

Bureau of Standards (Division VIII)

SOURCES OF INFORMATION AND DATA ON THE PROPERTIES OF METALS
AND ALLOYS.

The Bureau receives requests for general and comprehensive information on the properties of metals and alloys; general requests of this sort cover such a volume of information it is really possible to answer only with a statement of sources where the information may be obtained. This letter circular attempts to give a working bibliography of reference and handbooks on this subject. The Bureau itself is preparing circulars dealing with the properties of individual metals and alloys but these are as yet too few to permit a general circular to be based on them dealing with all metals and alloys. Suggestions and additions to this letter circular are invited.

Letter circular 118 of the Bureau of Standards, lists all publications of members of the Division of Metallurgy either as Bureau papers or as magazine articles. A copy of this letter circular will be sent on request.

The sources below are arranged topically, the reference books mentioned should be available in any large technical or scientific library. Mechanical properties of such materials are most excellently described by standard specifications for materials such as those of the American Society for Testing Materials.

Handbooks

<u>Reference</u>	<u>Date</u>	
1	1924	HANDBOOK OF CHEMISTRY AND PHYSICS. Chemical Rubber Publishing Co., Cleveland, Ohio.
2	1924	MECHANICAL ENGINEER'S HANDBOOK: McGraw Hill Book Co., Inc., 370-7th Ave., New York City.
3	1923	Ledebur, A. HANDBUCH DER EISENHUTTENKUNDE. Pt. I. EINFUHRUNG IN DIE EISENHUTTENKUNDE. Arthur Felix Leipzig.
4	1924	Kent, R. T. MECHANICAL ENGINEERS HANDBOOK London: Chapman and Hall, Ltd.
5	1923	Landolt-Bornstein-Roth: PHYSIKALISCHE-CHEMISCHE TABELLEN. Julius Springer, 23-4 Lunkstrasse, Berlin W9, Germany.

- 6 1923-5 HANDBOOK OF THE AMERICAN SOCIETY FOR STEEL TREATING. 4600 Prospect Ave., Cleveland, Ohio.
- 7 1923 Kempe, H. R., Smith, W. H. ENGINEERS YEAR BOOK OF FORMULAE, RULES, TABLES, DATA AND MEMORANDA FOR 1923. London: Crosby Lockwood & Son.
- 8 1922 HANDBOOK FOR ELECTRICAL ENGINEERS. J. Wiley & Sons, 440-4th Ave., New York City.
- 9 1922 Krupp, A. DIE LEGIERUNGEN. HANDBUCH FUR PRAKTIKER. Wien und Leipzig: A. Hartleben.
- 10 1922 Penders, H. HANDBOOK FOR ELECTRICAL ENGINEERS. J. Wiley Sons, 440-4th Ave., New York City.
- 11 1922 Gee, G. E. THE GOLDSMITH HANDBOOK: CONTAINING FULL INSTRUCTIONS FOR THE ALLOYING AND WORKING OF GOLD. London: Crosby Lockwood & Sons.
- 12 1921 Hopkins. SCIENTIFIC AMERICAN CYCLOPEDIA OF FORMULAS. Scientific American Publishing Co., New York City.
- 13 1920 Smithsonian Physical Tables. The Smithsonian Institution. Washington, D. C.
- 14 1920 HUTTE. Wilhelm Ernst & Sohn, Berlin Germany.
- 15 1919 HENLEY'S TWENTIETH CENTURY BOOK OF RECEIPES, FORMULAS, AND PROCESSES. Norman Henley Publishing Co., 32 Nassau St., New York City.
- 16 1918 Richards, J. W. METALLURGICAL CALCULATIONS, McGraw Publishing Co., 10th Ave. at 36th St., New York City.
- 17 1918 Liddell, D. M. METALLURGISTS' & CHEMISTS' HANDBOOK: McGraw Hill Book Co., 370-7th Ave., New York City.
- 18 1918 METALS AND ALLOYS. The Metal Industry, London.
- 19 1918 Peele, R. MINING ENGINEERING HANDBOOK. J. Wiley & Sons, 440-4th Ave., New York City.
- 20 1916 TABELLES ANNUELLES DE CONSTANTES ET DONNEES NUMERIQUES DE CHEMIE, DE PHYSIQUE ET DE TECHNOLOGIE. GAUTHIER VILLARS, Paris.
- 21 1913 Societe Francaise de Physique, RECUEIL DE CONSTANTES PHYSIQUES Gauthier-Villars, Paris.
- 22 1909 Winkelmann, A. HANDBUCH DE PHYSIK. Johann Ambrosius Barth Leipzig.

Statistics

- 23 annual MINERAL INDUSTRY. McGraw Hill Book Co.,
370-7th Ave.; New York City.
- 24 " ANNUAL STATISTICAL REPORT OF THE AMERICAN
IRON AND STEEL INSTITUTE. American Iron
and Steel Institute, 40 Rector St., New
York City.
- 25 " U. S. Geological Survey. MINERAL RESOURCES
OF THE UNITED STATES. Government Printing
Office, Washington, D. C.
- 26 " METAL STATISTICS. American Metal Market Co.,
11 Cliff St., New York City.

Books on Non-ferrous Metals and Alloys.

- 27 1924 Jeffries, Z., Archer, R. S. SCIENCE OF
METALS. McGraw Hill Book Co., 370-7th
Ave., New York City.
- 28 1924 Ledebur, A. DIE LEGIERUNGEN IN IHRER
ANWENDUNG FUR GEWERBLICHE ZWECKE. Berlin:
M. Krayn.
- 29 1924 Copper and Brass Research Association, 25
Broadway, New York City. LIST OF MANU-
FACTURERS OF COPPER, BRASS AND BRONZE
PRODUCTS.
- 30 1923-4 Mellor, J. W. A COMPREHENSIVE TREATISE
ON INORGANIC AND THEORETICAL CHEMISTRY.
5 vols. London: Longmans, Green & Co.
- 31 1923 Evans, U. R. METALS AND METALLIC COMPOUNDS.
4 vols. London: Edward Arnold and Co.
- 32 1923 Glazebrook, Sir Richard. Vol. V. AERO-
NAUTICS, METALLURGY, GENERAL INDEX. London:
MacMillan and Co., Ltd.
- 33 1923 Aitchison, L., Barclay, W. R. ENGINEERING
NON-FERROUS METALS AND ALLOYS. London:
Henry Frowde & Hodden & Stoughton.
- 34 1923 Vickers, C. METALS AND THEIR ALLOYS.
Henry Carey Baird Co., 2 West 45th St.,
New York City.
- 35 1922 Lumen Bearing Co., Buffalo, N. Y. HANDBOOK
FOR ENGINEERS AND MACHINE DESIGNERS.
- 36 1922 Gulliver, G. H. METALLIC ALLOYS, Chas.
Griffin & Co., Ltd., London.
- 37 1922 Campbell, W. LIST OF ALLOYS. American
Society for Testing Materials 22, 1922;
1315 Spruce St., Philadelphia, Pa.
- 38 1921 Hoyt, S. METALLOGRAPHY. Vol. 2. METALS
AND THEIR COMMON ALLOYS. McGraw Hill Book
Co., 370-7th Ave., New York City.

- 39 1921 Schnabel, C. HANDBOOK OF METALLURGY. Vol. I. Copper, Lead, Silver, Gold. Trans. by H. Louis. London: MacMillan & Co.
- 40 1920 Buchanan, J. F. PRACTICAL ALLOYING, Penton Publishing Co., Cleveland, Ohio: 220 Broadway, New York City.
- 41 1920 Gowland, W. METALLURGY OF COMMON METALS. Chas. Griffin & Co., London.
- 42 1920 Downie, J. R. CHEMISTS MANUAL OF NON-FERROUS ALLOYS. New York City: Spon & Chamberlain, 120 Liberty St.
- 43 1915 Wood, R. A. THE WATERBURY BOOK OF ALLOYS. Law Printing Co., 222 Fulton St., New York City.
- 44 1914 Hofman, H. O. METALLURGY OF COPPER. McGraw Hill Book Co., Inc., 370-7th Ave., New York.
- 45 1914 Law, E. F. ALLOYS AND THEIR INDUSTRIAL APPLICATIONS. C. Griffin & Co., Ltd., London.
- 46 1913 Ledebur, A. DIE LEGIERUNGEN. M. Krayn, Berlin.
- 47 1909 Cavalier, J. ALLIAGES METALLIQUES. Vuibert et Nony, Paris.
- 48 1906 Guillet, L. ETUDE INDUSTRIELLE DES ALLIAGES METALLIQUES. H. Dunod et E. Pinat, Paris.
- 49 1903 Sack, M. BIBLIOGRAPHIE DER METALLEGIERUNGEN. L. Voss, Leipzig.

Books on Iron and Steel.

- 50 1925 Gillett, H. W., Mack, E. L. MOLYBDENUM, CERIUM AND RELATED ALLOY STEELS. American Chemical Society Monograph 22, Chemical Catalogue Co., 19 E. 24th St., New York City.
- 51 1924 Heyn, E. DIE THEORIE DER EISENKOHLENSTOFF LEGIERUNGEN. J. Springer, 23-4 Lunkstrasse, Berlin W9, Germany.
- 52 1923 Stoughton, B. METALLURGY OF IRON AND STEEL. McGraw Hill Book Co., 370-7th Ave., New York City.
- 53 1923 Schaefer, R. DIE KONSTRUKTION STAHL UND IHRE WARMBEHANDLUNG. J. Springer, 23-4 Lunkstrasse, Berlin W9, Germany.
- 54 1923 Hadfield, R. A., Burnham, T. H. SPECIAL STEELS. Sir I. Pitman & Sons, London and New York.
- 55 1923 Circular 58, INVAR AND RELATED NICKEL STEELS. Bureau of Standards. Supt. of Documents, Government Printing Office, Washington, D.C. (Price 10 cents, stamps not accepted.)

- 56 1922 Hall, J. H. THE STEEL FOUNDRY, McGraw Hill Co., 370-7th Ave., New York City.
- 57 1922 Guillet, L., Portevin, A. AN INTRODUCTION TO THE STUDY OF METALLOGRAPHY AND MACROGRAPHY. Trans. by L. Taverner. London: G. Bell & Sons, Ltd.
- 58 1922 Hall, J. H. THE STEEL FOUNDRY. McGraw Hill Book Co., 370-7th Ave., New York City.
- 59 1921 Giolitti, F. HEAT TREATMENT OF SOFT AND MEDIUM STEELS. McGraw Hill Book Co., 370-7th Ave., New York City,
- 60 1921 Grard, C. L'ACIER. Berger-Levrault, Paris.
- 61 1921 Aitchison, L. ENGINEERING STEELS. Van Nostrand Co., 8 Warren St., New York City.
- 62 1919 Camp, J. M. MAKING, SHAPING AND TREATING OF STEEL. Carnegie Steel Co., Pittsburgh, Pa.
- 63 1919 Backert, A. O. THE A B C OF IRON AND STEEL. Penton Publishing Co., Cleveland, Ohio.; 220 Broadway, New York City.
- 64 1919 Tiemann, H. P. IRON AND STEEL: A Pocket Encyclopedia. McGraw Hill Book Co., 370-7th Ave., New York City.
- 65 1919 Hibbard, H. D. MANUFACTURE AND USES OF ALLOY STEELS. John Wiley & Sons, 440-4th Ave., New York City.
- 66 1918 Sauveur, A. METALLOGRAPHY AND HEAT TREATMENT OF IRON AND STEEL. Sauveur & Boylston, Cambridge, Mass.
- 67 1918 Bullens, D. K. STEEL AND ITS HEAT TREATMENT. John Wiley & Sons, 440-4th Ave., New York City.
- 68 1918 Oberg, E., Jones, F. D. IRON AND STEEL. The Industrial Press, 140-8 LaFayette St., New York City.
- 69 1917 Spring, L. W. NON TECHNICAL CHATS ON IRON AND STEEL. Frederick A. Stokes Co., New York City.
- 70 1913 Harbord and Hall. THE METALLURGY OF IRON AND STEEL. J. B. Lippencott Co., Washington Square, Philadelphia, Pa.
- 71 1916 Edwards, C. A. PHYSICO-CHEMICAL PROPERTIES OF STEEL. C. Griffin & Co., London.
- 72 1915 Giolitti, F., Richards, J. W., Rouiller, C. A., THE CEMENTATION OF IRON AND STEEL. McGraw Hill Book Co., Inc., 370-7th Ave., New York City.
- 73 1914 Brearley, H. CASE HARDENING OF STEEL. Iliffe & Sons, Ltd., London.

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| 74 | 1912 | Mars, G. DIE SPEZIALSTAHL. Ferdinand Enke, Stuttgart |
| 75 | 1911 | Brearley, H. HEAT TREATMENT OF TOOL STEEL. Longmans, Green & Co., London. |
| 76 | 1911 | Lake, E. F. COMPOSITION AND HEAT TREATMENT OF STEEL. McGraw Hill Book Co., 370-7th Ave., New York City. |
| 77 | 1910 | Haenig, A. DER KONSTRUKTIONS-STAHLE UND SEINE MIKRO-STRUKTUR. M. Krayn, Berlin. |
| 78 | 1910 | Becker, O. M. HIGH SPEED STEEL. McGraw Hill Book Co., 370-7th Ave., New York City. |
| 79 | 1907 | Campbell, H. H. THE MANUFACTURE AND PROPERTIES OF IRON AND STEEL, Hill Publishing Co., New York City. |
| 80 | 1906 | Taylor, F. W. ON THE ART OF CUTTING METALS. American Society of Mechanical Engineers, 29 West 39th St., New York City. |
| 81 | 1904 | Guillett, L. LES ACIERS SPECIAUX. Ch. Dunod, Paris. |
| 82 | 1903 | Howe, H. M. IRON, STEEL AND OTHER ALLOYS. Sauveur & Whiting, Boston, Mass. |

Useful pamphlets can be obtained describing their products from the following companies. Names of other manufacturers with the type of product they manufacture are listed in the Iron and Steel Works Directory of the United States, Canada, American Iron and Steel Institute, 61 Broadway, New York City;

Bethlehem Steel Co., Bethlehem, Pa.; Midvale Steel Co., Nicetown, Philadelphia, Pa.; Carpenter Steel Co., Reading, Pa.; Crucible Steel Co., Pittsburgh, Pa.; Central Steel Co., Massillon, Ohio; United Alloy Steel Co.; Canton, Ohio; American Rolling Mill Co.; Middletown, Ohio; Vanadium Alloys Steel Co., Latrobe, Pa.; Latrobe Electric Steel Co.; Latrobe, Pa.; Tacony Steel Co., Tacony, Philadelphia, Pa.; Carnegie Steel Co., Pittsburgh, Pa.; Firth Sterling Steel Co., McKeesport, Pa.; Titanium Alloys Mfg., Co., Niagara Falls, N. Y.; and Vanadium Corporation of America, 120 Broadway, New York City.

Books on Cast Iron

- 83 1924 Corbishley, H. IRON FOUNDRY PRACTICE: A TECHNICAL VOLUME COVERING BROADLY THE MODERN PRACTICE IN IRON FOUNDRY OF SPECIAL VALUE TO STUDENTS AND APPRENTICES. Funk & Wagnalls, 354-4th Ave., New York City.
- 84 1920 Horner, J. G. PRACTICAL IRON FOUNDING. Sir I. Pitman & Sons, Ltd., London and New York City.
- 85 1918 Hatfield, W. H. CAST IRON IN THE LIGHT OF RECENT RESEARCH. Chas. Griffin & Co., London.
- 86 1918 Turner, T. METALLURGY OF IRON. C. Griffin & Co., London.
- 87 1917 Moldenke, R. THE PRINCIPLES OF IRON FOUNDING. McGraw Hill Book Co., 370-7th Ave., New York City.
- 88 1917 Payne, D. W. THE FOUNDERS MANUAL. D. Van Nostrand & Co., 8 Warren Street, New York City.
- 89 1911 Kirk, E. Foundry Irons. H. C. Baird & Co., 2 West 45th St., New York City.
- 90 1911 Geiger, C. HANDBUCH DER EISEN UND STAHL-GIESSEREI. Julius Springer, 23-4 Lunkstrasse, Berlin W9, Germany.
- 91 1910 Moldenke, R. THE PRODUCTION OF MALLEABLE CASTINGS. Penton Publishing Co., Cleveland, Ohio., 220 Broadway, New York City.
- 92 1904 West, T. D. METALLURGY OF CAST IRON. Cleveland Printing and Publishing Co., Cleveland, Ohio.

Books on Individual Metals and Metallurgy

Aluminum

- 93 1924 Anderson, R. J. METALLURGY OF ALUMINUM AND ALUMINUM ALLOYS, H. C. Baird & Co., 2 West 45th St., New York City.
- 94 1924 Pulsifer, H. B. STRUCTURAL METALLOGRAPHY. Chemical Publishing Co., Easton, Pa.
- 95 1924 Berg, H. ALUMINUM UND ALUMINUM LEGIERUNGEN. Frankfurt a. M: H. Bechold.
- 96 1923 Krause, H. DAS ALUMINUM UND SEINE LEGIERUNGEN. Wien und Leipzig: A. Hartleben's Verlag.
- 97 1923 Czochralski & Welter. LEGERMETALLE UND IHRE TECHNOLOGISCHE BEWERKUNG. Julius Springer, Berlin W9, Germany.
- 98 1921 Grard, C. ALUMINUM AND ITS ALLOYS. Constable & Co., Ltd., London.

- 99 1921 Hoyt, S. METALLOGRAPHY. Vol. 2. METALS AND THEIR COMMON ALLOYS. McGraw Hill Book Co., 370-7th Ave., New York City.
- 100 1921 Borchers, W. ALUMINUM. Halle: Wilhelm Knapp.
- 101 1921 Escard, J. L'ALUMINUM DANS L'INDUSTRIE: METAL PUR, ALLIAGES D'ALUMINUM. Paris: Dunod.
- 102 1920 Pattison, J. THE MANUFACTURE OF ALUMINUM. Spon & Chamberlain, 120 Liberty St., New York City.
- 103 1919 Circular 76, ALUMINUM AND ITS LIGHT ALLOYS. Bureau of Standards, Government Printing Office, Washington, D. C. price 20¢ stamps not accepted.

The Aluminum Company of America, Pittsburgh, Pa., has various pamphlets for distribution,

Antimony

- 104 1909 Wang, C. Y. ANTIMONY. C. Griffith & Co., London.

Arsenic

- 105 1884 Charleton, G. A. (107)

Bismuth

- 106 1914 Gowland (41)
- 107 1884 Charleton, G. A. TIN, ARSENIC, BISMUTH AND WOLFRAM. E & F. Spon Ltd., London.

Cadmium

- 108 1924 Budgen, N. F. CADMIUM, ITS METALLURGY PROPERTIES AND USES. C.Griffin & Co., Ltd., London.
- 109 1913 Liebig, R.G.M. ZINC UND CADMIUM. O. Spanner, Leipzig
- 110 1911 Bouchonnet, A. ZINC, CADMIUM, CUIVRE, MERCURE, O.Doin et fils, Paris.

Chromium

- 111 1910 Ouward, L.V.R. INDUSTRIES DU CHROME, DU MANGANESE, DU NICKEL ET DU COBALT. O Doin et fils, Paris.
- 112 1909 Escard (192)

Cobalt

- 113 1920 Friend, J. N. COBALT, NICKEL AND THE ELEMENTS OF THE PLATINUM GROUP. London: Charles Griffin & Co.
- 114 1914 Gowland (41)
- 115 1913-6 Kalnus, H. T. RESEARCHES ON COBALT. Canada Dept. of Mines.
- 116 1910 Ouward (111)

Copper

- 117 1924 Davis, W. THE STORY OF COPPER. Century Co., 353-4th Ave., New York City.
- 118 1922 Bureau of Standards Circular 73, COPPER. Superintendent of Documents, Government Printing Office, Washington, D. C., 20 cents, stamps not accepted.
- 119 1914 Hofman, H. O. METALLURGY OF COPPER. McGraw Hill Book Co., 370-7th Ave., New York City.
- 120 1911 Bouchonnet, A. (110)

Gold

- 121 1915 Rose, T. R. THE PRECIOUS METALS. D. Van Nostrand Co., 8 Warren St., New York City.
- 122 1914 Gowland (41)

Iron

- 123 1918 Carnegie, D. LIQUID STEEL. Longmans, Green & Co., 4th Ave. and 30th St., New York City.
- 124 1918 Turner, T. THE METALLURGY OF IRON. C. Griffin & Co., London,
- 125 1916 Harbord & Hall (70)

Lead

- 126 1924 Harn, O. C. LEAD THE PRECIOUS METAL. Century Co., 358-4th Ave., New York City.
- 127 1923 Smythe, J. A. LEAD, ITS OCCURRENCE IN NATURE, THE MODES OF ITS EXTRACTION, ITS PROPERTIES AND USES. London; New York, Longmans Green & Co.
- 128 1918 Hofman, H. O. METALLURGY OF LEAD, McGraw Hill Book Co., 370-7th Ave., New York City.
- 129 1910 Collins, N. F. THE METALLURGY OF LEAD. C. Griffin & Co., London.
- 130 1909 Richter (178)

- 131 1906 Ingalls, W. R. LEAD SMELTING AND REFINING WITH SOME NOTES ON LEAD MINING. Engineering & Mining Journal, 10th Ave at 36 St., New York City.
- 132 1897 Hixon, H. W. NOTES ON LEAD AND COPPER SMELTING AND COPPER CONVERTING. New York & London Scientific Publishing Co.
- 133 1888 Pulsifer, W. H. NOTES FOR A HISTORY OF LEAD. Van Nostrand Co., 8 Warrent St., New York City.

The National Lead Co., 129 York St., Brooklyn, N. Y., has various pamphlets for distribution.

Magnesium

- 134 1923 American Magnesium Corporation, Niagara Falls, N. Y. Magnesium.
- 135 1923 Portevin, A. LE MAGNESIUM ET LES ALLIAGES ULTRA LEGRS. Paris: Impr. Chaix.
- 136 1916 Grosvenor, W. M. MAGNESIUM. American Electrochemical Society, Vol. 29, p. 521. Columbia University, New York City.

Manganese

- 137 1920 Weld, C. M. and others MANGANESE: ITS USES, PREPARATION, MINING COSTS & PRODUCTION OF FERRO-ALLOYS. Bureau of Mines Bulletin 173, Superintendent of Documents, Government Printing Office, Washington, D. C.
- 138 1910 Ouward (111)
- 139 1909 Escard (192)

Mercury

- 140 1911 Bouchonnet (110)

Molybdenum

- 141 1925 Gillett & Mack (50)
- 142 1916 Horton, F. W. MOLYBDENUM, ITS ORES ETC. Government Printing Office, Washington, D.C.
- 143 1909 Escard (192)
- 144 1905 Truchot (168)

The Climax Molybdenum Corp., New York City, has various pamphlets for distribution.

Nickel

- 145 1924 Bureau of Standards Circular 100, NICKEL AND ITS ALLOYS. Superintendent of Documents, Government Printing Office, Washington, D.C. Price 40 cents, stamps not accepted.
- 146 1923 White, F.B.H. NICKEL: THE MINING, REFINING, AND APPLICATIONS OF NICKEL. London: Sir I. Pitman and Sons.
- 147 1922 Borchers, W. NICKEL. Halle-a.S: Wilhelm Knapp.
- 148 1920 Friend, H. M. COBALT, NICKEL AND THE ELEMENTS OF THE PLATINUM GROUP, London: Charles Griffin & Co.
- 149 1917 REPORT OF THE ROYAL ONTARIO NICKEL COMMISSION. A. Wilgress. Toronto, Canada.
- 150 1914 Gowland (41)
- 151 1910 Ouward (111)
- 151a International Nickel Co., 67 Wall St., New York City, has various pamphlets on nickel for distribution.

Platinum

- 152 1924 Smith, E. A. PLATINUM METALS. Sir Isaac Pitman & Sons, London.
- 153 1921 Voison, J. LES METAUX PRECIEUX. Paris: J. B. Pailliere et fils.
- 154 1920 Friend (113)
- 155 1920 Lumb, A. D. THE PLATINUM METALS. London: John Murray.
- 156 1920 Howe, J. D., Holtz BIBLIOGRAPHY OF METALS OF THE PLATINUM GROUP. PLATINUM, PALADIUM, IRIDIUM, OSMIUM, RUTHERMIUM. U. S. GEOLOGICAL SURVEY, Washington, D. C.
- 157 1915 Rose (121)
- 158 1914 Gowland (41)
- 159 1912 Molinie and Dietz (164)

Silicon

- 160 1914 LeChatelier, H. LE SILICE ET LES SILICATES. A. Hermann et fils, Paris.
- 161 1909 Escard (132)

Silver

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| 162 | 1920 | White, B. SILVER. London, Sir Isaac Pitman & Sons. |
| 163 | 1915 | Rose (121) |
| 164 | 1912 | Molinie, M. and Dietz, H. INDUSTRIES DES METAUX PRECIEUX. O. Doin et fils, Paris. |

Tin

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| 165 | 1911 | Louis, H. METALLURGY OF TIN, McGraw Hill Book Co., 370-7th Ave., New York City. |
| 166 | 1909 | Richter (178) |
| 167 | 1884 | Charleton, G. A. (107) |

Titanium

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| 168 | 1905 | Truchot, P. LES PETITS METAUX, TITANE, TUNGSTENNE, MOLYBDENUM Gauthier-Villars, Paris. |
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Tungsten

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| 169 | 1911 | Mennicke, H. DIE METALLURGIE DES WOLFRAMS. M. Krayn, Berlin. |
| 170 | 1905 | Truchot, P. (168) |
| 171 | 1884 | Charleton, G. A. (107) |

Uranium, Vanadium

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| 172 | 1915 | Parsons, C. L. EXTRACTION AND RECOVERY OF RADIUM, URANIUM AND VANADIUM, Government Printing Office, Washington, D. C. |
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The Vanadium Corporation of America, New York City, has various pamphlets for distribution.

Zinc

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| 173 | monthly | American Zinc Institute Bulletin MAKE IT OF ZINC., 27 Cedar St., New York City. |
| 174 | 1920 | Lones, T. E. ZINC AND ITS ALLOYS, Sir I. Pitman and Sons, London. |
| 175 | 1918 | Smith, E. A. THE ZINC INDUSTRY, Longmans Green & Co., London and New York City (4th Ave and 30th St.) |

- 176 1913 Liebig, R.G.M. ZINK UND CADMIUM. O. Spanner
Leipzig.
- 176a 1913 Ingalls, W. R. THE METALLURGY OF ZINC AND
CADMIUM. The Engineering and Mining Journal,
10th Ave at 36th St., New York City.
- 177 1911 Bouchonnet, A (110)
- 178 1909 Richter, K. ZINK, ZINN UND BLEI. A. Hartle-
ben, Leipzig.
- 179 1905 Lodin, M. METALLURGIE DU ZINC. Ch. Dunod,
Paris.

The New Jersey Zinc Co., Palmerton, Pa., has
various pamphlets for distribution.

Zirconium.

- 180 1922 Venable, F. P. ZIRCONIUM AND ITS COMPOUNDS
Chem. Catalogue Co., 19 E. 24th St., New
York City.
- 181 1921 Marden, J. W. Piele, M. N. INVESTIGATIONS
OF ZIRCONIUM. Bureau of Mines, Bulletin
No. 186, U. S. Government Printing Office,
Washington, D. C.
- 182 1917 Meyer, H. C. THE INDUSTRIAL APPLICATIONS
OF ZIRCONIUM. Reprint from Mineral Foote
Notes, Foote Mineral Co., Philadelphia, Pa.
- 183 1915 Johnstone (187)

General

- 184 1923 Roberts-Austin, W. AN INTRODUCTION TO
THE STUDY OF METALLURGY. Griffin & Co.,
London.
- 185 1921 Schnabel, C. HANDBOOK OF METALLURGY.
MacMillan & Co., 64-5th Ave., New York City.
- 186 1920 Spencer, J. F. METALS OF THE RARE EARTHS
London: Longmans Green & Co.
- 187 1915 Johnstone, S. J. THE RARE EARTH INDUSTRY.
Crosby, Lockwood and Son, London.
- 188 1914 Gowland, W. (41)
- 189 1913 Hofman, H. O. GENERAL METALLURGY, McGraw
Hill Book Co., 370-7th Ave., New York City.
- 190 1912-13 Thrope, E. DICTIONARY OF APPLIED CHEMISTRY
5 Vols. Longmans Green & Co., London.
- 191 1912 Browning, P. E. INTRODUCTION OF THE RARE
ELEMENTS. J. Wiley & Sons, 440-4th Ave.,
New York City.
- 192 1909 Escard, J. LES METAUX SPECIAUX. Dunod et
Pinat, Paris.
- 193 1905-13 Abegg, R. Auerback, Fr. Handbuch Der Anor-
ganischen Chemie 5 Vols. S. Hirzel. Leipzig.

Books on Metallography

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| 194 | 1924 | Dean, R. S. THEORETICAL METALLURGY, J. Wiley & Sons, Inc., 440-4th Ave., New York City. |
| 195 | 1924 | Czochralski, J. MODERNE METALLKUNDE IN THEORIE UND PRAXIS. Julius Springer, 23-4 Lunkstrasse, Berlin W9, Germany. |
| 196 | 1924 | Pulsifer, H. B. STRUCTURAL METALLOGRAPHY. Chemical Publishing Co., Easton, Pa. |
| 197 | 1924 | Jeffries, Z., Archer, R.S., SCIENCE OF METALS. McGraw Hill Book Co., 370-7th Ave., New York City. |
| 198 | 1924 | Rinne, F. CRYSTALS AND FINE STRUCTURE OF MATTER. Trans. by W. S. Stiles. London: Methuen & Co., Ltd. |
| 199 | 1924 | Guillet, L. Portevin, A. PRECIS DE METALLOGRAPHIE MICROSCOPIQUE ET DE MACROGRAPHIE. Paris: Dunod. |
| 200 | 1923 | Tammann, G. LEHRBUCH DER METALLOGRAPHIE. CHEMIE UND IHRE LEGIERUNCEN. Leipzig: L. Voss. |
| 201 | 1924 | Greaves & Wrighton, PRACTICAL MICROSCOPICAL METALLOGRAPHY. Chapman & Hall, London. |
| 202 | 1923 | Guertler, W. METALLOGRAPHIE, Berlin Gebruder Borntraeger. |
| 203 | 1923 | Guillet, L. LES METHODES D'ETUDE DES ALLIAGES METALLIQUES, Paris: Dunod. |
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