University of Arizona Bulletin

List of United States Geological Survey Publications Relating to Arizona

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University of Arizona Bureau of Mines

G. M. BUTLER, Director
TUCSON, ARIZONA

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PREFACE

Fully half of the many inquiries that reach the Arizona Bureau of Mines can be answered satisfactorily only by one with a rather thorough knowledge of the geology of Arizona. Unfortunately, practically nothing descriptive of the geological conditions existing in fully one-half of the State has ever been published, and even where some work has been done, the available published data bearing on the results secured are often decidedly meager, and are admittedly inaccurate in some cases. No fairly reliable reconnaissance map of Arizona has ever been prepared, and such a map cannot be completed without extensive field investigations.

Realizing that nothing can so surely aid the development of the State's mineral resources as will the collection of geological data and the preparation of geological maps of and reports on the State and promising mineralized districts, the Bureau has been emphasizing this line of activity since the summer of 1918. Much has already been accomplished and a number of geological bulletins are either now ready for publication or in an advanced state of preparation; but the State is so large that it will take a number of years to cover it at the present rate of progress. In the meantime, the publications of the United States Geological Survey must remain the most satisfactory source of information on the geology of Arizona. The Survey has issued bulletins, folios, or other publications dealing more or less in detail with the geology of the shaded areas on Plate I. (The area dealt with in Professional Paper 115 (a recent publication) is not indicated on Plate I.) So few of the correspondents of the Bureau are familiar with the activities of the Survey, however, that it has seemed wise to prepare this bulletin in which are listed all references to Arizona that have appeared in Survey publications. The Arizona Bureau of Mines will, for some time at least, concentrate its investigations upon the areas not already described by members of the Survey, and it is believed that in this way the entire State will eventually be covered with a minimum of effort and in the shortest possible time.

The Director of the Bureau wishes to express his appreciation of the assistance rendered by members of the Survey in preparing this bulletin, and also his gratification at the fine spirit of cooperation that has always been shown by the Director of the Survey and those working under him. The services of N. H. Darton, the most experienced reconnaissance geologist on the Survey, have been loaned to the
Bureau, the Survey has undertaken the drafting and printing of a base map of Arizona, and in other ways has much facilitated the attempt of the Bureau to prepare a geological map of Arizona, and to describe the geological conditions prevailing in the State.

G. M. Butler, Director.

January 2, 1920.
LIST OF UNITED STATES GEOLOGICAL SURVEY
PUBLICATIONS RELATING TO ARIZONA

The principal publications that have been issued by the United States Geological Survey are as follows:

Annual Reports
Monographs
Professional Papers
Bulletins
Water-Supply Papers
Mineral Resources
Topographic Maps
Geologic Folios

With the exception of the topographic maps and geologic folios (which are sold by the Geological Survey only), these are all for sale by the Superintendent of Documents, Washington, D. C. In some cases, however, the publications may be out of stock and cannot now be obtained from the Government. Such reports are marked by an asterisk (*). All of the publications listed in this bulletin contain information relating to Arizona.

ANNUAL REPORTS

*First Annual Report of the United States Geological Survey, 1879-80; Clarence King, Director. 1880. 79 pp., 1 map.
Contains:

(Separate)

Contains:
Bulletin 104

(Separate)
D. Fauna of the Lower Cambrian or Olenellus Zone by C. D. Walcott, pp. 509-763, pls. xliii-xcvi.

(Separates)
Part II. Price, $1.25.

(Separates)
Part II. Price, $2.00.

(Separates)
Part III. Price, $1.85.
A. Water Supply for Irrigation, by F. H. Newell (Arizona, pp. 27, 33, 95, figs. 50, 51).

(Separates)
Part I. Price, $1.00.
Report of Director (work in Arizona, pp. 33, 36).
Part II. Price, $2.10.
B. Natural Mineral Waters of the U. S. by A. C. Peal, pp. 49-88, pls. III-IV.
List of U. S. G. S. Publications Relating to Arizona

I. Pre-Cambrian Igneous Rocks of the Unkar Terrane, Grand Canyon of the Colorado, Arizona, by C. D. Walcott, with Notes on the Petrographic Character of the Lavas, by J. P. Iddings, pp. 497-524, pls. IX-LXV.


(Separates)

Part IV.

A. Report of Director (topographic work in Arizona, pp. 30, 55, 64).


(Separates)

Part I. Price, $2.00.

A. Report of Director (hydrographic work in Arizona, pp. 44, 46).


Part II. Price, $1.25.


Part III. Price, $1.20.

Copper, by Charles Kirchhoff (Arizona, p. 343).

Part IV. Price, $1.20.


(Separates)

Part I. Price, $2.00.

A. Report of Director (hydrographic work in Arizona, p. 74).

Part III. Price, $1.00.
  Copper, by Charles Kirchhoff (Arizona, p. 102).

Part III. (Cont'd). Price, $1.00.
  Stone, by William C. Day (limestone and sandstone in Arizona, pp. 791, 778).


Part I. Price, $1.00.
  A. Report of Director (hydographic work and area surveyed in Arizona, pp. 75, 95).

Part IV. Price, $1.75.

Part V. Price, $1.00.
  Copper, by Charles Kirchhoff (Arizona, p. 205).

Part V. (Cont’d). Price, $1.00.
  Stone, by William C. Day (limestone, marble, and sandstone in Arizona, pp. 950, 1045, 1046, 1048, 987, 1015).
  Brownstones of Pennsylvania, by T. C. Hopkins (analysis of brownstone from Flagstaff, Arizona).

Nineteenth Annual Report of the United States Geological Survey, 1897-98; Charles D. Walcott, Director. 1898. (Parts II, III, and V, 1899.) Six parts in seven volumes, and separate case for maps with Part V.

Part I. Price, $1.00.
  A. Report of Director (geologic and hydrographic work and surveys in Arizona, pp. 48, 73, 108).

Part IV. Price, $1.85.
  A. Report of Progress of Stream Measurements for the Calendar Year, 1897, etc., by F. H. Newell (Arizona, pp. 415-423, figs. 148, 149).

Part V. Price, $1.25.
A. The Forests of the United States, by Henry Gannett (Arizona, pp. 12, 14, 21, 22, 24, 47-48).

Part VI. Price, $1.00.

Copper, by Charles Kirchhoff (Arizona, pp. 159-160).

Part VI (Cont’d). Price, $1.00.

Stone, by William C. Day (limestone and sandstone in Arizona, pp. 280-283, 286).

Gypsum, by Edward Parker (Arizona, p. 577).

Twentieth Annual Report of the United States Geological Survey, 1898-99; Charles D. Walcott, Director. 1899. (Parts II, III, IV, V, and VII, 1900.) Seven parts in eight volumes, separate cases for maps with Part IV.

(Separates)

Part I. Price, $1.00.


Part II. Price, $2.50.


Part IV. Price, $1.40.


PART V. Price, $2.80.

A. The Forests of the United States, by Henry Gannett (Arizona, p. 3).

Part VI. Price, $1.00.


Part VI (Cont’d). Price, $1.00.

Stone, by William C. Day (limestone and sandstone in Arizona, pp. 346, 339).


(Separates)
Part I. Price, $1.25.

Part IV. Price, $2.35.

Part VI. Price, $1.00.

Part VI (Cont’d). Price, $1.00.

(Separates)
   Part I. Price, $1.60.
   A. Report of Director for the Fiscal Year Ending June 30, 1901 (hydrographic work and surveys in Arizona, pp. 14, 33, 125, 129, 137, 144, 148, 158-159, 163, 171, pl. xviii (map).

Part IV. Price, $2.20.

MONOGRAPHS


List of U. S. G. S. Publications Relating to Arizona 7

Part I. Price, $1.00.
The Older Mesozoic of Arizona, pp. 13-46, pls. i-iv, figs. 1-8.

PROFESSIONAL PAPERS


93. Geology of the Navajo Country—a Reconnaissance of Parts of Arizona, New Mexico, and Utah, by H. E. Gregory. 1917. 171 pp., 34 pls. Price, 40c.

95. Shorter Contributions to General Geology, 1915; David White, Chief Geologist. 1916. iv, 120 pp., 7 pls. Price, 20c.

(Separates)

C. Relations of the Cretaceous Formations to the Rocky Mountains in Colorado and New Mexico, by W. T. Lee (Arizona, pp. 47, 48).


(Separates)

K. Some Paleozoic Sections in Arizona and Their Correlation, by F. L. Ransome, pp. 133-166, pls. xxxiv-xxxv.


BULLETINS


27. Report of Work Done in the Division of Chemistry and Physics, Mainly During the Fiscal Year 1884-85. 1886. 80 pp.
   Contains:
   Analyses of Coal from Deer Creek Valley, Arizona, by E. Whitfield, p. 74. Price, 10c.


*42. Report of Work Done in the Division of Chemistry and Physics, Mainly During the Fiscal Year 1885-86; F. W. Clark, Chief Chemist. 1887. 152 pp., 1 pl.
   Contains:
   Hypersthene-Andesite from San Francisco Mountains, by T. M. Chatard, p. 139.

*64. A Report of Work Done in the Division of Chemistry and Physics, Mainly During the Fiscal Year 1888-89; F. W. Clarke, Chief Chemist. 1890. 60 pp.
   Contains:
   Analysis of Recent Lavas from Two Miles South of Mt. Trumbull, Arizona, by L. G. Eakins, p. 48.

*66. On a Group of Volcanic Rocks from the Tewan Mountains, New Mexico, and on the Occurrence of Primary Quartz in Certain Basalts, by J. P. Iddings. 1890. 34 pp.

*78. Report of Work Done in the Division of Chemistry and Physics, Mainly During the Fiscal Year 1889-90; F. W. Clarke, Chief Chemist. 1891. 131 pp.
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Contains:
Analysis of Sanstone from Arizona, by T. M. Chatard, p. 124.


Contains:
Copper Deposits at Clifton, Arizona, by Waldemar Lindgren, pp. 133-140.
Copper Deposits of Bisbee, Arizona, by F. L. Ransome, pp. 149-157.

216. Results of Primary Triangulation and Primary Traverse, Fiscal Year 1902-3, by S. S. Gannett. 1903. 222 pp., 1 pl. Price, 20c.

Contains:
References to Arizona. pp. 70-72. Price, 15c.

Contains:

225. Contributions to Economic Geology, 1903; S. F. Emmons and C. W. Hayes, geologists in charge. 1904. 527 pp., 1 pl.
Contains:
The Deer Creek Coal Field, Arizona, by M. R. Campbell. pp. 240-258.

245. Results of Primary Triangulation and Primary Traverse, Fiscal Year 1903-4, by S. S. Gannett. 1904. 328 pp., 1 pl. Price, 20c.

*260. Contributions to Economic Geology, 1904; S. F. Emmons and C. W. Hayes, geologists in charge. 1905. 620 pp., 4 pls.
   Contains:
   The Production of Silver in the United States in 1904, by Waldemar Lindgren (Arizona, p. 41).
   Lead and Zinc Resources of the United States, by H. Foster Bain (Lead in Arizona, p. 254).

   Contains:
   Durmortierite, by W. T. Schaller. pp. 91-120.


276. Results of Primary Triangulation and Primary Traverse, Fiscal Year 1904-5, by S. S. Gannett. 1905. 263 pp., 1 pl. Price, 20c.

   Contains:
   The Copper Mines of the United States in 1905, by Walter Harvey Weed (Copper in Arizona, pp. 93, 95, 96, 98-104).

   Contains:
List of U. S. G. S. Publications Relating to Arizona


D. Rare Metals.—Note on a Wolframite Deposit in the Whetstone Mountains, Arizona, by F. L. Hess, pp. 164–165.


Contains:

Iron Ores of the United States, by C. W. Hayes (iron ore in Arizona, pp. 102–3).

Resources of the United States in Gold, Silver, Copper, Lead, and Zinc, by Waldemar Lindgren (copper, gold, silver, and zinc in Arizona, pp. 121, 130, 133–139, 154).

*397. Mineral Deposits of the Cerbat Range, Black Mountains,


(Separates)


(Separate)

B. Coal and Lignite.—The Black Mesa Coal Field, Arizona, by M. R. Campbell and H. E. Gregory, pp. 229-238, pl. xi. Coal Deposits near Pinedale, Navajo County, Arizona, by A. C. Veatch, pp. 239-242, pl. xii.


440. Results of Triangulation and Primary Traverse for the Years 1906, 1907, and 1908; R. B. Marshall, Chief Geographer. 1910. 688 pp., 1 pl. Price, 50c.

451. Reconnaissance of the Ore Deposits in Northern Yuma County, Arizona, by Howland Bancroft. 1911. 130 pp., 8 pls. Price, 30c.

463. Results of Spirit Leveling in Arizona, 1899 to 1909, inclu-
List of U. S. G. S. Publications Relating to Arizona

sive; R. B. Marshall, Chief Geographer. 1911. 94 pp., 1 pl.  (Superseded by Bulletin 573. Price, 10c.)

   (Separate)
   K. Miscellaneous Nonmetallic Products.
   Contains:
   The Types, Modes of Occurrence, and Important Deposits of Asbestos in the United States, by J. S. Diller, pp. 505-524.

   Contains:
   Geology of the San Juan Oil Field, Utah, by E. G. Woodruff. (Possibility of Oil in Northern Arizona, p. 104.)


   Contains:
   Notes on the Bisbee, Globe, Miami, Ray, and Jerome, (Separates)

   (Separates)
C. The Turquoise Copper Mining District, Arizona, by F. L. Ransome, pp. 125-134.


(Separates)

D. Copper Deposits near Superior, Arizona, by F. L. Ransome, pp. 139-158. Copper Deposits of the White Mesa District, Arizona, by J. M. Hill, pp. 159-163.


P. Potash in Western Saline Deposits, by J. H. Hance, pp. 457-469.


551. Results of Triangulation and Primary Traverse, 1911 and 1912; R. B. Marshall, Chief Geographer. 1914. 396 pp., 2 pls. Price, 30c.


(Separate)


613. Guidebook of the Western United States. Part C, the Santa Fe Route, with a Side Trip to the Grand Canyon of


(Separates)

C. Gold Deposits near Quartzite, Arizona, by E. C. Jones, Jr., pp. 45-57, pl. IV (map).
E. A Reconnaissance in the Kofa Mountains, Arizona, by F. L. Jones, Jr., pp. 151-164, pl. v.
F. Potash in Certain Copper and Gold Ores, compiled by B. S. Butler, with a Note on Muscovite, by George Steiger, pp. 227-236.


(Separate)

B. Triangulation in Arizona and New Mexico, 1913-1915, pp. 13-24, pl. ii.

666-aa. Lead, by C. E. Siebenthal (increase in lead output in Arizona in 1916).


666-ff. Quicksilver, by F. L. Ransome (Arizona quicksilver deposits occur in zones of fissuring or shearing in pre-Cambrian schist).

666-u. The Rarer Metals (vanadinite, lead chlorvanadate in Arizona, pp. 11).


(Separate)


WATER-SUPPLY PAPERS


Contains:
Tests of Cement Materials from Gila River, Arizona, by E. Duryee, pp. 82-90.

44. Profiles of Rivers in the United States, by Henry Gannett. 1901. 100 pp., 11 pls. Price, 15c.


Contains:

Contains:
b. Western Hydrology, by N. H. Darton, pp. 117-120.

100. Report of Progress of Stream Measurement for the Calendar Year 1903, by J. C. Hoyt. Part IV, Interior Basin,
211. Surface Water Supply of Colorado River Drainage above Yuma, 1906; R. I. Meeker and H. S. Reed, district hydrographers. 1908. 149 pp., 2 pls. Price, 20c.
213. Surface Water Supply of California, 1906, with a Section on Ground-Water Levels in Southern California (Great Basin and Pacific Ocean Drainages in California and Lower Colorado River Drainage); W. B. Clapp, district hydrographer. 1907. 219 pp., 4 pls. Price, 25c.


274. Some Streams of the Western United States, with Chapters on Sediments Carried by the Rio Grande, and the Industrial Application of Water Analyses, by Herman Stabler. 1911. 188 pp. Price, 15c.


375. Contributions to the Hydrology of the United States, 1915;
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(Separate)


(Separate)

450. Contributions to the Hydrology of the United States, 1919 (pages 1-27); N. C. Grover, chief hydraulic engineer. 1919. (Separate)
A. Geology and Water Resources of the Gila and San Carlos Valleys in the San Carlos Indian Reservation, by A. T. Schwennesen.

MINERAL RESOURCES

The Mineral Resources of the United States have been published annually since 1883 by the United States Geological Survey, and nearly all volumes give Arizona's mineral production with that of other states. Certain of these volumes, however, contain information of special interest. They are as follows:

*Mineral Resources of the United States, 1882; Albert Williams, Jr., Chief of Division of Mining Statistics and Technology. 1883. xviii, 813 pp.
Contains:
Mineral Resources of the United States, Calendar Years 1883 and 1884; Albert Williams, Jr., Chief of Division of Mining Statistics and Technology. 1885. xiv, 1016 pp. Price, 60c.
(Separate)
Mineral Resources of the United States, Calendar Year 1900; D. T. Day, Chief of Division of Mining and Mineral Resources. 1901. 927 pp. Price, 70c.
(Separate)
Mineral Resources of the United States, Calendar Year 1901; D. T. Day, Chief of Division of Mining and Mineral Resources. 1902. 996 pp. Price, 70c.
(Separate)
Mineral Resources of the United States, Calendar Year 1904; D. T. Day, Chief of Division of Mining and Mineral Resources. 1905. 1264 pp., 2 pls. Price, 70c.
(Separate)
(Deosits in Grand Canyon, Arizona, pp. 1137-1140.)
Mineral Resources of the United States, Calendar Year 1907. 1908. Part I, Metallic Products, 743 pp., 1 pl. Part II, Nonmetallic Products, 897 pp., 1 pl. Price, $1.00 per part.
Part II.
Contains:
The Production of Asbestos in 1907, by J. S. Diller. (Arizona, pp. 720-721.)
Part II.
Contains:
Mineral Resources of the United States, Calendar Year 1912. 1913.
Part I, Metals, 1079 pp., 3 pls. Part II, Nonmetals, 1218 pp., 8 pls.
Part I. Price, 90c.
(Separate)
B. Gold and Silver: Dry Placers in Arizona, Nevada, and New Mexico, by V. C. Heikes, pp. 255-262.
Mineral Resources of the United States, Calendar Year 1913. 1914.
Part II. Price, $1.25.
(Separate)

TOPOGRAPHIC MAPS

Topographic maps of sixty-two percent of Arizona have been published by the United States Geological Survey. These maps have been issued in the form of sheets covering quadrangles, and are not all drawn to the same scale. They are not bounded by political or physical lines or features, but by meridians of longitude and parallels of latitude. They are sold by the Geological Survey for ten cents a copy, or at six cents in lots of fifty or more.

There follows an alphabetical list of the topographic quadrangles already mapped in Arizona. The symbols are the same as have been used on the index map. The scale refers to the scale of the quadrangle listed.

1:250,000 is equivalent to 3.95— (approximately 4) miles to an inch.
1:125,000 is equivalent to 1.97— (approximately 2) miles to an inch.
1:62,500 is equivalent to 0.99— (approximately 1) mile to an inch.
1:48,000 is equivalent to 0.76— (approximately 3/4) of a mile to an inch.
1:31,680 is equivalent to 0.50— (approximately 1/2) of a mile to an inch.
1:24,000 is equivalent to 0.38— (approximately 3/8) of a mile to an inch.
1:12,000 is equivalent to 0.19— (approximately 1/5) of a mile to an inch.
1:6,000 is equivalent to 0.09— (approximately 1/10) of a mile to an inch.
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## List of U. S. G. S. Publications Relating to Arizona

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112. Bisbee Folio, by F. L. Ransome. (Reprinted in 1914.)

*126. Bradshaw Mountains Folio, by T. A. Jaggar, Jr., and Charles Palache.

*129. Clifton Folio, by Waldemar Lindgren.
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