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MINERALOGY OF TIN

BY

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## INTRODUCTION

Some years ago when one of the authors of this work was engaged in looking up authorities upon tin deposits, no list of the papers on even such noted occurrences as those of Great Britain, Germany, or the Malay Peninsula was to be found, while it required much effort and continued search to find what had been written upon Bolivia and the lesser known localities.

No monographic work covered the field, for many discoveries and great developments had taken place since the appearance of the only comprehensive book, E. Reyer's "Zinn," in 1880, and his bibliographic references were often indefinite and far from complete. There seemed to be real need for an extensive bibliography, and during five years one or both authors have been engaged a considerable part of the time in the collection and digestion of material for such a publication. Since the work was begun Sydney Fawns' "Tin Deposits of the World" has appeared, but the list of authorities given is not extensive.

Owing to the circumstances under which the work was done the notes upon the papers listed do not consistently follow one plan. Little attempt has been made to digest works in foreign languages. Of those in English, some are digested, some have the contents noted, and, in a few cases, where it conveys a good idea of the matter treated, only the title is given.

In digesting articles upon the geology of tin deposits it has been aimed to give, where possible, (a) the country rocks, (b) age, (c) origin of the deposits, (d) accompanying minerals, (e) economic importance, and (f) other details of value.

When desiring to consult the literature of tin deposits it is believed that as a rule persons will wish to know about the tin-bearing veins, dikes, or placers of a particular country or district, and in the arrangement of this bibliography the works are, where possible, placed under the names of the countries in which are located the tin deposits of which they treat. The names of the countries follow each other in alphabetic order, and under each heading names of authors are in similar order.

Anonymous articles are listed under "Anon." which takes its place in the alphabetic sequence. Where more than one article occurs under "Anon." they are arranged chronologically.

Where deposits in a number of countries are treated in one article, the title is placed under the heading "General."

Works treating preponderantly of the extraction, handling, and reduction of tin ores are placed under "Mining and Milling" and "Metallurgy." The lists given under these subjects are not published with the idea that they are complete and no effort has been made to make them so, but as important articles were met, it seemed best to note them, in the hope that even an incomplete list might be of use to many persons who desire only a certain amount of general knowledge upon the subject. The lists may serve, also, as a nucleus for some who wish to pursue the subject further.

Headings other than "General" and names of countries form a second alphabetic list which follows the list of countries.

In the geological portion of the bibliography it is believed that no important paper upon tin appearing up to the middle of 1908 has been omitted. Following this prefatory note will be found the abbreviations used for journals referred to in the work. The bibliography is classified as follows: I, By Countries; II, General; III, History; IV, Metallurgy and Chemistry; V, Mineralogy; VI, Mining and Milling; VII, Statistics. It is thought that the exhaustive index prepared by Mr. Lancaster D. Burling will supplement the arrangement of articles under countries and make the finding of particular papers comparatively easy.

FRANK L. HESS.

EVA HESS.



LIST OF JOURNALS AND OTHER PUBLICATIONS TO WHICH  
REFERENCE IS MADE, WITH ABBREVIATIONS USED

- 
- Abh. math. phys. Classe kön. bay. Akad. Wiss. Abhandlungen der mathematisch-physikalischen Classe der königlich bayerische Akademie der Wissenschaften, München.
- Actes Soc. sci. Chili.....Actes de la Société scientifique du Chili, Santiago.
- Amer. Chem. Journ.....American Chemical Journal, Baltimore.
- Amer. Geol.....American Geologist, Minneapolis. Incorporated in 1906 with Economic Geology, Lancaster, Pa.
- Amer. Inst. Mg. Eng.....American Institute of Mining Engineers, New York.  
Transactions of the American Institute of Mining Engineers, New York.  
Bulletin of the American Institute of Mining Engineers, New York.  
Bi-monthly Bulletin of the American Institute of Mining Engineers, New York.
- Amer. Journ. Sci. Arts.....American Journal of Science and Arts, New Haven. American Journal of Science after Vol. 19, 1880.
- Amer. Journ. Mg. Mill. Oilb. Geol. Min. Met. American Journal of Mining, Milling, Oilboring, Geology, Mineralogy, Metallurgy, New York. In 1866 title changed to Engineering and Mining Journal, New York.
- Amer. Mfr. Iron World.....American Manufacturer and Iron World, Pittsburg.
- Amer. Mg. Rev.....American Mining Review (now Mining Review), Los Angeles.
- Amer. Philos. Soc.....Proceedings of the American Philosophical Society, Philadelphia.
- Ann. Brit. Geol.....Annals of British Geology. By J. F. Blake, London.
- Ann. Chem. Pharm.....Annalen der Chemie und Pharmacie, Heidelberg.

- Ann. Chim. Phys.....Annales de Chimie et de Physique, Paris.
- Ann. Gén. Civ.....Annales du Génie Civil, Paris.
- Ann. Indust. nat. étr.....Annales de l'Industrie nationale et étrangère, Paris.
- Ann. Mines.....Annales des Mines, Paris.
- Ann. New York Acad. Sci.....Annals of New York Academy of Sciences, New York.
- Ann. Philos. Mag. Chem. Min. Mech. Nat. Hist. Agr. Arts. Annals of Philosophy or Magazine of Chemistry, Mineralogy, Mechanics, Natural History, Agriculture and the Arts, London.
- Ann. Philos.....Annals of Philosophy, London.
- Ann. Physik. Chem.....Annalen der Physik und Chemie, by Julius C. Poggendorff, Leipzig.
- Ann. Progr. Rep. Geol. Surv. Western Australia. Annual Progress Report of the Geological Survey of Western Australia, Perth.
- Ann. Rep. Board Reg. Smithsonian Institution. Annual Report of the Board of Regents of the Smithsonian Institution, Washington, D. C.
- Ann. Rep. California State Min.....Annual Report of the California State Mineralogist, Sacramento.
- Ann. Rep. Dep. Mines, New South Wales. Annual Report Department of Mines, New South Wales, Sydney.
- Ann. Rep. Dir. U. S. Geol. Surv.....Annual Report of the Director of the United States Geological Survey, Washington, D. C.
- Ann. Rep. Geol. Surv. Canada.....Annual Report of the Geological Survey of Canada, Ottawa.
- Ann. Rep. Geol. Surv. Texas.....Annual Report of the Geological Survey of Texas, Austin.
- Ann. Rep. Roy. Cornwall Polyt. Soc...Annual Report of the Royal Cornwall Polytechnic Society, Falmouth.
- Ann. Rep. Roy. Inst. Cornwall.....Annual Report of the Royal Institution of Cornwall, Truro.
- Ann. Rep. School Mines Zeehan.....Annual Report of the School of Mines Zeehan, Zeehan, Tasmania.
- Ann. Rep. Secr. Mines Water Supply.. Annual Report of the Secretary for Mines and Water Supply, Melbourne.
- Ann. Rep. Trans. Plymouth Inst. Devon and Cornwall Nat. Hist. Soc. Annual Report and Transactions of the Plymouth Institution and Devon and Cornwall Natural History Society, Plymouth.
- Ann. Rep. Under-Secretary for Mines, Queensland. Annual Report of the Under-Secretary for Mines, Queensland, Brisbane.

- Ann. Sci. Nat.....Annales des Sciences Naturelles, Paris.  
 Ann. Soc. géol. Belg.....Annales de la Société géologique de Belgique, Liége.  
 Ann. Voy.....Annales des Voyages, etc., Paris. Title changes: Nouvelles Annales des Voyages et des Sciences Geographiques, Paris.  
 Arch. Bergb. Hütt.....Archiv für Bergbau und Hüttenwesen. By C. J. B. Karsten, Breslau and Berlin. Title changes: Archiv für Mineralogie, Geognosie, Bergbau und Hüttenkunde.  
 Arch. Miner. Geogn. Bergb. Hütt.....Archiv für Mineralogie, Geognosie, Bergbau und Hüttenkunde. By C. J. B. Karsten und H. v. Dechen, Berlin. See also Arch. Bergb. Hütt.  
 Arch. Miss. sci. litt.....Archives des Missions scientifiques et littéraires, Paris.  
 Atti R. Accad. Lincei. (Trans. or Mem.).....Atti della Reale Accademia dei Lincei (Transunti or Memorie). Roma.  
 Ausland. ....Das Ausland, Stuttgart und München.  
 Austr. Ass. Adv. Sci.....Australasian Association for the Advancement of Science, Sydney.  
 Austr. Mg. Eng. Rev.....Australian Mining and Engineering Review, Melbourne and Sydney.  
 Austr. Mg. Stand.....Australian Mining Standard, Sydney and Melbourne.  
 Berg. Hütt. Zeit.....Berg- und hüttenmännische Zeitung, Leipzig.  
 Bi-mo. Bull. Amer. Inst. Mg. Eng....Bi-monthly Bulletin of the American Institute of Mining Engineers, New York.  
 Bol. Com. Mapa Geol. España.....Boletín de la Comision del Mapa Geologico de España, Madrid.  
 Bol. Inst. Geol. Mexico.....Boletín del Instituto Geológico de México, Mexico.  
 Bol. Min. Indust. Constr.....Boletín de Minas Industria y Construcciones, Lima.  
 Bol. R. Com. geol. Italia.....Bollettino Reale Comitato geologico d'Italia, Roma.  
 Bol. Secr. Fom.....Boletín de la Secretaría de Fomento, Mexico.  
 Bol. Soc. esp. Hist. Nat.....Boletín de la Sociedad española de Historia Natural, Madrid.  
 Bol. Soc. Ing.....Boletín de la Sociedad de Ingenieros, Lima, Peru.

- Bol. Soc. Nac. Min.....Boletin de la Sociedad Nacional Minera, Lima.
- British Columbia Mg. Rec.....British Columbia Mining Record, Victoria.
- Brit. Mfr. Indust.....British Manufacturing Industries. Edited by G. Phillips Beven, London.
- Bull. Imp. Inst. Great Britain.....Bulletin of the Imperial Institute of Great Britain, London.
- Bull. Inst. Mg. Met.....Bulletin of the Institution of Mining and Metallurgy, London.
- Bull. Geol. Surv. Alabama.....Bulletin of the Geological Survey of Alabama, Montgomery.
- Bull. Mines Indust. or.....Bulletin des Mines et de l'Industrie de l'or, Tomsk.
- Bull. North Carolina Geol. Surv.....North Carolina Geological Survey, Bulletin, Raleigh.
- Bull. Soc. belge Géol. Pal. Hydr.....Bulletin de la Société belge de Géologie de Paléontologie & d'Hydrologie, Bruxelles.
- Bull. Soc. franç. Min.....Bulletin de la Société française de Minéralogie, Paris.
- Bull. Soc. Géogr.....Bulletin de la Société de Géographie, Paris.
- Bull. Soc. géol. Belgique.....Bulletin de la Société géologique de Belgique, Liège.
- Bull. Soc. géol. France.....Bulletin de la Société géologique de France, Paris.
- Bull. Soc. Hist. nat. Toulouse.....Bulletin de la Société d'Histoire naturelle de Toulouse, Toulouse.
- Bull. Soc. Indust. min.....Bulletin de la Société de l'Industrie minière, Saint-Etienne.
- Bull. Soc. sci. méd. Ouest.....Bulletin Société scientifique et médicale de l'Ouest, Rennes.
- Bull. South Dakota Geol. Surv.....South Dakota Geological Survey Bulletin, Vermillion.
- Bull. U. S. Geol. Geogr. Surv. Terr....Bulletin of the United States Geological and Geographical Survey of the Territories, F. V. Hayden, U. S. Geologist-in-charge, Washington, D.C.
- Bull. Western Australia Geol. Surv....Western Australia Geological Survey Bulletin, Perth.
- Calcutta Journ. Nat. Hist.....Calcutta Journal of Natural History, by McClelland, Calcutta.
- California Journ. Techn. ....California Journal of Technology, Berkeley.
- Can. Mg. Rev.....The Canadian Mining Review, Montreal.

- Chem. Abs.....Chemical Abstracts, Easton, Pa.  
 Chem. Engr.....The Chemical Engineer, Chicago.  
 Chem. Gaz.....Chemical Gazette, London.  
 Chem. News.....Chemical News, London.  
 Coll. Guard.....Colliery Guardian, London.  
 Cienc. Indust.....Ciencia é Industrias, Buenos Aires.  
 C. R. Acad. Sci.....Comptes Rendus de l'Académie des  
 Sciences, Paris.  
 Dep. Mines Geol. Surv., New South Wales. Department of Mines, Geological Survey of New South Wales, Sydney.  
 Dublin Univers. Mag.....Dublin University Magazine, Dublin.  
 Echo des Mines.....Echo des Mines, Saint Étienne.  
 Econ. Geol.....Economic Geology with which is incorporated the *American Geologist*, Lancaster, Pa.  
 Edinburgh New Philos. Journ.....Edinburgh New Philosophical Journal, Edinburgh.  
 Electr. Eng.....Electrical Engineer, New York.  
 Engineer.....The Engineer, London.  
 Engineering.....Engineering, London.  
 Eng. Mag.....Engineering Magazine, New York and London.  
 Eng. Mg. Journ.....Engineering and Mining Journal, New York. See American Journal of Mining, Milling, Oilboring, Geology, Mineralogy, Metallurgy.  
 Eng. News Amer. Railw. Journ.....Engineering News and American Railway Journal, New York.  
 Erl. geol. Specialkarte Kön. Sachsen.Erläuterungen zur geologischen Specialkarte des Königreichs Sachsen, Leipzig.  
 Geol. Centr.....Geologisches Centralblatt, Leipzig.  
 Geol. För. Stockholm Förh.....Geologiska Föreningens i Stockholm Förhandlingar, Stockholm.  
 Geol. Mag.....Geological Magazine, London.  
 Geol. Minas.....Geología y Minas, Buenos Aires. Title changed in 1909 to *Ciencia é Industrias*.  
 Geol. Rec.....The Geological Record. Edited by Wm. Whitaker, London.  
 Ges. Nat. Freunde Berlin Mag. neuest. Entd. Ges. Nat. Der Gesellschaft naturforschender Freunde zu Berlin Magazin für die neuesten Entdeckungen in der Gesammten Naturkunde, Berlin.  
 Glean. Sci.....Gleanings in Science, Calcutta.

- Glück. Berg. hütt. Zeit. Nied. Westph. Glückauf; Berg- und hüttenmännische Zeitung für den Niederrhein und Westphalen, Essen (Ruhr.).
- Illustration .....L'Illustration, Journal universel, Paris.
- Imp. Inst. Tech. Rep. and Sci. Papers. Imperial Institute Technical Report and Scientific Papers, London.
- Ind. Eng.....Indian Engineering, Calcutta.
- Indust. Iron.....Industries and Iron, London. Formerly Iron, the Journal of Science, Metals and Manufactures, London.
- Institut .....L'Institut Journal des sciences et des Sociétés savantes en France et à l'étranger, Paris.
- Iron .....Iron. The Journal of Science, Metals and Manufactures. Continued from 1893 as *Industries and Iron*, a Journal for the Engineering, Electrical, Chemical and Metallurgical Trades, London.
- Iron Age.....Iron Age, New York.
- Jaarb. Mijnw. Ned. Oost-Indië.....Jaarboek van het Mijnwezen in Nederlandsch Oost-Indië, Amsterdam.
- Jahrb. Berg. Hütt. Kön. Sachsen.....Jahrbuch für das Berg- und Hüttenwesen im Königreiche Sachsen, Freiberg.
- Jahrb. k. k. geol. Reichs.....Jahrbuch der kaiserlich-königlichen geologischen Reichsanstalt, Wien.
- Jahrb. Min. Geogn. Geol. Petr.....Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefactenkunde; von Leonhard Heidelberg. For later series see Neues Jarbuch für Mineralogie, Stuttgart.
- Jahr. Chem.....Jahresbericht über die Fortschritte der Chemie und verwandter Theile anderer Wissenschaften, Giessen.
- Jern-Kont. Ann.....Jern-Kontorets Annaler, Stockholm.
- Journ. Appl. Sci.....Journal of Applied Science, London.
- Journ. Asiat. Soc. Bengal.....Journal of the Asiatic Society of Bengal, Calcutta.
- Journ. Bath West England Soc.....Journal of Bath and the West of England Society (and Southern Counties Association for the Encouragement of Agriculture, Arts, Manufacture and Commerce), Bath.

- Journ. Chem. Met. Min. Soc. South Africa. Journal of the Chemical, Metallurgical and Mineralogical Society of South Africa, Johannesburg.
- Journ. Chem. Soc. London.....Journal of the Chemical Society of London. Formerly Quarterly Journal of the Chemical Society.
- Journ. College Sci. Imp. Univers. Tokyo. Journal of the College of Science of the Imperial University, Tokyo.
- Journ. Elisha Mitchell Sci. Soc. ....Journal of the Elisha Mitchell Scientific Society, Raleigh.
- Journ. Franklin Inst.....Journal of the Franklin Institute, Philadelphia.
- Journ. Geol.....Journal of Geology, Chicago.
- Journ. Geol. Soc. Dublin.....Journal of the Geological Society of Dublin, Dublin.
- Journ. Indian Arch. East Asia.....Journal of the Indian Archipelago and Eastern Asia, Singapore.
- Journ. Mines.....Journal des Mines, Paris.
- Journ. Nat. Philos. Chem. Arts.....Journal of Natural Philosophy, Chemistry and the Arts, London.
- Journ. Pharm.....Journal de Pharmacie (et des Sciences accessoires contenant le Bulletin des Travaux de la Société de Pharmacie de Paris), Paris.
- Journ. prakt. Chem.....Journal für praktische Chemie. Otto Linne Erdmann, Leipzig.
- Journ. Print. Pap. Parl. Tasmania....Journal and Printed Papers of the Parliament of Tasmania, Hobart.
- Journ. Proc. Roy. Soc., New South Wales. Journal and Proceedings of the Royal Society of New South Wales, Sydney.
- Journ. Roy. Geol. Soc. Ireland.....Journal of the Royal Geological Society of Ireland. London, Dublin and Edinburgh.
- Journ. Roy. Inst. Cornwall.....Journal of the Royal Institution of Cornwall, Truro.
- Journ. Soc. Arts.....Journal of the Society of Arts, London.
- Journ. Straits Branch Roy. Asiatic Soc. Journal of the Straits Branch of the Royal Asiatic Society, Singapore.
- Kon. Nat. Tijdschr. Ned.-Indië.....Koninklijk Natuurkundig Tijdschrift van Nederlandsch-Indië, Batavia.
- Kön. Schwed. Akad. Wiss. Abh. Nat. Haush. Mech. Königlich Schwedische Akademie der Wissenschaften Abhandlungen aus der Naturlehre, Haushaltungskunst und Mechanik, Leipzig.
- La Nature.....La Nature, Paris.

- London, Edinburgh, Dublin Philos. Mag. Journ. Sci. London, Edinburgh and Dublin Philosophical Magazine and Journal of Science, London.
- London and Edinburgh Philos. Mag. Journ. Sci. London and Edinburgh Philosophical Magazine and Journal of Science, London.
- "Lotos" Zeitschr. Nat. . . . . "Lotos," Zeitschrift für Naturwissenschaften, Prag.
- Mech. Eng. . . . . The Mechanical Engineer, London.
- Mech. Mag. . . . . Mechanics' Magazine, London.
- Medd. Grönl. . . . . Meddelelser om Grönland, Kjøbenhavn.
- Mem. descr. Carta Geol. Italia. . . . . Memorie descrittive della Carta Geologica d'Italia, Roma.
- Mem. Com. Mapa Geol. España. . . . . Memoria de la Comision del Mapa Geológico de España, Madrid.
- Mem. Geol. Surv. Great Britain. . . . . Memoirs of the Geological Survey of Great Britain, London.
- Mem. Geol. Surv. New South Wales. . . . . Memoirs of the Geological Survey New South Wales, Sydney.
- Mem. Geol. Surv. Summ. Progr. Geol. Surv. United Kingdom and Mus. Pract. Geol. . . . . Memoirs of the Geological Survey. Summary of Progress of the Geological Survey of the United Kingdom and Museum of Practical Geology, London.
- Mem. Soc. Sci. Nat. Arch. Creuse. . . . . Memoires de la Société des Sciences Naturelles et Archéologiques de la Creuse, Guéret.
- Métallurgie . . . . . La Métallurgie, Paris.
- Mex. Mg. Journ. . . . . Mexican Mining Journal, Mexico.
- Mg. Alm. . . . . Mining Almanack, London.
- Mg. Ass. Inst. Cornwall. . . . . Mining Association and Institute of Cornwall, Truro. Report and Proceedings of Miners' Association and Institute of Cornwall, Truro.  
Transactions of the Mining Association and Institute of Cornwall, Cambridge.
- Mg. Journ. Railw. Comm. Gaz. . . . . Mining Journal, Railway and Commercial Gazette, London.
- Mg. Mag. . . . . Mining Magazine, New York.
- Mg. Mag. . . . . Mining Magazine, London.
- Mg. Rec., British Columbia. . . . . British Columbia Mining Record, Victoria.
- Mg. Rep. . . . . Mining Reporter, Denver, Colo.
- Mg. Rev. . . . . Mining Review, Los Angeles. See also American Mining Review.



- Mg. Sci. .... Mining Science, Denver.  
Mg. Sci. Press..... Mining and Scientific Press, San Francisco.
- Mg. Smelt. Mag. Mo. Rev. Pract. London Mining and Smelting Magazine, a Monthly Review of Practical Mining, Quarrying, and Metallurgy, etc., H. C. Salmon, editor.  
Mg. Quarry. Met.
- Mg. World. .... Mining World, Chicago.  
Mg. World Eng. Rec..... Mining World and Engineering Record, London.
- Mines and Min..... Mines and Minerals, Scranton, Pa.  
Min. Ind. .... Mineral Industry, New York and London.
- Min. Mag. Journ. Min. Soc..... Mineralogical Magazine and Journal of the Mineralogical Society, London.  
Min. Mitth. .... Mineralogische Mittheilungen, von G. Tschermak, Wien.
- Min. Proc. Inst. Civ. Eng..... Minutes of Proceedings of the Institution of Civil Engineers, London.  
Mg. Rep. .... Mining Reporter, Denver.
- Min. Res. U. S. Geol. Sur..... Mineral Resources of United States, published annually by the U. S. Geological Survey, since 1883.  
Min. Surv. Ceylon Adm. Rep..... Mineralogical Survey, Ceylon, Administration Reports, Colombo.
- Mitth. Jahrb. kön. ung. geol. Anst.... Mittheilungen aus dem Jahrbuche der königlich ungarischen geologischen Anstalt, Budapest.
- Mitth. k. k. Techn. Gewerbe-Museums in Wien. Mittheilungen des kaiserlich-königlichen Technologischen Gewerbe-Museums in Wien.
- Monatsb. deutsch. geol. Ges..... Monatsberichte der deutschen geologische Gesellschaft, Berlin.
- Monogr. U. S. Geol. Surv..... Monographs of the United States Geological Survey, Washington, D. C.
- Mo. Bull. Int. Bur. Amer. Repub.... Monthly Bulletin of the International Bureau of American Republics, Washington, D. C.
- Nat. Hist. Journ. School Rep. .... Natural History Journal and School Reporter, York.
- Nature. .... Nature, London.
- Neues Jahrb. Min. .... Neues Jahrbuch für Mineralogie, Stuttgart. For earlier series see Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefactenkunde; von Leonhard, Heidelberg.

- North Carolina Geol. Surv. Bull.....North Carolina Geological Survey, Bulletin, Raleigh.
- Northwest Mg. Journ.....Northwest Mining Journal, Seattle.
- Not. Indian Archipelago Adj. Countr..Notices of the Indian Archipelago and Adjacent Countries. By J. H. Moor, Singapore.
- Nouv. Ann. Voy. Sci. géogr.....Nouvelles Annales des Voyages et des Sciences géographiques, Paris. Formerly Annales des Voyages, Paris.
- Oest. Zeitschr. Berg. Hütt.....Oesterreichische Zeitschrift für Berg- und Hüttenwesen, Wien.
- Pap. Proc. Roy. Soc. Tasmania.....Papers and Proceedings of the Royal Society of Tasmania, Hobart.
- Pap. Proc. Roy. Soc. Van Diemen's Land.....Papers and Proceedings of the Royal Society of Van Diemen's Land, Tasmania.
- Parl. Pap.....Parliamentary Papers, London.
- Perak Gov. Gaz.....Perak Government Gazette, Kuala Lumpur, Federated Malay States.
- Perak Mus. Notes.....Perak Museum Notes, Taiping.
- Petermanns Mitth.....Dr. A. Petermanns Mittheilungen aus Justus Perthes' Geographischer Anstalt, Gotha.
- Philos. Mag.....The Philosophical Magazine, London.
- Philos. Trans. Roy. Soc. London.....Philosophical Transactions of the Royal Society of London, London.
- Polyt. Centr.....Polytechnische Centralhalle, Leipzig.
- Polyt. Journ.....Polytechnische Journal, Dingler, Stuttgart.
- Pop. Sci. Mo.....Popular Science Monthly, New York.
- Proc. Amer. Mg. Cong.....Proceeding of the American Mining Congress, Denver.
- Proc. Amer. Philos. Soc.....Proceedings of the American Philosophical Society, Philadelphia.
- Proc. Boston Soc. Nat. Hist.....Proceedings of the Boston Society Natural History, Boston.
- Proc. Chem. Met. Soc. South Africa...The Proceedings of the Chemical and Metallurgical Society of South Africa, Johannesburg. Title changed with Vol. 3, May, 1902, to Proceedings of the Chemical, Metallurgical and Mining Society of South Africa.
- Proc. Chem. Met. Min. Soc. South Africa...The Proceedings of the Chemical Metallurgical and Mining Society of South Africa, Johannesburg.

- Proc. Colorado Sci. Soc.....Proceedings of the Colorado Scientific Society, Denver.
- Proc. Geol. Soc. London.....Proceedings of the Geological Society of London, London.
- Proc. Geol. Ass.....Proceedings of the Geologists' Association, London.
- Proc. Inst. Civ. Eng.....Proceedings Institution of Civil Engineers, London.
- Proc. Inst. Mech. Eng.....Proceedings of the Institution of Mechanical Engineers, Birmingham.
- Proc. Liverpool Geol. Soc.....Proceedings of Liverpool Geological Society, Liverpool.
- Proc. Linn. Soc. New South Wales....Proceedings of the Linnean Society of New South Wales, Sydney.
- Proc. Roy. Soc. London.....Proceedings of the Royal Society of London, London.
- Prog. Min. Ind. Tasmania.....The progress of the Mineral Industry of Tasmania, Hobart.
- Prog. Rep. Geol. Surv. Victoria.....Progress Report Geological Survey of Victoria, Melbourne.
- Quart. Journ. Geol. Soc. London.....Quarterly Journal of Geological Society of London, London.
- Quart. Mg. Rev.....Quarterly Mining Review, London.
- Queensland Gov. Mg. Journ.....Queensland Government Mining Journal, Brisbane.
- Rec. Geol. Surv. India.....Records of the Geological Survey of India, Calcutta.
- Rec. Geol. Surv. New South Wales....Records of Geological Survey of New South Wales, Sydney.
- Rec. Geol. Surv. South Victoria.....Records of Geological Survey, South Victoria, Melbourne.
- Rec. Mines South Australia.....Record of the Mines of South Australia, Adelaide.
- Rep. Brit. Ass. Adv. Sci.....Report of the British Association for the Advancement of Science, London.
- Rep. California State Mg. Bur.....Report of California State Mining Bureau, Sacramento.
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# BIBLIOGRAPHY OF THE GEOLOGY AND MINERALOGY OF TIN<sup>1</sup>

BY  
FRANK L. HESS AND EVA HESS

## I. BIBLIOGRAPHY ARRANGED BY COUNTRIES AFRICA

1. BECK, R. Einige Bemerkungen über afrikanische Erzlagerstätten.  
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p. 307.  
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- 2a. JOHNSON, J. P. The ore deposits of South Africa. Part 1, Base metals.  
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Describes briefly the Rooiberg, Weynek, Doornhoek, Potgietersrust, Welbeloond,  
Embabaan, and Langerwacht tin deposits.
3. LAUNAY, L. DE. Les richesses minerales de l'Afrique.  
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Tin is found on the Benoue, an affluent of the Niger. In the French Congo it  
is found in the Crystal Mountains, on the Oubanghi and Ouelle Makua, also at  
Massinga (or Massinda) north of the village of Agapata in the upper basin of  
the Banghi in a region of Archean rocks and granite with copper.  
In the northeast part of Swaziland near the frontier of the Transvaal, tin has been  
known for a long time. Deposits at Embabaan only are promising. Though tin  
veins are present, only the alluvials have been worked.  
There has been the following production:
- |            |      |      |      |      |      |
|------------|------|------|------|------|------|
| Year ..... | 1894 | 1895 | 1896 | 1897 | 1898 |
| Tons ..... | 143  | 250  | 240  | 70   | 53   |
- According to Dr. Molengraaff the region is one of mica, talc, chlorite, and  
amphibolite schists with some quartzites carrying magnetite, similar to the forma-  
tion at Hospital Hill, Johannesburg. The cassiterite is found, not in the quartz,  
but in the pegmatite cutting the schists.
- LOUIS, HENRY. See No. 1340.
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111-112.

<sup>1</sup> It is believed that no important paper upon the geology or mineralogy of tin  
appearing up to the middle of 1908 has been omitted from this bibliography.

## AFRICA (Continued)

Holds that the pneumatolytic theory of tin deposits is untenable and attempts to explain the South African deposits on the hypothesis that they are formed by magmatic differentiation or by the combined action of magmatic differentiation and lateral secretion. The South African deposits are individually briefly reviewed.

## 3b. RUMBOLD, WM. R. The South African tin deposits.

Bi-mo. Bull. Amer. Inst. Mg. Eng. No. 22, 1908, New York, pp. 601-607, figs. 5. Trans. Amer. Inst. Mg. Eng., Vol. 33, 1909, New York, pp. 783-789.

Describes the Cape Town (Kuils River), Bushveld and Swaziland (Oshock and Forbes Reef) tin deposits as they appeared in 1904.

At Kuils River crystallized pinkish-gray cassiterite occurs with wolframite in a 5-foot quartz vein cutting granite. Placers have been formed from the vein. At Bushveld cassiterite occurs with quartz in decomposed granite.

The Oshock deposits are stanniferous hornblende pegmatites and placers derived from them. The pegmatites carry garnet, monazite, euxenite, æschynite, and large isolated crystals of cassiterite. In the Forbes Reef deposits cassiterite occurs in an aplite dike and in thin veins cutting schists which carry cinnabar, gold, scheelite, bismuth, monazite, euxenite, æschynite, copper and iron pyrites, pyrrhotite, margarite and tourmaline. Crystals from the veins when scratched, sometimes fly to pieces like Rupert's drops.

The description shows a marked resemblance between some of the South African deposits and some of those near Hill City, South Dakota.

STOKES, RALPH S. G. See No. 730.

## 3c. VOIT, F. W. Uebersicht über die nutzbaren. Lagerstätten Südafrikas.

Zeitschr. prakt. Geol., Vol. 16, 1908, Berlin, pp. 191-216.

A geological study of the economically valuable mineral deposits of South Africa, including gold, diamonds, copper, graphite, tin, monazite, iron ores, magnesite, asbestos, etc.

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At Embabaa, Swaziland, tin occurs in "the older granite" cutting Archaean beds composed of mica, chlorite and talc schists, with some amphibolite and quartzite. The granite shows dioritic phases. Where tin is most plentiful quartz is almost absent in the granite. The coarsest cassiterite occurs in the granite with pegmatite containing blue, white, or yellow quartz. Some cassiterite crystals appear monoclinic and, where twinned, orthorhombic. Pieces of cassiterite weighing  $\frac{1}{4}$  to  $\frac{1}{2}$  pound are not uncommon and masses of 8 pounds occur. Ilmenite, mostly in fine grains, corundum, monazite, æschynite, and euxenite in crystals as large as those of the tin ore are found in the debris and in the pegmatite with the cassiterite. Deposits in decomposed granite and pegmatite are worth up to \$1.25 per yard; residual concentrations and alluvial deposits of great irregularity as to distribution of values, are worked. The fields are not as large as those of Australia or the Malay Peninsula. Suction dredges may prove profitable. Labor is cheap, material high. Between 1600 and 1700 tons of tin ore have been produced, at a profit of £23 5s. 7d. per ton.

Second article describes mode of sluicing. Corundum and monazite are picked from the coarser concentrates.

Third article describes the Waterberg deposits, 100 miles north of Pretoria. Tin occurs in sandstone, granite, felsites and shales near contacts. In the northern part of the field the tin is in irregular impregnations in granite; in the southern part it is in pipes. At Zwartkloof decomposed granite carrying about 2s. worth of tin per cubic yard will be hydraulicked. Gives a description of the milling process at the Zaaiplaats and Rooiberg mines.

See also Cape Colony, Congo, Kamerun, Nigeria, Swaziland, Transvaal, Madagascar.

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## ALASKA

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U. S. Geol. Surv. reports on the York tin region for 1904 are quoted and from these the results of the development during the season of 1905, are given.

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"Prospects of the industry discussed."

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General.

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Northwest Mg. Journ., Vol. 7, 1909, Seattle, p. 79.

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Min. Ind. for 1903, Vol. 12, 1904, New York and London, pp. 326-327.

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 Écho des Mines, Dec. 30, 1907, St. Etienne.  
 Translated in Mg. Journ. Railw. Comm. Gaz. Vol. 83, 1908, London, p. 6.  
 Tin has recently been re-discovered in various parts of Argentina. Deposits were formerly exploited by Jesuits, who obtained tin from the outcrops of the veins for bell metal. Cassiterite occurs in small crystals in granulite near Tinogasta (Catamarca), at the village of Mazan. In La Rioja Province, close to the Catamarca frontier, a company is at work with 100 miners on a stockwerk of small veins occurring in altered granulite dikes. Surface ore gave 7 per cent tin, but in depth the per cent fell to 1 and 1½. Mining is cheap and easy; the country is fairly watered, well wooded and fertile.
37. CASTRO, MARIANO SALAS. Mining in the Province of Salta.  
 Rep. Secr. of the Immigration Commission, to the Finance Minister of the Province. No. 119. Published in Spanish, English and German, Buenos Aires, [no date], pp. 1-16, map 1.  
 Tin, gold, silver, copper and lead deposits reported in departments of Chicoana and La Poma, Province of Salta, Argentine Republic. Bismuth was worked in 1889 in a ravine called Agamillos. Vein said to be six and a half feet wide and forty-four yards deep.
38. HOSKOLD, H. D. Report upon the mines, mining, metallurgy and mining laws, etc., etc., of the Argentine Republic.  
 Natl. Sect. Mining and Geology, 1904, Buenos Aires, pp. 142-143.  
 States that cassiterite was found some years since near Tinogasta, Catamarca. After a few tons were mined the vein pinched out. Stream tin had recently been found in a small stream at Mazan, northeast of Chilecito, 6 miles from the frontier line of Catamarca.

## ASIA

39. FISCHER, H. Ueber Zinnerze, Aventuringlas und grünen Aventurinquarz aus Asien, sowie über Krokydolithquarz aus Griechenland.  
 Neues Jahrb. Min., 1882, II, Stuttgart, pp. 90-92.
40. HERMANN, [?]. Native tin.  
 Journ. prakt. Chem., Vol. 33, Leipzig, p. 300.  
 Abstract: Amer. Journ. Sci. Arts, ser. 2, Vol. 2, 1846, New Haven, p. 415.  
 " According to Hermann, native tin occurs in the gold washings of the Ural (Central Asia) in small gray metallic grains containing also some lead."
- See also under Burmah, Ceylon, China, East Indies, India, Japan, Laos, Malay Peninsula, Siam, Persia, Philippine Islands.

## AUSTRALIA

41. ANONYMOUS. More Australian tin.  
Iron, Vol. 5, 1875, London, p. 551. Digest from Geol. Rec., for 1875, London, p. 147.  
"Records the discovery of a sample of stream tin ore, weighing about 10 pounds, intermingled with  $\frac{1}{2}$  ounce of rough reef gold, at the foot of Mount Pilot, New South Wales. The geological formation consists of superficial deposits of granite."
42. ———. Australian tin at the Philadelphia Exhibition.  
Eng. Mg. Journ., Vol. 22, 1876, New York, pp. 72-73, 87.  
An account of the development and description of the deposits of the tin producing districts.
43. ———. Tin in Australia.  
Min. Ind. for 1899, Vol. 8, 1900, New York and London, pp. 620-621.  
Description of alluvial tin deposits on northern coast of New South Wales. Herberton field, Queensland, produced about \$1,000,000 worth of stream tin from 1883 to 1894 and nearly \$5,000,000 worth of lode tin. Discovery of lode tin reported at Sebastopol, Victoria.
44. ———. The Planet tin mines.  
Austr. Mg. Stand. April 5, 1900, Sydney and Melbourne.  
Not available to the authors.
45. ———. Tin in Australia.  
Min. Ind. for 1901, Vol. 10, 1902, New York and London, pp. 639-641.  
New South Wales, Northern territory, Queensland, South Australia, Tasmania and Western Australia tin deposits briefly treated.
46. ———. Australian tin and tin mining.  
Mg. Journ. Railw. Comm. Gaz., Vol. 72, 1902, London, p. 225.  
Tin deposits are scattered widely over Australia, there being more than 120 known tin localities in New South Wales alone. Tin was discovered in 1851, but not until 1872 were mining operations begun. Native tin has been found in New South Wales. A brief description of occurrences on a number of creeks, and amount of tin mined and exported.
- . *See also E———, C.*
- BECK, RICHARD. *See No. 1299.*
47. BENEDICT, WM. DE L. Tin in Australia.  
Min. Ind. for 1892, Vol. 1, 1893, New York and London, pp. 442-445.  
General survey of the tin deposits of Australia, including New South Wales, Queensland, Victoria, Western Australia and Tasmania.  
The tin bearing granite of Australia appears to be closely allied to that of other countries, and has been described as exactly corresponding to that of Cornwall.
48. COGHLAN, T. A. Tin. A statistical account of the seven colonies of Australasia, 1899-1900.  
1900, Sydney, pp. 569-572, map 1.
- DAUBRÉE, A. *See No. 1314.*
- DIEST, P. H. VAN. *See No. 1478.*



## AUSTRALIA (Continued)

## 49. E——, C. The Australian tin mines.

Mg. Journ. Railw. Comm. Gaz., Vol. 44, 1874, London, pp. 306, 507, 643, 751, 833, 973, 1057, 1281, 1394; Vol. 45, 1875, pp. 71, 287.

Mostly statistics of tin production.

## 50. ENGLISH, A. G. On Australian and Tasmanian tin.

Mg. Journ. Railw. Comm. Gaz., Vol. 45, 1875, London, p. 19.

Stream tin has been worked in the neighborhood of Ovens, Victoria, for many years in conjunction with gold, also near Albany. Deposits light, would scarcely pay if not accompanied by gold. Stream tin has been found in creeks and rivers in Gippsland. Country is unexplored as yet; cannot predict as to lodes. In the Inverel district of New South Wales, considerable deposits of tin have been worked with varying success. In Queensland, at Stanthorpe, is the largest and most promising deposit of tin. Chief deposit of Tasmania is at Mount Bischoff, 35 miles from Enu Bay, on northwest coast, a mountain 3000 feet above sea level, evidently of volcanic origin, surface stone is composed of decayed granite, porphyry, and quartzose rock, through which tin is disseminated. Wash dirt varies from 3 to 40 feet deep. No overburden beyond a foot or two. Purely lode tin. Probably deposited by some volcanic action. Near the mountain pieces of lode weighing from 1 pound to 1½ cwt. are found; not water worn, and very pure. Assays from 70 to 73 per cent.

FAWNS, SYDNEY. *See* No. 1320.

FUCHS, E., and LAUNAY L. DE. *See* No. 1323.

## 51. JOHNSON, J. C. F. Getting gold. A practical treatise for prospectors, miners, and students.

1897, Philadelphia and London, pp. 22-23, 600 words.

Short description of the occurrence of tin ore. Confined to Australian examples.

LOCK, C. G. WARNFORD. *See* No. 1338.

LOUIS, HENRY. *See* No. 1340.

## 52. MANCE, F. S. Eastern States of Australia.

Eng. Mg. Journ., Vol. 81, 1906, New York, p. 26.

Reviews tin mining in Queensland, New South Wales and Tasmania, during 1905.

## 53. MEUNIER, STANISLAS. Sources minérales de l'Australasie (Minerais d'étain de formation actuelle).

Bull. Soc. belge Géol. Pal. Hydr., Vol. 5, 1891, Bruxelles, pp. 8-11.

## 54. NEWLAND, D. H. Tin in Australia.

Min. Ind. for 1903, Vol. 12, 1904, New York and London, pp. 327-329.

Output and value of tin product during 1903.

## 55. NEWTON, E. WILTON. The metalliferous minerals of Australia.

59th Ann. Rep. Roy. Cornwall Polyt. Soc., 1891, Falmouth, pp. 117-131.

Treats of the mineral resources of South Australia, New South Wales, Victoria, Queensland, Western Australia, Tasmania and New Zealand, including tin.

PHILLIPS, J. A., and LOUIS, H. *See* No. 1350.

## 56. PLUMMER, JOHN. Australian tin and tin mining.

Iron Age, Feb. 6, 1902, New York, p. 9, 900 words.

Treats of the location of the deposits, and the extent to which they have been worked.

## AUSTRALIA (Continued)

57. REYER, EDUARD. Zinn in Australien und Tasmanien.  
Oest. Zeitschr. Berg. Hütt., Vol. 28, 1880, Wien, pp. 47-49, 61-63, 74-76, 85-87.  
———. *See* No. 1354.
58. ROBERTSON, J. R. M. The bismuth and tin deposits of Australia.  
Trans. Geol. Soc. Glasgow, pt. 1, Vol. 7, 1881-1884, Glasgow, pp. 126-127, 133-142, map.  
An account of the origin of the alluvial tin of Australia.
59. STEPHEN, D. Australian and Tasmanian tin ore.  
Mg. Journ. Railw. Comm. Gaz., Vol. 49, 1879, London, p. 191.  
Gives tin statistics for years 1877 and 1878, showing a decrease of production.
- THIBAUT, P. J. *See* No. 1578.
60. TREGAY, W. Australian and Tasmanian tin.  
Mg. Journ. Railw. Comm. Gaz., Vol. 48, 1878, London, p. 212.
61. VALE, STEPHEN S. Australian tin deposits.  
Trans. Mg. Ass. Inst. Cornwall, Vol. 1, 1887, Camborne, pp. 30-44, map.  
General description.
- WEEKS, JOSEPH D. *See* No. 1372.
62. WOLFF, G. Australisches Zinn.  
Berg. Hütt. Zeit., Vol. 34, 1875, Leipzig, pp. 2-3, 12-14, 24-26, 29-30.  
Mit einer Plan-Skizze auf Taf. 1.  
Abstract: Oest. Zeitschr. Berg. Hütt., Vol. 23, 1875, Wien, pp. 287-288.
63. WOODS, J. E. T. Tin in Australia.  
Mg. Journ. Railw. Comm. Gaz., Vol. 49, 1879, London, p. 225.  
Extracts from two letters in which author states that he thinks Australian tin, aside from Mount Bischoff, is of little value.
- See* under New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria, Western Australia.

## AUSTRIA

64. ANONYMOUS. Tin in Bohemia.  
Mg. World, Vol. 26, 1907, Chicago, p. 509.  
A brief notice of the re-opening of an old tin mine in Bohemia, about 15 miles from Carlsbad. The lodes contain wolframite as well as tin. The new operators are erecting a 100-ton mill, which will be equipped with a magnetic separator and other appliances for recovering both the tin and wolframite.
- CHARLETON, ARTHUR G. *See* No. 1310.
65. COTTA, B. VON. Ueber die Zinnerzlagertstätten von Graupen in Böhmen.  
Berg. Hütt. Zeit., Vol. 23, 1864, Leipzig, pp. 117-118.
- DAUBRÉE, A. *See* No. 1314.
66. FUCHS, E., and LAUNAY, L. DE. Traité des gîtes minéraux et métallifères.  
Vol. 2, 1893, Paris, pp. 127-136.  
Treats of tin in Saxony and Bohemia.

## AUSTRIA (Continued)

- GRODDECK, ALBERT. *See* No. 549.
67. HALLWICH, H. Geschichte der Bergstadt Graupen in Böhmen.  
1868, Prag.  
Schiller, Ph., and Lewald, P. The occurrence of tin ore at Graupen and Upper Graupen, and the manner of mining in ancient and modern times.
- JARS, G. *See* No. 416.
68. JOKÉLY, JOH. Das Erzgebirge im Leitmeritzer Kreise in Böhmen.  
Jahrb. k. k. geol. Reichs., Vol. 9, 1858, Wien, pp. 549-574, geol. map 1.  
1. Zinnerze. 2. Zinnerz gänge im grauen Gneiss. 3. Zinnerz gänge im Felsitporphyr. 4. Zinnerz im Greisen.
69. LAUBE, GUSTAV C. Mittheilungen über die Erzlagerstätten von Graupen in Böhmen.  
Jahrb. k. k. geol. Reichs., Vol. 14, 1864, Wien, pp. 159-178, fig. 1.
- LEWALD, P. *See* reference No. 67.
70. NEWLAND, D. H. Tin in Austria.  
Min. Ind. for 1902, Vol. 12, 1904, New York and London, p. 329.  
Tin production for 1903 was 34 metric tons valued at \$21,918.
71. NOWICKI, CONSTANTIN VON. Das Vorkommen des Zinnsteins bei Schlaggenwald und Schönefeld.  
"Lotos," Zeitschr. Nat., Vol. 7, 1857, Prag, pp. 106-112.
- PHILLIPS, J. A., and LOUIS, H. *See* No. 1350.
- SCHILLER, PH. *See* No. 67.
- SCHULTZ, —. *See* No. 573.
72. VOGELSANG, —. Berg- und hüttenmännische Mittheilungen über Böhmen.  
Zeitschr. Berg. Hütt. Sal. preuss. Sta., Vol. 10, 1862, Berlin, pp. B-164-165.  
Describes the mining and smelting of tin in Schlaggenwald Bohemia.
- See* also Bohemia, Saxony, etc.

## BANKA

73. AKKERINGA, J. E. Rapport van het distrikt Blinjoe, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1863 (1872), I, Amsterdam, pp. 41-148, I kaart en vijf bijlagen.
- . *See* No. 110.
74. ANONYMOUS. The tin mines of Banca.  
Mg. Journ. Railw. Comm. Gaz., Vol. 19, 1849, London, p. 178.  
Amer. Journ. Sci. Arts, ser. 2, Vol. 8, 1849, New Haven, pp. 291-292.  
Brief history of early tin mining in Banca, and mining methods used at time of writing.
75. ———. Exploitation du minerai d'étain a Banca.  
Rev. Univ. Mines Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 1, Vols. 23, 24, 1868, Liège and Paris, pp. 411-412.

## BANKA (Continued)

76. ———. The Banca tin mines.  
 Iron Age, Vol. 35, 1885, New York, p. 31.  
 Description of deposits and manner of working them by the Chinese.
77. ———. The best deposits of tin.  
 Mg. Sci. Press, Vol. 66, 1893, San Francisco, p. 52.  
 The stanniferous deposits of Banca and Billiton are said to be the best tin deposits in the world. An analysis of Banca metal gave:
- |              |                  |
|--------------|------------------|
| Tin .....    | .99.961 per cent |
| Iron .....   | .00.019 per cent |
| Lead .....   | .00.14 per cent  |
| Copper ..... | .00.006 per cent |
- There are 200 mines worked in Banca by private companies, while  $\frac{1}{2}$  of that number are exploited by the Dutch Government. Mines of Billiton are in possession of a private concern, which pays a royalty to the government of 3 per cent of annual yield.
78. ———. Wetten, Gouvernements-Besluiten en Bepalingen betreffende het Mijnwezen in Nederlandsch-Indië.  
 Jaarb. Mijnw. Ned. Oost-Indië, 1894, Tech. and Admin., Amsterdam, pp. 211-239,  
 Treats of the methods of tin mining in Banca.
79. ———. Tin in Banca.  
 Min. Ind. for 1897, Vol. 6, 1898, New York and London, p. 640.  
 Verbeek (Zeitschr. prakt. Geol., 1897, Berlin, p. 428) is authority for the statement that the duration of the tin deposits of Banca and Billiton is limited. Up to the time of writing, Banca had produced 7,000,000 piculs of tin, and the existing supply amounted to only about 3,000,000.
80. ———. Tin in Banca.  
 Min. Ind. for 1899, Vol. 8, 1900, New York and London, p. 621.  
 Mines have been under government control since 1832. Output in 1897 was 9307, raising to 10,220 tons in the succeeding year.
81. ———. Toepassing van graafwerktuigen bij de tinwinning op Banca.  
 1907, Batavia, pls. 13.  
 Not available to the authors.
82. BECK, R. Die Zinnerzlagerstätten von Banca und Billiton.  
 Zeitschr. prakt. Geol., 1898, Berlin, pp. 121-127.  
 Review of R. Verbeek, Geologische Beschreibung van Bangka en Billiton. Jaarb. Mijnw. Ned. Oost-Indië, 1897, Amsterdam.  
 Beck's article digested: Neues Jahrb. Min., 1899, II, Stuttgart, pp. 266-267.
83. BENEDICT, WM. DE L. Tin in East Indies.  
 Min. Ind. for 1892, Vol. 1, 1893, New York and London, pp. 445-446.  
 Occurrence of tin in island of Banca and Billiton described. Production from islands from 1850 to 1892 given.
84. BOERS, R. J. Over het gebruik van krachtinstallaties tot grondverzet bij de tinontginning op het eiland Banca.  
 (On the application of power machinery for the working of tin ground in the island of Banca.)  
 Jaarb. Mijnw. Ned. Oost-Indië, Vol. 32, 1903, Batavia, pp. 190-218. With 3 Append., illus. 7, and pls. 5.
85. BREDEMAYER, W. Tin mining in Banca.  
 Mg. Sci. Press, Vol. 25, 1872, San Francisco, p. 21.  
 Digest: Oest. Zeitschr. Berg. Hütt., Vol. 21, 1873, Wien, p. 76.

## BANKA (Continued)

86. CORDES, J. H. Rapport van het distrikt Pangkal-Pinang, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1876 (1878), I, Amsterdam, pp. 89-126. Met eene kaart en twee bijlagen.
87. ———. Rapport over het onderzoek naar het delfstoffelijk productief vermogen van het distrikt Koba eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1883 (1885), I, Tech. and Admin., Amsterdam, pp. 67-115. Met eene kaart en twee bijlagen.
88. CRETIER, H. Tinhoudend metaal, tinslak en tinertszand van het zeestrand bij Soengei Liat, district Muntok, residentie Banka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1888, Wet. Ged., Amsterdam, pp. 113.
89. CROOCKEWIT, J. H. Scheikundig onderzoek van tinerts, afkomstig v. h. eiland Banka.  
1853, Batavia, pp. 14.  
Not available to the authors.
- . See No. 1473.
90. DIEST, P. H. VAN. Inleiding tot de geognostische mijnbouwkundige rapporten der distrikten van Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1872, I, Amsterdam, pp. 3-40.
91. ———. Rapport van het distrikt Soengeileat, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1862 (1872), II, pp. 3-71. 1 kaart en vijf bijlagen.
92. ———. Rapport van het distrikt Merawang, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1861 (1873), I, Amsterdam, pp. 3-75. Met eene kaart.
93. ———. Verslag der onderzoekingen aan den heuvel Sambong Giri, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1873, I, Amsterdam, pp. 187-193. Met eene kaart en twee platen.
94. ———. Banca and its streams works.  
Translated from Dutch by Foster, C. Le Neve, 1867, Truro.  
Not available to the authors.
95. DIJK, P. VAN. Uitkomsten der waarnemingen omtrent eenige onderdeelen der Chineesche ontginningswijze van het tinerts op Bangka, getrokken uit officieele nota's van het jaar 1878 en medegedeeld.  
Jaarb. Mijnw. Ned. Oost-Indië, 1879, II, Amsterdam, pp. 55-91.
96. ———. Berekening van de verhouding tusschen de grens van ontginbaarheid der tinertsafzettingen op Bangka en het loon van den Chineeschen mijnwerker (tinprijs, inkoopprijs). Bepaling van beiden, zoodanig dat de te behalen winst op de tinontginning een maximum zij.  
Jaarb. Mijnw. Ned. Oost-Indië, 1882, II, Amsterdam, pp. 349-366.
- . See No. 1480.
97. DOREN, J. Vrijmoedige beschouwingen tegen het afstaan van de tinmijnen op Banka aan departiculiere industrie.  
1850, Gravenhage.  
Not available to the authors.

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98. EVERWIJN, R. Verslag van een onderzoek naar tinaders in het distrikt Djeboes, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1873, I, Amsterdam, pp. 151-155. Met twee kaartjes.
99. FRAENKEL, S. Bijdrage tot de kennis der tinmijnen van Banka.  
1843, Batavia.  
Not available to the authors.
- FOSTER, C. LE NEVE. See No. 94.
- FUCHS, E., and LAUNAY, L. DE. See No. 1323.
100. GODEFROY, W. Eene verbeterde steekboor (kogelklep-steenboor) voor het onderzoek op tinerts op Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1884, II, Tech., Amsterdam, pp. 324-333.
101. GROOT, C. DE. Rapport over de tin-slakken (tra), welke op Bangka onbeuuttigd worden weggegoorpen.  
Jaarb. Mijnw. Ned. Oost-Indië, 1854 (1878), II, Amsterdam, pp. 29-98.
102. HOOZE, J. A. Graphische voorstelling der productie, veilingsprijzen en geldswaarde van Bangka-tin.  
Jaarb. Mijnw. Ned. Oost-Indië, 1881 (1882), II, Tech., Amsterdam, pp. 83-87. Met 2 staten en 2 graphische voorstellingen.
103. HORSFIELD, THOMAS. Mineralogical description of the island of Banca.  
Journ. Indian Arch. East. Asia, Vol. 3, No. 7, 1848, Singapore, p. 398.  
Review: Amer. Journ. Sci. Arts, 2d ser., Vol. 7, 1849, New Haven, pp. 86-101.
104. HUGUENIN, J. A. Rapport van het district Toboali, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1869 (1877), I, Amsterdam, pp. 81-186. Met eene kaart en vier bijlagen.
105. JONGH, D. DE. Over het voorkomen van tinertsaders op het eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1883 (1884), II, Tech., Amsterdam, pp. 306-317.  
Soengei-Liat. Pangkal-Pinang. Merawang.
106. ———. Over het voorkomen van goud en tinerts op en langs de oostkust van het district Merawang, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1883 (1885), II, Amsterdam, pp. 161-175. Met twee kaarten.  
(a) Over het voorkomen van goud op Bangka in het algemeen.  
(b) De geologische gesteldheid der kuststreek van Merawang tusschen Tandjong Antoe en de monding der Merawang-rivier.  
(c) Het voorkomen van stofgoud en tinerts op de riffen en in de langs het strand gelegene valleities.
107. ———. Vervolg op het rapport over het jaar 1883 betreffende het voorkomen van tinader-ertsen op Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1884 (1885), II, Amsterdam, pp. 176-181.  
(a) District Soengei-Liat. (b) District Pangkal-Pinang. (c) District Merawang.
108. ———. Over de uitkomsten der tinwinning op Banka gedurende de ontginnings jaren 1882-83 tot en met 1899-1900 met zes staten en eenige graphische voorstellingen.  
Jaarb. Mijnw. Ned. Oost-Indië, 1900, Amsterdam, pp. 51-93.

## BANKA (Continued)

109. LANGE. Het eiland Banka en szyne angelegenheder.  
Hertogenbosch. 1850, p. 59 ff.  
Describes the tin deposits of Banka.  
Not available to the authors.
110. MENTEN, J. H. Het boren en het boormateriaal op Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1873 (1874), II, Amsterdam, pp. 163-189. Drie platen:  
Hoofdstuk I. Eenige algemeene beschouwingen over het opsporen van stroominertgronden.  
II. Beschrijving van het boormateriaal, zooals dit werd ontworpen door wijlen den Mijningenieur J. E. Akkeringa.  
III. Wijze waarop het boormateriaal bij de onderzoekingen wordt gebruikt.  
IV. Verbeteringen welke het boormateriaal later heeft ondergaan.
- MULDER, [?]. See No. 1538.
111. OUDEMANS, A. C., JR. Over verontreiniging van Banka-Tin.  
Jaarb. Mijnw. Ned. Oost-Indië, I, Tech. en Admin., 1890, Amsterdam, pp. XXIV-XLIV.
112. POSEWITZ, TH. Die Zinninseln im indischen Oceane.  
I. Geologie von Bangka. Mitth. Jahrb. kön. ung. geol. Anst., Vol. 7, 1885, Budapest, pp. 153-182.  
II. Das Zinnerzvorkommen und die Zinnengewinnung in Bangka. Ibid. Vol. 8, 1886, pp. 55-106.  
Reviewed by A. Stelzner: Neues Jahrb. Min. 1887, II, Stuttgart, pp. 107-110.
113. RAFFLES, THOS. S. On the tin of the island of Banka.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 3, 1827, Penzance, pp. 247-255.  
Short history of production of tin in Banka, ruling prices, brief description of placers, distribution of tin in the island and market conditions.
114. RENAUD, G. P. A. Rapport van het district Soengeiselan, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1780 (1874), I, Amsterdam, pp. 3-51.  
Met eene kaart en twee bijlagen.  
Hoofdstuk I. Vermelding van de wijze waarop de overzichtskaart werd vervaardigd.  
II. Beschrijving van de natuurlijke gesteldheid van het terrein.  
III. Geologische en mineralogische beschrijving.  
IV. Beschrijving van de tinertsvoerende valleien en den loop der ontginning.  
V. Algemeene blik op het productief vermogen van het district.
115. ———. Overzicht der tinproductie van eenige mijnen in het district Pangkal-Pinang, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1880, II, Amsterdam, 81-82.
- 115a. ———. Overzicht der tinproductie van eenige mijnen en het district Soengeiselan, eiland Bangka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1880, II, Amsterdam, pp. 77-80.
116. ———. Over de Chineseesche ontginningswijze van tinerts op het eiland Bangka en de eventueele toepassing daarop van Europeesche werktuigen.  
Jaarb. Mijnw. Ned. Oost-Indië, 1882 (1884), I, Tech. en Admin., Amsterdam, pp. 5-121.  
Hoofdstuk I. Administratieve regelingen volgens welke de betaling der mijnwerkers geschiedt.  
II. De gevolgde methode van ontginning der tingronden en hare onderdeelen.  
(a) Grondverzet. (b) Bemaling. (c) Ertswaschen. (d) Smelkosten. (e) Tin en rijstkruien.  
III. Bepaling van het dagloon van den Chineeschen mijnwerker.

## BANKA (Continued)

117. REYER, EDUARD. *Banka und Billitong.*  
Oest. Zeitschr. Berg. Hütt., Vol. 27, 1879, Wien, pp. 384-385, 395-397, 407-409.  
Extract: *Iron Age*, Vol. 24, Nov. 20, 1879, New York, p. 3.  
"Concise, though well-detailed notice of the nature and condition of tin-mining in Banka and Billitong, with geological sketch map of the northeast district of the former island, and full references to former observers and writers on these works and the structure of the islands."
- . *See* No. 1354.
- SCHURMAN, J. A. *See* No. 1415.
118. VAN DER WYCK, O. H. *The occurrence of tin ore in the islands of Banca and Billiton.*  
17th Ann. Rep. Dir. U. S. Geol. Surv. 1895-96, pt. 3, 1896, Washington, D. C., pp. 227-242.  
Conditions of occurrence, method of mining and smelting tin ore on the islands of Banca and Billiton.
119. VERBEEK, R. D. M. *Ueber die Zinnerzlagerstätten von Bangka und Billiton.*  
Zeitschr. prakt. Geol., 1899, Berlin, pp. 134-136.  
Digest: *Neues Jahrb. Min.*, 1901, I (Ref.), Stuttgart, pp. 422-423.  
Verbeek's first article on this subject appeared in *Jaarb. Mijnw. Ned. Oost-Indië*, Vol. 26, 1897, and was reviewed by Beck in *Zeitschr. prakt. Geol.*, 1898, Berlin, pp. 121-127.
- . *See* No. 136.
120. VLAANDEREN, C. L. *Scheikundig onderzoek van Bangka-tin.*  
*Jaarb. Mijnw. Ned. Oost-Indië*, 1874 (1875), I, Amsterdam, 233-235.
- WEEKS, JOSEPH D. *See* No. 1372.
- See also* Billiton and General.

## BILLITON

121. AKKERINGA, J. E. *Verslag van een onderzoek naar tinertsaders op het eiland Billiton.*  
*Jaarb. Mijnw. Ned. Oost-Indië*, 1873, II, Amsterdam, pp. 3-72. Written in 1860. Met drie kaarten en een plaatje.  
Hoofdstuk I. Beschrijving der kaarten.  
" II. De ontginbaarheid der tinaders.  
" III. Eenige opmerkingen omtrent geognosie, adererts en alluvialen tinerts.
122. ANONYMOUS. *Notiz über das Vorkommen von Zinn auf der Insel Billiton [in der Nähe der Insel Banka].*  
*Berg. Hütt. Zeit.*, Vol. 12, 1853, Leipzig, p. 609.
123. ———. *Billiton tin mines.*  
*Eng. Mg. Journ.* Vol. 26, 1878, New York, p. 294.  
Tin mines in four districts: Mangar (most important), Boeding, Tandjang-Padan, Dindang.  
Percentage of pure tin is 40 to 70 per cent. Since 1854 produced 1000 piculs for first year, and for the 20 years after 62,000 piculs.



## BILLITON (Continued)

124. ———. Verslag van het Mijnwezen in Nederlandsch Oost-Indië over het jaar 1880-1.  
 Jaarb. Mijnw. Ned. Oost-Indië, 1882, II, Tech., Amsterdam, pp. 116-132.  
 Tinontgunningen.  
 a. Ontginning van Gouvernementswege.  
 b. Billiton-Maatschappij.
125. ———. Verslag van het Mijnwezen in Nederlandsch Indië over het jaar 1881-2.  
 Jaarb. Mijnw. Ned. Oost-Indië, 1883, II, Tech., Amsterdam, pp. 147-157.  
 Tinontgunningen.  
 a. Ontginning van Gouvernementswege.  
 b. Particuliere ontgunningen. Billiton.
126. ———. Verslag van het Mijnwezen in Nederlandsch Indië over het jaar 1882-3.  
 Jaarb. Mijnw. Ned. Oost-Indië, 1884, II, Tech., Amsterdam, pp. 347-358.  
 Tinontgunningen.  
 a. Ontginning van Gouvernementswege.  
 b. Particuliere ontgunningen. Billiton.  
 c. Concessie-aanvragen.
- 126a. ———. Tin mining in the island of Billiton. A general sketch.  
 G. Kolff & Co., Batavia (Dutch East Indies), 1908, pp. 31.  
 Treats of the political, topographic, geological, and commercial aspects of Billiton, Dutch East Indies, and its tin mining industry. Describes in excellent manner the methods of working the deposits (from the commercial side rather than the mechanical) and handling the Chinese. Besides tin, iron is the only commercial mineral found in quantity. There are small quantities of tungsten, gold, lead, and copper.  
 Probably the most intimate English account of tin deposits and mining on Billiton Island.
- BECK, R. See No. 82.
127. CRETIER, H. Tinhoudend zand van Billiton.  
 Indische Gids, 1881, II.  
 Not available to the authors.
128. DIEST, P. H. VAN. Bijdrage tot de geschiedenis van Billiton, gedurende de eerste 15 jaren onzer vestiging aldaar, bepaaldelijk met het oog op het reeds te dien tijde bekend zijn van het voorkomen van tinerts aldaar.  
 Jaarb. Mijnw. Ned. Oost-Indië, 1874, II, Amsterdam, pp. 193-240.
129. FERRIER, —. Exploitation de l'étain a Billiton.  
 Rev. Univ. Mines Mét. Trav. Publ. Sci. Arts Appl. Indust. Ser. 2, Vol. 9, 1881, Liège and Paris, pp. 458-469. (Extract.)
- FUCHS, E., and LAUNAY L. DE. See No. 1323.
130. GROOT, C. DE. Die Insel Billiton durchforscht nach Zinnerz.  
 Kon. Nat. Tijdschr. Ned.-Indië, Jahr. 3, Lief. 2 n. 3, 1852, Batavia, p. 133, maps 2.  
 Not available to the authors.
131. ———. Tinader op Billiton.  
 Kon. Nat. Tijdschr. Ned.-Indië, 1870, Batavia.  
 Not available to the authors.

## BILLITON (Continued)

132. ———. Herinneringen aan Blitong.  
 1887, Gravenhage. Tinerts, pp. 168-228, sketch I.  
 Review: Neues Jahrb. Min., 1888, II (Ref.), Stuttgart, pp. 424-425.  
 1. Tinerts afgezet in het vastgesteente, p. 168.  
 2. Tinerts dat onvervoerd is blijven liggen op de plaats waar het door verweering van het vastgesteente, waarin het gelegerd was, daaruit werd losgemaakt, p. 189.  
 3. Laagvorming afgezetten stroomtinertsgrond, p. 199.  
 4. Stroomtinerts, p. 208.  
 5. Mineralen, welke met het stroomtinerts in den ertsgrond worden aangetroffen, p. 218.
133. MAIER, P. J., and LAUDON, J. Jets omtrent het voorkomen van tin op het eiland Billiton.  
 Kon. Nat. Tijdschr. Ned.-Indië, 1854, Batavia.  
 Not available to the authors.
134. POSEWITZ, TH. Die geologisch-montanistischen Verhältnisse der Insel Billiton.  
 Petermann's Mitth., Vol. 33, 1887, Gotha, pp. 108-116. Map.  
 History of the discovery of tin ore in Billiton, geology of the island, the occurrence and mining of tin, statistics of production.
135. RANT, H. F. E. Verslag van de bevinding en de vooruitzichten der aderontginning nabij den berg Tadjouw op het eiland Billiton.  
 Jaarb. Mijnw. Ned. Oost-Indië, 1873, II, Amsterdam, pp. 73-91.
- REYER, EDUARD. See No. 117.
136. VERBEEK, R. D. M. Geologische beschrijving van Bangka en Billiton.  
 Jaarb. Mijnw. Ned. Oost-Indië, 1897, Tech. Admin. en Weten. Ged., Amsterdam, pp. 1-220. Met 4 kaartjes, 2 bijlagen, en 4 platen.  
 Reviewed by Beck in Zeitschr. prakt. Geol., 1898, Berlin, pp. 121-127.  
 Beck's article digested: Neues Jahrb. Min., 1899, II [Ref.], Stuttgart, pp. 266-267.  
 Largely devoted to the manner of occurrence of tin in the islands.
- . See No. 119.
- WEEKS, JOSEPH D. See No. 1372.  
 See also "General."

## BOLIVIA.

137. ANONYMOUS. Tin mine in South America.  
 Mg. Mag. No. 1, Vol. 1, 1853, New York, pp. 210-212.  
 Extract from "New York Courier" without date. A non-technical and rather careless description of a tin mine at Onero (Oruro?) probably in Bolivia. Output said to have been 3000 tons per year.
- 137a. ———. Zinnvorkommen in Südamerika.  
 Oest. Zeitschr. Berg. Hütt. Vol. 8, 1860, Wien, pp. 48-49.  
 Brief mention of the very rich tin ore to be found in Bolivia, but location is said that the mining of it has not been very practicable.
138. ———. Tin in Bolivia.  
 Min. Ind. for 1895, Vol. 4, 1896, New York and London, p. 571.  
 Tin production while small, showing a steady increase, and in 1895 production was much larger than ever before.

## BOLIVIA (Continued)

139. ———. Bolivian tin and the supply of the United States.  
 Eng. Mg. Journ., Vol. 66, 1898, New York, p. 632.  
 Editorial in which is discussed the development of the tin plate industry in United States, and the increasing block tin importation. Why we do not import more raw material from Bolivia is also discussed.
140. ———. L'étain en Bolivie.  
 Illustration, Vol. 116, 1900, Paris, p. 419.  
 Review: Berg. Hütt. Zeit., Vol. 60, 1901, Leipzig, p. 268.
141. ———. Tin in Bolivia.  
 Min. Ind. for 1900, Vol. 9, 1901, New York and London, p. 639.  
 Tin is mined in the departments of Oruro, Potosi, La Paz and Cochabamba, of which Oruro is much the most important, containing within its borders 25 out of a total of 37 mines of the whole country.
- 141a. ———. Tin in Bolivia.  
 Min. Ind. for 1901, Vol. 10, 1902, New York and London, p. 641.  
 Most important tin mining district is that of Huanuni, where tin ore occurs in numerous veins and lodes, traversing the granite country rock.
142. ———. Tin in Bolivia.  
 Eng. Mg. Journ., Vol. 73, 1902, New York, p. 218.  
 Answer to correspondent asking about Bolivia tin deposits. Gives recent production and some other data.
143. ———. Tin in Bolivia.  
 Mo. Bull. Int. Bur. Amer. Repub., Jan.-June, 1902, Washington, D. C., pp. 588-590.  
 In the Huanuni district in Bolivia on the mountain of Pozoconi, many of the tin veins run into tin pyrites at from 100 to 200 feet in depth. "Solid tinstone of variable width up to 2 feet." One vein at the Challa and Apacheta mines, 10 miles south of Huanuni is 25 to 30 feet wide, averaging 20 per cent tin. The vein is composed of grains of SnO<sub>2</sub> in an argillaceous rock.  
 The Arecayo mine of the Oruro district, has lodes from 1 to 3 feet wide and has considerable masses of solid ore, averaging more than 40 per cent tin.
144. ———. A new tin mine, Bolivia.  
 Mg. Journ., Railw. Comm. Gaz., Vol. 74, 1903, London, p. 525.  
 Situated 57 miles south of Tupiza, anciently worked in a small way for silver. In 1901 opened as tin mine. Striking in an easterly and westerly direction, lodes cut decomposed clay, slate and shale. Principal lode over 800 feet in length, with an average width of 2 feet. With the rudest dressing machinery, about 23 tons of black tin of 55 per cent to 62 per cent is produced monthly.
145. ———. Tin mining in Bolivia.  
 Eng. Mg. Journ., Vol. 80, 1905, New York, p. 698.  
 Brief summary of report of the British Foreign Office. Since rise in price of tin, the famous silver mines of Oruro have depended for their prosperity more on their tin output than silver production. Bolivia now one of the largest producers of tin in the world. Total shipments in 1904 from Oruro district amounted to equivalent of 8000 tons of metallic tin, in 1903 the output was about one-half as large.
146. ———. Tin mining in Bolivia.  
 Eng. Mg. Journ., Vol. 81, 1906, New York, p. 1137.  
 Tin deposits of La Blanca, San José and Quinsachata are briefly described, giving output, etc.

## BOLIVIA (Continued)

147. ———. *Railway and mining development in Bolivia.*  
 Eng. Mg. Journ., Vol. 82, 1906, New York, p. 2, map of S. Bolivia.  
 "Tin mines of the country are undoubtedly destined to become one of the world's chief sources of supply. Already the Bolivians aspire to the premier place in tin production. The conditions under which this metal is found show wide differences, but it is found throughout a large area, and is undoubtedly abundant."
148. ———. *Tin in Bolivia.*  
 Eng. Mg. Journ., Vol. 82, 1906, New York, p. 631.  
 The prevalent idea that tin ore is superficial in Bolivia, only time will prove or disprove. If there is no notable increase for some time in the output of Bolivian tin, it will not be through want of ore in lodes, but through scarcity of labor.
- 148a. ———. *Producción de estaño en 1906 y 1907.*  
 Geol. Minas, Vol. 2, 1907-1908, Buenos Aires, p. 630.  
 Gives Bolivian production of tin for years 1906 and 1907.
- 148b. ———. *The mining industries of Bolivia.*  
 Journ. Soc. Arts, Vol. 57, 1909, London, pp. 721-722.  
 Reprint: Mg. World, Vol. 31, 1909, Chicago, p. 923.  
 Treats of the Bolivian tin output, market, machinery used, etc.
- 148c. ———. *The tin mines of Huanuni and Uncia, Bolivia.*  
 Mg. Journ. Railw. Comm. Gaz., Vol. 87, 1909, London, p. 125.  
 Abstract from "El Comercio" (Uñuni, Bolivia).  
 Gives brief notes regarding output and improvements in the various mines of Huanuni and Uncia.
- 148d. ———. *Tin Mining in Bolivia.*  
 Eng. Mg. Journ., Vol. 88, 1909, New York, p. 1284.  
 Extract from undesignated British consular report, giving the total production of barilla during 1908 as follows: Potosi, 18,139 tons; Oruro, 9620 tons; La Paz, 2,008 tons; Cochabamba, 170 tons. Total, 29,937.
- 148e. ———. *La producción de estaño en Bolivia.*  
 Cienc. Indust., Vol. 3, 1909, Buenos Aires, p. 209.
- 148f. ———. *Bolivia in 1909.*  
 Mg. Journ. Railw. Comm. Gaz., Vol. 88, 1910, London, p. 186.  
 Short account of the tin output for 1909, showing an increase over the production of 1908.
149. ARZRUNI, A. *Ueber einige Mineralien aus Bolivia.*  
 Zeitschr. Kryst. Min., Vol. 9, 1884, Leipzig, pp. 73-77.  
 Review: Neues Jahrb. Min., 1886, I (Ref.), Stuttgart, pp. 198-199.
150. BALLIVIÁN, M. V., and SAAVEDRA, BAUTISTA. *El estaño en Bolivia. Monografías de la industria minera, No. 3.*  
 Oficina nacional de inmigración, estadística, etc., 1900, La Paz, pp. 133.
151. BARBA, ALVARO ALONSO. *Arte de los Metales.*  
 Madrid, 1630, chap. 32.  
 Ref. from Frochot, L'étain in Bolivie, Ann. Mines, ser. 9, Vol. 19, 1901, Paris, p. 187.  
 "C'est encore aujourd'hui une autorité en matière de mines, et ses indications sur la géographie minière de la Bolivie ont été très rarement reconnues inexactes."  
 Not available to the authors.

## BOLIVIA (Continued)

A translation was published in London in 1740, entitled: "A collection of scarce and valuable treatises upon metals, mines and minerals. . . . Being a translation from the learned Alvaro Alonso Barba, director of the mines at Potosi in the Spanish West Indies, and the observations of several ingenious persons of our own country, founded on many years experience." Tin, chap. 32, pp. 107-110.

BECK, RICHARD. *See* No. 1299.

## 152. BENEDICT, WM. DE L. Tin in Bolivia.

Min. Ind. for 1892, Vol. 1, 1893, New York and London, pp. 450-451.

Tin at Potosi is found in large quantities in silver bearing veins. At Chorolque, bismuth and tin are found close together in distinct veins. A few deposits of alluvial or stream tin have been discovered, but only one that is of any importance.

152a. BERKEY, CHARLES P. *See* Rumbold, William R. Origin of Bolivian tin deposits.

Descriptions of microscopic sections of Bolivian tin ores and rocks.

## 153. BRADLEY, D. H., JR. Mining in Bolivia.

Mg. Mag., Vol. 11, No. 1, 1905, New York, pp. 41-48, 9 illus.

As a tin producing country, Bolivia is second to Malay Peninsula. With the exception of that from Potosi, bar tin, the product of Bolivia is second in quality to none. Deposits rich, output increasing. Tin will undoubtedly be found in many other parts of Bolivia. Bolivian mines offer immense opportunities for investments paying 25 per cent premium within 3 or 4 years.

## 153a. BROWN, GILMOUR E. Present position of Bolivian tin mines.

Mg. Journ. Railw. Comm. Gaz., Vol. 85, 1909, London, p. 399.

Extract: Mg. World, Vol. 26, 1909, Chicago, p. 829.

A few notes on the cost of mining and smelting, and the names of a few of the principal mines operating in Bolivia.

## 154. CONWAY, SIR MARTIN. Climbing and exploration in the Bolivian Andes.

New York, 1901, pp. 291-299.

The tin mines of Huaina Potosi are treated from a literary rather than geological standpoint. Veins from 3 meters to 10 meters wide occur in "porphyry," slate and trachyte.

D'ACHIARDI, ANTONIO. *See* No. 1313.

DAVIES, D. C. *See* No. 1317.

## 155. EMMONS, S. F. Geological distribution of the useful minerals.

Trans. Amer. Inst. Mg. Eng., Vol. 22, 1894, New York, p. 72.

"In Bolivia where tin ore forms an important part of the mineral product, it occurs in andesitic or trachytic rocks of Cretaceous or Tertiary age, is associated with sulphides of silver, copper, lead, zinc and iron and without the usual accompaniment of tourmaline, topaz, fluorspar or apatite."

## 155a. ENDTER, AUGUSTO. The tin mines of Llalagua, near Oruro, Bolivia.

Mg. Journ. Railw. Comm. Gaz., Vol. 86, 1909, London, pp. 52-53.

Abstracted from "Compañía Estañífera de Llalagua. Tercera Memoria del Directorio y Balance General al 31 de Diciembre de 1908." Santiago de Chile, 1909, 26 pages with five folding plates.

Treats of the geology, vein structure and mining methods, also announces and describes a newly found pocket of rich ore.

## BOLIVIA (Continued)

- 155b. EVERDING, —. *Unterlagen zu einer bergmännischen Lagerstättenbegutachtung in bolivianischen Zinnerzbezirk.*  
Glück. Berg. hütt. Zeit. Nied. Westph., 45 Jahr., 1900, Essen, pp. 1325-1335.
156. FAWNS, SYDNEY. *Tin deposits of the world.*  
Mg. Journ. Railw. Comm. Gaz., 1905, London.  
Deposits of Bolivia, pp. 112-124. Small outline map.  
No new material. Taken from Pasley's, Chas. S., "The tin mines of Bolivia." *Trans. Inst. Mg. Mct.*, Vol. 7, 1898-1899, London, pp. 70-90, 95; Roberts, Malcolm, "Chorloque tin mines," *op. cit.*, Vol. 9, 1900-1901; and *Min. Ind.*, New York and London, 1903.
157. FORBES, DAVID. *Researches on the mineralogy of South America.*  
London, Edinburgh, Dublin, *Philos. Mag. Journ. Sci.*, ser. 4, Vol. 29, 1865, pp. 133-136; Vol. 30, 1865, London, pp. 139-142.  
First article treats of the occurrence of tin ore in Bolivia; second article describes the different kinds of tin ore of Bolivia.
- FRENZEL, A. *See No. 1611.*  
Describes cylindrite from Bolivia.
158. FROCHOT, MAURICE. *L'étain en Bolivie.*  
*Ann. Mines*, ser. 9, Vol. 19, 1901, pp. 186-222.  
Extract: *Bol. Min. Indust. Constr.*, Ano 18, Nos. 7, 8, 1902, Lima, Peru, pp. 51-53, 59-62.  
Digest: *Trans. Inst. Mg. Eng.*, Vol. 23, 1901-1902, London and Newcastle-upon-Tyne, pp. 715-716.  
*Geol. Centr.*, Vol. 1, 1901, Leipzig, p. 707.  
35 tin mines at work; cost of production very heavy; no such deposits known in Peru or Chili; Oruro district largest producer; geological conditions extremely varied; Ituanuni mine credited with two-thirds of output of State; situated in a sort of stockwork in Mount Posconi, 10,500 feet high; in most cases SnO<sub>2</sub> gives way to stanniferous pyrites at depth of 130'-160', one vein is filled with pure tinstone to a depth of 650' or more; 9 miles south are mines of Challa and Apacheta where is a vein 25 to 30 feet thick which in parts can be dug with a spade (where pyritiferous). Many "veneros" in this neighborhood not well worked. Fifty miles north of Oruro is Colquiri, where the Spaniards used to work silver ores but neglected tin, as usual. Tin veins close at hand are still untouched. In the mountains of Tres Cruces, (20,000' alt.) the Sayaquiri vein is 25 feet thick. Ore rather poor, associated with iron pyrites and wolframite, but some crystalline ore runs 70 per cent tin.  
Avicaya mines are productive and rock is compact porphyry. In the department of La Paz, the mines of Milluni, Huayna Potosi and Chocaltaya are all on one ore belt 12 miles in length. Veins, appear to be of very recent origin, for they occur near fossiliferous gypsum-bearing beds and red clays which have been faulted by disturbances that raised the neighboring Andes. Are in slates of Silurian or pre-Silurian age. Many veins not worked. Bolivian tin ores are not connected with plutonic granite, but appear to be connected genetically with thermal springs, which hold metallic sulphides in solution and were the outcome of Cretaceous and Tertiary volcanic eruptions.
159. FUCHS, E., et LAUNAY, L. DE. *Traité des gîtes minéraux et métallifères.*  
Vol. 2, 1893, Paris, pp. 107-158.  
Brief note upon the occurrence of tin in Bolivia.
160. GAUTIER, FERDINAND. *Observation sur la formation des filons d'étain.*  
*Actes Soc. sci. Chili*, Vol. 5, 1895, Santiago, pp. 82-84.  
Theories on deposition of tin veins near Chorloque, Bolivia.

## BOLIVIA (Continued)

GMEHLING, ANDREAS. *See* No. 1497.

## 161. HARRISON, G. Tin in Bolivia.

Diplomatic and Consular reports (Bolivia). Trade of Bolivia for the years 1904-1905, No. 3600, Ann. ser. 1906, London, p. 4.

Mentions tin mining as principal industry.

## 161a. LIGHT, JOHN. El estaño boliviano y la iniciativa chilena.

Geol. Minas, Vol. 1, 1906-1907, Buenos Aires, pp. 392-397.

Taken from "La Lei," Santiago, Chile.

General article upon tin, particularly of Bolivia.

LOUIS, HENRY. *See* No. 1340.

## 162. MINCHIN, J. B. Tin mines in Bolivia.

Eng. Mg. Journ., Vol. 51, 1891, New York, pp. 586-587.

Good description of various tin mines of Bolivia, associated ores, manner of working, difficulties of transportation. Most important deposits are situated among the mountain ranges bordering the table-land to the east and northeast of Oruro and Lake Poopo, and are scattered over some 500 square miles. General country rock is shale, more or less highly inclined and contorted from eruptions of trachytic porphyry; the tin veins occur in the latter.

## 163. MINCHIN, J. B. Mineral resources of Bolivia.

Iron, Vol. 37, No. 962, 1891, London, p. 536.

## 164. ———. The mineral resources of Bolivia. (Tin mines.)

Engineering, Vol. 51, 1891, London, p. 453.

Tin-bearing country extends along eastern border of Bolivian table-land from lake Titicaca to near the Argentine boundary. At Potosi and Oruro tin is associated with ores of silver, in other places, found alone or mixed with iron oxide and earthy matter. Country rock is shale, inclined and contorted from eruptions of trachytic porphyry; the tin veins occur in the latter rock. Mode of occurrence varies even in one group of mines. Country lacks adequate mining machinery.

## 165. ———. Tin in Bolivia.

Mo. Bull. Int. Bur. Amer. Repub., No. 55, 1892. Revised to July 1, 1893, Washington, D. C., pp. 74-78.

Short, general, descriptive article, probably taken from his "Tin mines in Bolivia," Eng. Mg. Journ., Vol. 51, 1891, New York, pp. 586-587.

## 166. ———. Notes on tin mining in Bolivia.

Eng. Mg. Journ., Vol. 75, 1903, New York, p. 31.

Reprint with additions: Mo. Bull. Int. Bur. Amer. Repub., 1904, Washington, D. C., pp. 107-116.

Mines are briefly described. Tin ore occurs chiefly at La Paz on the north, Oruro in the middle, Chorolque on the south and Potosi on the east. Huanuni is richest tin district. Transportation by pack mules, llamas and wagons. The best tin is said to come from Berenguela, 45 miles east of Oruro. Mines were formerly worked for silver. Some of the tin ore is very hard to handle on account of the large amount of antimony and other sulphides. Tin mining develops as transportation becomes easier. 350 tons barilla (concentrates) estimated to give 210 tons of bar tin.

Output of barilla for 1902:		1901:
La Paz	9,536 met. quin.	10,780
Oruro	96,981 " "	100,206
Chorolque	13,365 " "	39,175
Potosi	56,201 " "	68,998
Total	176,083	219,159

## BOLIVIA (Continued)

167. ———. Tin in Bolivia.  
Min. Ind. for 1902, Vol. 11, 1903, New York and London, pp. 588-590.  
General description of tin deposits of Bolivia, methods of working, grade of ore, production, etc.
168. ———. Tin production in Bolivia.  
Eng. Mg. Journ., Vol. 77, 1904, New York, p. 244.  
Production of tin from mines in the neighborhood of Oruro. Description of the individual mines.
169. ———. Bolivian tin mines.  
Mg. Journ. Railw. Comm. Gaz., Vol. 79, 1906, London, p. 361, 450 words.  
Reprint: Eng. Mg. Journ., Vol. 81, 1906, New York, p. 810.  
A letter dated Oruro, Bolivia, Jan. 26, 1906, giving a short general description of the Bolivian tin mining industry.
170. NEWLAND, D. H. Production of Bolivian mines for 1903.  
Min. Ind., Vol. 12, 1904, New York and London, pp. 329-330.  
Mines in vicinity of Oruro briefly treated.
171. OCHSENIUS, C. Die Silber-Zinnerz-Lagerstätten Bolivias.  
Zeitschr. deutsch. geol. Ges., Vol. 49, 1897, Berlin, pp. 693-695.
- 171a. OLAECHEA, T. El estaño en Bolivia.  
Bol. Min. Indust. Constr., No. 7, ano, 18, 1902, Lima, pp. 51-53 and No. 8, pp. 59-62.  
"From an interesting article by Frochet, printed in "Annales des Mines," we extract the points which may be the most directly useful to national [i. e. Peruvian] mining; although the metal referred to has only been known to exist in the department of Puno, it will not be strange if some day, owing to the mineral wealth of the Peruvian soil, tin may be found as a result of new explorations, in conditions where it can be conveniently worked." Then follow extracts from Frochet's article.
172. PASLEY, CHAS. S. The tin mines of Bolivia.  
Trans. Inst. Mg. Met., Vol. 7, 1898-1899, London, pp. 77-90, 95.  
Digest: Min. Ind. for 1898, Vol. 7, 1899, New York and London, pp. 707-718.  
Abstract: Coll. Guard., Vol. 77, 1899, London, p. 18.  
Fawns, Sydney.—Tin deposits of the world, pp. 112 et al.  
Tin mines in East Cordilleras. Rocks Silurian graywacke, slate, shales, and sandstone, cut by granite and later "porphyritic rocks." Trachyte in south. Formerly worked at Iluanuni by Spaniards down to 1000 feet carrying ore out on their backs, two trips a day, 75 pounds per trip. Many rich veins from 1 foot to 30 feet wide and carrying up to 50 per cent tin. Mines located at from 13,000 feet to 15,000 feet altitude. Freights high. Fuel scarce. Tourmaline found with ores. Much antimony, pyrite, bismuth, and arsenic, with some silver, copper, and gold.
- PEARCE, R. See No. 1630.
- 172a. PEÑA, ALFONSO DE LA. La explotación de minerales de estaño en Bolivia.  
Geol. Minas, Vol. 2, 1907-1908, Buenos Aires, pp. 336-339.
173. PENBERTHY, JOHN. Tin mining in Bolivia.  
Eng. Mg. Journ., Vol. 82, 1906, New York, p. 458.  
Deposits of Bolivia are both lode and alluvial. Principal centers of production are Chorolque, Potosi, Uncia and Iluanuni. The transportation to shipping points



## BOLIVIA (Continued)

depends upon rainfall, since absence of grass paralyzes transport which is carried on by mules and llamas. The labor problem is one of great difficulty. With present price of tin, all mines are worked to limit; but it is improbable that there will be an increase in production in the near future owing to the excessive difficulties here encountered.

## 174. ———. Tin mining in Bolivia.

Amer. Mg. Rev., November 7, 1908, Los Angeles, p. 1, pl. 1. Abstract of paper read before Roy. Cornwall Polyt. Soc. of England.

Briefly describes the tin mines and mining conditions existing in Bolivia.

———. See No. 467.

PENFIELD, S. L. See No. 1631.

PHILLIPS, J. A., and LOUIS H. See No. 1350.

## 175. PREUMONT, G. The Bolivian tin mining industries and railways.

Mg. Journ. Railw. Comm. Gaz., Vol. 83, 1908, London, pp. 5-6, 65-66.

Bolivia presents after the Malayan States the most interesting field for tin mining. Since ore occurs mostly in lodes, it has, in many respects an advantage over those countries depending on alluvial grounds, which are rapidly becoming depleted. Most of the mines are comparatively yet in virgin ground. The possibility of the output increasing rapidly, is largely dependent on better and cheaper methods of transportation. Hence the outlook for railway development is treated at length.

## 176. ———. Northern tin fields of Bolivia.

Mg. Journ. Railw. Comm. Gaz., Vol. 83, 1908, London, pp. 160, 249, 314.

Gives location, geographic and climatic description of country in which tin deposits occur. The tin-bearing lodes seem to bear no direct relation to the granite core of the mountains, but occur in quartzite on their western flanks. This quartzite is neither very continuous nor very wide, but all areas of it have been found to be stanniferous. The tin fields of Milluni, Quimsa Cruz, Araca and Ichoca occur in such areas. Describes in detail the Huaina-Potosi, Milluni, Araca, Quimsa Cruz, and Santa Vela Cruz fields.

PRIOR, G. T. See No. 1636.

Describes teallite.

## 177. PUNNETT, H. MACAULEY. The tin deposits of Bolivia.

Mg. Journ. Railw. Comm. Gaz., Vol. 33, 1863, London, pp. 403, 443, 479, 498, 554.

Enumeration and description of principal tin districts of Bolivia and modes of working mines, crushing and washing of ores.

ROLKER, CHAS. M. See No. 1357.

## 178. ROBERTS, MALCOLM. Chorolque tin mines and alluvial deposits, Bolivia.

Trans. Inst. Mg. Met., Vol. 9, 1900-1901, London, pp. 372-376.

Geography, geology, mineralogy; description of the mines and their working, also a description of the alluvial deposits.

## 179. ———. Notes on Chorolque tin mines and alluvial deposits, Bolivia.

Trans. Inst. Mg. Met., Vol. 12, 1902-1903, London, pp. 404-405.

Additions to paper in Trans. Inst. Mg. Met., Vol. 9, 1900-1901, London, pp. 372-376, giving further details of the geology.

## 180. ROMAÑA, EDUARDO A. L. DE. Una inspección de los yacimientos de estaño de Bolivia y una exploración por el mismo metal en el Perú.

Boletín Cuerpo de Ingenieros de Minas del Perú No. 57, 1908, Lima, pp. 99, figs. 26, maps 2..

## BOLIVIA (Continued)

Abstract: *Mg. Journ. Railw. Comm. Gaz.*, Vol. 84, 1908, London, pp. 37-38, 91-92.

Reviews the uses and production of tin to p. 31; describes Bolivian deposits and their production to p. 68. The remainder of the bulletin describes investigations in the provinces of Huancane and Chucuito, department of Penco. Tin was found at but one place in Peru, on the mountain Calvario in Vilque Chico, where it occurs with lead.

## 180a. RUMBOLD, WILLIAM R. Origin of the Bolivian tin deposits.

*Econ. Geol.*, Vol. 4, 1909, Lancaster, pp. 321-364, map, figs. 31.

Abstract: *Mg. World*, Vol. 31, 1909, Chicago, pp. 1063-1066. Map.

The tin ore occurs in Devonian quartzite and quartzite-schist and in quartz porphyry cutting these.

The Concordia lode is in a breccia in a fissure, part of which is occupied by quartz porphyry. Besides cassiterite, the lode carries siderite, tourmaline, sphalerite, and pyrite.

The Elisa and Coya lodes as exposed where worked, are similar to the Concordia.

The Monte Blanco mine, besides having lodes, has schistose quartzite, carrying cassiterite and tourmaline between the laminae.

The Barrosa Cota Mine works white quartz veins, carrying pyrite, magnetite, and tourmaline, with cassiterite which in some places takes the form of wood tin.

The San Roque and La Boliviana mines work the "Galfofa" lode, which carries iron oxide and pyrite, arsenical pyrite, chlorite, and tourmaline. There is no igneous rock exposed in the mine.

At La Unificada Mine, Negro Pabellon, the lode carries cassiterite with iron oxide, quartz and barite.

Wolframite occurs in veins and pockets of the quartz porphyry.

In the Cataracagua lode at Huanuni, the writer thinks the cassiterite may have been deposited later than iron oxides. Little sulphide has been encountered along the lode.

The Morococala mines are in an inlier of quartzite schist in andesite. A great flow of andesite covers much of the tin-bearing rocks and many of the tin mines are located around the edge of the andesite which, however, has no relation to the origin of the tin ores.

The Antequera, Totoral, and Avicaya mines at Chualla Grande are on impregnation lodes in quartzite and carry cassiterite, quartz, tourmaline, iron pyrite, and less chalcopyrite.

In most of the Llallagua and Uncia veins, there is little impregnation but the walls are slickensided. The average width of the veins is about 2 feet. They carry much iron oxide in the upper portions; below that, sulphides of iron, bismuth, arsenic, antimony, a little silver, and traces of gold. There is no stannite. The writer considers these to be the richest tin mines in Bolivia and probably in the world.

The San José lode is 2 metres wide and carries 20 per cent tin.

The San Salvadora lode is 2 feet wide and is said to carry 25 per cent tin in dense sulphides. It also contains values in bismuth and silver. He claims that with proper handling, the barilla could be made as clean as the tin concentrates from the Malay Peninsula and cleaner than those from Cornwall.

Descriptions of numerous microscopic sections by Charles P. Berkey are quoted.

SPENCER, L. J. See No. 1641.

## 181. STEINMAN, G. Ueber die Zinnerzlagertstätten Bolivas.

*Monatsber. deutsch. geol. Ges.*, No. 1, 1907, Berlin, pp. 7-9.

Translation: *Mg. Journ. Railw. Comm. Gaz.*, Vol. 81, 1907, London, pp. 453-454.

Translation: *Informaciones y Memorias, Boletín de la Sociedad de Ingenieros*, Vol. 9, 1907, Lima, pp. 133-136.

Gives geological data on the tin deposits of Bolivia, additional to that published by Stelzner.

## BOLIVIA (Continued)

## 182. STELZNER, ALFRED W. Zinnerzlagerstätten von Bolivia.

Zeitschr. deutsch. geol. Ges., Vol. 44, 1892, Berlin, pp. 531-533. Also, Zeitschr. prakt. Geol., 1893, Berlin, pp. 81-82.

Digest: Min. Mag. Journ. Min. Soc., Vol. 10, 1893, London, pp. 264-262.

Digest: Neues Jahrb. Min., 1893, II (Ref.), Stuttgart, p. 81.

"Tin ores in South American Cordilleras are restricted to a zone extending from the 15th to the 21st degree of latitude. In paragenesis and mode of occurrence they offer a remarkable contrast to the tin ores of other countries. The ore is seldom in crystals but usually crypto-crystalline, kidney-shaped, or compact. The usual tourmaline, topaz, fluorite, apatite, etc., are almost entirely absent. Instead of these the tin ore is accompanied by stannite and other sulphides. Frequently the tin is restricted to the upper portion of a vein, its place being taken lower down by argentiferous fahlerz, pyrite, and (locally) galena and zinc blende. In its geological occurrence, the tin ore is remarkable, occurring in association, not with granite, but with trachytes and andesites referred to a late Cretaceous or early Tertiary age."

## 183. ———. Die Silber-Zinnerzlagerstätten Bolivias.

Zeitschr. deutsch. geol. Ges., Vol. 49, 1897, Berlin, pp. 51-142, map and bibliography.

Ein Beitrag zur Naturgeschichte des Zinnerzes.

Review: Neues Jahrb. Min., 1891, I (Ref.), Stuttgart, pp. 481-483.

———. See No. 1642.

## 184. WENDT, A. F. The Potosí, Bolivia, silver-district.

Trans. Amer. Inst. Mg. Eng., Vol. 19, 1891, New York, pp. 90-91.

"An almost constant accompaniment of the silver ores of Potosí, and of a great many of the silver ores of the plateau of Bolivia, is binocide of tin, in the shape of gray or yellow oxide. Some of the silver veins are very rich in the oxide of tin, notably so the Tajo-polo and the Veta Estaño, which was named after its contents of tin."

The country rock is rhyolite.

## BURMAH

## 185. ANONYMOUS. Maliwan tin mines [Mergui district].

Ind. Eng. July 20, 1889, Calcutta, pl. 1.

Reprint: Eng. Mg. Journ., Vol. 48, 1889, New York, p. 182.

Digest: Proc. Inst. Civ. Eng., Vol. 98, pt. 4, 1889, London, pp. 468-469.

Description of the almost deserted tin mines of Mergui, near Renaung. Veins of tin-sand are found at the surface, mined in open workings by shallow pits from 10 to 12 feet deep. Sand is raised by ladders from the mines and washed. Two smelting furnaces are situated at Maliwan. Output per day is 15 to 16 blocks of tin of 106 pounds each, bringing about Rs. 60 at Penang.

## 186. ———. Tin in Burmah.

Min. Ind. for 1900, Vol. 9, 1901, New York and London, p. 639.

## 187. ———. Tin in Burma.

Mg. World, Vol. 24, 1906, Chicago, p. 96.

Tin occurs in alluvial deposits all along the water courses, covering an area nearly 200 miles in length, by an average breadth of 40 miles. At Maliwan both vein and alluvial tin mining is carried on.

## BURMAH (Continued)

188. FOSS, K. MACKENZIE. The occurrence of tin and gold in Lower Burma.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, pp. 505-506.  
 Describes an alluvial tin deposit at Henzai. Assayed 73 per cent tin; one particular assay went 48 ounces of gold to ton, and 50 per cent metallic tin. Deposit contains considerable copper and wolframite. Worked by natives in crude manner. Some 28 miles inland from Mergui tin, coal and gold found. Mr. T. W. H. Hughes reported favorably on these deposits.
189. FRYAR, MARK. Burma.  
 Indian Economist, 1872, Calcutta, pp. 445-459.  
 Not available to the authors.
190. GRUNDY, JAMES. Mineral production of India.  
 Trans. Manchester Geol. Soc., Vol. 28, 1902-1904 (1905), Manchester, p. 14.  
 Tin is mentioned as occurring in Lower Burma. Relatively of small economic importance. Trade is trifling. Practically all the tin mined is used in India.
191. HELFER, J. W. Letter on tin, iron, etc., from Tenasserim.  
 Journ. Asiat. Soc. Bengal, Vol. 7, 1838, Calcutta, p. 171.  
 Expresses himself as "greatly satisfied" with tin mines of Tenasserim district. "They are very rich and very extensive."
192. HOLLAND, T. H. Tin ore in Burma.  
 Rec. Geol. Surv. India, Vol. 31, 1904, Calcutta, p. 43.  
 Note on discovery of a tin-bearing greisen in Tenasserim.
193. HUGHES, T. W. H. Tin-mining in Mergui District.  
 Rec. Geol. Surv. India, Vol. 22, pt. 3, 1889, Calcutta, pp. 188-208. Sketch map 1. Partly reprinted in Sydney Fawns', "Tin deposits of the world," pp. 39-41.  
 Has but little hope for lode mining. Stream tin is generally distributed through the gravels. Jungle thick so that exploration is difficult. Mines worked by Chinese, and ore is smelted at the mines. List of mines given.
194. ———. Report on the prospecting operations, Mergui district.  
 Rec. Geol. Surv. India, Vol. 26, 1891-1892 (1893), Calcutta, pp. 40-53.  
 Confirms previous reports that tin deposits are large and accessible enough to be worked profitably under economical management. Geology of country gives reason to hope that both north and east of country prospected, other paying tin deposits may be found.
195. KING, WILL. Tin in Tenasserim.  
 Rec. Geol. Surv. India, Annual Report for 1888, Vol. 22, pt. 1, 1889, Calcutta, p. 11; for 1889, Vol. 23, pt. 1, 1890, Calcutta, p. 8; for 1890, Vol. 24, pt. 1, 1891, Calcutta, pp. 9-10; for 1891, Vol. 25, pt. 1, 1892, Calcutta, p. 8; for 1892, Vol. 26, pt. 1, 1893, Calcutta, p. 4.  
 Outlines progress in opening up this new district.
196. LEMON, CHAS. and TREMENEERE, G. B. Reports on the tin of Province of Mergui, in Tenasserim, in the northern part of the Malayan Peninsula.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 6, 1846, Penzance, pp. 68-75.  
 Description of the occurrences of stream tin in Mergui. States that cassiterite is also found in granite dikes which cut sandstone. Both forms of deposits said to be large, especially these of stream tin.

## BURMAH (Continued)

## 197. LOCK, C. G. WARNFORD. Tin in Burmah.

Economic Mining, 1895, New York, p. 623.

"Burmah is the great source of Indian tin supplies. In the Tenasserim division, tinstone is very plentiful, every stream bed near Maliwun in Mergui yielding the metal when washed. Dr. Oldham states main source of all the Tenasserim tin is the granite range separating province from Siam, where it exists as an essential ingredient of the mass of rock."

## 198. OLDHAM, T. Remarks on papers and reports relative to the discovery of tin and other ores in the Tenasserim provinces.

Sel. Rec. Bengal Gov., Vol. 6, 1852, Calcutta, pp. 33-44.

Also: Papers on the geology and minerals of British Burmah, 1882, Calcutta, pp. 366-375.

Not available to the authors.

## 199. ———. Notes on the coal-fields and tinstone deposits of the Tenasserim provinces.

Sel. Rec. Gov. India, Vol. 10, 1856, Calcutta, pp. 31-67.

Also: Papers on the geology and minerals of British Burmah, 1882, Calcutta, pp. 375-406.

Not available to the authors.

REYER, EDUARD. See No. 1354.

## 200. ROYLE, —. On the tin mines of Tenasserim province.

London, Edinburgh, Dublin Philos. Mag. Journ. Sci., ser. 3, Vol. 24, 1844, London, pp. 63-65.

In 1837 tin was discovered near Lake Loadut, about 110 miles north-northeast of Maulmain, and in 1840 the country north of the Pakchan River was reported to be the richest stanniferous district within the Tenasserim provinces. Ore is found in the debris of primitive rocks, and the range is said to be a continuation of the Siamese tin district of Kinowng. In an hour and a half 11,889 grains of tin were collected in the vicinity of the coal mines on Great Tenasserim River.

## 201. SNOW, A. B. Tin mining in Lower Burma.

Mg. Journ. Railw. Comm. Gaz., Vol. 78, 1905, London, p. 247.

Describes alluvial tin-bearing ground as covering an area nearly 200 miles long with an average breadth of about 40 miles along the water courses. At Maliwun both lode and alluvial mining is carried on. Veins are from 1 inch to 6 feet wide. Mining is done in most primitive manner by natives. Climatic conditions are favorable.

## 202. THEOBALD, W. Metalliferous resources of British Burmah.

Rec. Geol. Surv. India, Vol. 6, pt. 4, 1873, Calcutta, pp. 91-93.

"Beyond some workings near Malce-wan on the Pakchan River, the ore is nowhere systematically worked on a large scale within British territory. South of the Pakchan stream the richness of the tin washings is derived from the degradation of a stanniferous granite, in which the tinstone occurs as one of the integral constituents of the rock."

## 203. TREMENNIERE, G. B. Report on the tin of the Province of Mergui.

Journ. Asiat. Soc. Bengal, Vol. 10, 1841, Calcutta, pp. 845-851. Additions to report, Vol. 11, 1842, Calcutta, pp. 24, 289.

Also, Calcutta Journ. Nat. Hist., Vol. 3, 1843, Calcutta, pp. 47-54.

Sci. Rec. Bengal Gov., Vol. 6, 1852, Calcutta, pp. 5-11; papers on the geology and minerals of British Burmah, 1882, pp. 350-356.

Not available to the authors.

## BURMAH (Continued)

204. ———. Second report on the tin of Mergui.  
 Journ. Asiat. Soc. Bengal, Vol. 11, 1842, Calcutta, pp. 839-851.  
 Gives more complete description of the tin-bearing ground and of the methods of working, than in earlier report.
205. ———. Report of a visit to the Pakchan River, and some tin localities in the southern portion of the Tenasserim provinces.  
 Journ. Asiat. Soc. Bengal, Vol. 12, 1843, Calcutta, pp. 528-534, map.  
 Malewan is only spot in Province where people have located for the purpose of collecting tin. Do not work veins, stream tin alone is collected. Not possible to work except in rainy season, at which time one man can extract four rupees worth of tin per day. Mining done by Chinese. Country rock is granite.
206. ———. Report, etc., with information concerning the price of tin ore of Mergui.  
 Journ. Asiat. Soc. Bengal, Vol. 14, 1845, Calcutta, pp. 329-332.
207. WARTH, H. Burmah tin deposits.  
 Eng. Mg. Journ., Vol. 54, 1892, New York, p. 449.  
 Reprint: Min. Ind. for 1892, Vol. 1, 1893, New York and London, p. 450.  
 The tin deposits are of two kinds:  
 1st. Tin gravels found in all or most of the valleys. Gravels are a mixture of quartz, garnet, black tourmaline and gray cassiterite.  
 2d. Tin-bearing deposits in original eruptive rock, which is weathered so that it is possible to wash out grains of whitish cassiterite which it contains.  
 The yield from deposits of second class near Malewan was only 0.04 per cent of impure wash tin.

## CALIFORNIA

208. ANONYMOUS. Sur les mines d'or, d'argent et d'étain récemment découvertes dan les environs de Los Angeles [Cal.].  
 Ann. Mines, ser. 6, Vol. 16, 1869, Paris, pp. 599-600.
209. ———. California tin.  
 Mg. Sci. Press, Vol. 64, 1892, San Francisco, p. 261.  
 Announcement of the first shipment of pig tin from Temescal, Cal., to New York, which consisted of 22,000 pounds, the output of two weeks. Said to be equal to Straits Settlement tin.
210. ———. The California tin mines.  
 Eng. Mg. Journ., Vol. 53, 1892, New York, p. 49.  
 Short account of progress of San Jacinto tin mine during 1891. Outlook bright. Tin raised for 1891 placed at 123,366 pounds having a gross value of \$24,673.
211. ———. Tin in California.  
 Mg. Sci. Press, Vol. 82, 1901, San Francisco, p. 209.  
 "The metal from Bishop Creek, Inyo Co., Cal., is tin." (Given to show possible tin-bearing locality.)
212. BENEDICT, WILLIAM, DE L. The San Jacinto (Cal.) tin mines.  
 Eng. Mg. Journ., Vol. 50, 1890, New York, pp. 450-453. Editorial on same, p. 447.  
 Briefly reviews the unsuccessful attempts made to exploit tin mines in the United States, and the history of the San Jacinto deposits, the metal in which was long thought to be silver. Compares the deposits with those of Cornwall, and gives an epitome of the several reports upon the deposits from which he decides that the deposits should be developed before extensive works are erected.

## CALIFORNIA (Continued)

213. ———. Tin in California.  
Min. Ind. for 1892, Vol. 1, 1893, New York and London, pp. 452-453  
Descriptive, historical, statistical. 269,000 pounds pig tin produced to the time of closing down in September, 1892.
214. BLAKE, WILLIAM P. Occurrence of tin [wood tin] in California, Idaho and Montana.  
2d Rep. State Mineralogist, California, 1880-1882 (1882), Sacramento, appendix, pp. 216-218.  
California: Tin specimens found in Feather River, Plumas Co.  
Montana: Stream tin occurs in many streams of the granitic region of the Bitter Root Mts.; in some localities in sufficient quantities to justify the hope that washing for this ore may be profitable. The many points at which this ore is found in Montana and Idaho indicate that it has a wide and general distribution in the granite region of the Northwest.
215. FAIRBANKS, HAROLD W. Geology of the Temescal tin district.  
11th Rep. Cal. State Mg. Bureau, 1893, Sacramento, pp. 111-118.  
Describes the geologic features of the region and the system of tin veins.
216. ———. The tin deposits at Temescal, Southern California.  
Amer. Journ. Sci., ser. 4, Vol. 4, 1897, New Haven, pp. 39-42.  
Also, Mg. Sci. Press, Vol. 75, 1897, San Francisco, p. 362.  
Digests: Neues Jahrb. Min., 1899, I (Ref.), Stuttgart, pp. 23-24, 86-87.  
Geological description of the district, and of the occurrence of tin.
217. GARRISON, F. LYNWOOD. Tin in the United States.  
Eng. Mg. Journ., Vol. 78, 1904, New York, p. 830.  
The Temescal tin mine is described.
218. HANKS, H. G. Cassiterite.  
4th Rep. California State Mg. Bureau, 1884, Sacramento, pp. 115-123.  
Gives a short general dissertation upon the occurrence of tin; describes its ores; gives a list of the alloys of tin and their uses; enumerates the principal localities where tin is found; and describes the Temescal mines.
219. JACKSON [J. R. (?)]. Sur la découverte de minerais d'étain en Californie. (Extraits d'une lettre.)  
C. R. Acad. Sci., Vol. 50, 1860, Paris, pp. 105-106.
220. KNIGHT, ENOCH. Temescal tin mines.  
Eng. Mg. Journ., Vol. 53, 1892, New York, p. 276, pl. 3.  
At writing (end of year 1891), Temescal tin mines (San Jacinto) have produced the first and only American tin ever sent to the market.  
Description and reports of mine given.
- OHLY, J. See No. 1215.
221. ROESSLER, —. New California tin mine.  
Eng. Mg. Journ., Vol. 8, 1869, New York, p. 371.  
Editorial on same, p. 377.  
Announces the discovery of tin near San Jacinto, California. Brief review of California tin mining.
222. WEST, H. E. Tin in California.  
Eng. Mg. Journ., Vol. 79, 1905, New York, pp. 852-853.  
History, occurrence, and milling and metallurgy of the Temescal mines.

## CALIFORNIA (Continued)

## 223. WHITNEY, J. D. Tin in Temescal range.

Geol. Surv. of California. (Geology), Vol. 1, 1865, Philadelphia, pp. 180-181.

Synopsis of the field work from 1860-1864.

During 1860-1861 the Temescal range was a scene of great excitement on the subject of tin. Description of the ore and its occurrence given.

## CANADA

## 224. ANONYMOUS. Discovery of tin in Canada.

Mg. Journ. Railw. Comm. Gaz., Vol. 81, 1907, London, p. 305. Also, Can. Mg. Rev., Vol. 28, 1907, Montreal, pp. 39-40.

Reports discovery of tin near New Ross, Lunenburg County, Nova Scotia. Only slight development, and economic value is unknown. Tin is found in small quantities in numerous other localities in Canada. States that tin has been discovered in Laurentian rocks in Greenland.

## 225. BETTS, A. G. Electrolytic lead-refining.

Trans. Amer. Inst. Mg. Eng., Vol. 34, 1903, New York, pp. 180.

Tin is found in electrolytically refined lead at Trail, B. C., to the extent of 0.02 per cent. A number of analyses given show from 0.0012 to 0.0140 per cent of tin. Small amounts of Cu, Bi, As, Sb, Ag, Au, Fe and Zn are found in the bullion.

## 226. BROCK, R. W. Tin in British Columbia.

Summ. Rep. Geol. Surv. Dep. Canada for 1902 (1903), Ottawa, p. 130.

"Tin is reported to have been found near Long Lake, British Columbia, but no information could be obtained regarding the exact locality. It is quite possible that traces may occur in connection with the intrusions of granite rock in that part of the district. But no alterations of these rocks were observed, such as take place where tin occurs in commercial quantities." (Whole ref.)

## 227. FAIRIBAUT, E. RODOLPHE. Lunenburg County, Nova Scotia.

Summ. Rep. Geol. Surv. Dep. Canada for 1907 (1908), Ottawa, pp. 80-82.

Tin oxide was found in sand at Tangier in 1868, and later at Shelbourne, Rawdon and Country Harbour in drift.

On the Reeves claim at New Ross, tin is found in a pegmatite dike containing large quartz crystals, and is accompanied by scheelite, wolframite, and amblygonite. In the granites near New Ross, besides the minerals named there have been found monazite, one of the columbite minerals, durangite, lepidolite, hübnerrite, molybdenite, zinc blende, beryl, apatite, tourmaline, fluorite, pyrolusite, manganite, limonite, hematite, magnetite, siderite, bismuthinite, argentiferous galena, copper, iron pyrites, and arsenical pyrites. Quartz crystals reach 27 inches long and 10 inches thick.

The amount of tin so far shown seems to be insignificant. Traces of tin were found in pegmatite 6 miles south of Reeves claim. Bismuthinite and molybdenite were found in a dike of quartz and aplite 1 mile south of New Ross corner.

Tungsten and rare-earth ores were found 1 mile east of New Ross corner. (See Report for 1906, p. 91.)

## 228. HOFFMAN, G. C. Cassiterite, var. wood-tin.

Ann. Rep. Geol. Surv. Canada, n. s., Vol. 12, 1899 [1902], Ottawa, pp. 16 R-17 R.

Small pebbles of wood-tin found in all tributaries of the Klondike River, most frequently in Bonanza and Hunter creeks.

## 229. INGALLS, WALTER RENTON; ARGALL, PHILIP; and GARDÉ, A. C. Report of the commission appointed to investigate the zinc resources of British Columbia and the conditions affecting their exploitation.

Mines Branch, 1906, Ottawa, pp. 15-16.



## CANADA (Continued)

Tin has been shown to occur to the extent of 0.17 per cent in zinc ore from the Payne mill, near Sandon, Slocan district, B. C., and traces of tin are reported in lead at the Trail smelter, the ore of which is supposed to have come from the Slocan district.

## 230. OSANN, A. Oxide of tin.

Ann. Rep. Geol. Surv. Canada, n. s., Vol. 12, 1899 (1902), Ottawa, pp. 720-730.

A very small quantity of cassiterite was found in graphitic gneiss derived from limestone, at Graphite City in the Ottawa Valley, Canada.

Proved by this test: "It was dissolved in a borax bead colored slightly blue by copper monoxide; the bead assumed a ruby color or became opaque, resembling red sealing wax." Occurs with rutile, augite, quartz, titanite, pyrite.

## 231. WOLF, A. G. The Betts process at Trail, British Columbia.

A thesis submitted to the Colorado State School of Mines for the degree of E. M. Read before West. Assn. Tech. Chem. and Met., April, 1907.

Mines and Min., Aug., 1907, Scranton, pp. 11-15.

Mg. World, August 31, 1907, Chicago, pp. 355-356; September 14, 1907, Chicago, pp. 438-439.

States that the refined lead made contains .301 per cent of tin, with small quantities of Ag, As, Sb and Fe.

## 232. YOUNG, G. A. The tin-bearing locality at New Ross, N. S.

Summ. Rep. Geol. Surv. Dept. of Canada for 1907 (1908), Ottawa, p. 77.

Gives geologic description of the tin bearing area near New Ross.

## CAPE COLONY

## 233. ANONYMOUS. The Kuils River tin field.

Mg. World, Vol. 25, 1906, Chicago, p. 213.

Large extent of alluvial ground; estimated that there is in sight ten million dollars worth of ore. Even the overburden is highly payable. Abundance of water. Country rock mainly granite mostly of fine structure, in places passing into syenite, belonging to the Cape system. Hills are traversed in a north and south direction by bands of greisen, with closely associated quartz lodes dipping to the east.

## 233a. ———. Kuils River tin mines.

Mg. Journ. Railw. Comm. Gaz., Vol. 82, 1907, London, p. 212.

Taken from "The Cape Argus," July 22, 1907. A newspaper description of the tin placers on the Kuils River, 13 miles from Cape Town.

States that much of the cassiterite is in very fine particles and that the tailings are being worked.

## 233b. ———. The tin deposits of Cape Peninsula.

South African Mg. Rev., December, 1908, Johannesburg, pp. 2.

Not available to the authors.

## 233c. ———. Tin mining in the Cape Peninsula.

South African Mg. Journ., Vol. 7, pt. 2, 1909, Johannesburg, p. 221.

Treats of new developments and promising outlook, with comments on Kuils River deposits.

———. See No. 1047.

## 234. GRIFFITHS, HARRY D. Notes on tin mining in Cape Colony.

Journ. Chem. Met. Min. Soc. South Africa, Vol. 8, 1907-1908, Johannesburg, pp. 167-181, figs. 6, illus. 2.

## CAPE COLONY (Continued)

Abstract: *Mg. Journ. Railw. Comm. Gaz.*, Vol. 83, 1908, London, pp. 119-120.

Describes Kuils River tin deposits which are located some 17½ miles southeast of Capetown in hills composed of gray granite, coarsely porphyritic in structure with large quantity of biotite. Ore occurs both as lode and alluvial. Methods and cost of working given.

## 234a. ———. New methods of concentrating alluvial tin.

*Mg. Journ. Railw. Comm. Gaz.*, Vol. 84, 1908, London, p. 56.

"Describes the new methods introduced at the Kuils River tin mines, Cape Colony, which consist in effecting a coarse concentration by means of a rotary pan similar to that used in diamond washing, and then cleaning the rough concentrates in a hydraulic separator to the grade required."

## 235. KEYZER, S. S. Tin in Cape Colony.

*Mg. Journ. Railw. Comm. Gaz.*, Vol. 80, 1906, London, p. 8.

Description of lode and alluvial deposits occurring in Cape Colony, between Kuils River and Stellenbosch.

## 235a. WAGNER, P. A. Notes on the tin deposits in the vicinity of Capetown.

*Trans. Geol. Soc. South Africa*, Vol. 12, 1909, Johannesburg, pp. 102-111, pl. 1 and figs. 2.

Describes the lode tin deposits at Langverwacht, Hazendal, Welbeloond, Papkuilsfontein, and Hoogekrall and detrital deposits at Langverwacht (Kuils River).

The first two occur in quartz veins in white granite dikes cutting granite. The veins carry cassiterite, wolframite, molybdenite, arsenopyrite, pyrite and a little tourmaline. The other three are quartz veins cutting slates, and are accompanied by much more tourmaline, arsenopyrite and pyrite.

At Papkuilsfontein an assay from one vein showed:

Sn = 12.9 per cent.

Bi = 0.27 "

Cu = trace.

As = 21.78 "

Au = 2 dwts. 3 gr. per ton.

Ag = 1 oz. 12 dwts. per ton.

Cassiterite impregnates the country rock, more or less, at all the places.

Fluorite and topaz are absent and no other fluorine-bearing minerals are noted.

## NORTH AND SOUTH CAROLINA

## 236. ANONYMOUS. Tin in North and South Carolina.

*Mg. Sci. Press*, Vol. 86, 1903, San Francisco, p. 300.

New tin veins have been discovered which give more promise than those formerly known. Manner of occurrence described. Ore strongly resembles the greisen of some of the Black Hills tin mines, although usually more decomposed.

## 237. ———. Tin ore in North Carolina.

*Mg. World*, Vol. 21, 1904, Chicago, pp. 174-175, photos 3, sketches 2.

Treated under the heads: geology of the deposits; development work; description of veins; equipment; history of development.

## 238. ———. Tin in South Carolina.

*Mg. Rep.*, Vol. 50, 1904, Denver, pp. 65-66.

Notice of the discovery of tin in South Carolina on the Ross place.

## 239. ———. Tin in the Carolinas.

*Eng. Mg. Journ.*, Vol. 82, 1906, New York, p. 223.

"Tin is present in exceedingly irregular pegmatite dikes, as cassiterite, which occurs only as an original constituent of the pegmatite. This mineral is not evenly distributed through the dikes, but is generally segregated or concentrated along certain lines."

Unimportant.

## NORTH AND SOUTH CAROLINA (Continued)

- 239a. BALL, S. MAYS. Tin deposits of the Carolinas.  
Eng. Mg. Journ., Vol. 87, 1909, New York, pp. 1139-1140.  
Gives brief history of the tin discovery, descriptions of the Ross Mine and other deposits and account of the tin produced in the Carolinas.
240. BENEDICT, WM. DE L. Tin in North Carolina.  
Min. Ind. for 1892, Vol. 1, 1893, New York and London, p. 455.  
King's Mountain tin deposit treated. The climate of district is very favorable to the disintegration of the rocks, as a result the small gullies running down sides of ledge contain much stream tin in places. Doubtful if ore can be mined at a profit.
241. DABNEY, CHAS. W. Note on cassiterite from King's Mountain, North Carolina.  
February, 1884, Raleigh, N. C., 2 page pamphlet.  
Also, Journ. Elisha Mitchell Sci. Soc., 1884, Raleigh, pp. 79-81; Geol. North Carolina, Vol. 2, 1888, Raleigh, pp. 347-349.  
Brief outline of the discovery and author's examination of the tin deposits at King's Mountain. Two assays are given, one showing 74.41 per cent, the other 65.21 per cent tin.
242. FURMAN, JOHN H. The tin deposits of North Carolina.  
Trans. New York Acad. Sci., Vol. 8, 1889, New York, pp. 136-145, pls. 2, figs. 5.  
Discussion, pp. 145-171.  
Location and history of the discovery of the deposits are given with a description of the geology of the occurrences.
- 242a. ———. The King's Mountain tin region.  
The King's Mountain Herald. Vol. 3, Aug. 3, 1905. States that cassiterite was discovered at King's Mountain by Robert Claywell in 1883. Describes the geology of the region, the efforts to mine tin, and the reasons for failure.
243. GARRISON, F. LYNWOOD. Tin in the United States.  
Eng. Mg. Journ., Vol. 78, 1904, New York, p. 831.  
The tin deposits of the Carolinas are treated among other deposits of the United States.
244. GENTH, FREDERICK A. The minerals of North Carolina.  
U. S. Geol. Surv. Bull. 74, Washington, D. C., 1891, p. 35.  
Cassiterite found in 1882 near King's Mountain. Short description and partial analysis given.
245. GRATON, L. C. The Carolina tin belt.  
U. S. Geol. Surv. Bull. 260, 1904, Washington, D. C., 1905, pp. 188-196.  
Digest: Mg. Mag., Vol. 11, 1905, New York, p. 477.  
Abstract: Iron Age, Vol. 75, II, 1905, New York, p. 1519.  
Development has not yet been sufficient to allow much valuable generalization or prediction regarding these deposits. The Carolina tin belt however, appears to offer a promising field for exploration.  
"The tin ore occurs in pegmatite dikes which cut across amphibolites and metamorphosed sediments. There are two varieties of pegmatite. One composed almost exclusively of quartz and microcline, appears to carry no tin. The other, which is tin bearing, is characterized by muscovite in various forms, and plagioclase feldspar, when any feldspar is present. Author believes the pegmatites are of igneous origin, and that the cassiterite is a primary constituent. What caused the segregation of tin ore in certain parts of the dike is not known."—H. Ries.
246. ———. Reconnaissance of some gold and tin deposits of the southern Appalachians.  
U. S. Geol. Surv. Bull. 293, 1906, Washington, D. C., pp. 31-57.  
Extract: Mg. World, Vol. 25, 1906, Chicago, p. 634.

### NORTH AND SOUTH CAROLINA (Continued)

History of tin mining in the Carolinas; geology of tin belt; mining developments; economic importance of tin deposits.

Practically the same article as that in Bull. 260.

247. HESS, FRANK L. The Carolina tin deposits.  
Eng. Mag., Vol. 32, 1906, New York and London, pp. 10-20, plates 4, map 1.  
General geology of the region, with detailed description of the mines and a short discussion of their probable future, which he considers an unsolved question. Believes cassiterite to be an original constituent of the pegmatite dikes in which it occurs.
248. LEDOUX, ALBERT R. Tin in North Carolina.  
Eng. Mg. Journ., Vol. 48, 1889, New York, pp. 521-522. About 2100 words.  
Describes King's Mountain tin deposits, method of working and probable future.
249. See No. 254a.
250. PHILLIPS, W. B. Tin in North Carolina.  
Eng. Mg. Journ., Vol. 43, 1887, New York, p. 111.  
Short discussion on the probability of finding tin in paying quantities in North Carolina.
251. PRATT, JOSEPH HYDE. Carolina tin belt.  
Min. Res. U. S., 1903, U. S. Geol. Surv., 1904, Washington, D. C., pp. 337-344.  
Geographic location; geology; mineralogical and chemical character of ore; production of tin from Carolina belt.  
An epitome of Pratt and Sterrett's "The tin deposits of the Carolinas." See No. 252.
252. PRATT, JOSEPH HYDE, and STERRETT, DOUGLASS B. The tin deposits of the Carolinas.  
North Carolina Geol. Surv. Bull. No. 19, 1904, Raleigh, pp. 64, figs. 8.  
Short abstract: Amer. Journ. Sci., ser. 4, Vol. 20, 1905, New Haven, p. 75.  
Introduction; geographical location; geology; mineralogical and chemical character of the ore; associated minerals of the cassiterite; percentage of cassiterite in the veins; development work.  
Besides a description of the Carolina ores, a brief resume is given of the other deposits of the world.
253. SLOAN, EARL. Mineral Resources of South Carolina.  
Rep. Proc. 7th Ann. Session, Amer. Min. Cong., Portland, Oregon, 1904, pp. 134-137.  
Brief account of the discovery of the Ross tin mine, near Gaffney, with description of the vein as shown by work to date.
- STERRETT, DOUGLASS B. See No. 252.
254. ULKE, TITUS. The occurrence of tin ore at King's Mountain, North Carolina, and near Vesuvius, Virginia.  
Min. Res. U. S. for 1893, U. S. Geol. Surv., 1894, Washington, D. C., pp. 178-182.  
Describes the character of the country rock of the two localities and the manner of occurrence of the tin ore.
- 254a. VAN NESS, W. W., JR. Tin in North Carolina.  
Eng. Mg. Journ., Vol. 44, 1887, New York, p. 344.  
Short description of discovery and workings at King's Mountain.

### CEYLON

255. COOMARASWAMY, ANANDA K. Minerals containing rare elements, and associated minerals.  
Min. Surv., Ceylon Adm. Rep., 1904 (1905), Colombo, p. E. 10.

## CEYLON (Continued)

Note stating that cassiterite had been identified in a specimen of "nanbu" from Niriella, near Ratnapura.

## 256. ———. Report on the occurrence of cassiterite (oxide of tin) in Ceylon.

May, 1905, Colombo. 2 page pamphlet. About 450 words.

Digest: Neues Jahrb. Min., 1906, Stuttgart, 1 (Ref.), p. 166.

Small amount of stream tin found in gem washing at Niriella (Palle Pattuwa, Nawadun Korale, Sabaragamawa). Of no commercial importance. Ilmenite occurs with it. Gives analysis.

## 257. COOMARASWAMY, A. K., and PARSONS, JAMES. Cassiterite.

Min. Surv., Ceylon Adm. Rep., 1905 (1906), Colombo, pp. E. 9-10.

Report of investigation of stream tin at Niriella, Induwehena, near Dela, and in Kuruwita. None of the deposits are of economic importance. The cassiterite is supposed to come from the surrounding granite. Zircon, rutile, ilmenite, etc., are found with the cassiterite.

## 258. DUNSTAN, WYNDHAM R. Report on cassiterite from Ceylon.

1905, Colombo. About 150 words. Published with article on cassiterite by Coomaraswamy, Mineralogical Survey of Ceylon. Pamphlet of 2 pages.

## ANALYSIS OF STREAM TIN FROM NIRIELLA.

Stannic oxide .....	94.60
Ferric oxide .....	0.86
Manganous oxide .....	0.03
Lime .....	0.50
Insoluble residue, chiefly niobic and tantallic oxides.....	4.64

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99.83

Equivalent to metallic tin 74.09 per cent.

## 259. PARSONS, JAMES. Additional report on an occurrence of cassiterite in Ceylon.

1905, Colombo. About 375 words published in pamphlet with article by Coomaraswamy.

Small occurrence of cassiterite (stream tin) in gravels at Noragala. Occurs with sapphire, topaz, and large quantities of zircon.

## CHILI

FOULLON, H. See No. 1322.

## 259a. GÜTTING, A. Die Erzgänge zu Punitaqui in Chile, mit besonderer Berücksichtigung der Zinnober führenden Lagerstätten.

Zeit. prakt. Geol., 1894, Berlin, pp. 224-230.

Cassiterite occurs in a diabase in which are also deposits of cinnabar, siderite, copper minerals and gold. The tin is apparently not in commercial quantity. Hornblende granite occurs not far away.

## 260. MÖRICKE, W. Erzgänge zu Punitaqui in Chile.

Zeitschr. prakt. Geol., 1894, Berlin, pp. 282-283.

Discusses the occurrence of tin mentioned by A. Gütting. See No. 259a.

## CHINA

## 261. ANONYMOUS. Zinn-Gruben von Johor in China.

Nouv. Ann. Voy. Sci. geogr., 1827, Paris, p. 418.

Extract: Taschen. ges. Min., 1828, Bd. 1, Frankfurt-am-Main, p. 47.

Original article not available to the authors.

Describes the alluvial deposit of tin near the town Gongong.

## CHINA (Continued)

262. ———. Tin mines in southwestern China.  
 Eng. Mg. Journ., Vol. 46, 1888, New York, p. 152.  
 Notes on a trip by Mr. F. S. A. Bourne, British Consular Agent at Chung King, quoted as stating that more than 1000 men are said to be employed in Southern Yunnan, Kuochinchang, in the tin mines of the region.
263. ———. The mineral resources of China.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 67, 1897, London, p. 915.  
 Richest tin mines are located in department of Linggau-fu, southeastern portion of Yunnan, whence the metal comes in shape of small truncated pyramids weighing about 2 catties each.
264. ———. Tin in China.  
 Min. Ind. for 1898, Vol. 7, 1899, New York and London, p. 711.  
 According to a report of the French Commercial Mission, the province of Yunnan now exports annually 2500 metric tons of tin. This is obtained from alluvial deposits at Katchion, 20 miles from Moung-tse.
265. ———. Tin mining in Indo-China.  
 Eng. Mg. Journ., Vol. 80, 1905, New York, p. 829, 200 words.  
 Tin has been obtained in the province of Yunnan for many years, most of it never reaching the outside world. More recently, alluvial deposits have been opened in the vicinity of Cao-Bang, in the north of Tonkin.
266. ———. Tin production in China.  
 Eng. Mg. Journ., Vol. 81, 1906, New York, p. 1238.  
 Note stating that China has long been a producer of tin for domestic consumption, although there is little information on the subject. Amount exported in 1904 was 50,043 piculs, valued at £478,082.
- BECK, RICHARD. *See* No. 1299.
- BROWNE, FRANK. *See* No. 1458.
- 266a. COLLINS, W. F. Tin production in Yunnan, China.  
 Bull. Inst. Mg. Met., Dec. 5, 1909, London, 3500 words, illus. 5.  
 Abstract: Mg. Journ. Railw. Comm. Gaz., Vol. 88, 1910, London, pp. 195-196, illus.  
 Review: Eng. Mg. Journ., Vol. 89, 1910, New York, p. 781.  
 Treats of the occurrence and nature of the mines and ore; mining and concentration; mining laws and customs; dressing and smelting.
- D'ACHARDI, ANTONIO. *See* No. 1313.
267. GROSIER, JEAN BAPTISTE GABRIEL ALEXANDER. A general description of China.  
 1795, London, p. 400, English Edition.  
 Mentions that "iron, lead and tin mines must be very common, since these metals are sold at a low rate throughout the whole empire."
268. LECLÈRE, A. Étude géologique et minière des provinces chinoises voisines du Tonkin.  
 Ann. Mines, ser. 9, Vol. 20, 1901, Paris, pp. 345-348, 439-440, 474-476.  
 Digest and translation: Trans. Inst. Mg. Eng., Vol. 25, 1902-1903, London and Newcastle-upon-Tyne (1904), p. 823.  
 Tin occurs at Tomuko, Tsementong, Kotiou, and Malaken, in province of Yunnan. Some of the tinstone occurs in veins in Triassic limestones, but there are also secondary ore bodies, from the decomposition of the limestones and veins. Worked open-cast. "At Malaken the red clay veins worked for tinstone are proving more and more barren of that ore, while the proportion of copper in the infilling increases." The stuff thrown on the wasteheaps is really rich copper oxide.

## CHINA (Continued)

269. PANSNER, HOFRATH. Beiträge zu einem Handbuche der Mineralogie des chinesischen Reichs.

Tasch. ges. Min., Vol. 12, II, 1818, Frankfurt-am-Main, pp. 415-416.

Treats briefly of tin and its occurrence in China.

- 269a. WILLIS, BAILEY. Mineral resources of China.

Econ. Geol., Vol. 3, 1908, Lancaster, p. 129.

At present mining and smelting of tin are the most important industrial developments of Yunnan. Metal occurs in veins, no alluvial deposits. Occurs always in red clay, contained sometimes in fissures of limestone, sometimes in the neighboring accumulations of soils. Resources of district in tin cannot easily be estimated. Deposits liable to run out suddenly. Difficult to define probable depth. Production limited by small amount of available water.

## COLORADO

270. EMMONS, S. F. Geology and mining industry of Leadville, Colo.

Monogr. U. S. Geol. Surv., Vol. 12, 1886, Washington, D. C., p. 377.

"Tin, indium and cadmium have been detected in furnace products."

271. STEVENS, R. P. On the San Juan Mountains of Colorado.

Trans. New York Acad. Sci., Vol. 5, 1886, New York, p. 128.

States that tin has been found in Colorado. Gives no locality or authority.

## CONGO

272. BARRAT, MAURICE. Sur la géologie du Congo Français.

Ann. Mines, ser. 9, Vol. 7, 1895, Paris, p. 459.

"On soupçonne depuis longtemps la présence de l'étain dans le massif cristallin qui apparaît sur la côte occidentale d'Afrique, et M. Mizon a récemment attiré l'attention sur l'étain de la Bénoué, qui est l'objet d'un trafic considérable. Dans notre colonie, on n'a encore signalé que des traces de cassitérite dans les monts de Cristal." Whole reference.

273. BUTTGENBACH, H. L'avenir industriel de l'état indépendant du Congo.

Rev. Univ. Mines, Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 4, Vol. 14, 1906, Liège and Paris, pp. 140-141, map and fig.

Taken from No. 274.

274. ———. L'avenir industriel du Katanga.

1906, Brussels, p. 21, 120 words.

Twenty thousand tonnes of tin said to be in sight in alluvial deposits, a short distance from navigable waters of the Lualaba.

275. ———. La cassitérite du Katanga.

Ann. Soc. géol. Belg., Vol. 33, 1906, Liège, pp. M49-M52, figs. 2.

Digest translation: Trans. Inst. Mg. Eng., Vol. 33, 1908, London and Newcastle-upon-Tyne, pp. 722-723.

Cassiterite occurs in nearly vertical lodes at the junction of a massif of pegmatoid granite with tourmaline quartzites, mica schists, etc. Gold and copper deposits occur not far away. Stanniferous area is rugged and veins sometimes crop out in the ravines, but are usually hidden by debris containing cassiterite pebbles up to several pounds in weight, which are frequently well crystallized.

## CONGO (Continued)

## 276. FARRELL, JOHN R. The copper and tin deposits of Katanga.

Eng. Mg. Journ., Vol. 85, 1908, New York, pp. 747-753, maps 2, illus.

Remarkable deposits in the Congo are being developed, and will be largely productive when railway communication is available. The tin belt extends for a hundred miles in a northeast and southwest direction from the Lualaba to the Lufira rivers just north of a range of granite hills. Cassiterite has been found as alluvial wash in a number of places. Wash consists of angular fragments of pinkish quartz mixed with tourmaline, tourmaline schists and schorl rock. Cassiterite contains from 63.5 to 65 per cent tin, unmixed with other metals.

## 277. FAWNS, SYDNEY. Tin deposits of the world.

London, 1905. Deposits of the Congo Free State, pp. 144-146.

Tin has been found both in alluvial drift and in ledges on the Tanganyika Concessions in the Congo Free State about lat. 10° 20' S., long. 25° 13' E., and at intervals for 60 miles northwest along the valley of the Lualaba River. Most important discovery at the Busanga Tin Mine, three-quarters of a mile from the junction of the Lufupa and Lualaba rivers. Cassiterite occurs in quartz veins too poor to work. It is also found scattered through the residual alluvium and in the stream gravels.

## 278. LACROIX, ALFRED. Minéralogie de la France et de ses colonies.

Vol. 3, 1901, Paris, p. 231.

Briefly states that tin has been found in the Congo region.

## 279. STANIER, X. The geology of the Congo.

Guide de la Section de l'État Indépendant du Congo à l'Exposition Bruxelles-Tervueren, 1897, p. 269.

Trans. Fed. Inst. Mg. Eng., Vol. 15, 1898, Newcastle-upon-Tyne and London, p. 496.

"Commanders Van Gèle and Roget have noticed the existence of stanniferous rocks on the Ubangi and Uelle [Djabbir], and they have also mentioned the presence of objects made from this metal in the hands of the natives. This fact would seem to indicate the presence of workable deposits, and deserves further study, for it is known that tin is a metal very easily extracted, and that its value is sufficiently high for it to support high rates of transport."

## EAST INDIES

## 280. ANONYMOUS. Tin in Singkep.

Min. Ind. for 1897, Vol. 6, 1898, New York and London, p. 641.

A paragraph stating that Singkep tin is to be smelted and sold as Straits tin.

## 281. BENEDICT, WM. DE L. Tin in Sumatra.

Min. Ind. for 1892, Vol. 1, 1893, New York and London, pp. 449-450.

Tin district described. In comparing the richness of the alluvial deposits of Sumatra with those of Banca it is stated that former yields at the rate of 0.348 lbs. of tin per cubic meter excavated, as against a yield of from 3 to 4½ lbs. in the latter. A number of assays given.

## 282. CRAWFURD, JOHN. History of the Indian Archipelago. etc.

1820, Edinburgh, Vols. 1 and 3.

Tin: Indigenous to the Archipelago, Vol. 1, p. 182; seldom used by natives in its pure state, Vol. 1, pp. 191-192; where found, Vol. 3, p. 450; history of mining, Vol. 3, p. 452; parallel between the mines of Banca and Cornwall, Vol. 3, p. 464; price and quantity exported, Vol. 3, p. 466; general reflections on the tin trade, Vol. 3, p. 466.



## EAST INDIES (Continued)

283. **CRETIER, H.** Bijdragen uit het scheikundig laboratorium van het hoofdbureau van het Mijnwezen in Nederlandsch-Indië te Batavia.  
Jaarb. Mijnw. Ned. Oost-Indië, No. 15, 1881, II, Amsterdam, pp. 246-247.  
Tinhoudend zand van Billiton.
284. **DACH, ROBERT.** Ueber das Vorkommen und den Abbau von Zinnseifen auf der Insel Karimon.  
Berg. Hütt. Zeit., Vol. 22, 1863, Leipzig, pp. 337-338.  
Brief digest: Neues Jahrb. Min., 1864, Stuttgart, p. 365.
285. **DIEST, P. H. VAN.** Begrooting van het kapitaal benoodigd voor het in ontginning brengen van tinert bevattende terreinen op het eiland Sinkep, en der voordeelen welke van die ontginning mogen worden verwacht.  
Jaarb. Mijnw. Ned. Oost-Indië, 1872, II, Amsterdam, pp. 127-152.
286. ———. Verslag der onderzoekingen aan den heuvel Salinta.  
Jaarb. Mijnw. Ned. Oost-Indië, 1873, II, Amsterdam, pp. 145-149. Met eene kaart.
- 286a. **DOORMAN, W. H. C.** Die Gewinnung des Zinns in den niederländisch-östindischen Kolonien.  
Glück. Berg. Hütt. Zeit. Nied. Wespht.; 45 Jahr., 1909, Essen, pp. 844-846.
287. **EVERWYN, R.** Forschung nach Zinnerzen in den Landschaften Sukan-dana, Simpang und Matam [westliche Abtheilung von Borneo] und nach Antimonerzen auf den Karimatainseln.  
Kon. Nat. Tijdschr. Ned.-Indië, n. s., Theil 6, 1853, Batavia, S. 58.  
Not available to the authors.
288. ———. Forschung nach Zinnerzen in der Landschaft Kandawangan [Südwestspitze von Borneo].  
Kon. Nat. Tijdschr. Ned.-Indië, n. s., Theil 9, 1856, Batavia, S. 449.  
Not available to the authors.
289. **EVERWIJN, R.** Verslag van een onderzoek naar tinerts, op eenige eilanden behorende tot de residentie Riouw.  
Jaarb. Mijnw. Ned. Oost-Indië, 1872, II, Amsterdam, pp. 73-126. Met eene kaart en drie bijlagen.
290. ———. Verslag van eene onderzoekingsreis in het rijk van Siak.  
Jaarb. Mijnw. Ned. Oost-Indië, 1874, I, Amsterdam, pp. 83-155.  
Chap 2, Geological sketch of country visited; Chap 3, Report on alluvial deposits of Kampar River district. An appendix is added which contains list of the mines worked in Siak.
291. ———. Overzicht van de mijnbouwkundige onderzoekingen, welke tot nu toe door den dienst van het mijnwezen in de wester-afdeeling van Borneo werden verricht.  
Jaarb. Mijnw. Ned. Oost-Indië, 1879, I, Amsterdam, pp. 58-82.  
Investigation of the tin deposits of Soekadana, Simpang, Matan and Palo.

D'ACHIARDI, ANTONIO. See No. 1313.

FAWNS, SYDNEY. See No. 1320.

## EAST INDIES (Continued)

292. FENNEMA, R. Onderzoek naar tinerts in het gebied der Boven Banjoëassin, residentie Palembang, naar aanleiding van een valsch bericht van een inlandsch hoofd, uitgevoerd door den opziener der 2<sup>e</sup> klasse P. J. Tant.  
Jaarb. Mijnw. Ned. Oost-Indië, 1878, II, Amsterdam, pp. 233-235.
293. ———. Topographische en geologische beschrijving van het noordelijk gedeelte van het gouvernement Sumatra's Westkust.  
Jaarb. Mijnw. Ned. Oost-Indië, 1857, II, Amsterdam, Weten., pp. 248-249.
- FUCHS, E., and LAUNAY, L. DE. See No. 1323.
294. HAMILTON, ALEXANDER. A new account of the East Indies.  
1727, Edinburgh, Vol. 2, pp. 75, 121.  
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310. ANONYMOUS. Tin mines. The whole history of the tin works in Cornwall, beginning with their manner of working in the times of the Saxons.  
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 A history and description of the various lodes and working of the Tincroft mine.
- 314a. ———. Cornwall and mines.  
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317. ———. Cornish tin-mining. Great Vor district.  
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 Discusses present mining conditions with special reference to the future of the Great Vor district.
318. ———. Working low grade tin ores.  
 Mg. Sci. Press, Vol. 65, 1892, San Francisco, p. 157.  
 The tin at Wheal Prosper, Cornwall, is doubtless the lowest grade of any in the world, yet is being worked with profit. Ore runs 3 pounds black tin per ton of ore, or about 0.13 per cent. Prof. C. Le Neve Foster gives following reasons:  
 1. Rock soft and friable, easily stamped.  
 2. Tin in large grains, hence fine stamping is not necessary.  
 3. The light specific gravity of substances mixed with tin, make separation by water easy.  
 4. There is water power at command.
319. ———. Tin mining.  
 Mg. Sci. Press, Vol. 67, 1893, San Francisco, p. 356.  
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Eighteen excellent photos showing mines, and methods of working, probably taken by J. C. Burrows. See 467.
321. ———. Tin mining in Cornwall.  
Mg. Journ. Railw. Comm. Gaz., Vol. 64, 1894, London, p. 928.  
Discovery of important tin deposits at the Park of Mines, near St. Columb. Country rock is entirely clay slate. Granite occurs within three-quarters of a mile of mine. Ore occurs in massive and crystallized form, in many small lodes.
322. ———. Tin in England.  
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Improvements and economies of Dolcoath mine. The mine shows increased quantity of ore as well as profits.
323. ———. Tin in Great Britain.  
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Abstract of report of directors for Dolcoath mine for half year ending June 30, 1898.
324. ———. Tin in Great Britain.  
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325. ———. Cornish tin mining.  
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Considers reasons why this industry has not revived with the rise in the price of tin.
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327. ———. Report of Dolcoath mine.  
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Statistics of output from 1897 to 1901 given.
328. ———. Tin mining in Cornwall.  
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329. ———. The tin mining industry of Cornwall.  
Sci. Amer. Suppl., Vol. 63, 1907, New York, pp. 26189-26191, photos 8.  
Mining conditions in Cornwall, difficulties to be overcome, and the improvements being made. Writer claims there are yet several million tons of ore awaiting development.
- 329a. ———. Cornish tin mining.  
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- 329b. ———. Cornish mining in 1908.  
Mg. Journ. Railw. Comm. Gaz., Vol. 85, 1909, London, pp. 12-14.  
"A brief account of the commercial conditions, together with tables of output and value of the ore mined in the different districts."

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- 329c. ———. The tin alluvials of Restronguet.  
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States, and gives reason for, the belief that tin alluvials of Cornwall are neither exhausted nor too poor to be profitably worked.
- 329d. ———. British Empire's tin output.  
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- 329e. ———. Cornwall and Devon.  
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- 329g. ———. Camborne, Cornwall.  
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330. ARGALL, WM. On the occurrence of wood-tin ore in the Wheal Metal lode at Wheal Vor in Breage.  
Journ. Roy. Inst. Cornwall, Vol. 4, No. 15, 1874, Truro, pp. 255-256.  
Description of the wood-tin found and condition under which it occurred.
331. BALDAUF, MARTIN. Bergmännische Reisebriefe aus England.  
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"Describing the geology, and the methods of mining and dressing the ores at the Redruth, Dolcoath and East Pool mines."
- 331a. BALL, LIONEL C. The Dolcoath.  
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- 331b. ———. Some Cornish mines and treatment works.  
Queensland Gov. Mg. Journ., Vol. 10, 1909, Brisbane, pp. 108-112, illus.  
Describes the mining and milling methods, with short account of the geology of Botallack and Wheal Bassett mines also method of treatment of tin ores at South Crofty and Porth Ledden mills.
- 331c. ———. Cornish mining.  
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333. BARROW, GEORGE. The high-level platforms of Bodmin moor, and their relation to the deposits of stream tin and wolfram.  
Mg. Journ. Railw. Comm. Gaz., Vol. 83, 1908, London, p. 361. Discussion, p. 384.  
Describes three platforms; first, marine, of Pliocene age, at 450 feet above sea, second at 750 feet seen about Camelford, and at foot of Delabole Hill, third at a little less than 1000 feet, first recognized on Davidstow Moor. Superficial deposits which bear tin above 750 feet platform differ very much in places from those below. Here ancient wash is preserved, perhaps protected, from denudation which has destroyed them below this level. The deposits are not so concentrated as the stream-sorted material below. Deposits have been worked in the past, but on account of difficulty of separating wolframite, were abandoned. Since that difficulty has been removed, the industry is reviving, and the wolframite is more valuable than the tin ore.
334. BARTLETT, THOMAS. A treatise on British mining; with a digest of the cost book system, stannerie and general mining laws.  
1850, London, pp. 112.
- BATTEN, JOHN, JR. *See* No. 1377.
335. BAWDEN, S. Dislocation of lodes and strata.  
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336. BENEDICT, WM. DE L. Cornwall.  
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Treated under heads:  
Tin forming one of the integrant parts of granite; p. 120.  
Stream tin, where met with in Cornwall; p. 162.  
Course of veins in Cornwall; pp. 163-166.  
Estimate of the number of mines of Cornwall, of the different kinds of ore they contain and of their relative ages; pp. 167-175.  
Of the different matrices accompanying the mineral deposits in Cornwall and Devonshire; pp. 173-181.
340. BLACK, A. and C. Black's guide to the Duchy of Cornwall, 12th ed.  
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A short description of Carelaze tin mine is given on p. 49, and a narrative explanation of tin mining and the handling of tin ores follows.

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341. BLAKE, WM. P. The Dolcoath tin mine, Cornwall.  
Eng. Mg. Journ., Vol. 54, 1892, New York, p. 414.  
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342. BOASE, G. C., and COURTNEY, W. P. *Bibliotheca Cornubiensis*, 3 vols. 1874-1882, London.  
Contains a large number of references to Cornwall and Devonshire tin mines, to their geology, customs, laws, history, etc.
343. BOASE, HENRY S. On the tin-ore of Botallack and Levant.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 2, 1822, Penzance, pp. 383-403.  
Examination of the tin-ore found in some of the St. Just mines; method of dressing it preparatory to smelting; explanation of method of separating the tin and copper from ores of these mines; the result of some experiments on the ore by which it was hoped to find an improved process for separating the copper.
344. ———. Contributions towards a knowledge of the geology of Cornwall.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 4, 1838, Penzance, pp. 166-474, pls. 3, 4.  
Description of the geology of Cornwall, with "numerous innovations," and deductions with which author has endeavored to disprove some accepted geological doctrines. The tin veins of Cornwall treated.
345. BONNARD, A. H. Note sur le gisement, l'exploitation et le traitement de l'étain dans le Duché de Cornouailles.  
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"The author more particularly describes Polgooth mine, Carclaze mine and Pentowan stream work, near St. Austell, from personal observations."
346. BORLASE, WM. COPELAND. Natural history of Cornwall.  
1758, Oxford.  
Not available to the authors.  
———. See Nos. 1381, 1382, and 1383.
347. BORLASE, REV. WM. COPELAND, and ROSEWARNE, H. Extract of letters giving an account of a specimen of native tin found in Cornwall.  
Philos. Trans. Roy. Soc. London, Vol. 12, 1769, London, p. 597-598.
- BROWN, A. SELWYN. See No. 1308.
348. BRUNNICH, MORTEN THIRANE. Beschreibung zweyer Zinnerze.  
Kön. Schwed. Akad. Wiss. Abh. Nat. Haush. Mech., Vol. 40, 1778 (Pub. 1783), Leipzig, pp. 307-310.  
Treats of tin ores of Cornwall.
349. BULLER, JOHN. An account of the Parish of St. Just.  
1842, Penzance.  
Not available to the authors.
- BURNARD, ROBERT. See No. 1384.
350. BUSZ, K. Mittheilungen über den Granit des Dartmoor Forest in Devonshire, England, und einige seiner Contactgesteine.  
Neues Jahrb. Min., Beilage-Band 13, 1899, Stuttgart, pp. 90-139, pl. 1, fig. 1.  
Page 100: Hornfels consists of light colored mica, quartz and tourmaline. Innumerable grains of cassiterite occur through it. Isolated by HF and metallic tin obtained. Describes also a garnet-datolite hornfels and a hedenbergite hornfels with accessory garnet, datolite, axinite, and quartz.



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CARCANAGUES, —. See No. 1651.

## 351. CAREW, RICHARD. Survey of Cornwall.

1811, London, pp. 25-60.

The first edition of this work was issued in 1602. Description of stream works and lode-mines; names of mines; mode of working; ore dressing; sharing black tin; tin coinage (paying tribute in metal); commercial practices; and courts.

## 352. CARNE, JOSEPH. An account of the Relistian tin mine.

Philos. Trans. Roy. Soc. London, 1807, London, pp. 293-295.

Journ. Nat. Philos., Chem. Arts, ser. 2, Vol. 20, 1808, London, p. 24.

Short description of pebbles of chlorite schist cemented by crystallized tin, which occurred in this mine.

## 353. ———. On the relative age of the veins of Cornwall.

Trans. Roy. Geol. Soc. Cornwall, Vol. 2, 1822, Penzance, pp. 49-128, pls. 1, 2.

The tin veins, among other metalliferous veins, are treated with regard to their age in relation to the country rocks.

## 354. ———. On the mineral productions, and the geology of the parish of St. Just.

Trans. Roy. Geol. Soc. Cornwall, Vol. 2, 1822, Penzance, pp. 290-358. Map of Parish of St. Just.

Treated under heads:

The tin of the parish described, pp. 292-294; description of veins, pp. 321-323; tin floors, pp. 326-331; the stream works of Parish, pp. 331-333; tin mines, pp. 339-344; ancient modes of mining, pp. 345-350; ancient history of the "Cassiterides," pp. 354-358.

## 355. ———. A description of the stream-work at Drift Moor, near Penzance.

Trans. Roy. Geol. Soc. Cornwall, Vol. 4, 1838, Penzance, pp. 47-56.

Antiquity of diggings and proof of the deluge.

## 356. ———. An account of the discovery of some varieties of tin-ore in a vein, which have been considered peculiar to streams, with remarks on diluvial tin in general.

Trans. Roy. Geol. Soc. Cornwall, Vol. 4, 1838, Penzance, pp. 95-112.

Describes wood tin, toadseye tin, and sparable-tin found in Garth mine, or East Wheal Cock.

## 356a. ———. Statistics of the tin mines in Cornwall, and of the consumption of tin in Great Britain.

Journ. Statis. Soc., London, Vol. 2, 1839, London, pp. 260-268.

Gives a brief history of tin smelting, the exports, imports and prices of tin from 1750 to 1837.

## 357. ———. Pseudomorphous minerals of Cornwall.

Trans. Roy. Geol. Soc. Cornwall, Vol. 6, 1846, Penzance, pp. 29-30.

Crystals of feldspar and quartz wholly or partially replaced by SnO<sub>2</sub>.

## 358. CHAPLIN, G. P. Cornish methods of mine timbering.

Trans. Fed. Inst. Mg. Eng., Vol. 13, 1897, Newcastle-upon-Tyne and London, pp. 200-210, pl. 11.

Some data about timbering. New Dolcoath shaft vertical and 18½ feet in diameter. It is bricked and expects to cut the lode at 2500 feet depth. The rocks of the mine are generally solid and need little timbering, but timbers 2 feet square and 30 feet long are sometimes used.

## ENGLAND (Continued)

CHAPMAN, E. J. *See* No. 1597.

359. CODRINGTON, T. On some submerged rock-valleys in South Wales, Devon and Cornwall.  
 Quart. Journ. Geol. Soc. London, Vol. 54, 1898, London, pp. 269-278.  
 Treats of the stream tin deposits of Cornwall.
360. COLENSO, JOHN W. A description of Happy-Union tin stream work at Pentuan.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 4, 1838, Penzance, pp. 29-39.  
 Overburden 53 feet. Tin from finest sand to large pieces of 200 pounds. Averages about .9 of 1 per cent of the gravel.
361. COLLINS, J. H. A handbook to the mineralogy of Cornwall and Devon. With instruction for their discrimination, and copious tables of localities.  
 1871, Truro, pp. 108, pls. 10.
362. ———. Note on a portion of the incrustated surface of a block of "Jews' Tin."  
 Journ. Roy. Inst. Cornwall, Vol. 4, 1872, Truro, pp. 83-84.  
 Abstract: Chem. News, Vol. 25, 1872, London, p. 271.  
 Analysis of the crust which covered a part of a block of "Jews' Tin," and which appeared to be chiefly peroxide of tin, probably formed by the slow oxidation of the outer surface of the block of metallic tin.
363. ———. Note on the rocks and Goonbarrow mines near St. Austell.  
 Rep. Proc. Min. Ass. Cornwall and Devon, 1872-1873, Truro, pp. 66-69, figs. 2.  
 Description of the occurrence of tin at Goonbarrow mines.
364. ———. On the mining district of Cornwall and West Devon.  
 Proc. Inst. Mech. Eng., 1873, Birmingham, pp. 89-106. Discussion pp. 107-118. pls. 22-36.  
 Treated under the heads:  
 Mineral lodes; tin and copper mines; quantities and values of the ores.
365. ———. Note on the occurrence of stanniferous deer horns in the tin gravels of Cornwall.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 10, 1887, Penzance, pp. 98-100.  
 Abstract: Amer. Journ. Sci. ser. 3, Vol. 22, 1881, New Haven, pp. 81-82, 175 words.  
 Description of deer horns which have been partly replaced by percolating stanniferous solutions. In some parts, the original horn structure is almost entirely preserved or reproduced in oxide of tin.  
 (Note: J. B. Scrivenor in a later examination of similar horns found the tin to be mechanically deposited and not a replacement. See 726b.)
366. ———. On the geology of Cornwall.  
 Proc. Geol. Ass., Vol. 10, 1889, London, pp. 101-111.  
 Treated under heads: Mineral lodes, stockworks; tin stream work; lode workings.
367. ———. On the origin and development of ore deposits in the west of England.  
 Journ. Roy. Inst. Cornwall, Truro.  
 Chaps. I and II, Vol. 10, 1891, pp. 109-149, figs. 13. Chap. III, Vol. 11, 1893, pp. 111-184, figs. 16. Chap. III, Vol. 11, 1893, pp. 327-377. Chaps. III and IV, Vol. 12, 1896, pp. 49-75. Chap. V, Vol. 13, 1899, pp. 283-312.

## ENGLAND (Continued)

Chap. I, Vol. 10, Formation of structural planes in rock masses.

Chap. II, Vol. 10, The mechanical phenomena of faulting.

Chap. III, Vols. 11 and 12, Rock-change as affecting the formation of ore deposits.

Chap. IV, Vol. 12, The formation and natural concentration of detrital deposits.

Chap. V, Vol. 13, The relative ages of the ore deposits of the west of England.

The tin deposits of England are treated in this series of articles, along with other metalliferous veins.

## 368. ———. Cornish mines and Cornish miners.

65th Ann. Rep. Roy. Cornwall Polyt. Soc., Vol. 65, 1897, Falmouth, pp. 64-96.

Journ. Soc. Arts, Vol. 47, 1899, London, pp. 359-376.

Treated under heads:

Antiquity of mining; the valley gravels; submarine tin gravels; the "Old Men"; copper and other minerals; deep mining; pumping machinery; winding apparatus; ore dressing; boring machines; the great extent of mining operations; tin; the first great collapse; the revival; the culmination; product of some leading mines; the future of Cornish mining.

## 369. ———. The precious metals in the west of England.

Journ. Roy. Inst. Cornwall, Vol. 16, pt. 1, 1904, Truro, pp. 103-119.

Article treats of the gold and silver of the West of England. Stream tin at Treloy frequently had mixed with it grains of gold, mostly about the size of wheat grains, sometimes as large as peas.

———. See Nos. 1385 and 1598 (Cornish tinstones).

## 370. COMBES, CHAS. Mémoire sur l'exploitation des mines des comtés de Cornwall et de Devon.

Ann. Mines, ser. 3, Vol. 5, 1834, Paris, pp. 109-144.

## 370a. CONRAN, R. H. Tin mining in Cornwall.

Austr. Mg. Eng. Rev., Vol. 1, 1909, Sydney and Melbourne, pp. 279-282, illus.

Abstract: Mg. World, Vol. 31, 1909, Chicago, pp. 549-551, illus.

Brief history of early mining and geological description of the country with more detailed account of mining methods.

## 371. COTTA, BERNARD VON. A treatise on ore deposits.

Translated by F. Prime, 1870, New York, pp. 406-427.

Summary of the ore deposits of Cornwall.

## 372. COUCH, R. Q. Notice of the occurrence of the horns and bones of several species of deer in the tin works of Cornwall.

Trans. Roy. Geol. Soc. Cornwall, Vol. 7, 1865, Penzance, pp. 185-191.

The author, describing a certain specimen, says, "the whole horn had undergone a change into tin ore." But thinks that possibly this may not imply solution of the tinstone.

D'ACCHIARDI, ANTONIO. See No. 1313.

## 373. DAHLBLOM, TH. Ueber die Cornwaller Zinngruben.

Jern-Kont. Ann. 1890, Stockholm, p. 334.

Review: Berg. Hütt. Zeit., Vol. 50, 1891, Leipzig, p. 290.

DAUBRÉE, A. See No. 1314.

DAVEY, STEPHEN. See No. 1603.

## ENGLAND (Continued)

374. DAVIES, ALFRED T. The phenomena of heaves or faults in the mineral veins of St. Agnes, Cornwall.  
Rep. Proc. Min. Ass. Cornwall and Devon, for 1879 (1880), Truro, pp. 12-33, figs. 21.  
Discussion of vein or lode formation, with a number of practical rules and diagrams for the guidance of miners showing how to follow the continuation of veins which have been faulted or heaved. Applies to the tin veins of the district.
- DAVIES, D. C. *See* No. 1317.
375. DAVY, SIR HUMPHRY. Hints on the geology of Cornwall.  
Trans. Roy. Geol. Soc. Cornwall, Vol. I, 1818, Penzance, pp. 38-50.  
Notes on the occurrence of tin in Cornwall.
- DECHEN, H. VON. *See* No. 545.
376. DE LA BECHE, HENRY T. Report on the geology of Cornwall, Devon and West Somerset.  
Mem. Geol. Surv. Great Britain, 1839, London, pp. 1-648, maps and plates.
- 376a. DEW, J. H. W. Cornish tin alluvials.  
Mg. Journ. Railw. Comm. Gaz. Vol. 88, 1910, London, pp. 599-600.  
Correspondence concerning tin bearing gravels in Cornwall.
- DIETZSCH, F. *See* No. 1479.
377. DREW, S. History of Cornwall. 1824.  
Not available to the authors.
378. DUFRÉNOY, P. A., and BEAUMONT, ELIE DE. Notice sur le gisement, l'exploitation et le traitement des minerais d'étain et de cuivre du Cornouailles.  
Ann. Mines, Vol. 9, 1824, Paris, pp. 827-908, Vol. 10, pp. 331-366, 401-426; Vol. 11, pp. 207-254.  
Reprint: Arch. Bergb. Hütt. Vol. 13, 1826, Berlin, pp. 60-185.  
Reviews: Zeitschr. Min., 1826, II, Frankfurt-am-Main, pp. 427-439.  
Ann. Sci. Nat., Vol. 7, 1826, Paris, pp. 195-243.
- EDMONDS, RICHARD. *See* No. 1389.
379. ENGLISH, HENRY. A compendium of useful information relating to the companies formed for working British mines, containing copies of the prospectuses, amount of capital, number of shares, names of directors, etc., with general observations on their progress, detailing their operations, mines in their possession and original information.  
1826, London, pp. 124.
- FAWNS, SYDNEY. *See* No. 1320.
- FERGUSON, HENRY T. *See* No. 1654.
- 379a. FEUVRE, P. A. Cornish Mining.  
Times Eng. Suppl., Vol. 1, 1905, London, pp. 250, 273, 274, and 309-310.  
Discusses briefly economic conditions of tin mining in Cornwall. Quotes Robert Hunt to the effect that the tin lodes down to 600 feet in depth average 3.97 feet wide, and below that 3.36 feet, and Henry Louis as saying that the average tin content is 2 per cent. In the second article dues and royalties and their effect upon Cornish tin mining are discussed. The third article treats of working costs.

## ENGLAND (Continued)

380. FLETT, J. S. On some brecciated stanniferous veinstones from Cornwall.  
 Mem. Geol. Surv. Great Britain, for 1902 (1903), London, pp. 154-159.  
 Microscopic examination of tin-bearing veinstones from following mines: Dolcoath, Wheal Basset, South Crofty, Carn Brea, Wheal Kitty and West Kitty. Essential constituents of these tin ores are quartz, tourmaline, chlorite and cassiterite. Fluorspar, pale micas, iron oxides, copper pyrites, kaolin (?) are present also, but not universally, occasionally there are pieces of altered feldspar and fragments of granite or slate.
381. FOSTER, C. LE NEVE. Notes on the Rosewarne mine.  
 Trans. Cornwall and Devon Min. Ass., 1866, Camborne, p. 26.  
 Not available to the authors.
382. ———. Report on the inspection of metalliferous mines in Cornwall, Devonshire and a part of Somersetshire for the year ended 31st December, 1873.  
 Rep. Insp. Mines for 1873 (1874), London.  
 Parl. Pap., Vol. 13, 1874, London, pp. 295-321.  
 Gives statistics regarding mines of district.
383. ———. The tin deposits of East Wheal Lovell.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 9, 1875, Penzance, pp. 167-176, pls. 1-4.  
 Two mines are included in the East Wheal Lovell namely, Tregonebris and Flatwork. In this article the tin deposit and the peculiarities of the latter mine are treated.
384. ———. On a deposit of tin at Park of Mines.  
 Rep. Proc. Min. Ass. Cornwall and Devon for 1875 (1876), Falmouth, pp. 22-26, figs. 5.  
 Abstract: Rep. Brit. Ass. Adv. Sci., Vol. 45, 1876, London, p. 64. (Note and abs.)  
 Digest: Geol. Rec. for 1876, London, p. 12.  
 The tin-ore occurs as lenticular layers generally one or two inches thick, between the planes of bedding of the killas. The layers appear to be the off-shoots from north and south veins.
385. ———. On the Great Flat Lode of Redruth and Camborne and some other tin deposits formed by the alteration of granite.  
 Quart. Journ. Geol. Soc. London, Vol. 34, 1878, London, pp. 640-653, figs. 10, pls. 39.  
 Plan and section of tin mines on Great Flat Lode.  
 Abstract: Rep. Brit. Ass. Adv. Sci., 1877, London, p. 71.  
 It is worked for three and one-half miles, and consists of a leader or true fissure vein only a few inches wide carrying tin and copper ores; a lode from 4 to 15 feet wide on one or both sides of the leader, mostly of tourmaline rock, carrying 1 to 3 per cent of tin; a capel of only slightly stanniferous tourmaline rock separates the lode from the slate or granite. There is an absence of wall or plane of separation between the lode and capel or the capel and granite. Thinks the lode and capel are altered granite, and that most of the lodes in Cornwall are of similar origin.
386. ———. On some tin stockworks in Cornwall.  
 Quart. Journ. Geol. Soc. London, Vol. 34, 1878, London, pp. 654-659, figs. 3.  
 Abstract: Rep. Brit. Ass. Adv. Sci., 1877, London, p. 70.  
 Stockworks occur in killas (slate), granite and elvan (granite porphyry dikes). Gives a list of the stockworks occurring in each rock.
387. FOX, CHAS. On a deposit of tin in Wendron.  
 Rep. Proc. Min. Ass. Cornwall and Devon, 1868, Truro, p. 35.  
 Not available to the authors.

## ENGLAND (Continued)

388. FOX, ROBERT WERE. On mineral veins.  
4th Ann. Rep. Roy. Cornwall Polyt. Soc., 1836-1838, Falmouth, pp. 81-141, figs. 1-21, colored.  
General description of tin and copper veins in Cornwall. Says that where tin and copper occur in the same vein, they are inclined to occur on opposite sides of the vein. Lodes said to be more productive when nearly vertical.
389. FRECHEVILLE, R. J. Notes on great main lode of Dolcoath, Cook's Kitchen, Tincroft, and Carn Brea mines.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 10, 1887, Penzance, pp. 146-156, colored plates 2, showing cross section of mines.  
General description of tin-bearing veins in these mines, with figures of production and remarks as to the probable continuance of the vein.
390. ———. The results obtained by the Cornish system of tin-ore dressing.  
Trans. Mg. Ass. Inst. Cornwall, Vol. 1, 1887, Camborne, pp. 93-104.  
Reprinted in Eng. Mg. Journ., Vol. 40, 1885, New York, pp. 416-417.  
An examination into the actual loss of black tin experienced in dressing.
391. FUCHS, E., et LAUNAY, L. DE. *Traité des gîtes minéraux et métallifères.*  
Vol. 2, 1893, Paris, pp. 112-127. Maps, figs. and bibliography.  
Tin deposits of Cornwall treated.
392. GARBY, JOHN. A catalog of minerals found in Cornwall with their localities.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 7, 1865, Penzance, p. 85.  
Cassiterite, wood-tin, siliceous oxide and tin-pyrites given, the latter two unimportant.
- GREG, R. P. and LETTSOM, W. G. *See* No. 1614.
393. GREGOR, WM. Observations on a remarkable change which metallic tin undergoes under peculiar circumstances, and on its partial conversion into a muriate of tin.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 1, 1818, Penzance, pp. 51-50.  
"Some observations on a remarkable change which metallic tin undergoes that has long lain under the surface of the earth and on its partial conversion into a muriate."
394. HANCOCK, RICHARD. On the mineral deposits of Old Wheal Vor mine, Breage.  
38th Ann. Rep. Roy. Cornwall Polyt. Soc., 1870, Falmouth, pp. 101-102.  
This mine is situated in a basin of killas, between two granite hills and has produced more than £3,000,000 worth of tin and copper.
395. HAWKINS, C. Observations on gold found in the tin stream works of Cornwall.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 1, 1818, Penzance, pp. 235-236.  
Notes that gold was frequently found with stream tin in a moor near the church of the parish of Ladock.  
———. *See* No. 1395.
396. HAWKINS, JOHN. On submarine mines.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 1, 1818, Penzance, pp. 127-142.  
An account of the early working of Huel Wherry tin mine, near Penzance. It was about 720 feet out from shore, barely uncovered at lowest tides, 19 feet under water at highest. Very rich ore. In dike 18' broad, 16' very rich.  $\text{SnO}_2$  one of the constituent parts of the porphyry, so that it was called "stannified granite." 70,000 pounds of ore removed.

## ENGLAND (Continued)

397. ———. On some remarkable phenomena attending the lodes of Polgooth tin mine.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 1, 1818, Penzance, pp. 143-153, pl. 5.  
 Description of the tin veins of Polgooth mine, which were observed by author or on which data were communicated to him, in 1791, by Capt. Phillips, director of mine, data being gathered as the working of mine opened it up.
398. ———. On the stratified deposits of tinstone, called tin-floors, and on the diffusion of tinstone through the mass of some primitive rocks.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 2, 1822, Penzance, pp. 29-48.  
 A description of the Cornwall tin deposits known as tin-floors is given, also an account of the form of deposit known in Germany as "stockworks" and methods used by Germans in working such deposits.
399. ———. Observations on the alluvial strata at Porth, Sandrycock and Pentuan.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 2, 1822, Penzance, pp. 285-289.  
 A paper in which the writer gives his views explanatory of alluvials of Porth and Sandrycock. Believes in deposition by a flood.
- . *See* No. 1396.
- HEADDEN, WM. P. *See* No. 1617.
400. HELMHACKER, R. Allgemeines über das Zinnerzvorkommen in Cornwallis, nebst einigen speciellen Beispielen.  
 Oest. Zeitschr. Berg. Hütt., Vol. 27, 1879, Wien, pp. 427-429, 443-445, 458-460, 466-470, 473-475, 490-492, 500-503, 509-511, 524-527, 537-538, illus.
401. HENTY, G. M. On the occurrence of wood-tin at the great Wheal Vor mines.  
 Rep. Proc. Min. Ass. Cornwall and Devon, 1867, Falmouth, p. 55.
402. HENWOOD, GEORGE. Observations on certain tin stream works in the county of Cornwall.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 22, 1852, London, pp. 607, 629; Vol. 23, 1853, p. 12. A series of three articles entitled the "Carnon," "Nancothan," and the "Bog," respectively treat of stream tin deposits, their situation, appearance, production, antiquities discovered in the course of working, animal and fossil remains, and methods of working. Theories as to the probable sources from which these great deposits were derived. Briefly treats of the character, superstitions and peculiarities of the Cornish miner.
403. ———. Four lectures on geology and mining.  
 1855, London.  
 (1) An introductory lecture, pp. 23; (2) Observations on certain tin stream works in the county of Cornwall, pp. 27; (3) On the metalliferous veins or lodes of Devon and Cornwall, and the methods of mining them, pp. 23; (4) On the manipulation of the ores of Devon and Cornwall, to render them marketable, pp. 21.
404. HENWOOD, W(ILLIAM) J(ORY). Deposits of stream tin ore in Cornwall with remarks on the theory of that formation.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 4, 1838, Penzance, pp. 57-69.  
 Overburden 14 to 53 feet. Gravel containing SnO<sub>2</sub>, 4 to 18 feet, on granite bottom. Believes in diluvial deposition.

## ENGLAND (Continued)

405. ———. On the metalliferous deposits of Cornwall and Devon.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 5, 1843, Penzance.  
 Treats of the quantity of tin mined in Cornwall and Devon; the form, displacement, and segregations of ore in the veins; the characteristics of tin veins in granite, slate and elvan; stream tin, wood tin and ordinary lode tin; and the minerals associated with cassiterite in the different country rocks.
406. ———. On a remarkable deposit of tin-ore at the Providence mines near St. Ives, Cornwall.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 7, 1865, Penzance, pp. 179-184.  
 London, Edinburgh, Dublin Philos. Mag. Journ. Sci., ser. 4, Vol. 4, 1852, London, pp. 538-541.  
 The Providence mines, in the parish of Lelant, comprise mines formerly known as Wheal Speed, Wheal Laity, Wheal Comfort and Wheal Providence. Observations on the eastern workings in the slate and on the western within the granite formation, have already appeared in Trans. Roy. Geol. Soc. Cornwall, Vol. 5, Penzance, pp. 16-20. The intermediate tract now described is wholly granite.
407. ———. Observations on the metalliferous deposits of Cornwall.  
 Journ. Roy. Inst. Cornwall, Vol. 4, 1871-1873, Truro, pp. ix-xxxix.  
 Reprinted with alterations and additions in Rep. Proc. Min. Ass. Cornwall and Devon, 1872-1873, Truro, pp. 1-20.  
 General description of veins of Cornwall, including tin-veins.
408. ———. On the detrital tin ore of Cornwall.  
 Journ. Roy. Inst. Cornwall, Vol. 4, 1871-1873, Truro, pp. 191-254. Read, May 16, 1873.  
 Abstracts: Geol. Mag. 1873, London, pp. 317-319; 1874, pp. 177-178.  
 Abstract translated by Zeiller, Ann. Mines, 7th ser. Vol. 6, 1874, Paris, pp. 114-130.  
 Contains summary of observations made at intervals during 45 years.  
 Four districts treated:  
 1. From Land's End to the eastern sources of Hayle River. 2. Included between the Camborne, Crowan, Wendron and Constantine granite, and the eastern tributaries of Restronguet, a creek of Falmouth. 3. Bounded on west by Truro River and the Gannel, on east by Fowey and lower part of the Camel. 4. From eastern part of third district to Tamar.  
 ———. See Nos. 1327 and 1656.
409. HILL, J. B. Mining in southern district (Cornwall and Devon).  
 Summ. Progr. Geol. Surv. United Kingdom for 1902 (1903), London, pp. 38-40.  
 Although areas surveyed have been extensive mining districts, few mines are still active. Tin streaming in original sense of the term, is practically a thing of the past. Mines operated with modern machinery. Last few years the debris from mine burrows have been put under stamps, more especially those mines originally worked for copper.
410. ———. The plutonic and other intrusive rocks of W. Cornwall in their relation to the mineral ores.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 12, 1905, Penzance, pp. 546-615.  
 Tin always found in minute quantities in lithia micas, and except in lepidolite, copper also. Favors first deposition by ascending meteoric waters.
411. HILL, J. B., and MACALISTER, D. A. Geology of Falmouth and Truro and of the mining district of Camborne and Redruth.  
 Mem. Geol. Surv. Great Britain, 1906, London, pp. 113-314, figs. 64.  
 Extracts: Min. World, May 11, 1907, p. 598; May 18, 1907, p. 626; June 1, 1907, p. 691.  
 Geology of districts is treated with particulars relating to the mines.



## ENGLAND (Continued)

412. HUNT, ROBERT. A notice of the copper and tin raised in Cornwall.  
Mem. Geol. Surv. Great Britain, Vol. 1, 1846, London, pp. 510-519.  
Several tables given showing average production of various mines of Cornwall.  
Short early history of copper and tin production.
413. ———. The economic geology of Devonshire and Cornwall in 1868.  
Journ. Bath West England Soc., n. s., Vol. 16, 1868, Bath, pp. 75-78.  
Treats briefly of the early history of tin, tin trade from 1558 to 1868, and manner  
of working the mines at the time of writing.
414. ———. On the mineral production of Cornwall and Devon.  
Rep. Proc. Min. Ass. Cornwall and Devon, 1869, Truro, pp. 5-11.  
Not available to the authors.
415. ———. British mining.  
1884, London, pp. 1-944, illus. -230.  
A treatise on the history, discovery, practical development and future prospects  
of metalliferous mines, including tin mines, in the United Kingdom.
- . See Nos. 1397, 1688.
- HUTCHIN, H. W. Notes on tin dressing. See No. 1507a.
- HUTCHINSON, A. See No. 1620.
- JAMES, HENRY. See No. 1398.
416. JARS, G. Voyages Métallurgique.  
Vol. 3, 1781, Paris, pp. 154-223.  
Sur les mines d'étain des hautes montagnes de la Saxe, celles de la Bohême,  
et de la province de Cornouaille en Angleterre, années 1757 et 1765.
417. K——, W. Die Bergwerke von Devonshire und Cornwall.  
Berg. Hütt. Zeit., Vol. 28, 1879, Leipzig, pp. 374-375.
418. KERL, BRUNO. Gewinnung von Zinnstein und Chinathon in der Car-  
lacegrube bei St. Austel in Cornwall.  
Berg. Hütt. Zeit. Vol. 21, 1862, Leipzig, pp. 82-83.
419. ———. Zinngewinnung in Cornwall.  
Berg. Hütt. Zeit., Vol. 21, 1862, Leipzig, pp. 144-148.  
Treated under the heads: Ore occurrences; preparation of the tin ore; metallurgy  
of tin.
420. KITTO, BENEDICT. On mineral veins.  
37th Ann. Rep. Roy. Cornwall Polyt. Soc., 1869, Falmouth, pp. 48-52.  
Treats of one of the oldest mines in Cornwall, the Great Work Mine, which is  
situated partly in the parish of Breage and partly in Germoe. The three principal  
lodes, Great Work, Wheal Breage and South Wheal Breage are described.
421. KUDERNATSCH, JOSEPH. Ueber die Gewinnung und Darstellung des  
Zinnes, insbesondere in England.  
Jahrb. k. k. geol. Reichs., Vol. 3, 1852, Wien, pp. 173-175.  
Also, Berg. Hütt. Zeit., Vol. 12 (n. f. 7), 1853, Leipzig, pp. 162-164.
- LE GRICE, C. V. See No. 1518.

## ENGLAND (Continued)

422. LEIFCHILD, JOHN R. Cornwall, its mines and miners, with sketches of scenery. Designed as a popular introduction to metallic mines.  
1855, London, pp. 303.  
A readable popular account of the scenery and mines of Cornwall, including both alluvial and lode tin mines, with a short summary of foreign tin mines known at the time. Contains a general account of the geology of the Cornish tin mines, including the faulting. It also covers, in a general way, the manner of operating the mines and metallurgical processes used. Gives cost of operating, production and wages.
- 422a. LINGTON, T. Dolcoath copper and tin mine, Cornwall.  
Mg. World, Vol. 32, 1910, Chicago, p. 107.  
Treated geologically, also gives figures showing ore raised, outlay and profit.
- LEWIS, GEORGE RANDALL. *See* No. 1402.
423. LOBLEY, J. LOGAN. Two days in a mining district.  
Proc. Geol. Ass., Vol. 2, 1873, London, pp. 45-60.  
Copper and tin mining district of East Cornwall is described. List of Cornish metallic minerals given. "All the Cornish tin is procured from the peroxide, for although tin pyrites or cupreous sulphuret of tin does occur in Cornwall, it is rare and not used for the production of metal."
424. LOCK, C. G. WARNFORD.  
Economic Mining, 1895, New York, pp. 622-623.  
Treats of Cornish tin.
- LOUIS, HENRY. *See* No. 1340.
- LOWER, T. *See* 489a.
425. MACALISTER, DONALD A. Vertical distribution of the commercially valuable ores in the Camborne lodes.  
Summ. Progr. Geol. Surv. United Kingdom for 1903 (1904), London, pp. 26-28.
426. ———. A cross section and some notes on the tin and copper deposits of Camborne, with special reference to the limits of productive ore ground.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 12, 1905, Penzance, pp. 773-795, figs. 5.
427. ———. Geological aspect of the lodes of Cornwall.  
Econ. Geol., Vol. 3, 1908, Lancaster, pp. 363-380. Geol. map.  
Gives a short historical summary of the Cornish mines and their yield from early times. He then treats the general geology, the lodes, their structure and relations to the granite. The pneumatolytic and metasomatic action of vein forming solutions is treated with regard to granite, slate and greenstone. The genesis of the ores is ascribed to the solutions from a cooling granitic magma. The alluvial tin deposits are briefly described.
- . *See* Nos. 449, 1659.
428. MACLAREN, J. MALCOLM. The occurrence of gold in Great Britain and Ireland.  
Trans. Inst. Mg. Eng., Vol. 25, 1903, London and Newcastle-upon-Tyne, pp. 438-439, 440, 494.

## ENGLAND (Continued)

The occurrence of gold in the tin placers of Cornwall is described.  $3\frac{1}{2}$  pounds of tin ore gotten from 150 pounds of gravel in Goldmine River, County Wicklow, Ireland. All wood-tin. Accompanied by magnetite, ilmenite, hematite, iron-pyrites, galena, wolframite, molybdenite, gold, copper-pyrites and oxides of manganese. Cassiterite was in grains up to  $\frac{1}{2}$  inch in diameter.

MACLEAN, JOHN. *See* No. 1403.

429. **Maps of the Geological Survey of Great Britain.**  
Show tin-bearing veins and placers. Published previous to 1869.
430. **MARTIN, JOSEPH S.** The position and prospects of Cornish mining.  
Coll. Guard., Vol. 77, 1899, London, p. 943.  
Notes from the author's annual report on the southwestern district for 1898. Urges that the mines be more properly equipped and wisely managed.
431. **MAYNARD, JOHN.** Remarks on two cross-sections through Carn Brea Hill and the neighboring mines.  
Rep. Proc. Min. Ass. Cornwall and Devon, 1873-1874, Falmouth, pp. 43-54; pls. 8. Sections through the principal tin mines and the intervening country.
432. **MERRET, C.** A relation of the tinn mines and working of tinn in the county of Cornwall.  
Philos. Trans. Roy. Soc. London, No. 138, Vol. 12, 1678, London, pp. 949-952.  
Philos. Trans. abridged, Vol. 2, 1809, pp. 424-426.  
Description of the manner of occurrence of tin ore, and brief account of methods of smelting.
433. **MOISSENET, LÉON.** Du minerai d'étain dans le Cornwall.  
Ann. Mines, ser. 5, Vol. 14, 1858, Paris, pp. 77-276.  
Brief abstract in Neues Jahrb. Min., 1860, Stuttgart, p. 300.  
Sketch of Cornwall; description of tin veins and associated minerals; description of the working of the mines and economic results.
434. ———. Étude sur les filons du Cornwall et du Devonshire.  
C. R. Acad. Sci., Vol. 55, 1862, Paris, pp. 759-762.  
Ann. Mines, ser. 6, Vol. 3, 1863, Paris, pp. 161-171.  
Mg. Smelt. Mag., Mo. Rev. Pract. Mg. Quarry. Met., Vol. 3, 1863, London, pp. 20-23 and Vol. 4, 1864, p. 25.
435. **MOISSENET, L. L.** Observations on the rich parts of the lodes of Cornwall.  
Translated by J. H. Collins, 1877, London.  
Not available to the authors.
- MYRICK, C. M.** *See* No. 1541.
436. **NEWLAND, D. H.** Tin in United Kingdom.  
Min. Ind. for 1902, Vol. 11, 1903, New York and London, p. 595.  
Review of tin industry in Cornwall during 1902.
437. ———. Tin in Cornwall.  
Min. Ind. for 1903, Vol. 12, 1904, New York and London, pp. 332-333.  
Review of tin mining in Cornwall during 1903.

## ENGLAND (Continued)

438. OXLAND, R. The mineral resources of Devon and Cornwall.  
Ann. Rep. Trans. Plymouth Inst., Devon and Cornwall Nat. Hist. Soc., Vol. 5, 1873-1874 (1874), Plymouth, pp. 485-493.  
Not available to the authors.  
At time of writing article, there was a great depression in Cornish tin and copper mining on account of market conditions. The article is an inquiry into the possibility of reviving the mining industries.
439. PARIS, JOHN AYRTON. A guide to Mount's Bay and the Land's End.  
1824, London, 2d Ed.  
Contains many semi-scientific allusions to the tin mines of Cornwall, with points concerning their history, origin of names, etc.
- PEARCE, GILBERT B. See No. 1407.
440. PEARCE, RICHARD. Notes on the occurrence of cobalt in connection with the tin ores of Cornwall.  
Journ. Roy. Inst. Cornwall, No. 13, Vol. 4, 1872, Truro, pp. 81-83.  
Author found an appreciable quantity of cobalt in a sample of dressed tin ore (black tin) from Dolcoath mine. Analysis of "hard-head" showed 4.40 per cent cobalt and 16.25 per cent tin. Concludes that cobalt might be extracted profitably from "hard-head" and at same time afford a means for recovery of large portion of tin which was then lost.
441. ———. The anniversary address of the president.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 13, pt. 2, 1906, Penzance, pp. 97-112.  
Discussion of Cornwall's mineral resources and their future.  
———. See No. 1629.
- PENBERTHY, JOHN. See No. 467.
442. PHILLIPS, J. ARTHUR. The rocks of the mining districts of Cornwall, and their relation to metalliferous deposits.  
Quart. Journ. Geol. Soc. London, Vol. 31, 1875, London, pp. 319-345, pl. 16.  
Gives a description both from macroscopic and microscopic examination of the rocks in which mineral deposits occur in Cornwall, with analyses of a number of them. Also discusses the mineral deposits including tin.  
———. See No. 1632.
- PHILLIPS, J. A., and LOUIS, H. See No. 1350.
443. PHILLIPS, WM. On the veins of Cornwall.  
Trans. Geol. Soc. London, Vol. 2, 1814, London, pp. 110-160.  
History and description of veins of Cornwall, including the Tincroft mine.
- PHILLIPS, WILLIAM. See No. 1633.
- PLINIUS, CAIUS. See No. 1408.
- POLWHELE, R. See No. 1409.
444. PRYCE, WILLIAM. Mineralogia Cornubiensis. A treatise on minerals, mines and mining: Containing the theory and natural history of strata, fissures and lodes, with the methods of discovering and working of tin, copper and lead mines, and of cleansing and metallizing their products,

## ENGLAND (Continued)

showing each particular processing for dressing, assaying and smelting of ores, to which is added an explanation of the terms and idioms of miners.

1778, London, pls. 7, tables 2, portrait of author, pp. 331.

Extract: Journ. Mines, No. 3, Vol. 1, 1795, Paris, pp. 91-126.

445. PUNNETT, H. MACAULAY. On some peculiar deposits of tin in St. Aubyn and Grylls mine.

Trans. Roy. Geol. Soc. Cornwall, Vol. 7, 1865, Penzance, pp. 379-380.

A brief inquiry into the nature of the contents of peculiar shoots of tin ore. The ore is said to be different in chemical character from the tin ore in the main lode.

RAMMELSBURG, C. See No. 1637.

446. RANCE, CHAS. E. DE. On the relative age of some valleys in the north and south of England, and of the various and post-glacial deposits occurring in them.

Proc. Geol. Ass. London, Vol. 4, 1876, London, p. 250.

Thinks stream tin deposits of South England are nearly synchronous with the West Lancashire post-glacial marine beds. Points out that there has been no glaciation in this region.

447. RASHLEIGH, P. An account of the alluvial deposition at Sandrycock.

Trans. Roy. Geol. Soc. Cornwall, Vol. 2, 1822, Penzance, pp. 281-284.

Drawn up in 1792, communicated by J. Hawkins in 1819.

"Tin ground and loose stones of all sorts" from one foot to 6 feet thick overlain by 35 feet overburden.

RAY, JOHN. See No. 1554.

448. REID, CLEMENT, and FLETT, J. S. The geology of the Land's End district.

Explanation of sheets 351 and 358, with contributions by Wilkinson, B. S. N., Dixon, E. E. L., Pollard, W. and a mining appendix by MacAllister, D. A.

Mem. Geol. Surv. Great Britain, 1907, London, p. 158, figs. 35, pls. 6.

Geology of district and mines, and their output of tin since 1852.

449. REID, CLEMENT, and SCRIVENOR, J. B. The geology of the country near Newquay.

Mem. Geol. Surv. Great Britain, 1906, London, pp. 72-80, and pp. 91-106, with map and figs.

Gives estimates of the amount of tin produced. Former work for stream-tin, now long ceased. Describe briefly the mines now working near St. Agnes, and some of those that are abandoned. Describe the microscopic appearance of the tin lodes. Also describe the geology of the lodes at Cligga head.

D. A. McAllister gives notes on the particular mines, their ores and geology on pp. 91-106, with figs.

———. See No. 1638.

450. REYER, E. Zinn.

1881, Berlin, pp. 102-156, figs. 3.

Treats under heads: Geologische Beschreibung; die Erzgänge; Geschichte der Zinnproduktion und des Zinnhandels von Cornwall.

- 450a. RICKARD, THOMAS. Fifty years in Cornwall.

Mg. Sci. Press, Vol. 160, 1910, San Francisco, pp. 795-797.

## ENGLAND (Continued)

Reviews the improvements in technical methods and appliances in Cornwall mining, and concludes that this improvement has not been inadequately translated into economic results.

451. ROWE, T. P., and FOSTER, C. LE NEVE. Observations on Balleswiddden mine.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 10, 1887, Penzance, pp. 10-17.  
 Short description of Balleswiddden mine, situated about 1 mile from village of St. Just-in-Penwith, which was abandoned in 1873. During the 36 years that the mine was worked, more than 12,000 tons of black tin were sold, valued at £694,094.
452. RUDLER, F. W. Handbook to minerals of the British Islands.  
 1905, London.  
 Cassiterite and its associates, pp. 5-32.  
 Treats not only of cassiterite and stannite, with their accompanying minerals, but of the origin, form and other characteristics of the veins in which they are found.
453. SALMON, ARTHUR L. Cornwall.  
 1903, London, pp. 16-21.  
 A short general description of tin-mining in Cornwall, adapted to the needs of tourists not particularly interested in the subject.
454. SALMON, H. C. The mines and mining operations of Cornwall.  
 Mg. Smelt. Mag. Mo. Rev. Pract. Mg. Quarry. Met., Vol. 5, 1864, pp. 257, 328.  
 Not available to the authors.
- SAUNDERS, C. D. See No. 1414.
- SCRIVENOR, J. B., and REID, CLEMENT. See No. 1638.
455. SIMMONS, WM. The metallic ores of Cornwall.  
 Proc. Liverpool Geol. Soc., Vol. 3, 1878, Liverpool, pp. 28-35.  
 Brief description of occurrences of the ores of tin, copper, iron and lead.
456. SKEWES, EDWARD. Red river tin stream, Cornwall.  
 Eng. Mg. Journ., Vol. 74, 1902, New York, pp. 178-180, figs. 5.  
 Abstract: Min. Ind. for 1902, Vol. 11, 1903, New York and London, p. 653.  
 An article discussing the mode of operation of the Cornish tin mines, the loss of tin, etc.
- SMITH, GEORGE. See No. 1418.
457. SMYTH, WARINGTON W. Metallic mining (tin mines).  
 Brit. Mr. Indust., Vol. 2, 1876, London, pp. 26-30.  
 Treats of the occurrence of copper and tin in certain districts of England.
- SOLLY, R. H. See No. 1640.
- SPARGO, T. See No. 1699.
458. STELZNER, A. W. Das Zinnerzvorkommen auf der Grube East Wheal Lovell in Cornwall.  
 Mith. Verh. Bergmänn. Vereins zu Freiberg, Sitzg., Vol. 2, Nov. 1876.  
 Digest: Neues Jahrb. Min., 1877, Stuttgart, pp. 416-417.  
 Berg. Hütt. Zeit., Vol. 35, 1876, Leipzig, pp. 417-419.  
 Based on "The tin deposits of East Wheal Lovell" by C. Le Neve Foster, published in Trans. Roy. Geol. Soc. Cornwall, Vol. 9, 1875, Penzance, pp. 167-176.  
 First reference not available to the authors.

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459. STEPHENS, FRANCIS J. Abstract of essay on the "Mineral resources of Falmouth."  
5th Ann. Rep. Roy. Cornwall Polyt. Soc., 1886, Falmouth, p. 193.  
Tin is mentioned as occurring at Kennace mine, Falmouth.
460. STEPHENS, F. J. The ancient tin mining districts of Cornwall.  
72d Ann. Rep. Roy. Cornwall Polyt. Soc., 1904, Falmouth, pp. 101-114.  
Notes on the geology, minerals and mines of Levant, St. Ives and Zennor.
461. STEPHENS, HUGH. Remarks on the mineral phenomena of Huel Rose in the parish of Sithney.  
Rep. Proc. Min. Ass. Cornwall and Devon, 1871 (1872), Truro, pp. 47-49.
462. SYMONS, BRENTON. Treatise on the geology of Cornwall.  
1884, Penzance.  
Not available to the authors.
463. SYMONS, R. On Carclaze tin and china clay pit.  
Journ. Roy. Inst. Cornwall, Vol. 6, 1881, Truro, pp. 140-143, map I.  
Describes in a general way Carclaze mine which yielded 10 to 12 tons of tin ore per year from small veins in a decomposed granite (growan). Had for many years produced large quantities of china clay and workings covered over 15 acres.
464. TAYLOR, CHAS. D. Description of the tin stream works in Restronguet Creek near Truro.  
Proc. Inst. Mech. Eng. for 1873, Birmingham, pp. 155-166, pls. 58-59.  
Discussion 162-166.  
Extracts: Bull. Soc. Indust. min., ser. 2, Vol. 4, 1875, Saint Étienne, pp. 678-680.  
Berg. Hütt. Zeit., Vol. 35, 1876, Leipzig, pp. 443-444.  
Description of methods used in recovering "a valuable deposit of stream tin which is found under the water in Restronguet Creek, and lies on the rock beneath the mud and silt that form the bottom of the creek."
- TAYLOR, J. See No. 1663.
- TAYLOR, JOHN. See Nos. 1419, 1576.
- THOLLIER, M. A. See No. 1579.
465. THOMAS, CHAS. Remarks on mining in Cornwall and Devon.  
22d Ann. Rep. Roy. Cornwall Polyt. Soc., 1854, Falmouth, pp. 28-35.  
Treats of the geological and mineralogical character of the rocks that have been found most productive of metallic ores.
466. THOMAS, C. Mining fields of the West, Cornwall and Devon. 1867.  
Not available to the authors.
467. THOMAS, HERBERT. Cornish mining interviews. Underground scenes by J. C. Burrows.  
1896, Camborne, pp. 351.  
Treats of tin mining in a popular way, and contains an interview with Capt. John Penberthy on "Bolivia as a tin-producing country and its probable effect on Cornwall" (pp. 1-8).  
The illustrations are good and have been widely reprinted. See 320 and 475.

## ENGLAND (Continued)

468. ———. The mineralogical constitution of the finer material of the Bunter pebble-bed in the west of England.  
 Quart. Journ. Geol. Soc. London, Vol. 58, 1902, London, p. 623.  
 Paragraph on cassiterite "Difficult to distinguish from rutile, but it occurs in small quantity in the heavy residues from some of these sands. Seem to be two modes of occurrence: (I) in pale-yellow, well-shaped crystals, and (II) in more or less rounded brownish grains."
469. THOMAS, JOSIAH. Description of the operations at Dolcoath mine.  
 Journ. Roy. Inst. Cornwall, Vol. 3, No. 11, 1870, Truro, pp. 191-197.  
 An account of the mine, and manner of working it. Author states that at time of writing he believes "we are working to a greater depth, and raising a larger quantity of tin, as well as making greater profits, than any other tin mine in the world."  
 "The mine has been producing of late about 87 tons of black tin per month, or 1050 tons per year."
470. ———. Description of Dolcoath main lode, illustrated by transverse section, and specimens from the lode and country.  
 Rep. Proc. Min. Ass. Cornwall and Devon, for 1882 (1883), Truro, pp. 13-15.  
 Dolcoath is the deepest metalliferous mine in Cornwall. The granite has become softer, and the tin lodes larger and more productive with depth; mine shows no sign of decay.
471. THOMAS, R. Report on a survey of the mining district of Cornwall, from Chasewater to Camborne.  
 1819, London.  
 Not available to the authors.
472. THOMAS, R. A. Notes on Cornish mines in 1896.  
 64th Ann. Rep. Roy. Cornwall Polyt. Soc., 1896, Falmouth, pp. 89-94.  
 Discussion of the decreased tin output of Cornwall, and of means for its increase.
- THOMAS, R. ARTHUR. *See* No. 1666.
473. THOMAS, RICHARD A. Some observations on the "Great Flat Lode" in Wheal Unity mine, near Redruth.  
 54th Ann. Rep. Roy. Cornwall Polyt. Soc., 1886, Falmouth, pp. 184-188. 1500 words.  
 Calls Great Flat Lode a "true fissure vein," but says it reaches 72 feet (12 fathoms) in width with a small amount of tin distributed evenly through it. Dip varies. Slickensides occur where vein narrows. Many "cross-courses" break up the vein. Generally dips to the west. Occasionally rich enough to work 30 feet wide. Copper ores in upper part of vein and some chalcopyrite below.
474. THOMAS, WM. Excursion to Cornwall.  
 Proc. Geol. Ass., Vol. 10, 1887, London, pp. 196-215, figs. 7.  
 Mentions a few general points about Carclaze, Carn Brea and other tin mines.
475. THOMAS, WM., and BURROWS, J. C. 'Mongst mines and miners, underground scenes by flashlight.  
 1883, London and Camborne, pp. 32, pls. 26. Colored section of Dolcoath main lode, 62½ fathoms per inch.  
 Written in popular style. The plates are excellent. *See* 467.
476. TREDINNICK, R. Tin and tin mining.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 46, 1876, London, p. 1388.  
 General article giving amount of ore raised and profits derived from some of the Cornwall mines.



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477. TREGASKIS, JAMES. Remarks on the geology of Cornwall and Devon in connection with the deposits of metallic ores and on the bearing of productive lodes.  
(Two lectures.) 1857, Redruth.  
Not available to the authors.
478. TWEEDY, W. M. Notices of minerals of uncommon occurrence recently found in Cornwall.  
21st Ann. Rep. Roy. Inst. Cornwall, 1841 (1842), Truro, pp. 38-39.  
Among other minerals which author mentions as uncommon are wood-tin and detached crystals of tinstone and sandstone in the form of crystals of feldspar.
479. ———. A description of the Lode at Wheal Coates Mine, in which the pseudomorphous crystals of tin occurred.  
27th Ann. Rep. Roy. Inst. Cornwall, 1845, Truro, pp. 20-24.  
Mineralogical and geological description of the tin deposits at Wheal Coates, with detailed descriptions of individual pseudomorphs of cassiterite after feldspar.
- TYLOR, A. See No. 1420.
480. UNWIN, GEORGE. Letters, remarks, etc., with a view to open an extensive trade in the article of tin from the county of Cornwall to India, Persia and China.  
1790, London.  
Not available to the authors.
481. USSHER, W. A. E., and MACALISTER, D. A. Summary of progress of the geological survey of the United Kingdom.  
Mem. Geol. Surv. Great Britain for 1903 (1904), London, pp. 22-23, 26-28.  
Report on the progress of tin mining in Cornwall for year 1903.
- 481a. VIVIAN, JOSEPH. Reminiscence of mining in Cornwall.  
Mg. Sci. Press, Vol. 100, 1910, San Francisco, pp. 743-745, map.  
Treats of the early history of copper and tin mining in Cornwall.
482. WAIT, F. W. The tin mines of Cornwall.  
Mg. Journ. Railw. Comm. Gaz. Vol. 54, 1884, London, p. 1423.  
Report of a lecture delivered before the Menai Society. Begins with the early history of tin in Cornwall, tracing it down to the present time. Gives description of principal mines. Treats of tin itself, the manner of occurrences and working. The Cornish miner, his habits, characteristics and mining methods, with the difficulties encountered. Popular.
- 482a. WALKER, EDWARD. The Red River, Cornwall.  
Mg. Sci. Press, Vol. 97, 1908, San Francisco, p. 849. Map of Cornwall.  
An account of the trouble caused in the Red River due to the tailings from the tin mines.
- WARNER, RICHARD. See No. 1421.
483. WATSON, J. Y. A compendium of British mining, with statistical notices of the principal mines in Cornwall; to which is added . . . a glossary of the terms and usages of mining. London, 1843.  
Mg. Journ. Railw. Comm. Gaz., Vol. 21, 1851, London, pp. 3, 22, 27, 39, 50, 62.  
Treated under heads: General features of a mine; on the nature of veins; the nature of lodes; the system of Cornish mining; on "bounding."  
Reprinted with revisions and corrections up to 1851.

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484. WEBB, —, and GEACH, —. History and progress of mining in the Caradon and Liskeard district.  
Not available to the authors.
- WEEKS, JOSEPH D. *See* No. 1372.
485. WEST, H. E. Cornish tin mining.  
Mg. Sci. Press, Vol. 94, 1907, San Francisco, pp. 179-181, 213-214.
486. WHITE, W. T. The south or main tin lode of Wheal Peevor.  
Trans. Min. Ass. Inst. Cornwall, Vol. 1, 1887, Camborne, pp. 81-84.  
A description of a tin lode with its faulting. At one place the throw is 75 fathoms.
487. WILLIAMS, ARCHIBALD. The romance of mining. The tin mines of Cornwall.  
London and Philadelphia, 1905, pp. 258-273.  
A popular and fairly accurate account of tin mining in Cornwall.
488. WILLIAMS, JOHN. Account of some remarkable disturbances in the veins of the mine called Huel Peevor, in Cornwall.  
Trans. Geol. Soc. London, Vol. 4, 1817, London, pp. 139-145.  
Huel Peevor contains numerous examples of almost every species of interruption known to Cornwall veins. Its tin vein was so heaved by other veins that it was not again discovered for forty years. Describes the disturbed condition of the veins.
489. WILLIAMS, R. H. Occurrence of tin in the St. Austell district.  
Mg. Journ. Railw. Comm. Gaz., Vol. 80, 1906, London, pp. 276-277, 1200 words.  
"A review of this district in Cornwall, England, describing the geological structure."
- 489a. WOODWARD, J(OHN). A catalogue of English native fossils in the collection of J. Woodward, M. D.  
1728, London, 3 vols., bound together. Vol. I, pp. 198-206. Vol. III, pp. 40-41.  
In the first reference 30 specimens of Cornish tin ores are briefly described with short, quaint descriptions, written by T. Lower, of most of the mines from which they came.  
In the third volume, which treats of foreign specimens, 18 specimens of tin ore from Saxony and Bohemia are noted.
- WORTH, R. N. *See* Nos. 1425, 1426, 1427.
490. ZIRKEL, FERDINAND. Bergmännische Mittheilungen über Cornwall.  
Zeitschr. Berg. Hütt. Sal. preuss. Sta., Vol. 9, 1861, Berlin, pp. B 242-261, figs. 4.  
Treated under the heads: Ore in Cornwall, dressing, metallurgy and production.

## EUROPE

ROLKER, CHAS. M. *See* No. 1357.

*See* under Austria (Bohemia), England (Cornwall and Devonshire), France, Germany, Ireland, Italy, Norway, Portugal, Russia, Scotland, Spain, Sweden.

## FINLAND

*See* under Russia.

## FRANCE

491. ANONYMOUS. Apperçu de l'extraction et du commerce des substances minérales en France avant la Révolution.  
 Journ. Minés, Vol. 1, No. 1, 1794-1795, Paris, pp. 72-73.  
 Notes a report by M. Schreiber on the finding of bits of metallic tin in Pieux, Manche, France.
492. ———. Ueber die Auffindung des Zinns in Frankreich.  
 Tasch. ges. Min. für 1815, Vol. 9, II, Frankfort-am-Main, pp. 560-562.  
 Brief account of the discovery of tin veins in France in 1809.
493. ———. Tin mines in France.  
 Mg. Journ. Railw. Comm. Gaz. Vol. 1, 1835, London, p. 53.  
 Tin was not known to exist in France until 1809, and it was not until 1817 that a deposit was discovered. This was found by a marine officer, and Dufrénoy was sent to examine it. The tin ore occurs at the junction of granite and slate and the country bears a marked resemblance to Cornwall.
494. ———. Tin in Montebbras, France.  
 Min. Ind. for 1899, Vol. 8, 1900, New York and London, p. 621.  
 Deposits of tin at Montebbras are at contact of granite and feldspathic porphyry. Ore said to average 4 per cent, which would be above the grade of other European deposits.
495. ———. Tin in France.  
 Min. Ind. for 1901, Vol. 10, 1902, New York and London, pp. 637-646.  
 Small veins carrying cassiterite are known to occur near Vaulry and have been worked from time to time. Recently a company, the Société des Mines de Vaulry et Cieux, secured a concession of alluvial ground near by, and some ore is being produced.
496. ———. The mines of Montebbras.  
 Mg. Journ. Railw. Comm. Gaz. Vol. 84, 1903, London, p. 3.  
 A very general description of the developments, dressing plants, and tin deposits at Montebbras in central France.  
 Antimony, amblygonite and montebbrasite occur with tin ore said to average 2 per cent cassiterite.
497. AUDIBERT, E. Sur le gîte d'étain oxydé de Maupas, Morbihan.  
 Ann. Mines, ser. 4, Vol. 7, 1845, Paris, pp. 181-186.  
 Review in Neues Jahrb. Min. 1847, Stuttgart, pp. 358-360.  
 Description of tin veins of Maupas, France.
498. BAUDOT, F. Les mines d'étain de la Villelder (Morbihan).  
 Bull. Soc. Indust. min., ser. 3, Vol. 1, Livre 1, 1887, Saint Étienne, pp. 151-157.  
 Treats of the situation and size of the concession; history of the discovery of the veins and their former working by the Romans, and other attempts at working the veins. Described the working of alluvial deposits of the locality, and geology. States that pyrite, mispickel, sphalerite, galena, quartz, emerald, muscovite and plogopite micas, gilbertite, tourmaline, topaz and feldspar are found with the cassiterite, all of which are described at some length, as are the veins. Much space is given to a description of the working of the mine, its machinery, etc.
- BECK, RICHARD. See No. 1299.
499. BLAVIER, ED., and LORIEUX, T. Sur un gîte d'étain nouvellement découvert, à la Villelder (Morbihan).  
 Ann. Mines, ser. 3, Vol. 6, 1834, Paris, pp. 381-388.

## FRANCE (Continued)

500. BURTLE, M. P. L. Note sur les travaux de recherche exécutés à Meymac, (S. France).  
 Ann. Mines, ser. 9, Vol. 12, 1897, Paris, pp. 5-31.  
 Extract: Zeitschr. prakt. Geol., 1897, Berlin, pp. 418-420.  
 Deposit not important from commercial standpoint, but, geologically, has attracted attention because of peculiarities. The deposit is described in detail.
501. COTTA, BERNARD VON. A treatise on ore deposits.  
 Translated by F. Prime, Jr., 1870, New York, pp. 380-384.  
 Treats of tin deposits of Brittany.
502. CRESSAC, C. DE. Die Entdeckung des Zinns in Frankreich.  
 Ges. Nat. Freunde Berlin Mag. neust. entd. ges. Nat., Vol. 4, 1810, Berlin, pp. 239-240.
503. CRESSAC, C. DE. Notice sur la découverte de l'étain en France.  
 Journ. Mines, No. 198, Vol. 33, 1813, Paris, pp. 435-452.  
 (1) Reconnaissance et indication d'un second gisement d'étain dans le département de la Haute-Vienne.  
 (2) Traduction littérale de l'indication du gisement d'étain reconnu par le mineur saxon Schnor de Schneeberg.  
 (3) Reconnaissance et indication d'un troisième gisement d'étain dans le département de la Haute-Vienne.
- D——, C. H. See No. 1386.
- D'ACHIARDI, ANTONIO. See No. 1313.
504. DAUBRÉE, AUGUSTE. Note sur le kaolin de La Lizolle et d'Échassières, département de l'Allier, et sur l'existence de minerai d'étain qui y a été exploité à une époque extrêmement reculée.  
 C. R. Acad. Sci., Vol. 68, 1869, Paris, pp. 1135-1139.
- . See Nos. 1314 and 1316.
- DAVIES, D. C. See No. 1317.
505. DAVY, L. Sur l'ancienneté probable de l'exploitation de l'étain, en Bretagne.  
 C. R. Acad. Sci., Vol. 125, 1897, Paris, pp. 337-339.  
 Abstract: Lèbesconte, P., Bull. Soc. sci. méd. Ouest, Vol. 7, 1898, Rennes, pp. 51-53.  
 Found slag with small grains of crystalline tin near old excavations. Considered to be product of ancient smelting. Found veins near by containing tin. Veins cut upper Silurian metamorphic rocks. They consist of quartz with muscovite, cassiterite, tourmaline, etc. Cassiterite where vein is most micaceous. Thinks work was done by Gauls before Roman conquest. Location: between Abbaretz and Vay in Lower Loire.
506. DUFRENÓY, P. A. Sur le plateau central de la France, et particulièrement sur les terrains secondaires qui recouvrent les pentes méridionales du massif primitif qui le compose.  
 Ann. Mines, ser. 2, Vol. 3, 1828, Paris, pp. 55-57.  
 Short account of the occurrence of tin in granite and gneiss in France.

## FRANCE (Continued)

507. DUFRENOY, PIERRE ARMAND, et JUNCKER. Rapport sur les recherches et les essais de la mine d'étain de Piriac, département de la Loire Inférieure.  
Ann. Mines, Vol. 4, 1819, Paris, pp. 21-58. (Sec No. 513.)
508. DUROCHER, M. J. Observations sur les dépôts stannifères de la Bretagne et sur les métaux précieux qu'ils renferment.  
C. R. Acad. Sci., Vol. 32, 1851, Paris, pp. 932-904, Vol. 45, 1857, pp. 522-525.  
Digest: Neues Jahrb. Min., 1852, Stuttgart, pp. 498-499.
509. FUCHS, E., et LAUNAY, L. DE. Traité des gîtes minéraux et métallifères.  
Vol. 2, 1893, Paris, pp. 101-158.  
A general article upon the tin deposits of the world with an especially good description of the French tin deposits at La Villeder, Montbras, Creuse, Vaulry, Cieux, Colettes (Allier), Chanteloube and St. Leonard. Gives general geology and list of accompanying minerals at each place.
510. GOUVENAIN, C. A. DE. Sur la dissémination de l'étain et sur la présence du cobalt et de diverses autres substances dans les kaolins des Colettes et d'Échassières situés dans le département de l'Allier.  
C. R. Acad. Sci., Vol. 78, 1874, Paris, pp. 1032-1034.
511. GUÉDRAS, MARCEL. Sur la présence de l'étain dans le département de la Lozère.  
C. R. Acad. Sci., Vol. 138, 1904, Paris, p. 1121.  
Digests: Trans. Inst. Mg. Eng., Vol. 27, 1903-1904 (1905), London and Newcastle-upon-Tyne, p. 629.  
Mg. Journ. Railw. Comm. Gaz., Vol. 75, 1904, London, p. 574.  
Neues Jahrb. Min., 1906, I (Ref.), Stuttgart, p. 332.  
Though department of Lozère is rich in metalliferous veins, tin ore has not hitherto been recorded there. Author discovered a vein close to Great Monastier fault, in parish of Barjac. Country rock is mica schist, vein dips 60°, and is 7½ feet thick at outcrop. The gangue consists chiefly of barytes and quartz; between these is a thin band of cassiterite barely 1 inch thick with which are closely associated pyrolusite and wolframite.
512. HERSART, CH. Sur une nouvelle découverte de minerai d'étain dans le département de la Loire-Inférieure.  
Journ. Mines, Vol. 35, No. 208, 1814, Paris, pp. 293-308.
513. JUNCKER, —, et DUFRENOY, P. A. Rapport sur les recherches et les essais de la mine d'étain de Piriac, département de la Loire Inférieure.  
Ann. Mines, Vol. 4, 1819, Paris, pp. 21-58.  
Review: Taschen. ges. Min. 1824, Vol. 18, III, 1824, Frankfurt-am-Main, pp. 676-678. (See No. 507.)
514. KERFORNE, F. Découverte d'un gisement d'étain et de wolfram dans l'Ille-et-Vilaine.  
Bull. Soc. sci. méd. Ouest., Vol. 11, 1903, Rennes, pp. 448-449.  
Trav. Sci. Univ. Rennes, Vol. 2, 1903, Rennes, pp. 380-381.  
Digest: Neues Jahrb. Min., 1905, II (Ref.), Stuttgart, p. 369.
515. KERNDT, C. H. THDR. Ueber die neueren Zinngruben zu Piriac.  
Polyt. Centr., 1858, Leipzig, pp. 86, 106, 168.  
Not available to the authors.

## FRANCE (Continued)

516. LACROIX, A. *Minéralogie de la France et de ses colonies. Description physique et chimique des minéraux. Étude des conditions géologiques de leurs gisements.*  
1901, Paris. Cassiterite. Tome 3, pp. 217-235.  
Crystallization and general description of cassiterite, pp. 217-220. In granites, Bretagne (Loire Inférieure), Plateau Central, p. 221. In quartz veins, pp. 221-231: Bretagne, pp. 223-227. Finistère, p. 223. Morbihan, pp. 223-227. Loire Inférieure, p. 227. Anjou, pp. 227-231. Maine-et-Loire, p. 227. Creuse, pp. 228-229. Corréze (Meymac), pp. 229-230. Haute-Vienne, pp. 230-231. Charente, p. 231. Puy-de-Dôme, p. 231. Allier, p. 231. Maures, Congo (10 words), Madagascar, Tonkin, p. 231. In veins with sulphides, Indochine (Laos), pp. 231-233. Alluvial deposits, pp. 233-235. Bretagne (Morbihan & Loire Inférieure), pp. 234-235. Plateau Central (Haute-Vienne & Creuse), p. 235. An excellent article treating cassiterite from the mineralogical standpoint.
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Tin deposits of Montebbras are on contact of granite and feldspathic porphyry. Ore said to average 4 per cent, which would be above the grade of other European deposits.
518. LAUNAY, L. DE. *Une mine de lithine en France.*  
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Digest: Geol. Centr., Vol. 1, 1901, Leipzig, p. 707.  
"Le gisement d'étain de Montebbras déjà exploité par les anciens gaulois, fournit surtout maintenant de l'amiblygonite (phosphate d'alumine et fluorure double de soude et de lithine) qui est utilisée pour la préparation des sels de lithine. Cette substance est accompagnée d'apatite et de plusieurs minéraux rares, tels que le niobium, la wavelite, l'urane, etc."—L. Pervinquière.
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Bull. Soc. Hist. nat. Toulouse, Vol. 16, 1882, Toulouse, pp. 247-261.
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Ann. Mines, ser. 9, Vol. 1, 1892, Paris, pp. 471-472.
- LOUIS, HENRY. *See No. 1340.*
522. MALLARD, ERNEST. *Note sur un filon d'étain oxydé situé près du village de Montebbras, commune de Soumans (Creuse).*  
Mem. Soc. Sci. nat. arch. Creuse, Vol. 3, 1862, Guéret, pp. 161-167.  
Old excavations supposed to be ancient earthworks found to be over tin mines, to exploit which the work was done. Veins are in granite carrying black mica.
523. ———. *Note sur les gisements stannifères du Limousin et de la Marche, et sur quelques anciennes fouilles qui paraissent s'y rattacher.*  
Ann. Mines, ser. 6, Vol. 10, 1866, Paris, pp. 321-352.  
Extrait par l'auteur, C. R. Acad. Sci., Vol. 62, 1866, Paris, pp. 223-225.  
Tin ores were discovered at Vaulry (Creuse) in 1812 and exploited by the government but given up in the '60's. Veins carried much columbite wolframite, mispickel, iron-arsenate, native copper, black oxide of copper, molybdenite, uranium-phosphate, fluorite, calcium phosphate, and barite.

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Institut, Vol. 20, 1852, Paris, p. 198.  
Not available to the authors.
- PATTISON, S. R. *See* No. 1406.
- PHILLIPS, J. A., and LOUIS, H. *See* No. 1350.
525. SÉNEZ, L. Des mines d'étain français. (Etr. de l'Union bretonne.)  
1856, Nantes.  
Not available to the authors.
526. SIMONIN, L. Sur les mines d'étain de la Villelder (Morbihan).  
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Reports metallic tin in a small specimen (2 grams) from the Approuague River, French Guiana.

## GEORGIA

- ROLKER, CHAS. M. *See* No. 1357.
- U. S. Eleventh Census, 1890. *See* No. 1221.

## GERMANY

528. ANONYMOUS. Zinnengewinnung zu Altenberg in sächsischen Erzgebirge.  
Eisenzeitung, No. 24, 1888.  
Treats of the occurrence, mining, ore dressing and smelting of tin of Altenberg.  
Not available to the authors.
529. BECK, RICHARD. Einige Beobachtungen im Gebiete der Altenberg-Zinnwalder Zinnerzlagertstätten.  
Zeitschr. prakt. Geol., 1896, Berlin, p. 148.
530. ———. Ueber die Erzlagertstätten von Schwartzenberg im sächsischen Erzgebirge.  
Zeitschr. Deutsch. geol. Ges., Vol. 52, 1900, Protok., Berlin, pp. 58-60.  
Digest Trans. Inst. Mg. Eng., Vol. 22, 1901-1902 (1903), London and Newcastle-upon-Tyne, p. 700.  
Near Schwarzenberg, in the Western Erzgebirge a dome of augen-gneiss forms the basement-rock which is mantled by mica-schist; on the north conformably overlain by phyllites but faulted against them on the south. All broken through by granite-dikes. In the altered schists occur two concentric ore belts intimately associated with crystalline limestone, dolomite and skarn (sahlite-actinolite-rock). Magnetite occurs in regular beds or inter-stratified with the limestone. Red and brown hematite beds are altered from magnetite. Other ores are in two dis-

## GERMANY (Continued)

tinct groups: (1) pyrite-blende group, including iron-pyrite, zinc-blende, argentiferous galena and copper pyrite with some arsenical and magnetic pyrites, more rarely polybasite and native silver; (2) the stanniferous group, including tinstone in columnar crystals, molybdenite, specular-iron ore, etc.

The pyritic and stanniferous ores were the last constituents deposited from the siliceous solutions.

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The Graupen tin deposits are described.  
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Berg. Hütt. Zeit., Vol. 27, 1868, Leipzig, pp. 3-4.
533. BLÖDE, GOTTLÖB VON. Versuch einer Theorie über die Bildung des Geyer'schen Stockwerkes.  
Tasch. ges. Min., Vol. 10, I, 1816, Frankfurt-am-Main, pp. 1-32.  
Not available to the authors.
534. BONNARD, A. H. DE. Essai géognostique sur l'Erzgebirge ou sur les Montagnes métallifères de la Saxe.  
Journ. Mines, Vol. 38, 1815, Paris, pp. 261-318, 339-382, 415-452.  
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Treats of the Saxon tin mines.
535. BREITHAUPT, A. Die Paragenesis der Mineralien. Freiberg, 1849.  
Said to treat of tin deposits of Germany.  
Not available to the authors.
- BROWN, A. SELWYN. See Nos. 1307 and 1308.
- CHARLETON, ARTHUR G. See No. 1310.
536. CHARPENTIER, J. F. W. Mineralogische geographie der Thürsachsischen Lande.  
1778, Leipzig, geol. map, wood cuts 7.  
Contains many references to the tin deposits at Altenberg and other places in Saxony.
537. COTTA, BERNARD VON. Das Altenberger Zinnstockwerk.  
Berg. Hütt. Zeit., Vol. 19, 1860, Leipzig, pp. 1-2.
538. ———. Mineralien der Freiburger Erzgänge.  
Berg. Hütt. Zeit., Vol. 19, 1860, Leipzig, pp. 301-305.  
Gives a list of the tin and other minerals of the Freiberg ore deposits.
539. ———. Altenberg Zwittergestein Festschrift zum hundertjährigen Jubiläum der Königl. Sächs. Bergakademie zu Freiberg.  
1866, Dresden, p. 156. (Not seen.)  
Digest: Trans. Roy. Geol. Soc. Cornwall, Vol. 9, Penzance, p. 175.  
"Prof. von Cotta proves that there is a gradual passage from fine grained reddish granite to the almost compact black stanniferous Zwittergestein. The Zwittergestein is an altered granite which has lost about 3 per cent of silica and 2 per cent of potash and has taken up 4 per cent of ferrous oxide, and ½ per cent of stannic oxide."—C. Le Neve Foster.



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540. ———. A treatise on ore deposits.  
 Trans. by F. Prime, 1870, New York.  
 Treats of Altenberg tin stockwerk, pp. 106-109; tin deposits of Zinnwald, pp. 109-110; tin deposits of Graupen and Poebel, pp. 111; tin deposits of Marienberg, pp. 114-115; tin deposits of Ehrenfriedersdorf and Geyer, p. 115; tin deposits of District of Johann-georgenstadt and Eibenstock, pp. 123-124.
541. ———. Die Geologie der Gegenwart.  
 1872, Leipzig, pp. 154-159.  
 Describes the tin deposits of Germany, and more briefly the principal ones of other parts of the world.
- D'ACHIARDI, ANTONIO. See No. 1313.
542. DALMER, KARL. Der Altenberg-Graupener Zinnerzlagertätendistrict.  
 Zeitschr. prakt. Geol., 1894, Berlin, pp. 313-322, with text figs.  
 Digest: Trans. Fed. Inst. Mg. Eng., Vol. 10, 1895-1896, Newcastle-upon-Tyne and London, pp. 588-589.  
 In district north of Teplitz, Archaean rocks of the Erzgebirge are cut by quartz-porphry, granite porphyry, and albite-granite intruded along fault lines. Tin closely connected with granite, which is youngest, but there are broad zones of impregnation around the granite, and these are the most important. Believes in pneumatolytic deposition. Seams contain chiefly quartz and lithia-mica with which are tinstone, wolframite and fluorspar, topaz being rarer. Chlorine shown to occur in the micas of Zinnwald, Graupen and Altenberg. Thinks chlorine played important part in the formation of the deposits. Stanniferous lodes near the "impregnation zones" contain galena, arsenical and copper pyrites and malachite. Tin lodes of Graupen district said to pass gradually southeastwardly into pyrite-veins. Believes blende-bearing lead ores to be also in causal connection with granitic intrusion, but that the conditions that originated them, acted further away than those of the tin veins.
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 Zeitschr. prakt. Geol., 1897, Berlin, pp. 265-272.
- DAUBRÉE, A. See No. 1314.
- DAGIES, D. C. See No. 1317.
545. DECIEN, H. VON. Die Bildung der Gänge.  
 Verh. nat. Ver. preuss. Rheinl. Westph., Vol. 7, 1850, Bonn., pp. 161-175.  
 Also, Neues Jahrb. Min., 1851, Stuttgart, pp. 210-220.  
 Tin deposits of Germany and England described.
- FAWNS, SYDNEY. See No. 1320.
546. FREIESLEBEN, J. C. Das Kies-, Eisen- und Zinnsteinlager bei Breitenbrunn.  
 Geognostische Arbeiten, Vol. 5, pp. 47ff.  
 Extract: Tasch. ges. Min., 1820, Vol. 14, II, Frankfurt-am-Main, 1820, pp. 428-434.  
 Not available to the authors.
547. ———. Beiträge zur Geschichte, Statistik und Literatur des Sächsischen Erzbergbaues.  
 1848, Freiberg.  
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- FUCHS, E., and LAUNAY, L. DE. *See* No. 1323.
- GÄTZSCHMANN, M. F. *See* No. 1391.
548. GMELIN, J. F. *Beyträge zur Geschichte des deutschen Bergbaues.*  
1783, Halle.  
Not available to the authors.
549. GRODDECK, ALBERT. *Traite des gites métallifères.* Translated from the German by H. Kuss.  
1884, Paris, pp. 242-251.  
Describes tin stockworks at Altenberg, Geyer, and Zinnwald, Saxony; and tin veins at Schalaggenwald and Graupen, Bohemia. Brief references to tin deposits are made at a number of other places in the book.
550. HALLWICH, H. *Das Zinnerz-Vorkommen zu Graupen und Obergraupen und Art und Weise des Bergbaues daselbst in alter und neuer Zeit.*  
*Oest. Zeitschr. Berg. Hütt.*, Vol. 16, 1868, Wien, pp. 150-151, first article.  
Extract from Dr. Hallwich's "Geschichte der Bergstadt Graupen."
- JARS, G. *See* No. 416.
551. KLIPSTEIN, A. *Altenberger Zinnstocks.*  
*Neues Jahrb. Min.*, Vol. 1, 1830, Stuttgart, pp. 256-261.
- LAMPADIUS, W. A. *See* No. 1516.
- 551a. LEPSIUS, RICHARD. *Geologie von Deutschland und den angrenzenden gebieten.*  
Vol. 1, 1903, Leipzig, p. 66 et seq.  
The tin deposits of the Erzgebirge are briefly treated.
- LOUIS, HENRY. *See* No. 1340.
552. MANÈS [—]. *Mémoire sur les mines d'étain de Saxe.*  
*Ann. Mines*, Vol. 8, 1823, Paris, pp. 499-594, 837-886; Vol. 9, 1824, pp. 281-304, 463-476, 625-656.  
Not available to the authors.
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*Sitz. Abh. Nat. Ges. "Isis,"* 1904, Dresden, pp. 61-73, figs. 2, geol. map.
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Occurrence of cassiterite as original rock making constituent: with rutile in lithia mica of "Greifenstein."
555. MÜLLER, HERMANN. *Ueber die Bildung der Zinnstockwerke im östlichen Erzgebirge.*  
*Berg. Hütt. Zeit.*, Vol. 24, 1865, Leipzig, pp. 178-180.  
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Not available to the authors.

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557. ———. Ueber die Erzlagerstätten in der Umgegend von Berggiesshübel.  
Erl. geol. Specialkarte Kön. Sachsen, 1890, Leipzig, p. 55.  
Gänge der Zinnerzformation.
558. ———. Die Erzgänge des Annaberger Bergrevieres.  
Erl. geol. Specialkarte Kön. Sachsen, 1894, Leipzig. Zinnerbergbau in den  
Annaberger Revieren, pp. 32-36. Gänge der Zinnerz-Formation, pp. 67-71.
559. ———. Die Erzgänge des Freiburger Bergrevieres.  
Erl. geol. Specialkarte Kön. Sachsen, 1901, Leipzig, pp. 129-141.  
Treated under heads: Zinnerz und Kupfererz führende Gänge; Zinnstockwerk bei  
Seiffen; Zinnseifenablagerungen bei Seiffen; Zinnerz führende bei Freiberg; Zinn-  
seifen in der Gegend von Freiberg und Dorfthain.
560. MÜLLER, H., und RICHTER [—]. Ueber das Vorkommen von Zinn in der  
Zinkblende der Freiburger Erzgänge.  
Berg. Hütt. Zeit., 1851, Leipzig, pp. 353-356.
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561. OPPE, H. V. Die Zinn- und Eisenerz-Gänge der Eibenstocker Granitpartie  
und deren Umgebung inner halb der Bergamtsreflere Johannegeorgen-  
stadt und Schneeberg.  
In Cotta (B.) Gang-studien, Vol. 2, Freiberg, 1854, pp. 133-195.  
Digest: Neues Jahrb. Min., 1853, Stuttgart, pp. 725-726.
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- RAMMELSBURG, C. See No. 1637.
562. REUSS, A. E. Die Umgebungen von Teplitz und Bilin, in Beziehung auf  
ihre geognostischen Verhältnisse. Prag und Teplitz, 1840.  
Der Zinngänge bei Graupen, p. 4; ueber das Zinnwalder Stockwerk und die Zinngänge  
im Seegrunde, pp. 40-51.
563. REYER, EDUARD. Ueber die erzführenden Tieferruptionen von Zinnwald-  
Altenberg und über den Zinnerbergbau in diesem Gebiete.  
Jahrb. k. k. geol. Reichs., Vol. 29, 1879, Wien, pp. 1-60, figs. 4.  
Digest: Oest. Zeitschr. Berg. Hütt., Vol. 27, 1879, Wien, pp. 494-495.
564. ———. Tektonik der granitergüsse von Neudeck und Karlsbad, und  
Geschichte des Zinnerbergbaues im Erzgebirge.  
Jahrb. k. k. geol. Reichs., Vol. 29, pt. 3, 1879, Wien, pp. 405-461.  
"This memoir is divided into:  
1. A study of the relations of the granite and schists.  
2. A discrimination of the various local kinds of granite, as being necessary for  
a knowledge of the nature and origin of the granite masses; with both earlier  
descriptions of the several granites and the author's own researches.  
3. The history of the most important tin-bearing rocks and tin works of the  
districts. These chapters are illustrated with several wood cuts, among which is a  
plan of the country between Karlsbad, Ebenstock and Schwarzenberg."

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565. ———. The history of tin mining in Bohemia and Saxony.  
Iron Age, Vol. 24, Dec. 18, 1879, New York, p. 5.  
Probably an abstract from Jahrb. k. k. geol. Reichs., Vol. 29, 1879, Wien, pp. 405-461.
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Oest. Zeitschr. Berg. Hütt., Vol. 28, 1880, Wien, pp. 349-350, 366-367, 374-377, 388-390, 399-400, 414-415, 422-424.
567. ———. Zinn.  
1881, Berlin, pp. 6-101, figs. 7.  
I. Geologie von Zinnwald und Altenberg. II. Geschichte des Zinnbergbaues von Graupen, Zinnwald und Altenberg. III. Platten, Ehrenfriedersdorf, Geier. IV. Schlackenwald. V. Kronik des Zinnbergbaues in Böhmen und Sachsen.  
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568. RÜCKER, ANTON. Beitrag zur Kenntniss des Zinnerzvorkommens bei Schlaggenwald.  
Jahrb. k. k. geol. Reichs., Vol. 14, pt. 3, 1864, Wien, pp. 311-324.  
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569. SANDBERGER, F. Ueber die Bildung von Erzgängen mittelst Auslaugung des Nebengesteins.  
Zeitschr. deutsch. geol. Ges., Vol. 32, 1880, Berlin, pp. 350-370.
- SCHERTEL, A., and STELZNER, A. W. See No. 1643.
570. SCHMIDT, ALBERT. Die Frage nach dem Ursprung des Zinns in der vorhistorischen Zinnbronze und das Fichtelgebirge.  
Montan. Ztg. Oest. Ungarn., Vol. 7, No. 19, 1900, Graz, pp. 479-482.  
Not available to the authors.
571. ———. Das Vorkommen von Zinnstein im Fichtelgebirge und dessen Gewinnung im Mittelalter.  
Zeitschr. Berg. Hütt. Sal. preuss. Sta., Vol. 54, 1906, Berlin, pp. 377-382. Mit 11 text fig.  
Abstract: Geol. Centr., Vol. 9, 1907, Leipzig, p. 297.  
The Fichtelgebirge played a considerable role in the earlier historic and in pre-historic time as a source of tin. The tin bearing rocks appear in exactly the same relations and with the same paragenesis as in the cases of better known sources of tin. Most of the former mining operations were confined to the working of placers. At the villages Schönwind and Weissenhaid, six tin lodes were uncovered. There appears to have been a further vein-like occurrence which is shown by float ore at Sechause in the Schneebergkette. The prospect of again carrying on placer mining is very slight.  
Translation of R. Bärtling's digest.
572. SCHRÖDER, M. Ueber Zinnerzgänge des Eibenstocker Granitgebietes und die Entstehung derselben.  
Sitz. Nat. Ges., 1883, Leipzig, p. 70ff.  
Review: Neues Jahrb. Min., 1887, Stuttgart, I [Ref.], p. 268.
573. SCHULTZ, —. Bemerkungen auf einer bergmännischen Reise durch Sachsen und einer Theil von Böhmen.  
Arch. Bergb. Hütt., Vol. 2, 1820, Breslau und Berlin, pp. b140-b142.  
Treats of tin deposits of Saxony.

## GERMANY (Continued)

## 573a. SINGEWALD, J. T., JR. The Erzgebirge tin deposits.

Econ. Geol., Vol. 5, 1910, Lancaster, pp. 166-177, 265-272, figs. 2. (geol. maps) and 1 plate.

The tin deposits are grouped around two belts of granite cutting across the Erzgebirge, between Saxony and Bohemia. Around the eastern belt are the tin mines of Sadisberg, Altenberg, Zinnwald, and Graupen, and around the western are those of Schneeberg, Annaberg, Joachimstahl, etc.

At Sadisdorf a stockwork of veinlets has made zwitter of the granite—the feldspars having been replaced by topaz and quartz. Cassiterite, fluorspar, pyrite, arsenopyrite, chalcopyrite, chalcocite and cuprite have been impregnated in the granite. An eighteen-foot quartz vein carrying fluorspar, wolframite, molybdenite, and zinnwaldite cuts the granite. At Altenberg is a similar zwitter which extends downward about 700 feet. It carries an average of about 0.3 per cent tin and 0.002 per cent of bismuth. At Zinnwald quartz veins 1½ to 2 feet thick carrying cassiterite and wolframite (which is more important), with zinnwaldite, are worked. At Graupen the Luxer vein, now worked, contains white quartz which in places gives way to coarsely crystalline orthoclase and albite and to fluorspar. Cassiterite, lithium mica, wolframite, chalcopyrite, and galena are the other vein minerals.

At Geyer zwitter bands are mined. At the Leier Mine north of Geyer a greisen dike 3 feet wide, locally carrying 1 per cent tin, and tin-bearing veins are worked. The ores carry nearly 30 per cent of iron and arsenic. At Sauberg, tin veins occur in gneissic mica schist. No granite has been encountered. There are five groups which consist of 3 to 15 parallel veins each, 1 to 3 feet apart, and from 2 to 10 inches wide. They carry much arsenopyrite and some wolframite. At one place they are faulted by a silver cobalt vein.

The deposits on the Austrian side are not described.

## 574. STELZNER, A. W. Beiträge zur geognostischen Kenntniss des Erzgebirges.

Vol. 1, 1865, Freiberg, pp. 3-58.

Abstract: Die Granite von Geyer und Ehrenfriedersdorf sowie die Zinnerzlagertstätten von Geyer.

Neues Jahrb. Min., 1865, pp. 863-866; 1866, Stuttgart, pp. 229-230.

## 575. ———. Beiträge zur Entstehung der Freiburger Bleierz- und der erzgebirgischen Ziinnerzgänge.

Zeitschr. prakt. Geol., 1896, Berlin, pp. 377-412.

Digest: Neues Jahrb. Min., 1898, II (Min), Stuttgart, pp. 72-74.

Thinks ore deposits due to ascending waters. No rutile present in deposits.

STELZNER, A. W., and SCHERTEL, A. See No. 1643.

## 576. STERNBERGER, KARL. Die ärarischen Bergbau-Unternehmungen im löhmischen Erzgebirge.

Oest. Zeitschr. Berg. Hütt., Vol. 5, 1857, Wien, pp. 62-63.

## 577. TELKIN (Vice-Consul). Tin mining in Saxony.

Mg. Journ. Railw. Comm. Gaz., Vol. 51, 1907, London, p. 624.

Notes a revival of Erzgebirge mines, which flourished in 16th and 17th centuries, "but began to be abandoned when the South American deposits were discovered."

## 578. VIEBIG, W. Die Silber-Wismutgänge von Johannegeorgenstadt im Erzgebirge.

Zeitschr. prakt. Geol., Vol. 13, 1905, Berlin, pp. 95-96.

## 578a. WEINSCHENK, ERNST. Die Kieslagerstätte im Silberberg bei Bodenmais.

Abh. Math. Phys. Classe Kön. Bay. Akad. Wiss., Vol. 21, München, 1901, pp. 349-410.

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Digest Translation: Trans. Inst. Mg. Eng., Vol. 22, 1901-2 (1903), London and Newcastle-upon-Tyne, p. 694.

"Among other interesting minerals from this locality are graphite, tinstone, tourmaline, garnet, etc."

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579. ALLEN, THO. Memorandums respecting some minerals from Greenland.  
Ann. Philos., 1813, London, p. 107.  
Tin is briefly mentioned as being found among other minerals in Greenland.
580. ANONYMOUS. Half hours in the far north.  
Dodd, Mead and Co., New York, p. 145.  
"We were happy enough to obtain a few minerals, some specimens of rough garnets, allanite, tantalite, molybdenite, etc., with copper, tin, and iron ores in small quantities (near Frederikshaabs, Greenland)."
581. BOGGILD, O. B. Mineralogia Groenlandica.  
Medd. Grönl., Vol. 32, 1905, Kjøbenhavn, pp. 89-91.  
Mentions the finding of cassiterite in Greenland.
582. FLINK, GUST. Berättelse om en mineralogisk resa i Syd-Grönland sommaren 1897.  
Medd. Grönl. 14<sup>de</sup> hefte, 1898, Kjøbenhavn, p. 261.  
(Résumé des Communications sur le Grönland p. 416.)  
Briefly mentions cassiterite as having been found in small quantities during the trip.
583. GIESECKE, K. L. Mineralogiske rejse i Grönland.  
1878, Kjøbenhavn.  
Cassiterite was found in the Christianshaabs district (p. 83); in the Frederikshaabs district on Arsus Fjord (pp. 161, 180 and 338) and at Itivdliaarsuk in the Godhavn district (p. 289).  
Unimportant except as showing distribution and mineralogical occurrence.
584. HOFF, TH. Om tinstenens forekomst ved Ivikaet ved Arsut Fjord i Syd-Grönland.  
Vid. Medd. nat. Foren. Kjøbenhavn, for 1854 (1855), Kjøbenhavn, pp. 201-204, fig. 1 in text.
585. RINK, HENRY. Danish Greenland its people and its products. Edited by R. Brown.  
1877, London, p. 391.  
Merely states that "tinstone accompanies the cryolite."
586. TAYLER, J. W. On the veins of tin-ore at Evigtok, near Arksut, Greenland.  
Quart. Journ. Geol. Soc. London, Vol. 15, 1859, London, pp. 606-607.  
Quoted in Fawns, Sydney, "Tin deposits of the world," 1905, p. 146.  
About twenty veins through an area 80 by 1500 feet, also disseminated through rocks with fine grained galena and tantalite. One and one-half inches of cassiterite on one side of largest vein, which is ten inches wide. Gangue feldspar, quartz, fluorspar, and "sparry iron"; vein runs into white cryolite. Other accompanying minerals are "blende," copper, iron and arsenical pyrites, black cryolite, "molybdena," and zircon. No wolframite.

## HONDURAS

## 586a. MONTIS, E. DE. Mining in Honduras.

Mex. Mg. Journ., Vol. 7, 1908, Mexico, p. 24.

Makes bare statement that, among other metals, tin is found in Honduras.

## IDAHO

HANKS, H. G. See No. 218.

## 586b. LINDGREN, WALDEMAR. A geological reconnaissance across the Bitter-root Range and Clearwater Mountains in Montana and Idaho.

U. S. Geol. Surv., Prof. Paper No. 27, 1904, Washington, D. C., p. 89.

"Stream tin [wood tin, F. L. II.] is frequently found with the gold in this [Hughes] creek."

## INDIA

## 587. ANONYMOUS. Occurrence of tin in India.

Mg. Journ. Railw. Comm. Gaz., Vol. 75, 1904, London, p. 605.

Note stating a new discovery of tin ore has been made at Hosainpura, State of Palanpur. Mineral occurs in large distinct crystals, together with the mineral gadolinite, as a constituent of tourmaline-pegmatite.

## 588. ———. Mineral production of India.

Bull. Imp. Inst. Great Britain, Vol. 4, No. 2, 1906, London, pp. 156-164.

Brief review of mineral productions of India as given by Rec. Geol. Surv. India, Vol. 33, pt. 1, 1906, Calcutta, pp. 1-32.

"Tin ore is found in the Hazaribagh district of Chota Nagpur and other localities of India proper, but it has only been worked to any extent in South Burma. The total output in 1904 just exceeded 70 tons. It is sent to the Straits Settlements, from which the greater part of the tin imported into India is obtained. The metal is mainly employed in India to form a coating in the inside of copper cooking utensils, which is renewed from time to time. The consumption shows no signs of increase." (Whole Ref.)

## 589. BALL, V. A manual of the geology of India.

Geol. Surv. India, pt. 3, 1881, Calcutta, pp. 313-322.

The only localities (Indian) where tin ore occurs in sufficient quantities to be of commercial value are situated in the Tenasserim division of British Burma.

## 590. ———. The mineral resources of India and their development.

Journ. Soc. Arts, Vol. 30, 1882, London, p. 583.

Although ores of tin do occur in parts of the Indian Peninsula, there is at present time no deposit large enough to warrant working to any great extent. Localities where tin ore occurs are numerous. Mostly included in the strip of land in Tenasserim which extends from Yé to Maleewoon, a distance of about 400 miles. Sources of stream tin, which is found in the majority of rivers of this district, are in range of hills separating British Tenasserim from Siam. An attempt was made by a British company at Maleewoon to work deposits, but it resulted in loss. Working of ore is carried on by Chinese, Shans and Burmese.

D'ACHARDI, ANTONIO. See No. 1313.

## 591. HOLLAND, T. H. Tin ore and gadolinite in Palanpur.

Rec. Geol. Surv. India, Vol. 31, 1904, Calcutta, p. 43.

In Sept. 1903, tin ore was discovered at Hosainpura, Palanpur State. "Mineral occurs in distinct, large crystals as a constituent of tourmaline-pegmatite together with the mineral gadolinite."

## INDIA (Continued)

592. KING, W. Index of the local distribution of important minerals, etc., in India.  
 Rec. Geol. Surv. India, Vol. 22, pt. 4, 1889, Calcutta, p. 254.  
 Tin ores are mentioned as coming from Chota Nagpur; Nurgo or Nurunga, where there are grains of tinstone in gneiss; Phira, and at Simratari, where mere traces have been found.
593. MALLET, F. R. Geological notes on part of Northern Hazáribágh.  
 Rec. Geol. Surv. India, Vol. 7, pt. I, 1874, Calcutta, pp. 35-36, 43.  
 Cassiterite, is found at Nurgo, a village south of Baraka in grains thickly distributed through a thinly foliated gneiss containing some thin "seams of pegmatite." Also occurs in lepidolite in pegmatite at Pihra, and in granite cutting mica schist at Simratari, west of Pihra.  
 Natives smelted tin ore for iron ore and when they saw the white metal, thought they had obtained silver.
594. ———. A manual of the geology of India. pt. 4.  
 1887, Calcutta, pp. 54-55.  
 "Tinstone has been reported from several parts of the peninsula of India, but nowhere has it as yet been found in any quantity."
595. MEDLICOTT, H. B. and BLANFORD, W. T. Tin in India.  
 Manual of the Geology of India, Calcutta, 1879, pp. 19, 708.  
 Mr. Mallet found tinstone in the gneiss in district of Hazáribágh. Tinstone is found in some abundance in parts of the Tenasserim and in Martaban.
596. OATES, ROBERT. The copper and tin deposits of Chotà-Nagpore, Bengal, India.  
 Trans. Fed. Inst. Mg. Eng., Vol. 9, 1895, Newcastle-upon-Tyne and London, pp. 445-451, pls. 24, 25.  
 Gives geology, account of the working, machinery used and results obtained, at Narungo tin-mine, 5 miles north of Baragunda.
- PHILLIPS, J. A., and LOUIS, H. See No. 1350.
597. RUDRA, SARAT C. Mineral resources of British India.  
 Trans. Amer. Inst. Mg. Eng., Vol. 34, 1904, New York, p. 828.  
 "Although no deposit of tin ore has yet been discovered in Peninsular India, stray samples have been found in Bengal, Chotà-Nagpur, Bombay and Bastar. The only place in British India where this mineral is known to exist in a large quantity is in Lower Burma, at Amherst, Tavoy and Mergui."
598. STEPHENS, F. J. Geology and mineral resources of Kumaon and Garhwal.  
 Trans. Inst. Mg. Met., Vol. 10, 1901-1902 London, pp. 394, 401, 411.  
 Tin is briefly mentioned as occurring in small quantities in India.

## IRELAND

599. ANONYMOUS. Tin ore and gold in Wicklow, Ireland.  
 Amer. Journ. Sci. Arts, ser. 2, Vol. 11, 1851; New Haven, p. 232.  
 Gives following analysis of tin ore made by W. Mallet:
- |                        |         |
|------------------------|---------|
| " Peroxyde of tin..... | 95.26   |
| Peroxyde of iron.....  | 2.41    |
| Silica .....           | 0.84    |
|                        | —       |
|                        | 98.51 " |

FAWNS, SYDNEY. See No. 1320.



## IRELAND (Continued)

600. FITTON, WILLIAM. Notice respecting the geological structure of the vicinity of Dublin; with an account of some rare minerals found in Ireland.  
Trans. Geol. Soc. London, Vol. 1, 1811, London, p. 270.  
Tinstone found in the gold mines of Wicklow.
601. KINAHAN, G. H. On the mode of occurrence and the winning of gold in Ireland.  
Sci. Proc. Roy. Dublin Soc., n. s., Vol. 3, 1883, Dublin, p. 272.  
Tinstone crystals are mentioned as occurring with the gold at Ballinvally. Found also in Monaglogh and Coolbawn.
602. ———. Economic geology of Ireland.  
Journ. Roy. Geol. Soc. Ireland, Vol. 18 (Vol. 8, new series), 1889, Dublin, pp. 11, 17, 79, 82, 86, 121, 122.  
A collection of papers appearing in the Sci. Proc. Roy. Dublin Soc., from March 1886 onward. Three counties in which tin is said to be found:  
1. County Dublin, Dalkey, at Kingstown with lead and zinc in granite. Only place in Ireland that it is known in a lode. Rumored at Kilerohane (Sheep Head) County Cork, but not authenticated.  
2. County Kerry, Lough Leane, Killarney. Questionably.  
3. County Wicklow, Goldmine River, Woodenbridge, in gravels with gold and magnetic sand. Suggests possibility of finding tin lodes at last place.
603. ———. Notes on mining in Ireland.  
Trans. Inst. Mg. Eng., Vol. 26, 1903, London and Newcastle-upon-Tyne, pp. 279-280, 286.  
Tin ore in the Ovoca district, County Wicklow, has not been found in place. Thinks it may occur in copper-bearing veins in the district and that copper may give way to tin in depth. Treats shortly of old bronze, showing that tin was known in Ireland long ago.  
Only localities where tin is known are Dalkey, County Dublin, and the Goldmine Valley, County Wicklow. Said to have been found near the lakes of Killarney, County Kerry.  
H. J. Seymour is quoted as crediting minute crystals of cassiterite to the Mourne Mountains.
604. MACLAREN, J. MALCOLM. The occurrence of gold in Great Britain and Ireland.  
Trans. Inst. Mg. Eng. Vol. 25, 1902-1903, Newcastle-upon-Tyne and London, p. 494.  
States that in the Croghan Kinshelagh area, County Wicklow, Ireland, "the black sand is composed mainly of magnetite, ilmenite, hematite and iron pyrite, but cassiterite, galena, wolframite, molybdenite, gold, copper-pyrite and oxides of manganese also occur in the sand. The late Mr. W. Mallet records having obtained from a washing of 150 pounds, no less than 3½ pounds of stream tin, in all sizes from small grains up to pebbles ½ inch in diameter and of the variety known as wood-tin."
605. MALLET, W. On the minerals of the auriferous district of Wicklow.  
Journ. Geol. Soc. Dublin, Vol. 4, 1848, Dublin, pp. 272-273.  
Abstract: London, Edinburgh, Dublin Philos. Mag. Journ. Sci., Vol. 37, 1850, London, pp. 393-394.  
Brief abstract: Amer. Journ. Sci. Arts, 2d ser. Vol. 11, 1851, New Haven, p. 232.  
Tin in County Wicklow, Ireland, "Should this mineral be found in the mass of sand in a quantity at all approaching that in which it existed in the specimen examined, it would probably richly repay the labor and expense of collection and smelting. The fact of the existence of tinstone in such considerable quantity in these auriferous streams, would seem to indicate the probable existence somewhere in the surrounding district of masses of ore, and possibly forming the continuation of those vast deposits of Cornwall."

## IRELAND (Continued)

606. SEYMOUR, H. J. On the occurrence of cassiterite in the tertiary granite of the Mourne Mts., County Down.  
 Sci. Proc. Roy. Dublin, Soc., Vol. 9, 1902, Dublin, p. 583, 584.  
 This occurrence of cassiterite in an undoubted Tertiary granite is of great interest, as tending to show the comparatively recent origin of some mineral lodes. First record of the occurrence of tin in Ireland dates from 1796.
607. SMITH, AQUILA. On Irish tin ore.  
 London, Edinburgh, Dublin Philos. Mag. Journ. Sci., ser. 3, Vol. 18, 1841, London, pp. 134-136.  
 Tin ore is said to have been found in Wicklow County about 1796, in some gold mines. Messrs. Mills, King and Weaver, published in Trans. Dublin Soc., Vol. 2, 1801, Dublin, p. 147, an announcement of the occurrence of tinstone crystals associated with the gold in Croghan Mts. in Wicklow County. This is first announcement of the existence of tin in Ireland. The author in examining some washed sand from the gold works in Wicklow County, found small particles of "native tin oxide."
608. WEAVER, THOMAS. Memoir on the geological relations of the east of Ireland.  
 Trans. Geol. Soc. London, Vol. 5, 1821, London, p. 135.  
 Mentions "tinstone" as having been found in granite, and stream tin at Croghan Kinshela, County Wicklow.
609. ———. On Irish tin ore.  
 London, Edinburgh, Dublin Philos. Mag. Journ. Sci., ser. 3, Vol. 19, 1841, London, pp. 27-31.  
 Mr. Weaver reviews the paper on Irish tin ore by Aquila Smith, printed in Philos. Mag., Vol. 18, 1841, London, pp. 134-136. Mentions that tin, contrary to Mr. Smith's assertion, is found in three distinct localities in Ireland, two in the county of Wicklow, and one in county of Dublin.

## ITALY

610. ANONYMOUS. A tin mine in Tuscany.  
 Journ. Appl. Sci., Vol. 7, 1876, London, p. 56.  
 Notes the discovery of a vein of cassiterite near Campiglia, Tuscany. The vein is about 4 inches wide, between limonite and a Lias limestone. Believed to be the first time tin has been found unconnected with granite.
611. ———. The discovery of tin ore in Italy and its relation to the bronze manufacture of the ancients.  
 Iron, Vol. 14, 1879, London, pp. 166-167, 322-324.
612. BECO, JEAN, and THONARD, LÉON. L'industrie minérale en Italie depuis 1860 jusqu'en 1880.  
 Rev. Univ. Mines Mét. Trav. Publ. Sci. Arts Appl. Indust. ser. 2, Vol. 14, 1883, Paris and Liège, p. 115.  
 The oxide of tin was discovered in Tuscany in 1876.
613. BERGEAT, ALFRED. Beiträge zur Kenntniss der Erzlagerstätten von Campiglia Marittima (Toscana) insbesondere des Zinnsteinvorkommen dortselbst.  
 Neues Jahrb. Min., Vol. 1, 1901, Stuttgart, pp. 135-156, text figs. 2, pl. 7.  
 Review: Zeitschr. prakt. Geol. 1901, Berlin, pp. 422-423.  
 Digest: Trans. Inst. Mg. Eng., Vol. 22, 1901-1902, London and Newcastle-upon-Tyne, pp. 705-706.

## ITALY (Continued)

These stanniferous deposits differ from all others known, for they do not appear to be associated with eruptives, but occur in limestone with hematite. Campiglia is 12½ miles from Massa Marittima, 18 miles from Elba and about same distance from borax-producing localities of Larderello and Castelnuovo. Ore deposits extend in belt of over 3 miles from Monte Valerio to Monte Calvi. 1¼ miles southwest of town are tin ores, 2 miles northwest are sulphide-ores—argentiferous-galena, pale and dark zinc blende, pyrite and chalcopyrite. Ores intimately associated with cordierite-bearing quartz trachyte, epidote, chlorite, ilvaite, manganiferous pyroxene, quartz, and fluorspar, separated from tin-deposits by Marmi valley. These ores are eruptive and metasomatic. No tin in them. Tin deposits are on Monte Valerio and Monte Fumacchio. Country-rock gray or pinkish marble, probably Middle Lias, overlain by variegated Upper Lias slates, with quartz nodules. No eruptives to be seen here. Tin ore in limonite in fissures in slates and very irregular metasomatic masses in limestone. Think ores are not of secondary concentration and are not a stanniferous gossan. Gangue is calcite and kaolin. None of ordinary accompanying minerals of tin. Copper ores of Boceheggiano and Massa Marittima are stanniferous.

## 614. BLANCHARD, FRÉD. Sur la découverte de la cassitérite à Campiglia Marittima.

Atti R. Accad. Lincei (Mem.), ser. 2, Vol. 3, 1875-1876 (1876), Roma, pp. 93-94.

## 615. ———. Sulla scoperta della cassitérite à Campiglia Marittima.

Bol. R. Com. geol. Italia, Vol. 7, 1876, Rome, pp. 52-54.

Digest: Geol. Rec. for 1876, London, p. 194.

At Cento Camerelle, on west side of Monte Fumacchio, a small tin-vein occurs, accompanied by limonite. Has east-westerly direction, with underlay to south. Country rock is Lower Lias limestone.

## 616. ———. Sulla miniera di stagno in Campiglia.

Atti R. Accad. Lincei (Trans.), ser. 3, Vol. 2, 1877-1878 (1878), Rome, pp. 186-191.

## 617. BRAUN, MAX. Zinnstein in Italien.

Neues Jahrb. Min., 1877, Stuttgart, pp. 498-499.

A communication describing Italian tin deposits.

BROWN, A. SELWYN. See Nos. 1307 and 1308.

## 618. CAILLAUX, ALF. Note sur la découverte de minerai d'étain en Toscane.

Bull. Soc. Geol. France, ser. 3, Vol. 4, 1875-1876 (1876), Paris, pp. 293-295.

Geologically, an important discovery on account of its rather unusual occurrence. Two analyses were made of this tin by Hallway of London:

Oxyde d'étain .....	75.18	92.40
— de fer.....	4.00	3.49
Carbonate de chaux.....	19.64	3.34
Plomb et bismuth.....	traces	0.00
Matières indéterminées .....	1.18	0.77
Total .....	100.00	100.00
Étain métallique .....	58.90	72.00

## 619. CHARLON, E. Note sur la découverte de l'étain oxydé en Toscane.

Ann. Mines, ser. 7, Vol. 9, 1876, Paris, pp. 119-122.

## 620. CHURCH, A. H. La scoperta del minerale di stagno in Italia, e sua relazione colla lavorazione del bronze presso gli antichi.

Bol. R. Com. geol. Italia, Vol. 10, 1879, Rome, pp. 382-394, 545-556.

## ITALY (Continued)

621. D'ACHIARDI, ANTONIO. Entdeckung des Zinnsteins in Campiglia Maritima.  
 Neues Jahrb. Min., 1876, Stuttgart, p. 285.  
 Digest: Geol. Rec. for 1876, London, p. 222.  
 "Notes on the discovery of cassiterite, with brown iron ore, in the Cento Camerelle, where the Romans and perhaps the Etruscans, had important mines. The tin-stone contains 72.45 per cent tin."  
 ———. See No. 1313.
622. DALMER, KARL. Zinnerzlagerstätten.  
 Zeitschr. prakt. Geol. 1894, Berlin, p. 400.  
 Additions made to a communication by Herr Gurlt concerning the occurrence of tin in Campiglia.
623. ERNST, C. VON. Die Montanindustrie Italiens.  
 Oest. Zeitschr. Berg. Hütt., Vol. 31, 1883, Wien, p. 597.  
 Brief account of localities, and manner of occurrence of tin in Italy, also production from 1876 to 1880 inclusive.
- FAWNS, SYDNEY. See No. 1320.
- FUCHS, E., and LAUNAY, L. DE. See No. 1323.
624. GURLT, A. Zinn-Vorkommen im Kalkstein von Cava del Fumacchio bei Campiglia, Toscana.  
 Zeitschr. prakt. Geol. 1894, Berlin, pp. 324-326.  
 Remarks on this article by Karl Dalmer, p. 400.
625. HERTER, PAUL, and RATH, G. VON. Zinnstein von Campiglia.  
 Zeitschr. deutsch. geol. Ges., Vol. 29, 1877, Berlin, pp. 194-196.
626. LANGER, J. H. Zinnsteinvorkommen in Toscana.  
 Oest. Zeitschr. Berg. Hütt., Vol. 24, 1876, Wien, p. 502.
627. LOTTI, B. Sulla genesi dei giacimenti metalliferi di Campiglia Maritimi in Toscana.  
 Bol. R. Com. geol. Italia, Vol. 31, 1900, Rome, pp. 327-337, sections 2.  
 Digest Trans.: Trans. Inst. Mg. Eng., Vol. 22, 1901-1902, London and Newcastle-upon-Tyne, pp. 704-745.  
 Quartz-trachytes, some of them bearing tourmaline, and tourmaline-granite cut gray and white limestones of lower Liassic. Metalliferous deposits in more direct contact with trachyte than with granite. At Campo Alle Buche at the contact of the granite and gray limestone are masses of hematite, limonite, carbonate of lead and traces of cassiterite. At Monte Valerio are notable deposits of tin with the iron ore in the white Lower Lias limestone. At the Cento Camerelle tin and iron ores occur in the red Middle Lias limestone and continue into Lower Lias. Are in a horizontal vein with tin ore in lower part of ore-body. Trachyte changes to pyroxenite with epidote and garnet in contact with limestone country-rock. Ore deposits same age as intrusives, post-Eocene, not later than upper Miocene. The sulphides are probably the outcome of infiltration of siliceous metalliferous solutions, possibly (after Vogt and De Launay) from magmatic segregation. Iron and cassiterite come from oxidation of sulphides. Cassiterite probably carried from granite by alkaline carbonate solutions with carbonate of iron which was later decomposed into oxide.
628. PHILLIPS, J. A., and LOUIS, HENRY. A treatise on ore deposits.  
 1896, London, pp. 476-477.  
 In Italy tin was found in connection with hematite, near Campiglia Marittima, in 1875. In Lower Lias limestone in fissures in connection with hematite. 70 tonnes of ore produced up to 1894, but none during that year.

## JAPAN

629. ANONYMOUS. *Les Mines du Japon*.  
Bureau des Mines, 1900, Paris, pp. 294-297.  
Tin occurs in tertiary tuffs, with galena and pyrite at Taniyama. Ore said to carry 10 per cent of tin.
630. ———. *Outlines of the geology of Japan*.  
Imp. Geol. Surv. Japan, 1902, Tokyo, pp. 183-184.  
Kiura mine, situated in Bungo province was discovered many hundred years ago, and was once prosperous. At present ore is almost exhausted. Tin ore occurs in cavities in limestone. Taniyama mine was discovered in 1655, was most productive between 1848-1860, annually yielding from 120,000 to 130,000 kin of tin. Ore occurs in veins. Stream tin is found in vicinity of Takayama and Hirukawa.
- . *See No. 1672.*
- BECK, RICHARD. *See No. 1299.*
- D'ACHIARDI, ANTONIO. *See No. 1313.*
- FAWNS, SYDNEY. *See No. 1320.*
631. GODFREY, J. G. H. *On the geology of Japan*.  
Quart. Journ. Geol. Soc. London, Vol. 34, 1878, London, pp. 542-555, 100 words.  
Tin ore occurs only in small quantities. Found in province of Bungo and Satsuma (Taniyama). Estimate of total production per annum is 7½ tons.
632. JIMBO, KOTORI. *Notes on the minerals of Japan*.  
Journ. College Sci. Imp. Univ. Tokyo, Vol. 11, 1899, Tokyo, pp. 224, 231.  
Describes specimens of cassiterite from Mino, Satsuma, Bungo and Hitachi provinces. Brief.
633. MUNROE, HENRY S. *The mineral wealth of Japan*.  
Trans. Amer. Inst. Mg. Eng., Vol. 5, 1877, Easton, Pa., pp. 297-299.  
Reprint: Eng. Mg. Journ., Vol. 22, 1876, New York, p. 427.  
Translated from the English by Leon Thonard, in *Rev. Univ. Mines, Mèt. Trav. Publ. Sci. Arts Appl. Indust.*, ser. 2, Vol. 2, 1877, Paris and Liège, pp. 273-275.  
Tin is found in but three of the thirty-five ken of Japan, so far as author knows, only in veins. Nearly all tin produced comes from Taniyama mine. There are, here, 21 distinct veins of tin averaging 1½ feet in thickness, but varying from a few inches to four feet. The ore is cassiterite, found in almost microscopic crystals scattered through a gangue of quartz. Method of treating the ore is given.
634. REIN, J. J. *The industries of Japan*.  
English translation, 1889, London, p. 303.  
Merely a note. Little tin in Japan; on island of Kinshin and Tani-yama in Satsuma; and in Ohira-tetsu-san, in Bungo. These localities are in the southern end of Japan.
- ROLKER, CHAS. M. *See No. 1357.*
635. WADA, TSUNASHIRO. *The mining industry of Japan during years 1867-1892*.  
Mining Bureau Dept. Agriculture and Commerce, 1893, Tokyo, pp. 1, 300.  
Tin has been mined since the end of the 7th century. Production in 1890, from Taniyama, 791 piculs.

## JAPAN (Continued)

## 636. ———. Minerals of Japan.

Translated by T. Ogawa, 1904, Tokyo, pp. 50-51.

Cassiterite sometimes occurs in fluvial deposits, as in the provinces of Mino and Bungo, and sometimes in rocks as in the provinces of Satsuma, Hitachi, Suo and Hyūga. It occurs usually in small quantities, and the mineral is worked only in Satsuma and Hyūga.

## KAMERUN

## 637. ANONYMOUS. Tin deposits in Kamerun.

Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 405, 150 words.

Digest from Mg. Mag., Vol. 10, 1904, New York, p. 336.

"Brief confirmation of the truth of important discoveries of pure tin in British, French and German possessions in Northern Nigeria."

## 638. ———. Kamerun tin deposit.

Zeitschr. prakt. Geol., Vol. 12, 1904, Berlin, pp. 427-428.

Paragraph stating that tin has been found in Kamerun along the British Nigerian boundary, and that two companies had acquired mining rights.

## 639. MACCO, A. Die nutzbaren Bodenschätze der deutschen Schutzgebiete.

Zeitschr. prakt. Geol., Vol. 11, 1903, Berlin, pp. 28-33, 193-202, map.

Digest: Trans. Inst. Mg. Eng., Vol. 24, 1902-1903 [1904], London and Newcastle-upon-Tyne, p. 712.

"Tin ore certainly occurs in that area [Kameruns] but how and where the natives work it is as yet unknown."

FAWNS, SYDNEY. See No. 1320.

## KOREA

## 640. OPPERT, ERNEST. A forbidden land: Voyages to the Corea.

1880, London, pp. 171-172.

Briefly mentions that quicksilver, lead and tin are found in province of Hoang-hai.

## LAOS

## 641. ANONYMOUS. L'étain au Laos.

Métallurgie, Vol. 32, 1901, Paris, pp. 891, 893.

## 642. ———. L'étain au Laos.

La Nature, Vol. 32, I, Dec. 26, 1903 (1904), Paris, pp. 58-59.

Short general article giving the location, general geology and mineral associations, of the tin deposits of Laos, and the manner of working.

## 643. GASCUEL, L. Gisements stannifères au Laos Français.

Ann. Mines, ser. 10, Vol. 8, 1905, mem., Paris, pp. 321-332, fig., sketch map.

Digest: Geol. Centr. Vol. 7, 1905-1906, Leipzig, p. 683.

La vallée du Nam-Patène montre un synclinal de grès argileux, flanqué de part et d'autre par des calcaires. Les grès paraissent d'âge tertiaire. Ces grès renferment d'importants dépôts de limonite, parfois très manganésifère; l'oxyde d'étain y est en outre répandu à l'état de fine division.—L. Perviniquière.

## 644. LACROIX, ALFRED. Sur les gisements stannifères de Hin-boun (Laos).

Bull. Soc. franc. Min., Vol. 24, 1901, Paris, pp. 422-425.

Digest Translation: Trans. Inst. Mg. Eng., Vol. 25, 1902-1903, London and Newcastle-upon-Tyne, p. 826.

## LAOS (Continued)

Mine located in Province of Kammun, Laos, in a small tributary valley of the Hin-bun River. At present worked by French, has long been worked by natives. Ore occurs in limestone, no eruptives. Not in place, but little water worn. None of the ordinary minerals accompanying tin are present. Cassiterite often resembles "needle ore" of Cornwall. Cassiterite supposed to be a primary constituent of a sulphide gossan, as at Campiglia, Italy.

645. PELATAN, L. Les richesses minérales des colonies françaises (Asie Française).

Rev. Univ. Mines, Mët. Trav. Publ. Sci. Arts Appl. Indust., ser. 3, Vol. 54, 1901, Liège and Paris, pp. 247-249.

## MADAGASCAR

646. BOUSE, JOHN. Madagascar mineral and other resources.

California Journ. Tech., Vol. 4, No. 2, 1904, Berkeley, p. 61.

Copper and tin ores are mined in a small way. So far these ore deposits do not seem very extensive or rich. Some tin is exported.

647. DUNSTAN, WYNDHAM R. Tinstone from Madagascar.

Bull. Imp. Inst., Great Britain, Vol. 3, No. 1, 1905, London, p. 41.

The analysis of a specimen from Antananarivo gave 77.5 per cent metallic tin, but it is scarcely to be expected that when mined on a large scale such a high content of metallic tin will be maintained.

LACROIX, ALFRED. See No. 516.

648. PELATAN, L. Les richesses minérales des colonies françaises (Madagascar).

Rev. Univ. Mines, Mët. Trav. Publ. Sci. Arts Appl. Indust., ser. 3, Vol. 52, 1900, Paris and Liège, pp. 294-295.

Tin has long been known to exist in region of Ambatofanghana, and recently tin has been found in the southern part of the district of Ambohimanga.

## MAINE

649. HITCHCOCK, C. H. State Geol. of Maine. Letter to D. W. Hendrickson.

In prospectus bound in Mining Pamphlets, Vol. 69, U. S. Geol. Surv. Library. (Letter dated Aug. 8, 1865.)

States that tin ore at Mt. Mica, Paris, Maine, is in "a very coarse granite, in a finer granite, and this cuts a coarse mica schist, the oldest rocks in Oxford Co." "Largest known cut tourmaline in the world came from this hill, and is valued at £300. It is owned by Prof. C. U. Shepard of Amherst College." A crystal of cassiterite exceeding 5 pounds in weight had been taken out. Thinks the deposit and the one at Mt. Rubelite, in Hebron, worth exploring.

650. ———. Reputed tin discovery in Maine.

Eng. Mg. Journ., Vol. 30, 1880, New York, p. 173.

Quoted: Mg. Sci. Press, Vol. 41, 1880, San Francisco, p. 194.

Short article recording a recent discovery of tin ore at Winslow, Maine. The inclosing rock is described as a mica slate, adjacent to which is a hard quartzite band. Author states that mineralogical, geological, and physical features are identical with those common to the stanniferous districts of Europe.

## MAINE (Continued)

651. HUNT, T. STERRY. Remarks on an occurrence of tin ore at Winslow, Maine.  
 Trans. Amer. Inst. Mg. Eng., Vol. 1, 1871-1873, New York, pp. 373-375.  
 Remarks by Prof. Silliman and R. W. Raymond.  
 Tin veins an inch or two in thickness, traverse an impure gray micaceous limestone. Gangue consists of purple fluorspar, and silvery white mica with quartz, through which the cassiterite associated with mispickel, is disseminated in small crystalline masses.
652. ———. Discovery of tin ore and emery at Winslow, Me.  
 Eng. Mg. Journ., Vol. 30, 1880, New York, p. 218.  
 Short communication regarding discovery of tin at Winslow, Me.
653. JACKSON, C. T. Sur les mines de cuivre du lac Supérieur et sur un nouveau gisement d'étain dans l'État du Maine. (Extract d'une Lettre.)  
 C. R. Acad. Sci., Vol. 69, 1869, Paris, pp. 1082-1083.
654. ———. Tin ore at Winslow, Me.  
 Proc. Boston Soc. Nat. Hist., Vol. 12, 1869, Boston, p. 267.  
 An account of discovery of tin at Winslow. Rock in which veins exist is a compact mica slate or gneiss, and the vein matter consists of purple fluorspar, silvery radiated mica in hexagonal prisms, and quartz.

## MALAY PENINSULA

655. ANONYMOUS. Geology and mineralogy of the Malay Peninsula.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 15, 1848, London, p. 197.  
 Amer. Journ. Sci. Arts, ser. 2, Vol. 6, 1848, New Haven, pp. 129-132.
656. ———. Tin in the Malay Peninsula.  
 Eng. Mg. Journ., Vol. 47, 1889, New York, p. 48.  
 Short review of a report of Belgian Consul-General.
657. ———. The production of tin in the Malay Peninsula.  
 Journ. Soc. Arts, Vol. 41, 1893, London, pp. 421-422.  
 Statistics of production for 1891. Description of Chinese methods of mining.
658. ———. The Perak tin mines.  
 Eng. Mg. Journ., Vol. 56, 1893, New York, pp. 268-269, illus. 1, figs. 6.  
 Abstract from "London Engineer" describing the Chinese method of working tin mines. The mines are not profitable when worked by expensive western methods.
659. ———. Mining in the Malay Peninsula.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 66, 1896, London, pp. 277, 308-309.  
 Editorials.  
 Description of Peninsula, geology and minerals. Tin and gold the only metals in deposits of commercial importance. Tin deposits mostly alluvial, bedrock is kaolin, or rarely, shale or limestone, upon which is the stanniferous gravel from a few inches to 80 feet thick. A little lode mining is being carried on in Kuantan; in Pahang and at Bundi, in Tringganu. At Kuchal, in Selangor, also at Sungei Rin in Jebebu leaders and veinlets of tin ore have been found in a "greisen" similar to occurrences in Saxony and Bohemia. Thinks discovery of veins may have great future results.



## MALAY PENINSULA (Continued)

660. ———. Tin mining in Perak.  
Mg. Sci. Press, Vol. 76, 1898, San Francisco, p. 61.  
Extract from report of the Commissioner of Lands and Mines of Perak, giving mining conditions, output, prices, etc., for 1896.
661. ———. The Malay tin industry.  
Iron Age, Vol. 62, II, Dec. 8, 1898, New York, pp. 17-18.  
Shows that federated Malay States will continue to be by far the largest tin producing country in the world; describes deposits, mining, etc.
662. ———. Tin of Straits Settlements.  
Min. Ind. for 1898, Vol. 7, 1899, New York and London, p. 711. See No. 1287.
663. ———. Tin in the Malay Peninsula.  
Min. Ind. for 1900, Vol. 9, 1901, New York and London, pp. 639-640.  
While river dredging for tin has not been seriously attempted, applications for water rights to follow this method of mining are being made. Progress has been made in the development of lodes, especially in district of Kuantan, Pahang.
664. ———. Tin supplies.  
Engineering, Vol. 72, No. 1872, November 15, 1901, London, pp. 684-685, 1300 words.  
"Editorial on the tin supply in the Malay States, based on information given in the last annual government report and claiming that there is no cause for anxiety concerning the future supply."  
Not available to the authors.
665. ———. Tin mining in Malaya.  
Austr. Mg. Stand., Vol. 20, Dec. 26, 1901, Sydney and Melbourne. Serial. 1st part.  
"Discusses the tin deposits in the Malay Peninsula, and the future outlook as a tin-producing region."  
Vol. 21, 1902, p. 47, 2d part. Outlines advantages to be gained by the use of water power as a mining agent in Malaya. Describes the deep lead and lode mining.  
First article not available to the authors.
666. ———. Tin in Malay Peninsula.  
Min. Ind. for 1901, Vol. 10, 1902, New York and London, pp. 641-642.
667. ———. Mining in the Malay Peninsula.  
Mg. Journ. Railw. Comm. Gaz., Vol. 72, 1902, London, p. 754.  
A statement of the production and a brief description of the tin deposits of four of the Federated Malay States: Perak, Selangor, Negri Sembilan and Pahang.
668. ———. Malayan tin mining.  
Austr. Mg. Stand., Vol. 30, 1903, Sydney and Melbourne, p. 665.  
Reprint from "Straits Echo."  
A Chinaman has applied ground-slucing to placer tin mining and it is described as a novelty.
669. ———. Malay mining; the tin duty.  
Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 233, 420 words.  
Digest: Mg. Mag. Vol. 10, 1904, New York, p. 336.  
Extract from the "Malay Mail," incorporating protest of miners' association against high advalorem duty on exportation of tin. Statistics of production and costs are included.
670. ———. The Tambum tin mine, Perak.  
Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 626.  
Mine situated 5 miles from Ipoh; owned by Mr. Leong Fee; turns out 140 piculs of ore per day. Net profits for Sept. 1904, \$60,000.

## MALAY PENINSULA (Continued)

671. ———. Production de l'étain dans les États fédérés malais.  
Métallurgie, Vol. 35, 1904, Paris, p. 1493.
672. ———. The Straits tin mines.  
Eng. Mg. Journ., Vol. 80, 1905, New York, pp. 831-832.  
Brief summary of Senior Warden of Mines' report. Output in 1904, 856,238 piculs. Perak continues the premier producer of tin in Federated Malay States. Brief accounts of progress in various mining districts.
673. ———. Monazite tin ore in Federated Malay States.  
Selangor Government Gazette, Sept. 14, 1906.  
Review: Eng. Mg. Journ., Vol. 82, 1906, New York, p. 918.  
Contains a report on a specimen of washed alluvial tin ore from the land worked by the Sempam Tin Mining Co., Pahang. The ore consisted principally of a mixture of cassiterite, ilmenite and monazite. An analysis of the ore is given. Original article not available to the authors.
674. ———. See No. 673.  
Quoted in Mg. Journ. Railw. Comm. Gaz., Vol. 80, 1906, London, p. 475.
675. ———. Tin production in the far East.  
Eng. Mg. Journ., Vol. 82, 1906, New York, p. 963.  
Treats mostly of the labor troubles in connection with mining in the Malay States and Dutch East Indies. Average output of tin in Malay States for 1905 was 4.09 piculs (534 pounds) per coolie.
676. ———. Tin dredging on the foreshore in the Malay Peninsula.  
Mg. Journ. Railw. Comm. Gaz., Vol. 83, 1908, London, p. 237.  
Description of the tin dredging operations in Tongkah Harbor, Siam.
- 676a. ———. Tongkah Harbor Tin Dredging Co.  
Austr. Mg. Eng. Rev., Vol. 1, 1909, Melbourne, pp. 277-278. Illus.  
Editorial on same. Austr. Mg. Eng. Rev., Vol. 1, 1909, Melbourne, pp. 347-348.  
Very brief description of the tin bearing area of Tongkah Harbor, located on Puket Island, a Siamese possession on west side of Malay peninsula. Also describes work now being done by the dredging company.
- 676b. ———. Tin ores from the Federated Malay States.  
Bull. Imp. Inst., Vol. 6, 1908, London, pp. 155-157.  
Describes placer tin samples containing corundum, rutile and a small amount of rare earths, besides tin. Lode stuff carried Co, Zn and As.
- 676c. ———. Tin mining in Malaya.  
Eng. Mg. Journ., Vol. 88, 1909, New York, p. 929.
- 676d. ———. Tin mining in the Federated Malay States.  
Austr. Mg. Stand., Vol. 43, 1910, Sydney and Melbourne, pp. 169-170, illus. 1.  
Deals with mining and treatment methods.
677. BALFOUR, JOHN F. Tin in the Malay Peninsula.  
Journ. Soc. Arts, Vol. 55, 1907, London, pp. 505-507.  
Treats of the general features of the peninsula, geology, and tin deposits. The tin is considered under: Lode mining, impregnations (contact deposits and stockworks) and alluvial deposits, as to the manner of occurrence and method of working.
678. BECHER, H. M. Mining in the Malay Peninsula.  
Trans. Inst. Mg. Met., Vol. 1, 1892-1893, London, pp. 78-107, discussion, pp. 131-141.  
Treated under heads: The tin formation; the Malay gold-bearing formation; the Chinese system of mining; the character of the alluvial; modern methods vs. Chinese; pumping methods; the machinery employed; general conclusions; prospects of the Malayan tin fields.

## MALAY PENINSULA (Continued)

BECK, RICHARD. *See* No. 1299.

## 679. BENEDICT, WM. DE L. Tin in the Malayan region.

Min. Ind. for 1892, Vol. 1, 1893, New York and London, pp. 446-450.

Perak produces two-thirds of tin production of the Straits, and one-third of that of the world. Description of Perak deposits, methods of mining. Tin deposits of Island of Sumatra treated. Assays given.

BROWN, A. SELWYN. *See* Nos. 1307 and 1308.

## 680. CLIFFORD, HUGH. Tin in Malaya.

Austr. Mg. Stand., Vol. 29, 1903, Sydney and Melbourne, p. 250.

Extract of a lecture delivered before the Royal Colonial Institute, Dec. 9, 1902. Deals with tin resources of the Malay States.

## 681. COLLETT, OCTAVE J. A. L'Étain. Étude minère et politique sur les Etats fédérés malais.

1903, Brussels, p. 196, map 1, and plates.

On tin in the Malay Peninsula. Divided into six parts: (1) Geography. (2) History. (3) Geology. (4) Methods of mining tin. (5) Methods of mining and smelting tin. (6) Legislation regarding tin. Production, prices, etc. Geology. General structure of the country. Popular explanation of formation of placers from veins. Very little description of the veins or of the placers themselves. Cassiterite accompanied by grains of quartz, hematite, fluorite, pyrite, tourmaline and feldspar.

## 681a. CORNUBIAN. Lode mining in the Malay States.

Mg. Journ. Railw. Comm. Gaz., Vol. 84, 1908, London, p. 622.

Letter in which a correspondent states that the lode mines of Pahang are among the big tin mines of the world, and gives figures to support his statement.

## 682. CRAMER, CARL. Das Zinnerz und seine Gewinnung auf der Halbinsel Malacca.

Oest. Zeitschr. Berg. Hütt., Vol. 42, 1894, Wien, pp. 543-545, pl. 20.

Digest translation: Trans. Fed. Inst. Mg. Eng., Vol. 10, 1895-1896, Newcastle-upon-Tyne and London, p. 589.

Thickness of ore-bearing deposit (karang) up to 3¼ feet. Overburden up to 33 feet, average 6½ to 10 feet. Tin ore in karang varies up to 15 per cent, may be barren. Pays with as little as 0.5 per cent. French company tried to dredge in river Muar, but failed. Impurities: iron, wolframite, ilmenite. 77.15 pounds tin per head per month average production.

## 683. CROCKEWIT, H. Tin mines of Malacca.

Journ. Ind. Arch. East. Asia, Vol. 8, 1854, Singapore, pp. 112-133.

Translated from Tijdschr. Ned. Ind., Nov. 1851, Batavia.

Not available to the authors.

D'ACHIARDI, ANTONIO. *See* No. 1313.

DAVIES, D. C. *See* No. 1317.

## 684. DE LA CROIX, J. ERRINGTON. Some account of the mining districts of Lower Pèrak.

Journ. Straits Branch Roy. Asiatic Soc., June 1881, Singapore, pp. 1-10, section 1.

The region of Lower Pèrak comprises numerous mining districts, which can be placed under following heads: 1. Sungei Kinta District. 2. Sungei Bâtang Pâdang District. 3. Sungei Bidor District. The geology of these districts is given, the

## MALAY PENINSULA (Continued)

occurrence of tin ore, and the manner of mining by Chinese and Malays. Author believes the mining in all of the districts is in its infancy, and with better roads, and the clearing of streams, rendering transportation easier, many of the deposits now neglected could be worked with profit. There is at least 7,680 acres of actual alluvial ground, which under ordinary circumstances, will afford work to 25,000 miners for the next hundred years.

## 685. ———. Les mines d'étain de Perak.

Arch. Miss. sci. litt., ser. 3, Vol. 9, 1882, Paris, pp. 1-78.

Digests: Nature, Vol. 28, 1883, London, pp. 202-203; Sci. Amer. Suppl., Vol. 16, 1883, New York, pp. 6368-6369.

Memoir result of seven months exploration in the Malay State of Perak. Perak, although only 95 by 50 miles in dimensions, having an area of less than 5000 square miles, has long been known as a tin producing country, but only since the influx of Chinese has it been of first rate importance. Mines worked at present, chiefly alluvial, water-courses being filled with sand and gravel deposits to a depth of 20 or 30 feet, resting upon a floor of pure china clay, apparently derived from decomposition of the granitic rocks. Geological description necessarily imperfect, owing to the dense tropical vegetation which covers the entire country. Author has been able to establish the presence of numerous quartz veins traversing the granite which is coarsely porphyritic in the center and largely charged with tourmaline at the edges of the masses, reproducing the conditions to be found in the northwestern tin districts of Cornwall. Ore very pure, free from wolframite, arsenic, etc., which is troublesome to the Cornish miner. No vein mines have yet been opened. Methods of working, very primitive. Great improvement of mining conditions under British rule.

## 686. ———. Le royaume de Pérak.

Bull. Soc. Géogr., ser. 7, Vol. 4, 1883, Paris, pp. 333-354.

Describes the country in general, economic conditions, mines and miners.

## 687. DERRICK, W. H. Notes on lode tin mining in the Malay Peninsula.

Trans. Inst. Mg. Met., Vol. 7, 1898-1899, London, pp. 12-16. Discussion, pp. 16-19.

Abstract: Eng. Mg. Journ., Vol. 68, 1899, New York, pp. 784-785.

Description and cost of working the mines of Kuantan, Pahang, the principal lode mine of the Federated Malay States. These mines, so report says, were worked 100 years. The open cast system was the only one adopted by the old miners. Under native management (at least within recent years) the mines were not a financial success. Good outlook for increased output under European management.

## 688. DOYLE, PATRICK. Tin mining in Larut.

Mg. Journ. Railw. Comm. Gaz., Vol. 48, 1878, London, pp. 1191, 1219, 1247.

Reprinted in book form, 1879, London and New York.

A series of three articles giving a brief historical summary of Larut, a subsidiary district of Perak; description of the geological features of the country, and mineralogical productions. Describes miners (Chinese), modes of living, prosperity, manner of mining and its difficulties.

## 689. ———. On some tin deposits of the Mayalan Peninsula.

Quart. Journ. Geol. Soc. London, Vol. 35, 1879, London, pp. 229-232.

"All the ore worked up to the present time has been found in the alluvium derived from the mountain ranges; that is, in mining language, in stream works. The ore has been traced up to veins in the rock, but these have not hitherto been worked. The tin beds are composed of the debris of granitic rocks mixed with the ore."

## 690. DIJK, P. VAN. Tinontginning in het district Larut Perak, Gouvernment Straits Settlements.

Jaarb. Mijnw. Ned. Oost-Indië, 1883, II, Genuegde, Tech., Amsterdam, pp. 115-116.

## MALAY PENINSULA (Continued)

691. DYKES, F. J. B. Tin mining in Malaya.  
 Austr. Mg. Stand., Vol. 32, 1904, Sydney and Melbourne, p. 137.  
 Extract from Senior Warden of Mines' report for 1903. Statistics of population employed in tin mining, output per annum, earnings of laborer, etc. Tronoh and Tambun are mentioned as the two richest mines in Malaya. Brief history of Tambun.
692. ———. Report of the administration of the mines department, and on the mining industry for the year 1903.  
 Perak Gov. Gaz, Suppl., Vol. 17, No. 22, 1904, Kuala Lumpur, pp. 1-11.  
 Treats of tin mining and the output.
693. ———. Federated Malay States. Report on the administration of the mines department and on the mining industry for the year 1904. [Tin and gold.]  
 Perak Gov. Gaz. Suppl., July 14, 1905, Kuala Lumpur, pp. 1-9.
- ELLIS, THOS. F., and MCKILLOP, JOHN. See No. 1530.
694. FAWNS, SYDNEY. Tin lode mining in Tringganu.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 377.  
 Abstract: Lakes, Arthur, Min. Rep., Vol. 50, 1904, Denver, p. 500.  
 "Describes the mode of occurrence and work done up to present time in this part of the Malay Peninsula."
- . See No. 1320.
- 694a. FLOWER-ELLIS, T. A brief account of the Malay tin industry.  
 Proc. Chem. Met. Soc. South Africa, Vol. 2, February, 1897-September, 1899, Johannesburg, pp. 5-18.  
 Treats of the geology of the Malay Peninsula, properties of cassiterite, methods of mining, richness of deposits, purification of the ores, Chinese method of smelting tin ores, European method of smelting tin ores, refining the rough metal, tests for quality of tin, Swaziland tin fields.
695. HAMPTON, J. H. The tin deposits of the Straits.  
 Iron Age, Vol. 38, 1886, New York, p. 1.  
 Description of the country, the tin deposits, the Chinese methods of mining and smelting, and output from 1876-1884.
696. ———. Tin deposits of the State of Perak, Straits Settlement.  
 Trans. Min. Ass. Inst. Cornwall, Vol. 1, 1887, Camborne, pp. 143-152. Map.  
 A short descriptive article.
697. ———. On the occurrence of tin.  
 Trans. Geol. Soc. South Africa, Vol. 4, 1899, Johannesburg, pp. 37-40.  
 Malay Peninsula tin deposits were first visited by author in 1882. The contour of country and existence of forests made geological observations difficult. Stanniferous gravels extend over a very large area. Tin was raised by Chinese as long ago as 1793. Lode tin is attracting attention in State of Pahang.
- HUGHES, T. W. H. See No. 1507.
698. HUME, W. J. P., and DYKES, F. J. B. Report of proceedings of the mining conference held at Ipoh, Perak, Federated Malay States, Sept. 23 to Oct. 6, 1901.  
 1902, Taiping, pp. 1-64, pl. 5, fol.
- LAKES, ARTHUR. See No. 694.

## MALAY PENINSULA (Continued)

699. LOCK, C. G. WARNFORD. Tin mining and milling in Tringganu.  
Mg. Mag., Vol. 13, No. 4, 1906, New York, pp. 290-294, pls. 7. 1400 words.  
Short general description of tin mining conditions in northeastern Malay States.  
No productive mines in granite, but some in overlying slates. Tin veins often have no quartz in them, being solid cassiterite. No fluorite or tourmaline. Much monazite and xenotime with some zircon and ilmenite in the stream gravels.
700. ———. Tin in Tringganu.  
Mg. Journ. Railw. Comm. Gaz., Vol. 79, 1906, London, p. 182.  
Gives outline of geography and geology of Tringganu, and describes both the lode and alluvial deposits of the State. The veins are mostly in shales overlying granite. For original article see No. 699.
701. ———. Mining in Malaya for gold and tin.  
1908, London,  
Not available to the authors.
702. LOUIS, HENRY. Tin in the Malayan region.  
Min. Ind. for 1895, Vol. 4, 1896, New York and London, pp. 571-573.  
Digest of article from Mining Journal Railway and Commercial Gazette. See No. 1340.
703. ———. Die Zinnseifen der Halbinsel Malakka.  
Zeitschr. prakt. Geol., 1896, Berlin, pp. 233-234.  
Taken from "Western Daily Mercury," March, 1895.  
———. See No. 1340.
704. LOW, JAMES. Observations on the geological appearances and general features of portions of the Malayan Peninsula and of the countries lying betwixt it and 18° N. lat., pp. 128-162.  
Book not available to authors, but a brief digest is found in Glean. Sci., Vol. 1, 1829, Calcutta, pp. 223-224.  
Tin-bearing ground extends in a continuous line from the southern extremity of Peninsula to about 15° N. lat. No mines discovered beyond this. Mines are pits of from twelve to twenty feet deep. Ore generally in round or oblong masses, with well-defined crystals, in matrix of quartz, or bedded in masses resembling half decomposed granite. Brief description of metallurgical processes used.
- 704a. MARKS, E. SEABORN. Mining in the Malay States.  
Mg. Sci. Press, Vol. 98, 1909, San Francisco, pp. 31-36, illus.  
"A description of the climatic conditions of the country and the method of mining and concentrating tin ore."
- McKILLOP, JOHN, and ELLIS, THOS. F. See No. 1530.
705. MEUNIER, STANISLAS. Examen chimique d'eaux minérales provenant de Malaisie mineral d'étain de formation actuelle.  
C. R. Acad. Sci., Vol. 110, 1890, Paris, pp. 1083-1085.  
Author "found 0.5 per cent of SnO<sub>2</sub> in an opaline deposit, resembling geysericite, from a thermal spring in Selangor." See No. 726b.
- 705a. MILES, EDWARD T. Notes on Tongkah tin dredging.  
Austr. Mg. Stand., Vol. 42, 1909, Sydney and Melbourne, p. 60.  
Describes the deposits of tin and difficulties experienced in dredging in Tongkah Harbor, situated on northeast side of Tongkah Island (Junk Ceylon).

## MALAY PENINSULA (Continued)

706. MORGAN, J. DE. Note sur la geologie et sur minière du royaume de Perak et des pays voisins.  
Ann. Mines, ser. 8, Vol. 9, 1886, Paris, pp. 368-442, pls. 8, 9, 10.  
Discusses the geography, the geology and the tin mines of Perak. Also treats the main workings individually, the manner of exploitation, metallurgy, the Chinese companies, the mining laws and the statistics.
707. MOSS, E. W. Observations on the distribution and economic value of tin ores in the Malay Peninsula.  
Rep. Rugby School Nat. Hist. Soc. for 1890 (1891), Rugby, pp. 17-21, map.  
Digest from Ann. Brit. Geol., 1891, London, p. 377.  
"A general notice of the stream tin of Banca and the vein tin of Perak."
708. NEWLAND, D. H. Tin in Malay States.  
Min. Ind. for 1903, Vol. 12, 1904, New York and London, pp. 330-331.  
Short article dealing with the Malayan tin trade during 1903.
709. NOYES, H. HERBERT. Tin deep leads in Selangor.  
Mg. Journ. Railw. Comm. Gaz., Vol. 79, 1906, London, p. 690.  
Reprint: Eng. Mg. Journ., Vol. 82, 1906, New York, p. 1.  
Gives a description of the alluvial tin deposits of the Serendah Valley, Selangor. The writer states that these once famous fields have been practically abandoned by the Chinese. They leave as soon as the shallow and easily worked deposits near exhaustion. Believes Europeans will have to take up the work in the deep deposits.
710. OSBECK, PETER. A voyage to China and the East Indies.  
1771, London, Vol. 1, p. 244 (English edition); p. 204 (German edition).  
Briefly mentions that "tin comes in small pieces from Pegu and Jahor."
711. OWEN, FRANK. Mining in Perak.  
Trans. Inst. Mg. Met., Vol. 6, 1897-1898, London, pp. 51-87.  
Abstract: Min. Ind. for 1897, Vol. 6, 1898, New York and London, pp. 641-644.  
Extract: "Chinese tin smelting," Coll. Guard., Vol. 74, 1897, London, p. 931.  
Area, population, statistics, manner of mining, etc. Describes the Chinese system of smelting tin in a blast furnace.
712. ———. A review of the tin industry of the Malay Peninsula (up to the end of 1889).  
Min. Ind. for 1900, Vol. 9, 1901, New York and London, pp. 646-656, map 1.  
Describes the occurrence of tin ore in the Malay Peninsula, the general geology of the country, and the prices obtained for tin. Also treats of the mining conditions and the future prospects of the industry.
713. PARKES, CHAS. R. Surface tin mining in the Malay Archipelago.  
Proc. Inst. Civ. Eng., Vol. 115, pt. 1, 1894, London, pp. 352-354. Abridged.  
Malay alluvial tin deposits are briefly described, and methods of mining are given in considerable detail.
714. PENROSE, R. A., JR. Tin deposits of the Malay Peninsula, with special reference to those of the Kinta districts.  
Journ. Geol., Vol. 11, 1903, Chicago, pp. 135-154, figs. 9, pls. 4.  
Digest: Zeitschr. prakt. Geol., Vol. 11, 1903, Berlin, pp. 278-279. Neues Jahrb. Min., 1905, 1 (Ref.), Stuttgart, p. 100.  
Abstracts: Min. Ind. for 1902, Vol. 11, 1903, New York and London, pp. 590-593; Eng. Mg. Journ., Vol. 75, 1903, New York, pp. 926-928, map, illus. 3.

## MALAY PENINSULA (Continued)

The geographical position of the Malay tin regions is given and the general geology of the Malay Peninsula. The Kinta district is then taken up, its location described, and the occurrence and nature of alluvial tin ores of the district are treated. The accompanying minerals are also noted. The occurrence of tin ore in the rocks, the origin of the deposits and the commercial features are discussed.

PHILLIPS, J. A., and LOUIS, H. *See* No. 1350.

## 715. PIKE, E. R. Mining in Perak, Straits Settlements.

Trans. Mg. Ass. Inst. Cornwall, Vol. 3, 1892, Camborne, pp. 194-201, discussion pp. 201-206.

Gives a brief general description of Perak, the location of the tin-placers and the mining methods of the Chinese. Also describes the Kinta tin lodes and Malayan tin-smelting practice.

## 716. PLACE, JOHN. Tin mining in the Malay States.

Engineering, Vol. 82, 1906, London, pp. 281-284, pl. 1.

A very general article giving a description of the country and trade conditions, with short descriptions of mines and smelting. Prophesies further development and increase of output.

## 717. RATHBORNE, AMBROSE B. Camping and tramping in Malaya, fifteen years' pioneering in the native States of the Malay Peninsula.

1898, London, pp. 117-166, 333-334.

Pages 117-166: General description of mines (wholly untechnical), labor, social, economic conditions, fuel supply, roads, etc. 333-334, geology: "Upheaval of the granite"; "more violent" between 3° and 6° than between 1° and 3°. Limestone occurs in the northern half of the country. Near Thaiping, borings show country to have recently sunk over a hundred feet. Old cannon found at Larut 30 feet below surface in tin mine. Stone implements frequently found, but no mammalian bones in the gravels. A hoard of Portuguese coins of the 15th century was dug up at Kinta.

## 718. RITTER, CARL. Die Erdkunde.

Vol. 5 (Die indische Welt), 1835, Berlin, pp. 77-79, 246.

Treats of the tin of the Malayan Peninsula.

## 719. ROLKER, CHARLES M. The tins of Banca and Billiton.

Eng. Mg. Journ., Vol. 28, 1879, New York, p. 338. An abstract from an article by E. Reyer. *See* No. 117.

———. *See* No. 1357.

## 720. ROSS, D. Notice of some tin ore from the coast of Tenasserim.

Glean. Sci., Vol. 1, 1829, Calcutta, pp. 143-144.

Description of some stream tin from Chanda, half way between Mergui and Tavoy.

## 721. RUMBOLD, WM. R. The tin deposits of the Kinta Valley, Federated Malay States.

Amer. Inst. Mg. Eng., Vol. 37, 1906, New York, pp. 879-889, figs. 1-4.

Reprint: Mg. Journ., Vol. 80, 1906, p. 460.

General description of Kinta Valley; alluvial tin deposits; lode deposits; (a) those in granite, (b) those in limestone; origin of the deposits.

States that this district is probably, at the present time, the richest alluvial tin district in the world.



## MALAY PENINSULA (Continued)

722. SAUNDERS, W. T. Tin mining in the Straits Settlement.  
 Trans. Inst. Mg. Eng., pt. 4, Vol. 27, 1904, London and Newcastle-upon-Tyne, pp. 343-350.  
 Digest: Mg. Mag., Vol. 11, No. 1, 1905, New York, p. 71.  
 Reprint: Mg. Journ. Railw. Comm. Gaz., Vol. 75, 1904, London, p. 661.  
 About 60 per cent of the world's supply of tin comes from Straits Settlement. In the past most of it has been obtained from alluvial deposits, and while the placers appear to be unfailling, much attention is now given to lode mining. Alluvial mining is carried on largely on the west side of the Peninsula, while lode mining is confined to east side.
723. SCRIVENOR, J. B. A preliminary report on the geology of the neighborhood of Taiping, Perak.  
 Perak Gov. Gaz., Suppl., Vol. 17, No. 3, January 15, 1904, Kuala Lumpur, pp. 1-14, 13,000 words.  
 Part I. Physical features, igneous rocks, sedimentary rocks, alluvial deposits, faults and mineral lodes, weathering.  
 Part II. Geological history, mining prospects.
724. ———. Federated Malay States. Geologist's Report for 1904 (Tin).  
 Perak Gov. Gaz. Suppl., July 14, 1905, Kuala Lumpur, pp. 7.  
 The material in this article appears in the same author's "Geologist's Report of Progress," September, 1903-January, 1907. See No. 726.  
 Not available to the authors.
725. ———. Alluvial and lode tin in Malaya.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 78, 1905, London, pp. 273, 2400 words.  
 "From the annual report of the Federated Malay States. Describes three mines of detrital tin associated with limestone, gives information of the tin lodes, and briefly discusses the origin of the deposits."
726. ———. Geologist's report of progress, Sept., 1903-Jan., 1907.  
 Federated Malay States Government Press, Kuala Lumpur, 1907, pp. 1-44, sketch map 1.  
 Reprint: Mg. Journ. Railw. Comm. Gaz., Vol. 81, 1907, London, pp. 781-782, 793, 843-844, 866-867.  
 A summary of work done embracing that published in the Perak Government Gazette except report on geology of Sarawak. First 18 pages deal with structural geology. Describes tin lodes of Kuantan (Sungei Lembing); Bundi, Kemaman; Machi tin field; mines in the Main Range, including the Telom district, Tras, Bentong, Gunong Gapis, Bukit Fraser and neighboring places; Chin Chim and Tanjong Seraf, Malacca; stockworks at Brusoh and Tanjong Malin; tin ore in limestone at Changkat Pari, Ayer Dangsang, Siak and Jesophat's Valley; alluvial mines of Tronoh and Sungei Besi, Perak.
- 726a. ———. Geologist's annual report for 1908.  
 Federated Malay States, Kuala Lumpur, 1909, pp. 2-7.  
 The Ayer Dangsang pipe changed at a depth of 170 feet to a vein 5 to 6 feet thick with the same mineral association—abundant sulphides in a calcite matrix, with fluorite and a little quartz. In the Lahat pipe the original calcite and sulphides were dissolved and after a partial concentration the pipe was recemented with calcite from the limestone walls.  
 Scheelite with abundant tourmaline, a little pyrite, traces of copper and arsenic, occur in a quartz vein at Sakak North, Perak. Scheelite occurs in a number of Pahang tin mines.  
 Cassiterite occurs with tremolite in a pipe at Lahat. Describes a stockwork of minute veins which is a type of many deposits in the Kledang Range.

## MALAY PENINSULA (Continued)

Some of the alluvial tin ore contains metallic copper in fine sharp crystals.

Small seams of lignite standing vertically, occur in the tin gravels. Leaching of the underlying limestone has let the gravels down until they are, in places, on edge, and have been covered over by horizontal beds.

## 726b. ———. The origin of tin deposits.

1909, Kuala Lumpur, pp. 11.

Also, *Mg. Journ. Railw. Comm. Gaz.*, Vol. 85, 1909; London, pp. 397, 340.

Reviews the commonly accepted theories concerning the deposition of tin minerals. He doubts the analysis of Meunier showing tin oxide in siliceous sinter from Ayer Panas (see No. 705), and states that his examination of deer-horns similar to those supposed by J. H. Collins to have been partly replaced by  $\text{SnO}_2$ , showed no tin.

Numerous tin deposits of the Malay Peninsula are in limestone or clay-slate, but granite is supposed to be close at hand in each place. At Bundi, in Kemaman, a tin deposit in which the  $\text{SnO}_2$  is in small yellow needles, carries no tourmaline, but there is some axinite.

Most of the deposits are veins, large or small, but there are a few tin-bearing pegmatites in the Malay Peninsula.

Shows that in many places in the Malay Peninsula, especially in the limestone region, there is very little tourmaline, but generally much fluor spar with the tin deposits. He believes fluorine to be more important than boron in the genesis of tin minerals. There is also much arsenopyrite in the limestone, more than when the deposits are in granite.

## 727. SLACK, W. E. Malay tin mines. Handbook giving particulars of mining companies working in the Malay Federated States.

1907 (?), London.

Not available to the authors.

## 728. STEPHENS, F. J. Mineral features of Pahang, Malay Peninsula.

*Trans. Inst. Mg. Met.*, Vol. 9, 1900-1901, London, pp. 419-424.

Describes the physical conditions under which mining must be carried on, transportation facilities and economic details; the geology of the country; the vein systems; the workings of individual companies; tin and gold ores, and their richness.

## 729. STOKES, RALPH, S. G. A series of articles on Malay tin fields.

*Mg. World*, Vol. 25, 1906, Chicago. Illustrated.

1. Industrial position of Malay tin fields. Sept. 1, 1906, pp. 234-235.

2. Geology of Malay tin fields. Sept. 8, 1906, pp. 262-263.

3. Malay tin fields. Oct. 6, 1906, pp. 424-425.

4. Geology and treatment of tin in the Malay fields. Nov. 10, 1906, pp. 572-573.

## 730. ———. Mines and minerals of the British Empire. Being a description of the historical, physical and industrial features of the principal centers of mineral production in the British Dominions beyond the seas.

1908, London, pp. 65-75 and others, with a number of plates.

The Malay States tin fields are treated in chapters 6 and 7. A review of the world's sources of tin supply is given, after which he discusses the labor available, the production of tin in the different states; taxation and other heavy charges of the government; the geology, and the different classes of deposits, both in place and alluvial. Chapter 7 is devoted to methods of mining and a description of the alluvial mines.

A chapter is devoted to the Mt. Bischoff tin mine, Tasmania, and another to the northeastern tin fields of that Province. The tin deposits of New South Wales, Transvaal, Cape Colony and Northern Nigeria receive passing mention.

## MALAY PENINSULA (Continued)

731. SWETTENHAM, FRANK. About Perak.  
Published by "Straits Times." 1893, Singapore.  
Book not available to the authors.
732. SWETTENHAM, F(RANK) A. Annual report of the State of Perak for the year 1893.  
Taiping, Perak, pp. 53. Progress of tin mining in Perak, and information concerning output.
733. TAYLOR, WILLIAM. Tin mining in the Federated Malay States.  
Eng. Mg. Journ. Vol. 82, 1906, New York, p. 529.  
Short extract from Ann. Rep. for 1905.  
Figures given, showing output from various mines. "The acting Senior Warden sees no cause for alarm in the decreased output, and is of the opinion that no evidence is forthcoming to show that the stanniferous deposits of the country are nearing exhaustion."
734. TENISON-WOODS, J. E. Geology of the Malayan Peninsula.  
Nature, Vol. 30, 1884, London, p. 76.  
Notes caves in limestone with deposits of "tin sand," which are 1000 feet above the plain; now exposed in precipices and reached by steps cut in the rock. Show extent of erosion.
735. ———. Physical geography of the Malayan Peninsula.  
Nature, Vol. 31, 1884, London, pp. 152-154.  
"The tin deposits hitherto found are all stream tin, no lodes have yet been worked . . . Though tin has been worked for centuries, only a comparatively small portion of the country has been worked out or worked at all. I consider that the deposits in Perak are practically inexhaustible."
736. ———. Explorations in Pahang.  
Nature, Vol. 33, 1885, London, p. 32.  
Refers to a peculiar coinage of tin "shaped for the most part like an old fashioned square ink-stand."  
Short reference to tin-bearing gravels.
737. ———. Report on the geology and physical geography of the State of Perak.  
Proc. Linn. Soc. New South Wales, Vol. 9, 1885, Sydney, pp. 1176, 1186, 1189, 1190, 1192, 1203. Tin mines at Thaiping, Assam Kumbang, Kamunting, Salak, Pappan, Poussin, Lahat, Goping, Tecca, Kampar River, Kuala Diepang, Dindings and Selama are described.
738. TREACHER, W. H. Mining tin.  
Perak Gov. Gaz. Suppl., Vol. 17, No. 22, 1904, Kuala Lumpur, pp. 1-9. Report for 1903. 3 charts showing output of tin and iron ore pp. 40-43.  
Reprinted: Board of Trade Journal, Vol. 66, 1904, p. 17.  
Description of labor conditions and supply, manner of working, wages, contracts, etc., and mode of operating mines.
739. TREMENHEERE, H. SEYMOUR. Tin in Tenasserim.  
Mg. Journ. Railw. Comm. Gaz., Vol. 40, 1870, London, p. 919.  
Extract of address delivered before Royal Geological Society of Cornwall. The matter is largely the same as that in the report of his brother, Geo. Borlase Tremeneere, on the "Tin of the Province of Mergui in Tenasserim, in the northern part of the Malay Peninsula."  
Besides the stream tin found along the banks of the creeks, there is a rich vein of tin 3 feet wide in the side of an isolated hill, about eleven miles from Mergui. The hill consists almost entirely of decomposed granite. Crystals of cassiterite occur thickly imbedded in pure kaolin.

## MALAY PENINSULA (Continued)

740. VERCOE, CHAS. Tin deposits in the Malay Peninsula.  
Mg. Journ. Railw. Comm. Gaz., Vol. 50, 1880, London, p. 904.  
Brief description of the mines near Malacca, at Qualla Lumpor and Laroot, and of methods used by Chinese in working them.
741. VERCOE, H. B. Tin deposits of the Straits.  
Mg. Journ. Railw. Comm. Gaz., Vol. 56, 1886, London, p. 1277.  
Treats briefly of alluvial deposits of Muntaha District of Johore, expresses a belief that tin lodes exist in the surrounding hills, which would prove very productive.
742. VIATOR. A trip to the Johore River (tin mines).  
Not. Indian Archipelago Adj. Countr., 1837, Singapore, pp. 265-266, map.  
Popular article. Visited tin mines at village of Gongong, which were formerly worked by followers of the Sultan. Smelting furnace now in ruins. Ore about 12 feet under surface, in a stratum of coarse "quarry sand," mixed with white clay. Did not seem to be very productive mines. Country very unhealthy.
743. W——. Der Zinnhandel der malayische Halbinsel.  
Oest. Zeitschr. Berg. Hütt., Vol. 51, Wien, 1903, p. 645.
744. WRAY, LEONARD, JR. Tin in the Straits of Malacca and Tenasserim.  
Mg. Journ. Railw. Comm. Gaz., Vol. 44, 1874, London, p. 378.  
Extract from his lecture "The Settlement on the Straits of Malacca," delivered before Royal Colonial Institute, March 24, 1874. Discussion as to whether the early Phœnicians first got their tin in India or Cornwall.
745. ———. Physical geography of the Malayan Peninsula.  
Nature, Vol. 31, 1885, London, p. 459.  
A communication correcting what he considers to be errors in an article by J. E. Tenison-Woods in "Nature," Vol. 31, pp. 152-154, 1884.  
Bears upon the geology of the tin deposits.
746. ———. Alluvial tin prospecting: including tables for checking the accuracy of bore holes, and for estimating the amount, richness and value of the ore obtained from them.  
Perak Mus. Notes, No. 2, 1893, Taiping, pp. 1-114.
747. ———. Some account of the tin mines and the mining industry of Perak.  
Perak Mus. Notes, No. 3, 1894, Taiping, pp. 1-24, table 1, pls. 4, 5, giving diagrams.  
The first three chapters of a continued article upon tin in Perak, the other numbers of which are not available to the authors. In this installment the history and statistics of the Malayan tin trade, the geology of the deposits, a description of old mines, and native uses of tin are given.

## MASSACHUSETTS

748. HITCHCOCK, ED. Tin in Massachusetts.  
Amer. Journ. Sci. Arts, ser. 1, Vol. 16, 1829, New Haven, pp. 188-191.  
Brief review: Jahrb. Min. Geogn. Geol. Petr., 1830, Heidelberg, pp. 316-317.  
Letter written to editor of Amer. Journ. Sci. Arts. Writer sent specimen from Goshen, Mass., of what he thought to be first tin found in the United States.
749. HITCHCOCK, EDWARD. Report on the geology of Massachusetts examined under the direction of the Governor of that state during the years 1830-1831.  
Amer. Journ. Sci. Arts, ser. 1, Vol. 22, 1832, New Haven, pp. 62-63.  
Tin at Goshen described.

## MASSACHUSETTS (Continued)

750. TESCHEMACHER, J. E. Description of the oxide of tin found at the tourmaline locality, Chesterfield, Mass.

Report Association American Geologists and Naturalists, 1840-1842 (1843), Boston, pp. 296-297.

A. A. Hayes, to whom a portion was submitted for examination, says: "From these experiments it appears that the mineral is a nearly pure oxide of tin, its hardness and closeness of texture, as indicated by its high lustre, exceed those of any specimen I ever examined."

## MEXICO

751. AGUILERA, JOSÉ G. Bosquejo geológico de Mexico.

Bol. Inst. Geol. Mexico, Nos. 4, 5, 6, 1897, Mexico, pp. 234-235.

A note in which he states that tin ore occurs in small veins in rhyolite, accompanied by hematite, topaz, and durangite. Rhyolites of Upper Tertiary age.

752. ———. Catálogos sistemático y geográfico de las especies mineralógicas de la República Mexicana.

Bol. Inst. Geol. Mexico, No. 11, 1898, Mexico, pp. 83-84.

Tin is found in the following states: Aguas Calientes, Guanajuato, Jalisco, Querétaro, Sonora, Durango, Hidalgo, Puebla, San Luis Potosí, Zacatecas.

753. ———. Geographical and geological distribution of the mineral deposits of Mexico (tin).

Trans. Amer. Inst., Mg. Eng., Vol. 32, 1902, New York, pp. 506-507.

"The tin deposits of Mexico are of two classes: Those of the Tertiary, and the alluvial placers of the Quarternary. . . . In Mexico the characteristic association of minerals and rocks is, so we might say, that of the latest tin-veins of the Tertiary, in which are found crystallized hematite, topaz and in some cases wolframite and durangite. The associated rocks are Pliocene rhyolites and rhyolitic tufa."

754. ALLEN, D. K. Tin in Baja California, Mexico.

Mg. Journ. Railw. Comm. Gaz., Vol. 54, 1884, London, p. 1194.

Gives an account of a piece of cassiterite weighing 314 pounds broken from ledge, brought in by Indians, source unknown. Another vein said to give 18 to 38 per cent tin from picked samples. Pay streak 2 to 4 feet wide. Found in same range or belt with same formation as that of the Temescal (Cal.), tin mines.

755. ANONYMOUS. Tin deposits of Mexico.

Mg. Journ. Railw. Comm. Gaz., Vol. 54, 1884, London, p. 1412.

Deposits occur at small town of Coneto, about 90 miles northwest of Durango. Ore is principally red and black cassiterite of extreme purity, found both in veins and placers. "Sulphuret of tin," similar to that of Cornwall has been found in one part of the mountains, while arseniate of tin, also very finely divided red ophite of tin, are found in many veins.

756. ———. Tin deposits of Durango, Mexico.

Eng. Mg. Journ., Vol. 43, 1889, New York, p. 80.

Describes briefly the tin deposits near Coneto, Durango.

757. ———. Mines in the State of Guerrero, Mexico.

Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 556.

Extract from Bull. Oficial Ministerio de Fomento. In describing the mines in the district of Taxco, tin is mentioned as occurring at Acamistla and Coapango.

## MEXICO (Continued)

758. ———. Tin in Mexico.  
 Eng. Mg. Journ., Vol. 80, 1905, New York, pp. 519-520, 1500 words.  
 "The tin properties now under development are 5 in number: La Esperanza, Tinnit, La Santa (sic) Francisco, La Minita and Los Dos Amigos. The tin at La Esperanza occurs in threads or stringers in the vein. When development work was started on property, the first stringer discovered was only 1-64 inch thick, but in uncovering the vein, stringers ranging from  $\frac{1}{4}$  to  $\frac{3}{4}$  inch thick were encountered and about 800 pounds of tin ore running 75 per cent tin was taken out. An assay across the vein runs from 2 to 4 per cent tin, while the ore as sorted by natives runs from 55 to 65 per cent and by concentration it can be brought up to 75 or 85 per cent tin.
759. ———. Mexico's first tin ingot.  
 Mo. Bull. Int. Bur. Amer. Repub., Vol. 21, Sept. 1905, Washington, D. C., p. 802.  
 States that although stream tin has been produced in Mexico for many years, the first ingot of lode tin has only recently been smelted. Gives a few details of a tin deposit at Aguas Calientes.
760. ———. Tin in Mexico.  
 Mg. World, Vol. 25, 1906, Chicago, p. 301.  
 "The tin-bearing area extends from south of Aguas Calientes to north of Durango on the eastern side of the Sierra Madre range. The localities are widely separated and according to reports, quite different in geology and ore occurrence."
761. BARCENA, MARIANO. Tratado de geología elementos aplicables á la agricultura, á la ingeniería á la industria.  
 Bol. Secr. Fom. 1886, Mexico, p. 146.  
 Tin occurs in veins in Mesa de los Caballos in Zacatecas, and in alluvium in Lagos and other localities.
762. BARRIGA, MANUEL DIAZ. Mining in Mexico.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 77, 1905, London, p. 631.  
 Tin bearing ground is found in many portions of the Republic, but the deposits of the Coneto region in Durango are the most important. Occur in calcareous trachite. Concentrated ores, mostly in form of oxides, yield from 35 to 75 per cent of metal.
- BECK, RICHARD. See No. 1299.
763. BENEDICT, WM. DE L. Tin in Mexico.  
 Min. Ind. for 1892, Vol. 1, 1893, New York, pp. 451-452.  
 "Tinstone has been found in Mexico at numerous widely separated localities. None of the deposits have been systematically or extensively exploited except those of Durango, where the ore is found to occur in small but frequently very rich pockets in ill-defined veins in trachite-porphry, which is the common country rock."
764. BERGEMANN, C. Zinnstein von Xeres in Mexico.  
 Neues Jahrb. Min. 1857, Stuttgart, p. 395.  
 Gives an analysis of tin ore from Xeres, Mexico.
765. BRETHERTON, H. G. The tin deposits of Mexico.  
 Mg. World, Vol. 27, 1907, Chicago, pp. 685-686.  
 "Notes on the history and present standing of the tin deposits which are situated in and about the border region between the states of Jalisco and Aguas Calientes."
766. BROMLY, A. H. Tin mining and smelting at Santa Barbara, Guanajuato, Mexico.  
 Trans. Amer. Inst. Mg. Eng., Vol. 36, 1906, New York, pp. 227-233, figs. 2.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 78, 1905, London, p. 121, 139.

## MEXICO (Continued)

Describes deposits and method of producing ore. Ore formation is of an "unusual nature consisting of cracks in the rhyolite which have been filled with clay." These clay stringers carry a mixed mineralization, particularly in the form of iron and tin oxide. Deposits not considered of commercial value.

Data showing results from smelting various classes of ore given. Methods of treatment of the ore are described.

## 767. CHANDLER, C. F. On tin ore at Durango in Mexico.

Amer. Journ. Sci. Arts, 2d ser., Vol. 39, 1865, New Haven, p. 349.

The cassiterite is in form of wood-tin and is accompanied by topaz. Gives crucible assay.

## 768. COLLINS, J. H. Specimens of tinstones from Durango.

Journ. Roy. Inst. Cornwall, Vol. 13, pt. 1, 1895-1898, Truro, p. 129, about 150 words.

Describes specimens of tin ore from Durango, Mexico.

## 769. DEL MAR, ALEX. History of the precious metals.

2d edition, revised. 1902, New York, p. 206.

States Cortes reported that "chisel-shaped" tin money was used in Mexico, and that specimens are in the "Paris collection."

## 770. FAWNS, SYDNEY. Tin deposits of the world.

Published by the Mining Journal, 1905, London. Tin deposits of Mexico, pp. 154-157, 1300 words.

Compilation from Ingalls' "Tin deposits of Durango, Mex.,"; Louis' "Production of tin"; and Nevius' "The Sain Alto tin deposits."

## 771. GENTH, F. A. On the occurrence of tin ores in Mexico.

Proc. Amer. Philos. Soc. Vol. 24, 1887, Philadelphia, pp. 23-35.

Description of specimens of tin ore from Sierra de Catalan, State of Durango, Mexico. Small crystals of hematite are replaced by cassiterite. Also mentions wood tin and other forms from various Mexican localities, which contain much iron and arsenic. Quotes from Wm. Semmons, concerning a deposit of  $\text{SnO}_2$  upon bismuthinite.

## 772. GROSE, JOSEPH. Tin discovery in Mexico.

Mg. Journ. Railw. Comm. Gaz., Vol. 43, 1873, London, p. 863.

Alluvial tin ore washed down from the mountains is found scattered over an area of several square miles, 250 miles southwest of the city of Mexico.

## 773. HALSE, ED. The occurrence of tin ore at Sain Alto, Zacatecas, with reference to similar deposits in San Luis Potosi and Durango, Mexico.

Trans. Amer. Inst. Mg. Eng., Vol. 29, 1900, New York, pp. 502-511, figs. 1-6.

Abstract: Eng. Mg. Journ., Vol. 68, 1899, New York, p. 428.

Describes occurrences of tin ore in other localities than Durango, and compares them with the latter. Description of tin smelting at Las Cuevas.

## 774. HANKS, HENRY G. On the occurrence of durangite in the tin-bearing region of Durango, Mexico.

Amer. Journ. Sci. Arts, ser. 3, Vol. 12, 1876, New Haven, pp. 274-275.

Description of the tin deposits of Durango. Durangite is found only in the "Baranca" tin mine, eighteen miles northwest from Coneto, State of Durango.

## 775. HUMBOLDT, ALEXANDER DE. Essai politique sur le royaume de la Nouvelle-Espagne.

1811, Paris, Vol. 3, pp. 203, 299, 306-307; Vol. 4, pp. 105-106, 194-195.

Extract: Arch. Bergb. Hütt., Vol. 17, 1828, Breslau and Berlin, pp. 358-359.

Extract by A. J. M. Brochant, Notice sur les Mines du Mexique. Journ. Mines, Vol. 30, 1811, Paris, p. 104.

Briefly treats of tin occurrences in Mexico.

## MEXICO (Continued)

776. INGALLS, WALTER RENTON. Tin deposits of Durango, Mexico.  
 Eng. Mg. Journ., Vol. 59, 1895, New York, p. 293.  
 This paper is based on a study of mines of Mexico in 1892. Deposits at Potrillos and Cacária are described. A table of 10 analyses made by Dr. Genth on Mexican tin ore—half from Potrillos, remainder from Cacária—is given.
777. ———. The tin deposits of Durango, Mexico.  
 Trans. Amer. Inst. Mg. Eng., Vol. 25, 1896, New York, pp. 146-163, map 1, figs. 2.  
 Treats of early tin mining in Mexico, and especially of the physical characteristics, geology, and occurrence of tin at Potrillos, Cacária and Cerro de Iglesia de los Remedios, tin regions of Durango.  
 Discussion by C. W. Kempton, pp. 997-998. (See No. 779.) Additional notes, Vol. 27, 1897, pp. 428-429.
778. ———. Notes on the tin deposits of Mexico.  
 Trans. Amer. Inst. Mg. Eng., Vol. 27, 1897, New York, pp. 428-429.  
 Some additional notes on tin localities in Mexico, mentioned in paper "Tin deposits of Durango" in Trans. Amer. Inst. Mg. Eng., Vol. 25, New York, p. 146.
- KEMP, JAS. F. See No. 1213.
779. KEMPTON, C. W. The tin deposits of Durango, Mexico.  
 Trans. Amer. Inst. Mg. Eng., Vol. 25, 1896, New York, pp. 997-998.  
 In discussion of paper on same subject by W. R. Ingalls (No. 777), mentions an occurrence of tin placers at Sain Alto, Zacatecas, Mexico.
- LOCK, C. G. WARNFORD. See No. 1338.
- LOUIS, HENRY. See No. 1340.
780. MANZANO, JESUS P. The mineral zone of Santa Maria del Rio, San Luis Potosi, Mexico.  
 Trans. Amer. Inst. Mg. Eng., Vol. 32, 1901, New York, pp. 481-482.  
 Description of tin ores and occurrences, and output of several mines. Deposits generally small. Country poorly forested.
781. NEVIUS, J. NELSON. The Sain Alto tin deposits (Mexico).  
 Eng. Mg. Journ., Vol. 75, 1903, New York, p. 929, fig. showing tin smelter.  
 Digest: Geol. Centr., Vol. 5, 1904, Leipzig, p. 437.  
 The cassiterite occurs in rhyolite, associated with chalcedony. As the rock weathers the cassiterite nodules are washed out and concentrated in the ravines where they are collected. The method of smelting the ores is also described.—II. Ries.
782. NEWLAND, D. H. Tin in Mexico.  
 Min. Ind. for 1903, Vol. 12, 1904, New York and London, pp. 331-332.  
 Sain Alto deposits described. Output amounts to a few tons a year. Grade of ore as smelted is about 40 per cent metallic tin.
- PIRSSON, L. V. See No. 1635.
- PRATT, JOSEPH HYDE, and STERRETT, DOUGLASS B. See No. 252.
783. RICHTHOFEN, F. Ueber das Alter der goldführenden Gänge und der von ihnen durchsetzten Gesteine.  
 Zeitschr. deutsch. geol. Ges., Vol. 21, 1869, Berlin, p. 737.  
 A foot note describes the tin ore at Durango.
- ROLKER, CHAS. M. See No. 1357.
784. WILSON, GEO. Tin and petroleum in Mexico.  
 Eng. Mg. Journ., Vol. 34, 1882, New York, p. 280.



## MEXICO (Continued)

Tin in veins and alluvial. One tract of over 200 square miles, hastily prospected, shows stream tin in every water course, yielding by washing, from 5 to 20 per cent tin ore. Can be worked by hydraulicking at small cost. Vein tin yields from 60 to 70 per cent metallic tin; very free from injurious impurities. Country granite.

## MICHIGAN

## 785. STEVENS, HORACE J. Tin in Michigan.

Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 233.

Sketch of desultory attempts at tin mining in United States, with brief mention of recent discoveries of deposits in Keeweenaw County, Michigan.

(These "discoveries" proved false.)

## MISSOURI

## 786. DUNSTAN, R. W. Discovery of tin in Missouri.

Mg. Journ., Railw. Comm. Gaz., Vol. 37, 1867, London, pp. 699, 731.

A letter giving very encouraging outlook for the tin in Missouri, 100 miles south of St. Louis, in a mountainous district of granite, trap and porphyritic rock. States that lodes run nearly north and south. Tin also occurs in alluvial floors, decomposed granite and black sand.

## 787. GENTH, F. A. Tin ore in the United States.

U. S. Railroad and Mg. Journ., May 4, 1870, Philadelphia.

Reprint: Eng. Mg. Journ., Vol. 9, 1870, New York, p. 322.

Mg. Journ. Railw. Comm. Gaz., Vol. 40, 1870, London, pp. 486-487.

Extract: Ann. Mines, ser. 6, Vol. 17, 1870, Paris, pp. 572-575.

Treats briefly of the tin deposits in the United States. Tells of the pretended discovery of tin in Missouri and the resulting excitement; gives analysis of supposed tin ore sent from Madison County, Mo., and states that traces of tin were found in one specimen; also gives analyses of two concentrates from San Jacinto, Cal.

WHEELER, H. A. See No. 1423.

## MONTANA

HANKS, H. G. See No. 218.

## 787a. RAYMOND, ROSSITER W. Statistics of mines and mining in the states and territories west of the Rocky Mountains.

Fourth annual report of Rossiter W. Raymond, United States Commissioner of Mining Statistics [for the year 1871], Washington, D. C., 1873, pp. 288-289.

"A Mr. Hall has several bars of tin, weighing a couple of pounds each, reduced by himself from ore picked from the gravel at the adjacent bar [Big Prickly Pear Creek]. The ore is very pure, and similar to the float tin found in Durango, Mexico. Some prospecting has been done for the ledge that this ore is evidently derived from, but so far without success." Entire reference.

## NEVADA

## 788. HOFFMAN, W. J. On the mineralogy of Nevada.

Bull. U. S. Geol. Geogr. Surv. Terr., Vol. 4, 1878, Washington, D. C., p. 734.

The only locality in Nevada where stream tin occurs is at the Tuscarora placer mines where small crystals are occasionally found.

## NEWFOUNDLAND

## 789. MILNE, J. Notes on the physical features and mineralogy of Newfoundland.

Quart. Journ. Geol. Soc. London, Vol. 30, 1874, London, p. 745.

States that tin is found in Newfoundland, but whether in paying quantities is not yet determined.

## NEW GUINEA

790. ANONYMOUS. Tin on Ferguson Island.

Eng. Mg. Journ., Vol. 75, 1903, New York, p. 623.

Rich tin lodes and gravel have been recently discovered on Ferguson Island on the northeast coast of New Guinea. No details given.

## NEW HAMPSHIRE

791. JACKSON, CHARLES T. Description of the tin veins of Jackson, N. H.

Report Association American Geologists and Naturalists, 1840-1842 (1843), Boston, pp. 316-321, figs. 2.

Describes the occurrence of small tin-bearing veins near Jackson and the minerals associated with the tin and discusses the origin of the veins.

792. ———. Final report on the geology and mineralogy of the State of New Hampshire, with contributions toward the improvement of agriculture and metallurgy.

1844, Concord, N. H., pp. 139-145, figs. 2.

Review: Amer. Journ. Sci. Arts, ser. 1, Vol. 49, 1845, New Haven, p. 34.

Tin ore at Jackson, N. H. Description of tin veins, crystallization, association. Short translation from Daubr e on description and theory of tin veins. With the tin occurs arsenic pyrites, black sulphuret of copper (rare), carbonate of copper, native copper, tungstate of manganese and iron (rare), black tourmaline and quartz.

## NEW JERSEY

793. LESLEY, J. P. The iron manufacturers' guide to the furnaces, forges and rolling mills of the United States, with discussions of iron as a chemical element, an American ore, and a manufactured article, in commerce and in history.

1859, New York and London, p. 428.

Trace of tin (.18 per cent SnO<sub>2</sub>) found in "garnet rock," about 1½ miles northeast of Andover, New Jersey.

794. SCHNABEL, CARL. Handbook of Metallurgy.

Translated by Louis Henry, 1898, London, Vol. 2, p. 3.

"Tin has only been found by Eliot and Storer in American zinc from New Jersey, and English zinc made by Vivian & Co., of Swansea."

## NEW SOUTH WALES

795. ADAMS, ROBERT. Mining in New South Wales.

Mg. Journ. Railw. Comm. Gaz., Vol. 43, 1873, London, p. 1009.

Working only alluvial deposits. Not more than one-tenth of mines are paying, owing to poor management.

796. A——, R. D. Tin mining in Australia.

Mg. Journ. Railw. Comm. Gaz., Vol. 49, 1879, London, pp. 909-910.

Description of the tin mining at Vegetable Creek, New South Wales.

797. ANDREWS, E. C. The geology of the New England Plateau, with special reference to the granites of northern New England.

Rec. Geol. Surv. New South Wales, pt. 1; Vol. 7, pt. 4, 1904, pp. 281-300, pls. 55-56. Parts 2 and 3, Vol. 8; pt. 2, 1905, pp. 108-152, pl. 20. Parts 4 and 5, Vol. 8, pt. 3, 1907, pp. 196-250, pl. 39.

## NEW SOUTH WALES (Continued)

Part 1 describes the physiography; part 2, the general geology; part 3 treats of the genesis of the ore deposits; part 4, of the petrology, and part 5 contains additional notes on the ore deposits.

Permo-carboniferous slates were intruded by granite accompanied by pegmatite, eurite, micrographic dikes and quartz veins and masses. Many of the younger accompanying rocks carry tin, tungsten, and bismuth minerals, molybdenite, monazite, gold and allied minerals. Most of the New England ore deposits are considered to have been formed by magmatic segregations, in which are included those formed from heated gases or waters. The ores are arranged peripherally around acid granite massifs. The Gulf tin deposits occur as pipes formed at the intersection of fissures some of which are of very irregular form. The deposits contain arsenical pyrites, tourmaline, fluorspar, beryl, monazite, bismuth, and wolframite. At Kingsgate, pipes 18 inches to 40 feet in diameter carry molybdenite in masses up to one ton in weight, bismuth, bismuthinite, and bismuth carbonate, and at Tabletop, Timbarra, pipes carry gold in sufficient quantity to pay for working, but at neither place are they tin bearing. The pipes are all formed through replacement of the granite by solutions following very small cracks. At Tingha tin occurs in "a eurite vein," pegmatite and pipes, with chalcedony, and quartz; in the Emerald mines at Emma-ville, in quartz veins with white mica, emeralds, and fluorspar cutting carboniferous (?) slates; at Giant's Den, in quartz veins with tourmaline, topaz, and chalcopryrite, cutting greisen; at Pheasant Creek with wolframite, in greisen and "mica rock"; in the Inverell District with abundant topaz, in greisen; at Deepwater with wolframite and iron pyrites in greisen; at Wilson's Dewufall with huge quartz crystals and platy wolframite in greisen and granite; at Bald Nob in fissure veins; at Silent Grove in a granular quartz vein with bismuth and galena. At Howell stannite occurs in the Conrad and King Conrad reefs with argentiferous galena and sphalerite.

## 798. ANONYMOUS. The discovery of tin in New South Wales.

Eng. Journ. Railw. Comm. Gaz., Vol. 42, 1872, London, pp. 45, 398.

## 799. ———. More Australian tin.

Iron, Vol. 5, n. s. 1875, London, p. 551.

A very brief description of some stream tin from foot of Mount Pilot, New South Wales. The region is described geologically.

## 800. ———. Tin in New South Wales.

Min. Ind. for 1900, Vol. 9, 1901, New York and London, pp. 636-637.

Brief epitome of the tin mining conditions in New South Wales.

Tin production of State from 1872 to 1899 inclusive amounted in value to £6,390,484. The lodes have scarcely been touched. Principal lode mine is the Oetery in the Emmaville district.

## 801. ———. Tin in New South Wales.

Min. Ind. for 1901, Vol. 10, 1902, New York and London, p. 639.

Very brief general remarks about tin deposits in New South Wales.

## 802. ———. Tin and tin mining in New South Wales.

Journ. Soc. Arts, Vol. 50, 1902, London, pp. 285-286.

Brief history of tin discovery in New South Wales; localities and manner of occurrence; production.

## 803. ———. Tin in New South Wales.

Journ. Franklin Inst., Vol. 161, 1906, Philadelphia, p. 384.

A note. "At Tingha, Inverell district, there are fifteen or sixteen dredges working for tin, all doing well. Reported that they have work for six to ten years ahead of them."

## NEW SOUTH WALES (Continued)

804. ———. Beach mining in New South Wales.  
 Queensland, Gov. Mg. Journ., Vol. 8, 1907, Brisbane, p. 175.  
 Refers to report on beach mining in Queensland, made by L. C. Ball in 1905, and states that under similar conditions to those he described a French company intends to work the 13 miles of beach, from one mile south of Evans or Little River, at the mouth of Richmond River, running northerly to McAuley's Lead. "The sands are said to contain gold, platinum, tin, monazite, and other minerals," but the richness is not known.
805. ———. Beach mining in New South Wales.  
 Queensland Gov. Mg. Journ., Vol. 8, 1907, Brisbane, p. 275.  
 The Byron Bay correspondent of the "Town & Country Journal," under date 8th May, writes: A new mining plant has been set up at Broken Head, on the northern end of Seven-mile Beach, that was formerly very rich in gold, tin and platinum. A Sydney syndicate has just completed a plant, to treat the black sands for six or more kinds of minerals, which have a good market value. All previous work along this foreshore was confined to the recovery of gold and tin. It has now been found that minerals of equal value exist in the concentrates. Other parties are also working the beach sands.
806. BEER, ADOLF. Geschichte des Welthandels.  
 1864, Vienna, pp. 210-211.  
 Short notice of the tin production in New South Wales and Queensland.
807. BENEDICT, WM. DE L. Tin in New South Wales.  
 Min. Ind. for 1892, Vol. 1, 1893, New York, p. 443.  
 Principal alluvial deposits in New South Wales are situated about 400 miles north of Sydney, on western slope of the great dividing range. Alluvial deposits said to be practically exhausted. Tin has been found in veins in the Emmaville district, the principal one being the Oetery mine.
- BROWN, A. SELWYN. See Nos. 1307 and 1308.
808. CARD, GEORGE W. Minerals of economic value, New South Wales (tin).  
 Handbook to the Mining and Geological Museum, Sydney, 1902, Sydney, pp. 66-67, 113-115.  
 General description of tin ore and its manner of occurrence, with a list of tin specimens in the museum at Sydney.
809. CARNE, J. E. The auriferous beach sands of the Esk River and Jerusalem Creek, in the parish of Esk County, Richmond, New South Wales.  
 Rec. Geol. Surv. New South Wales., Vol. 5, 1898, Sydney, pp. 71-86.  
 A number of assays of the sands are given, nearly all showing presence of tin. The possible sources of the gold, platinum and tinstone in the sands are:  
 (1) The underlying Siluro-Devonian rocks which contain poor quartz reefs.  
 (2) The Clarence coal measures.  
 (3) Drifts under basalt, known to occur and to be slightly auriferous.  
 (4) The basalt, doubtfully gold bearing.  
 (5) The draining channels from New England.
810. CLARKE, W. B. Leading article on mining containing a prognostication of the discovery of tin in New South Wales.  
 April 16, 1849, Sydney Morning Herald.  
 Not available to the authors.

## NEW SOUTH WALES (Continued)

811. ———. Mines and mineral statistics of New South Wales.  
May 7, 1853, p. 71.  
In author's report to the Colonial Secretary, he drew attention for the first time to the probable occurrence of extensive deposits of tin ore. He then stated that "wolfram and oxide of tin with tourmaline, occur near Dundee and in Paradise Creek, and it is probable that this ore of tin is plentifully distributed in the alluvial of other tracts as I have found it amidst the spinelle, rubies, oriental emeralds, sapphires, and other gems of the detritus from granite."
812. ———. Researches in the Southern gold fields of New South Wales, 1860.  
Tin, pp. 109, 128.
813. ———. Anniversary Address.  
Trans. Proc. Roy. Soc. New South Wales, for 1873 (1874), Sydney, pp. 1-39.  
Address contains notes on tin in New South Wales.
814. ———. Remarks on the sedimentary formations of New South Wales, etc.  
Edition 3, 1875, Sydney, pp. 61, vertical sections.  
Digest: Geol. Rec. for 1875, London, p. 148.  
Tin mines of New South Wales and Queensland occur in Devonian rocks.
815. COGLAN, T. A. The wealth and progress of New South Wales for 1886-1887.  
Sydney, 1887, pp. 82-84. Ibid., for 1890-1891 (1891), pp. 84-86. Ibid., for 1894 (1896), pp. 210-212. Ibid., for 1895-1896, Vol. 2, 1897, pp. 493-5023.
816. CONDER, HARTWELL. The occurrence of stannite in Australasia.  
Austr. Mg. Stand., Vol. 40, 1908, Sydney and Melbourne, p. 577.  
Gives a description of stannite and mentions localities in which it has been found. States that it occurs in considerable quantity in the Conrad mines, New South Wales, and the Oonah Mine (Zechan) and at Heemskirk, Tasmania. In the Conrad mine stannite occurs in a quartz vein cutting granite and is accompanied by argentiferous galena, zinc blende, chalcopyrite and arsenical pyrites. Cassiterite occurs in the granite, but rarely if ever in the vein. At Oonah stannite occurs with bismuthinite, wolframite, galena, pyrite, and zinc blende in a vein between quartzite and graphitic schist, and closely connected with galena deposits. Stannite at both places is argentiferous. Discusses difficulties of treatment.
- 816a. COTTON, LEO A. The tin deposits of New England, New South Wales.  
Part 1, Proc. Linn. Soc. New South Wales, Vol. 34, 1910, Sydney, pp. 733-781, pls. 59-62, figs. 13, geol. map.  
Describes the country rocks in detail, the distribution of the lodes, their direction and causes of trend. The deposits are divided into eleven classes which do not appear to be very distinctive. The veins under the different classes are described and comparisons made with occurrences in other countries.
817. COX, HERBERT S. Tin deposits of New South Wales.  
Journ. Proc. Roy. Soc. New South Wales, for 1886, Vol. 20, 1887, Sydney, pp. 93-112, figs. 7.  
General description of both lode and alluvial deposits with geology of district. Accompanying minerals are wolframite, copper pyrites, arsenical pyrites, fluorspar (not in large quantities), tourmaline, fluorine bearing micas, and topaz; at Gulf mine, near Bendemeer, beryl forms a rock in which cassiterite is impregnated. In the Inverell district, diamonds, sapphires and zircons occur with stream tin. Cassiterite is iridescent at Silverton.

## NEW SOUTH WALES (Continued)

DAVIES, D. C. *See* No. 1317.

818. DAVID, T. W. Edgeworth. *Geology of the Vegetable Creek tin-mining field, New England District, New South Wales.*  
 Dep. Mines Geol. Surv., New South Wales, No. 1, 1887, Sydney, pp. x and 169, figs. 12, and map.  
 Review: *Amer. Geol.*, Vol. 1, 1888, Minneapolis, p. 122.  
 Gives a history of tin-mining in New South Wales; physiography, meteorology; geology; mineralogy, etc. Much of the country is covered by basalt up to 300 feet thick, averaging 200 feet. In places, stanniferous stream gravels covered by the basalt have to be crushed before the tin can be obtained.  
 Siluro-Devonian sediments are intruded by quartz felsite dikes and granite, probably of Permian age. The tin deposits are associated with this granite. The stanniferous gravels both exposed and lava-covered are described in detail. Some of the stream tin is only 1/70 of an inch in diameter but shows sharp crystal edges. Sapphire, topaz, zircon, spinel, garnet, magnetite and ilmenite are found in the placers. Gold is also found in small quantities.  
 Ninety veins and stockworks are described.  
 Quartz is found in 69 veins; chlorite in 29; feldspar in 20; mica and arsenopyrite each in 8; pyrite and fluorspar, each in 4; tourmaline and wolframite, each in 3; zinc blende, galena, chalcopyrite, bismuth, molybdenite, vesuvianite and stibite, each in 2; hematite, pyrrhotite, manganese, scheelite and beryl, each in one vein.  
 The veins range up to 3 feet in thickness.  
 Gold, silver, lead and copper occur in veins of the neighborhood. Silver is in commercial quantity.
819. DEPARTMENT OF MINES, New South Wales, *Annual Reports from 1875.*  
 Sydney.  
 Since 1875, the Department of Mines of New South Wales has issued annual reports upon mines and minerals of the State, with the statistics of production and progress of the industry as shown by reports from the wardens of the various districts, mine inspectors and geologists.
- FAWNS, SYDNEY. *See* No. 1320.
820. GENTH, F. A. *Contributions to mineralogy.*  
 Proc. Amer. Philos. Soc. Vol. 23, 1886, Philadelphia, pp. 30-31.  
 Treats of some specimens of tin ore and their associated minerals from Aberfoil and Sam rivers, New South Wales.
821. GOWER, GEORGE H. *Report on the Vegetable Creek tin field.*  
 Ann. Rep. Dep. Min. New South Wales, for 1874, Sydney, pp. 63-70. (With plan of the dressing machinery designed by W. H. Wesley.)
822. ———. *New England and Clarence district. Vegetable Creek division.*  
 Ann. Rep. Dep. Mines New South Wales for 1876 (1877), Sydney, pp. 110-114, pls. 2.  
 Giving progress of each mine of the district with total yield from 1872-1876; also a description of new machinery used for washing gravel for tin.
823. ———. *Report on the New England and Clarence Mining District.*  
 Ann. Rep. Dep. Min. New South Wales, for 1878, Sydney, pp. 126-130 (with a sketch plan of the Vegetable Creek mining district, showing the approximate position of the creeks, and the localities of the principal mines working for stream tin under basaltic formation, and of the tin lodes. Scale: 4 miles to 1 inch).

## NEW SOUTH WALES (Continued)

824. ———. Report on the condition and prospects of the Vegetable Creek tin mining district for the year 1879.  
Ann. Rep. Dep. Min. New South Wales for 1879 (1880), Sydney, pp. 149-156. (With plan and section of Messrs. Wesley Bros. workings, two plans of machinery, and a table showing total yield of tin ore from the Vegetable Creek tin mining district.)
825. JAQUET, J. B. Tin bearing dykes (?) of Euriowie and Waukeroo.  
Geol. of the Broken Hill Lode and Barrier Ranges Mineral Fields, New South Wales, Mem. Geol. No. 5, 1894, Sydney, pp. 128-131, pl. 1.  
After general description of the ore and accompanying rocks, the following subjects are treated:  
Analogous occurrence of tin in Dakota; Huel Byjerkerne mine; Mount Euriowie mine; Badjerican mine; Calorra (Euriowie Tin-mining Co.); Barrier Bischoff mine; Thistle mine.
826. KJERULF, TIL, and BRÖGGER, W. C. Zinnsteinvorkommniss aus New South Wales.  
Neues Jahrb. Min., 1879, Stuttgart, pp. 566-567.
827. LIVERSIDGE, A (RICHARD). The minerals of New South Wales.  
Trans. Proc. Roy. Soc. New South Wales, Vol. 9, 1876, Sydney, pp. 177-179.  
Description of tinstone; its occurrence in veins and alluvial deposits, and the localities where found.
828. ———. Minerals of New South Wales.  
1st edition, 1876, Sydney, pp. 25-27. 2d edition, 1882, Sydney, pp. 39-41. 3d edition, 1888, Sydney, pp. 76-84.  
Treats of: Tin (chemical composition, appearance, specific gravity of ores); tin deposits; localities.
829. ———. Map of the minerals of New South Wales.  
1888, Sydney, pp. 3-32. Min. map.  
An alphabetical list of mineral localities, including the tin deposits of the state.
830. ———. On some New South Wales and other minerals.  
Journ. Proc. Roy. Soc. New South Wales, Vol. 29, 1895, Sydney, pp. 323-324.  
Analyses of some cassiterite crystals from Elsmore mine, Inverell, New South Wales.
- LOUIS, HENRY. See No. 1340.
831. MINGAYE, JOHN C. H. Notes on the occurrence of platinum, gold and tin in the beach sands in the Richmond River district, New South Wales.  
Journ. Proc. Roy. Soc. New South Wales, Vol. 26, 1892, Sydney, pp. 368-370.  
Sand from the Richmond River district was examined and a few of the results obtained given. Tin was present in all the samples, but percentage was not determined in every case.
832. NEWLAND, D. H. Tin in New South Wales.  
Min. Ind. for 1902, Vol. 11, 1903, New York and London, p. 593, 250 words.  
Gives the tin output of New South Wales during 1902 and reviews conditions of mining.
833. ———. Tin in New South Wales.  
Min. Ind. for 1903, Vol. 12, 1904, New York and London, pp. 327-328.  
Gives the tin output of New South Wales during 1903 and notes that there was a marked increase in the use of dredges, the recovery by this means amounting to 244 long tons. Considerable abandoned ground has been worked profitably, owing to the increased price obtained for tin and to improved methods.

## NEW SOUTH WALES (Continued)

PHILLIPS, J. A., and LOUIS, H. *See* No. 1350.

834. PITTMAN, E(DWARD) F. Tin deposits of New South Wales.  
Published by the Government, giving a full description of the mines and methods of working. 1899.  
Not available to the authors.
835. ———. The mineral resources of New South Wales.  
Geol. Surv. New South Wales, 1901, Sydney, pp. 130-150, pls. 3, figs. 4.  
Tin: History of development, occurrence and places where mined.  
Largely a digest of T. W. E. Davids' "Geology of the Vegetable Creek Tin-mining Field."
836. PLUMMER, JOHN. Tin mining in New South Wales.  
Eng. Mg. Journ., Vol. 73, 1902, New York, p. 212.  
General description of tin deposits of New South Wales and a more detailed account of Vegetable Creek tin field, the leading one of the State.
837. ———. Mining in New South Wales.  
Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 375.  
Dredgers for tin not properly equipped for saving tin ore.
838. REID, G. H. An essay on New South Wales, the mother colony of the Australias.  
1876, Sydney, pp. 72-73.  
A very brief sketch of the tin industry at that date. Tin production from 1872-1875 given.
- REYER, EDUARD. *See* No. 1354.
839. SLEE, W. H. J. Mineral deposits, etc., in New South Wales.  
Report of Mining Conference, New South Wales, 1896, p. 6.  
Not available to the authors.
840. STEPHEN, G. MILNER. Discovery of tin in New South Wales.  
Mg. Journ. Railw. Comm. Gaz., Vol. 42, 1872, London, pp. 45, 398.  
Also, Quart. Journ. Geol. Soc. London, Vol. 28, 1872, London, p. 42.  
Announcement by letter of great deposit of tin ore in district of New England. The tin ore is said to be in "pepitas crystals, and beds of conglomerate, especially in micaceous granite more or less decomposed."
- STOKES, RALPH S. G. *See* No. 730.
841. STONIER, G. A. Report on tin-bearing country in the county of Bourke.  
Mg. Journ. Railw. Comm. Gaz., for 1889 [1890], London, pp. 234-235.
842. TAYLOR, N. Report on the property of the Pheasant Creek tin syndicate, New England.  
New South Wales Leg. Ass. Papers, 1883-1884, 796-A, pp. 20-21.  
Not available to the authors.
843. THIBAUT, P. J. Tin mining in New South Wales.  
Austr. Mg. Stand., Vol. 33, 1905, Sydney and Melbourne, pp. 444-445, 465-466. Serial.  
"A summary review covering the period from 1900 to 1904 inclusive."
844. ———. Tingha tin dredging industry, New South Wales.  
Austr. Mg. Stand., Vol. 38, 1907, Sydney and Melbourne, pp. 128, 148-149, 174-175, 197-198, 222-223, 246-247, 265-266, 292. Illustrated.



## NEW SOUTH WALES (Continued)

Gives methods of dredging and results obtained by following companies: Melbourne Cope's Creek Tin Sluicing Co., Tingha Consolidated Tin Mines, Elsmore Tin Sluicing Co., The Tingha Tin Dredging Co., Cope's Creek Central Tin Dredging Co., The Amalgamated Tin Dredging Co., Cope's Creek Dredging Co.

———. See No. 1644.

- 844a. TRENCHARD, H. G. Recovery of tin from alluvial deposits.  
Austr. Mg. Stand., Vol. 41, 1909, Sydney and Melbourne, pp. 37-38.  
"Notes on the stream sluicing plants at Tingha, New South Wales, for recovering tin from the abandoned workings and leads too poor for hand treatment."
845. ULRICH, G. H. F. Observations on some of the recent tin ore discoveries in New England, New South Wales.  
Quart. Journ. Geol. Soc. London, Vol. 29, 1873, London, pp. 5-11, figs. 2.  
Abstracts: Mg. Journ. Railw. Comm. Gaz., Vol. 42, 1872, London, p. 1105; Geol. Mag., Vol. 9, 1872, London, pp. 569-571.  
District described is in northern part of colony of New South Wales, almost immediately adjoining tin region of Queensland.
846. Changed to 578a.
- 847a. WILKINSON, C. S. Report on the discovery of tin and other metals in the Burra Burra district, between the Bogan and Lochan rivers.  
Queenslander, Vol. 12, 1876.  
Not available to the authors.
- 847b. ———. Report on tin bearing country, New England.  
New South Wales Leg. Ass. Papers, 1872, 181-A (Folio, Sydney, 1873. By authority), p. 10, pls.  
Not available to the authors.
- 847c. ———. Report on tin bearing country, district of Inverell.  
Enclosing Rev. W. B. Clarke's report on Geological Surveys, May 7, 1853, pp. 11, New South Wales Leg. Ass. Papers, 1872-1873, 176-A (Folio, Sydney, 1873. By authority).  
Not available to the authors.
- 847d. ———. Tin deposits of New South Wales.  
Iron, Vol. 3, 1874, London, pp. 267, 296, 325.
- 847e. ———. Tin deposits of New South Wales.  
Mg. Journ. Railw. Comm. Gaz., Vol. 44, 1874, London, p. 200.
- 847f. ———. Report of Progress (Vegetable Creek tin fields).  
Ann. Rep. Dept. Min. New South Wales for 1883 [1884], Sydney, pp. 148-152.
- 847g. ———. Report on mineral reserves, Molong district. (Gumble tin lodes.)  
Ann. Rep. Dept. Mines New South Wales, for 1886 [1887], Sydney, p. 132.
- 847h. ———. Report on tin lodes near Poolamacca, in the Silverton district, New South Wales.  
Ann. Rep. Dept. Mines New South Wales, for 1887 [1888], Sydney, pp. 141-144.
848. ———. Report on the Mount Euriowie tin properties, New South Wales, 1887.  
Not available to the authors.

## NEW SOUTH WALES (Continued)

849. WILKINSON, C. S., and DAVID, T. W. E. Geological map showing the principal stanniferous leads in the Tingha and Elsmore districts, 1895. Scale, 80 chains to 1 in.  
Not available to the authors.
850. WOOD, HARRIE M. Tin.  
Min. Products of New South Wales, 1882, Sydney, p. 27, *Ibid.*, 1887, p. 34.  
Brief very general articles upon the occurrence and production of tin in New South Wales.

## NEW ZEALAND

851. ANONYMOUS. Tin on Stewart Island (N. Z.).  
Austr. Mg. Stand., Vol. 18, 1900, Sydney and Melbourne, p. 310.  
A note stating that tin exists on Stewart Island in vein and alluvial deposits. The latter are worked in a small way at Half Moon Bay. The deposits are not extensive.
852. BELL, JAMES M. The salient features of the economic geology of New Zealand.  
Econ. Geol., Vol. 1, 1906, Lancaster, p. 750.  
"Cassiterite has been found in the form of 'stream tin' in some of the streams amid the rugged hills of Stewart Island, and has been reported to occur actually in granite." Whole Reference.
853. BINNS, GEORGE J. Mining in New Zealand.  
Trans. Fed. Inst. Mg. Eng., Vol. 4, 1892-1893, Newcastle-upon-Tyne and London, p. 67.  
Tin ore has been known for some years in auriferous conglomerates at the base of the coal measures at Lankey's Creek, Reefton, Milford and Dusky sounds on the west coast of Otago. In 1888 tin ore was found in gravels, and *in situ* "associated with gneissic granitoid rocks" in the Remarkable Mountains, Stewart Island. Deposits small, climate wet. In April, 1892, stream tin was found in the gold wash at Humphrey's Gully, near Hokitika, on the west coast of the South Island.

FAWNS, SYDNEY. See No. 1320.

854. LAUNAY, L. DE. Les richesses minérales de la Nouvelle-Zélande.  
Ann. Mines, ser. 9, Vol. 5, 1894, Paris, pp. 549-550.
855. MCKAY, ALEXANDER. On the geology of Stewart Island and the tin deposits of Port Pegasus district.  
Reports of Geological Explorations during 1888-89, New Zealand Geological Survey, Publication No. 20, Wellington, 1890, pp. 74-85. Sketch map of tin fields of Pegasus Dist., figs. 6.  
Stream tin was found in shallow gravels with gold, but was not rich enough to work except with the gold. It averaged less than 1 ounce of stream tin to the "tin-dishful" (*sic*). In the Tin Range on Port Pegasus tin occurs in "quartz rock" 6 inches to 1 foot thick, with "mica rock" above and below. More wolframite than cassiterite is carried by the "quartz rock." Granular topaz, gahnite, sphalerite with "blue faces," and pyrites, accompany the cassiterite.

## NIGERIA

856. ANONYMOUS. Alluvial tinstone deposits of Northern Nigeria.  
Bull. Imp. Inst. Great Britain, Vol. 5, No. 2, 1907, London, pp. 179-183.  
Extract: Mg. World, Vol. 27, 1907, Chicago, p. 562.  
Description of alluvial tin deposits along the River Delime, tributary to Lake Tchad, 220 miles northeast of Lokoja. In highest land of Northern Nigeria. Country

## NIGERIA (Continued)

rock is gneiss cut by basalt, dolerite and pegmatite dikes. No tin ore is found in place. Metallic tin reported as native, is always near native furnaces. An analysis of a specimen of stream tin is given showing about 67 per cent  $\text{SnO}_2$ . Ilmenite and some monazite and zircon occur with the stream tin.

Gives an account of the native method of working stream tin. The Niger Co. in 1905 produced one ton of "black tin" per day.

857. DUNSTAN, WYNDIAM R. Tin ore from the Bautshi tin fields, Northern Nigeria.

Imp. Inst. Tech. Rep. and Sci. Papers, London, 1903, p. 53. Same, Bull. Imp. Inst. Great Britain, Vol. 1, 1903, London, p. 21.

Chemical examination of a tin specimen weighing 1 pound which came from a depth of 6 feet from the surface of a plain lying to the north of a range of hills about 70 miles southwest of Bautshi in Northern Nigeria. Analysis showed 81.30 per cent tin dioxide. Extent of deposit not known.

858. ———. Report on a series of mineral and vegetable products from Northern Nigeria.

Colonial Reports (Miscellaneous), No. 26, 1904, London, pp. 17-18.

Tin ore from the Tilde area about 15 miles southwest of Badika, also gravel carrying tin, from the River Gimpu, three miles west of Tilde, are analyzed and described.

859. ———. Reports on the mineral survey of Southern Nigeria for 1903-1904 and 1904-1905.

Colonial Reports (Miscellaneous), No. 33, 1906, London, pp. 22-29.

Extract: Mg. Journ. Railw. Comm. Gaz., Vol. 78, 1906, London, p. 546.

Digest: Eng. Mg. Journ., Vol. 51, 1906, New York, p. 992.

Describes alluvial tin occurrences of Uwet and Akwa-Ibana districts. Only the latter contained tin deposits rich enough to warrant working, but these are described as poor in comparison with other alluvial deposits. Associated with columbite, garnet, ilmenite and tourmaline, with a small amount of quartz and occasionally magnetite. Conclusions drawn from examination are not of a definite character.

860. NICOLAUS, R. C. Tin deposits of Northern Nigeria. In tin deposits of the world, by Sydney Fawns.

1905, London, pp. 139-141. Written Dec. 1904.

Found in the Naraguta and Shere Hills, outliers of the Gura Mountains in the Badiko district, Province of Bauchi, 600 miles northeast of Lokoja, situated at the confluence of the Niger and Benue rivers. Occurs as coarse and fine stream tin along the Gimpy or Kogin-Delume ("river tin"). Hills of granite with intrusions of diabase and porphyry. Near river is a contact with coarse gray gneiss. Tin thought to come from stockworks in granite. Metallic tin in nodules about the size of a bean, thinly coated with  $\text{SnO}_2$ , is found 15 feet below the surface of the gravels. Gravels said to average 36.66 pounds stream tin per ton. Smelted with charcoal in small local furnaces. The product is 99.40 fin.

## NORTH AMERICA

See under Canada, Greenland, Mexico, Santo Domingo, United States and separate States.

## NORTHERN TERRITORY

861. ANONYMOUS. Tin at Port Darwin, Northern Territory, Australia.

Mg. Sci. Press, Vol. 89, 1904, San Francisco, p. 273.

A shipment of tin ore from Port Darwin is said to have carried 75 per cent tin and worth about £80 per ton, it is said this was taken from an area of ground not covering 25 yards (square), depth 4 feet. Open cut work; is below an outcrop of quartz thickly studded with tin ore.

## NORTHERN TERRITORY (Continued)

## 861a. PLAYFORD, E. C. Tin in Australia.

Mg. Journ. Railw. Comm. Gaz., Vol. 85, 1909, London, p. 577.

Notice of same. Eng. Min. Journ., Vol. 87, 1909, New York, p. 1272.

Gives an account of, and outlook for a new discovery of alluvial tin at a place bearing the native name of Warra, close to Pine Creek, Northern Territory.

Tin ore is black, with a little brown, ruby, amber and wood tin. Country rock consists of a gray granite and sandstone, with a little quartz. Small amount of monazite has been found with tin.

## 862. TATE, RALPH. Report on the Northern Territory.

Geol. Surv. South Australia, No. 63, 1882, Adelaide, p. 4, map.

Two alluvial deposits have been located, along one of the tributaries of McKinlay River, and the head waters of a stream near Mt. Wells. The deposits are of comparatively little importance. Neither of these deposits of tinstone seemed to be associated with granite.

## 863. TENISON-WOOD, J. E. Report on the geology and mineralogy of Northern Territory.

Geol. Surv. South Australia, No. 122, 1886, Adelaide, p. 7.

Ore occurs in the form of reef tin. Is abundant and rich. Spread over wide area. Metalliferous country resembles that of Cornwall. "The Northern Territory may be emphatically pronounced to be a tin country."

## NORWAY

BRÖGGER, W. C. See No. 1596.

## PERAK

See Malay Peninsula

## PERSIA

## 864. HENNECKE, LUDWIG. Die Bodenschätze Persiens.

Zeitschr. Berg. Hütt. Sal. preuss. Sta., Vol. 47, 1899, Berlin, pp. 272-274.

Digest trans: Trans. Inst. Mg. Eng., Vol. 18, 1899-1900, London and Newcastle-upon-Tyne, p. 509.

"Rich occurrences have been certified in many parts of Persia, of mercury, copper, tin, and antimony-ores, realgar, native sulphur, brown iron ore, manganese and cobalt-ores, kaolin, borax and alum."

## 865. MACTEAR, JAS. Some notes on Persian mining and metallurgy.

Trans. Inst. Mg. Met., Vol. 3, 1894-95, London, pp. 2-3.

Quotes from a letter of Dr. Riach to Lord Palmerston in 1837 concerning a supposedly very large deposit of tin ore on Anngert Creek near the village of Juwaa, 60 miles northeast of Tabriz, but when visited in 1893 or 1894 by Mactear, nothing was known of the tin.

## PERU

## 866. ANONYMOUS. Nuevos yacimientos de estaño y bismuto en el Perú.

Bol. Soc. Nac. Min., No. 87, 1905, Lima, pp. 103-105.

Extract: Mo. Bull. Int. Bur. Amer. Repub., Vol. 21, July, 1905, Washington, D. C., p. 131.

Until recently tin ores were considered rare in Peru, the only deposits known to exist being those described by Prof. Raimondi in the district of Moho, Province of Huancané, Dept. of Puno. Mineral veins and veinlets containing tin were afterwards described by Carlos Posth as existing in quartz in the Pataoca and Accaobina spurs of the Andes in the Vilque district. Tin is now known to be widely distributed in Peru. Some specimens from Province of Cajatambo, were rich in metallic tin.

## PERU (Continued)

867. LARROUX, —. *L'industrie minière au Pérou en 1900.*  
Ann. Mines, ser. 9, Vol. 20, 1901, Paris, p. 510. Extract of report by author.  
Tin ore is rare in Peru and no veins that would pay for working have been found; there is however, a vein of no importance at Huancane, Puno.
868. Changed to 171a.
869. POSTH, C. *Estado actual de la minería en el Depto. de Puno.*  
Bol. Min. Indust. Constr., Año 10, No. 8, 1894, Lima, p. 63.  
Notes the finding of stanniferous quartz veins in the Pataoca and Accoabina Mountains. Vilque district, Puno Department.
870. RAIMONDI, A. *Minerales del Perú.*  
1878, Lima, pp. 168-170.  
A French translation was made by Martinet, J. B. H., "Minéraux du Pérou."  
1878, Paris, pp. 187-189.  
Digest: *Zeitschr. Kryst. Min.*, Vol. 6, 1882, Leipzig, p. 632.  
Amorphous cassiterite is found in small quantities in Moho district, Huancané province. Describes a new mineral plumbostannite, a sulphide of lead, tin and antimony, discovered in same district. Occurs with zinc blende and quartz.

## PHILIPPINE ISLANDS

871. McCASKEY, H. D. *Stream tin in Negros.*  
Philippine Min. Ind., a separate from Min. Res. of the United States, 1905, Washington, D. C., pp. 12-13.  
Reported that "large tin deposits of stream tin occur in Negros" but no details are given. [This report was later found to be erroneous.—Authors.]

## PORTUGAL

872. ANONYMOUS. *Tin mines in Sandinha, Portugal.*  
Mg. Journ. Railw. Comm. Gaz., Vol. 90, 1906, London, p. 495.  
Brief note. Mines situated near Gocs. Deposits included in old Cambrian schists, near granite. Quartz veins are impregnated with cassiterite and small quantities of pyrite and mispickel.  
———. *See No. 1027.*
- BECK, RICHARD. *See No. 1299.*
873. BREIDENBACH, TH. *Die Zinnerzlagertstätten Portugals.*  
Glück. Berg. hütt. Zeit. Nied. Westph., 1893, Essen, pp. 1032, 1050.  
Digest: *Neues Jahrb. Min.*, 1894, II (Ref.), Stuttgart, pp. 429-430.
- BROWN, A. SELWYN. *See Nos. 1307 and 1308.*
- CALDERÓN, D. SALVADOR. *See No. 1029.*
- D'ACHIARDI, ANTONIO. *See No. 1313.*
874. ESCHWEGE, W. VON. *Bemerkungen über den Bergbau und Hüttenbetrieb in Portugal.*  
Arch. Miner. Geogn. Bergb. Hütt., Vol. 8, 1835, Berlin, pp. 221-222, 224.
- FAWNS, SYDNEY. *See No. 1320.*
- FUCHS, E., and LAUNAY, L. DE. *See No. 1323.*

## PORTUGAL (Continued)

## 875. HEALE, JOSIE. Tin in Portugal.

Mg. Journ. Railw. Comm. Gaz., Vol. 44, 1874, London, p. 343.

Report on the tin mines of São Martinho and Montesinhos in the Province of Tras os Montes.

LOUIS, HENRY. See No. 1340.

PHILLIPS, J. A., and LOUIS, HENRY. See No. 1350.

## QUEENSLAND

## 876. ANONYMOUS. Vulcan tin mine, Irvinebank, Queensland.

Austr. Mg. Stand., Vol. 11, 1895, Sydney and Melbourne, p. 524.

Digest: Trans. Fed. Inst. Mg. Eng., Vol. 10, 1895, Newcastle-upon-Tyne and London, p. 590.

Describes the Vulcan mine and states that it is the most productive tin mine in North Queensland.

## 877. ———. Mining in Queensland (gold, silver, tin, copper, coal and other minerals).

The Queenslander, Vol. 51, March 27, 1897, Brisbane, p. 2.

Not available to the authors.

## 878. ———. Tin in Queensland.

Min. Ind. for 1900, Vol. 9, 1901, New York and London, p. 637.

A short general review of conditions in the tin fields of Queensland during 1900.

## 879. ———. Tin in Queensland.

Min. Ind. for 1901, Vol. 10, 1902, New York and London, pp. 639-640.

Brief review of tin mining conditions during 1901.

## 880. ———. Queensland tin mining.

Austr. Mg. Stand., Vol. 30, 1903, Sydney and Melbourne, p. 801.

Particulars of a new find of rich tin ore in the neighborhood of Reid's Creek, Queensland, taken from "Wild River Times," Q.

## 881. ———. Tin mining in north Queensland.

Mg. Journ. Railw. Comm. Gaz., Vol. 75, 1904, London, p. 602.

Outlook for tin in Herberton district very encouraging. The Lancelot lode, in Silver Valley, 10 miles southwest of Herberton, has an average width of 2 feet, and has been exploited to a depth of 250 feet. Average per cent of tin in the ore is from 12 to 13 per cent. Concentrates contain 60 per cent metallic tin, 5 per cent bismuth and 5 per cent copper. Outputs from 1899 to 1903 of New South Wales and Queensland given.

## 882. ———. Tin mining in Queensland.

Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 113.

Gives present conditions in tin mining and the production in the Herberton district.

## 883. ———. Dredging for tin at Stanthorpe.

Queensland Gov. Mg. Journ., March 15, 1904, Brisbane, p. 103.

"Shows Brisbane dredging plant."

Not available to the authors.

## 884. ———. Queensland tin supply.

Austr. Mg. Stand., Vol. 31, 1904, Sydney and Melbourne, p. 809.

"Information concerning the output, which shows a marked increase."

## QUEENSLAND (Continued)

885. ———. The Vulcan tin mine, North Queensland.  
 Eng. Mg. Journ., Vol. 82, 1906, New York, p. 155.  
 Vulcan mine, Herberton district, North Queensland, has recently developed into one of the most important lode tin mines of the world. It surpasses, as producer and dividend payer, even the famous Mt. Bischoff mine. During 1905, production was at the rate of 130 tons of black tin per month. Description of mine is from report by Walter E. Cameron, Asst. Geol. of the Queensland mines department.
886. BABINGTON, ARTHUR. Herberton tin field.  
 Austr. Mg. Stand., Vol. 16, 1899, Sydney and Melbourne, pp. 88-89, 129.  
 "Information concerning these deposits in North Queensland, and their workings."
887. BAIN, W. H. The Tate tin mines.  
 Austr. Mg. Stand., May 28, 1896, Sydney and Melbourne.  
 "Description of the largest and most important of the stream tin mining properties now being worked in North Queensland."  
 Not available to the authors.
888. BALL, LIONEL C. Crow's Nest tin deposits.  
 Queensland Gov. Mg. Journ., Oct. 15, 1903, Brisbane.  
 "Report on the geology and workings of tin deposits in Queensland."  
 Not available to the authors.
889. ———. Notes on tin, copper and silver in the Stanthorpe District.  
 Geol. Surv. Queensland, Pub. 191, 1904, Brisbane, pp. 9-21, pls. 1-8, plan and elevation 1.  
 Also, Queensland Gov. Mg. Journ., July 15, 1904, 1st part. Brisbane.  
 Notes on tin mining in the Stanthorpe district treat of pan-washing and cradling; ground sluicing; dredgers, and lode tin mining.
890. ———. Progress Report, 1904.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for the year 1904 (1905), Brisbane, pp. 155.  
 "On the 7th January, I left Brisbane to investigate a discovery of tinstone on Brovina Creek, in the Gayndah district. Small quantities of the mineral were found to occur in one branch of the creek, but the prospects were not encouraging, and it is believed that work has now ceased." (Whole reference.)
891. ———. Gold, platinum, tinstone and monazite in the beach sands on the South Coast (Queensland).  
 Geol. Surv. Rep., Queensland, Pub. No. 198, 1905, Brisbane, pp. 1-19, figs., pls. 1, 2.  
 "At intervals along the Currumbin-Coolangatta Beach, the sands contain payable tin, accompanied by gold. The concentrates, however, assay very much lower than was expected, and the assays show that the work thus far done for tin has been at a loss, either owing to local poverty of the ground or to the escape of tinstone with the tailings. Nevertheless, the hope is entertained that the ground may yet be proved sufficiently rich for dredging."
- 891a. ———. King of the Ranges tin mine, Watsonville, N. Q.  
 Queensland Gov. Mg. Journ., Vol. 10, 1909, Brisbane, pp. 228-232, illus.
- 891b. ———. Irvinebank Company's treatment works.  
 Queensland Gov. Mg. Journ., Vol. 16, 1909, Brisbane, pp. 329-330, illus.  
 Description of methods used for crushing, concentrating and smelting of tin ores at Irvinebank.
- BEER, ADOLF. See No. 806.
- BROWN, A. SELWYN. See Nos. 1307 and 1308.

## QUEENSLAND (Continued)

892. CAMERON W (ALTER) E. Report on the Stannary Hills tin deposits.  
Queensland Gov. Mg. Journ., Vol. 1, 1900, Brisbane, pp. 190-191.  
Not available to the authors.
893. ———. Report on the Kangaroo Hills mineral fields, Queensland.  
Geol. Surv. Rep. Queensland, Pub. No. 167, 1901, Brisbane, pp. 1-11, pls. 8, geol. map 1.
894. ———. Report on the Cardigan (Queensland) Tin-Syndicate's Properties, Thompson's Creek, and the Coolgarra Federal Corporation Limited, Leases, Herberton Mineral District, North Queensland.  
Geol. Surv. Rep. Queensland, Pub., No. 165, 1901, Brisbane, pp. 1-4.  
"The above syndicate has acquired a number of abandoned tin properties formerly worked for tin by the prospectors of the Herberton field. The object of this syndicate is to develop and work these leases in a more systematic manner than was possible with the methods available to small parties of working miners."  
Each piece of leased property is described.
895. ———. The Herberton tin field.  
Geol. Surv. Rep. Queensland, Pub. No. 192, 1904, Brisbane, pp. 1-29, pl. 1 (geol. map.)  
Digest: Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 359.  
Describes the topography of the area, the geology and mining methods used. A short history of the region is given and the following districts are described: Herberton, Watsonville, Irvinebank, Eureka Creek, Koorboora, Newellton and Coolgarra. The Smith's Creek mine and the lodes on California Creek and Reid's Creek are also described.
896. ———. The Annan River tin field, Cooktown District.  
Geol. Surv. Rep. Queensland, Pub., No. 210, 1907, Brisbane, pp. 27, map 1, pls. 14.  
Also, Queensland Gov. Mg. Journ., November, 1906, Brisbane.  
Abstract: Mg. World, Vol. 26, 1907, Chicago, p. 7.  
Tin occurs on Mt. Amos, Mt. Leswell, and at the Lion's Den in granite much altered and tourmalinised along joints. From these the alluvial deposits along the Annan River and its tributaries have been formed. Gives general description of claims.
897. CLELAND, W. LAUDER. Tin dressing at Stannary Hills, North Queensland.  
Trans. Austr. Inst. Mg. Eng., Vol. 12, 1907, Melbourne, pp. 154-164, pl. 1, figs. 2.  
Description of the mills and some of the principal machinery, also methods employed in dressing of tin ore.
898. CLOTEN, E. Die Zinn- und Wolfram- Vorkommen von Nord-Queensland.  
Min. Mitth., n. f., Vol. 24, 1905, Wien, pp. 137-139.  
Digest: Neues Jahrb. Min., 1906, II (Ref.), Stuttgart, pp. 26-27.  
Alluvial tin was first discovered in Herberton district, North Queensland, "some-time ago," and afterwards rich deposits were found on Wild River. Older alluvial deposits were later discovered in the Herberton lowland, at Watsonville, Irvinebank, and still later, very rich and extensive tin ore deposits were found in Silver Valley near Herberton. The ores of these deposits contain on an average, 4 per cent of bismuth, 3 to 8 per cent of copper and considerable tungsten. The tin-bearing territory has now been shown to extend over an area of 12,000 square miles.
899. CUSACK, W. G. KELLEY. Ravenswood fields.  
Ann. Rep. Under-Secretary for Mines, Queensland, for year 1904 (1905), Brisbane, p. 95.  
A short description of the tin camps on Running Creek is given, but nothing is said about the geology.



## QUEENSLAND (Continued)

D'ACHIARDI, ANTONIO. See No. 1313.

## 900. DAINTREE, R. Tin in Queensland.

Mg. Journ. Railw. Comm. Gaz., Vol. 42, 1872, London, pp. 680-690.

Also, Quart. Journ. Geol. Soc. London, Vol. 28, 1872, London, pp. 301-302.

At time of writing, discoveries were limited to drainage area of the upper part of the Severn River. These are swampy beds, intersected by numerous broad bars of granite. The alluvial beds vary in thickness from 3 to 20 feet. Outlook very encouraging; the greatest difficulty to overcome will be the swampy character of the ground, especially during the rainy season.

DAVIES, D. C. See No. 1317.

## 901. DOWEL, W. S. The Herberton tin field.

Austr. Mg. Stand., Nov. 17, 1898, Sydney and Melbourne. Serial.

"Information concerning these lode tin deposits in Queensland."

Not available to the authors.

## 902. DUNSTAN, B. Tin in Queensland.

Ann. Rep. Under-Secretary for Mines, Queensland, for 1904 (1905), Brisbane, p. 149.

The Lancelot Tin Mine at Silver Valley is described, and the general geology of the region is given.

## 903. ———. Monazite in Queensland.

Geol. Surv. Rep. Queensland, Pub. No. 196, 1905, Brisbane, p. 11.

Brief mention of cassiterite, found in the beach sands at the mouth of the Tweed River, with monazite. A concentrated sample yielded 54 per cent of tin.

## 904. ———. Stanhills tin fields, Queensland.

Geol. Surv. Rep., Queensland, Pub. No. 211, 1907, Brisbane, pp. 21, maps 2, pls. 3.

Country rock is altered granite, aplite and quartz-felsite. Cassiterite occurs in irregular masses of chlorite and quartz in granite; in quartz veins cutting quartz-felsite; in chlorite veins in quartz-felsite, granite and aplite; chlorite and greisen veins in granite. There are limited tin placers, and the Desert sandstone is tin-bearing, though in what way is not explained. The total yield is small.

## 905. ———. Stanhills tin fields.

Geol. Surv. Rep., Queensland, Pub. No. 211, 1907, pp. 21.

Queensland Gov. Mg. Journ., Vol. 9, 1908, Brisbane, pp. 285-288, map 1, pls. 3.

Discusses the geology, the mines, the alluvial deposits and prospects of the Stanhills district, Queensland. Cassiterite occurs in altered granite, or in close connection with granite, with much chlorite. Galena, zinc blende, chalcopryrite, and graphite occur with the tin. Alluvial deposits occur in the neighborhood around the head of Ten-mile Creek.

## 906. EDLINGER, W. Einige Bemerkungen über die Zinnerzlagerstätten des Herberton distrikts in Queensland.

Zeitschr. prakt. Geol., Vol. 16, 1908, Berlin, pp. 275-279 and 340-343.

I. Die primären Lagerstätten, pp. 275-279.

A description of the lode occurrences.

II. Die Zinnseifen, pp. 340-343.

Description of elluvial, alluvial, and fossil ("deep leads") placers.

FAWNS, SYDNEY. See No. 1320.

## 907. FRYAR, WM. The mineral resources of the colony of Queensland.

Trans. Fed. Inst. Mg. Eng., Vol. 13, 1896-1897, Newcastle-upon-Tyne and London, pp. 358-359.

Enumerates places where tin is found, but gives little more about tin deposits.

## QUEENSLAND (Continued)

908. GREGORY, T. F. Tin in Queensland.  
 Journ. Soc. Arts, Vol. 20, 1872, London, pp. 853-854.  
 A communication from the Secretary of State for the Colonies to the Council in which he describes the stanniferous country geologically and gives its extent.
909. ———. A report on the tin discoveries in Queensland.  
 Quart. Journ. Geol. Soc. London, Vol. 29, 1873, London, pp. 1-5.  
 Abstract: Mg. Journ. Railw. Comm. Gaz., Vol. 42, 1872, London, p. 1105.  
 Abstract: Geol. Mag., 1872, London, p. 569.  
 Tin ore discovered in district situated about the head waters of Severn River and its tributaries, comprising area of about 550 square miles. District is described as an elevated granite tableland intersected by ranges of abrupt hills, some 3000 feet above sea. Richest deposits are found in beds of streams and in the alluvial flats along their banks.
910. HALDANE, A. C.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1897 (1898), Brisbane, pp. 102-105.  
 Progress in mining in the Herberton tin mining district is described.
911. ———. Herberton (Walsh and Tinnaroo) fields.  
 Ann. Rep. of the Under-Secretary for Mines, Queensland, for 1904 (1905), Brisbane, pp. 68-71.
912. HORSLEY, SYDNEY. Report upon the Kangaroo Hills and Star River mineral fields.  
 Ann. Rep. Under-Secretary for Mines, Queensland, 1904 (1905), Brisbane, p. 110.
913. HUME, W. C. Report on the Queensland tin fields.  
 1874, pp. 31.  
 Not available to the authors.
914. JACK, ROBT. L. Report on the Wild River tin mines.  
 Geol. Surv. Rep., North Queensland, Pub. No. 9, 1881, Brisbane, pp. 8-10, map 1.  
 Reconnaissance report upon the tin mines in the vicinity of Wild River.
915. ———. On the Stanthorpe tin mining district.  
 Geol. Surv. Rep., Queensland, Pub. No. 12, 1882, Brisbane, pp. 1-2.  
 "As it will be necessary for me to return to the district and make a survey of the field, I confine myself, in the meantime, to putting on record in general terms, the conclusions to which I have been led, and my strong faith in the probability of discovering payable deposits of ore in the rocks from which the vast stream deposits were originally derived."
916. ———. On the tin mines of Herberton, Western and Thompson's Creek districts and the silver mines of the Dry River.  
 Geol. Surv. Rep., Queensland, Pub. No. 13, 1883, Brisbane, pp. 3-32, with geol. maps 2 and 6 plates of sections.  
 Abstract: Eng. Mg. Journ. Vol. 37, 1884, New York, p. 353.  
 The intimate connection of the tin deposits with metamorphosed igneous rocks is shown. The claims in the various districts are treated separately.
917. ———. On the tin mines near Cooktown.  
 Geol. Surv. Rep., Queensland, Pub. No. 63, 1891, Brisbane, pp. 1-9. Geol. map and 2 sheet plans.  
 Describes the mines of the region in detail.

## QUEENSLAND (Continued)

918. ———. The Kangaroo Hills silver and tin mines.  
 Geol. Surv. Rep., Queensland, Pub. No. 82, 1892, Brisbane, pp. 1-11, map 1.  
 Describes the tin mines in the central area of the Kangaroo Hills, the unnamed lodes, the Mount Brown silver and tin mines and a group of mines near Running River crossing.
- LOCK, C. G. WARNFORD. *See* No. 1338.
- LOUIS, HENRY. *See* No. 1340.
919. MACDONALD, A. R.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1895 (1896), Brisbane, pp. 124-126.  
 The progress of tin mining in the Herberton District during 1895 is epitomized.
920. ———.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1899 (1900), Brisbane, pp. 13-14.  
 Reports on Herberton, Kangaroo Hills, Cooktown, Stanthorpe, Ravenswood, Palmer and Port Douglas districts. Herberton yield was largest for year. The reports are devoted to economic progress more than to geology.
921. ———.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1900 (1901), Brisbane, pp. 15-16.  
 The reports of the wardens of the different mining districts, showing progress in tin mining are summarized.
922. ———.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1904 (1905), Brisbane, pp. 8-10, 16-17.  
 General review of tin mining throughout the Province during the year with statistics. The volume contains beside, descriptions by their respective commissioners of work done in the various districts.
923. ———. Tin mining in Queensland.  
 Queensland Gov. Mg. Journ., Apr. 15, 1905, Brisbane.  
 "Reviewing the condition of tin mining in Queensland."  
 Not available to the authors.
924. ———. Under Secretary for Mines, The Queensland Mining Industry, Review of the year 1906.  
 Queensland Gov. Mg. Journ., Vol. 8, 1907, Brisbane, pp. 111-113.  
 An advance copy of the Annual Report, summarizing economic conditions in the tin mining districts.
925. MACLAREN, J. M. Report on Stannary Hills tin mines, Eureka Creek, Watsonville district (North Queensland).  
 Geol. Surv. Rep., North Queensland, Pub. No. 146, 1900, Brisbane, pp. 1-2.  
 Describes the geology, ores and working of the tin mines in the Stannary Hills.
926. MAITLAND, A. GIBB. On the Coolgarra tin mines and surrounding district.  
 Geol. Surv. Rep., Queensland, Pub. No. 72, 1891, pp. 1-5. With geol. map and plans.  
 The geological features and the mines of the district are described.

## QUEENSLAND (Continued)

927. MUNDAY, JOHN. Notes on tin mining in and around Herberton, North Queensland.  
 Austr. Ass. Adv. Sci. Vol. 6, 1895, Sydney, pp. 375-381. Map 1.  
 Reprint: Mg. Journ. Railw. Comm. Gaz., Vol. 66, 1896, London, pp. 990-991.  
 Abstract: Eng. Mg. Journ., Vol. 59, 1895, New York, pp. 556-557.  
 Tin is found both in massive and stratified rocks. Lode mining has been extended from Herberton as a center westward to Watsonville, Irvinebank, Eureka Creek and Koorboora, southwest to Coolgarra, Glenlinedale and California Creek. Alluvial ore occurs from Herberton to the Tate River and Fossilbrook, a distance of 80 miles. In the neighborhood of Herberton, the tin bearing rock is mostly porphyry at the outcrop, but of a granitoid structure in depth; hornblende is in places a constituent. Quotes R. L. Jack in describing tin bearing veins as metamorphosed dikes, probably originally diorite, now mainly of quartzose chlorite and quartzose serpentine. In depth veins develop more quartz. Ore is cassiterite, mostly in lenticular deposits, reaching a length of 40 and 50 feet, and in depth from a few inches to several hundred feet. Yield ranges from 5 to 40 per cent oxide. Wolframite, fluorspar, galena and molybdenite occasionally accompany the tin. Alluvial tin is derived from open gullies and gravels now covered by lava. Ilmenite and gem stones sometimes accompany ore.
928. NEWLAND, D. H. Tin in Queensland.  
 Min. Ind. for 1902, Vol. 11, 1903, New York and London, p. 593.  
 Brief summary of tin mining conditions in Queensland.
929. NEWMAN, G. H. Kangaroo Hills mineral field.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1904 (1905), Brisbane, pp. 82-84.  
 The progress of tin mining in the Kangaroo Hills district during 1904 is summarized.
- 929a. NICHOLAS, C. E. Stannary Hills mines, N. Q.  
 Queensland Gov. Mg. Journ., Vol. 10, 1909, Brisbane, pp. 552-554. Illus.  
 Reports for six months, April, 1909, to September, 1909.
- PHILLIPS, J. A., and LOUIS, H. See No. 1350.
- REYER, EDUARD. See No. 1354.
- ROLKER, CHAS. M. See No. 1357.
930. RUSSELL, MURRAY. Report on the Walsh and Tinaroo mineral field and Hodgkinson gold field.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1904 (1905), Brisbane, pp. 111-115.
931. SELLEHEIM, P. F. Report of mining industry of Queensland for year 1895.  
 1896, Brisbane, pp. 32-34.  
 Treats briefly the tin of Herberton and surrounding districts.
932. ———.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1896 (1897), Brisbane, pp. 102-104.  
 Reviews tin mining during 1896 and shows that there was some reduction in the output.
933. SHORT, C. H. Stanthorpe and Pikedale fields.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1904 (1905), Brisbane, pp. 100-101.  
 Notes on the mining progress of the Stanthorpe and Pikedale tin mining fields during 1904.

## QUEENSLAND (Continued)

934. SKERTCHLY, SYDNEY B. J. Report on the deep (tin) lead at Herberton.  
 Geol. Surv. Rep., Queensland, Pub. No. 115, 1896, Brisbane, pp. 1-15, pls. 1-5. (Map, 1 inch=40 chains.)  
 Discussion of geological conditions, history, and description of tin workings.
935. ———. Tin mines of Watsonville, and various tin, silver, copper and gold mines at Herberton, Montalbion, Irvinebank, Muldiva, Calcifer, Chillagoe, California Creek, Tate River, etc.; also geological notes on Myola, on the recovery of the lost lodes and on the copper plant.  
 Geol. Surv. Rep., Queensland, Pub. No. 119, 1897, Brisbane, pp. 64, pls. 18, figs. 37.  
 Describes various mines of the Watsonville district, with geology of the surrounding country. Gives statistics of the region. Notes tin ore that is phosphorescent when heated. Considers the tin mines of the region unsurpassed.
936. ———. On the geology of the country round Stanthorpe and Warwick, South Queensland, with special reference to the tin and gold fields, and the silver deposits.  
 Geol. Surv. Rep., Queensland, Pub. No. 120, 1898, Brisbane, pp. 98, pls. 3, maps 2 and text figs.  
 Gives a general article on tin showing distribution; output; percentage in ores of famous mines; table giving associated rocks, mineral, etc.; output; origin; minerals containing traces of tin. Thinks tin was deposited from solution. Detailed description of mines.
937. STAINES, ARTHUR. Port Douglas district.  
 Ann. Rep. Under-Secretary for Mines, Queensland, for 1904 (1905), Brisbane, p. 87.  
 Report of mining progress in the Port Douglas tin mining fields during 1904.
938. STERLING, JAMES. Monograph on the geology and mining features of Silver Valley, Herberton, North Queensland, Australia.  
 Two parts, 1905, Hamburg.  
 Part I, pp. 41, 5 pp. geologic maps and sections, text figs.  
 Part II, pp. 16, 1 p. of 35 figs.  
 Part I deals with the geology and veins of a portion of the country adjacent to Dry River. Describes veins carrying silver, lead, tungsten, copper, bismuth and tin. Considers the mineral deposits of deep-seated origin.  
 Part II deals with the microscopic characters of the rocks.
939. WEEDON, THORNHILL. Queensland, past and present. An epitome of its resources and development.  
 1898, Brisbane, pp. 252-253.  
 Tin is found on the Pascoe River, at Bloomfield, on Palmer River, the Barron Waters, at Herberton including Irvinebank, on the Star River and at Stanthorpe. Mineral first discovered at Stanthorpe in 1872. Production and export value for each year from 1872 to 1896 given. Queensland is third amongst the seven colonies as a tin-producing district coming after New South Wales and Tasmania.
940. WILLIAM, J. VIVIAN. Tin production in Queensland.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 47, 1877, London, p. 601.  
 Describes the mineral resources along Hopkinson and Palmer rivers, Queensland, and possible effect the tin deposits might have on the Cornwall tin trade.
- 940a. WILLIAMS, G. W. Tin mining and milling in North Queensland.  
 Eng. Mg. Journ., Vol. 87, 1909, New York, pp. 1092-1094.  
 Treats of mining conditions, describing operations of various companies of North Queensland.

## RUSSIA

941. ANONYMOUS. Russische Bergwerksverhältnisse.  
Berg. Hütt. Zeit., Vol. 52, 1893, Leipzig, p. 328.  
Gives the tin production of Russia, also the amount imported for years 1888, 1889, 1890.
942. ———. Tin in Russia.  
Mg. Journ. Railw. Comm. Gaz., Vol. 81, 1907, London, p. 219.  
Translation from "Viestnik Frnansoff." The tin situation in Russia is serious, since the closing of the Pitkäranta tin smelter. Russia imported in 1904, 301,000 poods. Pitkäranta deposits are of little value. Recommends attention to deposits on Onon River, Transbaikal region, where the tin outlook is encouraging.
- BORGSTRÖM, L. H. See No. 1594.
- COTTA, BERNARD VON. See No. 1312.
943. FIEDLER, K. G. Ueber die alten Zinnstein-Gruben am Onon in Dauurien (Ononsky Priski Olowennoi Sawod).  
Arch. Miner. Geogn. Bergb. Hütt., Vol. 12, 1839, Berlin, pp. 178-188.  
Digest: Neues Jahrb. Min., 1841, Stuttgart, p. 714.  
Tin deposits are located 87 "werst" from the junction of Onon and Ingoda rivers. Tin occurs in segregations in granite dikes cutting hornblende schists. Wolframite occurs with ore in some places.
- GADOLIN, S. A. See No. 1612.
944. GURNEY, H. P. Notes on the geology of Finland.  
Trans. Fed. Inst. Mg. Eng., Vol. 15, 1898, Newcastle-upon-Tyne and London, pp. 147, 152.  
Mentions the deposits of tin at Pitkäranta, on the northeastern shore of Lake Ladoga. Production is small.
945. HERMANN, R. Untersuchungen russischer Mineralien. Ueber das Vorkommen von gediegenem Zinn in den Ural'schen Goldseifen.  
Journ. prakt. Chem., B. 33, 1844, Leipzig, p. 300.
946. KEPPEM, A. DE. Aperçu général sur l'industrie minérale de la Russie.  
Ann. Mines, ser. 9, Vol. 5, 1894, Paris, pp. 233-234.  
Treats very briefly of tin in Finland.
- KOULIBINE, S. See Nos. 1690, 1691 and 1692.
947. KRUSCH, P. Ueber sicht über die nutzbaren Lagerstätten Russlands.  
Zeitschr. prakt. Geol., 1897, Berlin, p. 277.  
States that lode tin is found at Pitkäranta, Finland, and that stream tin is found along the Onon River, Siberia.
- LOUIS, HENRY. See No. 1340.
948. NORDENSKIÖLD, A. E. Beitrag zu Finnlands mineralogie.  
[Trans.] Ann. Physik. Chem., Vol. 101, 1857, Leipzig, pp. 625-642.  
Brief digest, Neues Jahrb. Min. 1858, Stuttgart, p. 467.  
Tin of Pitkäranta treated.
- . See No. 1628a.
- PHILLIPS, J. A., and LOUIS, H. See No. 1350.

## RUSSIA (Continued)

949. PUSCH, GEO. G. Kupfer- und Zinnerz-Bau am Ladoga-See; Geognosie Finnlands und von Petersburg.  
Neues Jahrb. Min., 1836, Stuttgart, pp. 197-199.  
A communication written Dec. 1835, giving an account of the tin occurrences in Finland.
950. SCHOULTZ-ASCHERADEN, G. VON. Die Kupfer- und Zinnerz-Lagerstätte zu Pitkäranta in Finland.  
Berg. Hütt. Zeit., Vol. 35, 1876, Leipzig, pp. 280-281. Mit. fig. 8 u. 9 auf Taf. 13.
951. STRUVE, H. VON. Tin in Russia.  
Neues Jahrb. Min., 1834, Stuttgart, p. 398.  
The announcement of a discovery of tin ore at Pitkäranta, communicated in a letter by H. von Struve.
952. TÖRNEBOHM, A. E. Om Pitkäranta malmfält och dess omgifningar.  
Geol. Förr. Stockholm Förrh., Vol. 13, 1891, Stockholm, pp. 324-325, map 1.  
Description of the tin of Pitkäranta, Finland.
953. TRÜSTEDT, OTTO. Die Erzlagerstätten von Pitkäranta am Ladoga-See.  
Bull. Com. Géol. de Finland, No. 19, 1907, Helsingfors, pp. 333, with geol. map 1, pls. 19 and text figures 80. Pp. 140-151, and others.  
Reviewed by Knopf, Adolph, Econ. Geol., Vol. 3, 1908, Lancaster, pp. 540-542.  
"This monographic report of ore deposits of Pitkäranta, is interesting from three standpoints: As a study of contact, metamorphism; as an investigation of pre-Cambrian ore-deposits in highly metamorphic rocks, and as an application of magnetometry to the location and computation of iron-ore reserves.  
"Briefly, Pitkäranta is characterized as an iron-ore district locally rich in copper and tin ores. The latter deposits are quite fully treated."

## SANTO DOMINGO

954. GARSTON, E. M. DE. Mineral Resources of the Dominican Republic.  
Mg. Journ. Railw. Comm. Gaz., Vol. 83, 1908, London, p. 682.  
States that "Tin deposits are said to exist in Seybo and in the Higuei, Province of Seybo." Quoted from a British Consular Report.

## SCOTLAND

FAWNS, SYDNEY. See No. 1320.

955. FLETT, J. S., and CLOUGH, C. T. Tinstone in Scotland.  
Mem. Geol. Surv., Summ. Progr. Geol. Surv. United Kingdom and Mus. Pract. Geol. for 1903 (1904), London, pp. 2, 59-60.  
First recorded occurrence of tinstone in Scotland. Occurs with magnetite. No indication that it occurs in any quantity.

## SIAM

956. ANONYMOUS. A note on mining in Siam. A reprint from the copyright publications of the Royal Commission for the Louisiana Purchase Exposition.  
Published by Mining Department of Siam, 1904, pp. 3-4.  
Gives a list of the districts in which alluvial tin is mined, and states that the possibilities of tin mining in Siam are large.

## SIAM (Continued)

957. ———. Mining in Siam.  
Eng. Mg. Journ., Vol. 79, 1905, New York, p. 190. Probably taken from the Siamese Louisiana Purchase Exposition Publication. See No. 960.  
Tin is the only metal, the working of which is of any importance in Siam. Deposits of importance are derived from, and lie adjacent to, the great granitic range which forms the boundary between central Siam and Tenasserim, and the backbone of the Malay Peninsula.
958. ———. Tin mining in Siam.  
Écho des Mines, April 29, 1907.  
Quoted in Mg. Journ. Railw. Comm. Gaz., Vol. 51, 1907, London, p. 593.  
Tin mined principally in the provinces of Puket and Kedah. Annual production about 5000 tons. Vast district yet unexplored, which probably contains considerable mineral wealth.
959. BLEWETT, JASPER. Tin mining in the Straits Settlement.  
Eng. Mg. Journ., Vol. 22, 1876, New York, p. 156.  
An account of the tin mining on Junk-Seylon or Salanga, an island on the coast of Lower Siam.
960. CARTER, A. CECIL. Editor. The kingdom of Siam.  
Published by the Ministry of Agriculture for Louisiana Purchase Exposition, 1904, New York, pp. 241-243, 500 words.  
Small amounts of tin are found in the valley of the Nam Sak River. Tin placers are worked in the following provinces: East Coast—Ratburi, Bangtaphan Langsuan, Chaija, Bandon, Lakon, Jalar, Rangeh, Rahman, Kelantan, Tringanu. West Coast—Kra, Renong, Takupar, Panga, Takuatung, Puket, Trang, Stul, Perlis, Kedah. Annual production about 5000 long tons, valued at \$3,000,000. Puket Island on the West Coast is the most important field. Most promising for future developments are Kedah Rahman, Jalar, Takuatung and Renong. Work mostly in hands of Chinese. One American, one English, and one Dutch firm at work. There is an enormous field for the expansion of the tin-mining industry in the Siamese possessions in the Malay Peninsula.
- D'ACHIARDI, ANTONIO. See No. 1313.
- F'AWNS, SYDNEY. See No. 1320.
961. FISCHER, H. Ueber siamesische Mineralien.  
Neues Jahrb. Min., 1882, II, Stuttgart, p. 196.  
Tin is the most important mineral of Siam. Alluvial tin is found in provinces of Xaláng, Xaija, Xumphon, Rapri and Pak-Phrök.
- REYER, EDUARD. See No. 1354.
962. SCOTT, H. G. A note on mining in Siam.  
Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 185.  
Practically the same as No. 960 from which it seems to be largely taken.
- See also Laos.

## SIBERIA

963. ANONYMOUS. Tin in Siberia.  
Min. Ind. for 1900, Vol. 9, 1901, New York and London, p. 640.  
Notes recent discoveries of tin on the Onon River.



## SIBERIA (Continued)

964. ———. Zinnerzlager in Ost-Sibirien.  
 Zeitschr. prakt. Geol., 1901, Berlin, p. 245.  
 Brief digest: Eng. Mg. Journ., Vol. 71, 1901, New York, p. 240, taken from  
 "Engineering," London.  
 Notice of the deposits of tin in Province Transbaikalien, near Onon River and  
 tributaries. Its situation is fortunate, being easy of transportation, and nearness to  
 the forest facilitates working.
- D'ACHIARDI, ANTONIO. See No. 1313.
- FAWNS, SYDNEY. See No. 1320.
965. FONIAKOFF, ANTONIN. The gold deposits of Siberia.  
 Trans. Fed. Inst. Mg. Eng., Vol. 7, 1894, Newcastle-upon-Tyne and London, pp. 447,  
 466, 479.  
 For more than a century and a half in the Transbaikal, silver, gold, lead, iron,  
 copper, mercury and tin have been worked.
966. ———. Les richesses minières de la Sibérie.  
 Rev. Univ. Mines Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 3, Vol. 29, 1895,  
 Liège and Paris, p. 129.
967. GLASSER, E. Note sur les richesses minérales de la Sibérie et sur l'état  
 actuel de leur exploitation.  
 Ann. Mines, ser. 9, Vol. 18, 1900, Paris, p. 53, maps.  
 Mentions that tin is found in the valley of the Onon.
968. HERMANN, R. Sur l'étain natif.  
 Extrait: Journ. prakt. Chem., Vol. 33, 1844, Leipzig, p. 300.  
 Ann. Mines, ser. 4, Vol. 8, 1845, Paris, p. 660.  
 M. Hermann indique la présence de l'étain natif avec l'or, dans les lavages d'or de  
 la Sibérie. Il s'y trouve sous la forme de petits grains métalliques gris qui sont de  
 l'étain allié d'un peu de plomb. Ces grains sont du reste peu abondants. [Whole  
 extract.]
- JEREMEJEV, P. See No. 1622.
969. KEPPEM, A. Mineral wealth of Siberia.  
 Industries of Russia, Vol. 4, 1893, St. Petersburg, pp. 30-31.  
 (For the World's Columbian Exposition at Chicago. Trans. by J. M. Crawford.)  
 Reprint: Mg. Journ. Railw. Comm. Gaz., Vol. 65, 1895, London, p. 243.  
 Deposits of tin are known only in Finland and Baikal province of Siberia. Produc-  
 tion under 20 tons. Since yearly demand of Russia is over 100,000 poods, internal  
 production is utterly insufficient for home consumption.
970. KORZOUKHINE, J. A. Gisements de minerais d'étain sur la Rivière Onon.  
 Bull. No. 4, Soc. Ing. Mines, 1899, St. Petersburg, pp. 22-35.  
 Digest: Trans. Inst. Mg. Eng., Vol. 17, 1900, London and Newcastle-upon-Tyne,  
 pp. 642-646.  
 "With the exception of Pitkäranta, where the production of tin is insignificant,  
 the only Russian deposits of cassiterite are in the territory of the Transbaikal, on  
 the River Onon and its affluents."
971. RÉONTOVSKI, —. Les gisements miniers de la Sibérie.  
 (Bulletin) Rev. Univ. Min. Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 4, Vol.  
 12, 1905, Paris and Liège, p. 204.  
 Les gisements de cassitérite sont connus dans la vallée de la Rivière Onon, en  
 Transbaicalie. Leur exploitation exige une préparation mécanique importante.

## SOUTH AMERICA

*See under Argentine Republic, Bolivia, Chili, French Guiana, Peru.*

## SOUTH AUSTRALIA

## 972. ANONYMOUS. Tin in South Australia.

Min. Ind. for 1900, Vol. 9, 1901, New York and London, pp. 637-638.

Discovery of tin ore near Erea Dam, in quartz vein, reported. Prospects seem encouraging.

## 973. BROWN, H. Y. L. Report on the Koetong tin field, Wodonga district.

Reports of the Mining Surveyors and Registrars, 1873, (App. A.), Melbourne, p. 42.

Quoted in *Mg. Journ. Railw. Comm. Gaz.*, Vol. 43, 1873, London, p. 1220.

Tin-field comprises large area between Murray and Mitta-mitta rivers. Bed rock is granite of various kinds, mostly coarse with black and white mica in large plates. Deposit varies from few inches to 2 or 3 feet thick. Wash dirt made up of boulders and angular fragments of granite and quartz. Ore is disseminated all through wash, and also in layers, but more plentiful on or near bed rock. No lodes of workable size found. Lists of principal claims given.

## 974. ———. Report on the gold discovery at Tarcoola, the Enterprise Mine, the Earea Dam tin find and the Mount Gunson copper mine.

Rec. Mines, South Australia, 1900, Adelaide, p. 6.

The tin discovery is situated 1½ miles south of Earea Dam, on a mud lake where the surface sand and loam have been eroded, and expose granite, diorite and other hornblending rocks containing quartz. A dishful of the alluvial soil over the tin vein outcrop yielded 1 pound, 10 ounces of tin; on being smelted, it gave 1 pound tin or 90 per cent. Prospectors have sunk in the quartz veins, but would probably meet with more success in prospecting for alluvial tin.

FAWNS, SYDNEY. *See* No. 1320.

## SOUTH DAKOTA

## 975. ANONYMOUS. The Black Hills of Dakota. [Tin ore.]

Eng. Mg. Journ., Vol. 36, 1883, New York, p. 111.

A communication from one who had visited the mines.

## 976. ———. Tin in the Black Hills.

Eng. Mg. Journ., Vol. 38, 1884, New York, p. 358.

Editorial: Brief review of the effect of Prof. Chas. A. Schaeffer's paper, "Note on tantalite and other minerals accompanying the tin ore in the Black Hills." *Trans. Amer. Inst. Mg. Eng.*, Vol. 13, 1884-1885, New York, pp. 231-233.

## 977. ———. An immense tin deposit.

Mg. Sci. Press, Vol. 48, 1884, San Francisco, p. 34.

A very enthusiastic and exaggerated account of a recent tin discovery in the Black Hills. Statements are made that discovery will "revolutionize the trade." "Deposits are so vast as to be able to supply the whole world for centuries."

## 978. ———. The tin mines of Dakota.

Eng. Mg. Journ. Vol. 42, 1886, New York, pp. 325-326.

Editorial on the outlook of the Dakota tin mines.

## SOUTH DAKOTA (Continued)

979. ———. The waning probabilities of finding paying mines in Dakota.  
Eng. Mg Journ., Vol. 48, 1889, New York, p. 312. About 500 words.  
Editorial on the effort of Harney Peak Tin-mining Co., to boom their mines. The company has induced many English, and are now endeavoring to induce the French to invest in stock.
980. ———. Nigger Hill tin district (South Dakota).  
Eng. Mg. Journ., Vol. 50, 1890, New York, p. 555.  
Short account of the finding of stream tin in the placer gold; excitement aroused; forming of companies; working of deposits.
981. ———. The Harney Peak tin deposits.  
Mg. Journ. Railw. Comm. Gaz., Vol. 62, 1892, London, pp. 1210-1215. Illus.  
General description of the property, when and how tin was discovered in the Black Hills, the opinions of experts, present position of the properties and their possible future.
982. ———. The Harney Peak tin mines.  
Mg. Journ. Railw. Comm. Gaz., Vol. 62, 1892, London, p. 1357.  
Extract from "Hill City Tin Miner," of Nov. 18, 1892, detailing the working of the new mill.
983. ———. The tin ore concentrating plant at Harney Peak, South Dakota.  
Eng. Mg. Journ., Vol. 54, 1892, New York, pp. 102-104.  
Reprint: Ann. Rep. Secr. Min. Wat. Supp. of Victoria for 1892 (1893), Melbourne, p. 52.  
Two pages devoted to plans of Harney Peak tin ore concentrating mill. Article describes methods used and results obtained.
984. ———. Tin at Nigger Hill, South Dakota.  
Mg. Sci. Press, Vol. 89, 1904, San Francisco, p. 19.  
The Tinton Co., on Nigger Hill, Lawrence Co., South Dakota, has the distinction of being the only concern in America at present, crushing and concentrating tin ore. Ore occurs in large dikes of coarse granite, similar to that in Harney Peak region.
985. ———. Tin in United States.  
Mg. Sci. Press, Vol. 89, 1904, San Francisco, p. 385. Illus.  
The Nigger Hill-Bear Gulch region on the South Dakota-Wyoming line has received much encouragement in the development of the industry. The Tinton Tin Co., has been operating a small concentrating plant. Cassiterite occurs in dikes of granite of very coarse crystallization.
986. ———. South Dakota.  
Mg. World, Vol. 22, 1905, Chicago, pp. 412-413.  
A stamp mill and tin concentrating plant which have been erected will treat tin and gold ore taken from a shaft 500 feet deep which has been sunk on the old Gertie property.
987. ———. Tin in Dakota.  
Eng. Mg. Journ., Vol. 79, 1905, New York, p. 469.  
Brief account of recent discovery of tin ore at Tinton, Lawrence Co., S. D.
- 987a. ———. Tin mining in South Dakota.  
Eng. Mg. Journ., Vol. 88, 1909, New York, p. 828.  
Short description of tin mill of Tinton Milling Co., Tinton, S. D.
988. BAILEY, GILBERT E., and RIOTTE, E. N. Harney Peak Tin Mining, Milling and Manufacturing Company.  
1886, New York, pp. 77.  
Reports on the property of the company.

## SOUTH DAKOTA (Continued)

BECK, RICHARD. See No. 1299.

989. BENEDICT, WM. DE L. Prof. Vincent's estimates of possible profits of the Harney Peak tin mines (Dakota).  
Eng. Mg. Journ., Vol. 48, 1889, New York, pp. 358-359.  
A brief review and criticism of Prof. Vincent's report on the mine.
990. ———. Tin in South Dakota.  
Min. Ind. for 1892, Vol. 1, 1893, New York and London, pp. 453-455.  
Short account of the discovery of tin and the early history of development.
991. BLAKE, W(ILLIAM) P. The discovery of tinstone in the Black Hills of Dakota.  
Eng. Mg. Journ., Vol. 36, 1883, New York, pp. 145, 163-164, 344; Vol. 38, August 2, 1884, p. 69.  
Summary: Amer. Journ. Sci., ser. 3, Vol. 26, 1883, New Haven, p. 235. Same material in Min. Res. U. S. for 1883-1884, U. S. Geol. Surv., Washington, D. C., pp. 592-640.  
Reviews occurrence of tin in U. S. Special description of Black Hills occurrence. Notes on foreign occurrences. A good paper.
992. ———. Tin ore of the Etta mine, Dakota.  
Eng. Mg. Journ., Vol. 38, 1884, New York, p. 69.  
An addition to author's article of September of year before. The accompanying minerals are named and briefly described.
993. ———. Columbite and tantalite with the tin ore of the Black Hills.  
Eng. Mg. Journ., Vol. 38, 1884, New York, p. 376.  
Interesting communication explaining the difficulty occasioned by Prof. Schaeffer's analysis of a sample sent to him for examination. It was not sent as tin ore, but as a specimen to be analyzed, the nature of which the superintendent wished to know. It was analyzed as tantalite and from this went abroad the report that there was no tin ore, but tantalite, in the Black Hills.
994. ———. Tin ore in the Black Hills, Dakota.  
Min. Res. of U. S. 1883-1884, U. S. Geol. Surv., 1885, Washington, D. C., pp. 602-613.  
Treated under following subjects:  
The discovery of tin at the Etta mine; geological horizon; development work at the Etta mine; concentric structure of the Etta vein; varieties of ore at the Etta claim; greisen rock carrying tinstone; percentage of tin in the greisen; Bob Ingersoll claim; western slope of Harney range; tin discovered at Dogtown; area of the tin region; stream tin in Dakota. An excellent account of the geology and development of the Black Hills tin district.
995. ———. Tin ore veins in the Black Hills of Dakota.  
Trans. Amer. Inst. Mg. Eng., Vol. 13, 1885, New York, pp. 691-696.  
Digest: Oest. Zeitschr. Berg. Hütt., Vol. 33, 1885, Wien, p. 302.  
Treated under: Structure of the Etta vein; percentage of black tin in the ore; minerals associated with the tin ore; extent of the tin region; contemporaneous origin of the ore and rock.
996. ———. Tantalite and columbite in the Black Hills of Dakota.  
Trans. Amer. Inst. Mg. Eng., Vol. 13, 1885, New York, pp. 696-697.  
"There are two localities where the mineral (tantalite or columbite) is found in the same dike or vein as the cassiterite: (1) at the Etta mine; (2) at the Bob Ingersoll claim."  
Gives observations upon the occurrence of the minerals with the tin ore. States that one mass of columbite or tantalite from the Ingersoll claim weighed approximately, 2000 pounds. (Digest by Cleophas C. O'Harra.)

## SOUTH DAKOTA (Continued)

997. ———. Cassiterite, spodumene and beryl in the Black Hills, Dakota.  
 Amer. Journ. Sci., Vol. 26, 1883, New Haven, p. 235.  
 Brief review: Neues Jahrb. Min., 1885, II (Ref.), Stuttgart, p. 4.  
 A short description of the manner in which tin ore occurs in the Black Hills.
998. CARPENTER, FRANKLIN R. Tin in the Black Hills.  
 Preliminary Report Dakota School of Mines, upon the Geology, Mineral Resources and Mills of the Black Hills of Dakota, 1888, Rapid City, pp. 133-166, figs. 2.  
 The paper is divided into two parts:  
 1. Relating to the Black Hills tin.  
 2. Relating to the subject of tin generally.  
 The occurrence of tin in the Black Hills, including its geology, extent and mode of treatment, also information compiled from the works of others that may be of benefit to the mining prospector and mining companies preparing to work deposits. A number of assays are given.
999. ———. Ore deposits of the Black Hills of Dakota.  
 Trans. Amer. Inst. Mg. Eng., Vol. 17, 1889, New York, pp. 570-598, colored map, fig. 1.  
 Practically same thing in Min. Res. U. S. for 1888, U. S. Geol. Surv. 1890, Washington, D. C., pp. 149-156.  
 General statement of occurrence of tin ore. Mentions presence of mineral autunite. Says that when all three constituents of granite are present no tin is found. Any two get tin. Mentions galena, graphite, barite, ilmenite as accompanying minerals. Thinks both granite and tin are deposited by solutions. Says tin has been found near veins in the country rock. Not very reliable paper.—L. C. Graton.
1000. ———. Tin in the Black Hills.  
 In Pa-Ila-Sa-Poh, or the Black Hills of South Dakota, by Rosen, Peter, 1895, St. Louis, pp. 630-645.  
 Gives an account of the discovery, the occurrence and character of the veins and the accompanying minerals, and likens the veins to those of Zinnwald.
1001. ———. Tin in the Black Hills, South Dakota.  
 Mg. World, Vol. 25, 1906, Chicago, pp. 600-601. Sketch showing formation of the Black Hills' tin deposits.  
 The writer believes with increased price of tin and improvements in mining machinery, that tin mining in Black Hills will yet be an industry that will rank second to gold mining of that section.
- CARPENTER, F. R., and HEADDEN, W. P. See No. 1466.
1002. CHANCE, H. M. Resources of the Black Hills and Big Horn Country, Wyoming.  
 Trans. Amer. Inst. Mg. Eng., Vol. 19, 1891, New York, pp. 49-58. Read New York meeting September, 1890.  
 Gives result of an examination made in 1887-1888 of the country lying between the Black Hills and Big Horn Mountains. Refers briefly to the structure, resources and scenery of the Hills. Thinks there will be a considerable output of tin from the southern hills, especially from about Custer City.
1003. CLAYPOLE, E. W. Tin islands of the northwest.  
 Amer. Geol., Vol. 9, 1892, Minneapolis, pp. 228-236.  
 Detailed account of geologic history of Black Hills with only short space devoted to tin. Thinks granite masses are segregated veins, since they conform with the schists.
1004. DAY, DAVID T. Tin.  
 Min. Res. U. S. for 1887, U. S. Geol. Surv., 1888, Washington, D. C., pp. 134-137.

## SOUTH DAKOTA (Continued)

A review of work done and tin mines opened in the Black Hills, Dakota. "Cleveland" mine was selected for heaviest operations. Hoisting plant and suitable buildings have been erected. Three tons of stream tin and 250 pounds of metallic tin have been shipped.

## 1005. ———. Dakota tin mines.

Min. Res. U. S. for 1888, U. S. Geol. Surv., 1890, Washington, D. C., pp. 144-156.

Review: Neues Jahrb. Min., 1891, 11 (Ref.), Stuttgart, 237-238.

Present outlook reported as very encouraging. Character of veins; analyses of cassiterite from veins; percentage of black tin in the rock; treatment of the ore; yield of metallic tin.

## 1006. EMMENS, STEPHEN H. Tin in South Dakota.

Eng. News Amer. Railw. Journ., Vol. 28, 1892, New York, pp. 298-300.

Author gives what seems to be a careful and apparently unprejudiced statement concerning the South Dakota tin.

## 1007. GARRISON, F. LYNWOOD. Tin in the Black Hills.

Eng. Mg. Journ., Vol. 78, 1904, New York, p. 830.

Review of work done.

Geology of the district.

## 1008. HEADDEN, WM. P. Notes upon the history of the discovery and occurrence of tin ores in the Black Hills of South Dakota.

Proc. Colorado Sci. Soc., Vol. 3, 1890, Denver, pp. 347-350.

A good article upon the general geology of the deposits. Thinks there are two kinds of deposits: (1) original in the granites; (2) secondary in quartz veins. Says the granite (i. e. pegmatite) is pre-Cambrian.

"States that the earliest identification of tin from the Black Hills was in 1876 by Mr. Richard Pearce of Denver, Colo., who detected cassiterite as stream tin in gold dust from the Northern Hills. The second discovery was made on Elk Gulch, southern section, in April, 1877. The material from the latter place was assayed by Theo. Vosburg, but the true nature of the bullion was first recognized by Mr. Fred J. Cross. Dates of various other discoveries and remarks on the general geology of the region are also given." (Digest by Cleophas C. O'Harra.)

———. See No. 1616.

## 1009. HESS, FRANK L. Tin, tungsten and tantalum deposits of South Dakota.

U. S. Geol. Surv. Bull., 380, 1909, Washington, D. C., pp. 131-163, text fig. 1.

Abstract: Mg. World, Vol. 31, 1909, Chicago, pp. 457-460.

Cassiterite occurs in the southern Black Hills in pegmatite dikes and in quartz veins. The quartz veins also carry important amounts of wolframite which sometimes forms beautiful intergrowths with light colored cassiterite. Many other minerals occur in the pegmatites with the cassiterite, including spodumene, amblygonite, lepidolite, apatite, tantalite, columbite, pyrite, arsenopyrite, chalcopyrite, tourmaline, etc., but there is little or no fluorite, topaz, or axinite. The dikes which carry most tin are the finer-grained and carry the least number of accessory minerals. The quartz veins are probably a later phase of the same intrusions which formed the pegmatites, and the two grade into each other.

In the northern Black Hills, at Tinton, tin occurs in pegmatites, similar to those in the southern Hills, but with fewer accessory minerals.

HOFMAN, HEINRICH O. See No. 1506.

## 1010. IRVING, JOHN DUER. Economic resources of the Northern Black Hills.

U. S. Geol. Surv., Prof. Paper No. 26, 1904, Washington, D. C., pp. 95-97.

## SOUTH DAKOTA (Continued)

Gives a short history of the discovery of tin in the Black Hills and the efforts to mine it. States that cassiterite occurs at Nigger Hill in Cambrian pegmatitic granite which is an inclusion in Tertiary acid porphyry. Columbite, tantalite, tourmaline, and wolframite accompany the cassiterite. The cassiterite is irregularly distributed through the granite, and may possibly be mined on a small scale at a profit.

Says topaz accompanies stream tin in the creeks of the area.

## 1011. ———. The ore deposits of the Northern Black Hills.

Mg. Rep. Vol. 50, 1904, Denver, pp. 430-431.

Some tin occurs in the Algonkian schists. "The tin ore also occurs in placers as stream gravels, derived from disintegration of the country rock containing tin. The cassiterite in these gravels is but little rounded and differs in its black color from the reddish brown type of stream tin." See No. 1010.

## 1012. M——, H. Tin mines in the Black Hills of Dakota.

Mg. Journ. Railw. Comm. Gaz., Vol. 61, 1891, London, p. 694.

Extracts from report of English Consul at Chicago. Speaks of tin outlook as very encouraging from various reports of experts. Describes deposits chief of which are found in Custer and Pennington counties, as veins, varying from a foot to more than 300 feet in width, and in length from a few yards to 5 miles. Outcrops are from a few feet to 150 feet above surface. Abundant fuel at hand.

## 1013. MORSE, ARTHUR J. The Harney Peak tin mines.

Eng. Mg. Journ. Vol. 58, 1894, New York, p. 463.

Summary of surface developments. Says surface indications are not borne out in depth. Describes and gives illustration of pinching out of "greisen" band, and says quartz veins do the same.

## 1014. O'HARRA, CLEOPHAS C. The mineral wealth of the Black Hills (South Dakota). Tin.

South Dakota, Geol. Surv. Bull. No. 3, Mineral Resources of South Dakota, 1902, Vermillion, pp. 62-67.

Gives a general sketch of the geology of the Black Hills and describes the occurrence of the minerals.

ROSEN, PETER. See No. 1000.

## 1015. S(TORMS?), W. H. Bear Gulch tin district, South Dakota.

Mg. Sci. Press, Vol. 86, 1903, San Francisco, pp. 198-199.

This district is of unusual interest, as in it occur both mines of gold and tin. The gold miners were greatly hampered in their sluicing, by the abundant occurrence of black sand and small pebbles of high specific gravity which filled riffles and caused loss of gold. About 1880 it was discovered that this sand—at least part of it, was cassiterite. Other minerals of economic importance in this district are, wolframite and columbite-tantalite.

## 1016. SADTLER, B. Gold and tin in Northwestern Black Hills.

Mg. World, Vol. 25, 1906, Chicago, pp. 520-522, sections 5.

Editorial on same: *Ibid.*, p. 517.

Treats of gold and tin bearing districts in Crook Co., Wyoming, and Lawrence Co., South Dakota. "The district shows proper geologic conditions being identical with the historic Deadwood district, with addition of a large belt of tin veins. It is admirably located as regards wood, water and all necessary supplies, as well as being within the reach of railroads. It has exposed and partly developed large bodies of gold and tin ore in vein, and large and quickly available amounts of the same metals in placers, all of pay grade. Incidental to the extraction of the above metals, mica and tungsten form a probable source of income."

## SOUTH DAKOTA (Continued)

1017. SCHAEFFER, CHAS. A. Note on tantalite and other minerals, accompanying the tin ore in the Black Hills.  
 Trans. Amer. Inst. Mg. Eng., Vol. 13, 1884-1885, New York, pp. 231-233.  
 The analysis of some ore from Etta mine which at first seemed like tin ore, but proved to be tantalite. This report caused a great stir among mining men, thinking Prof. Schaeffer intended to show that the supposed tin ore was tantalite. Such was not the case. The specimen sent for examination was not sent as tin ore, but as an unknown ore which proved to be the above-named mineral.
1018. SIMMONS, JESSE. Review of South Dakota mining conditions.  
 Mg. Rep., Vol. 50, 1904, Denver, p. 63, photos 3, 2700 words.  
 "Illustrated description of the Black Hills gold and tin mines. Gives monthly tonnage, treatment and value of the different ores."
1019. ———. Tin mining, metallurgy and geology, Black Hills.  
 Mg. Rev., May 25, 1906, Los Angeles.  
 Not available to the authors.
- 1019a. ———. Tin in the Black Hills of South Dakota.  
 Mg. World, Vol. 30, 1909, Chicago, pp. 925-926, sketch 1.  
 Extract: Mg. Journ. Railw. Comm. Gaz., Vol. 85, 1909, London, p. 703.  
 "A short historical review of tin mining in the Black Hills, with notes on the geology of the district and the operations of the Harney Peak Company."
1020. STRUTHERS, JOSEPH, and PRATT, JOSEPH HYDE. Tin in South Dakota and Wyoming.  
 Min. Res. for 1903, U. S. Geol. Surv., 1904, Washington, D. C., pp. 335-336.  
 A new district has been worked for past two years, located partly in Lawrence Co., South Dakota, and partly in Crook Co., Wyoming. Cassiterite occurs in pegmatite greisen or altered granite, and is generally in the form of coarse granules, although large masses of fine grains of the mineral are found between the schist and porphyry. Ore has averaged 1 per cent of metallic tin, and concentrates have ranged from 62.5 to 65 per cent of metallic tin.
1021. THOMAS, JOSIAH, with notes by J. S. CHILDS. The Harney Peak tin deposits.  
 Eng. Mg. Journ., Vol. 54, 1892, New York, pp. 512-514, 536.  
 Reprint: Mg. Journ. Railw. Comm. Gaz., Vol. 62, 1892, London, pp. 1182-1183.  
 Editorial: pp. 1190-1191.  
 Lodes occur in slate and schists surrounding Harney Peak, which is of granite. In almost all instances lodes or ledges are either vertical or dipping away from the granite. Lodes small but continuous, being from 1 to 3 feet wide composed principally of quartz. Gives description of various workings. No theory as to origin of deposits. Ore will yield 40 pounds of black tin per ton, giving 73 per cent metallic tin.
1022. THURLOW, LORD. The Harney Peak tin properties.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 62, 1892, London, p. 907.  
 Extracts from a report made after visiting deposits, the object of which was to ascertain the amount of development done, inspect machinery, ascertain probable date at which tin production on a commercial scale might begin. Report does not give geographical or geological description.
1023. TODD, J. E. Geology of South Dakota. Tin.  
 South Dakota Geol. Surv. Bull No. 1, a Preliminary Report on the Geology of South Dakota, 1895, Sioux Falls, pp. 149-150, pls. 5, figs. 2, map 1.  
 Analyses of tin ore from veins contains 74.5 to 76.7 per cent tin which is higher than that from other prominent localities.



## SOUTH DAKOTA (Continued)

1024. ULKE, TITUS. A contribution to the geology of Dakota tin mines.

Eng. Mg. Journ., Vol. 53, 1892, New York, p. 547.

Thinks granitic dikes are of igneous origin but says they show little metamorphosing action on the schists. Mentions apatite, triplite, heterosite, triphylite, almandite, wolframite, beryl, sphalerite, cuprocassiterite, graphite. Calls attention to absence of fluorine minerals, hornblende, molybdenite, etc. Tin segregated in pockets or zones with intervening barren places.—L. C. Graton.

———. See No. 1646.

1025. VINCENT, M. C. The tin deposits of Dakota.

Mg. Journ. Railw. Comun. Gaz., Vol. 58, 1888, London, pp. 971-972.

Extracts from a report on the Black Hills deposits. Tin occurs in granite in two distinct forms or types, "1st of the approximately circular or columnar form, where the granite mass stands almost vertical, and 2d, those filling a long narrow, longitudinal rent or fissure." 83 assays of black tin made by author averaged 74.31 per cent metallic tin. Absence of iron, lead, arsenic, and zinc. Description of mines. Author believes that mines will prove productive.

## SPAIN

1026. ANONYMOUS. L'industrie minérale de l'Espagne en 1893.

Rev. Univ. Mines Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 3, Vol. 26, 1894, Paris and Liège, p. 236.

The provinces of Orense, Pontevedra and Coruña are mentioned as tin producing, while that of Salamanca has ceased since 1894 on account of heavy taxation.

1027. ———. Tin in Spain and Portugal.

Min. Ind. for 1897, Vol. 6, 1898, New York and London, p. 641.

According to report of U. S. Consul at Corunna, tin ore has been worked considerably in Galicia during late years. There is a wide tin-bearing belt, which runs from Zamora through a corner of Portugal, through the Province of Orense and from there through Santiago up to the coast, nearly 250 miles.

BECK, RICHARD. See No. 1299.

1028. BORLASE, WILLIAM COPELAND. Tin mining in Spain, past and present.

London (1898), pp. 40, illus. 10, map 1.

Gives a historical sketch and generalized account of tin mining in Spain, with a few references to Portugal. Geology is lightly skimmed. Thinks there is a large quantity of ore in Spain carrying 2½ per cent tin.

BROWN, A. SELWYN. See Nos. 1307 and 1308.

1029. CALDERÓN, D. SALVADOR. La cassiterite y los filones estanníferos de nuestra Península.

Bol. Soc. esp. Hist. Nat., Vol. 1, 1901, Madrid, pp. 231-240.

Digest: Geol. Centr., Vol. 2, 1902, Leipzig, p. 357.

L'auteur donne la bibliographie concernant les filons stannifères depuis 1847 à 1900, et examine les régions stannifères de la Péninsule, qui se groupent en une région principale située dans la Galice et passe en Portugal, et en gisements épars, de peu d'importance.—Choffat.

1030. CALVERT, ALBERT F. Impressions of Spain.

1903 (?) London.

Reviewed: Austr. Mg. Stand., Vol. 31, 1904, Sydney and Melbourne, p. 87.

Tin is mentioned as among the resources of Spain, yet "considerably untouched." Not available to the authors.

## SPAIN (Continued)

1031. COQUEBERT, CH. *Mémoire sur les mines d'Espagne.*  
*Journ. Mines, No. 29, Vol. 5, 1796-1797, Paris, p. 407.*
- 1031a. CORNIDE, JOSEPH D. *Memoria sobre las Minas de Galicia y otras producciones del reyno mineral dirigida al Sr. D. Miguel Bañuelos, su Intendente General.*  
 The work is a folio MS. of 18 pages, in the Biblioteca de la Real Academia de la Historia, Madrid.  
 Noted by W. C. Borlase in *Tin Mining in Spain, Past and Present (1898)*, page 37.
- 1031b. DE CORTÁZAR, DANIEL. *Datos Geologico. Mineros de la Provincias de Zamora y Orense.*  
*Bol. Com. Mapa Geol. España, Vol. 1, 1874, Madrid, pp. 6, 14.*
- D'ACHIARDI, ANTONIO. *See No. 1313.*
- FAWNS, SYDNEY. *See No. 1320.*
- FUCHS, E., and LAUNAY, L. DE. *See No. 1323.*
1032. GARCÍA, MANUEL. *Nota acerca de algunos filones estanníferos de la Provincia de Salamanca.*  
*Bol. Com. Mapa Geol. España, Vol. 3, 1876, Madrid, pp. 91-95.*
1033. GARLAND, JOSEPH. *On certain tin deposits in Galicia, Spain.*  
 56th Ann. Rep. Roy. Cornwall Polyt. Soc. 1888, Falmouth, pp. 54-57, figs. 3.  
 No systematic mining or quarrying has been attempted on these tin deposits. The work has been carried on mainly by agricultural laborers and women and children. The ore occurs in a strata of soil, clay, decomposed shale, sand and pebbles. The soft character of this tin ground would admit of cheap working, the only essential dressing machinery being perhaps washing and sizing trommels and automatic jigs. There can be no doubt that these tin deposits would pay to work on a considerable scale.
1034. GIL Y MAESTRE, AMALIO. *Descripción, física, geológica y minera de la Provincia de Salamanca.*  
*Mem. Com. Mapa Geol. España, 1880, Madrid, pp. 255-261.*  
 At Martinamor veins are in gneiss, at other places they are in Silurian slates, more or less dark, gray, greenish, brown, blue. Veins are principally quartz, carrying tourmaline, wolframite, some arsenopyrite and copper sulphide. Veins running in different directions are without noticeable difference in mineralization. Some greisen dikes carry up to 9 per cent tin. One vein at Terubias gave 25 kilos per cubic metre of 40 per cent tin ore. This vein is 1600 metres long. Some 60 per cent ore was obtained.
1035. HARMONY, JULIO. *The mines of Galicia.*  
*U. S. Consular Reports, No. 197, Vol. 53, Feb. 1897, Washington, D. C., p. 312. (House of Representatives' Document No. 164, pt. 3, 54th Congress, 2d Session.)*
- 1035a. LA ESCOSURA, LUIS DE. *Descripción de las minas de la Provincia de Zamora, 1846.*  
 Not available to the authors.
- LOCK, C. G. WARFORD. *See No. 1338.*
- LOUIS, HENRY. *See No. 1340.*

## SPAIN (Continued)

1036. LOZANO, R. SANCHEZ. Nota referente á varios yacimientos de estaña de la provincia de Pontevedra.  
Bol. Com. Mapa Geol. España, Vol. 28, 1907, Madrid, pp. 14-25.
1037. MALLADA, L. Explicación del mapa geológico de España.  
Mem. Com. Mapa Geol. España, Vol. 1, 1895, Madrid, pp. 173-174, 545-547.
1038. MASSART, ALFRED. Gisements métallifères du district de Carthagène (Espagne).  
Ann. Soc. géol. Belg., Vol. 2, 1875, Liège, pp. 58-107, colored plate 1.  
Wood tin is found in small veins in a schist. The veins lie in the planes of schistosity at the San Isidoro, Marinera and Superior segunda mines. In the last, the vein is in lenticular spongy masses of quartz with some barytes and galena.
1039. PACHECO, HERNANDEZ E. Los filones estanníferos de Cáceres y su comparación con los de otras regiones.  
Bol. Soc. esp. Hist. Nat., Vol. 2, 1902, Madrid, pp. 72-81.  
Digest: Geol. Centr. Vol. 3, 1903, Leipzig, p. 73.  
L'auteur décrit quelques petits filons de cassitérite récemment découverts dans les schistes siluriens de la Montaña de Cáceres, à 5 kilom. de cette capitale. La cassitérite en cristaux simples ou maclés (bee d'étain) est incluse dans un quartz laité, accompagnée d'un fluorure aluminique hydraté que l'auteur rapporte à la fluéllite. Dans les bords des filons il y a une zone constituée par des lamelles de nacrite et souvent d'une bande blanche ou veodâtre de lithomarge qui forme la gangue. Un filon est constituée seulement par du quartz et phosphorite.  
Ces la première fois que la fluéllite est mentionnée en masse considérable.  
Ces filons diffèrent de tous les autres filons stannifères connus en Espagne, étant dépourvus de roches éruptives dans leur voisinage. D'après l'auteur ces filons de Cáceres doivent être envisayés comme alumineux plutôt que comme stannifères.—S. Calderon.
- PHILLIPS, J. A., and LOUIS, H. See No. 1350.
1040. PILZ, R. Die Erzlagerstätten von Cartagena in Spanien.  
Zeitschr. prakt. Geol., Jahr. 16, 1908, Berlin, pp. 177-190, figs. 31-37.  
The principal ore deposits carry argentiferous galena, zinc blende, and pyrite, with secondary cassiterite and limonite; others carry cassiterite and barite.  
The cassiterite is thought to be secondary after stannite.
1041. PUIG Y LARRAZ, D. GABRIEL. Descripción física y geológica de la Provincia de Zamora.  
Mem. Com. Mapa Geol. España, 1883, Madrid, pp. 411-437.  
Tin occurs generally in quartz, sometimes in granite or granulite. Is also found in alluvial deposits. Occurs rather widely. Found in zone of contact of crystalline schists and granite rocks, and is also found in both rocks. Much tourmaline. Some chalcopyrite, cut by veins of lead-antimony sulphides. Rarely found far from eruptives. Veins usually 25 to 50 centimetres wide, rarely 1 metre wide.
1042. SCHUBARTH, E. L. Ueber das Vorkommen von Zinn in Spanien.  
Ann. Physik. Chem., Vol. 86, 1852, Leipzig, p. 600.  
Digest: Neues Jahrb. Min., 1853, Stuttgart, p. 460.
1043. SCHULZ, GUILLAUME, and PAILLETTE, ADRIEN. Notice sur une pyrite stannifère (ballestéosite) et sur quelques gisements d'étain en Espagne.  
Bull. Soc. géol. France, ser. 2, Vol. 7, 1850, Paris, pp. 16-25.  
Abstracts: Neues Jahrb. Min., 1850, Stuttgart, p. 710 and 1851, p. 350; Berg. Hütt. Zeit., Vol. 10, 1851, Leipzig, p. 352.

## SPAIN (Continued)

- 1043a. SCHULZ, DON GUILLERMO. Descripción geognostica de Reino de Galicia, acompañada de un mapa petrográfico de esta país.  
1835, Madrid, pp. 52, pls. 2.  
Abstract: Bull. Soc. géol. France, t. 4, 1835, Paris, pp. 416-418.  
The original is not available to the writers. The abstract which is in the form of a letter written to the Société Géologique de France gives a sketch of the geology of the tin-bearing part of northwestern Spain.
1044. THOMAS, CHARLES. Some Spanish tin deposits.  
Trans. Mg. Ass. Inst. Cornwall, Vol. 2, 1888-1889, Camborne, pp. 66-70.  
Short description of stream tin placers near Ribadavia, Province of Orense, in Galicia.

## SWAZILAND

1045. ANONYMOUS. Tin in South Africa.  
Min. Ind. for 1896, Vol. 5, 1897, New York and London, p. 528.  
Extract from communication of S. Ryan. Describes geology of tin district of Swaziland.
1046. ———. Tin in Swaziland.  
Min. Ind. for 1897, Vol. 6, 1898, New York and London, p. 644.  
According to British Consular Report No. 1996, Annual series, the Ryan Tin Company did a good deal of work in 1896, and in the first six months produced upward of 260 tons of black tin. Machinery has been erected. Great drawback to working tin and coal deposits of territory is lack of transportation facilities.
1047. ———. Tin in South Africa.  
Austr. Mg. Stand., Vol. 29, 1903, Sydney and Melbourne, p. 699.  
" 'S. A. Mines' considers that it is not improbable that South Africa may in the near future, become one of the important tin producing countries of the world.'  
Description of deposits in Swaziland, near Embabaan, and new discoveries in Cape Colony, most important of which has been made on Kuil's River.
- 1047a. ———. Alluvial tin in Swaziland.  
South African Mg. Journ., Vol. 7, pt. 2, 1909, Johannesburg, pp. 115-116.  
Notes from Annual report of the manager of Swaziland Tin, Ltd., which, describing various creeks on which alluvial tin occurs, points out new fields for prospecting, and explains a scheme for hydraulicking or sluicing all the hill creeks.
- BECK, RICHARD. See No. 1299.
1048. HAHN, P. D. Presidential address.  
Rep. South African Ass. Adv. Sci. 1903, Cape Town, p. 43.  
" Another interesting problem for research for the student of mineral chemistry is furnished at the tin ore deposits at Embabaan in Swaziland. Together with tin ore occur at this locality extraordinarily rare and most interesting minerals, such as aeschynite, euxenite, fergusonite and monazite."
1049. HAMPTON, J. H. On the occurrence of tin.  
Trans. Geol. Soc. South Africa, Vol. 4, 1899, Johannesburg, pp. 37-40.  
The tin deposits of Malay Peninsula, Mt. Bischoff and Swaziland, near Embickelweni are treated in a brief manner. The author visited Swaziland in 1889-1890, and at that time received the impression from appearance of the country that tin existed in lode or alluvial form.

## SWAZILAND (Continued)

1050. JORISSEN, E. Notes on some intrusive granites in the Transvaal, the Orange River colony and in Swaziland.  
 Trans. Geol. Soc. South Africa, Vol. 7, 1905, Johannesburg, p. 158. Read December 12, 1904.  
 In East Swaziland near Embabaan, cassiterite occurs in gneiss at the contact of a narrow vein of pegmatite. Much biotite present.
- LOCK, C. G. WARNFORD. See No. 1338.
1051. LYBURN, JOHN. Mining and minerals in the Transvaal and Swaziland.  
 Sci. Proc. Roy. Dublin Soc., n. s., Vol. 9, 1899-1902, Dublin, p. 20.  
 "Alluvial cassiterite occurs in the Embabaan, Swaziland. The mother lode has not yet been discovered."
1052. MOLENGRAAFF, G. A. F. Tinstone in Swaziland. Report of the State geologist of the South African Republic for the year 1897.  
 Trans. Geol. Soc. South Africa, Vol. 4, pt. 6, 1898, Johannesburg, pp. 141-144.  
 Abstract: Zeitschr. prakt. Geol., Vol. 8, 1900, Berlin, pp. 146-147.  
 Digest: Neues Jahrb. Min., 1900, I (Ref.), Stuttgart, pp. 263-265.  
 The Ryan tin works near Embabaan in the northeast part of Swaziland, are the only important deposits of the country.  $\text{SnO}_2$  occurs in pegmatite dikes cutting granite near the contact of the latter with various schists, and in placers derived from the dikes, accompanied by corundum, monazite, magnetite, etc. Crystals of cassiterite are so distorted as to appear monoclinic. Does not think the outlook good for very large placers.
1053. NEWLAND, D. H. Tin in South Africa.  
 Min. Ind. for 1903, Vol. 12, 1904, New York and London, p. 332.  
 Discovery of lode tin in the Transvaal was reported in August, 1903. Principal formation is granite, which is overlain in places by schistose rocks, and the tin-bearing veins occur near the contact. Three lodes have been discovered.
1054. PRIOR, G. L. Minerals from Swaziland: niobates and titanates of the rare earths, chemically allied to euxenite and fergusonite; cassiterite, monazite, etc. The "Aeschnyrite from Hitterö."  
 Min. Mag. Journ. Min. Soc., Vol. 12, 1899, London, pp. 96-101.  
 Digest: Neues Jahrb. Min., 1901, I (Ref.), Stuttgart, p. 31.
1055. RYAN, —. Swaziland tin fields.  
 Proc. Chem. Met. Soc. South Africa, Vol. 2, 1897, Johannesburg, pp. 16-18.  
 Tin fields along Embabaan River on eastern slope of Drakensberg Mountains, 15 miles from Transvaal border were discovered by Mr. Ryan in 1891. Geology: "Granite boss flanked by metamorphic rocks intersected by elvan dykes, diorite and rhyolite." From January, 1894, to June, 1896, exported about 600 tons of ore. Deposits mostly alluvial, average thickness of beds  $4\frac{1}{2}$  feet, though on Lower Embabaan and Usutu rivers, beds of considerable thickness are being found.
1056. SMUTS, —. Report on the trade, commerce and general condition of Swaziland.  
 British Consular Rep., No. 1996, 1897, London, p. 3.  
 The Ryan Tin Company has done a good deal of work during 1896. First 6 months, by sluicing process, upwards of 260 tons of tin were produced, valued at about £45 sterling per ton. During latter half of year, about 20,000 tons of tin-bearing gravel was exposed. Tin reefs have been discovered, and further prospecting is being undertaken.

## SWEDEN

DAVIES, D. C. *See* No. 1317.

## TASMANIA

1057. ANONYMOUS. Report on Mount Bischoff tin mines, Tasmania, with topographical sketch map.  
1874, Launceston, Svo., pp. 5.  
Not available to the authors.
1058. ———. Tin from Tasmania.  
Iron, Vol. 6, n. s., 1875, London, p. 42.  
Announcing the first shipment of tin to England. Assayed 99.96 pure tin, superior to Australian tin. Shipment for the year probably not over 300 tons.
1059. ———. Tasmanian tin.  
Iron, Vol. 6, n. s., 1875, London, p. 711.  
A short review of a report by Mr. Newman, on the Mount Bischoff, Cummings and Henry, Stanhope and Waratah mines.
1060. ———. Tin fields of Tasmania.  
Mg. World, Eng. Rec., Vol. 14, 1878, London, p. 649.  
Not available to the authors.
1061. ———. The greatest tin mine in the Southern Hemisphere.  
Austr. Mg. Stand. September, 1896, Sydney and Melbourne.  
Description, with illustration, of the Mount Bischoff Mine, Tasmania.  
Not available to the authors.
1062. ———. Tin in Tasmania.  
Min. Ind. for 1898, Vol. 7, 1899, New York and London, p. 712.  
Mt. Bischoff continued to be largest producer. Tin ore is also found in the Ringarooma Valley at Branxholm, Derby, Moorina, Pioneer and Mt. Cameron, where the Brothers' Home, Briseis, Brothers' Home No. 1, Arba and Armuz mines are situated. The east coast deposits have been proved to be extensive, and a discovery of tin ore on the Great Mussel Roe River has recently been reported.
1063. ———. Mt. Bischoff tin mine.  
Mg. Sci. Press, Vol. 81, 1900, San Francisco, p. 431.  
Note stating Mt. Bischoff tin mine contains perhaps most remarkable tin deposit in the world. Average grade of ore is 3 per cent. The concentrates average about 70 per cent tin, yielding an average of 68 per cent in smelting.
1064. ———. Tin in Tasmania.  
Min. Ind. for 1899, Vol. 8, 1900, New York and London, pp. 622-623.  
The working expenses of Mt. Bischoff mine given. Gives a short account of the Briseis mine. A new discovery of tin at Renison Bell mine at North Dundas, on the west coast is reported. Tin was found in schist near Mt. Lyell.
1065. ———. Tin in Tasmania.  
Min. Ind. for 1900, Vol. 9, 1901, New York and London, pp. 638.  
Tasmania is largest producer of tin in Australia, output for 1899 amounting to 3281 long tons of ore, valued at £270,864. A large part of the ore is obtained from alluvial deposits, the lodes, except at Mt. Bischoff mine, have received little attention.

## TASMANIA (Continued)

1066. ———. Tin mining in Tasmania.  
 Austr. Mg. Stand., Vol. 20, August 15, 1901, Sydney and Melbourne.  
 "Describes the alluvial deposits at Mt. Bischoff."  
 Not available to the authors.
1067. ———. Tin in Tasmania.  
 Min. Ind. for 1901, Vol. 10, 1902, New York and London, p. 640.  
 The output of tin ore was less in 1901 than in the preceding year. This unexpected result being due principally to the poorer quality of the ore raised from the Mt. Bischoff mines, the most productive in the State.
1068. ———. Heemskirk (T.), tin find.  
 Austr. Mg. Stand., Vol. 21, 1902, Sydney and Melbourne, p. 665.  
 An account of a "rich find of lode tin on the Orient farm," about nine miles from Zeehan T. Outlook is said to be good.
1069. ———. Tin in Tasmania.  
 Min. Ind. for 1902, Vol. 2, 1903, New York and London, p. 504.  
 Mt. Bischoff Tin Mining Company in the last six months of the fiscal year crushed 50,044 tons of stone for a yield of 636 tons of concentrates. The cost of mining, crushing and dressing was 5s. 7d. per ton. During year the company earned profits of £62,612 and distributed dividends of £54,000.
1070. ———. The Pioneer tin mine, Tasmania.  
 Austr. Mg. Stand., Vol. 20, 1903, Sydney and Melbourne, pp. 13-15, 49-50. Serial. Illus.  
 Description of the deposits of northeast Tasmania, with some details of the history and difficulties in working (from a financial standpoint), and methods and machinery used.
1071. ———. Northeast Dundas [Tasmania] tin.  
 Austr. Mg. Stand., Vol. 31, 1904, Sydney and Melbourne, pp. 810-811, 1300 words.  
 "Describes the deposits of this district, and work done in developing."
1072. ———. Mining in Tasmania.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 27, 1000 words.  
 Digest from Mg. Mag., Vol. 10, 1904, New York, p. 154.  
 "Recent news of the condition of Tasmanian mines; gold, tin and copper, with estimates of reserves at Mount Lyell."
1073. ———. Tasmania tin fields.  
 Min. Ind. for 1904, Vol. 13, 1905, New York and London, pp. 392-393.  
 "The cassiterite of Mt. Bischoff is associated with topaz, both crystalline and amorphous, in large dikes of an acidic porphyritic rock penetrating slate and sandstone. The topaz has replaced feldspar, the rock containing no alkali, and consisting practically of quartz and topaz. It is comparable to the Saxon 'sneckenstein,' a topaz quartz-porphyr."   
 Gives a résumé of tin mining in Tasmania during 1904.
- BECK, RICHARD. See No. 1299.
1074. BENEDICT, WM. DE L. Tin in Tasmania.  
 Min. Ind. for 1892, Vol. 1, 1893, New York, pp. 444-445.  
 "Tin ore was found in Tasmania at an early date in the history of the colony, but it was not until 1872 that the great Mt. Bischoff property was discovered. . . . The tin is found in what is termed euritic porphyry and the most productive portions of the deposit are situated close to the porphyry and slate."  
 The next district in importance is Ringarooma. The deposits at this place appear to be the bed of an ancient river running nearly north and south and are covered by a crust of basalt.

## TASMANIA (Continued)

1075. BONWICK, JAMES. Tasmanian tin.  
Mg. Journ. Railw. Comm. Gaz., Vol. 44, 1874, London, p. 331.  
Brief description of the lode and alluvial tin deposits at Mount Bischoff.
- BROWN, A. SELWYN. See Nos. 1307 and 1308.
1076. CLARK, DONALD. Tasmanian mining and metallurgy.  
Austr. Mg. Stand., Vol. 29, from March 12 to April 16, 1903, Sydney and Melbourne, pp. 362-363, 398-400, 432-435, 462-463, 496-498, 528-530.  
A series of articles which deal with tin mining and smelting in Tasmania.
- 1076a. ———. Australian mining and metallurgy.  
1904, Melbourne, Sydney and Perth, pp. 185-228, pls. 7, figs. 13.  
Describes the geology, mining methods and milling methods at the Mt. Bischoff, Anchor, Cornwall, and Maynes tin mines. All are located in Tasmania.
1077. COGHILAN, T. A. Tin.  
A statistical account of Australia and New Zealand, 1903-1904, p. 934.
1078. CONDER, HARTWELL. Tin mining in Tasmania.  
Mg. Journ. Railw. Comm. Gaz., Vol. 78, 1905, London, p. 350, 1800 words.  
Reviews briefly the history, and describes present conditions of tin mining in Tasmania.
- 1078a. ———. Stanley River tin field.  
Austr. Mg. Stand., Vol. 41, 1909, Sydney and Melbourne, p. 637, map 1.  
The Stanley River tin field is 20 miles north of Zeehan, Tasmania, on the west coast. A road has just been finished which makes it accessible. Country rocks are quartzites and clay-stones cut by porphyritic granite. Porphyritic feldspars in many places have been replaced by green tourmaline and this, in turn, partly replaced by SnO<sub>2</sub>. One tourmaline-quartz lode 16 feet wide carries 2 per cent tin. Boulders in river are probably worth working. Wolframite and monazite form impurities in the stream tin. Notes the occurrence of pyrrhotite carrying a "small proportion of Cu and Ni." Map gives geology, claims and owners.  
Gives some objections to the government's system of renting claims.
1079. COUNSEL, E. A., Surveyor General. Sketch map, general geological features of Tasmania.  
Government Printing Department, January, 1898, Hobart. Lithograph, hachured. 1 inch=15 miles.  
Geological features in colors. Gold, tin, silver and lead, bismuth, antimony, copper, iron, and coal deposits shown by characters.
- D'ACHIARDI, ANTONIO. See No. 1313.
1080. DAVEY, JOHN. Mount Bischoff tin mines.  
Rep. Proc. Min. Ass. Cornwall and Devon, for 1881 (1882), Truro, pp. 8-10.  
Extract from a letter dated May, 1881. Geographical description of the tin-bearing country; manner of occurrence and working; percentage of yield; loss of ore in dressing.
- DAVIES, D. C. See No. 1317.
1081. DIJK, P. VAN. Tinontginning in Tasmanië.  
Jaarb. Mijnw. Ned. Oost-Indië, 1882, II, Amsterdam, pp. 91-101.
1082. ———. Tinontginning in Tasmanië.  
Jaarb. Mijnw. Ned. Oost-Indië, 1883, II, Amsterdam, pp. 109-114.



## TASMANIA (Continued)

ENGLISH, A. G. *See* No. 50.

## 1083. FAWNS, SYDNEY. Notes on the Mount Bischoff tin mine.

Trans. Inst. Mg. Met., Vol. 14, 1905, London, pp. 221-228. Discussion, pp. 229-243.

Contributed remarks, pp. 244-249.

Abstracts: Mg. Journ. Railw. Comm. Gaz., Vol. 77, 1905, London, p. 62. Eng. Mg. Journ., Vol. 79, 1905, New York, pp. 470-471.

Digest: Min. Mag., Vol. 11, 1905, New York, pp. 355-357.

Gives short history of mine; says tin occurs in veins and replacement deposits in topaz porphyry. Briefly describes the Queen and North Valley lodes, Don and Stanhope sections, the White, Brown, Slaughter-yard, and Alluvial North faces. Gives a list of minerals and rocks occurring with the deposits. Most of the paper is devoted to the working system and costs.

## 1084. ———. Mount Bischoff and Dolcoath.

Mg. Journ. Railw. Comm. Gaz., Vol. 77, 1905, London, p. 297.

A letter comparing some of the modes of working.

———. *See* No. 1320.

## 1085. FIRCKS, F. W. VON. Die Zinnerzlagertstätten des Mt. Bischoff in Tasmanien.

Zeitschr. deutsch. geol. Ges., Vol. 51, 1899, Berlin, pp. 431-434, pls. 27-28.

Digest: Neues Jahrb. Min., 1901, I (Ref.), Stuttgart, pp. 423-425.

## 1086. GOULD, CHAS. A note upon a recent discovery of tin ore in Tasmania.

Quart. Journ. Geol. Soc. London, Vol. 31, 1875, London, pp. 109-110.

Digest: Geol. Rec. for 1875, London, p. 242.

"Ore is not 'stream tin' in true sense of the word; but the disintegration of veins and strings running through the porphyritic rock, of which the mount is composed, gives rise to a shallow surface-drift from which the tin-ore is procured. Lodes in adjacent slaty rocks contain antimony and zinc blende." (Mt. Bischoff.)

## 1087. GRANT, H. Tasmanian tin deposits.

Austr. Mg. Stand., November 17, 1898, Sydney and Melbourne.

"The history of the tin mining on the Blue Tier formations."

Not available to the authors.

## 1088. ———. The Blue Tier [Tasmania] tin dykes.

Austr. Mg. Stand., Vol. 17, 1900, Sydney, p. 151.

"Information concerning this important discovery and the working of the deposits."

## 1089. ———. Tasmanian tin fields. (I) The Blue Tier, East Coast, The Moon and Lottah claims. (II) The Echo Mine.

Austr. Mg. Stand., Vol. 18, 1900, Sydney, pp. 277-278, 551-552.

Description of Blue Tier and Echo mines on the East Coast; their possibilities, difficulties encountered and outlook.

## 1090. ———. Mining in Eastern Tasmania.

Austr. Mg. Stand. Vol. 19, 1901, Sydney and Melbourne, pp. 667-668, 3500 words.

"An account of the tin mining, the deposits and their development."

## 1091. ———. Brookstead tin field.

Austr. Mg. Stand., Vol. 35, 1906, Sydney and Melbourne, 2000 words.

"A review of the development of the Brookstead lode, in northeastern Tasmania, showing the richness of the field, and the importance of thorough prospecting."

## TASMANIA (Continued)

1092. GREGORY, J. W. The geological plans of some Australian mining fields. Science Progress, No. 1, 1906, London, pp. 117-136.  
Describes among others the Mt. Bischoff mine, the character of the ore in the different faces, and the metamorphism of the rocks.
1093. GRODDECK, A. VON. Zur Kenntniss der Zinnerzlagerstätte des Mount Bischoff in Tasmanien. Zeitschr. deutsch. geol. Ges., Vol. 36, 1884, Berlin, pp. 642-652. Translated by Thureau, G. in Pap. Proc. Roy. Soc. Tasmania, for 1885 [1886], Hobart, pp. 388-394. Reviewed: Neues Jahrb. Min., 1885, II (Ref.), Stuttgart, pp. 91-92.  
Continuation of original article, Zeitschr. deutsch. geol. Ges., Vol. 38, 1886, Berlin, pp. 370-375. Translated by Wolfhagen in Pap. Proc. Roy. Soc. Tasmania for 1886 [1887], Hobart, pp. 189-193.  
Continuation of original article. Zeitschr. deutsch. geol. Ges., Vol. 39, 1887, Berlin, pp. 78-87.  
Reviewed in Neues Jahrb. Min., 1888, I (Ref.) Stuttgart, pp. 86-87.
1094. HAMPTON, J. On the occurrence of tin. Trans. Geol. Soc. South Africa, Vol. 4, 1899, Johannesburg, pp. 37-40.  
The tin mine at Mt. Bischoff, discovered 1872, was visited by author in 1883. Tin bearing rock was 100 feet wide. Largest tin deposit yet discovered. It is at considerable elevation from the sea, where neither pumping nor hauling machinery are required.
1095. HARCOURT-SMITH, J. Report on the Shepherd and Murphy's tin mine, Bell Mount. Rep. Sec. Min., Tasmania, for 1896-1897 (1897), Hobart, pp. lv-lvi.  
This property is situated 22 miles southwest from Sheffield, at an elevation of about 2000 feet above sea level. Lodes 1 to 6 are described, and the work done, with results obtained. The company will attempt to separate tungsten and bismuth as well as the tin contents.
- See also No. 1148.
- 1095a. ———. The mineral industry of Tasmania. See Tasmania, Government Geologist, No. 1134.
1096. HUNT, JOHN. Mount Bischoff tin mines, Tasmania. Mg. Journ. Railw. Comm. Gaz., Vol. 44, 1874, London, p. 207.  
Very general; unimportant.
1097. ———. On mining in Tasmania. Mg. Journ. Railw. Comm. Gaz., Vol. 45, 1875, London, pp. 539-540.  
Thinks the deposit of tin at Mount Bischoff is not of volcanic origin. Believes the greater part of alluvial tin is derived from decomposition of granitic rocks.
1098. IRELAND, MARK. A method of timbering at the Mt. Rex tin mine, Ben Lomond, Tasmania. Trans. Austr. Inst. Mg. Eng., Vol. 10, 1905, Melbourne, pp. 263-264.  
Short article giving method of timbering which is of such a character that no blasting, however heavy, can injure it.
1099. JOHNSTON, R. W. Geology of Tasmania. 1888, Hobart, pp. 22-29.  
Description of tin lodes, mode of occurrence, distribution, discovery and derivation. Age of superficial gravels discussed.

## TASMANIA (Continued)

1100. KAYSER, H. W. F. Tin mining in Tasmania.  
 Trans. Fed. Inst. Mg. Eng., Vol. 13, 1897, London and Newcastle-upon-Tyne, pp. 570-582, pl. 24, map (1 inch=1125 feet).  
 Abstract: Ind. and Iron, June 11, 1897, London.  
 A review of the mining industry of Tasmania. Discovery, difficulties and results of early tin mining. The writer was connected with Mt. Bischoff Mining Company more than 21 years, and that mine is treated at some length.
1101. ———. The Mount Bischoff tin mining company, registered.  
 Ann. Rep. School Mines Zeehan, Tasmania, for 1905, pp. 96-98, pls. 2.  
 Gives very briefly a history of the mine, its geology and method of working. Also description of milling plant, and the profits paid.
1102. KAYSER, H. W., and PROVIS, RICHARD. Mt. Bischoff tin mine, Tasmania.  
 Proc. Inst. Civ. Eng., Vol. 123, 1896, London, pp. 377-387, figs. 8. Abridged.  
 Ore in large veins averages 2 to 3 per cent cassiterite. Cost of mining and delivering ore to dressing works is 3s. 2½d. or 80 cents per ton of 2240 pounds. Cost of dressing is 1s. 1¼d., or say 27 cents per ton, about 6000 long tons of material being treated per month. First grade concentrates average 70.5 per cent tin. Second grade concentrates average 65 per cent tin; does not pay to dress cleaner than this.
1103. KLOCKMANN, F. Ueber den Antheil von Groddeck's an der Deutung der Zinnerzlagerstätte des Mt. Bischoff.  
 Zeitschr. deutsch. geol. Ges., Vol. 52, 1900, Berlin, pp. 167-168.  
 Digest: Neues Jahr. Min., 1903, I (Ref.), Stuttgart, p. 91.  
 Digest: Geol. Centr. Vol. I, 1901, Leipzig, p. 228.  
 W. von Fricks äusserte in einem Aufsätze über die Zinnerzlagerstätten des Mt. Bischoff in Tasmanien (Zeitschr. deutsch. geol. Ges., Vol. 51, 1899, Berlin, p. 431), dass v. Groddeck die Zinnführenden Gesteine dieses Berges für ursprünglich und nicht für pseudomorph erklärt habe. Verf. weist dagegen aus zwei Nachträgen v. Groddeck's, Arbeiten, die v. Fricks anscheinend übersehen hat, nach, dass v. Gr. bereits sich mit aller Bestimmtheit für die pseudomorphe Entstehung der Erzlagerstätten des Mt. Bischoff ausgesprochen hat.
- LATTA, GEO. J. See No. 1517.
1104. LEWIS, JAMES B. The New Brothers' Home No. 1 Tin Mining Company, Derby.  
 Rep. Secr. for Mines, Tasmania, 1902-1903 (1903), Hobart, pp. XC1X-C11, pls. 2.  
 Abstract: Eng. Mg. Journ., Vol. 75, 1903, New York, pp. 815-816.  
 A description of the manner in which overburden is removed.
1105. ———. The Anchor tin mine, Tasmania.  
 Eng. Mg. Journ., Vol. 81, 1906, New York, p. 1249.  
 A communication giving a brief analysis of working cost for low grade tin ore. They are working profitably on a yield of 5 pounds black tin per ton, or 3.5 pounds metallic tin.
1106. ———. Tin mining in Tasmania.  
 Eng. Mg. Journ., Vol. 85, 1908, New York, pp. 485-489; pls. 3, map 1.  
 Commercial conditions at the Mount Bischoff, Heenskirck, Brookstead, Avoca, Briseis and Pioneer mines are described.  
 Gives a few notes upon dredging for tin in Tasmania, and refers to tin mining operations in the Gladstone District. The article has evidently been edited and abridged, not altogether to its advantage.
- LOCK, C. G. WARNFORD. See No. 1338.

## TASMANIA (Continued)

LOUIS, HENRY. *See* No. 1340.

———. *See* No. 1525.

1107. MEREDITH, C. Verbal remarks on specimens of tin ore from Mount Bischoff, Tasmania.

Pap. Proc. Roy. Soc. Tasmania [monthly notices—June], 1873 [1874], Hobart, p. 21.

Not available to the authors.

- 1107a. MILLEN, J. D. Mount Bischoff tin mining company, Tasmania.

Austr. Mg. Stand., Vol. 41, Nos. 1061, 1062, 1900, Sydney and Melbourne, pp. 264, 293-294. Illus. (In section of Electrical Record, Vol. 19.)

"A description of the hydro-electric power plant, its equipment and operation."

———. *See* No. 1535.

1108. MONTGOMERY, ALEX. The Blue Tier tin field.

Geol. Surv. Rep. Tasmania, November, 1889, Hobart.

Not available to the authors.

1109. ———. The tin mines at the Blue Tier, county of Dorset.

Geol. Surv. Rep. Tasmania, January, 1903, Hobart.

Not available to the authors.

1110. MONTGOMERY, ALEXANDER. The mineral resources of Tasmania.

1894, Hobart, pp. 3-28.

Tasmania is the third largest tin producer in the world, the value of tin ore raised being greater than all the other minerals of Tasmania put together. The tin deposits may be grouped as: (1) Alluvial. (2) Lodes or veins. (3) Impregnations or stockworks. The veins occur in districts which are composed almost entirely of granite or of sedimentary rocks penetrated by quartz-porphphyry dikes. Vein or lode mining has not yet been very successful in Tasmania. Stockworks or impregnations of tin ore, found in several localities are likely to be of very great importance. Mt. Bischoff mine shows a curious combination of all the different types of tin deposits.

1111. ———. The mineral industry of Tasmania.

Eng. Mg. Journ., Vol. 57, 1894, New York, p. 389.

Good general description of tin deposits. Principal alluvial workings in northeast part of Tasmania, along Ringarooma and George's rivers and their tributaries. Deposits of different ages, miocene to recent. Some of older drifts covered by basalt and worked by underground mining, but most is obtained from shallow workings by ground sluicing. The ore which has been easily worked is about all taken out. Hydraulicizing larger and poorer deposits. Thinks they will last for a century.

1112. ———. Report on the progress of the mineral fields in the neighborhood of Zeehan, viz.: Mackintosh River, Mount Black, Mount Read, Mount Dundas, Mount Zeehan, Stanley River and Mount Heemskirk.

Rep. Sec. Min. Journ. and Printed Papers of the Parliament of Tasmania. Vol. 33, 1895, Hobart, pp. VII-LI.

Not available to the authors.

1113. ———. The useful minerals of Tasmania.

Trans. Austr. Inst. Mg. Eng., Vol. 3, 1895, Adelaide, pp. 224-229.

The tin deposits of Tasmania are classed as alluvial, fissure lodes and stockworks, and impregnations. Examples of these types may be found at different mines, while at Mt. Bischoff the deposit is unusual, presenting almost all of these known types. The ore is practically confined to the granite regions and their immediate vicinity.

## TASMANIA (Continued)

1114. MOORE, T. On the occurrence of tin, zinc, silver, and traces of gold in the killas of St. Paul's Plains.  
Pap. Proc. Roy. Soc. Van Diemen's Land, Vol. 2, pt. 3, 1854, Tasmania, p. 490.
1115. MUFFORD, J. Tasmanian tin fields.  
Mg. Journ. Railw. Comm. Gaz., Vol. 47, 1877, London, pp. 1383, 1411, 1439; Vol. 48, 1878, pp. 19, 48, 183.  
A series of six articles, describing the country surrounding the tin-bearing districts, the deposits, methods of working and output. The output of Mount Bischoff from 1873-1877, given.
1116. ———. The tin mines of Tasmania.  
Mg. Journ. Railw. Comm. Gaz., Vol. 48, 1878, London, p. 483.  
Extract of paper read before Mining Institute of Cornwall, 1878, with discussion. Gives output of Tasmania for first half of 1878 and estimates whole output for the year. All derived from alluvial washings. Gives descriptions of the tin bearing districts. Believes Tasmanian mines have reached their highest production.
1117. NEWMAN (——). Tasmanian tin.  
Iron, Vol. 6, 1875, London, p. 711.  
Extract of a report by author on the Mount Bischoff tin mines.
1118. PETTERD, W. F. Minerals of Tasmania. Cassiterite.  
Pap. Proc. Roy. Soc. Tasmania, 1893 [1894], Hobart, pp. 20-23.  
Describes the different varieties of cassiterite found in Tasmania, where found and the principal tin-producing localities. Gives the production to close of 1892.
1119. ———. Catalogue of the minerals of Tasmania.  
1896, Launceston.  
Stannite occurs in considerable quantity in the Silver Queen mine at Zeehan, associated with galena, copper, and iron pyrites. The stannite is gold and silver bearing.
1120. ———. The minerals of Tasmania.  
Pap. Proc. Roy. Soc., Tasmania for 1900-1901 (1902), Hobart, pp. 75-84.  
A short article reviewing the mineralogy of the island in a concise manner.
1121. ———. Notes on Tasmanian minerals.  
Rep. Sec. Min. for 1903, Tasmania, 1904, Hobart, pp. 74-75.  
Abstract: Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 475.  
Description of unusual tin specimens from several Tasmanian mines.
- PHILLIPS, J. A., and LOUIS, H. See No. 1350.
- 1121a. PLUMMER, JOHN. Australia's premier tin mine.  
Mg. Sci. Press, Vol. 100, 1910, San Francisco, p. 820.  
Brief account of the dividends paid by Mount Bischoff tin mine, and the outlook for future productiveness.
1122. RANFT, THEOD. Der Zinnbergbau am Bischoffsberge, Tasmania.  
Berg. Hütt. Zeit., Vol. 48, 1889, Leipzig, pp. 351-353.  
Brief digest: Neues Jahrb. Min., 1891, II [Ref.], Stuttgart, p. 295.  
Short historical notices upon the growth of mining at Mt. Bischoff, the tin-ore occurrences of which have become better known through von Groddeck, also a sketch of the geological relations and technical operations.

## TASMANIA (Continued)

1123. RATH, M. J. VON. Eine topographisch-montanistische Karte des Mount Bischoff auf Tasmanien.  
Verh. Nat. Ver. preuss. Rheinl. Westph. (Sitzungsberichte), Vol. 35, 1878, Bonn, p. 7.
1124. REPORT of the Secretary for Mines, Tasmania.  
Hobart.  
Contains reports of the mining industry, progress and development work. Issued annually for the preceding fiscal year.
- REYER, EDUARD. *See* Nos. 87 and 1354.
1125. RICKARD, EDGAR. The Briseis tin lead at Derby, Tasmania.  
Eng. Mg. Journ., Vol. 75, 1903, New York, pp. 119-120. Sketch plan.  
Describes placer cassiterite occurring in the gravel of a river 100 feet below the present streams. It is capped by basalt. Worked by a modification of the hydraulic system.
1126. RITCHIE, W. Tin in Tasmania.  
Mg. Journ. Railw. Comm. Gaz., Vol. 43, 1873, London, p. 1109.  
Extract from letter. Description of tin deposits of Mount Bischoff. Some pieces of tin ore were of such size that a man could not lift them. Both lode and alluvial tin ore of much richness occur. Great natural facilities for the working of mine.
- ROLKER, CHAS. M. *See* No. 1357.
1127. ROWE, CAPT. JAMES. Tin mining in Tasmania.  
Trans. Mg. Ass. Inst. Cornwall, Vol. 1, 1887, Camborne, pp. 153-163, map.  
Also, Berg. Hütt. Zeit., Vol. 47, 1888, Leipzig, pp. 183-185.  
First discovery of importance at Mount Bischoff in 1872, by Chas. Smith in a deposit "of a highly ferruginous nature, consisting of oxide of iron, decomposed porphyry and tin ore." Cut 1000 feet wide and 100 feet deep gave 3 per cent ore. Two other districts. Mt. Bischoff is in northwest portion, the "West Coast" region is just southwest of it, and the Northeast District is in the northeast part of the island. "West Coast" not paying. Deposits in northeast in both recent and old river beds partly covered by basalt. Gravel up to 170 feet deep in places, carrying about three-fourths per cent of ore worked by hydrauliclicking.
1128. SANDEMAN, J. J. The mineral resources of Tasmania.  
Trans. North of England Inst. Mg. Mech. Eng., Vol. 49, 1901, Newcastle-upon-Tyne, pp. 32-37, illus.  
Reprint: Trans. Inst. Mg. Eng., Vol. 18, 1899-1900, London, pp. 32-37.  
The tin production of Tasmania holds, according to writer, the first place among the Australian colonies. Up to end of 1897, it produced 80,000 tons of tin, valued at £6,500,000; of this Mt. Bischoff contributed about £2,700,000. This mine is worked in three open faces or quarries: The Brown Face, the Slaughter Face and the White face. Descriptions of these quarries are given. The Blue Tier district is described as having intrusive dykes of stanniferous granite. The mines have suffered from poor management. There is every evidence that they should yield good paying ores, with modern appliances and good management.
1129. SHAW, A. Tin of Mount Bischoff, Blue Tier, and River Ringarooma.  
Rep. Mines Dept., for 1883-1884, H. A. Paper, No. 70, 1884.  
Not available to the authors.
1130. SHAW, B. Tin of Mount Bischoff, Mount Heemskirk, Blue Tier, Moorina, and Gladstone.  
Rep. Mines Dept., 1884-1885, H. A. Paper, No. 58, 1885.  
Not available to the authors.

## TASMANIA (Continued)

1131. **SOWDEN, C.** To the Tasmanian tin mines.  
 Nat. Hist. Journ. School Rep., Vol. 17, 1893, York, pp. 6-8.  
 Digest from Ann. Brit. Geol., 1893, London, p. 347.  
 "A description of the works at Mount Bischoff."
- STEPHENS, D.** See No. 59.
1132. **STOKES, RALPH (S. G.).** The Tasmanian tin industry.  
 Mg. World, Vol. 26, 1907, Chicago, pp. 718-719, 776-777, 806-807.  
 A series of illustrated articles giving a general review of the tin industry of Tasmania. Not much geology is given.
1133. ———. Mount Bischoff tin mine, Tasmania.  
 Mg. World, Vol. 27, 1907, Chicago, pp. 55-58. Illus.  
 General article giving account of the decreased output of Mt. Bischoff tin mine, owing to the working out of the Brown Face; also a description of the working of a new electric plant.
- . See No. 729.
1134. **TASMANIA.** Government geologist. The mineral industry of Tasmania.  
 Published quarterly. Compiled by: Harcourt-Smith, J., from 1897 through March, 1899. Wallace, W. H., from June, 1899-. (From June, 1899 to December 31, 1901, not available to the authors.) Twelvetrees, W. H., from December, 1901.
1135. **THUREAU, G.** Report on the Ben Lomond tin deposits. On the St. Paul's River tin deposits.  
 Tasm. Parl. Pap. No. 108, 1881, Hobart, pp. 4, plans.
1136. ———. The Blue Tier Mining District.  
 Geol. Surv. Rep., Tasmania, 1886, Hobart.  
 Not available to the authors.
- TREGAY, W.** See No. 60.
1137. **TWELVETREES, W. H.** Report on some tin mines in the St. Paul's River valley near Avoca.  
 Rep. Secr. for Mines, for 1899-1900, Tasmania, 1900, Hobart, pp. XIV-XXVII, pls. 3.  
 Describes the Roy's Hill tin mine as being in Permian-carboniferous "wash and conglomerate" 20 feet thick and overlain by Jura-Trias sandstone. Beneath the deposit is a quartz-mica-tourmaline rock with some kaolin, from which the tin has been derived. Both are worked. Gives an exposition of the theory of pneumatolytic deposition, and advises further prospecting. The St. Paul's mines were at this time idle. They are in much silicified and tourmalinized granite. The cassiterite is well crystallized and often of amber or ruby color.
1138. ———. Report on the Arba extended tin sections at Branxholm.  
 Rep. Secr. for Mines for 1899-1900, Tasmania, 1900, Hobart, pp. XLI-XLIII.  
 Prospects are that the tin mines (placer) will be small. The gravel occurs in pockets in a granite which contains considerable tourmaline and many quartz veins. Some gold is found with the tin.
1139. ———. Preliminary report on the deep lead or infra-basaltic stanniferous gravels of the Ringarooma valley near Derby.  
 Rep. Secr. for Mines, for 1899-1900, Tasmania, 1900, Hobart, pp. CVII-CXXVII, sketch maps 2.  
 Tries to trace the old valley of the Ringarooma River under basalt by which it is covered. The river and tributary streams are known to have flowed through stanniferous granite so that it is supposed the gravels may pay for working. Where denuded both tin and gold have been obtained from the gravel.

## TASMANIA (Continued)

1140. ———. Report on the mineral fields between Waratah and Corinna.  
Rep. Sec. for Mines for 1899-1900, Tasmania, 1900, Hobart, pp. CXL-CCVII, plans 2.  
Review: Austr. Mg. Stand., Vol. 18, 1900, Sydney and Melbourne, pp. 592-598.  
Mt. Bischoff tin mine [pp. CL-CLVI], rises 500 feet above the Waratah plateau.  
The first discovery of tin ore was made by James Smith in 1871. The mine has been dividend-paying continuously since 1878; total dividends paid to date being £1,674,000; total tin ore to date, 57,358 tons; value £3,316,528.  
The geology of the deposit is treated.  
Webster's Workings [pp. CLVI-CLVII] and Ten-mile tin claim at White River Bridge [pp. CLVII-CLIX] are alluvial tin claims.
1141. ———. Report on the tin mines of Blue Tier, county of Dorset.  
Geol. Surv., Tasmania, 1901, Hobart, pp. 33, figs. 9.  
Also in Rep. Sec. Mines, Tasmania, 1901-1902, Hobart, pp. 90-123.  
Supposing only that the tinstone continues a very little below already proved depths, there is sufficient tin bearing rock to keep several mines going for a good many years. If it descends indefinitely, there is enough stone for generations. If the dyke theory is correct, there is no reason why it should not persist to great depth. If the floor theory is the right one, it will still descend to any required depth. The development of the mines appears to be governed by the water power available. With adequate water supply, the district would undoubtedly be a busy tin-producing center. It is a productive district as it is, but its production is intermittent, being dependent upon rainfall. Author holds high hopes of a future for the Tier. The mines of the district are described individually.
1142. ———. The Bell Mount Mining Field.  
Journ. Print. Pap. Parl., Tasmania, Vol. 45, 1901, Hobart, pp. 57-60.  
Not available to the authors.
1143. ———. Report on the tin-bearing capabilities of the Gladstone district.  
Journ. Print. Pap. Parl., Tasmania, Vol. 45, 1901, Hobart, pp. 72-83, geol. map 1.  
Also in Rep. Sec. for Mines, Tasmania, 1901, Hobart, pp. 232-267, plan.  
Digest: Geol. Centr., Vol. 2, 1902, Leipzig, p. 581.  
The tin ore occurs principally in gravels spread far and wide over the surface of the country. The changes in level of the land since Tertiary times and their effect on the tin deposits, as also that of lava streams, is described. Topaz, sometimes very fine, and sapphires occur in the drift.—Geo. W. Card.
1144. ———. Report on the coal field of Llandaff, the Denison and Douglas rivers, on the deposits of tin ore on Schouten Main, and on out-crops of quartz near Buckland.  
Rep. Sec. for Mines, for 1901-1902, Tasmania, 1902, Hobart, pp. 52-62, sketch maps 2.  
"Schouten Main is the name used for that part of the mainland which is at the head of Freycinet's Peninsula, and consists of granite, with the exception of some Silurian metamorphic sandstone on the crest and east slope of the hill overlooking Bluestone Bay."  
It is estimated that 150 tons of alluvial tin ore has been mined—it is possible that large lodes exist in the granite, that have eluded discovery, but the author would give different sources for it:  
1. Small quartz veins enclosing coarse tin.  
2. Greisenised bands of granite containing small quantities of ore.
1145. ———. Report on mineral fields between Waratah and Long Plains.  
Geol. surv., Tasmania, 1903, Hobart, pp. 33.  
Badger tin mines, pp. 35-37.  
Situated 5 miles from Waratah. Tin occurs in kaolinized and silicified porphyritic granite. Samples assayed 7.77 to 9.2 per cent metallic tin. Some alluvial tin. Little work done.



## TASMANIA (Continued)

1146. ———. Report on the Renison Bell tin field.  
 Geol. Surv., Tasmania, 1906, Hobart, pp. 12.  
 Renison Bell tin mine, the chief mine of the Dundas tin-bearing belt, is situated at the northern end of the area. At present worked by optionees, producing ore by sluicing; are driving underground to intersect a large pyrrhotite lode a hundred feet below its exposure in a railway cutting. District is undeveloped. Present price of tin is acting as a stimulus that will lead to working lodes.
1147. ———. Geological report on Cox's Bight tin field.  
 Geol. Surv., Tasmania, 1906, Hobart, pp. 18, geologic map 1.  
 A little known field on the south coast of Tasmania, 36 miles by water from Recherche, and three or four days walk overland. A biotite granite boss of Devonian age,  $1\frac{1}{4}$  miles in diameter, intruded through quartzite and schist is intersected by veins carrying cassiterite and accessory molybdenite. Tin found here in early '90's, and about 120 tons taken out to 1906. Gives individual descriptions of several claims. Yield, 1 pound to  $7\frac{1}{2}$  pounds per cubic yard, generally nearer the smaller figure. Gravel 6 feet and more thick. Field restricted.
1148. ———. Report on the Bell Mount and Middlesex district (Tasmania).  
 Geol. Surv., Tasmania, 1907, Hobart, pp. 1-30.  
 At Shepherd & Murphy mine, on Bismuth Creek, a tin-tungsten-bismuth vein occurs in a wollastonite-epidote rock, evidently altered limestone. Vesuvianite, diopside and garnet also occur. Granite or quartz-porphry supposed to exist close at hand. Topaz occurs in the vein with quartz. The vein cuts Middle Silurian rocks. Also mentions quartz bismuth-tungsten veins at All Nations mine; tin-bearing stockworks in granite and quartz-porphry, at All Nations and Dolecath mines; alluvial deposits of gold, tin and tungsten and veins carrying pyrite, galena, molybdenite, "cupriferous quartz," gold and silver occur in the same district. Spodumene is found in one of the veins.
- 1148a. ———. The mineral industry of Tasmania. *See* No. 1134.
1149. TWELVETREES, W. H., and PETTERD, W. F. On the topaz quartz porphyry or stanniferous elvan dykes of Mount Bischoff.  
 Pap. Proc. Roy. Soc., Tasmania, 1897 (1898), Hobart, pp. 119-128, pl. 1.  
 The dikes of Mt. Bischoff are granitic and both feldspar and quartz have been more or less replaced by topaz and to a lesser degree, cassiterite, so that the latter mineral is also secondary.
- 1149a. TWELVETREES, W. H., and WARD, L. KEITH. Geological examination of the Zeehan field.  
 Geol. Surv., Tasmania, Bull. No. 7, 1909, Hobart, pp. 25. (Preliminary statement.)  
 Extract: Mg. Journ. Railw. Comm. Gaz., Vol. 87, 1909, London, pp. 532-534.  
 Treated under heads: Introduction; nature of the examination; its scope and method; forecast of the forthcoming report; preliminary statement of the results of the geological examination.
1150. ULRICH, G. H. F. A report on Mount Bischoff tin mines, Tasmania, with topographical sketch map.  
 1874, Launceston, pp. 5.  
 Not available to the authors.
1151. ———. Ueber die Zinnmine am Mt. Bischoff in Tasmanien.  
 Neues Jahrb. Min., 1877, Stuttgart, pp. 494-497.
1152. WADDINGTON, H. Tin; its future.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 49, 1879, London, p. 1310.  
 Extracts from a report by H. W. F. Kayser on the Bischoff tin mines.

## TASMANIA (Continued)

- 1152a. WALLACE, W. H. The mineral industry of Tasmania. See No. 1134.
1153. WALLER, G. A. Report on the mining districts of the Scamander River and St. Helens.  
Rep. Secr. for Mines, 1900-1901, Tasmania, 1901, Hobart, pp. 268-301.  
Alluvial deposits of tin at the Scamander River and at St. Helens.  
A description of the following mines is given: The Scamander Tin and Gold Co.; the mines at St. Helens; Royal Ruby Tin Mining Co.; Fern Tree Creek; Saxelby Creek; Thureau's Deep Lead Tin Mining Co.; Fenton's Mine; the Upper Ruby; the Rose Tin Co., Ltd.
1154. ———. Tin mining at St. Helens, Tasmania.  
Austr. Mg. Stand., Vol. 20, October 17, 24, 31, 1901, Sydney and Melbourne.  
Serial, 3 parts, 4000 words.  
"Describes the deposits and various workings."  
Not available to the authors.
1155. ———. Report on the tin mining district of Ben Lomond.  
Journ. Print. Pap. Parl. Tasmania, Vol. 45, 1901, Hobart, pp. 95-107, geol. sketch map 1, figs. 3.  
Also in Rep. Secr. for Mines, Tasmania, 1900-1901, Hobart, pp. 302-342.  
Digest: Geol. Centr., Vol. 2, 1902, Leipzig, pp. 580-581.  
Tin occurs in silicified and pegmatitic portions of Devonian granite, which breaks through Silurian slates, sandstones, etc. Considers tin to be of pneumatolitic origin. Accompanied by tourmaline, beryl, fluor spar, chlorite, argentiferous-galena, zinc blende, chalcocopyrite, arsenopyrite and pyrite, wolframite, and probably gold. In one occurrence, considers tin in a fine grained granitic rock to be original. Some veins in neighborhood carry considerable quantities of wolframite. Describes different mines and gives rainfall.
1156. ———. Tin ore deposits of Mount Heemskirk.  
Geol. Surv., Tasmania, 1902, Hobart, pp. 46, pls. 4.  
Review: Austr. Mg. Stand., Vol. 28, 1902, Sydney and Melbourne, pp. 441, 586.  
Five miles from coast between Trial and Granville harbors. Geology of the district described. Four kinds of veins carry  $\text{SnO}_2$ , viz.: Quartz-tourmaline veins, pinitoid (decomposed feldspar) veins, greisen veins, and pyritic veins. Tin occurs in nodules of quartz and tourmaline, sometimes hollow, generally in aplite segregations, but sometimes in the granite. Green tourmaline more apt to occur with tin than black tourmaline. Much of tin in residual gravel in gray colored nuggets with granular center covered by thin concentric layers, frequently layers are radiating. Residual gravel 1 foot to 3 feet deep, gave 7.7 per cent cassiterite. Extent unknown. Some rich veins carry up to 39 per cent tin. Tin ore spreads out from veins into sandstone, parallel to bedding.  
Treats nineteen tin localities of district. Thinks region has good future.
1157. ———. Report on the tin-ore deposits of North Dundas.  
Rep. Secr. for Mines, 1901-1902, Tasmania, 1902, Hobart, pp. 139-153, pls. 1, 2, plan and section, Renison Bell mine.  
Most of the deposits of tin ore are located in the center of the northeast Dundas District. Most of the ore consists of dense iron-pyrites and pyrrhotite, with small grains of tin oxide embedded in it. Following mines are described:  
1. Penzance Tin Mining Co. 2. Mount Lyell Copper Estate Co. 3. Cornwall Tin Mining Co. 4. Renison Bell Prospecting and Mining Co.
1158. ———. Report on the prospects of the Stanley River tin field.  
Geol. Surv., Tasmania, January, 1904, Hobart, pp. 1-19, map 1.  
On Stanley River, a tributary of the Pieman, West Tasmania. Field five miles long. Rocks, granite, porphyry and aplites, in southern part "older Silurian metamorphic sandstones and claystones." Tin of pneumatolitic origin. Feldspar

## TASMANIA (Continued)

replaced by tin, tourmaline and quartz. Tin lodes consist of a zone of replaced granite (quartz tourmaline), with usually a central seam or fissure filled with tourmaline and tin, which may vary from a few inches to many feet in width. Pyrites and monazite occur in some veins. The small amount of work done has not only shown the presence of rich alluvial tin, but has afforded evidence of the presence of rich lode tin.

## 1158a. WARD, L. KEITH. The tin field of North Dundas.

Geol. Surv., Tasmania, Bull. No. 6, 1909, Hobart, pp. 166. Locality map, pls. 5.  
 Extract: Mg. Journ. Railw. Comm. Gaz., Vol. 86, 1909, London, pp. 232-233.  
 Treated under heads: Introduction; previous literature on the field; physiography; general geology; economic geology; history of mining on the field; the mining properties.

## 1159. WELLINGTON, WM. Notice on Mount Bischoff, Tasmania.

Trans. Roy. Geol. Soc. Cornwall, Vol. 9, 1875, Penzance, pp. 161-162.  
 Author thinks tin of Mt. Bischoff is the result of volcanic eruptions, Mt. Bischoff being an extinct volcano.  
 First deposit, of about 6 feet, is composed of small detached pieces of porphyry, granite and tin disseminated through it.  
 Second eruption is more granite, in shape of large boulders and not so much tin.  
 Last eruption appears to have been more violent sending up large masses of granite and the greatest quantity of tin.

## 1160. WICKHAM, F. D. The tin products of Mount Bischoff, Tasmania.

Mg. Journ. Railw. Comm. Gaz., Vol. 44, 1874, London, p. 396.

## 1161. ———. The tin mines of Tasmania.

Mg. Journ. Railw. Comm. Gaz., Vol. 48, 1878, London, p. 483.

## 1161a. WILLIAMS, GERARD W. Notes on the Zeehan mining field, Tasmania.

Eng. Mg. Journ., Vol. 89, 1910, New York, pp. 713-715, diagrams 2.

## 1162. WILSON, A. P. Minerals and mining in Tasmania.

Trans. Fed. Inst. Mg. Eng., Vol. 7, 1893-1894, Newcastle-upon-Tyne and London, 1894, pp. 277-278.

Also, Trans. North of England Inst. Mg. Mech. Eng., Vol. 43, 1894, Newcastle-upon-Tyne, p. 385.

Short account of Mt. Bischoff tin mining. Other districts mentioned as important are: Ringarooma, Branxholme, George's Bay and Blue Tier.

Author thinks Tasmania is destined to occupy a more prominent place as a tin producing district. Further examination will doubtless bring to light massive lodes of tinstone which have been the source of the great alluvial deposits of the island.

## 1163. WINTLE, S. H. Stanniferous deposits of Tasmania.

Trans. Proc. Roy. Soc. New South Wales, for 1875, Vol. 9, 1876, Sydney, pp. 87-94, fig. 1.

Extract: Mg. Journ. Railw. Comm. Gaz., Vol. 45, 1875, London, pp. 1095-1096.

Mount Bischoff tin deposits in euryte porphyry thrust through Paleozoic rocks, "clay-slate, altered sandstone, limestone, conglomerate and quartzose rock."

Limestones carry argentiferous galena, tin- and iron-pyrites and bismuth. All covered by basalt. Mount Bischoff 3500 feet altitude. Tin ore occurs as veins and lodes in porphyry.

Description of tin ore occurrence at Mt. Ramsay.

## 1164. ———. Notes on the mineral resources of Tasmania.

Eng. Mg. Journ., Vol. 28, July 19, 1897, New York, pp. 38-39.

An outline of the geological and commercial features of the island, including the tin resources.

## TEXAS

- 1164a. CHAUVENET, REGIS. Franklin mountain tin prospects.  
 Mines and Min., Vol. 30, 1910, Scranton, pp. 529-531, figs. 3.  
 Treats of the locality, extent, and geology of the deposits, also nature of ores in the Franklin Mountains, near El Paso, Texas.
1165. COMSTOCK, THEO. B. Report on the geology and mineral resources of the central region of Texas.  
 1st Ann. Rep. Geol. Surv. Texas, 1889 (1890), Austin, p. 345.  
 Author was unable, in a critical examination of more than 8000 specimens from various parts of the districts, to detect presence of tin.
1166. ———. Tin in Central Texas.  
 2d Ann. Rep. Geol. Surv. Texas, 1890 (1891), Austin, pp. 595-602, figs. 68-69.  
 Discussion of the situation, with cuts showing the geological conditions in the Llano region where tin ore is said to have been found, character of ore and mode of occurrence. Uncertainty of discovering the mineral in commercial quantities.
1167. ———. Tin in central Texas.  
 Eng. Mg. Journ., Vol. 51, 1891, New York, pp. 117-118.  
 Mr. Comstock, as a member of the Geol. Surv. of Texas, tells of his discovery of tin, the manner of its occurrence, and the localities. Did not find any extensive deposits.  
 P. 229. An addition to above article made by correspondent [G. A. F.], in which he says two discoveries of tin in the State have been overlooked.  
 P. 281. Mr. C. answers correspondent.
1168. ———. Occurrence of tin in central Texas.  
 Amer. Journ. Sci., Vol. 41, 1891. New Haven, p. 251.  
 States that a few crystals of cassiterite have been found in Mason and Llano counties, but not in commercial quantity.
- 1168a. DINSMORE, CHAS. A. Development of a Texas tin mine.  
 Mg. World, Vol. 31, 1909, Chicago, p. 1120.  
 The tin prospect now being developed is on Mount Franklin, 16½ miles from El Paso. The deposit is in a ternary granite, composed of a pink or reddish orthoclase feldspar, quartz and mica; it is intersected in many places by veins of fine-grained granite and pegmatite. This is overlain by rhyolite. The tin-bearing area contains "true fissure veins of quartz carrying cassiterite," and of zones of impregnations in the neighboring granite. The cassiterite occurs disseminated through the quartz and in masses, many of which are pure enough for smelting. Associated minerals are uncommon, and so far consist of hematite, pyrite, pyrrhotite, tourmaline, topaz, fluorite, garnet and hornblende. Tungsten, gold, silver and copper have also been found in small quantities on the property. The cassiterite is often found in very beautiful twin crystals, varying in color from white to dark brown.
1169. DUMBLE, E. T. Tin.  
 2d Ann. Rep. Geol. Surv. Texas, 1890 (1891), Austin, p. LXIX.  
 Found in connection with lead ores in Trans-Pecos, Texas. Dr. Comstock and party found pieces of cassiterite in Burnet and Mason counties.
- 1169a. LAKES, ARTHUR. A tin mine in the United States.  
 Mg. Sci., Vol. 61, 1910, Denver, pp. 346-348.  
 Description of tin prospect in Franklin Mountains, 10 miles north of El Paso, Texas. Regis Chauvenet's article "Franklin Mountain tin prospects" in Mines and Min., Vol. 30, No. 9, 1910, Scranton, pp. 529-531 is quoted in full.

## TEXAS (Continued)

PAVLOV, ALEXANDER W. See No. 1216.

1170. RICHARDSON, G. B. Tin in the Franklin Mountains, Texas.  
U. S. Geol. Surv. Bull. 285, 1906, Washington, D. C., pp. 146-149, fig. 1.  
Description of the El Paso tin deposits, first described by Weed in U. S. Geol. Surv. Bull. 178, 1901. Gives a general description of the topography and geology of the Franklin Mountains, and a partial analysis of the tin bearing granite. The tin deposits are close to faults. Found little new development. States that water can be obtained in the mesa east of the mountains.
1171. STREERUWITZ, W. H. VON. Report on the geological and mineral resources of Trans-Pecos, Texas.  
2d Ann. Rep. Geol. Surv. Texas, 1890 (1891), Austin.  
Mentions finding traces of tin in West Texas ores.
1172. WEED, WALTER H. The El Paso tin deposits (Texas).  
U. S. Geol. Surv. Bull. 178, 1901, Washington, D. C., pp. 1-15, pl. 1, figs. 1-4.  
Digest: Neues Jahrb. Min., 1902, II (Ref.), Stuttgart, p. 342.  
Reprinted, U. S. Geol. Surv. Bull. 213, 1903, pp. 99-102.  
Describes briefly the geological structure and formation of the Franklin Mountains. Thinks the veins are similar to those of Cornwall, and that the ores are formed largely by replacement. Notes the absence of topaz and presence of wolframite.

## TRANSVAAL AND RHODESIA

1173. ANONYMOUS. Discovery of tin in the Transvaal.  
California Journ. Tech., Vol. 2, No. 3, 1903, Berkeley, p. 53.  
Quotes from the "British South African Export Gazette," of September 4, 1903, that three tin-bearing lodes have been discovered in the Transvaal.
1174. ———. Gold and tin in northern Rhodesia.  
Austr. Mg. Stand., Vol. 32, 1904, Sydney and Melbourne, p. 373.  
Taken from South African Mines, reports a deposit of stream tin on west bank of Lualaba.
1175. ———. Tin discoveries in the Bushveld.  
Journ. Soc. Arts, Vol. 52, 1904, London, pp. 736-737.  
A summary of particulars respecting the discovery of tin in the Bushveld, near Pretoria, taken from the "African Review."
1176. ———. Tin in the Transvaal.  
Mg. Sci. Press, Vol. 89, 1904, San Francisco, p. 295, 250 words. (Probably from Hall, A. L., No. 1181.)  
Digest: Mg. Mag., Vol. 10, New York, p. 442.  
"Notes on the occurrence of this metal in several different places in the Transvaal."
1177. ———. Tin in the Transvaal.  
Mg. World, Vol. 24, 1906, Chicago, p. 774.  
States that the first output of tin in the Transvaal has recently been declared. Tin lodes in various forms have been traced over a considerable area. Other tin areas in the neighborhood are being discovered from time to time.
1178. ———. Failure of tin mine at Vlaklaagte, South Africa.  
Eng. Mg. Journ., Vol. 82, 1906, New York, p. 180.  
It was expected that this mine would prove one of the world's greatest deposits. Unless things improve considerably, the tin mine at Vlaklaagte cannot run much longer. Up to date the total amount of material won is roughly 25½ long tons cassiterite equal to 17.85 tons or 1.75 per cent metallic tin, from 1020 tons treated.

## TRANSVAAL AND RHODESIA (Continued)

- 1178a. ———. Potgietersrust tin fields.  
South African Mg. Journ., May 23, 1908, Johannesburg, pp. 1½.  
Not available to the authors.
- 1178b. ———. The Groenfontein tin plant.  
South African Mg. Journ., July 4, 1908, Johannesburg, p. ¾.  
“Describes methods for the recovery of tin in the Potgietersrust field, and also a new plant which is to be built.”  
Not available to the authors.
- 1178c. ———. Base metals in the Transvaal.  
Eng. Mg. Journ., Vol. 88, 1909, New York, p. 250.  
Briefly describes tin producing districts of the Transvaal.
- 1178d. ———. Tin deposits of the Transvaal.  
Eng. Mg. Journ., Vol. 88, 1909, New York, p. 778.  
Describes the manner of occurrence in the various fields.
- 1178e. ———. Zaaiplaats tin mines.  
South African Mg. Journ., Vol. 7, pt. 1 (Feb. 13), 1909, Johannesburg. Illus.  
“Describes the plant and workings, going into the geology of the deposits.”  
Not available to the authors.
- 1178f. ———. Notes on the tin fields.  
South African Mg. Journ., Vol. 7, pt. 1, 1909, Johannesburg, p. 109, illus.  
Describes some occurrences and operation on Groenvlei.
- 1178g. ———. Transvaal tin: establishment of an industry.  
South African Mg. Journ., Vol. 7, pt. 1, 1909, Johannesburg, p. 145.  
Gives encouraging reports from the Waterberg, also an account of activity at Rooiberg and Weynek.
- 1178h. ———. Waterberg tin mines.  
South African Mg. Journ., Vol. 7, pt. 1, 1909, Johannesburg, p. 407.  
Very encouraging outlook for tin-mining becoming a great industry in this colony.  
Describes activity at Zaaiplaats property—geological features, extension of plant, scarcity of labor, etc.
- 1178i. ———. The government tin report.  
South African Mg. Journ., Vol. 7, pt. 1, 1909, Johannesburg, No. 338, pp. 719-721, pl. 1.  
Deals with the tin industry of the Waterberg field, which is treated under heads: General geological structure; the tin rocks; the tin limits; investigation in depth; the shale-felsite deposits; the Rooiberg quartzites.
- 1178j. ———. The Transvaal tin industry to-day.  
South African Mg. Journ., Vol. 7, pt. 2, 1909, Johannesburg, pp. 253-254.  
Treated under heads: Some monthly reports; the Groenfontein profits; alleged secondary enrichment at Rooiberg; prospects at Doornhoek.
- 1178k. ———. Tin in Rhodesia: the beginning of an industry.  
South African Mg. Journ., Vol. 7, pt. 2, No. 350, 1909, Johannesburg, p. 279, 400 words.  
Probably reference to same occurrence in Mines & Min., Vol. 30, 1909, p. 11—quoted from U. S. Consular report.  
Note on the discovery of tin at Rusapi on the Salisbury-Beira line.

**TRANSVAAL AND RHODESIA (Continued)**

1179. DAVEY, T. G. Trans-Zambesian mining.  
 Mg. Journ. Railw. Comm. Gaz., Vol. 73, 1903, London, p. 153.  
 "In many instances the granite and porphyries, which I traversed, show promising indications of the presence of tin." Whole reference.
1180. GRIFFITH, H. D. Largest tin producing fields in the world.  
 South African Mines, December 3, 1904, Johannesburg, 2000 words.  
 "Abstract of a report on the Bushveld tin properties; character of deposits, results of development, and estimate of costs."
1181. HALL, A. L. The geological survey of the northeastern portions of the Pretoria district, including the tin fields.  
 Transvaal Mines Department, Report Geological Survey for 1904 (1905), Pretoria, pp. 37-44, pls. 15, 22, map 1.  
 The larger part of the article is devoted to the general geology of the district. A coarse red granite at Bushveld (Enkeldoorn), 42 miles northeast of Pretoria, is apparently the youngest of the rocks except diabase, and is intrusive in a felsite. Finer grained portions, probably a later phase, carry the cassiterite in microscopic grains. One lode is about 12 feet wide at the surface, and is said to carry 1.5 per cent tin. The Vlaklaagte deposits are 12 miles further northeast. Here cassiterite is rather evenly distributed through a gray granite cutting the coarse red granite. Cassiterite crystals are  $\frac{3}{8}$  inch and less long. Topaz and mica also occur, and the author supposes the deposit to be due to pneumatolytic action.
1182. ———. Geological notes on the Bushveld tin fields and surrounding area.  
 Trans. Geol. Soc. South Africa, Vol. 8, 1905, Johannesburg, pp. 47-55, pls. 9, 10, [geol. map and section of vein].  
 Practically the same article as No. 1181.
1183. JOHNSON, J. B. The tin, molybdenum and lead occurrences near Potgietersrust.  
 Trans. Geol. Soc. South Africa, Vol. 10, 1908, Johannesburg, pp. 115-119.  
 The tin deposits occur between the Magalakwin and Sterk rivers. A quartz vein carries coarsely crystalline cassiterite, which is sparsely distributed in fine crystals through the granite for a width of 40 yards. Fluorite is an accompaniment in both vein and granite. Peculiar round pipes in the granite also carry cassiterite. Other minerals with the cassiterite are molybdenite, pyrite, chalcopyrite, arsenopyrite, galena, copper, tourmaline and a greenish mica. Attributes tin, molybdenum and lead deposits to pneumatolytic metasomatism.
- 1183a. KYNASTON, H. Cassiterite deposits of the Waterberg.  
 South African Mg. Journ., Nov. 21, Dec. 12, 1908, Johannesburg. See 1183b.
- 1183b. ———. Report on a preliminary examination of the cassiterite deposits of Zaaiplaats, and some of the neighboring farms of the Waterberg district.  
 Transvaal Mines Dep., Rep. Geol. Surv. for 1907 (1908), Pretoria, pp. 91-102, figs. 5-7.  
 Reprint: South African Mg. Journ., Nov. 21, and Dec. 12, 1908, Johannesburg.  
 Deposits at Zaaiplaats, Groenfontein and Roodepoort are described.  
 The cassiterite occurs in the red (Bushveld) granite in pipes and chutes. The former are cylindrical bodies of altered granite impregnated with ore and sometimes surrounded with a selvage of tourmaline, fluorspar, copper and arsenic pyrites, specular iron ore, blende, galena, stibnite, wolframite, and molybdenite.

## TRANSVAAL AND RHODESIA (Continued)

## 1183c. LAWN, —. South African tin mines.

South African Mg. Journ., Vol. 7, pt. 2, 1910, Johannesburg, p. 660.  
 Extracts from report of Consulting Engineer Lawn of the Doornhoek mine of South African Tin Mines Company, Ltd., Transvaal. He reports very promising outlook.

## 1184. MERENSKY, H. Neue Zinnerzvorkommen in Transvaal.

Zeitschr. prakt. Geol., Vol. 12, 1904, Berlin, pp. 409-411, 1000 words.  
 Digests: Neues Jahrb. Min., 1906, II (Ref.), Stuttgart, p. 228.  
 Geol. Centr., Vol. 7, 1905-1906, Leipzig, pp. 328-329.  
 Mg. Mag., Vol. 11, 1905, New York, p. 359.  
 South African Mines, Vol. 2, 1904, Johannesburg, p. 512.  
 The new occurrence is in Enkeldoorn district, 40 miles northeast of Pretoria. The ore could be readily concentrated and smelted where found, water and coal being close at hand. Prospecting is now under way.

## 1184a. ———. The rocks belonging to the area of the Bushveld granite complex, in which tin may be expected, with descriptions of the deposits actually found. (Read March 16, 1908.)

Trans. Geol. Soc. South Africa, Vol. 11, 1908, Johannesburg, pp. 25-42.  
 Discusses the general theory of tin deposition, the rocks surrounding the South African deposits, and their relative ages. He then takes up the tin deposits and discusses them and their accessory minerals and also other veins which seem to have close relations to the tin veins. Treats the Rooiberg, Warmbaths, Nylstroom and Potgietersrust districts. Believes the tin ore was deposited largely from thermal solutions.

## 1185. ———. Potgietersrust tin fields.

South African Mines, May 23, 1908, Johannesburg.  
 "Treats of output to date, geology of district, failure of government scheme and success of private producer."  
 Not available to the authors.

## 1185a. MILLS-DAVIES, J. E. The Transvaal tin industry.

South African Mg. Journ., Vol. 7, pt. 1, 1909, Johannesburg, pp. 463-465, 493-494, 547-548, 575-576, 605-606. Illus.  
 A series of five articles.  
 I. Treats of tin mining at Nylstroom.  
 II. Treats of Potgietersrust district.  
 III. Treats of Warmbaths district, describing especially the Rooiberg mine, and ancient Rooiberg workings.  
 IV. Continues description of Rooiberg mines, extent of lodes, ore chutes and values.  
 V. Describes Rooiberg dressing plant. Yield to date.  
 New discoveries in Rooiberg district are described in Vol. 7, pt. 2, 1910, p. 495.

## 1186. PRAAGH, L. V. The Transvaal and its mines.

London and Johannesburg (1907), pp. 631-633.  
 States that cassiterite occurs along the Transvaal-Swaziland border on the watersheds of Steynsdorp Creek and Black Umbelosi and Little Usutu rivers in pegmatite accompanying gneissoid and schistose rocks. In September, 1906, the mines of this area were idle, owing to paucity of ore. Gives history of discovery of Bushveld (Vlaklaagte) deposits. Tin ore on the Enkeldoorns farm in this area is in thin quartz veins cutting a coarse red granite and in the rock between the veins. Describes the unsuccessful working of these mines. Refers to several other prospects in the Great Red Granite Laccolite.

## 1186a. RECKNAGEL, R. On some mineral deposits in the Rooiberg district.

Trans. Geol. Soc. South Africa, 1909, Johannesburg, pp. 83-106, pls. 6-16.  
 Read July 20, 1908.  
 Abstract: Mg. Journ. Railw. Comm. Gaz., Vol. 84, 1908, London, p. 778.



## TRANSVAAL AND RHODESIA (Continued)

Describes the geology of the country in the neighborhood of Rooiberg, 40 miles west of Warmbaths. Tin occurs in granite, in irregular pockets, as veins in sediments and replacement deposits in quartzite. In one group of replacement deposits cassiterite occurs with cebaltilite, scheelite, cupro-scheelite, wolframite, and tourmaline. Nickel deposits are possibly connected with the tin deposits. The tin deposits were worked long ago as shown by old pits, slag-dumps, etc., but by whom is unknown.

## 1187. SIMMERSBACH, W. Die neuen Entdeckungen von Zinnerzlagerstätten in Transvaal.

Zeitschr. Berg. Hütt. Sal. preuss. Sta., Vol. 53, 1905, Berlin, pp. 245-248.

Digest: Geol. Centr., Vol. 7, 1905-1906, Leipzig, p. 521.

"Im roten Granit 35-50 engl. Meilen nordöstlich von Prätoria setzen die Zinnerzgänge in einem 11m mächtigen bisweilen sich teilenden Hauptgange und 8 kleineren parallel verlaufenden Nebengängen auf."—K. Keilhack.

## 1188. STEWART, D. S. S. The mineral wealth of Zoutpansberg: the Murchison Range gold-belt.

Trans. Inst. Mg. Eng., Vol. 17, 1898-1899, London and Newcastle-upon-Tyne, p. 424.

"Tin occurs as stream tin at the Great Letaba River and also in veins in the granite which contains large orthoclase crystals." Whole reference.

## 1189. SWINBURNE, U. P. Government tin prospecting in Transvaal.

Mg. Journ. Railw. Comm. Gaz., Vol. 83, 1908, London, p. 7.

Extract from Government Gazette, November 29, 1907. Deposits located at Zaaipplaats, 22 miles northwest of Potgietersrust. Ore occurs in: (a) more or less isolated ore chutes or chimneys in the red granite, (b) pegmatites and coarse granite containing large tin crystals, (c) alluvial or shed tin, probably derived from the rocks referred to in (b).

## 1189a. ———. The economic aspect of Waterberg tin field.

South African Mg. Journ., Vol. 7, pt. 1, Nos. 337, 338, 1909, Johannesburg, pp. 695-699, 719-721.

Describes various mines and reviews their prospects.

## UNITED STATES

## 1190. ANONYMOUS. Tin in America.

Mg. Journ. Railw. Comm. Gaz., Vol. 58, 1888, London, p. 384.

An enthusiastic outlook for American tin.

## 1191. ———. Our tin mines.

Eng. Mg. Journ., Vol. 54, 1892, New York, p. 98.

Editorial. Treats of tin mining in the United States.

## 1192. ———. Tin mining in United States.

Mg. Sci. Press, Vol. 82, 1901, San Francisco, p. 143, illus. 2.

Tin deposits of Southern California and South Dakota are recorded as only deposits in United States which might be made paying. Both are described, with brief history of South Dakota tin boom, and unsatisfactory results.

## 1193. ———. Tin in United States.

Mg. Sci. Press, Vol. 87, 1903, San Francisco, p. 117.

Brief outline of tin developments in United States. Deposits of York, Alaska, are most promising, because unproven. The stone occurs there in abundance, though the veins have not been explored.

## UNITED STATES (Continued)

1194. ———. Tin in United States.  
Mg. Sci. Press, Vol. 87, 1903, San Francisco, p. 282.  
Editorial. Giving brief outline of the tin mining industry of United States.
1195. ———. The production of tin in 1903.  
Mg. Rep., Vol. 50, 1904, Denver, p. 632, 700 words.  
Editorial. Short review of tin deposits in United States and their outlook.
1196. ———. Tin in United States.  
Mg. Sci. Press, Vol. 89, 1904, San Francisco, p. 385.  
Rather general and brief review of tin deposits of the Carolinas; Black Hills of South Dakota; Southern California and Alaska.
1197. ———. Development of American tin deposits.  
Iron Age, December 8, 1904, New York, 1800 words.  
Review of the tin industry taken from the United States Geological Survey reports.
1198. ———. The search for tin.  
Mg. Rep., Vol. 51, 1905, Denver, pp. 624-625, 1500 words.  
" Gives a summary of places in the United States where tin ore is known to have been found, with a brief description of the mode of occurrence and means for determining the mineral."
1199. ———. Tin mining in United States.  
Eng. Mg. Journ., Vol. 81, 1906, New York, pp. 474-475.  
Editorial on the prospect of profitably mining low grade tin ore in the United States.
- BECK, RICHARD. *See* No. 1299.
1200. BENEDICT, WM. DE L.  
Min. Ind. for 1892, Vol. 1, 1893, New York, pp. 452-457.  
Tin deposits of California, South Dakota, North Carolina, Virginia and Alabama treated.
1201. BLAKE, WM. P. Occurrence of tin ore (wood-tin) in California, Idaho and Montana.  
Mg. Sci. Press, Vol. 45, 1882, San Francisco, p. 89.  
Stream tin has been found in the alluvions of the middle fork of the Feather River about 3 miles above Big Bar, in Plumas County, California.  
" The many points at which the ore has been found in Montana and Idaho indicate that this important ore has a wide and general distribution in the granitic region of the northwest, particularly in the Rocky Mountains at the headwaters of the Missouri and in the western drainage, including the streams flowing from the Bitter Root range, especially in the Snake and the Salmon and their affluents."
1202. ———. Ores of tin.  
Min. Res., U. S. Geol. Surv., 1883-1884, Washington, D. C., pp. 592-640.  
Contains chapters on: Ores of tin; origin of tin ore; tin ore in the New England States; tin ore localities in the Middle and Southern States; tin ore in the Black Hills of Dakota, in Wyoming, Idaho and Montana; tin ore in California; foreign sources of tin; physical properties of tin; alloys of tin; the tin plate industry and prices, exports, etc.

D'ACHIARDI, ANTONIO. *See* No. 1313.

## UNITED STATES (Continued)

## 1203. DAY, DAVID T. Tin.

Min. Res. U. S. for 1891, U. S. Geol. Surv., 1893, Washington, D. C., pp. 164-166.  
Treats of the development of the tin mines of United States during 1891.

## 1203a. ———. Tin. Mineral Industries of the United States.

Eleventh Census. Census Office, 1892, Washington, D. C., pp. 249-265.  
Treats of the occurrence of tin in Massachusetts, New Hampshire, Maine, Virginia, North Carolina, Georgia, Alabama, Texas, California and South Dakota. The conditions of occurrence in the Black Hills is treated at some length, development work done, and a list of claims given. Also treats of the foreign production of tin.

## 1204. DOUGLAS, JAS. Summary of American improvements and inventions in ore crushing and concentration, and in the metallurgy of copper, lead, gold, silver, nickle, aluminum, zinc, mercury, antimony and tin.

Trans. Amer. Inst. Mg. Eng., Vol. 22, 1894, New York, p. 343.  
"Tin is widely diffused from Maine to Alabama in Appalachian Range, exploited from Dakota to California, but the mining of it so far has nowhere been sufficiently remunerative to create a smelting industry."

## 1205. EMMENS, STEPHEN H. American tin mines.

Eng. News Amer. Railw. Journ., Vol. 28, 1892, New York, pp. 454-486.  
Abstract of reports of J. Thomas and Lord Thurlow on Harney tin mines. Also brief review and prospects of the tin deposits in North Carolina, California and Virginia.

## 1206. EMMONS, S. F. Geological distribution of useful metals in United States.

Trans. Amer. Inst. Mg. Eng., Vol. 22, 1893, New York, pp. 71-72.  
Describes the geological occurrence in different parts of the United States of iron, manganese, nickel, tin, copper, lead, zinc, quicksilver, gold and silver, and gives a summary of conclusions concerning the genesis of their minerals.

FAWNS, SYDNEY. See No. 1320.

FUCHS, E., and LAUNAY, L. DE. See No. 1323.

## 1207. GARRISON, F. LYNWOOD. Tin in the United States.

Eng. Mg. Journ., Vol. 78, 1904, New York, pp. 830-832.  
Reprint: Min. Ind. for 1904, Vol. 13, 1905, New York and London, pp. 400-405.  
Brief review of history of discoveries of tin in this country. Summary of occurrence in Black Hills, at Temescal, York River, Virginia, North and South Carolina. Compares United States deposits with those in different parts of the world.  
Gives average yield from some principal producers elsewhere. Short sketches of occurrence in Bolivia and Malay Archipelago.

## 1208. HEADDEN, W. P. Mineralogical notes, No. III.

Proc. Colorado Sci. Soc., Vol. 8, 1906, Denver, pp. 167-173.  
Pp. 167-168 give an analysis of cassiterite (credited to "Mecklenberg, N. C.," but probably from further west or south in the tin belt), which contains SnO<sub>2</sub> 95.18, FeO, 1.11 and Ta<sub>2</sub>O<sub>5</sub> 3.82. Sp. gr. 6.7671. Pp. 169-170: Cassiterite which he thinks resulted from the decomposition of stannite, from the Etta mine, South Dakota, gave SnO<sub>2</sub> 94.36, Ta<sub>2</sub>O<sub>5</sub> 2.42, Fe<sub>2</sub>O<sub>3</sub> 1.80, SiO<sub>2</sub> 1.00.  
Analyses of cassiterite from Herbert's Placer and the Sammelias claim No. 3, Pennington County, South Dakota, showed only iron and SiO<sub>2</sub> as impurities.

## 1209. HESS, FRANK L. Tin.

Min. Res. U. S. for 1905, U. S. Geol. Surv., 1906, Washington, D. C., pp. 445-451.

## UNITED STATES (Continued)

1210. ———. Tin.  
Min. Res. U. S. for 1906, U. S. Geol. Surv., 1907, Washington, D. C., pp. 543-549.  
The production of tin in the United States during the year is reviewed and estimates made of the world's production.
1211. ———. Tin.  
Min. Res. U. S. for 1907, Geol. Surv. 1908, Washington, D. C., pt. 1, pp. 725-729.  
Reviews briefly the production of tin in the United States, imports, market conditions and prices. Gives an estimate of the world's production and the amount recovered in the United States from secondary sources.  
Similar articles were published in the volumes for 1908 and 1909.
1212. KEMP, J. F. Zinn in den Vereinigten Staaten von Nord-Amerika.  
Zeitschr. prakt. Geol., 1896, Berlin, p. 233.  
Brief paragraph stating different localities where tin has been found in the United States.
1213. KEMP, JAS. F. The ore deposits of the United States and Canada.  
3d Edition, New York, 1900, pp. 441-444, fig. 1. Bibliography.  
Edition of 1893: pp. 273-274.  
Edition of 1895: pp. 324-325.  
General description of tin.  
Short account of deposits in Black Hills, Montana, Idaho, California, Virginia, North Carolina, Alabama, Maine, New Hampshire and Texas. The tin of Mexico is also briefly treated.
1214. LEONHARD, GUSTAV. Topographische Mineralogie der Vereinigten Staaten von Nord-Amerika.  
Neues Jahrb. Min., 1849, Stuttgart, p. 836.  
Tin is mentioned as occurring at Goshen, Massachusetts; Jackson, New Hampshire; and in Virginia.
- LOCK, C. G. WARNFORD. *See* No. 1338.
- LOUIS, HENRY. *See* No. 1340.
1215. OHLY, J. Tin and its occurrence, mineralogy and metallurgy.  
Mg. Rep., Vol. 48, 1903, Denver, pp. 487-488, 509-510. Serial.  
1st article describes the characteristics of tin and its occurrence in the United States and Alaska.  
2d article gives brief history of Temescal (Cal.), ore deposits. Notes foreign localities where mostly produced, describes the ores of tin, and treats of the metallurgy of tin.
1216. PAVLOV, ALEXANDER W. Ueber einige neue Zinnlagerstätten der Vereinigten Staaten von Amerika.  
Bull. Mines Ind. or, Nos. 19 and 20, Tomsk, 1904, text figs. 2. (Russian.)  
Short description of tin deposits of El Paso (Texas) and Alaska (York Region).  
(Geol. Centr. Vol. 6, 1905, Leipzig, p. 200.)
- PHILLIPS, J. A., and LOUIS, H. *See* No. 1350.
1217. PRATT, J. H. Tin.  
Min. Res. U. S. Geol. Surv., 1904 (1905), Washington, D. C., pp. 377-380.  
Reviews briefly the production of tin in the United States and in other portions of the world.

## UNITED STATES (Continued)

1218. R——, N. Zinn in der Vereinigten Staaten.  
Zeitschr. prakt. Geol., 1893, Berlin, pp. 170-171.  
Brief notice of tin in South Dakota, California, Virginia. Outlook for tin production in United States not very bright.
1219. RAYMOND, R. W. Occurrence of tin in the United States.  
Trans. Amer. Inst. Mg. Eng., Vol. I, 1871-1873, Philadelphia, pp. 374-375.  
Remarks following a paper by T. S. Hunt on tin in Maine, in which the ore from other states is discussed.
- ROLKER, CHAS. M. See No. 1357.
1220. STRUTHIERS, JOSEPH, and PRATT, J. H. Tin.  
Min. Res. U. S. for 1903 (1904), Washington, D. C., pp. 335-349.  
Digest: Neues Jahrb. Min., 1906, II, Stuttgart [Ref.], p. 169.  
Tin of South Dakota and Wyoming briefly treated. The Carolina tin belt, its geological location, geology of district, and mineralogical and chemical character of ore, with production, treated by J. H. Pratt.
1221. See No. 1203a.
- WEEKS, JOSEPH D. See No. 1372.
- See also Alabama, Alaska, California, Carolinas, Colorado, Georgia, Idaho, Maine, Massachusetts, Michigan, Missouri, Montana, Nevada, New Hampshire, New Jersey, South Dakota, Texas, Virginia, Washington, Wyoming.

## VICTORIA

1222. ANNUAL Reports of the Secretary for Mines and Water Supply.  
From 1899, Melbourne, Victoria.  
Give statistics of production and amount exported and imported annually.
1223. ANONYMOUS. Tin in Australia.  
Min. Ind. for 1898, Vol. 7, 1899, New York and London, p. 710.  
Tin-bearing gravel 6 to 8 feet deep found near Beenah, Gippsland, Victoria. Plenty of water.
1224. BRACHÉ, J. Report on gold and tin mining at Eldorado, Victoria.  
1872, Melbourne,  
Not available to the authors.
- D'ACHIARDI, ANTONIO. See No. 1313.
- DAVIES, D. C. See No. 1317.
1225. EDDY, WILLIAM. Special report on the Victoria stream tin deposits.  
Mg. Journ. Railw. Comm. Gaz., Vol. 45, 1875, London, p. 1223.  
The deposits on Latrobe River, South Gippsland, are from 6 to 30 feet below the surface, and from 6 inches to 3 feet thick all over the flat valley which is from 500 to 1000 feet across. Average assay of concentrates is 65 per cent SnO<sub>2</sub>. From deepest parts of flat, sufficient gold exists to pay working expenses. River affords abundant water and power, and there is plenty of timber.
- FAWNS, SYDNEY. See No. 1320.

## VICTORIA (Continued)

1226. GREGORY, J. W. The Mount Cudgewa tin field.  
 Geol. Surv. Victoria Bull. No. 22, 1907, Melbourne, pp. 1-4.  
 A preliminary report on recently discovered tin lodes of the Cudgewa district, in Benambra. Alluvial tin has unquestionably wide distribution in some parts of north-east Victoria, but attempts to work the tin-bearing lodes have hitherto failed. The tin-bearing veins of the district occur mostly in the granitic rocks, close to the contact with the schists, but sometimes in the schists.
1227. HERMAN, H. Report on mining at Mitta-Mitta, Eskdale, Tallandoon, and Mt. Elmo.  
 Special Report Department Mines, 1898, Melbourne, Victoria, pp. 5-6.  
 Brief article on the geology of the surrounding country and the tin deposits of the districts.
1228. ———. Report on alleged tin and gold discovery at Falls Creek, near Bruthen.  
 Records of Geological Survey Victoria, Vol. 1, pt. 1, 1902, Melbourne, pp. 70-71, sketch locality plan 1.  
 Writer visited locality and found nothing done by way of development work since 1880, until two months before his visit, so little real information could be obtained. Discoverers claim 10 pounds tin obtained on Foggy Creek, and good prospects of tin found in most of gullies tried, also in loam on the slopes of the hills.
1229. KITSON, A. E. The economic minerals and rocks of Victoria.  
 Special Report Department of Mines, 1906, Melbourne, Victoria, p. 520.  
 Tin is the second mineral of importance in Victoria, gold occupying the first place. It occurs as lodes:  
 1. Thin veins [stockworks] ramifying granitic and porphyritic rocks.  
 2. Dykes of coarsely crystalline rocks [pegmatite and greisen].  
 3. Quartz reefs traversing granitic and porphyritic rocks.  
 As alluvial or stream tin, it is found in the sands and gravels of streams, which have worn down rocks containing tin.  
 Principal occurrences of the lode tin are at Mt. Cudgewa, Mt. Wills, Pilot Range, and Eskdale in the northeastern district, and Mt. Singapore on Wilsons Promontory, Southern Gippsland.  
 Stream tin is found in the northeast district, Southern Gippsland, Eastern Gippsland, Western Gippsland, Upper Yarra and other districts.
1230. MURRAY, REGINALD A. F. Report on the geology and mineral resources of Southwest Gippsland.  
 Rep. Prog. Geol. Surv. Victoria, 1876, Melbourne, p. 171.  
 No payable tin workings in this district have been mapped. The largest quantity yet obtained was in two small tributaries of the Franklin River. As the deposits are narrow, and do not occupy any considerable length of the creeks, remunerative tin workings are hardly to be hoped for.
1231. MURRAY, R. A. F. Report on the Mt. Wills tin field.  
 Reports and Statistics of Mines Department for Quarter ended March 31, 1890, Melbourne, Victoria, pp. 15-17, 2 sheets of underground survey of mines, Ballarat East. Digest: Neues Jahrb. Min., 1891, 11, Stuttgart, p. 100.
1232. NEWBERY, J. COSMO. Laboratory report of tin ore.  
 Rep. Prog. Geol. Surv. Victoria, No. 11, 1873, Melbourne, p. 129.  
 Brief examination of cassiterite from Franklin, Corner Inlet, and Upper Murray.

## VICTORIA (Continued)

1233. NICHOLAS, WM. Localities of minerals which occur in Victoria.  
Rep. Prog. Geol. Surv. Victoria, No. 3, 1876, Melbourne, p. 287.  
The most important districts where tin is to be found are:  
1. Lode tin, Beechworth.  
2. Stream tin, Beechworth, Berwick, Bright, Burrowa Creek, Cudgewa Creek, Dry Forest Creek, La Trobe River, Mt. Fatigue, Murray River [upper].
- PHILLIPS, J. A., and LOUIS, H. See No. 1350.
- REYER, EDUARD. See No. 1354.
- ROLKER, CHAS. M. See No. 1357.
1234. ROSALES, HY. Report on Mt. Wills as a gold field and tin field respectively.  
Special Report Department Mines, Melbourne, Victoria, 1897, p. 5.
1235. SKENE, A. J., and SMYTH, R. B. Report on the physical character and resources of Gippsland.  
1874, Melbourne, pp. 3-65, with map and geol. sect.  
"Black oxyd of tin" has been found in basin of River La Trobe, near Mt. Fatigue. Nearly all areas occupied by granite, yield some tin ore. Up to this time little has been done in Gippsland toward mining tin ore.
1236. SMYTH, R. BROUGH. The manner of occurrence of tin ore on the Upper Murray River.  
Rep. Prog. Geol. Surv. Victoria, No. 1, 1874, Melbourne, pp. 5-7.  
In all granitic tracts, "black oxyd of tin" is found in the beds of the creeks and gullies. Mr. H. Y. L. Brown, of Geological Survey of West Australia, examined the district and gives facts concerning the tin deposits.
1237. ———. Tin in Victoria.  
Rep. Prog. Geol. Surv. Victoria, 1875, Melbourne, pp. 41, 42, 45.  
Author predicts that rich veins of tin ore will be found in the basin of the Mitta-Mitta and the Cudgewa.  
Tin ore is found in southwestern and northwestern parts of Gippsland.
1238. STIRLING, JAMES. Report on the tin lodes at Wombat Creek.  
Department of Mines, Victoria, Report of Mining Registrars for quarter ended March 31, 1889, Melbourne, pp. 65-67, hachured map 1, pls. 3, figs. 4.  
Veins are on a ridge between Mt. Wills Creek [tributary of Big River], and Wombat and Nine Mile creeks, tributary to Mitta River. Tin found in creeks and bench gravels with bismuth and gold. Some lodes were found by government party. The country rock is slate and feldspathic sandstones, of Upper Silurian age, converted into nodular schists and sandstones and highly inclined. Cut by pegmatite and aplite masses. Tin occurs in pegmatites as stockworks. "Granulitic" lodes traverse the slates. At places there is much tourmaline in the pegmatite. Some granite dikes [ternary] near by are younger than Silurian; thought probably to be Devonian. [No proof given.] Small amount of alluvial tin in Wombat valley, probably indicates that veins have not been exposed long to erosion, and will grow better in depth. Several large diorite dikes have cut the sediments and metamorphosed them. "When the lode or vein intersects certain felsitic sandstones and nodular schists, and the lode is mainly greisen, it is rich in tin, and when the small grains of white feldspar, partly converted into kaolinite are present as additional ingredients, schorl is more abundant." Cassiterite is said to be evenly distributed through some of the lodes. Lodes 1 to 5 feet wide carry 2.9 per cent to 20 per cent tin. Accompanying minerals: tourmaline, wolfram and plumose muscovite in large plates.

## VIRGINIA

## 1239. BENEDICT, WM. DE L. Tin in Virginia.

Min. Ind. for 1892, Vol. I, 1893, New York, pp. 455-456.

Tin known to exist in Virginia about ten years. Found on Irish Creek, Rockbridge County. Ore found in veins in granite. Three veins thus far discovered. Developments consist of open cut extending about 60 feet into face of hill, and a tunnel which penetrates some 40 feet further. Mill has been erected, and experimental tests of ore were made.

1st test: 90 tons assayed 3.44 per cent metallic tin; concentrates from which assayed 43.44 per cent tin.

2d test: 75 tons assayed 3.28 per cent tin, concentrates showing 40.40 per cent tin.

3d test: 125 tons ore, assayed 3.26 per cent tin, concentrates gave 45.07 per cent tin.

## 1240. BROWN, W. G. On cassiterite from Irish Creek, Rockbridge Co., Virginia.

Amer. Chem. Journ., Vol. 6, 1885, Baltimore, pp. 185-187.

The veins have not been prospected to more than 20 feet in depth, and are much weathered. The cassiterite is brown, from waxy to dark, and the flocs are generally dull. Wolframite, arsenopyrite, quartz and mica accompany the cassiterite. Gives a description of crystals and an analysis which shows nearly 0.3 per cent  $Ta_2O_5$ .

## 1241. CAMPBELL, HARRY D. Tin ore (cassiterite) in the Blue Ridge in Virginia.

The Virginias, Vol. 4, 1883, Staunton, p. 151.

Abstract: Amer. Journ. Sci. Arts, ser. 3, Vol. 27, 1884, New Haven, p. 411.

Note on the discovery of tin in eastern corner of Rockbridge County. Cassiterite occurs in quartz veins. Incomplete analysis given.

## 1242. CROOKES and ROEHRIG. Tinstone, cassiterite.

The Virginias, Vol. 4, 1883, Staunton, p. 169.

Extract from Crookes & Roehrig's Metallurgy.

Short general article.

GARRISON, F. LYNWOOD. See No. 1207.

## 1243. McCREATH, A. S., and PLATT, FRANKLIN. Description of locality of tin ore, Rockbridge Co., Virginia.

The Virginias, Vol. 4, 1883, Staunton, pp. 150-151.

Not sufficient prospecting had been done to give a good idea of the veins. They occur in crystallines beneath Potsdam No. 1. The ore taken out probably averaged 31.60 per cent tin.

## 1244. ROBERTSON, W. B. On Virginia tin mines.

Mg. Journ. Railw. Comm. Gaz., Vol. 54, 1884, London, pp. 1221-1222.

Deposits are in high ridges on both sides of Irish Creek, in Rockbridge County. Ore occurs in the form of a "pure and rich cassiterite" permeating quartz veins and mica slate to a width of 40 feet or more. Many crystals are also found. Gives description of the tin veins and outcrops of the district.

## 1245. ULKE, TITUS. Cash Mine, near Vesuvius, Virginia.

Min. Res. U. S. Geol. Surv., 1893 (1894), Washington, D. C., pp. 178-182.

Development of property hindered by years of litigation. In writer's judgment Cash property warrants development. Mill, said to have cost \$50,000, was erected on property several years ago, and about 290 tons of rock, averaging about 3.3 per cent metallic tin were tested. Mineral association and geological occurrence of tin here more closely resembles that of Cornwall than that of any other known tin locality in United States.



## VIRGINIA (Continued)

## 1246. WATSON, THOS. L. Mineral resources of Virginia.

The Virginia Jamestown Exposition Commission. 1907, Lynchburg, pp. 567-578.

Gives the location, a short history of the working, and a brief description of the geology of the Irish Creek tin-bearing locality. Most of the article is a transcript of a commercial report upon the region by Major Hotchkiss. Mentions that the occurrence of cassiterite has been reported at Nellys Ford, Nelson County, and at Capron Springs. Gives a bibliography.

## 1247. WHITEHEAD, EDGAR. The tin ore of Virginia.

The Virginias, Vol. 5, 1884, Staunton, p. 33.

Reprinted from "The Advance" (no date), Lynchburg, Va.

A letter dated January 22, 1884, to the "American Artizan," Chicago, in which the Martha Cash tin properties are described. States that there are five known veins, which he thinks will supply the United States with tin. Gives a number of assays of both tin ore and mispickel from the same veins. The latter carried gold and silver up to \$255 per ton.

## 1248. WINSLOW, ARTHUR. Tin ore in Virginia.

Eng. Mg. Journ., Vol. 40, 1885, New York, p. 320, sketch maps 3.

Abstract: The Virginias, Vol. 6, 1885, Staunton, p. 168.

Location—western slope of Blue Ridge Mountains, in eastern edge of Rockbridge County.

Description of veins—fissure veins, traversing the granite in all directions. Present developments not sufficient to permit estimate of value nor a prediction as to future of deposits.

## WASHINGTON

## 1249. ANONYMOUS. Tin in Washington.

Mg. World, Vol. 26, 1907, Chicago, p. 784, 325 words.

Short account of discovery of tin ore, May 1906, near Spokane, Washington, close to border of Idaho, with brief notes upon the geology and development.

## 1250. COLLIER, ARTHUR J. Tin ore at Spokane, Wash.

U. S. Geol. Surv. Bull. 340, 1908, Washington, D. C., pp. 295-305.

Cassiterite occurs in an elevation known as Silver Hill half an hour's ride from Spokane on an electric road. Cassiterite is in pegmatite accompanied by sillimanite, andalusite and tourmaline. Wolframite and scheelite occur in granite in the same hill.

## WESTERN AUSTRALIA

## 1251. ANONYMOUS. Tin mines in West Australia.

Mg. Sci. Press, Vol. 70, 1895, San Francisco, p. 39.

A short account of mining operations in the tin fields at Greenbushes, West Australia.

## 1252. ———. Greenbushes tin field.

Austr. Mg. Stand., Vol. 17, 1900, Sydney, pp. 247-248.

"Information concerning the situation and the character of these deposits, which are known to contain certain deleterious impurities, difficult to eliminate."

## 1253. ———. Tin of Western Australia.

Min. Ind. for 1900, Vol. 9, 1901, New York and London, pp. 638-639.

Mining operations were active during 1900, at Greenbushes. The district is described geologically. About 400 tons of ore were treated at local smelting works during 1900. Specimens of rock from the Cornwall mine assayed 1.79 per cent Sn.

## WESTERN AUSTRALIA (Continued)

1254. ———. Tin in Western Australia.  
Min. Ind. for 1901, Vol. 10, 1902, New York and London, p. 641.  
Total quantity of black tin mined during 1901 amounted to 734 tons, valued at £40,000.
1255. ———. Die Zinnproduction Westaustraliens.  
Zeitschr. prakt. Geol., 1902, Berlin, pp. 209-210.  
Taken from "The British Australasian," 1899, p. 330.
1256. ———. Tin in West Australia.  
Eng. Mg. Journ., Vol. 80, 1905, New York, p. 1071.  
Tin ore has been mined for several years on the Greenbushes and Pilbarra mining fields, West Australia. Output of these fields is about 200 tons per annum. Mentions recent discoveries of tin in the Wodgina district, and thinks it possible that within the next few years West Australia will become an important tin producer.  
Wodgina district described.
1257. KRUSCH, P. Die Tellurerze Westaustraliens.  
Zeitschr. prakt. Geol., Vol. 9, 1901, Berlin, pp. 211-217.  
Digest translation in Trans. Inst. Mg. Eng., Vol. 22, 1901-1902, London and Newcastle-upon-Tyne, pp. 731-733.  
"Quartz porphyry dikes, also occur bearing tinstone with tourmaline and titanite; and the weathering of these dikes has given rise to the Greenbushes stream tin workings."
1258. ———. Beitrag zur Kenntniss der nutzbaren Lagerstätten Westaustraliens.  
Zeitschr. prakt. Geol., Vol. 11, 1903, Berlin, pp. 378-385, figs. 2.  
Digest: Neues Jahrb. Min., 1904, II [Ref.], Stuttgart, p. 242.  
Author states that cassiterite occurs:  
I. Sparsely in granite.  
II. In greisen cutting amphibolite. Wolfram bearing minerals are rare and there are apparently no lithia micas.  
III, IV. In alluvial and disintegrated deposits along with muscovite, tourmaline, quartz, garnet, wolframite, tantalum and columbium minerals.  
Thinks veins occupy cooling cracks in granite, and that the cassiterite is of pneumatolytic origin though some water is present.
1259. LAPAGE, HERBERT. Gold and other mineral resources of Western Australia.  
Trans. Fed. Inst. Mg. Eng., Vol. 7, 1894, London and Newcastle-upon-Tyne, p. 510.  
"In 1888, Mr. Stinton found some stream tin near Bridgetown on the Blackwood River, which led to rich deposits, extending over about 100 square miles. The tin fields are likely to produce great wealth, if properly worked."
1260. MAITLAND, A. GIBB. Notes on the Greenbushes tin field.  
Ann. Progr. Rep. Geol. Surv. Western Australia for 1899 (1900), Perth, pp. 7-8 and 15-20, geologic map 1.  
Description of claims and geology of Dumpling Gully, Cowan Brook, Bunbury Gully, and adjoining land. The country rock is granite, sometimes gneissoid and containing much tourmaline, largely covered, up to 20 feet thick, with a residual conglomerate. Cassiterite occurs in both alluvial and residual deposits.
1261. ———. The mineral wealth of Western Australia.  
Western Australian Geol. Surv. Bull. No. 4, 1900, Perth, pp. 84-90.  
Introduction treating of tin deposits in general.  
Exports of tin ore from Greenbushes and Pilbarra, given. Production of tin throughout Western Australia also given.

## WESTERN AUSTRALIA (Continued)

1262. ———. Preliminary report on the geological features and mineral resources of the Pilbara gold field.  
 Western Australia Geol. Surv. Bull. No. 15, 1904, Perth.  
 Digest: Mg. Mag., Vol. 11, 1905, New York, p. 369.  
 The tin deposits so far worked are all of detrital origin and have yielded considerable quantities of ore. The ores examined seem to be free from the deleterious constituents which are known to occur in the Greenbushes tinfield.
1263. ———. Report on the Wodgina tin field.  
 Rep. Dept. Mines for 1905 Western Australia, 1906, Perth, pp. 126-140.  
 Digest: Eng. Mg. Journ., Vol. 80, 1905, New York, p. 1971.  
 Output of Greenbushes and Pilbara fields about 200 tons of tin per annum. In the new Wodgina field, tin always occurs in granite and pegmatite dikes. In pegmatite dikes tin generally occurs along the sides, though sometimes through the mass. Veins are accompanied by mica and tourmaline.
1264. MAITLAND, A. GIBB, and JACKSON, C. F. V. The mineral production of Western Australia up to the end of 1903.  
 Western Australia Geol. Surv. Bull. No. 16, 1904, Perth, pp. 56-60.  
 Brief introduction treating tin deposits in general, followed by a detailed description of the Greenbushes and Marble Bar (Pilbara) districts.
1265. MULHOLLAND, C. A. The Greenbushes tin field, Western Australia.  
 Austr. Mg. Stand., Vol. 29, 1903, Sydney and Melbourne, pp. 159-160, '192. Serial.  
 "Begins a description of an interesting field from a scientific point of view, the variety of the deposits and the metallurgical problems to be solved."  
 Second article treats of mineralogical details in connection with deposits at Greenbushes.
1266. NEWLAND, D. H. Tin in Western Australia.  
 Min. Ind. for 1902, Vol. 11, 1903, New York and London, p. 595.  
 Output of tin ore in 1902 was 620 long tons valued at £39,783 as compared with 734 tons valued at £40,000 in 1901. Greenbushes alluvial ore carries 40 to 73 per cent tin and is associated with tantalite. Tin dressing plant has been erected in the district by the government as an aid to the mining industry.
1267. SIMPSON, EDWARD S. Report of the mineralogist and assayer (gold, tin, cobalt).  
 Annual Progress Report, Geological Survey of Western Australia for 1899 (1900), Perth, pp. 52-54.  
 Gives notes upon tin ore from Greenbushes field; assays of dressed ore ran from 22.6 to 71.3 per cent, averaging 53.8 per cent.  
 The reason why some apparently well-dressed ore ran so low was found to be on account of the presence of stibiotantalite. Gives analysis. Notes presence of fine particles of native tin, also zircon, garnet, topaz, and tourmaline.
1268. ———. Cassiterite (tinstone). Minerals of economic value.  
 Western Australia Geol. Surv. Bull. No. 19, 1905, Perth, pp. 53-54.  
 General account of the properties and characteristics of cassiterite; its mode of occurrence and of troublesome accompanying minerals. Also a few words about stannite.
1269. SIMPSON, EDWARD S., and GIBSON, CHAS. G. The distribution and occurrence of the baser metals in Western Australia.  
 Western Australia Geol. Surv. Bull. 30, 1907, Perth, pp. 49-76 with map showing distribution.  
 A compilation of the information upon the various tin claims in each district of the State, with history, geologic conditions, and production.

## WESTERN AUSTRALIA (Continued)

1270. "STANNIFER." The Greenbushes tin fields (Western Australia).  
 Austr. Mg. Stand., Vol. 18, 1900, Sydney and Melbourne, p. 811.  
 Describes country geologically and geographically, and gives an account of both stream and lode deposits, the prospects of which he considers are good.
1271. TALBOT, —. Wodgina tin field.  
 Rep. Dep. Mines for 1905, Western Australia, 1906, Perth, pp. 126-128, sketch map 1.  
 Wodgina is at headwaters of western branch of the Turner River, and within limits of the Pilbara goldfield, about 74 miles from Port Hedland. District bids fair to rise to importance as tin and tantalite producer.
1272. WOODWARD, H. P. Coal and tin in West Australia.  
 Geol. Mag., n. s., Vol. 6, 1889, London, p. 432.  
 Thinks discoveries of tin at Bridgetown seems to indicate the biggest thing of the kind that has ever been found. One shaft 18 feet deep will average all the way down about 4 or 5 pounds to the pan. Tin found at surface in sand over area of about 100 square miles.
1273. WOODWARD, HARRY P. Greenbushes tin field (with special reference to the deep leads).  
 Western Australia Geol. Surv. Bull. 32, 1908, Perth, pp. 1-75, maps 3, pls. 3.  
 A general description of the district and its mineralogy with detailed descriptions of claims.
- WOOLNOUGH, W. G. See No. 1649.

## WYOMING

- ANONYMOUS. See No. 985.
1274. AUGHEY, SAMUEL. Minerals of Wyoming territory.  
 Annual Report of the Territorial Geologist, 1886, Laramie, p. 111.  
 Tin occurs near Rawhide Buttes in minute quantities, also in small quantities in Silver Crown district.
1275. BENEDICT, WM. DE L. Tin in Wyoming.  
 Min. Ind. for 1892, Vol. I, 1893, New York, p. 454.  
 Area of tin-bearing rocks extends to granite district west and south of Custer City, South Dakota, throughout Nigger Hill district, and into Wyoming.
- CHANCE, H. M. See No. 1002.
1276. RICKETTS, LOUIS D. Tin in Wyoming.  
 Annual Report of the Territorial Geologist Wyoming, 1890, Cheyenne, pp. 74-75.  
 The tin described in this report is in the Black Hills, Crook County. The cassiterite occurs in imperfect crystals [rare], granules, and grains scattered through dikes of quartz, feldspar and mica, which cut the granite country rock. Samples yielded from 2 to 6 per cent metallic tin, and those samples showing no tin minerals from 2 to 4 per cent. Stream tin in fine particles has been found in all gulches that cut the granite dikes.
- SADTLER, B. See No. 1016.

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1277. AGRICOLA, GEORGIUS (pen name of George Bauer). Bergwerck buch: darinn nicht allain alle empte' instrument gezeug und alles so zu diesem handel gehörig mit figurem vorgebildet und klärlich beschrieben.  
1580, Frankfort-am-Mayn.  
General treatise on mining and smelting, in which the working of tin ores is mentioned in a number of places.
1278. ANONYMOUS. Notes on tin.  
Journ. Soc. Arts, Vol. 1, 1853, London, p. 550.  
Briefly treats of bronze articles of Assyria; the Great Polgooth tin mine of Cornwall; metallurgy of tin and the recent discovery of tin at St. Ives, Cornwall. General article.
1279. ———. The position of tin.  
The Iron Monger, September 4, 1880, London.  
Reprint: Eng. Mg. Journ., Vol. 30, 1880, New York, p. 205.  
Tin of the great mining centers discussed and compared.
1280. ———. Tin.  
Mg. Sci. Press, Vol. 45, 1882, San Francisco, p. 152.  
Tin ore and how it appears. Some plain directions to enable the prospector to distinguish that ore. Character of the rocks in which tin ore is generally found.
1281. ———. Tin.  
Eleventh census U. S. 1890, Min. Industries, 1892, Washington, D. C., pp. 249-265.  
Tin of Virginia, North Carolina, Georgia, Alabama, Texas, South Dakota and California treated. The tin deposits of the world are discussed in a general manner.
1282. ———. Tin.  
Min. Ind. for 1893., Vol. 2, 1894, New York, pp. 607-614.  
A general article treating of general conditions.
1283. ———. Tin.  
Min. Ind. for 1894, Vol. 3, 1895, New York and London, pp. 521-528.  
A general article, prices, statistics, etc.
1284. ———. Tin.  
Min. Ind. for 1895, Vol. 4, 1896, New York and London, pp. 569-573.  
General prices; the situation in Bolivia, Singkep, Malay Peninsula and Tasmania is reviewed.
1285. ———. Tin.  
Min. Ind. for 1896, Vol. 5, 1897, New York and London, pp. 523-532.  
General article upon the tin production of the world and the general situation of tin mining. A full page (528) is devoted to South Africa.
1286. ———. Tin.  
Min. Ind. for 1897, Vol. 6, 1898, New York and London, pp. 637-648.  
Banka, Bolivia, England, Singkep, Spain, Portugal, Straits Settlements, Swaziland and Tasmania are treated briefly.

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1287. ———. Tin.  
 Min. Ind. for 1898, Vol. 7, 1899, New York and London, pp. 707-716.  
 General, markets, statistics.  
 Tin resources of Australia, Bolivia, China, Congo, Great Britain, Straits Settlements and Tasmania briefly treated.
1288. ———. The occurrence of tin.  
 Mg. Sci. Press, Vol. 79, 1899, San Francisco, p. 749.  
 Short general review of tin, localities where found, average yearly output, percentage of output from various countries, manner of occurrence, associated rocks, and kinds of deposits.
1289. ———. Tin.  
 Min. Ind. for 1899, Vol. 8, 1900, New York and London, pp. 618-628.  
 Short remarks on the tin-deposits and production of Australia, Banka, France (Montebras) Great Britain and Tasmania.
1290. ———. Tin.  
 Min. Ind. for 1900, Vol. 9, 1901, New York and London, pp. 635-646.  
 General article; statistics, short articles on Australasian colonies (New South Wales, Queensland, South Australia and Western Australia), Bolivia, Burmah, Malay Peninsula, Russia (Siberia), and United Kingdom; tin markets; progress of technology (metallurgy, tinning, effect of tin on canned meats, chemical analysis, electrolytic deposition).
1291. ———. Sources of tin supply.  
 Engineer, Vol. 91, 1901, London, p. 6, 1700 words.  
 "Discusses the position of tin in the market, and the need of readjusting the balance. Reviews the principal supplies and conditions affecting the output."
1292. ———. Tin.  
 Min. Ind. for 1901, Vol. 10, 1902, New York and London, pp. 637-646.  
 Imports, supplies, production; Alaska, New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Western Australia, Bolivia, France. Malay Peninsula, United Kingdom; tin markets in 1901.
1293. ———. The sparse distribution of tin.  
 Mg. Sci. Press, Vol. 85, 1902, San Francisco, pp. 51-52.  
 Considered most sparingly distributed metal in common use. Workable deposits of gold cover 1,500,000 square miles, while tin deposits cover less than 125,000 square miles. Gold is, or has been obtained in nearly every country in the world, while tin comes from not more than a dozen different districts.
1294. ———. Tin.  
 New Volumes of the Encyclopædia Britannica, 10th Edition, Vol. 33, 1902, London, pp. 346-347.  
 "Primary deposits of tin are in or closely connected with granite or acid eruptive rocks of the same type, associated with tourmaline, fluorspar, topaz, wolfram and arsenical pyrites, and the invariable gangue being quartz." Bolivia is the only exception, "where the tin ore occurs intimately associated with silver ores, bismuth ores and various sulphides, whilst the gangue includes barytes and certain carbonates."  
 Over 5% of the world's tin is from secondary alluvial deposits. Cornwall and Bolivia deposits all in veins. Small portion of that yielded by Australia from veins. Methods of smelting.
1295. ———. Tin in 1902.  
 Eng. Mg. Journ., Vol. 75, 1903, New York, pp. 29-30.  
 Good general review of the year.

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Mg. World, Vol. 20, 1904, Chicago, p. 21.  
A page of random paragraphs on tin.
1297. ———. The tin position.  
Mg. Journ. Railw. Comm. Gaz., Vol. 76, 1904, London, p. 595.  
"An editorial reviewing trade conditions and the probable effect of recent discoveries."
1298. ———. Tin.  
Min. Ind. for 1904, Vol. 13, 1905, New York and London, pp. 391-400.  
Tin mining in United States: Carolinas, South Dakota. Tin mining in foreign countries: Australia, Bolivia, Cornwall, Dutch East Indies, Germany, Malay States. Tin Markets.
- 1298a. ———. The origin of tin.  
Mg. Sci., Vol. 59, 1909, Denver, p. 227, about 190 words.
- 1298b. ———. Tin.  
Mg. Sci., Vol. 59, 1909, Denver, pp. 401-402.  
Rather general, reviewing the various localities in United States in which tin has been found, closing with brief account of tin in Cornwall.
- 1298c. ———. Review of mining in foreign countries.  
Eng. Mg. Journ., Vol. 87, 1909, New York, p. 125.  
Brief review of tin mining at Mount Bischoff and in Derby districts, Tasmania; New South Wales; Queensland and Northern Territory.
- 1298d. ———. World's production of tin.  
Mg. World, Vol. 32, 1910, Chicago, p. 140.  
Statistics showing world's tin production and average prices.
- 1298e. ———. Short answers to some problems in economic geology.  
Mg. Sci., Vol. 61, 1910, Denver, p. 517.  
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- BAUER, GEORGE. *See* No. 1277.
1299. BECK, RICHARD. Lehre von den Erzlagerstätten.  
1901, Berlin.  
———. Nature of ore deposits.  
Translated and revised by Walter H. Weed, Vols. 2, 1905, New York.  
Contains descriptions of the occurrence and method of mining tin ore, both in alluvial and lode deposits in various parts of the world, and discusses the origin of tin ore.
1300. BECK, R. On the relation between ore veins and pegmatites.  
Trans. Geol. Soc. South Africa, Vol. 8, 1905 (1906), Johannesburg, pp. 147-150.  
States that tin veins at Zinnwald, Graupen, on the island of Elba, the Etta mine (South Dakota), and Embabaan, South Africa, are pegmatite dikes.  
Translated from English by G. Berg in Zeitschr. prakt. Geol., Vol. 14, 1906, Berlin, pp. 71-73.
1301. BENEDICT, W. DE L. Tin.  
Min. Ind. for 1892, Vol. 1, 1893, New York, pp. 439-462.  
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Numbers 31: 22. Tin found among spoils of Midianites in days of Moses.  
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From an examination of evidence to be found in Cornwall, and also from early writers, the author reaches the conclusion that the "probable antiquity of the Bronze Age in Britain is from three to four thousand years, and the consequent production of tin in Devon and Cornwall must be as old."  
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- CHURCH, A. H. See No. 620.
1385. COLLINS, J. H. Seven centuries of tin production in the west of England. Read March, 1891.  
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HUNT, ROBERT. See Nos. 412 and 413.
1398. JAMES, HENRY. Note on the block of tin dredged up in Falmouth harbor.  
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Considering the peculiar form of this block of tin, its weight and the place where it was dredged up, it appears to throw light upon the still vexed question of the locality of the Ictis of Diodorus. Quotations from passages of Diodorus, relative to tin trade of Britain.
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Treats of the early Phœnician tin trade with Britain and speculates as to the Cassiterides.
1401. LEWIS, GEORGE CORNEWALL. An historical survey of the astronomy of the ancients.  
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Quotes many of the ancient writers on Phœnician trade, and comes to the conclusion that tin was supplied in early times to nations in the east of the Mediterranean by the overland route across Gaul, and that the Phœnician ships got it at the mouth of the Rhone, without sailing as far as Britain. Some tin may have been obtained from Gades.
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 Remarks on same, pp. XXVI-XXVII.  
 Extracts from MSS. showing the magnitude of tin mining in Cornwall during the fourteenth century.
1404. ———. The tin trade of Cornwall in the reigns of Elizabeth and James compared with that of Edward I.  
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 Brief account of tin "coined" between years 1365-1607.
1405. NAPIER, CHAS. R. G. On the localities from whence the gold and tin of the ancients were derived.  
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 Tin was known, at least 1500 years B. C. Britain, Brazil and Sumatra mentioned as tin supplying countries for ancients.
1406. PATTISON, S. R. On ancient and modern tin-works in France.  
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 Author arrives at following conclusions, some as historical facts, the rest as probabilities:  
 (1) At one epoch the provinces of Limousin and Marche possessed at Montbras and Vaulry important tin mines.  
 (2) Similar works were probably attempted throughout these two Provinces, which accounts for the numerous remains of open works now visible.  
 (3) Gold, which is found at Vaulry, and traces of gold at St. Leonard, had probably been sought for by the old miners in these works.  
 (4) The silence of history, and the open character of the works, justify him in attributing them to the Gauls.
1407. PEARCE, GILBERT B. Blocks of tin found in Fowey Harbour.  
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 Brief account of four blocks of tin, very rough castings. As they bore no mark or coinage stamp, the writer infers that they probably belong to a time previous to the institution of the coinage law.
1408. PLINIUS, CAIUS. Natural History.  
 Bohns Classical Library.  
 Trans. by John Bostock & H. T. Riley, 1887, London.  
 Book 4, chap. 30, Vol. 1, p. 352.  
 Timaeus, the historian said to mention that "white lead" is found on the island of Mictis 6 days' sail from Britannia.  
 Book 7, chap. 57, Vol. 2, p. 225.  
 Midacritus was the first who brought tin from the island called Cassiteris.  
 Book 34, chap. 47, Vol. 6, pp. 212-215.  
 Greeks brought "white lead" from Lusitania and Gallæcia.  
 P. 213. "White lead was held in estimation even in the days of the Trojan war, a fact that is attested by Homer, who calls it 'cassiteros.'"
1409. POLWHELE, R. The history of Cornwall.  
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 Not available to the authors.

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1410. RAWLINSON, GEORGE. Phœnicia.  
1898, New York and London, pp. 66-67, 69-70.  
Gives an account of the planting of colonies in Andalusia, Spain; led there by riches of country, among which gold, silver, quicksilver, tin, lead, copper and iron are mentioned as occurring in the mountains in which the ancient Baetis and tributaries rise. They also planted colonies on the Scilly islands, attracted by mineral wealth, and from there they exported tin and lead to Greece and Asia.
1411. REYER, —. Tin, and its history.  
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Historical sketch of tin beginning with 1800 B. C. down to 1873, A. D., when Tasmanian stream tin became known.
1412. REYER, EDUARD. Allgemeine Geschichte des Zinnes.  
Oest. Zeitschr. Berg. Hütt. Vol. 28, 1880, Wien, pp. 499-501, 514-516.  
Translated by Symons, B. in 1881. Trans. Mg. Ass. Inst. Cornwall, Vol. 4, 1893, pp. 138-150.  
Review: Eng. Mg. Journ., Vol. 31, 1881, New York, pp. 313-314.  
Digest: Ann. Brit. Geol. 1893, London, p. 280.  
"The name 'tin' is of Gallie origin, being derived from 'ostean,' Cornish 'stean.' It is estimated that in 1881 the production of tin in the various parts of the world was: Australia, 10,000 to 15,000 tons; England, 10,000; Straits of Malacca, etc., 10,000; Banca and Billiton, 7000 to 9000; Tasmania, 3000 to 5000; and China, 5000 tons."
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1904, London, pp. 44, 46, 48, 204, 257.  
Gives account of early tin trade, history of Cassiterides, location, etc.
1414. SAUNDERS, C. D. The ancient Cornish tin trade.  
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A discussion as to whether the Phœnicians carried on their tin trade as a maritime one, i. e. through the Pillars of Hercules, or as a land trade through Gaul to Mediterranean Sea.
- SCHEMIDT, ALBERT. See Nos. 570 and 571.
1415. SCHURMAN, J. A. Historische schets van de tinwinning op Banka.  
Jaarb. Mijnw. Ned. Oost-Indië, 1898, II, Tech. and Admin. Amsterdam, pp. 1-112.
1416. SIMONIN, L. Sur l'ancienne exploitation des mines d'étain de la Bretagne.  
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1417. SMIRKE, EDWARD. Tin trade between Britain and Alexandria in the 17th century.  
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1418. SMITH, GEORGE. The Cassiterides: an inquiry into the commercial operations of the Phœnicians in Western Europe, with particular reference to the British tin trade.  
1863, London, pp. 154.  
Believes that tin was obtained from Cornwall as early as the period between 1200 and 1500 B. C., and that tin did not come from Malay Peninsula during these early times.
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 Historical. States that pure iron was used in Egypt B. C. 3124, and argues that since iron was a necessity for production of copper, and tin was of no use without copper, iron and copper must have been known first.
- WAIT, F. W. *See* No. 482.
1421. WARNER, RICHARD. A tour through Cornwall (with an account of the mines).  
 1809, Bath and London, pp. 245-282.  
 Gives a sketch of the early history of tin, and in a brief way, the geology of tin deposits of Cornwall.
- WEEKS, JOSEPH D. *See* No. 1372.
1422. WERNER, —. Le plus ancien de tous les métaux.  
*Journ. Mines* No. 18, Vol. 3, 1795 et 1796, Paris, pp. 90-96.
1423. WHEELER, H. A. Tin mining in the Ozarks. A bit of history.  
*Eng. Mg. Journ.*, Vol. 77, 1904, New York, p. 323.  
 Describes attempt to mine tin at Tin Mountain, some 10 miles south of Fredericktown, about 130 miles south of St. Louis, Mo., where there was no tin. Exposes the methods used. Account of a clever fraud.
1424. WINER, —. Die Metalle und Mineralien bei den alten Egyptiern.  
*Berg. Hütt. Zeit.*, Vol. 40, 1881, Leipzig, p. 467.  
 Tin is mentioned among the metals used by the ancient Egyptians.
1425. WORTH, R. N. Historical notes concerning the progress of mining skill in Devon and Cornwall.  
 40th Ann. Rep. Roy. Cornwall Polyt. Soc., 1872, Falmouth, pp. 63-121.  
 From a historical point of view the author treats of the discovery, methods and progress of early mining, including tools, machinery and power; dressing, smelting and sale of tin and copper, with short discussion of the early miner.
1426. ———. The antiquity of mining in the west of England.  
 42d Ann. Rep. Trans. Plymouth Inst. Devon and Cornwall Nat. Hist. Soc., 1873-1874 (1874), Plymouth, pp. 120-140.  
 Conclusions reached are:  
 "First. That the historical evidence of the antiquity of western mining takes it back at least 2300 years.  
 "Second. That the inferential evidence carries it nearly 2000 years further, and possibly doubles the first-named period.  
 "Third. That the geological evidence would antedate the commencement of mining, and consequently the use of metals, to a time when the mammoth either still existed in the west of England, or had not long disappeared; and when the general level of Devon and Cornwall was at least 30 feet higher than it is now. Taking Sir Charles Lyell's estimate of the rate of crust motion at 2½ feet in a century, fully 2000 years would thus be covered by the gradual process of subsidence and whilst we cannot tell when it ended, nor perhaps accurately estimate the chronological value of later changes, we know from St. Michael's Mount that it must have ceased certainly 2000 years ago; whilst other reasons appear to indicate a much more remote antiquity."
1427. ———. The ancient stannary of Ashburton.  
*Trans. Devonshire Ass. Adv. Sci. Lit. Art*, Vol. 8, 1876, Plymouth, pp. 311-322.  
 Digest: *Geol. Rec.* for 1876, London, p. 332.  
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## IV. METALLURGY AND CHEMISTRY

1428. AARON, C. H. Assaying of tin ores.  
Assaying, pts. II and III, 1900, San Francisco, pp. 127-128.  
Short account of methods used in assaying tin ore.
- AGRICOLA, GEORGIUS. See No. 1277.
1429. ALLARD, —. Crystallization of tin.  
Ann. Indust. nat. étr., April, 1820, Paris.  
Translated and abstracted by Editor Amer. Journ. Sci. Arts, 1st ser., Vol. 17, 1830, New Haven, pp. 206-208.  
A method of producing "noiré métallique" on tin plate by the application of acids and heat.
1430. ALLEN, ALFRED H. On metastannic acid and the detection and estimation of tin.  
Chem. News, Vol. 25, 1872, London, pp. 170-171.  
Abstract of paper read before the Chemical Society, March 7, 1872.  
Finds that metastannic acid is much more soluble in acids than had been supposed by Fresenius and others, and that ordinary stannic sulphate is formed by treatment with hot  $H_2SO_4$ . Uses this reaction in the estimation of tin in alloys.
1431. ALLEN, J. F. On the alloys of tin, zinc, lead and other metals with manganese.  
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Makes manganese-copper alloy from the oxides, then adds tin or other metal, forming an alloy that can be rolled or cast for bearings, etc.
1432. ANONYMOUS. Improved method of estimating tin.  
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"Hitherto in chemical analysis tin has always been estimated in the form of stannic acid (peroxide of tin) . . . . . The new method depends on the facility with which protochloride of tin withdraws chlorine from bodies capable of furnishing it."
1433. ———. Properties of the alloys of copper and tin.  
Iron Age, Vol. 24, 1879, Dec. 4, New York, p. 15; Dec. 11, pp. 9, 11; Dec. 18, p. 3.  
Gives results of torsional, compressive and transverse stress tests; analyses and specific gravities; and a comparison of the ductilities of various bronzes.
1434. ———. Disintegration of tin.  
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Short discussion of the cause of the disintegration of tin from cold. Theory advanced that it is due to crystallization, possibly to dimorphism.
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Describes a process of tin recovery by oxidizing the tin on tin scrap in heated air. Copied. Original place of publication unknown to authors.

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Note from "Chemical Journal," of Nürnberg stating persons working in a smelting establishment were poisoned by tin containing 1.3 per cent Hg.
1437. ———. Assais des minerais d'étain par la voie seche.  
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1438. ———. Recovering tin from scrap.  
Eng. Mg. Journ., Vol. 76, 1903, New York, p. 58, about 150 words.  
Plants for the recovery of metallic tin are being operated in Germany [seven], Austria [one], England [one]. Germany is drawing supplies for tin recovery plants from England, France and Switzerland.
1439. ———. British patent, 736, 924 of 1903.  
Eng. Mg. Journ., Vol. 76, 1903, New York, p. 360.  
Electrolytic method of recovering tin from scrap.
1440. ———. Electrolytic production of tin.  
Queensland Gov. Mg. Journ., November, 1904, Brisbane.  
"Description of German patent for obtaining tin from any substance containing the metal."  
Not available to the authors.
1441. ———. Electrolytic methods of treating tin scrap.  
Engineer, Vol. 98, 1904, London, pp. 5-6, 2500 words.  
Details of all processes which have been tried industrially; cost of operating, and the future of industry.
1442. ———. Recovery of tin from old cans.  
Eng. Mg. Journ., Vol. 79, 1905, New York, p. 428, 500 words.  
"Tin cans are put in 2 per cent solution of  $\text{SnCl}_2$ , which dissolves tin forming  $\text{SnCl}$ . Then electrolysed, tin falling in crystals .1875 in. long and solution again containing  $\text{SnCl}_2$  is pumped back. Carried on at 70° F. Known as Bergse process and used at Copenhagen, Denmark, works.
- 1442a. ———. Wet method for the assay of tin in ores, etc.  
South African Mg. Journ., May 2, 1908, Johannesburg, p. 3/4.  
"Gives a simple and reliable process for the determination of tin in tin ores by the wet method."
- 1442b. ———. Detinning industry.  
Iron and Coal Tr. Rev., Vol. 78, 1909, London, p. 415, fig. 2.  
"A review of the detinning industry with notes on chlorine detinning and also a short note on the Goldschmidt company."
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1443. BALLING, CARL. Manuel pratique l'art de l'assayeur.  
1881, Paris, pp. 488-500.  
Methods of assaying tin ores.
1444. BANNISTER, C. O. On the assay of auriferous tinstone.  
Trans. Inst. Mg. Met., Vol. 15, 1905-1906, London, pp. 513-519. Discussion pp. 520-523.  
Gives results obtained in assaying stream-tin for gold by scorification, crucible assay, a wet method, concentration of the gold in a part of the tin, and by the collection of the gold in the whole of the tin. Considers the crucible method to be the best.



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C. R. Acad. Sci., Vol. 52, 1861, Paris, pp. 757-759.
1446. BERGEMANN, C. Mineral-Analysen. Zinnstein von Xeres in Mexico.  
Neues Jahrb. Min., 1857, Stuttgart, p. 395.
1447. BERGLUND, EMIL. Neue Methode zur qualitativen Scheidung von Zinn, Antimon und Arsen.  
Berichte deutsche Chemische Gesellschaft, Vol. 17, I, 1884, Berlin, pp. 95-98.  
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- 1447a. BERINGER, J. J. Wet assay of tin ores.  
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Discussion by Pearce, Richard, *ibid.*, pp. 307-308.
1448. BERTHELOT, —. Action de l'oxygène sur les chlorures acides et composés analogues: étain, silicium, bore.  
C. R. Acad. Sci., Vol. 86, 1878, Paris, pp. 920-926.
1449. BERTHIER, P. Analyse d'un étain allié.  
Ann. Mines, 3d ser., Vol. 11, 1837, Paris, pp. 513-514.
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- 1450a. BETTEL, W. Assaying tin ores.  
South African Mg. Journ., September 12, 1908, Johannesburg, pp. 1½.  
"Discusses the various methods for the assay of tin and compares the merits of the Cornish wet and dry methods."
1451. BETTS, ANSON G. Electrolytic lead refining. [Tin in refined lead.]  
Trans. Amer. Inst. Mg. Eng., Vol. 34, 1903, New York, p. 180.  
Tin has been found in electrolytically refined lead at Trail, B. C., to the extent of 0.02 per cent. No difficulty is experienced in removing this from the lead by poling before casting.
1452. BILLINGS, G. H. The properties of iron alloyed with other metals.  
Trans. Amer. Inst. Mg. Eng., Vol. 5, 1877, New York, p. 450.  
Reprint: Eng. Mg. Journ., Vol. 23, 1877, New York, pp. 394-395.  
Results of experiments made by combining a small per cent of tin with iron. Of all metals alloyed with iron, experiments point to the fact that tin has the most hurtful effect.
1453. BOHNE, E. Vererbeitung der Schlacken vom Zinnerzschmelzen vermittelst verdünnter Schwefelsäure.  
Berg. Hütt. Zeit., Vol. 57, 1898, Leipzig, pp. 203-204.  
Digest: Proc. Inst. Civ. Eng., Vol. 133, 1898, London, pp. 452-453.  
"The final slags produced in smelting of tin ores in the reverberatory furnace cannot, as a rule, be brought to lower content of tin than about 4 per cent, which in works smelting ten tons of ore daily, represents a loss of 3 cwt. to 4 cwt. of metallic tin. Author finds that this may be recovered to a great extent by decomposing the slag with sulphuric acid, when the iron and tin are dissolved, giving a solution from which the latter metal may be recovered by electrolysis."
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 A brief record of experiments made to ascertain the cause of the low results which are often obtained in the determination of tin.
1458. BROWNE, FRANK. Chinese tin.  
 Chem. News, Vol. 95, 1907, London, pp. 3, 4.  
 Abstract by W. S. Landis in Chem. Abs., No. 5, Vol. 1, March 5, 1907, Easton, p. 549.  
 Description of a Chinese method of smelting tin.
1459. BUNSEN, R. Unterscheidung und Trennung des Arseniks von Antimon und Zinn.  
 Ann. Chem. Pharm., Vol. 106, 1858, Heidelberg, p. 3.
1460. CAHOURS, A. Recherches sur les radicaux organo-métallique.  
 C. R. Acad. Sci., Vol. 48, 1859, Paris, pp. 833-837.  
 Action des alliages d'étain et de sodium sur les éthers iodhydriques des différentes séries alcooliques.
1461. CAHOURS, A., and DEMARÇAY, E. Sur les stannpropyles et les isostannpropyles.  
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Discussion by Blake, W. P., *ibid.*, pp. 785-787.

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CLARK, DONALD. See No. 1076.

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(See No. 1477.)

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Reference to furnaces and slags at some large old tin mines at Bundi, Federated Malay States.

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Abstract: Eng. Mg. Journ., Vol. 77, 1904, New York, p. 928.

Believes vaning to be the best mine test, and reduction by fusion of SnO<sub>2</sub> with KCN a good assay. Finds that finely powdered SnO<sub>2</sub> may be largely dissolved by H<sub>2</sub>SO<sub>4</sub> and zinc, and with HCl.

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Digest: Min. Proc. Inst. Civ. Eng., Vol. 136, pt. II, 1898-1899 (1899), London, p. 442.

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2. Precipitation of silver out of tin, by scorification, pp. 228-230.
  3. The reduction of tin ore in a close vessel, pp. 334-335.
  4. The reduction of tin ore, extempore, pp. 335-336.
  5. To reduce tin ore by a stratification with coals, pp. 336-337.
1473. CROOCKEWIT, J. H. Over de wijze van uitsmelting (herleiding) van den tinerts door de Chineezen op Banka.  
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1477. DEWEY, FRED P. On Clarke's method for the separation of tin from arsenic and antimony.  
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Abstract: Berg. Hütt. Zeit., Vol. 32, 1873, Leipzig, pp. 423-424.  
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Peninsula is described as a "huge ridge of granite and porphyry, with occasional tracts of overlying and highly distorted sandstone, slate, schists and limestones, the lower ground being filled in with alluvial beds of clay, sand and gravel." Ore is associated with granite, both in lode and alluvial deposits. Richest pay gravel rests on the lowest clay bed, usually an impure kaolin. Methods of obtaining valuation of tin-bearing ground, Chinese method of mining, methods of smelting used by both Chinese and Europeans, tests for quantity of tin given.

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Estimates 75,000 tons of scrap are treated in Germany each year, and about 25,000 tons in the rest of Europe, making 1500 tons of tin and tin-salts. In America 60,000 tons, giving 3000 to 3500 tons tin or 3½ per cent of the world's product.  
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The paper is discussed by various members and author's reply given.

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I. Assays in charcoal-crucibles.  
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Rep. Secr. Mines for 1899-1900, Tasmania, 1900, Hobart, pp. 91-92.  
Gives the amount and kind of tin ores smelted during first half of 1899, the method of smelting used, proper mixtures of ores, and charges.



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- (c) Chinese method of tin smelting; (d) treatment of the slag.
2. Tin smelting in the reverberatory furnace.

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Journ. prakt. Chem., Vol. 57, Leipzig, p. 385.

Extract: Amer. Journ. Sci. Arts, ser. 2, Vol. 16, 1853, New Haven, pp. 116-118.

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- 1531a. MEADE, RICHARD K. The valuation of engineering alloys.  
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 C. R. Acad. Sci., Vol. 119, 1894, Paris, pp. 224-226.
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## METALLURGY AND CHEMISTRY (Continued)

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- |            |       |               |        |
|------------|-------|---------------|--------|
| Iron ..... | 6.019 | Copper .....  | 0.006  |
| Lead ..... | 0.014 | Pure tin..... | 99.961 |
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## V. MINERALOGY

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1593. BERNHARDI, —. Bestimmung der Krystallisation einiger mineralischen Substanzen.  
Tasch. ges. Min., 1807, Vol. 3, 1809, Frankfurt-am-Main, pp. 76-86.  
On the crystal form of tin.
1594. BORGSTRÖM, L. H. Ueber Kassiterit von Pitkäranta.  
Zeitschr. Kryst. Min., Vol. 40, 1905, Leipzig, pp. 1-12, pl. 1.  
Description of cassiterite crystals from Pitkäranta, Finland.
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Nordenskiöldine, a very rare borate of calcium and tin, is described. Interesting because it directly connects tin and boron. Composition:  $CaSnB_2O_6$ . Mentioned as occurring on the island Arö.



## MINERALOGY (Continued)

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London, Edinburgh, Dublin Philos., Mag. Journ. Sci., ser. 4, Vol. 6, 1853, London, p. 121.

A paragraph upon the composition of pseudomorphs of cassiterite after feldspar twins. They carried 43.6 and 55.46 per cent of metallic tin.

## 1598. COLLINS, J. H. On some Cornish tinstones and tin capels.

Min. Mag. Journ. Min. Soc., 1st paper, No. 17, Vol. 4, April, 1880, London, pp. 1-20; 2d paper, No. 18, Vol. 4, September, 1880, London, pp. 103-116; 3d paper, No. 24, Vol. 5, April, 1883, London, pp. 121-130.

Vol. 4 contains 12 plates, 5 of which are colored.

A description of Cornish tin-ores, and the minerals accompanying the cassiterite.

## 1599. CRONSTEDT, AXEL F. Mineralogy. Translated from Swedish with annotations, and an additional treatise on the blow-pipe by Gustav von Engestrom.

2d Ed. Vol. 2, 1788, London, pp. 618-643.

Tin is treated under heads: Its properties; native tin; calciform ores of tin; calciform tin ores crystallized; tin grains, calces of tin, mixed with metals; aurum musivum; observations on tin.

## 1600. DANA, J. D. A system of mineralogy.

1892, New York. (6th Ed.).

Mineralogical descriptions are given as follows: Cassiterite, pp. 234-236; norden-skiöldine, p. 875; stannite, p. 83.

An analysis is quoted from Leuchtenberg which shows the presence of tin in olivine found in a meteorite (p. 453) and a number of analyses showing the presence of tin in tantalite and columbite are given on pp. 732-733.

## 1601. DAUBRÉE, A. Sur la production artificielle de quelques espèces minérales cristallines particulièrement de l'oxyde d'étain, de l'oxyde de titane et du quartz. Observations sur l'origine des filons titanifères des Alpes.

Ann. Mines, 4th ser., Vol. 16, 1849, Paris, pp. 129-141.

Extrait par auteur, C. R. Acad. Sci., Vol. 29, 1849, Paris, pp. 227-229.

Extract: Bull. Soc. Geol. France, 2d ser., Vol. 7, 1849, Paris, pp. 267-276.

Report: C. R. Acad. Sci., Vol. 30, 1850, Paris, pp. 383-387.

Extract: Neues Jahrb. Min., 1849, Stuttgart, pp. 712-715.

Abstract: Amer. Journ. Sci. Arts, 2d ser., Vol. 9, 1850, New Haven, pp. 120-121.

The first part of this memoir gives the results of experiments made by Daubrée, with a view of imitating the processes by which Nature may have acted in forming minerals. Instead of using fluorides, which are not so easily prepared, Daubrée generally employed chlorides. From the great analogy of fluorides with chlorides he considers that the results obtained with the latter may be safely supposed to occur with the former. The first experiment consisted in passing a current of stannic chloride and a current of steam into a red-hot porcelain tube. Double decomposition took place, and crystals of stannic oxide were deposited on the sides of the tube. The crystals were found to belong to the rhombic system, which shows that stannic oxide, like titanic oxide, is dimorphous. The temperature of the end of the tube, where the crystals were deposited did not exceed 572° F. (300° C.), or, in other words was rather less than the melting point of lead. Titanic chloride, treated in the same way, gave crystals of brookite; whilst a deposit of vitreous and in part crystallized quartz was obtained from chloride of silica and steam.—C. Le Neve Foster.

## MINERALOGY (Continued)

1602. ———. Recherches sur la production artificielle des minéraux de la famille des silicates et des aluminates, par la réaction des vapeurs sur les roches.  
C. R. Acad. Sci., Vol. 39, 1854, Paris, pp. 135-140.  
Cassiterite artificially prepared by passing the vapor of stannic chloride over heated lime.
- . See No. 1314.
- DAVEY, RICHARD. See No. 1603.
1603. DAVEY, STEPHEN. Notice of pseudomorphous crystals of oxide of tin, found in Huel Coates mine, in St. Agnes in the year 1828.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 4, 1838, Penzance, pp. 484-485.  
A short description of pseudomorphs after feldspar. Crystals in many stages of replacement were found.  
Boase and Courtney (Bibliotheca Cornubiensis, Vol. 1, 1874, London, p. 106), state that this paper is really by Richard Davey, which is the name given in the index of the book in which the article occurs.
1604. DEVILLE, H. SAINT-CLAIRE. De la reproduction de l'étain oxydé et du rutile.  
C. R. Acad. Sci., Vol. 53, 1861, Paris, pp. 161-164.  
The crystallized oxide of tin obtained "by heating the amorphous oxide in a slow current of hydrochloric acid gas and again by a repetition of Daubrée's first process."
1605. DEVILLE, SAINT-CLAIRE H., and CARON, H. Sur un nouveau mode de production à l'état cristallisé d'un certain nombre d'espèces chimiques et minéralogiques.  
C. R. Acad. Sci., Vol. 46, 1858, Paris, p. 768.  
"The crystallized oxide of tin was obtained when stannic fluoride and boric oxide were heated together to whiteness." No details.
1606. DITTE, A. Sur quelques combinaisons du bioxyde d'étain.  
C. R. Acad. Sci., Vol. 104, 1887, Paris, pp. 172-175.
- FAWNS, SYDNEY. See No. 1320.
1607. FIELD, FREDERICK. On a specimen of tin ore hitherto undescribed.  
Rep. Brit. Ass. Adv. Sci., Vol. 34, Bath, 1864, London, 1865, p. 27. (Notes and abstracts.)  
Description of two specimens of "sline tin," a variety of "toad's-eye wood-tin (sic)."
1608. FOSTER, C. LE NEVE. On the place and mode of occurrence of the mineral Andrewsité.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 9, 1875, Penzance, pp. 163-164.  
A hydrous iron-copper-phosphate occurring with tin ore at the West Phoenix Mine, Liskeard, Cornwall.
1609. FOULLON, H. Ueber krystallisirtes Zinn.  
Jahrb. k. k. geol. Reichs., Vol. 34, 1884, Wien, pp. 367-384, wood cuts 2, pl. of figs. 1.  
Abstract: Min. Mag. Journ. Min. Soc., Vol. 6, 1885, London, p. 148.  
Found that crystals of tin obtained from the molten metal were of rhombic form, generally twinned. Such crystals may also be obtained by electrolytic deposition.

## MINERALOGY (Continued)

1610. FOUQUÉ, F., and LÉVY, MICHEL. Synthèse des minéraux et des roches. G. Masson, Ed., 1882, Paris, pp. 389-391.  
Treats of the making of artificial cassiterite.
1611. FRENZEL, A. Ueber den Kyindrit.  
Neues Jahrb. Min., 1893, II, Stuttgart, pp. 125-128.  
Description of a rare tin mineral, occurring in Bolivia. Composition,  $Pb_3FeSn_4Sb_2S_{14}$ . (Cylindrite.)
1612. GADOLIN, S. A. Beobachtungen über einige mineralien aus Pitkaeranta in Finnland.  
Verh. Russ. Kais. min. Ges., 1855-1856 (1856), St. Petersburg, pp. 184-196.  
Descriptions of cassiterite crystals.
- GENTH, F. A. See No. 820.
1613. GRANGER, A. Sur un sulfophosphure d'étain cristallisé.  
C. R. Acad. Sci., Vol. 122, 1896, Paris, pp. 322-323.
1614. GREG, R. P., and LETTSOM, W. G. Mineralogy of Great Britain and Ireland.  
1858, London, pp. 355-361.  
Also, Neues Jahrb. Min., 1859, Stuttgart, pp. 186-189.  
1. Oxide. Cassiterite: a. Forms of crystals. b. Analyses. c. Localities. d. Description of varieties, i. e. wood-tin, etc.  
2. Sulphide in combination. Stannine.
1615. HAÛY, —. Suite de l'extrait du "Traité de Mineralogie."  
Journ. Mines, Vol. 6, 1797, Paris, pp. 575-582.
1616. HEADDEN, WM. P. Stannite and some of its alteration products from the Black Hills.  
Amer. Journ. Sci., ser. 3, Vol. 45, 1893, New Haven, pp. 105-110.  
Discusses analyses of his own and of Titus Ulke's of stannite alterations from the Peerless and Etta mines. He thinks that some of these alteration products may be soluble in water and this may explain the origin of the tin in various pseudomorphs.
1617. ———. Some products found in the hearth of an old furnace upon the dismantling of the Trethellen tin works, Truro, Cornwall.  
Proc. Colorado Sci. Soc., Vol. 6, 1897, Denver, pp. 74-85.  
Abstract: Amer. Journ. Sci., ser. 4, Vol. 5, 1898, New Haven, pp. 93-96.  
Author describes "wood-tin" (cassiterite) and compounds of arsenic, sulphur, iron, etc., formed in an old Cornwall furnace. He believes them sublimation products but Pearce believes them to be from slow cooling of magma.
- . See No. 1208.
- HERMAN, R. See No. 968.
1618. CHANGED to 1505a.
1619. HUNT, ROBERT. Researches on the influence of magnetism and voltaic electricity, on crystallization, and other conditions of matter.  
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Digest: Trans. Fed. Inst. Mg. Eng., Vol. 21, 1903, Newcastle-upon-Tyne and London, p. 590.  
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1621. JAMESON, ROBERT. Mineralogy.  
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Tin ore is treated under: External characters; chemical characters; constituent parts; geognostic situation; geographic situation; uses; observations.
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- LACROIX, A. See No. 516.
1625. LAUNAY, LOUIS DE. Formation des gîtes métallifères ou métallogénie.  
1905, Paris, pp. 129-130.  
Brief summary in which he gives the ages of the tin deposits of the world.
- LETTSON, W. G., and GREG, R. P. See No. 1614.
1626. MATHER, W. W. Contributions to chemical science.  
Amer. Journ. Sci. Arts, 1st ser., Vol. 27, 1835, New Haven, pp. 254-255.  
Describes crystals of metallic tin formed from a saturated solution of tin chloride.
1627. MILLER, W. H. On the forms of the crystals of tin.  
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Measurements of metallic tin crystals formed by electrolytic action.
1628. NÖGGERATH, J. J. Gegenden von Zinnwald und Altenberg.  
Jenaische Lit. Zeit., 1823, p. 370.  
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- 1628a. NORDENSKIÖLD, A. E. Beskrifning öfver de i Finland funna mineralier.  
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Quoted in Dana's "System of Mineralogy" (6th Ed. 1909), p. 236.  
Describes amalite, a cassiterite containing  $\text{SnO}_2$  88.95,  $\text{Ta}_2\text{O}_5$  8.78,  $\text{Fe}_2\text{O}_3$  2.04,  $\text{CuO}$  0.78=100.55 from Pennikoja in Somero, Finland, with tantalite and beryl in albite.
1629. PEARCE, RICHARD. Siliceous oxide of tin after quartz and allophane found in Cornwall.  
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Not available to the authors.

## MINERALOGY (Continued)

1630. ———. Notes on the occurrence of pseudomorphs of oxide of tin after some unknown mineral from Bolivia.  
 Trans. Roy. Geol. Soc. Cornwall, Vol. 13, 1906, pt. 2, Penzance, pp. 150-152.  
 Notice of cassiterite crystals that are apparently pseudomorphs, possibly after sulpho-stannites, as they are accompanied by what seem to be alteration products.
1631. PENFIELD, S. L. On canfieldite, a new sulphostannate of silver from Bolivia.  
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 Gives description and analysis of a sulphostannate of silver, containing germanium.  
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1632. PHILLIPS, J. ARTHUR. On the structure and composition of certain pseudomorphic crystals having the form of orthoclase.  
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1633. PHILLIPS, W. A description of the oxyde of tin, the production of Cornwall; of the primitive crystal and its modifications, including an attempt to ascertain with precision, the admeasurement of the angles, by means of the reflecting goniometer of Dr. Wollaston: to which is added, a series of crystalline forms and varieties.  
 Trans. Geol. Soc. London, Vol. 2, 1814, London, pp. 336-376, figures.  
 Review *Tasch. ges. Min.*, Vol. 12, II, 1813, Frankfurt-am-Main, pp. 543-544.  
 The title is a fair digest of the article, which is a classic upon the subject.
1634. PHILLIPS, WILLIAM. On the measurements, by the reflecting goniometer, of certain primitive crystals; with observations on the methods of obtaining them by mechanical division along the natural joints of crystals.  
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 Gives method of cleaving cassiterite crystals by first heating them, so that faces parallel to all the sides of the common prism, its diagonals and faces of the primitive octohedron may be measured.
1635. PIRSSON, L. V. Mineralogical notes.  
 Amer. Journ. Sci., ser. 3, Vol. 42, 1891, New Haven, p. 407.  
 Description of crystals of hematite inclosing cassiterite, from Mina del Diablo, Durango, Mexico.
1636. PRIOR, G. T. On teallite, a new sulphostannite of lead from Bolivia; and its relations to franckeite and cylindrite.  
 Min. Mag. Journ. Min. Soc., Vol. 14, 1907, London, pp. 21-27.  
 "The new mineral occurs in thin graphite-like folia embedded in glistening kaolin, upon a dark grey matrix impregnated with iron-pyrites; on one specimen it is associated with a little wurtzite in thin plates, and on the other with a little galena." It is much like the other two minerals in physical character, but differs chemically, containing no antimony, only lead, tin and sulphur. Composition— $PbSnS_2$ .
- RAIMONDI, A. See No. 870.  
 Describes plumbostannite, a sulphide of lead, tin and antimony.

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1637. RAMMELSBURG, C. Ueber die chemische Zusammensetzung des Zinnkieses.  
 Ann. Physik. Chem., Vol. 88, 1853, Leipzig, pp. 603-608.  
 Digest: Neues Jahrb. Min., 1855, Stuttgart, pp. 72-73.  
 Gives a number of analyses of stannite from Zinnwald and Cornwall.
1638. REID, CLEMENT, and SCRIVENOR, J. B. The geology of the country near Newquay.  
 Mem. Geol. Surv. Great Britain, 1906, London, p. 39.  
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1639. ROSENBUSCH, H. Microscopical physiography of the rock-making minerals.  
 Translation and abridgement by Jos. P. Iddings, 1889, New York, pp. 151-152.  
 Microscopical-optical properties. Only one unquestioned occurrence noted of cassiterite occurring as a microscopical rock-making mineral, where it occurs with rutile as inclusions in the lithia-mica of the granite of Greifenstein.
- SCHERTEL, A., and STELZNER, A. W. See No. 1643.
- SCRIVENOR, J. B., and REID, CLEMENT. See No. 1638.
1640. SOLLY, R. H. Cassiterite, "sparable tin," from Cornwall.  
 Mg. Mag., Vol. 9, No. 43, 1891, New York, pp. 199-208, figs. 3.  
 Brief digest: Neues Jahrb. Min., 1892, II (Min.), Stuttgart, p. 15.  
 Descriptions of the tin crystals of various mines of Cornwall.
1641. SPENCER, L. J. Crystallized stannite from Bolivia.  
 Min. Mag. Journ. Min. Soc., Vol. 13, 1901, London, pp. 54-65, pl. 1. Read November 14, 1899.  
 Reprint: Zeitschr. Kryst. Min., Vol. 35, 1902, Leipzig, pp. 468-469, pl. 12, figs. 3-7.  
 Reviews the literature upon the crystallization of stannite, and shows from measurement of specimens from Bolivia that the mineral crystallizes in the scalenohedral-tetragonal system. Crystals 1-1.5 mm. across and had the composition  $Cu_2FeSn_4S_{14}$ .  
 Reviews specimens from Oruro, Potosi, and Tatasi, Bolivia, and from Cornwall.
1642. STELZNER, A. W. Ueber Franckeit, ein neues Erz aus Bolivia.  
 Neues Jahrb. Min., 1893, II, Stuttgart, pp. 114-124.  
 Composition,  $Pb_2FeSn_2Sb_2S_{14}$ .
1643. STELZNER, A. W., and SCHERTEL, A. Ueber den Zinngehalt und über die chemische Zusammensetzung der schwarzen Zinkblende von Freiberg.  
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1644. THIBAUT, P. J. Conradite. A new mineral compound of tin.  
 Austr. Mg. Stand., Vol. 33, 1905, Sydney and Melbourne, pp. 124-125.  
 Discovered by author at the Conrad Mines, Howell, New South Wales, in 1902. Composition,  $7SnO_2 + Fe_2O_3$ , being a compound of stannic and ferric oxides containing: Tin, 68.44 per cent, iron 9.2 per cent, oxygen 22.32 per cent. Absolutely insoluble in nitric, hydrochloric, sulphuric and hydrofluoric acids and aqua regia. Specific gravity about 6.2; not attracted by the magnet.
1645. TRECHMANN, C. O. On a probably dimorphous form of tin; and on some crystals found associated with it.  
 Min. Mag. Journ. Min. Soc., Vol. 3, 1879, London, pp. 186-192.  
 Two forms of crystals apparently obtained by electrolytic and dry methods of manufacture of metallic tin crystals.

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TWEEDY, W. M. See No. 478.

Pseudomorphs after feldspar.

1646. ULKE, TITUS. A new tin mineral in the Black Hills.

Trans. Amer. Inst. Mg. Eng., Vol. 21, 1893, New York, pp. 240-241.

Mr. Ulke has named this new tin mineral "Cuprocassiterite." "Cuprocassiterite is a light-yellowish to malachite-green mineral of an earthy fracture, dull glance, and, in the Etta mine, found with cassiterite filling cavities in a compact quartz gangue. Hardness, 3, specific gravity, nearly 5, streak, white."

Analysis: 62 per cent Sn, 13 per cent Cu, and 6 per cent  $H_2O$ , with traces of iron and silica.

1647. VLAANDEREN, C. L. Bepaling van de hoeveelheid tinoxide in tinerts aanwezig.

Jaarb. Mijw. Ned. Oost-Indië, 1872, I, Amsterdam, pp. 269-273.

1648. VOGT, J. H. L. Künstliche Bildung von Kassiterit durch einen einfachen Oxydationsprocess ohne Gegenwart von sogenannten "agents minéralisateurs."

Zeitschr. Kryst. Min., Vol. 31, 1899, Berlin, pp. 279-280.

1649. WOOLNOUGH, W. G. Symmetrically distorted crystals from Western Australia.

Journ. Proc. Roy. Soc. New South Wales, Vol. 35, 1901, Sydney, pp. 332-335, pl. 1.

Crystals of cassiterite from Pilbarra, West Australia, are so distorted as to appear monoclinic. Intergrown with monazite which the author thinks may have caused the distortion.

See Molengraaff, G. A. F. (No. 1052) for similar crystals from Swaziland, also, Lacroix, A. (No. 516) for like distorted crystals from France.

## VI. MINING AND MILLING

1650. ANONYMOUS. The losses in dressing Cornish tin ores.  
Eng. Mg. Journ., Vol. 55, 1893, New York, p. 295.  
Brief description of improved methods and results gained.  
———. *See* No. 312.
1651. CARCANAGUES, —. Mémoire sur la préparation mécanique du minéral d'étain dans le Cornwall.  
Ann. Mines, ser. 7, Vol. 14, 1878, Paris, pp. 209-239.  
CHARLETON, ARTHUR G. *See* No. 1310.
1652. COLLINS, J. H. On the use of the impact screen in tin dressing.  
Trans. Inst. Mg. Met., Vol. 15, 1905-1906, London, pp. 524-525.  
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The author reports that the impact screen is for the first time, as far as is known, being used for tin dressing at Wheal Kitty mine, and with very satisfactory results.
1653. COMMANS, ROBERT E. The concentration and sizing of crushed minerals.  
Proc. Inst. Civ. Eng., Vol. 116, 1894, London, pp. 3-66. Discussion and correspondence pp. 67-113, figs. 50.  
An account of methods and apparatus used in treatment of ores including tin ores, to render them marketable.  
FAWNS, SYDNEY. *See* No. 1320.
1654. FERGUSON, HENRY T. On the mechanical appliances used for dressing tin and copper ores in Cornwall.  
Proc. Inst. Mech. Eng., 1873, London, pp. 119-137.  
Discussion, pp. 137-152.  
Treated under the heads: Tin dressing, stamping, buddling, calcining, treatment of slimes, pulverizing.
1655. FRECHEVILLE, R. J. The results obtained by the Cornish system of dressing tin ore, with observations thereon.  
Trans. Mg. Ass. Inst. Cornwall, Vol. 1, 1887, Camborne, pp. 93-104.  
Reprint: Eng. Mg. Journ., Vol. 40, 1885, New York, pp. 416-417.  
A paper discussing the amount of tin saved at the mines, the amount caught by the stream works, and amount finally lost.
1656. HENWOOD, W. J. On the manipulation to which the ores of tin and copper are subjected in the central mining district of Cornwall.  
Trans. Roy. Geol. Soc. Cornwall, Vol. 4, 1838, Penzance, pp. 145-165.  
Description of stamps, buddles, kieves, etc., used. Also roasting furnace and jigs.
1657. HICKS, JAMES. Treatment of slime tin.  
Trans. Mg. Ass. Inst. Cornwall, Vol. 4, 1893-1895, Camborne, pp. 111-123.  
Discussion, pp. 123-137, figs. 4. Read December 20, 1892.  
"The increasing importance of the careful treatment of slime tin arises from the fact that as our mines increase in depth the tin in the stone becomes finer in grain."  
Mentions the fact that ore is being crushed finer than formerly, and discusses the loss of slimes in the Red River and the recovery by streamers.



## MINING AND MILLING (Continued)

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School Mines Quart., 1884, New York, pp. 103-104.  
Describes calcining, to fissure tough rock, as practiced in tin districts of Saxon Erzgebirge; and roasting, to decompose arsenopyrite in tin ore.
1659. MACALISTER, DONALD A. Notes on ore dressing in Cornwall.  
Summ. Progr. Geol. Surv. United Kingdom for 1904 (1905), London, pp. 153-163, fig. 1.  
Present high price of tin makes it probable that some abandoned mines could be profitably worked by modern methods. In early days lodes were worked for only one of the metalliferous minerals, rest thrown to waste. Can be made to cover cost of mining and dressing if it carries only a little under 1 per cent (22.4 pounds per ton) of "black tin" which generally contains over 90 per cent cassiterite and yields on smelting about 65 per cent of metallic tin.
1660. PEARCE, RICHARD. Losses in vanning tin ores.  
Mg. Journ. Railw. Comm. Gaz., Vol. 77, 1904, London, pp. 116-117.  
Gives results of experiments in vanning material containing a known amount of cassiterite.  
———. See Nos. 1546 and 1547.
1661. PHILLIPS, JOHN. Improvements in dressing of tin.  
Mg. Journ. Railw. Comm. Gaz., Vol. 15, 1845, London, p. 184, fig. 1.  
Explanation of diagram of improved furnace for calcining tin ore.  
SEXTON, A. HUMBOLT. See No. 1361.
1662. SKEWES, EDWARD. Magnetic separation of tin and wolfram at Gunnislake Clitters.  
Eng. Mg. Journ., Vol. 76, 1903, New York, pp. 424-425, 700 words.  
After crushing and separating the concentrates are calcined and then run through the magnetic separator. One magnet picks up the iron oxide made from pyrites, and a second picks out the wolframite. Tin ore sold ranks as best in Cornwall. Yield of tin 0.378 per cent, wolframite 0.72 per cent.
1663. TAYLOR, J. On the economy of the mines of Cornwall and Devon.  
Trans. Geol. Soc. London, Vol. 2, 1814, London, pp. 309-327.  
A general treatise upon the business methods of mines in Cornwall and Devon, including operations of the tin mines.
1664. TERRELL, S. L. The final stages of tin and wolfram dressing.  
Mg. Journ. Railw. Comm. Gaz., Vol. 83, 1908, London, pp. 714-715, figs. 2.  
"Deals with tin and wolfram after concentration, considering fine and rough concentrates."
1665. THOMAS, CHAS. Tin dressing.  
50th Ann. Rep. Roy. Cornwall Polyt. Soc., 1882, Falmouth, pp. 182-186. Discussion pp. 186-193.  
Treats of methods and improvements that will reduce the waste of tin resulting from dressing.
1666. THOMAS, R. ARTHUR. On crushing and concentrating at Dolcoath mine, Cornwall.  
Trans. Inst. Mg. Met., Vol. 7, 1899, London, pp. 175-180. Discussion, pp. 180-190.  
A general description of the treatment of tin ore at the mine; crushing and concentration, roasting and reconcentration, with accounts of experiments.

## MINING AND MILLING (Continued)

1667. TREGAY, W. All about tin; an enquiry.  
Mg. Journ. Railw. Comm. Gaz., Vol. 50, 1880, London, pp. 49, 76, 105, 190, 221.  
Treats of tin dressing.
1668. WILLIAMS, R. H. Tin dressing and Williams's buddle.  
Mg. Journ. Railw. Comm. Gaz., Vol. 47, 1877, London, pp. 487-488, 684-685, 796.  
Description of, and results obtained with Williams's buddle.

## VII. STATISTICS

1669. ANONYMOUS. Statistics on tin in Cornwall, etc.  
Trans. Roy. Geol. Soc. Cornwall, Penzance, Vol. 1, 1818, pp. 250-251. Vol. 2, 1822, pp. 424-427. Vol. 3, 1827, pp. 339-341. Vol. 4, 1838, p. 491. Vol. 6, 1846, p. 358. Vol. 7, 1865, p. 112. Vol. 8, 1871, pp. 442, 443, 444, 446, 447, 448, 452-453, 472, and table 14, Vol. 10, 1887, pp. 153-155.
1670. ———. La situation de l'étain.  
Métallurgie, Vol. 32, 1901, Paris, pp. 1013, 1015.  
Gives statistics of important tin producing countries from 1885 through 1899.
1671. ———. Supplement to government gazette of Western Australia, No. 66.  
M. S. No. 61, Perth, November 25, 1904, pp. 2963-2969.  
General return of ore and minerals, other than gold, showing the quantity produced and the value thereof during 1904 and previous years.  
The statistics of tin production are published annually in this form.
1672. ———. Japan in the beginning of the 20th century.  
Published by Imperial Japanese Commission to Louisiana Purchase Exposition, 1904, pp. 293, 321.  
Gives the output of tin by years from 1892 to 1902, inclusive.
1673. ———. Return showing the quantity and value of tin exported from Tasmania from 1880 through 1904, compiled from customs returns only, and tin ore produced during 1905.  
Rep. Sec. Mines, Tasmania, for 1905 (1906), Hobart, p. XVII.
1674. ———. Billiton and Banca tin.  
Mg. World, Vol. 24, 1906, Chicago, p. 778.  
Giving the Banca tin production from 1881 to 1906 (25 years) as 184,349 long tons. During last ten years from 1896 to 1906 Billiton produced 46,938 long tons.
1675. ———. Tin from the Malay Peninsula.  
Mo. Bull. Int. Bur. Amer. Repub., Vol. 23, November, 1906, Washington, D. C., pp. 1179-1180.  
As the sliding scale of prices for Bolivian tin is regulated by the quotations for the Straits Settlements product, a report on the subject by United States Consul General, D. F. Wilber is given.
1676. ANNUAL Report, Department of Mines, New South Wales, from 1875.  
Sydney.  
Gives statistical and other information about the tin output of New South Wales.
1677. COGHLAN, T. A. A statistical account of the seven colonies of Australasia.  
1892, Sydney, pp. 142-145.  
Tin of New South Wales, Tasmania, Queensland and Victoria described briefly. Production for 1890 given. Fluctuations in the price of tin.

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1678. ———. A statistical account of the seven colonies of Australasia. 1899-1900.  
1900, Sydney, pp. 1-836, map 1.  
Includes tin production in Australia.
1679. ———. Tin. A statistical account of Australasia and New Zealand, 1903-1904.  
Sydney, pp. 933-936.  
New South Wales, p. 934; Western Australia, p. 935; Victoria, p. 935; South Australia, p. 935; Queensland, p. 935; Tasmania, p. 934.
1680. COLLINS, J. H. Seven centuries of tin production in the west of England.  
Trans. Mg. Ass. Inst. Cornwall, Vol. 3, 1892, Camborne, pp. 173-193.  
"Estimates the total produce of metallic tin in the West country between 1201 and 1800 A. D. to be 875,900 tons, from which it may be reckoned that 711,990 tons were yielded between 1201 and 1750 A. D., from both Cornwall and Devon. Of 283,000 tons of tin yielded between 1201 and 1600 A. D., 75,000 were derived from tin stream gravels; and of 573,500 tons yielded between 1601 and 1800 A. D., 473,000 tons were derived from tin stream gravels."
1681. EARL OF MOUNT EDGCUMBE. Production of tin in Cornwall.  
Journ. Roy. Inst. Cornwall, Vol. 8, 1886, Truro, pp. 8-9.  
The tin produced in Cornwall from 1873-1883 given.
1682. EHRENWERTH, J. VON. Production an Zinn in den Jahren 1881 bis 1890.  
Oest. Zeitschr. Berg. Hütt. Vol. 41, 1893, Wien, p. 220.  
Statistics showing the tin production of the world for the years 1881 to 1890.
1683. ENGINEERING and Mining Journal.  
Since Vol. 17, 1874, New York.  
Annually collects statistics of the world's tin production.
1684. ESTADÍSTICA Minera España.  
Annual, Madrid.  
Tables showing production of tin producing provinces of Spain.
1685. GREAT Britain. Home Office.  
London.  
Title varies: 1882, Mineral statistics of the United Kingdom of Great Britain and Ireland.  
1882, Mines and minerals. Summaries of the reports of the inspectors of mines. . . . and mineral statistics of the United Kingdom of Great Britain and Ireland.  
1884-1887, Mines and minerals. Mining and mineral statistics of the United Kingdom of Great Britain and Ireland.  
1888-1894, Mines and minerals. Mineral statistics of the United Kingdom of Great Britain and Ireland with the Isle of Man. . . .  
1895-1896, Mines and quarries. Mineral statistics of the United Kingdom of Great Britain and Ireland with the Isle of Man.  
1897, Mines and quarries: General report and statistics. . . . Issued in four parts: Pt. I. District statistics. Pt. II. Labor. Pt. III. Output. Pt. IV. Colonial and foreign statistics.  
General statistics of tin.
1686. There is no reference bearing this number.
1687. HUNT, ROBERT. On the present state of tin production and the tin trade.  
Rep. Proc. Min. Ass. Cornwall and Devon, for 1874 (1875), Truro, pp. 35-40.

### STATISTICS (Continued)

Gives number of productive tin mines, quantity of ore produced, and average price per ton, of the Cornwall mines from 1864-1873; also production and price of foreign tin for same years.

1688. ———. Mineral statistics of the United Kingdom from 1853 through 1880.  
London.
1689. JAARBOEK van het Mijnuwezen in Nederlandsch Oost-Indië, from 1872, Amsterdam to 1899. Batavia since 1900.  
Publishes statistics of tin produced in East Indies.
1690. KOULIBINE, S. La production minière et métallurgique de la Russie en 1885 (Bulletin).  
Rev. Univ. Mines, Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 3, Vol. 4, 1888, Paris and Liège, p. 88.  
(Extrait d'un rapport de M. Koulibine.)  
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1691. ———. La production minerale et metallurgique de la Russie en 1887.  
Rev. Univ. Mines Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 3, Vol. 11, 1890, Paris and Liège, p. 314.  
(Extrait du rapport de M. Koulibine.) 10<sup>t</sup> 351 d'étain ont été retirées du traitement de 1738<sup>t</sup>, de minerais à l'usine de Pitkäranta (Finland). (Whole reference.)
1692. ———. Tableau de l'industrie minérale de la Russie en 1888-1889.  
Rev. Univ. Mines Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 3, Vol. 16, 1891, Liège and Paris, p. 214.  
Tin production in Pitkäranta (Finland); 1888, 1.186 poods; 1889, .721 pood.
1693. MACALISTER, DONALD A. Total quantity of tin, copper and other minerals produced in Cornwall, particularly with regard to the quantities raised from each parish.  
Summ. Progr. Geol. Surv. Great Britain for 1906 (1907), London, pp. 132-139.
1694. METALLGESELLSCHAFT. Comparative statistics of lead, copper, tin, silver, nickel, aluminum and quicksilver, from 7th year, 1890-1899.  
Frankfort-on-the-Main.  
Publishes estimates of the world's production and consumption of tin.
1695. REPORT on Mineral Industries in the United States at the eleventh census, 1890.  
1892, Washington, D. C., p. 249.  
For 1889, California, South Dakota, Virginia.
1696. MINERAL Industry.  
Vol. I, 1892, New York; New York and London since Vol. 3, 1895.  
Publishes annual articles on the production of tin throughout the world.
1697. MINERAL Statistics of Victoria, 1873-1877 to 1885-1888, also Reports and Statistics since 1890-1891.  
Melbourne.

## STATISTICS (Continued)

1698. PLUMMER, JOHN. Australian mineral production and export.  
Mg. World, Vol. 25, 1906, Chicago, p. 430.  
Statistics of tin production during 1904 and 1905.
- ROLKER, CHAS. M. *See* No. 1357.
1699. SPARGO, T. Statistics and observations on the mines of Cornwall and Devon.  
1864, London.  
Not available to the authors.
- See* Tasmania, Government geologist No. 1134.
1700. TRASENSTER, PAUL. Revue économique et statistique.  
Rev. Univ. Mines Mét. Trav. Publ. Sci. Arts Appl. Indust., ser. 2, Vol. 13, 1883,  
Paris and Liège, p. 480.  
Estimates the tin production of the world during 1879, 1880 and 1881.
- VICTORIA. *See* No. 1222.
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[Prepared by Lancaster D. Burling.]

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