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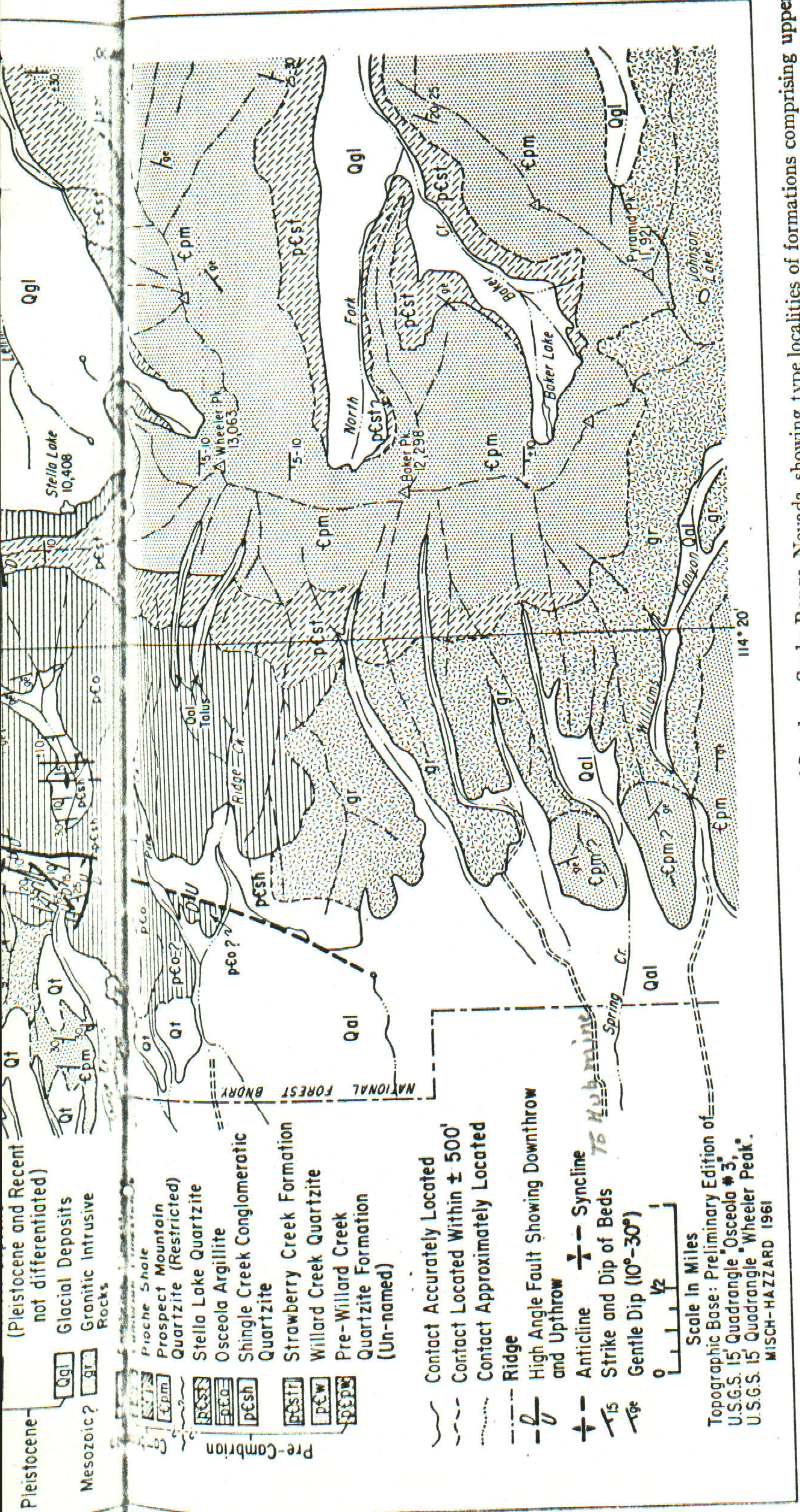


PLATE 1.—Geologic map of Wheeler Peak-Strawberry Creek area, northern part of Southern Snake Range, Nevada, showing type localities of formations comprising upper part of Late Precambrian McCoy Creek Group. Type localities are indicated by numbers 2 to 6, corresponding with formation descriptions in Part I of text.  
2—Willard Creek Quartzite; 3—Strawberry Creek Formation; 4—Shingle Creek Conglomeratic Quartzite; 5—Osceola Argillite; 6—Stella Lake Quartzite; 1 indicates best exposure of pre-Willard-Creek-Quartzite strata for which no formation name is proposed.

Tungsten district

Misch and Hazzard, 1962, pl. 1

see Osceola

file Tungsten district,



Min, Res, of the U.S. 1906

file Tungsten Dist,

NICKEL, COBALT, VANADIUM, ~~ETC~~ Tungsten 525

Large quantities of sodium tungstate are manufactured, much of which is said to be used in fireproofing cloth for curtains, drapery, etc., and as a mordant in dyeing. Other tungsten salts are used in weighting silks. When the silks are dyed, tungsten salts, owing to their high specific gravity, are introduced to give more apparent weight to the fabric.

*Colorado.*—During 1906 Boulder County, Colo., was the greatest producing locality. Some work was done in this field during the year by Mr. Waldemar Lindgren, of the United States Geological Survey, who has written a short description of the deposits, for publication in the current volume of Economic Geology. Mining has been carried down to a depth of between 200 and 300 feet, and the ores are apparently of about the same grade as nearer the surface. The ore is wolframite.

*California.*—There was considerable activity in tungsten mining in California during the year, and there will probably be still more in 1907. There is a good deal of work being done in the neighborhood of Randsburg, along the Kern-San Bernardino County line, where scheelite (calcium tungstate) occurs in the gold mines and also in quartz veins unaccompanied by gold. At the Sidney mine, in the Stringer district, 5 to 6 miles southwest of Randsburg, scheelite occurs in thin veins, up to 4 inches in thickness, to a depth of over 200 feet.

The most important known tungsten vein of the vicinity is on the Papoose claim, at Atolia,  $4\frac{1}{2}$  miles southeast of Johannesburg, on which large improvements were made and much work was done during 1906.

A small quantity of scheelite was also produced in the Amalie district during the year. This district is about 35 miles east and a trifle south of Bakersfield, and is reached by a stage ride of about 15 miles from Caliente on the Southern Pacific Railroad; it has produced scheelite at irregular intervals for a number of years.

Scheelite has been reported from Manvel, San Bernardino County, a number of times, but the rocks taken for that mineral have so far proved to be something else. Scheelite is also reported from Kelso, on the Salt Lake Railroad.

A small quantity of wolframite has been found about 12 miles northeast of Raymond, Madera County.

*Arizona.*—The output from Arizona for the year was small. A few tons of wolframite were shipped from Kingman, Mohave County, that had been obtained at points within a radius of about 50 miles. The deposits at Dragoon, Cochise County, were worked in a small way during the year; and at Benson, a few miles west of Dragoon, a small quantity was obtained. The deposits at Arivaca, 60 miles south of Tucson, were not worked during the year.

*Montana, New Mexico, Washington.*—A few tons of tungsten ore were shipped during the year from Lordsburg, N. Mex., Loomis, Wash., and Jardine, Park County, Mont. The ore from the two former places was wolframite, and from the latter scheelite. About 60 tons of scheelite were put on the market from Park County, Mont.

*Alaska, Connecticut, Idaho, Nevada, Oregon.*—There was no known production from the deposits in Alaska, Connecticut, Oregon, Nevada, or Idaho, though considerable development work was reported from Osceola, Nev. More scheelite is reported to have been found in the

*Golden Chest mine at Murray, Idaho, ---*

Hub Basin



file Tungsten Dist

Min. Res. of the U.S. 1905.

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#### MINERAL RESOURCES.

Before the ore can be shipped, however, it is necessary for it to be concentrated. As yet there has been no concentrator erected in this district and therefore very little of the tungsten minerals has been shipped, not over a few carloads as a trial shipment.

*Idaho.*—Development work was carried on during 1905 on property near Murray, Shoshone County, Idaho. No tungsten ore was produced beyond that obtained in running a tunnel in developing the property. The operating company expects in the near future to erect a concentrating mill, when it will begin to ship concentrates.

*California.*—Scheelite has been found in considerable quantity in San Bernardino County, Cal., near Randsburg, Manvel, and Johannesburg. During 1905 considerable ore was shipped from these localities, principally for exportation. These properties are being thoroughly developed and preparations made to produce the mineral on a large scale.

*Nevada.*—The Nevada deposits have been described in detail in previous reports, and although there was considerable tungsten ore mined during 1905, there was none shipped or concentrated, principally on account of the distance of this deposit from the railroad. Some specimens of high-grade wolframite have been found about 40 miles south of Lovelocks, Humboldt County, Nev., but little work has been done, however, to develop this property, and nothing definite is known regarding the extent of the ore.

*Arizona.*—The tungsten deposits in the Dragoon Mountains of Arizona were not very extensively operated during 1905. There were quite a number of small producers in this district who shipped their ore to Primos, Pa.

Another tungsten locality in Arizona that has been developed to some extent is near Owens, Mohave County. The locality is 80 miles south of Kingman and 12 miles east of Big Sandy River, in the Aquerra Range. The development work consists of an open cut, 70 feet long and 30 feet deep in its face, which follows a vein 8 feet wide. The wolframite occurs in masses and crystals from 1 ounce to 20 pounds in weight. This property, which consists of twelve claims, has outcrops of the vein ranging from 4 inches to 8 feet in width. There was a small shipment of ore made from this property in 1905, and the owner writes that he will develop the property extensively during the present year. The concentrates average 64.5 per cent tungstic acid.

*Other localities.*—The scheelite deposits near Trumbull, Conn., Neihart, Mont., and Baker City, Baker County, Oreg., were not operated during 1905. In a copper mine near Holmes, Wyo., a small stringer of wolframite was encountered 800 feet in the tunnel. This was assayed by the State chemist of Wyoming, who found it to contain 52 per cent  $WO_3$ . No special work has been done to determine the extent of the tungsten ore.

#### MOLYBDENUM.

Although there continues to be a good many inquiries for sources of supply of molybdenum ores, the actual demand for ores of this metal is not large and, as far as can be determined, did not increase to any great extent during 1905. In the United States there was a small production of the molybdenum ores molybdenite and wulfenite during 1905, principally from Arizona. Some of the properties which were described in the report for last year were developed to some extent, but none of the ore produced or mined was placed on the market as far as could be determined. There was no discovery of new deposits of molybdenum minerals in this country reported during 1905. There are, however, considerable quantities of this mineral mined abroad, principally in Norway and Australia. Ferro-alloys of this metal have been made in this country at Primos, Pa., and at Kanawha Falls, W. Va. Perhaps the main reasons for this lack of increase in the demand for molybdenum minerals are the fact that the properties which it imparts to steel are somewhat similar to those



is northeast-southwest and the dip to  
Only one is developed, and as the  
determined from the croppings only,  
sarily much uncertainty regarding the  
acter, or whether some of the veins will  
together.

cases the croppings are very prominent,  
on the hübnerite, where the vein can  
one continuous line for a distance of 600  
2 shows the vein running from the



NADA.

tunnel up the mountain side. Talus  
the veins in many places, but they are  
or a total distance of 1,800 feet, either  
or as parts of several, up the mountain  
as a general slope of about 18°.

rite vein, as shown in the tunnel, has a  
70° E. and a dip of 65° N. W. The walls  
ned and part easily from the vein being  
the foot by a layer of clay. The width  
18 to 36 inches and averages 26 inches  
the whole length of the tunnel.

face the vein shows greater width in  
in some it has narrowed to 6 inches.  
rs of quartz not properly in place, which  
proximity to the vein show their con-  
it, are scattered along the slopes below

of the Ore.—The hübnerite occurs in the  
in various sized crystals, many of which  
long and plainly show the crystalline  
massive specimens when broken show  
es from 2 to 4 inches long and 1 to 3

However, much of the mineral is in  
nd in irregular bodies. The quartz is  
y enclosing the hübnerite in some cases  
erse is also true in that some specimens  
solid mineral will be found to enclose  
his plainly shows that the two minerals  
d simultaneously. In some cases a lam-  
ance of the quartz is fund with the hüb-  
trated between the laminæ of quartz,  
led appearance to the mineral. This is  
nt where the vein pinches to a width of

is very solid with practically no evi-

the walls was found to change from one side of the  
vein to the other in short distances. It was also  
found that a concentration of the mineralization into  
so-called shoots had taken place. These shoots were  
from 15 to 25 feet in length and were separated by  
less mineralized portions of the vein of about the  
same length. At the same time some mineral was  
found in all of the vein.

These shoots are very prominent on the surface,  
as each shows an abundance of the hübnerite in  
massive form owing to the high contrast in the colors  
of the hübnerite and the gangue. At a depth of 80  
feet at the face of the tunnel, it is reported that the  
mineral was found in as good a proportion as the  
surface indications would suggest.

*Accessory Minerals.*—As far as examined the ore  
is remarkably free from other minerals. Pyrite was  
found in a few places in small bunches, but the  
absence of iron stains would indicate a small content  
of pyrite. None was seen on the croppings. Fluo-  
rite in very small quantities was found on the dump  
from the tunnel workings, though to what extent it  
occurred in the vein could not be learned. These  
two minerals, besides the hübnerite, scheelite and  
quartz, were the only ones found, unless more care-  
ful examination discloses the presence of wolframite  
mixed with the hübnerite.

Practically all of the ore shipped has been either  
hand sorted and cobbled or concentrated by the crude  
methods outlined above. These ores carried an aver-  
age of 68 per cent tungstic acid. One shipment of  
2,000 pounds gave 600 pounds of 65 per cent concen-  
trates. The ore was closely cobbled before shipment.  
Hand concentrated samples have assayed as high as  
67½ per cent WO<sub>3</sub>.

From the ore as exposed in the croppings and in  
the tunnel workings it is the opinion of the writer  
that the whole vein matter, if carefully concentrated  
so as to save both the hübnerite and the scheelite,  
would produce 10 per cent of mineral carrying 70  
per cent, WO<sub>3</sub>.

A small sample of the pyrite found on the dump  
was assayed for gold and silver and found to carry  
2½ ounces silver and a trace of gold. Samples of  
pure hübnerite were found to carry 2 ounces silver  
and likewise a trace of gold.

The mine appears to be singularly favored, for  
Nevada mines, in that it is very accessible, being  
practically in the valley, at the foot of the mountain,  
and in close proximity to water both for milling  
purposes and for power. The mountain sides above  
are still covered with wood for fuel and some of  
this is large enough for mill and mine timbers.  
The nearest railroad point is Frisco, Utah, on the  
Oregon Short Line, a distance of 85 miles, over  
fairly good desert roads.

#### QUINCY, MASS., GRANITE SHIPMENTS.

The year 1901 was less active than 1900, and the  
total shipments show a decrease of over 10 per cent.  
As distributed, the 1901 movement was 85,664,897  
pounds from West Quincy, 62,126,740 pounds from  
Quincy Adams, and 73,585,620 pounds from the  
Quarry Railroad, making a total of 221,377,257  
pounds, against 246,064,662 pounds in 1900. The de-  
crease was due to the smaller shipments from the  
Quarry Railroad. The best month was May, which  
recorded shipments aggregating 29,758,105 pounds,  
while January holds the low record of 7,737,815  
pounds.

would seem an app-

*Anthracite.*—The demand is good, owing  
weather, but shipments from collieries are  
by the small car supply. In January sh-  
were approximately 4,538,138 tons, which c-  
with 5,183,392 tons in January, 1901, the  
breaking month. The Pennsylvania Railroa-  
from January 1 to February 15, a total of  
short tons, against 631,443 tons in the cor-  
ing period last year. This decrease of 58  
was more than made up by the heavier s-  
of bituminous coal and coke for the sam-  
Receipts of anthracite coal at ports on v-  
Lakes in 1901 aggregated 3,371,254 tons, o-  
tons more than 1900. The increase was p-  
in the tonnage received at Milwaukee and  
The shipments from Lake ports in 1901 w-  
ly as large as the receipts, amounting to  
tons, against 2,073,500 tons in 1900; showi-  
crease of 1,236,823 tons, or over 37 per ce-  
improvement was chiefly in the Buffalo s-  
which were 2,594,159 tons in 1901, as again-  
663 tons in 1900. Lake freight rates fro-  
in 1901 averaged fractionally above those  
but are much less than 1899, when tonna-  
at fancy rates.

*Bituminous.*—Collieries report a better  
the large 50-ton steel hopper cars, while t-  
cars, which are in most demand, move slo-  
shipments originating on the Pennsylvania  
from January 1 to February 15 aggregate  
short tons, or 106,888 tons more than for  
sponding period last year. During Ja-  
Beech Creek District in Pennsylvania se-  
494,049 short tons. The Huntingdon &  
Mountain Railroad moved from January  
ruary 22 a total of 290,255 tons, which is  
of 67,768 tons from last year, due to t-  
shipments from the Cumberland Regio-  
Top showed an increase of 40,732 tons th-  
the full year 1901 the Broad Top ship-  
642,598 tons, while those of Cumberland  
749,988 tons, making a total of 2,392,586  
ing an increase of 306,522 tons, or 12.8  
compared with 1900. In the 11 months  
vember 30, 1901, the Norfolk & Weste-  
shipped 5,379,036 tons, of which 2,315,1-  
43 per cent, went to tidewater. In the sam-  
1900 there were shipped 5,278,304 tons,  
239,385 tons, or proportionately the sam-  
as in 1901, went to tidewater. The tota-  
1901 over 1900 was 100,732 tons. Shipm-  
Chesapeake & Ohio Railroad from July  
ber, 1901, the first 5 months of the cor-  
were somewhat less than 1900, the de-  
chiefly in the movement of New River  
water. In the 5 months of 1901, the to-  
were 2,159,724 short tons, against 2,40-  
1900, a decrease of 242,790 tons. The  
ment was 1,567,279 tons New River c-  
tons in 1900); 551,842 tons Kanawha  
in 1900), and 40,603 tons Kentucky (1-  
1900). In addition to these shipmen-  
received from connecting lines 29,980-  
15,465 tons in 1900. In December, 1-  
road moved 387,179 short tons, agains-  
in 1900. The shipments of Ohio coal c-  
roads reporting to the Traffic Associat-  
year 1901 aggregated 11,757,625 tons,  
685,850 tons, or 31 per cent, were c-