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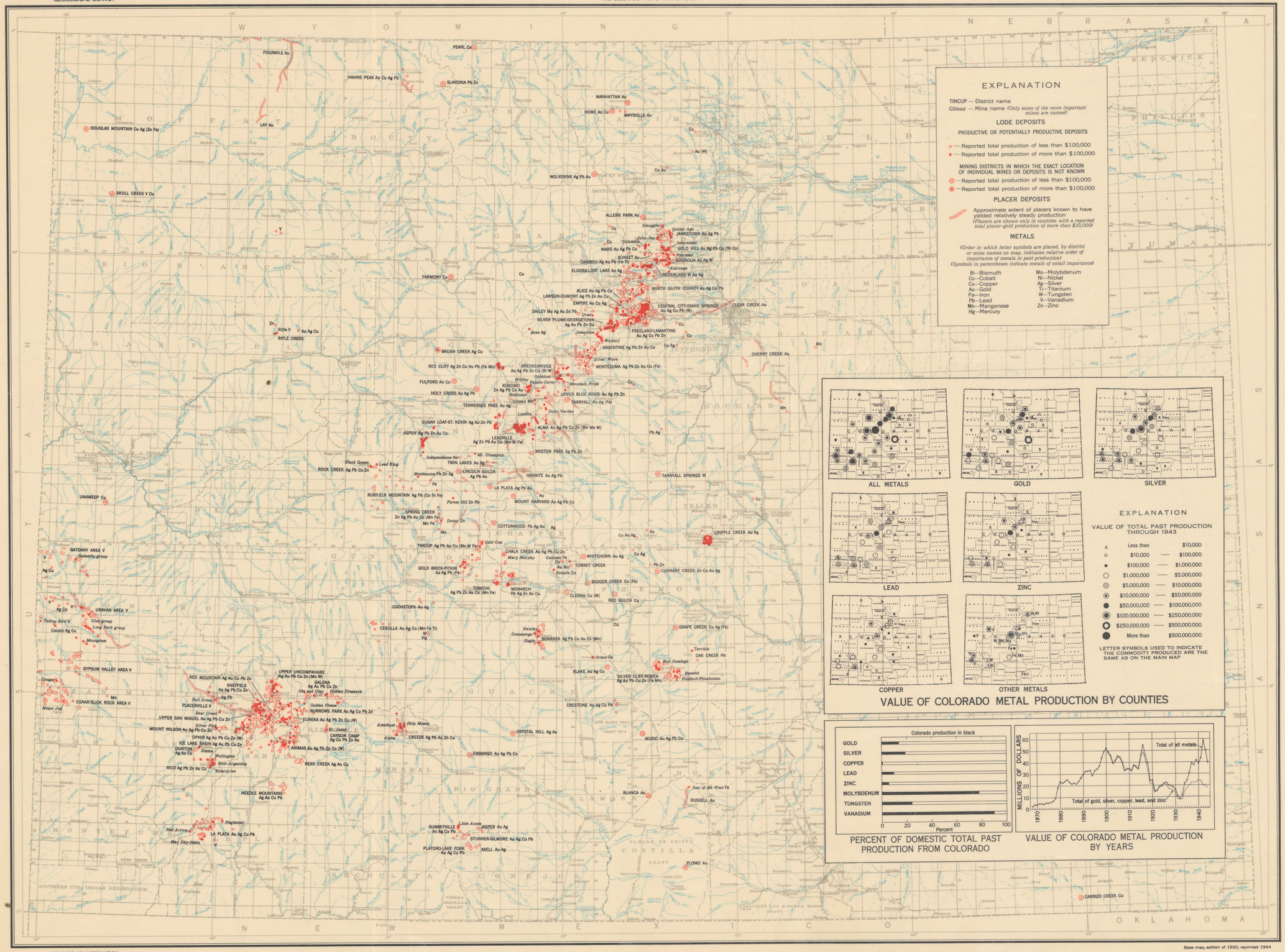
MISSOURI BASIN STUDIES, NO 8
METALLIC MINERAL DEPOSITS OF COLORADO



EXPLANATION

TINCUP — District name
Climax — Mine name *(Only some of the more important mines are named)*

LODE DEPOSITS

PRODUCTIVE OR POTENTIALLY PRODUCTIVE DEPOSITS

- ○ — Reported total production of less than $100,000
- ● — Reported total production of more than $100,000

MINING DISTRICTS IN WHICH THE EXACT LOCATION OF INDIVIDUAL MINES OR DEPOSITS IS NOT KNOWN

- ◎ — Reported total production of less than $100,000
- ◉ — Reported total production of more than $100,000

PLACER DEPOSITS

Approximate extent of placers known to have yielded relatively steady production
(Placers are shown only in counties with a reported total placer-gold production of more than $10,000)

METALS

(Order in which letter symbols are placed, by district or mine names on map, indicates relative order of importance of metals in past production)
(Symbols in parenthesis indicate metals of small importance)

Bi—Bismuth	Mo—Molybdenum
Co—Cobalt	Ni—Nickel
Cu—Copper	Ag—Silver
Au—Gold	Ti—Titanium
Fe—Iron	W—Tungsten
Pb—Lead	V—Vanadium
Mn—Manganese	Zn—Zinc
Hg—Mercury	

VALUE OF COLORADO METAL PRODUCTION BY COUNTIES

PERCENT OF DOMESTIC TOTAL PAST PRODUCTION FROM COLORADO

VALUE OF COLORADO METAL PRODUCTION BY YEARS

SOURCES OF INFORMATION
Published and unpublished data of the U. S. Geological Survey
Published and unpublished data of the U. S. Bureau of Mines
Publications of the Colorado Geological Survey
Publications of the Colorado Scientific Society
Technical and trade journals

MAP SHOWING

METALLIC MINERAL DEPOSITS OF COLORADO

Compiled by R. P. Fischer, Wilbur Burbank, Helen Cannon,
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Scale 1:1,000,000
10 0 10 20 30 40 Miles

1946

METALLIC MINERAL DEPOSITS OF COLORADO

By R. P. Fischer

Colorado ranks first among the states in the total production of silver, molybdenum, and vanadium; second in gold; third in tungsten; fourth in lead; sixth in zinc; and eighth in copper. It has also produced a relatively small amount of iron, manganese, bismuth, cobalt, nickel, and arsenic ore, and in addition some antimony, bismuth, and cadmium have been recovered at smelters treating Colorado ores. The total production in terms of the value of recovered metals from 1858 through 1944 slightly exceeds $2,150,000,000.[1] The production record and the known and inferred ore reserves seem to indicate a good outlook for continued production at a high rate under favorable economic conditions.

The Map.—The accompanying map is primarily an index map showing the general distribution of the metalliferous deposits of Colorado. It was compiled from reports and maps prepared by the United States Geological Survey and the Colorado Geological Survey and from papers published in the Proceedings of the Colorado Scientific Society and other scientific journals. Production data were compiled partly from these sources but mainly from Mineral Resources and Minerals Yearbook series of the Geological Survey and Bureau of Mines of the United States Department of the Interior, and from the files of the Bureau of Mines. The compilation of a map to show the general relations between ore deposits and the major geologic features in Colorado is believed desirable but, until such a map can be prepared, it is hoped that the issue of this map in its present form will serve a useful purpose.

Productive and potentially productive deposits and mining districts are shown by symbols on the accompanying map. The well known districts are named, and where space permits some of the important mines are identified. Most of the metalliferous deposits in Colorado are complex in the character of the ore, containing varying proportions of gold, silver, copper, lead, and zinc, and some of them containing small quantities of minor metals as well. A few, such as the Climax molybdenum deposit and the tungsten deposits in the Nederland district, are mainly monometallic. Metals produced are indicated by letter symbols arranged in the order of importance of past production; metals produced in relatively small quantities or present in accessory amounts are shown in parentheses.

As far as the map scale permits, each productive and potentially productive lode deposit that could be accurately located from available information is shown individually with a small circle. Mining districts in which the exact locations of the mines or deposits are not known but which have been productive sometime during the period 1905 to 1945, are shown by a larger circle enclosing a small one. A few mines and deposits are not shown on the map because of lack of data on locations, but few if any of these mines are known to have had an appreciably large production. Even so, some of them no doubt have been more productive than some of the mines that are shown.

Within the limits of error resulting from lack of complete recorded production data, changes of mine names, and other omissions in the records, all mines having a production thought to be worth $100,000 or more are shown with a solid circle, and those thought to have a smaller production are shown with an open circle. Likewise, mining districts in which individual mines cannot be located are shown with a solid inner circle if their total production appears to be worth $100,000 or more, and districts with a smaller total production are shown with an open inner circle. In choosing individual deposits to be shown, an attempt was made to select those that have produced ore worth at least $1,000, thus eliminating the numerous prospects that are present in every mining district, except in the few places where large and potentially productive deposits without recorded production are shown. In some places away from the major mining districts prospects have been shown if their exact locations are known, in order to indicate the distribution of mineralization, even though the available data may not fulfill the qualifications noted above.

The total value of production from each county of all metals collectively, the precious and base metals individually, and the other metals (ferrous and minor metals) collectively are shown by insert maps. The yearly total production of all metals from 1868 to 1944 and of gold, silver, copper, lead, and zinc from 1900 to 1944 is shown by a graph. The percent of the total Colorado production to the total domestic production of several metals is shown by a bar chart.

Gravels containing placer gold are widely scattered in Colorado, but only the placer areas known to have yielded relatively steady production in counties with a reported placer-gold production of more than $10,000 are shown on the map.

History, production, and outlook.—A detailed account of the history of mining in Colorado to 1923 is given by Henderson[2] and will be reviewed only briefly here.

The first organized prospecting and mining in Colorado was in 1858 on the placer deposits near the present site of Denver. During the rush of prospectors to the territory in 1859 and 1860, gold placers and some of the lode deposits in the mountainous country extending from Boulder County southwest to Lake County were found, and considerable gold was taken from the placers. Lode mining at many places in this region was under way by the middle and late sixties. Although some of the deposits in the San Juan Mountains region were discovered in the early seventies, the rush to that part of Colorado began in 1874 and soon resulted in active mining. The deposits in the Aspen district, Pitkin County, and those near Red Cliff, Eagle County, were discovered in 1879. Although a few fragments of gold ore were found in the area surrounding the Cripple Creek district, Teller County, as early as 1874, the rich deposits were first discovered in 1891. The presence of molybdenite at Climax, Lake County, was recognized in the late nineties, but significant production did not begin until World War I. Most of the important mining districts in Colorado were discovered and were active before 1900, although it was not until 1900 and later that the tungsten and vanadium deposits became productive.

In most of the Colorado mining districts the lure of gold first attracted the prospector, and many camps were dominantly gold producers in their early history. In some of these camps the interest soon shifted to the rich silver ores, and the period of major silver production was accompanied by or closely followed by a large production of lead. Generally speaking, substantial recovery of zinc did not occur until most mining districts were well past their early stages of development. In many districts the value of the copper produced has been incidental to that of the other metals, but nevertheless it has contributed substantially to the total value of the ore.

The need to recover a high proportion of the total value of the complex ores in Colorado, especially those containing zinc, has inspired many improvements in milling practices. Although the complex ores are difficult to treat, their content in several metals has helped to sustain operations at times when the price of one or two metals was low.

The average yearly value of metals produced in Colorado from 1858 to 1944 is about $25,000,000. Although production dropped below this yearly average for 17 years following World War I, it rose rapidly in the middle thirties, and in 1942, stimulated by war demands for metals, the production exceeded $58,000,000, an all-time high for Colorado. Before 1933 the production of gold, silver, copper, lead, and zinc dominated the production of metals in Colorado, amounting to about 96 percent of the total value. Since 1933 one mine, that at Climax, has contributed a large part of the total value of Colorado metal production, but the values of the precious and base metal production, especially the latter, also increased substantially over the production in the 1918-1933 period. The curtailment of gold mining during World War II has appreciably affected the production curves since 1942.

The diversified character of Colorado ore deposits, the ability of the mining industry to increase production in response to the stimulus of rising metal prices and the National need for metals, and the known and inferred reserves of ore in some of the major mining districts seem to indicate a good outlook for continued production at a high rate under favorable economic conditions.

[1] Because of Government restrictions, uranium and radium are not included in this appraisal of Colorado metalliferous resources, nor is their distribution in deposits shown on the accompanying map.

[2] Henderson, C. W., Mining in Colorado: U. S. Geol. Survey Prof. Paper 138, 1926.