to 15 cts.	45 to 65 cts.			6
			28 cts.	30 cts.	50 cts.	19 cts.				7
10 00 to 25 00			25 to 30 cts.	30 cts.	50 to 60 cts.	20 to 25 cts.				8
20 00 to 25 00		8 cts.	22 to 25 cts.	15 to 18 cts.	45 to 48 cts.	16 cts.				9

GEORGIA.

$10 00		3 cts.	17 cts.	12 cts.						1
		3 cts.	20 cts.	15 cts.						2
	50 cts. per cord	3 cts.	45 cts.	15 cts.	25 cts.	18 cts.				3
				20 cts.		18 cts.				4
10 00 to 12 50		3¼ to 4 cts.	16 cts.	15 to 16 cts.		13½ cts.				5
10 00		3 cts.	20 cts.	16 cts.		15 cts.				6
	$2 per cord		18 cts.	14 cts.	50 cts.					7

IDAHO.

	2 cts. per running foot	10 cts.	28 cts.	23 cts.	70 to 80 cts.					1
	$2 50 to $4 per set	12½ to 15 cts.	17 to 35 cts.	24 to 25 cts.	46 to 85 cts.		60 cts.	$97 50	18 cts.	2
	$2 50 per set		21 to 23 cts.	25 cts.	50 to 75 cts.					3
		12½ cts.	25 cts.	20 cts.	80 cts.		60 cts.			4
	2½ cts. per running foot	12 to 15 cts.	25 cts.	20 cts.	65 to 80 cts.		55 cts.	90 00	18 cts.	5
	do									6
		10 cts.	20 cts.	20 cts.	60 cts.		45 cts.			7
			25 cts.	25 cts.	80 to 90 cts.		50 cts.			8
			27 cts.	25 cts.	50 to 75 cts.	23 cts.				9
			27½ cts.	27 cts.	64 cts.					10
$50 00 to $100 00		9 to 15 cts.	20 to 35 cts.	20 to 25 cts.	50 to 90 cts.		48 cts.	80 00	12½ cts.	11
90 00		12½ to 13 cts.	25 to 30 cts.	25 to 27½ cts.	75 to 90 cts.		55 cts.	80 00	25 cts.	12

MAINE.

					45 cts.					1
$12 00			13 cts.		45 cts.					2
12 50		4½ cts.	14½ cts.		45 cts.					3
					46 cts.					4

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

MONTANA.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	BEAVER HEAD.	*Per cord.*	*Per bushel.*	*Per ton.*	*Per ton.*
1	Bald Mountain	$2 00			
2	Bannock				
3	Trapper	4 75			
4					
	DEER LODGE.				
5	Flint Creek	3 75 to 4 50			
6	Silver Creek	2 80 to 2 90			
7	Summit	4 50			
8	Summit Valley	3 50 to 5 00	16 cts.		
	JEFFERSON.				
9	Cedar Plains	6 00			
10	Colorado	4 00	15 cts.		
11	Elkhorn	2 50			
12	Mountain				
13		3 00			
	LEWIS AND CLARKE.				
14	Owyhee	5 00			
15	Silver Creek	3 25			
16	Stemple	2 50 to 3 00			
	MADISON.				
17	Hot Spring	8 50			
18	Lower Hot Spring				
19	Mineral Hill				
20	Silver Star				

NEVADA.

	ELKO.				
1	Columbia	$6 00	45 cts.		
2	Tuscarora	*a* 11 00	45 cts.		
	ESMERALDA.				
3	Columbus	16 00 to 20 00	40 cts.		
4	Esmeralda	8 00			
5	Oneota	5 00			
6	Wilson	7 00			
	EUREKA.				
7	Cortez	6 00	25 cts.		
8	Eureka	9 00 to 11 00	25 to 30 cts.		
9	Secret Cañon	4 50	15 cts.		
	HUMBOLDT.				
10	Mount Rose		35 to 50 cts.	$12 00	
11	Sierra, or Dun Glen				
	LANDER.				
12	Lewis	12 00			
13	Reese River	12 00	30 cts.		
	LINCOLN.				
14	Ely	6 00			
	NYE.				
15	Tybo	6 00			
16	Union	3 50			
	STOREY AND LYON.				
17	The Comstock	9 50 to 12 50	40 cts.		
	WHITE PINE.				
18	Cherry Creek	5 75 to 6 50			
19	Ward	5 30			
20	White Pine	7 50	25 cts.	8 50	

a Sagebrush, $2 40 to $2 50.

NEW MEXICO.

	GRANT.				
1	Choride Flat	$2 50			
2	Lone Mountain				
3	Pinos Altos				
4	Silver Flat	2 50			

NORTH CAROLINA.

	DAVIDSON.				
1	Emmons township	$0 80			
2		0 40			
	GASTON.				
3		1 25			

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

MONTANA.

Timber: Board feet.	Timber: Other measure.	Iron.	Steel.	Candles.	Nitro-glycerine powders.	Black powder.	Quicksilver.	Salt.	Bluestone.	
Per M.		*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per ton.*	*Per pound.*	
		22 cts.					50 cts.	$90 00	12 cts.	1
							90 cts.			2
										3
		20 cts.					55 cts.	70 00	20 cts.	4
$12 00 to $28 00		2 to 20 cts.	22 to 30 cts.	18 to 25 cts.	52 to 75 cts.	20 cts.	50 cts.	70 00 to 75 00	10 cts.	5
		9 to 10 cts.	18 cts.	21½ cts.	50 to 75 cts.	20 to 23¾ cts.	50 cts.			6
				20 cts.	90 cts.	20 cts.				7
12 00 to 25 00		6½ to 20 cts.	15 to 25 cts.	18 to 22 cts.	60 to 90 cts.	16 to 20 cts.	45 to 50 cts.	45 00 to 50 00	8½ to 15 cts.	8
2 00		9 cts.	17 cts.	15 cts.	75 cts.	18 cts.				9
										10
							50 cts.	60 00	12½ cts.	11
		7 cts.	23 to 25 cts.	20 to 21½ cts.	55 cts.	19 cts.				12
18 00		8 cts.	23 cts.	12½ cts.			60 cts.			13
		25 cts.		20 cts.		18 cts.				14
		7 to 8½ cts.	17½ cts.	20½ cts.	50 cts.	18¾ cts.	45 cts.	90 00		15
40 00		10 to 12 cts.	20 to 25 cts.	23 to 25 cts.	55 to 90 cts.	20 to 25 cts.	50 to 60 cts.			16
27 50		10 cts.	35 cts.	25 cts.			65 cts.			17
				21¼ cts.		18 cts.				18
			22 cts.	26 cts.		20 cts.				19
		10 cts.	22 to 25 cts.	25 cts.	60 to 90 cts.	17 to 18 cts.				20

NEVADA.

Board feet.	Other measure.	Iron.	Steel.	Candles.	Nitro-glycerine powders.	Black powder.	Quicksilver.	Salt.	Bluestone.	
	8 cts. per running foot	9 cts.	25 cts.	16¾ cts.	28 cts.		50 cts.	$40 00		1
$50 00	16 to 20 cts. per running foot	8¾ to 17 cts.	22 to 30 cts.	20 to 25 cts.	45 to 80 cts.		45 cts.	35 00	15 cts.	2
50 00			19 to 20 cts.	40 cts.			43 cts.	16 00		3
								35 00		4
								30 00		5
										6
60 00	$1 per running foot	9 cts.	23 cts.	21 cts.	37½ cts.		50 cts.	30 00		7
46 00 to 55 00		8 to 10 cts.	20 to 22 cts.	21¼ to 25 cts.	50 to 56 cts.	13 9/16 to 23¾ cts.				8
			22 cts.							9
		8 to 12 cts.	25 cts.	20 cts.	60 cts.		50 cts.	40 00	15 cts.	10
			19 cts.	14 cts.						11
			22 cts.	20 cts.						12
							45 cts.	30 00		13
	55 cts. per running foot	10 cts.	24 cts.	22½ cts.	85 cts.	20 cts.				14
		12 cts.					50 cts.	60 00		15
				22½ cts.	74 cts.		45 cts.	35 00		16
17 50 to 25 00		5½ to 8 cts.	12 to 21 cts.	13 to 20 cts.	35 to 55 cts.		40 to 45 cts.	20 00	10 cts.	17
40 00		6 to 8 cts.	18 cts.	21 cts.	45 to 80 cts.	18 cts.	45 cts.	30 00	9 cts.	18
		10 cts.		20 cts.	80 cts.		50 cts.	35 00		19
75 00			22 to 25 cts.	20 to 24 cts.	58 cts.		50 cts.	35 00		20

NEW MEXICO.

Board feet.	Other measure.	Iron.	Steel.	Candles.	Nitro-glycerine powders.	Black powder.	Quicksilver.	Salt.	Bluestone.	
$45 00		5 cts.	25 to 28 cts.	20 cts.		18 to 20 cts.				1
45 00		5 cts.	23½ cts.	20 cts.		18 cts.				2
40 00		5 to 6 cts.	25 cts.	22 cts.		20 cts.				3
45 00 to 50 00		2½ to 5 cts.	25 cts.	20 cts.	45 cts.	20 cts.	54 cts.	$50 00	14½ cts.	4

NORTH CAROLINA.

Board feet.	Other measure.	Iron.	Steel.	Candles.	Nitro-glycerine powders.	Black powder.	Quicksilver.	Salt.	Bluestone.	
$7 50				14 cts.		15 cts.				1
10 00		4½ cts.	16 cts.							2
		5 cts.	16 cts.	13 cts.	50 cts.	15 cts.				3

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

NORTH CAROLINA—Continued.

	County and district.	Wood.	Charcoal.	Coal.	Coke.
	GUILFORD.	*Per cord.*	*Per bushel.*	*Per ton.*	*Per ton.*
4					
	MECKLENBURG.				
5	Capp's Hill	$1 00			
6	Sixth	1 75			
7		1 60			
	MOORE.				
8					
	ROWAN.				
9		0 70			

OREGON.

	BAKER.				
1	Burnt River				
2	Connor Creek	$6 00			
3	Pocahontas				
4	Rye Valley	3 00 to 3 50			
5	Silver Creek				
6		5 00			

UTAH.

	BEAVER.				
1	San Francisco	$2 50	17 to 18 cts.		
	SALT LAKE.				
2	West Mountain	6 00 to 3 00	10 to 12½ cts.	$7 00 to $15 00	$20 00 to $23 00
	SUMMIT.				
3	Uinta	3 25 to 4 00		8 25 to 10 75	
	TOOELE.				
4	Ophir				
5	Rush Valley	4 00		$9 50	
	UTAH.				
6	American Fork				
	WASATCH.				
7	Snake Creek				
	WASHINGTON.				
8	Harrisburg, or Silver Reef	7 00 to 8 00		15 00	

VIRGINIA.

	CULPEPER.				
1		$1 00		$6 00	
	LOUISA.				
2	Coohoo	1 50			

TABLE XLII.—DEEP MINES: PRICES OF MINE AND MILL SUPPLIES.

NORTH CAROLINA—Continued.

TIMBER.		Iron.	Steel.	Candles.	Nitro-glycerine powders.	Black powder.	Quicksilver.	Salt.	Bluestone.	
Board feet.	Other measure.									
Per M.		*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per pound.*	*Per ton.*	*Per pound.*	
$7 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
10 00	.....	5 cts.	16 cts.	16 cts.	45 cts.	.....	.....	.....	.....	5
10 00	.....	3 cts.	17 cts.	13 cts.	45 cts.	.....	.....	.....	.....	6
.....	.....	*a* $\frac{7}{10}$ cts.	.....	.....	.....	.....	45 cts.	.....	.....	7
10 00	.....	2 cts.	18 cts.	16 cts.	45 cts.	.....	.....	.....	.....	8
40 00	.....	3½ cts.	18 cts.	10½ cts.	50 cts.	.....	.....	.....	.....	9

a Scrap iron.

OREGON.

$25 00	.....	11 to 12½ cts.	25 cts.	20 cts.	$1 00	.....	$1 00	.....	.....	1
9 40	.....	14 cts.	22 cts.	20 cts.	70 cts.	.....	68 cts.	.....	.....	2
25 00	.....	.....	25 cts.	25 cts.	85 cts.	50 cts.	.....	.....	.....	3
11 00	.....	25 cts.	17 cts.	25 cts.	1 00	.....	60 cts.	.....	15 cts.	4
.....	.....	15 cts.	20 cts.	10 cts.	90 cts.	.....	.....	.....	.....	5
20 00	.....	12½ cts.	20 cts.	12 cts.	75 cts.	.....	75 cts.	.....	.....	6

UTAH.

.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	8⅝ cts.	.....	.....	.....	.....	.....	2
$27 50 to $50 00	.....	.....	20 cts.	.....	85 cts.	.....	.....	$8 00	.....	3
.....	.....	.....	.....	20 cts.	.....	12½ cts.	.....	.....	.....	4
30 00	.....	9 cts.	20 cts.	16⅙ cts.	.....	14⅔ cts.	.....	.....	.....	5
.....	7 cts. per running foot	.....	.....	.....	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	20 cts.	85 cts.	.....	.....	.....	.....	7
45 00	15 to 18 cts. per running foot	.....	24 to 25 cts.	21⅓ to 23¾ cts.	85 cts.	18 to 19 cts.	45 cts.	$30 00	15 to 17 cts.	8

VIRGINIA.

.....	.....	.....	.....	10 cts.	37½ cts.	15 cts.	.....	.....	.....	1
$12 00	.....	3 cts.	15½ cts.	.....	40 cts.	.....	.....	.....	.....	2

It needs but a moment's consideration to perceive how important an influence the prices of supplies have upon the mining industries, and how they enter into all discussions of the methods employed. Processes which yield a fair profit in localities where labor and supplies are to be had at low rates would result in a loss in a great portion of the mining districts of the far West, and processes and methods developed in other regions must be modified to suit the local economical conditions or be abandoned. The higher cost of mine supplies in the mining camps of the West, as compared with the prices demanded for the same articles at centers like San Francisco, Saint Louis, or Chicago, is almost entirely due to expense of transportation. This often exceeds the original cost of the article transported, and sometimes reverses the relative value of materials in their technical application. Steel may be worth four times as much as iron at commercial centers; but as the freight on each metal is the same, steel at a mining camp may be worth but twice as much as iron. If, for a given purpose, steel will do three times as much service as iron, the latter will be employed at centers of commerce, while the former will be more economical in the mining regions. The application of these relations to the choice of boilers has already been pointed out, and many instances will occur to the professional reader in which they would govern the choice of material, apparatus, and process.

As has been mentioned, the price of articles of uniform quality, such as candles and quicksilver, is a gauge of the rates of transportation and an index of the cost of supplies excepting such as the locality itself may supply. Salt is naturally cheap near the Great Salt lake and other deposits, while at long distances from them it is extremely expensive. At the Uintah district, Utah, salt is worth $8 per ton, but in some districts in Arizona it sells for $100. It might clearly be more economical to amalgamate raw an ore in Arizona containing a considerable proportion of rebellious silver minerals, which it would be folly not to roast if it were found at the Uintah district. Similarly it will make a great difference in the system of timbering a mine whether timber is worth $6 or $100 per thousand feet.

TABLE XLIII.—DEEP MINES: ITEMIZED COST OF SUPPLIES.

State or territory and county.	No. of mines reported.	Coal.	Charcoal.	Wood.	Timber.	Iron.	Steel.	Candles.	Explosives.	Sundries.
ALABAMA.										
Cleburne	1				$78 00			$64 00		
Talladega	1									$50 00
ARIZONA.										
Maricopa	2									8,476 00
Mohave	1							20 00	$100 00	
Pima	14			$3,303 00	3,690 00		$50 00	120 00	1,200 00	25,113 00
Pinal	8									4,489 00
Yuma	1				429 00					1,330 00
CALIFORNIA.										
Amador	4			29,646 00	31,930 50	$6,050 00	5,692 00	3,091 00	5,790 00	4,860 00
El Dorado	2			6,587 50	280 00	43 20	216 00	780 00	780 00	
Inyo	6			4,250 00						24,575 56
Lassen	3									11,404 00
Mariposa	1				2,400 00	90 00	78 00	67 50	1,020 00	
Mono	18			131,607 00	26,261 00	1,126 00	877 00	5,583 00	10,044 00	4,065 43
Novada	5			4,700 00	710 00	110 00	75 00	680 00	10,031 20	
Placer	1				170 00				1,200 00	
Plumas	6			3,064 50	9,328 63	2,995 85	1,963 63	5,030 72	11,587 61	321 00
San Bernardino	2				1,505 00	170 00	335 00	1,095 00	1,350 00	
Siskiyou	3	$651 90	$1,500 00	3,011 25	6,838 20	1,422 94	681 32	2,332 25	4,281 00	3,042 45
Tuolumne	2			1,250 00	725 00	150 00	170 00	580 00	1,000 00	
COLORADO.										
Boulder	10	200 00	1,164 00	13,535 00	6,930 00	1,043 70	1,957 70	6,972 00	9,080 00	360 00
Chaffee	2					78 00	35 00	141 00	3 70	
Clear Creek	31		654 18	1,543 20	4,969 50	6,766 53	2,086 60	6,111 20	14,556 15	19,382 42
Custer	7	408 00		6,018 00	11,123 00	3,204 50	1,308 00	2,212 00	3,546 00	504 00
Gilpin	25	3,010 00		57,168 50	12,267 92	3,180 00	1,969 12	7,813 57	10,308 17	846 45
Gunnison	1				750 00	240 00	125 00	72 00	182 50	
Hinsdale	3		117 00		425 00	150 00	414 60	328 50	635 00	
Huerfano	1	60 00		30 00	150 00	280 00	125 00		245 60	
Lake	21		420 00	28,855 00	90,829 14	6,253 19	2,336 99	13,083 90	11,083 19	190,563 76
Ouray	16	42 00	355 55		2,018 33	204 00	574 10	606 00	2,586 05	
Park	9		37 50	2,824 00	361 25	217 77	596 22	1,177 20	3,434 80	1,000 00
Rio Grande	1		14 00			27 00	175 00	8 00	50 00	
San Juan	18		2,231 00	9,000 00	1,293 08	1,215 00	2,492 45	3,694 13	9,551 11	
Summit	4			4,900 00	210 00	450 00	930 50	2,056 00	2,524 60	
DAKOTA.										
Custer	9			315 00	688 50	1,664 00	158 85	118 80	1,433 85	
Lawrence	41			431 75	30,251 45	8,133 71	4,436 49	7,522 20	40,590 85	150,762 00
Pennington	7				510 00	80 00	239 70	153 00	1,377 50	
GEORGIA.										
Cherokee	2			90 00	50 00	9 00	11 50	112 80		
Cobb	1									300 00
Forsyth	1			985 50	50 00	15 00	22 50	108 00	39 30	
Hall	2					60 00	100 00	80 00	15 75	400 00
Lincoln	2			692 70	280 81	8 50	8 00	83 80	54 45	
McDuffie	1			361 60	40 00	15 00	40 00	144 64	60 00	
Meriwether	1			382 85	100 00		18 00	39 62	25 00	
IDAHO.										
Alturas	12		854 50	2,328 50	4,612 50	1,034 00	491 71	1,633 00	4,149 50	300 00
Boisé	6		575 50	6,050 00	4,310 00	50 00	378 75	1,528 00	3,021 00	2,725 00
Lemhi	2		326 00		1,250 00		82 00	552 40	1,767 00	
Owyhee	8		1,005 75	4,850 00	2,698 00	211 80	509 75	896 40	3,721 00	1,277 50

TABLE XLIII.—DEEP MINES: ITEMIZED COST OF SUPPLIES—Continued.

State or territory and county.	No. of mines reported.	Coal.	Charcoal.	Wood.	Timber.	Iron.	Steel.	Candles.	Explosives.	Sundries.
MAINE.										
Hancock	1	$300 00							$1,800 00	
Penobscot	2	900 00			$420 00	$382 50	$127 50		1,012 50	
Washington	1								690 00	
MONTANA.										
Beaver Head	8			$4,750 00						$1,555 00
Deer Lodge	24			42,615 00	23,161 10	2,454 30	7,032 20	$10,305 50	19,602 70	
Jefferson	4			936 00	478 00	177 80	112 95	300 50	311 50	
Lewis and Clarke	5		$648 00	1,100 00	200 00	263 00	521 50	1,200 50	3,082 45	
Madison	5				545 50	10 00	183 80	457 00	753 75	
NEVADA.										
Elko	11		1,791 00	74,203 50	18,219 72	1,149 13	803 00	5,346 75	13,741 50	437 50
Esmeralda	10			5,280 00	4,000 00	868 20			1,584 00	46,510 56
Eureka	18		974 10	27,279 00	13,345 19	2,977 42	2,385 10	7,893 73	15,749 67	110,086 61
Humboldt	2	24 00	300 00		240 00	133 00	65 00	306 00	1,200 00	150 00
Lander	1			6,564 00			132 00	960 00	1,128 00	
Lincoln	1			43,200 00	3,025 00	2,500 00	1,440 00	4,320 00	4,060 00	
Nye	3				6,000 00			1,080 00	7,992 00	12,840 00
Storey and Lyon	32			1,100,000 00	500,000 00	52,435 14	22,003 92	123,265 64	208,127 60	200,000 00
White Pine	4		18 75	37,747 00	8,474 00	2,854 50	1,044 50	2,517 00	22,335 50	2,540 58
NEW MEXICO.										
Grant	10			117 50	1,742 12	53 95	925 75	1,187 80	2,741 10	25 00
Santa Fé	1					1 25	35 00	32 00	50 00	
NORTH CAROLINA.										
Davidson	4			1,590 40	5,350 00	630 00	550 00	672 00	975 00	826 00
Gaston	1			1,125 00		25 00	240 00	780 00	487 50	
Guilford	1				240 00			1 45		
Mecklenburg	2			2,709 00	530 00	77 00	126 00	313 60	551 25	
Moore	1			336 00	200 00	4 00	180 00	48 00	135 00	
Nash	1									600 00
Rowan	1			1,330 00	200 00	17 50	50 00	604 80	140 00	
Stanley	1									200 00
OREGON.										
Baker	6		240 00	25,900 00	4,014 76	724 00	880 00	1,010 20	3,725 30	
Grant	2				540 00	160 00	256 00	846 00	1,385 00	
Josephine	1					4 00	15 00	52 50	75 00	
UTAH.										
Beaver	11									55,405 78
Juab	7				1,200 00					13,214 00
Pi Ute	2									2,600 00
Salt Lake	41	2,000 00		4,000 00	830 00	200 00	150 00	1,402 00	2,692 00	121,613 92
Summit	6	7,685 50		42,460 50	1,602 23	2,803 64		3,144 00	5,178 80	23,338 90
Tooele	12	242 25		1,000 00	490 17	519 93	150 20	665 50	253 30	14,582 22
Utah	6				1,500 00					4,725 00
Wasatch	7				350 00	150 00		400 00	255 00	15,724 50
Washington	7	968 01	173 80	522 25	1,505 86	112 85	495 05	2,497 71	4,693 23	10,105 95
VIRGINIA.										
Buckingham	1									700 00
Culpeper	1	6 00		70 00			10 00	88 00	190 05	
Fauquier	1									2,000 00
Louisa	1			487 50	180 00	30 00	46 50		60 00	90 00
Stafford	1									600 00
WASHINGTON.										
Yakima	1									500 00

TABLE XLIV.—DEEP MINES: ITEMIZED COST OF SUPPLIES.

RECAPITULATION BY STATES AND TERRITORIES.

State or territory.	No. of mines reported.	Coal.	Charcoal.	Wood.	Timber.	Iron.	Steel.	Candles.	Explosives.	Sundries.
Total	589	$17,397 66	$13,400 63	$1,752,203 50	$859,172 55	$118,376 80	$71,718 45	$248,485 81	$502,792 98	$1,097,719 18
Alabama	2				78 00			64 00		50 00
Arizona	21			3,303 00	4,119 00		50 00	140 00	1,300 00	39,408 00
California	53	651 90	1,500 00	184,116 25	80,154 33	12,067 99	10,087 95	19,239 47	49,783 81	48,868 44
Colorado	149	4,620 00	4,993 23	122,973 70	131,327 22	23,309 69	15,076 28	44,365 50	68,695 27	212,656 63
Dakota	57			746 75	31,449 95	9,877 71	4,835 04	7,794 00	43,402 20	150,762 00
Georgia	10			2,512 65	520 81	107 50	200 00	568 86	194 50	700 00
Idaho	28		2,761 75	13,228 50	12,870 50	1,295 80	1,462 21	4,609 80	12,658 50	4,302 50
Maine	4	1,200 00			420 00	382 50	127 50		3,502 50	
Montana	46		648 00	49,401 00	24,384 60	2,905 10	7,850 45	12,269 50	23,750 40	1,555 00
Nevada	82	24 00	3,083 85	1,294,273 50	553,304 00	62,917 39	27,873 52	145,689 12	275,918 27	372,565 25
New Mexico	11			117 50	1,742 12	55 20	960 75	1,219 80	2,791 10	25 00
North Carolina	12			7,090 40	6,520 00	753 50	1,192 00	2,419 85	2,288 75	1,626 00
Oregon	9		240 00	25,900 00	4,554 76	888 00	1,151 00	1,908 70	5,185 30	
Utah	99	10,895 76	173 80	47,982 75	7,547 26	3,786 42	795 25	8,109 21	13,072 33	261,310 36
Virginia	5	6 00		557 50	180 00	30 00	56 50	88 00	250 05	3,390 00
Washington	1									500 00

TABLE L.—DEEP MINES: ACCIDENTS NOT FATAL.

State or territory.	Total.	CAUSE.												
		Caving, fall of roof, etc.	Premature explosions.	From unexploded charges.	Falls unconnected with hoisting machinery.	Falling of cages, buckets, etc.	Falling from cages, buckets, etc.	Crushed by cages, cars, etc.	Struck by falling timbers, buckets, etc.	Overwinding of cages, etc.	Caught by machinery.	Carelessness in handling tools.	Leading.	Unclassified.
The United States	312	110	39	4	26	13	5	6	12	17	11	8	35	26
Alabama	1									1				
Arizona	6				1	2	1							2
California	39	10	9		2	3	1		1		1	1		2
Colorado	87	39	22	1	8	3	1	2	2			2		7
Dakota	11	3	5		1				1			1		
Georgia	2				1									1
Idaho	1	1												
Maine	5		1		3				1					
Montana	5	3			1									1
Nevada	51	13	1		4	1	2	4	4	15	4	1		2
North Carolina	8					3					5			
Oregon	4	3												1
Utah	86	24	1	3	5	1			3	1		3	35	10
Virginia	1										1			
Wyoming	5	5												

TABLE LI.—DEEP MINES: TOTAL ACCIDENTS.

State or territory.	Total.	CAUSE.														
		Caving, fall of roof, etc.	Premature explosions.	Falls unconnected with hoisting machinery.	Leading.	Falling of cages, buckets, etc.	Overwinding of cages, buckets, etc.	Struck by falling timbers, buckets, etc.	Crushed by cages, cars, etc.	Falling from cages, buckets, etc.	Caught by machinery.	Fire.	Carelessness in handling tools.	From unexploded charges.	Suffocation not caused by fire.	Unclassified.
The United States	435	135	55	53	35	24	19	16	13	12	11	9	8	6	4	35
Alabama	1						1									
Arizona	11		2	1		4				1				1		2
California	69	24	9	10		10		3	2	1	1		1		1	7
Colorado	108	48	26	12		3		3	3	2			2	1		8
Dakota	23	4	11	4		1		1		1			1			
Georgia	2			1												1
Idaho	1	1														
Maine	5		1	3				1								
Montana	8	5		2												1
Nevada	79	16	3	11		2	17	5	6	6	4	3	1		1	4
North Carolina	10			2		3					5					
Oregon	4	3														1
Utah	107	28	3	7	35	1	1	3	2	1		6	3	4	2	11
Virginia	1										1					
Wyoming	6	6														

TABLE LII.—ALL MINES (DEEP AND PLACER): ACCIDENTS.

State or territory.	Total.	RESULT.	
		Fatal.	Not fatal.
The United States	472	136	336
Alabama	1		1
Arizona	12	5	7
California	97	39	58
Colorado	109	22	87
Dakota	24	13	11
Georgia	2		2
Idaho	2		2
Maine	5		5
Montana	8	3	5
Nevada	79	28	51
North Carolina	10	2	8
Oregon	9	2	7
Utah	107	21	86
Virginia	1		1
Wyoming	6	1	5

TABLE LIII.—DEEP MINES: ACCIDENTS.

Cause.	Total.	RESULT.	
		Fatal.	Not fatal.
Total	435	123	312
Caving, fall of roof, etc	135	25	110
Premature explosions	55	16	39
Falls unconnected with hoisting machinery	53	27	26
Leading (a)	35		35
Falling of cages, buckets, etc	24	11	13
Overwinding of cages, buckets, etc	19	2	17
Struck by falling timbers, buckets, etc	16	4	12
Crushed by cages, cars, etc	13	7	6
Falling from cages, buckets, etc	12	7	5
Caught by machinery	11		11
Fire	9	9	
Carelessness in handling tools	8		8
From unexploded charges	6	2	4
Suffocation not caused by fire	4	4	
Unclassified	35	9	26

a Leading, or sickness caused by the inhalation of carbonate dust in dry lead mines, and also of lead fumes about metallurgical works, is much more frequent than appears from this exhibit. The small number of cases included under this head includes merely such serious injuries as occurred in mines reported by special schedule.

TABLE LIV.—DEEP MINES: PERCENTAGE OF DIFFERENT CLASSES OF ACCIDENTS.

Cause.	PERCENTAGE FROM EACH CAUSE IN—		
	Total accidents.	Fatal accidents.	Accidents not fatal.
Total	100.00	100.00	100.00
Caving, fall of roof, etc	31.03	20.33	35.26
Premature explosions	12.64	13.01	12.50
Falls unconnected with hoisting machinery	12.18	21.95	8.33
Leading	8.05		11.22
Falling of cages, buckets, etc	5.51	8.94	4.17
Overwinding of cages, buckets, etc	4.37	1.62	5.45
Struck by falling timbers, buckets, etc	3.68	3.25	3.85
Crushed by cages, cars, etc	2.99	5.69	1.92
Falling from cages, buckets, etc	2.76	5.69	1.60
Caught by machinery	2.53		3.53
Fire	2.07	7.32	
Carelessness in handling tools	1.84		2.56
From unexploded charges	1.38	1.63	1.28
Suffocation not caused by fire	0.92	3.25	
Unclassified	8.05	7.32	8.33

TABLE LV.—DEEP MINES: PERCENTAGE OF FATALITY IN EACH CLASS OF ACCIDENTS.

Cause.	PERCENTAGE.	
	Fatal accidents.	Accidents not fatal.
Total	28.28	71.72
Caving, fall of roof, etc	18.52	81.48
Premature explosions	29.09	70.91
Falls unconnected with hoisting machinery	50.94	49.06
Leading	.....	100.00
Falling of cages, buckets, etc	45.83	54.17
Overwinding of cages, buckets, etc	10.53	89.47
Struck by falling timbers, buckets, etc	25.00	75.00
Crushed by cages, cars, etc	53.85	46.15
Falling from cages, buckets, etc	58.33	41.67
Caught by machinery	.....	100.00
Fire	100.00	.....
Carelessness in handling tools	.....	100.00
From unexploded charges	33.33	66.67
Suffocation not caused by fire	100.00	.....
Unclassified	25.71	74.29

TABLE LVI.—DEEP MINES: PROPORTION OF ACCIDENTS TO NUMBER OF MINES REPORTED, ACCORDING TO CAUSE.

Cause.	TOTAL ACCIDENTS.		FATAL ACCIDENTS.		ACCIDENTS NOT FATAL.	
	Ratio to total number of mines reported.	Ratio to number of mines returning definite answers.	Ratio to total number of mines reported.	Ratio to number of mines returning definite answers.	Ratio to total number of mines reported.	Ratio to number of mines returning definite answers.
Total	1: 1.84	1: 1.74	1: 6.50	1: 6.15	1: 2.56	1: 2.43
Caving, fall of roof, etc	1: 5.93	1: 5.61	1: 32.00	1: 30.28	1: 7.27	1: 6.88
Premature explosions	1: 14.55	1: 13.76	1: 50.00	1: 47.31	1: 20.51	1: 19.41
Falls unconnected with hoisting machinery	1: 15.09	1: 14.28	1: 29.63	1: 28.04	1: 30.77	1: 29.11
Leading	1: 22.86	1: 21.63	0: 800.00	0: 757.00	1: 22.86	1: 21.63
Falling of cages, buckets, etc	1: 33.33	1: 31.54	1: 72.73	1: 68.82	1: 61.54	1: 58.22
Overwinding of cages, buckets, etc	1: 42.10	1: 39.84	1: 400.00	1: 378.50	1: 47.06	1: 44.53
Struck by falling timbers, buckets, etc	1: 50.00	1: 47.31	1: 200.00	1: 189.25	1: 66.67	1: 63.08
Crushed by cages, cars, etc	1: 61.54	1: 58.23	1: 114.28	1: 108.14	1: 133.33	1: 126.17
Falling from cages, buckets, etc	1: 66.67	1: 63.08	1: 114.28	1: 108.14	1: 160.00	1: 151.40
Caught by machinery	1: 72.73	1: 68.22	0: 800.00	0: 757.00	1: 72.73	1: 68.82
Fire	1: 88.89	1: 84.11	1: 88.89	1: 84.11	0: 800.00	0: 757.00
Carelessness in handling tools	1: 100.00	1: 94.63	0: 800.00	0: 757.00	1: 100.00	1: 94.63
From unexploded charges	1: 133.33	1: 126.17	1: 400.00	1: 378.50	1: 200.00	1: 189.25
Suffocation not caused by fire	1: 200.00	1: 189.25	1: 200.00	1: 189.25	0: 800.00	0: 757.00
Unclassified	1: 22.86	1: 21.63	1: 88.89	1: 84.11	1: 30.77	1: 29.11

TABLE LVII.—DEEP MINES: PROPORTION OF ACCIDENTS TO NUMBER OF MINES REPORTED, ACCORDING TO LOCALITY.

State or territory.	TOTAL ACCIDENTS.		FATAL ACCIDENTS.		ACCIDENTS NOT FATAL.	
	Ratio to total number of mines reported.	Ratio to number of mines returning definite answers.	Ratio to total number of mines reported.	Ratio to number of mines returning definite answers.	Ratio to total number of mines reported.	Ratio to number of mines returning definite answers.
The United States	1: 1.84	1: 1.74	1: 6.50	1: 6.15	1: 2.56	1: 2.43
Alabama	1: 2.00	1: 2.00	0: 2.00	0: 2.00	1: 2.00	1: 2.00
Arizona	1: 5.45	1: 5.27	1: 12.00	1: 11.60	1: 10.00	1: 9.67
California	1: 1.30	1: 1.19	1: 3.00	1: 2.73	1: 2.31	1: 2.10
Colorado	1: 2.33	1: 2.18	1: 12.00	1: 11.24	1: 2.89	1: 2.71
Dakota	1: 2.52	1: 2.52	1: 4.83	1: 4.83	1: 5.27	1: 5.27
Georgia	1: 5.00	1: 4.50	0: 10.00	0: 9.00	1: 5.00	1: 4.50
Idaho	1: 35.00	1: 35.00	0: 35.00	0: 35.00	1: 35.00	1: 35.00
Maine	1: 1.60	1: 1.40	0: 8.00	0: 7.00	1: 1.60	1: 1.40
Montana	1: 8.87	1: 8.75	1: 23.67	1: 23.33	1: 14.20	1: 14.00
Nevada	1: 0.85	1: 0.85	1: 2.39	1: 2.39	1: 1.31	1: 1.31
New Hampshire	0: 3.00	0: 2.00	0: 3.00	0: 2.00	0: 3.00	0: 2.00
New Mexico	0: 14.00	0: 12.00	0: 14.00	0: 12.00	0: 14.00	0: 12.00
North Carolina	1: 1.20	1: 1.20	1: 6.00	1: 6.00	1: 1.50	1: 1.50
Oregon	1: 2.25	1: 2.25	0: 9.00	0: 9.00	1: 2.25	1: 2.25
Utah	1: 0.84	1: 0.82	1: 4.20	1: 4.19	1: 1.05	1: 1.02
Virginia	1: 5.00	1: 5.00	0: 5.00	0: 5.00	1: 5.00	1: 5.00
Washington	0: 1.00	0: 1.00	0: 1.00	0: 1.00	0: 1.00	0: 1.00
Wyoming	1: 2.17	1: 0.67	1: 13.00	1: 4.00	1: 2.60	1: 0.80

TABLE LVIII.—DEEP MINES: ACCIDENTS—RATIO OF MEN KILLED OR INJURED TO NUMBER EMPLOYED, ACCORDING TO CAUSE.

Cause.	RATIO OF MEN KILLED OR INJURED TO NUMBER EMPLOYED.		
	Total accidents.	Fatal accidents.	Accidents not fatal.
Total	1 : 44.02	1 : 155.67	1 : 61.37
Caving, fall of roof, etc	1 : 141.83	1 : 765.88	1 : 174.06
Premature explosions	1 : 348.13	1 : 1,196.69	1 : 490.95
Falls unconnected with hoisting machinery	1 : 361.26	1 : 709.15	1 : 736.42
Leading	1 : 547.06	0 : 19,147.00	1 : 547.06
Falling of cages, buckets, etc	1 : 797.79	1 : 1,740.63	1 : 1,472.84
Overwinding of cages, buckets, etc	1 : 1,007.74	1 : 9,573.50	1 : 1,126.30
Struck by falling timbers, buckets, etc	1 : 1,196.69	1 : 4,786.75	1 : 1,595.58
Crushed by cages, cars, etc	1 : 1,472.84	1 : 2,735.28	1 : 3,191.17
Falling from cages, buckets, etc	1 : 1,595.58	1 : 2,735.28	1 : 3,829.40
Caught by machinery	1 : 1,740.63	0 : 19,147.00	1 : 1,740.63
Fire	1 : 2,127.44	1 : 2,127.44	0 : 19,147.00
Carelessness in handling tools	1 : 2,393.37	0 : 19,147.00	1 : 2,393.37
From unexploded charges	1 : 3,191.17	1 : 9,573.50	1 : 4,786.75
Suffocation not caused by fire	1 : 4,786.75	1 : 4,786.75	0 : 19,147.00
Unclassified	1 : 547.06	1 : 2,127.44	1 : 736.42

TABLE LIX.—DEEP MINES: ACCIDENTS—RATIO OF MEN KILLED OR INJURED TO NUMBER EMPLOYED, ACCORDING TO LOCALITY.

State or territory.	RATIO OF MEN KILLED OR INJURED TO NUMBER EMPLOYED.		
	Total accidents.	Fatal accidents.	Accidents not fatal.
The United States	1 : 44.02	1 : 155.67	1 : 61.37
Alabama	1 : 17.00	0 : 17.00	1 : 17.00
Arizona	1 : 77.55	1 : 170.60	1 : 142.17
California	1 : 45.78	1 : 165.30	1 : 81.00
Colorado	1 : 56.67	1 : 291.43	1 : 70.34
Dakota	1 : 41.74	1 : 80.00	1 : 87.27
Georgia	1 : 72.50	0 : 145.00	1 : 72.50
Idaho	1 : 431.00	0 : 431.00	1 : 431.00
Maine	1 : 26.20	0 : 131.00	1 : 26.20
Montana	1 : 145.50	1 : 382.00	1 : 232.80
Nevada	1 : 44.94	1 : 126.79	1 : 69.61
New Hampshire	0 : 26.00	0 : 26.00	0 : 26.00
New Mexico	0 : 215.00	0 : 215.00	0 : 215.00
North Carolina	1 : 52.90	1 : 264.50	1 : 66.13
Oregon	1 : 29.00	0 : 116.00	1 : 29.00
Utah	1 : 14.30	1 : 72.86	1 : 17.79
Virginia	1 : 105.00	0 : 105.00	1 : 105.00
Washington	0 : 7.00	0 : 7.00	0 : 7.00
Wyoming	1 : 14.83	1 : 89.00	1 : 17.80

These tables are based upon the entire number of miners reported, 19,147, employed in 693 mines. Calculated per thousand men, the entire number of accidents during the census year for these mines was $22\frac{7}{10}$, of which $6\frac{4}{10}$ were fatal, and $16\frac{3}{10}$ caused only temporary disability. This proportion would have been very much reduced had the investigation included all the small mines, for, as will appear by inspecting the table of causes, a very large proportion of the accidents is connected with hoisting machinery. Taking this fact into consideration, the number of accidents compares favorably with that which occurs in European countries, where the mines are subjected to frequent and rigid inspection by government officers for the express purpose of insuring safety to the miners. In 1875, $2\frac{6}{100}$ per 1,000 employed in the French mines were reported as killed and $17\frac{73}{100}$ per 1,000 as wounded.

The most fruitful causes of accidents are the caving or falling of roofs and falls connected with hoisting machinery. "Leading" is a source of accidents not met with in most mining countries. It occurs in lead mines which are so dry that the ore fills the air as dust. This is the case only above the water-level, which, however, in many mines of the Great Basin, is several hundred feet below the surface. On the Comstock about 12 per cent. of the accidents are due to heat.