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UNITED STATES GEOLOGICAL SURVEY  
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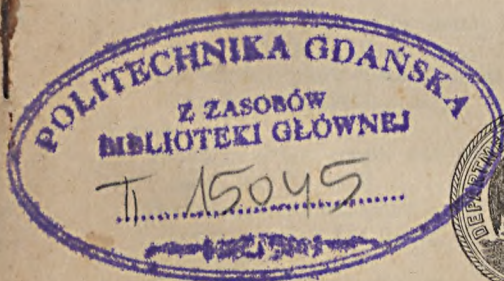
# CONTRIBUTIONS TO ECONOMIC GEOLOGY

(SHORT PAPERS AND PRELIMINARY REPORTS)

1915

PART I.—METALS AND NONMETALS EXCEPT FUELS

F. L. RANSOME AND HOYT S. GALE  
GEOLOGISTS IN CHARGE



Wpisano do inwentarza  
ZAKŁADU GEOLOGII

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[Arranged according to subjects.]



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## CONTRIBUTIONS TO ECONOMIC GEOLOGY, 1915.

### PART I. METALS AND NONMETALS EXCEPT FUELS.

F. L. RANSOME and HOYT S. GALE, *Geologists in charge.*

#### INTRODUCTION.

This volume is the thirteenth of a series that includes Bulletins 213, 225, 260, 285, 315, 340, 380, 430, 470, 530, 540, and 580, "Contributions to economic geology" for 1902, 1903, 1904, 1905, 1906 (Pt. I), 1907 (Pt. I), 1908 (Pt. I), 1909 (Pt. I), 1910 (Pt. I), 1911 (Pt. I), 1912 (Pt. I), and 1913 (Pt. I), respectively. These bulletins are prepared primarily to insure prompt publication of the economic results of investigations made by the United States Geological Survey. Beginning with the present volume the year included in the title will be the year of publication<sup>1</sup> instead of the year in which the field work reported was done. This volume is therefore dated 1915, and there will be no volume entitled "Contributions to economic geology, 1914."

As the subtitle indicates, the papers included are of two classes—(1) short papers giving comparatively detailed descriptions of occurrences that have economic interest but are not of sufficient importance to warrant a more extended description; (2) preliminary reports on economic investigations the results of which are to be published later in more detailed form. These papers are such only as have a direct economic bearing, all topics of purely scientific interest being excluded. Each paper has been issued as an advance chapter as soon as it was ready.

Brief abstracts of the publications of the year are given in the annual report of the Director. The complete list of Survey publications affords, by means of finding lists of subjects and of authors, further aid in ascertaining the extent of the Survey's work in economic geology.

Since 1905 the annual economic bulletin has been printed in two parts, the second part comprising papers on mineral fuels. These

<sup>1</sup> Owing to unexpected delays in printing some of the maps it has been impossible to publish all the chapters of this bulletin in 1915.



volumes for 1906, 1907, 1908, 1909, 1910, 1911, 1912, and 1913 are Bulletins 316, 341, 381, 431, 471, 531, 541, and 581. Bulletin 621 forms Part II of the "Contributions" for 1915.

The reports on work in Alaska have been printed in a separate series since 1904, the volumes so far issued being Bulletins 259, 284, 314, 345, 379, 442, 480, 520, 542, 592, and 622.



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