

cortex, or of the appearance of the leaf-scars, neither of which is perceptible. It is probably *S. lepidodendrifolia*, with scattered fruits.

In conclusion, it appears to me extremely probable that the following forms, which are usually found associated, are specifically identical :

*S. lepidodendrifolia*. Brongniart.

*S. rhomboidea* and *obliqua*, Brongt.

*S. sculpta*, Lesq.

*S. Brardii*, Brongt.

*S. Menardi*, Brongt,

*S. Serlii*, Brongt.

*S. Defranci*, Brongt.

With these, future investigation will perhaps unite,

*S. stellata*, Lesq.

*S. spinulosa*, Germ.

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### XIII. *Index to the Literature of Vanadium, 1801-1877.*

By GEORGE J. ROCKWELL, M. A.,

Late Professor of Chemistry in the Imperial University of Tokio, Japan.

Read April 2, 1877.

I offer this "Index to the Literature of Vanadium" to chemists, with the hope that it may be of use to them in their researches respecting an element which is beginning to be of value in the arts, and has been the subject of much study during the past year. Dr. H. C. Bolton first suggested the idea of compiling indices to the literature of each of the elements, and has published two, on Uranium and on Manganese, in the Annals of this Society; while a third, on Titanium, has been prepared by Mr. E. J. Hallock.

G. J. R.

[For List of Abbreviations, see page 142.]

|      |                   |                                                                          |                                                                                                                                                                            |
|------|-------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1801 | Del Rio           | Discovery of Erythronium in a lead-ore (Zimapan, Mexico)                 | Gilb., Ann., LXXI, 7.<br>Gehlen's J., II, 695.                                                                                                                             |
| 1805 | Collet-Descotils  | Declares erythronium to be impure Cr. (analysis of the Zimapan lead-ore) | Ann. d. Chimie, LIII, 260.                                                                                                                                                 |
| 1830 | Sefström          | Discovery of Vanadium in bar-iron, and refinery slag of Taberg, Sweden   | Vetensk. Acad. Handl., 1830<br>A. c. p., (2) XLVI, 105.<br>Pogg., XXI, 43.<br>Phil. Mag., (2) X, 151.<br>Schweigg., LXII, 317 and 2.<br>Am. J. Sci., (1) XX, 386.          |
| 1830 | Berzelius         | Letter announcing Sefström's discovery                                   | A. c. p., (2) XLV, 332.<br>Schweigg., LXII, 323.<br>" LXII, 26.                                                                                                            |
| 1831 | Berzelius         | Researches (metal, at. wt., oxides, compounds with P and S, vanadates)   | Abh. Schw. Acad. Wiss., 1831.<br>Pogg., XXII, 1.<br>Phil. Mag., (2) X, 321; XI, 7.<br>Berz., Jahresb., XI, 97.<br>Berz., Traité d. Chimie, IV, 642.                        |
| 1831 | Johnston          | Vanadinite (Scotland)                                                    | Edinb. J. Sci., 1831.<br>Schweigg., LXIII, 119.                                                                                                                            |
| 1831 | Wöhler            | Occurrence of Vanadium in the Zimapan lead-ore                           | Pogg., XXI, 49.                                                                                                                                                            |
| 1831 | Prideaux          | Ammonium vanadate and other compounds                                    | Phil. Mag., (2) X, 209.                                                                                                                                                    |
| 1831 | Berzelius         | Analysis of vanadinite (Zimapan, Mexico)                                 | Berz., Jahresb., XI, 200.                                                                                                                                                  |
| 1832 | Johnson           | Vanadinite (Scotland)                                                    | Edinb. J. Sci., V, 166, 318.<br>Berz., Jahresb., XII, 97, 171.<br>Am. J. Sci., (1) XXVI, 386.<br>Schweigg., LXIV, 88.                                                      |
| 1832 | Berzelius         | Vanadium ink                                                             | J. c. T., 1860, 291, 817.                                                                                                                                                  |
| 1833 | Rose              | Vanadinite (Beresowsk, Ural Mts.)                                        | Pogg., XXIX, 455.<br>A. C. P., XIV, 90.<br>Berz., Jahresb., XIV, 196.<br>Leonh., Jahrb., 1834, 231.                                                                        |
| 1836 | Regnault          | Action of vapor of water upon the metal                                  | A. c. p., (2) LXII, 357.<br>Ann. d. M., (3) XI, 24.                                                                                                                        |
| 1837 | Damour            | Lead vanadate containing Zn and Cu                                       | Ann. d. M., (3) XI, 161.<br>J. pr. Ch., XI, 134.<br>Berz., Jahresb., XVIII, 236.                                                                                           |
| 1837 | Thomson           | Analysis of vanadinite (Wicklow, Ireland)                                | Thoms., Outlines, I, 574.<br>Leonh., Jahrb., 1837, 332.                                                                                                                    |
| 1838 | Volborth and Hess | Volborthite                                                              | Petersb. Acad. Bull., IV, 22.<br>J. pr. Ch., XIV, 52.<br>A. C. P., XXVIII, 341.<br>Berz., Jahresb., XIX, 296.<br>Leonh., Jahrb., 1838, 423.<br>Am. J. Sci., (1) XLII, 387. |
| 1839 | Schrötter         | Occurrence of Vanadium in scoria from iron-works                         | Pogg., XLVI, 318.<br>Berz., Jahresb., XX, 245.                                                                                                                             |

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|------|------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1839 | Svanberg   | In hydrophite (analysis)                                   | Vetensk. Acad. Handl., 1839.<br>Pogg., LI, 538.                                                                                                                  |
| 1840 | Kersten    | In cupriferos slate (Kupferschiefer)                       | Pogg., LI, 539.<br>Leonh., Jahrb., 1842, 606.<br>Berz., Jahresb., XXI, 114.                                                                                      |
| 1841 | Kersten    | "Kupferschiefer" (analysis)                                | J. pr. Ch., XXII, 381.                                                                                                                                           |
| 1841 | Kersten    | Occurrence of Vanadium                                     | J. pr. Ch., XXIV, 379.                                                                                                                                           |
| 1842 | Wöhler     | In uraninite (Bohemia)                                     | A. C. P., XLI, 345.                                                                                                                                              |
| 1842 | Bodemann   | In siderite (Hartz Mts.)                                   | Pogg., LV, 633.                                                                                                                                                  |
| 1842 | Ficinus    | In uraninite                                               | J. pr. Ch., XXVI, 35.                                                                                                                                            |
| 1842 | Schultz    | In iron-ore (Silesia)                                      | Pharm. Centr., 1842, 372.<br>Berz., Jahresb., XXIII, 120.                                                                                                        |
| 1843 | Kersten    | In iron-ore                                                | Pogg., LIX, 121.<br>Berz., Jahresb., XXIV, 115.                                                                                                                  |
| 1843 | Ficinus    | In serpentine (Zöbletz)                                    | J. pr. ch., XXIX, 491.<br>Leonh., Jahrb., 1844, 360.<br>Berz., Jahresb., XXIV, 115.                                                                              |
| 1844 | Schafhäütl | Analysis of vanadin bronze (Bracco)                        | A. C. P., LI, 254.<br>Berz., Jahresb., XXV, 362.<br>Leonh., Jahrb., 1844, 721.                                                                                   |
| 1846 | .....      | Copper vanadate (Ural Mts.)                                | L'Institut, No. 525, 68.<br>Berz., Jahresb., XXV, 333.<br>Am. J. Sci., (2) II, 414.                                                                              |
| 1847 | Plauer     | Vollborthite (occurrence)                                  | Arch. wiss. Kunde Rus., VIII, 135.<br>Gorny's Journ., 1847?<br>Rammelsb., Min., 313.                                                                             |
| 1847 | Thomson    | Test for vanadic acid in minerals                          | Phil. Mag., (3) XXXI, 258.<br>J. pr. Ch., XLII, 434.<br>Jahresb., 1847, 965.                                                                                     |
| 1848 | Deck       | Occurrence in refinery slag, (Staffordshire)               | Chem. Gaz., 1848, 298.<br>Pharm. Centr., 1848, 782.<br>Jahresb., 1848, 413.                                                                                      |
| 1848 | Domeiko    | Analysis of vanadinite and chileite (vanadinkupferbleierz) | Ann. d. M., (4) XIV, 145.<br>Phil. Mag., (3) XXXIV, 395.<br>Rammelsbg., Min., 314.                                                                               |
| 1848 | Domeiko    | Chileite (analysis)                                        | Compt. rend., XXIV, 793.<br>J. pr. Ch., XLIII, 312.                                                                                                              |
| 1849 | Credner    | Kalkvollborthit (contains analyses)                        | Pogg., LXXIV, 546.<br>J. pr. Ch., XLVI, 409.<br>Rammelsbg., Min., 314.                                                                                           |
| 1849 | Fritzsche  | Konichalcite                                               | Pogg., LXXVII, 140.                                                                                                                                              |
| 1850 | Bergemann  | Dechenite (determ. of vanadic acid, &c.)                   | Pogg., LXXX, 393.<br>Arch. ph. nat., XV, 248.<br>Phil. Mag., (4) 1, 242.<br>Jahresb., 1850, 752.                                                                 |
| 1850 | Von Kobell | Arceoxene (bleizinkvanadat)                                | J. pr. Ch., L, 496.<br>Jahresb., 1850, 753.                                                                                                                      |
| 1850 | Fritzsche  | Occurrence and preparation of pure vanadic acid            | Petersbg. Acad. Bull., IX, 195.<br>A. C. P., LXXVIII, 338.<br>Pharm. Centr., 1851, 375.<br>J. pr. Ch., LIII, 90.<br>Chem. Gaz., IX, 432.<br>Jahresb., 1851, 350. |
| 1851 | Gisecke    | Extraction from uraninite                                  | Arch. Pharm., Feb., 1851,<br>J. pr. Ch., LV, 445.                                                                                                                |
| 1851 |            | Price of "Bohnerz," containing $V_2O_5$ .                  | J. pr. Ch., LII, 320.                                                                                                                                            |

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|------|---------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1851 | Teschemacher        | Vanadic ochre (Lake Superior)                                                                                      | Am. J. Sci., (2) XI, 233.<br>Pharm. Centr., 1852, 73.<br>Jahresb., 1851, 764.<br>Leonh., Jahrb., 1856, 193.                                                                                                            |
| 1851 | Wöhler              | Extraction from pisolitic iron ore (Bohnerz)                                                                       | A. C. P., LXXXVIII, 125.<br>Jahresb., 1851, 349.                                                                                                                                                                       |
| 1852 | Müller              | Occurrence in "Bohnerz" (Württemberg)                                                                              | J. pr. Ch., LVII, 124.<br>Z. C. P., 1852, 22.                                                                                                                                                                          |
| 1853 | Müller              | Analysis of "Bohnerz" containing $V_2O_5$                                                                          | A. C. P., LXXXVI, 127.<br>J. pr. Ch., LX, 63.                                                                                                                                                                          |
| 1853 | Mohr?               | Chileite                                                                                                           | Mohs' Min., 28.                                                                                                                                                                                                        |
| 1854 | Fischer and Nessler | Eusynchite                                                                                                         | Ber. Ges. Freiburg, 1854, III, 33.<br>Leonh. Jahrb., 1855, 570.<br>Jahresb., 1855, 964.                                                                                                                                |
| 1854 | Damour              | Descloizite (analysis, &c.)                                                                                        | A. c. p., (3) XLI, 72.<br>J. pr. Ch., LXII, 246.<br>Am. J. Sci., (2) XVII, 434.<br>Pharm. Centr., 1854, 539.<br>Arch. ph. nat., XXV, 78.<br>Leonh. Jahrb., 1854, 346.<br>Jahresb., 1854, 855.<br>Rammelsb., Min., 312. |
| 1854 | Descloizeaux        | Cryst. form of Descloizite                                                                                         | A. c. p., (3) XLI, 78.                                                                                                                                                                                                 |
| 1855 | Genth               | Volborthite                                                                                                        | Am. J. Sci., (2) XIX, 23.<br>Leonh., Jahrb., 1857, 439.                                                                                                                                                                |
| 1855 | Smith               | Descloizite from Penn. (analysis:—occurrence of $V_2O_5$ in red varieties of wulfenite)                            | Am. J. Sci., (2) XX, 246.<br>J. pr. Ch., LXVI, 433.<br>Pharm. centr., 1855, 850.<br>Rammelsb., Min., 313.<br>Jahresb., 1855, 964.                                                                                      |
| 1855 | Canaval             | Vanadinite from Windischkappel, Carinthia, (cryst. form, sp. gr., &c.)                                             | Jahrb. d. nat. Land., III, 171.<br>Jahresb., 1855, 963.<br>Leonh., Jahrb., 1857, 173.                                                                                                                                  |
| 1855 | Bödeker             | Vanadium and titanium in clay-ironstone                                                                            | A. C. P., XCIV, 355.<br>J. pr. Ch., LXVI, 190.                                                                                                                                                                         |
| 1856 | Patera              | Occurrence and separation of vanadium in uraninite (Joachimsthal)                                                  | Berg. Hüttenm. Ztg., 1856, No. 31.<br>J. pr. Ch., LXIX, 118.<br>Dingl. pol. J., CXXI, 375.<br>Chem. Centr., 1856, 843.                                                                                                 |
| 1856 | Von Hauer           | Researches (sep. from Joachimsthaler uraninite; estim. of $V_2O_5$ ; sep. from Pb, Ba, Sr; reactions of vanadates) | Wien. Acad. Ber., XX, 37.<br>J. pr. Ch., LXIX, 118.<br>Dingl. pol. J., CXXI, 375.<br>Jahresb., 1856, 377, 744.                                                                                                         |
| 1856 | Kenngott            | Vanadinite                                                                                                         | Pogg., XCIX, 95.                                                                                                                                                                                                       |
| 1856 | Rammelsberg         | Windischkappel vanadinite (cryst form, analysis, &c.)                                                              | Berl. Acad. Ber., 1856, 153.<br>Pogg., XCVIII, 249.<br>J. pr. Ch., LXVIII, 244.<br>Chem. Centr., 1856, 374.<br>Leonh. Jahrb., 1857, 716.<br>Jahresb., 1856, 872.                                                       |
| 1856 | Von Hauer           | Researches ( $NH_4$ , Na, Ba, Sr vanadates)                                                                        | Wien. Acad. Ber., XXI, 333.<br>J. pr. Ch., LXIX, 385.                                                                                                                                                                  |
| 1857 | Schabus             | Cryst. form of vanadinite                                                                                          | Pogg., C., 297.                                                                                                                                                                                                        |
| 1857 | Bergemann           | Analysis of arceoxene                                                                                              | Leonh., Jahrb., 1857, 397.<br>Jahresb., 1857, 683.                                                                                                                                                                     |

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|------|-------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1857 | Struve                  | Vanadinite (Beresowsk)                                                                            | Vehr. d. min. Ges. Petersbg., 1857, III, 42.<br>Jahresb., 1859, 804.                                                                                                                           |
| 1857 | Brush                   | Dechenite, eusynchite, (presence of ZnO; identity of eusynchite and aræoxene with dechenite, &c.) | Am. Jour. Sci. (2) XXIV, 116.<br>Jahresb., 1857, 685.                                                                                                                                          |
| 1857 | Wöhler                  | Detection of vanadic acid in wulfenite                                                            | A. C. P., CII, 383.<br>J. pr. Ch., LXXI, 447.<br>Jahresb., 1857, 199.                                                                                                                          |
| 1858 | Uhrlaub                 | Compounds of vanadium with nitrogen                                                               | Pogg., CIII, 134.<br>J. pr. Ch., LXXIII, 378.<br>Chem. Centr., III, 166.                                                                                                                       |
| 1858 | Grailich                | Cryst. form of vanadates                                                                          | Kryst. Untersuch., 3.                                                                                                                                                                          |
| 1858 | Schafarik               | Researches (chlorides, metal, vanadic acids, &c.)                                                 | Wien Acad. Ber., XXXIII, 3.<br>A. C. P., CIX, 84.<br>J. pr. Ch., LXXXVI, 142.<br>Chem. Centr., 1859, 97.<br>Rep. chim. pure, I, 292.<br>A. C. P., (3) LV, 497.<br>Jahresb., 1858, 166.         |
| 1858 | Hallwachs and Schafarik | Action of ethyl iodide on vanadium                                                                | Wien Acad. Ber., XXXIII, 569.<br>A. C. P., CIX, 206.<br>Chem. Centr., 1859, 161.<br>J. pr. Ch., LXXXVI, 140.<br>N. Jahrb. Pharm., XI, 201.<br>Rep. chim. pure, I, 334.<br>Jahresb., 1859, 407. |
| 1859 | Von Hauer               | Strontium trivanadate                                                                             | J. pr. Ch., LXXXVI, 156.<br>Jahresb., 1859, 177.                                                                                                                                               |
| 1859 | Handl                   | Cryst. form of the above                                                                          | Wien Acad. Ber., XXXVII, 391.<br>Jahresb., 1859, 178.                                                                                                                                          |
| 1859 | Buff                    | Electrolytic                                                                                      | A. C. P., CX, 257.<br>Chem. Centr., 1859, 686.<br>Phil. Mag., (4) XVII, 394.<br>Jahresb., 1859, 34.                                                                                            |
| 1859 | Beauvallet              | Occurrence in clay (Gentilly)                                                                     | Compt. rend., XLIX, 301,<br>Ann. d. M., (5) XVII, 20.<br>Rep. chim. appl., I, 406.<br>J. pr. Ch., LXXXIV, 256,<br>Phil. Mag., (6) XVIII, 480.                                                  |
| 1859 | Von Hauer               | Vanadates (NH <sub>4</sub> , Na, Sr, Ba, Ca, Mg vanadates)                                        | Wien Acad. Ber., XXXIX, 299, 448.<br>J. pr. Ch., LXXX, 324.<br>Chem. Centr., 1860, 439.<br>Rep. chim. pure, II, 208.<br>Chem. News, 1860, 59.<br>Jahresb., 1860, 164.                          |
| 1859 | Hermann                 | Vanadium gummite                                                                                  | J. pr. Ch., LXXXVI, 328.                                                                                                                                                                       |
| 1860 | Engelbach               | V and Ti in brachydolerite and nepheline dolerite (Vogelsberg)                                    | Jahresb., 1860, 810.                                                                                                                                                                           |
| 1860 | Nordenskiöld            | Vanadic acid (cryst. form, properties)                                                            | Oefv. Ak. Stockh., 1860.<br>Pogg., CXII, 160.<br>Jahresb., 1860, 164.                                                                                                                          |

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| 1860 | Terreil             | Occurrence in clays (Gentilly, Forges les-Eaux, and Dreux)                              | Comp. rend., LI, 94.<br>Rep. chim. pure, II, 283.<br>Chem. Centr., 1860, 896.                                                                                                                                                    |
| 1861 | Zippé               | Rhombic vanadite                                                                        | Wien Acad. Ber., XLIV, (I Abth.) 197.<br>Leonh., Jahrb., 1852, 728.<br>Jahresb., 1861, 1020.                                                                                                                                     |
| 1861 | Tschermak           | Analysis of rhombic vanadite                                                            | Wien Acad. Ber., XLIV, (II Abth.) 157.<br>Leonh., Jahrb., 1862, 728.<br>Jahresb., 1861, 1021.                                                                                                                                    |
| 1861 | Werther             | Delicate test for vanadic acid                                                          | J. pr. Ch., LXXXIII, 195.<br>N. Arch. ph. nat., XI, 82.<br>Z. anal. C., I, 72.<br>Rep. chim. pure, IV, 57.<br>Jahresb., 1861, 849.                                                                                               |
| 1861 | St. Claire De-ville | Extraction from iron-ore (Baux)                                                         | Ann. d. M., (5) XVII, 19.<br>Compt. rend., XLIX, 210.<br>J. pr. Ch., LXXXIV, 255.<br>Dingl. pol. J., CLXIII, 396.<br>Pol. Notizbl., 1862, 64.<br>J. c. T., 1862, 334.                                                            |
| 1861 | St. Claire De-ville | Analysis of aluminous minerals containing $V_2O_5$ , (detection in cryolite, &c.)       | A. c. p., (3) LXI, 309, 342.<br>Chem. News; 1862, 103.                                                                                                                                                                           |
| 1862 | Böttger             | Extraction from "Bohnerz"                                                               | Jahres. des phys. Ver. zu Frankfurt, 1861-2, 70.<br>J. pr. Ch., XC, 33.<br>Dingl. pol. J., CLXVIII, 392.<br>Bull. soc. chem., VI, 183.<br>Chem. Centr., 1864, 416.<br>Pol. Centr., 1863, 1100.<br>Jahresb., 1863, 219.           |
| 1862 | Schrauf             | Zippé's vanadite compared with dechenite and descloizite                                | Pogg., CXVI, 355.<br>Leonh., Jahrb., 1862, 1000.<br>Jahresb., 1862, 754.                                                                                                                                                         |
| 1862 | Tschermak           | Criticism on Schrauf.                                                                   | Pogg., CXVII, 349.<br>Jahresb., 1862, 754.                                                                                                                                                                                       |
| 1862 | Thompson            | Argyllite or lead-sulpho-vanadate                                                       | London J. of Arts, N. S., XVI, 260.                                                                                                                                                                                              |
| 1863 | Schafarik           | Researches (at. wt., oxides, compound with P and S, vanadium residues, &c.)             | Wien Acad. Ber., XLVII, (II Abth.) 246.<br>J. pr. Ch., XC, 1.<br>Chem. Centr., 1863, 634.<br>Z. C., 1863, 408.<br>Bull. soc. chem., VI, 23.<br>Jahresb., 1863, 15, 219.                                                          |
| 1863 | Phipson             | Vanadic ochre (contains analyses of clays, bog-iron ores, &c., containing vanadic acid) | Compt. rend., LVII, 152.<br>J. Chem. Soc., (2) I, 244.<br>Chem. News, VII, 210.<br>J. pr. Ch., XCI, 49; XCII, 63.<br>Chem. Centr., 1863, 987.<br>J. c. T., 1863, 376.<br>Leonh., Jahrb., 1863, 861.<br>Jahresb., 1863, 219, 861. |
| 1863 | Thompson            | Action of vanadium on iron                                                              | Le Technologiste, 1863, 450.<br>Pol. Centr., 1863, 1172.<br>Dingl. pol. J., CLXIX, 475.                                                                                                                                          |

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| 1863 | Thompson    | Action of vanadium on iron                                                                                                                                                                   | Berg. Hüttenm. Ztg., 1863, 380.<br>J. c. T., 1863, 60.                                                                                                                                                                                                                                                                     |
| 1863 | Czudnowicz  | Researches (oxygen compounds: estim. of $V_2O_5$ , sep. from Zn: review of previous analyses of dechenite, vanadinite, æcoxene, eusynchite, &c)                                              | Pogg., CXX, 17.<br>Chem. Centr., 1864, 161.<br>Jahresb., 1863, 221, 826.<br>Leonh. Jahrb., 1864, 237.<br>Z. anal. C., 1864, 377.<br>J. c. T., 1864, 285.<br>Am. J. Sci. (2) XXXVII, 270.                                                                                                                                   |
| 1863 | Riley       | Occurrence in gray pig-iron; and mode of extraction                                                                                                                                          | J. Chem. Soc., (2) II, 21.<br>Chem. News, 1863, 361, 277.<br>Chem. Centr., 1864, 688.<br>Bull. soc. chim. (2) II, 286.<br>Pol. Notizbl., 1864.<br>Jahresb., 1864, 232.<br>Dingl. pol. J., CLXXV, 244.<br>J. c. T., 1864, 58.                                                                                               |
| 1864 | Rammelsberg | Natural compounds of lead oxide and vanadic acid                                                                                                                                             | Ber. Acad. Ber., 1864, 33.<br>J. pr. Ch., XCI, 405.<br>Chem. Centr., 1865, 23.<br>Leonh. Jahrb., 1864, 844.<br>Bull. soc. chim. (2) II, 344.<br>J. Pharm., (3) XLVI, 70.<br>Institut., 1864, 160.<br>Jahresb., 1864, 855.                                                                                                  |
| 1864 | Huber       | Occurrence in psilomelane, (Krakow mine, Katzenellenbogen)                                                                                                                                   | A. C. P., CXXX, 268, 371.<br>Jahresb., 1863, 861.                                                                                                                                                                                                                                                                          |
| 1864 | Rammelsberg | Occurrence in soda-lye                                                                                                                                                                       | Berl. Acad. Ber., 1864, 680.<br>J. pr. Ch., XCIV, 237.<br>Chem. Centr., 1865, 1801.<br>Z. C., 1865, 581.<br>Pol. Centr., 1865, 1081.<br>Jahresb., 1864, 185.                                                                                                                                                               |
| 1865 | Engelbach   | Occurrence in basalt                                                                                                                                                                         | A. C. P., CXXXV, 123.<br>Z. C., 1865, 605.<br>Chem. Centr., 1866, 367.<br>A. c. p., (4) VI, 482.<br>Jahresb., 1865, 219.                                                                                                                                                                                                   |
| 1865 | Baumgarten  | Occurrence in soda-lye                                                                                                                                                                       | Z. C., 1865, 605.<br>Chem. Centr., 1866, 367.<br>Jahresb., 1865, 165, 219.                                                                                                                                                                                                                                                 |
| 1866 | Bunsen      | Flame-reactions                                                                                                                                                                              | A. C. P., CXXXVIII, 257.<br>Z. anal. C., V, 351.<br>Phil. Mag., (4) XXXII, 81.<br>N. Arch. ph. nat., XXVII, 25.<br>Jahresb., 1866, 782.                                                                                                                                                                                    |
| 1867 | Roscoe      | Researches, Part I. (1) Occurrence in copper-bearing beds at Alderley Edge and Mottram St. Andrews, Cheshire, (2) sep., (3) at. wt., (4) estim., (5) oxides, (6) oxychlorides (7) nitrides.) | Phil. Trans., 1868, 1.<br>Proc. Roy. Soc., XVI, 220.<br>Phil. Mag., (4) XXXV, 307.<br>A. C. P., Suppl., VI, 77.<br>Am. J. Sci., (2) XLV, 394.<br>Chem. News, XVII, 135.<br>Z. C., 1868, 417.<br>N. Arch. ph. nat., XXXI, 331.<br>A. c. p., (4) XIV, 438.<br>J. pr. Ch., CIV, 429.<br>Jahresb., 1867, 2<br>Dt. Ind. Ztg., 1 |

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| 1868 | Rammelsberg  | Ammonium tungsto-vanadate $[(\text{NH}_4)_2\text{O}, 3\text{V}_2\text{O}_5, \text{WO}_3 + 6\text{H}_2\text{O}]$                                        | D. C. Ges., 1868, 158.<br>Z. C., 1868, 226.<br>Chem. Centr., 1868, 652.<br>Jahresb., 1868, 226.                                                                                                                                                                                                                                               |
| 1868 | Thalén       | Spectrum, giving wavelengths                                                                                                                           | Nova Acta Reg. Upsal., 1868, (3) VI.<br>A. c. p., (4) XVIII, 243.<br>Roscoe's Spect. Anal., 1873, 123.                                                                                                                                                                                                                                        |
| 1869 | Roscoe       | Researches. Part II. (1) metal, (2) chloride.                                                                                                          | Phil. Trans., 1869, 679.<br>Proc. Roy. Soc., XVIII, 37.<br>Phil. Mag., (4) XXXIX, 146.<br>Chem. News, XX, 37.<br>Am. J. Sci., (2) XLVIII, 407.<br>A. C. P. Suppl., VII, 1869, 70.<br>J. pr. Ch., CVIII, 303.<br>D. C. Ges., 1869, 424.<br>Z. C., 1869, 553.<br>Bull. soc. chim., XII, 447.<br>Jahresb., 1869, 289.                            |
| 1869 | Smith        | Descloizite (Penn.)                                                                                                                                    | Am. J. Sci., (2) XLVIII, 137.<br>Jahresb., 1869, 1231.                                                                                                                                                                                                                                                                                        |
| 1869 | Descloizeaux | Goniometric measurement of the above                                                                                                                   | Am. J. Sci., (2) XLVIII, 137.                                                                                                                                                                                                                                                                                                                 |
| 1870 | Roscoe       | Researches. Part III. (1) metal, (2) V and I., (3) V. and Br., (4) vanadates, absorption of oxygen by vanadic acid; bleaching properties of same, &c.) | Phil. Trans., 1870, 317.<br>Proc. Roy. Soc., XVIII, 316.<br>Phil. Mag., (4) XL, 62.<br>Am. J. Sci., (3) I, 374.<br>Chem. News, XXI, 183.<br>A. C. P. Suppl., 1870, VIII, 95.<br>Z. C., 1870, 357.<br>Chem. Centr., 1870, 644.<br>D. C. Ges., 1870, 432.<br>Bull. soc. chim., XIV, 208.<br>Am. Chem., 1871, 435.<br>Jahresb., 1870, 368, 1314. |
| 1870 | Hermann      | Vanadiolite (association, analysis, &c.)                                                                                                               | Bull. Soc. Imp. Moscow, XLII, 234.<br>J. pr. Ch., (2) I, 442.<br>Chem. Centr., 1870, 424.<br>Am. J. Sci., (2) L, 273.<br>Leonh., Jahrb., 1870, 780.<br>Jahresb., 1870, 1287.                                                                                                                                                                  |
| 1870 | Schrauf      | Eosite, dechenite, descloizite, &c., (cryst. forms and relations of chromo-wulfenites, eosite, dechenite, &c.)                                         | Wien. Acad. Ber., (1 Abth.) LXIII, 167.<br>Proc. Roy. Soc., XIX, 451.<br>Chem. News, XXIII, 230, 246.<br>J. Chem. Soc., (2) IX, 500.<br>Leonh., Jahrb., 1871, 163, 638.<br>Jahresb., 1871, 1168.                                                                                                                                              |
| 1871 | Roscoe       | Estimation of vanadic acid                                                                                                                             | J. Chem. Soc., (2) IX, 28.<br>Z. anal. C., X, 223.<br>Bull. soc. chim., XVII, 43.<br>Jahresb., 1871, 942.                                                                                                                                                                                                                                     |
| 1871 | Roscoe       | Orthovanadates                                                                                                                                         | Z. anal. C., X, 224.<br>Bull. soc. chim., XVII, 42.                                                                                                                                                                                                                                                                                           |
| 1871 | Lightfoot    | Action of vanadium on aniline salts                                                                                                                    | Pamphlet, Manchester, 1871, 36 pp.<br>Bull. Soc. Ind. d. Mulhouse, XLI, 285.                                                                                                                                                                                                                                                                  |

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| 1871 | Lightfoot               | Action of vanadium on aniline salts                                                                                         | Textile Colorist, 1876, 130.                                                                                                       |
| 1871 | Thorpe                  | Vanadyl-chlorides                                                                                                           | Phil. Mag., (4) XLII, 305.                                                                                                         |
| 1871 | Frenzel                 | Pucherite, a new mineral, (cryst. form, analyses, &c.)                                                                      | J. pr. ch., (2) IV, 227, 353.<br>Leonh., Jahrb., 1872, 97, 514, 939.<br>Jahresb., 1871, 1168.                                      |
| 1871 | Pinkney                 | Application of vanadium and uranium together, or in combination with nickel, for producing aniline black (patented Oct. 16) | Textile Colorist, 1876, 115, 131.<br>Bull. soc. chim., XVIII, 47.                                                                  |
| 1871 | Pinkney                 | Vanadium marking-ink, "Jetoline," (patented Oct. 16)                                                                        | Textile Colorist, 1876 198.                                                                                                        |
| 1871 | Thorpe                  | Vapor density of vanadyl-trichloride                                                                                        | Chem. News, XXIV, 287.<br>Jahresb., 1871, 57.                                                                                      |
| 1872 | Maskelyne and Flight    | Analysis of vanadinite, (S. Africa)                                                                                         | J. Chem. Soc., (2) X, 1053.<br>Jahresb., 1872, 1129.                                                                               |
| 1872 | Kenngott                | Descloizite isomeric with lead sulphate                                                                                     | Zurich. naturf. G., (3) XVI, 137.<br>Leonh., Jahrb., 1872, 535.<br>Jahresb., 1872, 1129.                                           |
| 1872 | Websky                  | Cryst. form of pucherite, (Schneeberg)                                                                                      | Leonh., Jahrb., 1873, 183.<br>Jahresb., 1872, 1129.                                                                                |
| 1872 | Böttger                 | Separation. Application of ammonium vanadate to making ink                                                                  | Jahresb. des phys. Ver. zu Frankfurt, 1871-2, 18.<br>Chem. Centr., IV, 514.<br>Bull. soc. chim., XX, 501.<br>Chem. News, XXIX, 62. |
| 1872 | Lasaulx                 | Ardennite (properties and analysis)                                                                                         | Leonh., Jahrb., 1872, 930.                                                                                                         |
| 1872 | R. Apjohn               | Occurrence and detection of vanadium in trap-rock                                                                           | Chem. News, XXVI, 183.<br>J. Chem. Soc., (2) X, 1116.<br>Bull. soc. chim., XIX, 123.<br>Jahresb., 1872, 916.                       |
| 1872 | E. Sonstadt             | Occurrence in trap-rock                                                                                                     | Chem. News, XXVI, 214.                                                                                                             |
| 1872 | Lasaulx and Bettendorff | Occurrence in ardennite                                                                                                     | Leonh., Jahrb., 1872, 930;<br>1873, 124.<br>Pogg., CXLIX, 241.                                                                     |
| 1872 | R. J. Hodges            | Occurrence in iron-ore, (Antrim, Ireland)                                                                                   | Chem. News, XXVI, 238.<br>Jahresb., 1872, 267.                                                                                     |
| 1872 | Carnelley               | Thallium vanadates. Separation of vanadium from thallium                                                                    | A. C. P., CLXVI, 155.<br>J. Chem. Soc., (2) XI, 323.<br>Bull. soc. chim., XIX, 502.<br>Jahresb., 1873, 945.                        |
| 1872 | Pisani                  | Ardennite (analysis)                                                                                                        | Compt. rend., 1872, No. 23.                                                                                                        |
| 1873 | B. W. Gerland           | Metavanadic acid                                                                                                            | Chem. News, XXVII, 92.<br>Bull. soc. chim., XIX, 501.                                                                              |
| 1873 | Hautefeuille            | Chloro-vanadates                                                                                                            | Compt. rend., LXXVII, 896.<br>Bull. soc. chim., XXI, 180.                                                                          |
| 1873 | Patera                  | Preparation of salts                                                                                                        | Bericht. Wien. Weltausstellung, 1873, III, (1. Abth.) 841.<br>J. c. T., 1875, 615.                                                 |
| 1873 | V. Roussel              | Occurrence in basalt, near Clermont-Ferrand. (Detect. of small quantities in silicates.)                                    | Compt. rend., LXXVII, 1102.<br>Bull. soc. chim., XXI, 71.<br>Chem. News, XXVIII, 313.<br>Jahresb., 1873, 944.                      |

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| 1873 | B. Apjohn          | Occurrence in meteorites                                                                                          | J. Chem. Soc. (2) XII, 104.<br>Chem. News, XXVIII, 278.<br>Am. Chemist, V, 29.<br>Jahresb, 1874, 997, 1340.                       |
| 1873 | Norblad            | Vanadium salts (sep. of vanadic acid from alkalis and alkaline earths)                                            | Bull. soc. chim., XXIII, 64.<br>D. C. Ges., VIII, 126.<br>Z. anal. C., XIV, 344.                                                  |
| 1874 | Lasaulx            | Presence of vanadium in ardeninite                                                                                | Leonh., Jahrb., 1874, 276.                                                                                                        |
| 1874 | Jas. Gibbons       | Photographic properties                                                                                           | Chem. News, XXX, 267.<br>Les Mondes, 1875, XXXVI.<br>Bull. soc. chim., XXIV, 368,<br>Am. Chemist, VI, 277.<br>Jahresb. 1874, 171. |
| 1874 | Sellon and Pinkney | Vanadium salts in conjunction with vegetable and animal coloring matter, for dyeing and printing (Pat. Dec. 4)    | Textile Colorist, 1876, 86, 122, 131.                                                                                             |
| 1875 | A. A. Hayes        | Wide diffusion of V compounds, associated with P in porphyritic and slate rocks, occurrence in natural waters, &c | Proc. Am. Acad. Sci., X, 300.<br>Chem. News, XXXII, 34.<br>Am. J. Sci., (3) X, 61.                                                |
| 1875 | H. C. Bolton       | Occurrence in uraninite                                                                                           | Am. Chemist, V, 363.                                                                                                              |
| 1875 | H. Fresenius       | Action of $H_2SO_4$ on vanadic acid.                                                                              | Z. anal. C., XIV, 193.                                                                                                            |
| 1875 | Frenzel            | Descloizite, vanadinite (analyses &c.)                                                                            | Leonh., Jahrb., 1875, 673.                                                                                                        |
| 1875 | Jno. Priestley     | Physiological effect                                                                                              | Proc. Roy. Soc., XXIV, 40.                                                                                                        |
| 1875 | P. Bedson          | Compound of ether and vanadyltrichloride—<br>( $VOCl_3 + C_4H_{10}O$ )                                            | A. C. P., CLXXX, 935.                                                                                                             |
| 1876 | R. Pinkney         | Vanadium in production of aniline black                                                                           | Moniteur de la Teinture, III, 208.<br>Bull. soc. chim., XXV, 45.                                                                  |
| 1876 | A. Guyard          | Aniline black by means of vanadium salts                                                                          | Bull. soc. chim., XXV, 58.<br>Textile Colorist, 1876, 131, 284.<br>Am. Chemist, VII, 114.                                         |
| 1876 | M. A. Rosenstiehl, | Aniline black                                                                                                     | Bull. soc. chim., XXV, 291.                                                                                                       |
| 1876 | A. Guyard          | Vanadium salts                                                                                                    | Bull. soc. chim., XXV, 350.                                                                                                       |
| 1876 | Von Zepharovich    | Red vanadinite                                                                                                    | Leonh., Jahrb., 1876, 561.                                                                                                        |
| 1876 | B. W. Gerland      | Sulphates; metavanadic acid                                                                                       | D. C. Ges., IX, 869.<br>Bull. soc. chim., XXVII, 52.                                                                              |
| 1876 | Rosenstiehl        | Aniline black                                                                                                     | A. C. P., (2) VIII, 561.                                                                                                          |
| 1876 | Lasaulx            | Occurrence of vanadium in ardeninite; analysis, &c.                                                               | Leonh., Jahrb., 1876, 363.                                                                                                        |
| 1876 | G. A. Koenig       | Occurrence in schorlomite, perowskite, and other minerals from Arkansas                                           | Proc. Phila. Acad. Sci. 1876, 37.                                                                                                 |
| 1876 | I. Walz            | Occurrence in American magnetites                                                                                 | Am. Chemist, VI, 453.                                                                                                             |

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| 1876 |                   | Vanadium in dyeing and calico printing                                        | Textile Colorist, 1876.                                                             |
| 1876 | F. A. Genth       | Roscoelite, a vanadium mica                                                   | Am. Chemist, VII, 57,<br>Am. J. Sci., (3) XI, July.<br>Phil. Mag., (5) 11, 156,     |
| 1876 | C. M. Stillwell   | Occurrence in American hematites and other secondary iron ores                | Am. Chemist, VII, 41.                                                               |
| 1876 | Witz, M. G.       | Use of vanadium in preparing aniline black                                    | Compt. rend., 1876.<br>Am. Chemist, VII 61.                                         |
| 1876 | Homme             | Experiments upon the uses of aniline black in dyeing woolen and mixed tissues | Bull. Soc. Ind. Rouen, IV, 263.<br>Textile Colorist, 1876,<br>Am. Chemist, VII, 60. |
| 1876 | M. A. Rosenstiehl | Theory of the formation of aniline black                                      | Bull. Soc. Ind. Mulhouse, 1876.                                                     |
| 1876 | Crow              | Tetroxide                                                                     | Am. Chemist, VII, 94.                                                               |

## EXPLANATION OF ABBREVIATIONS.

|                             |                                                                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Abh. Schw. Acad. Wiss.      | Abhandlungen der königlichen Schwedischen Academie der Wissenschaften, Stockholm.                                           |
| A. c. p.                    | Annales de chimie et de physique, Paris,                                                                                    |
| A. C. P.                    | Annalen der Chemie and Pharmacie, Heidelberg.                                                                               |
| Am. Chemist                 | American Chemist, C. F. and W. H. Chandler, New York.                                                                       |
| Am. J. Sci.                 | American Journal of Science and Arts, Silliman and Dana, New Haven, Ct.                                                     |
| Ann. d. Chimie              | Annales de Chimie, Paris.                                                                                                   |
| Ann. d. M.                  | Annales des Mines, Paris.                                                                                                   |
| Arch. Pharm.                | Archiv der Pharmacie, Bley, Halle, etc.                                                                                     |
| Arch. ph. nat.              | Archives des sciences physiques et naturelles, Genève.                                                                      |
| Arch. wiss. Kunde Russ.     | Archiv für wissenschaftliche Kunde von Russland, Berlin.                                                                    |
| Ber. Acad. Ber.             | Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preussische Academie der Wissenschaften zu Berlin. |
| Ber. Ges. Freiburg          | Bericht d. Gesellsch. f. Naturwissenschaften zu Freiburg.                                                                   |
| Ber. Wiener Weltausstellung | Bericht über die Wiener Weltausstellung von 1873, Braunschweig, 1875.                                                       |
| Berg Hüttenm. Ztg.          | Berg-und Hüttenmannische Zeitung, Leipzig.                                                                                  |
| Berz., Jahresb.             | Jahresbericht über die Fortschritte der Chemie, etc., Berzelius, Tübingen.                                                  |
| Berz., Traité d. chimie     | Traité de chimie. Berzelius.                                                                                                |
| Bull. Sci. St. Petersb.     | Bulletin Scientifique publié par l'Académie Imp. des Sciences de St. Petersbourg.                                           |
| Bull. soc. chim.            | Bulletin de la Société chimique de Paris.                                                                                   |
| Bull. soc. Ind. Mulhouse    | Bulletin de la Société Industrielle de Mulhouse.                                                                            |
| Bull. soc. Ind. Rouen       | Bulletin de la Société Industrielle de Rouen.                                                                               |
| Bull. soc. Imp. Moscou      | Bulletin de la Société Impériale des naturalistes de Moscou.                                                                |

- Chem. Centr.  
Chem. Gaz.  
Chem. News.  
Compt. rend.  
Dingl., pol. J.  
D. C. Ges.  
Dt. Ind. Ztg.  
Edinb. J. Sci.  
Engineering.  
Gehlen's J.  
Gilb., Ann.  
Instit.  
Jahrb. d. nat. Land.  
Jahresb.  
Jahres. des phys. Ver. zu  
Frankfurt  
J. c. T.  
J Chem. Soc.  
J. pr. Ch.  
J. Pharm.  
Kryst. Untersuch.  
Les Mondes.  
Le Technologiste  
Leonh., Jahrb.  
London J. of Arts.  
Mohs' Min.  
Monit. de la teinture  
N. Arch. ph. nat.  
N. Jahrb. Pharm.  
Nova Acta Reg. Upsal.  
Oefv. Ak. Stockh.  
Petersb. Acad. Bull.  
Pharm. Centr.  
Phil. Mag.  
Phil. Trans.  
Pogg.  
Pol. Centr.  
Pol. Notizbl.  
Proc. Am. Acad. Sci.  
Proc. Phila. Acad. Sci.  
Proc. Roy. Soc.  
Rammelsbg., Min.
- Chemisches Centralblatt, Knop ; Leipzig.  
Chemical Gazette, Francis and Croft, London.  
Chemical News, Crookes, London.  
Comtes rendus hebdomadaires des séances de  
de l'académie des sciences, Paris.  
Polytechnisches Journal. Dingler ; Stuttgart.  
Berichte der deutschen chemischen Gesellschaft  
zu Berlin.  
Deutsche Industrie Zeitung, Binder ; Leipzig.  
Edinburgh Journal of Science, Brewster.  
Engineering, London.  
Allgemeines Journal der Chemie, Gehlen ; Berlin.  
Annalen der Physik, Gilbert ; Halle.  
L'Institut ; section des sciences mathématiques,  
physiques et naturelles, Arnott, Paris.  
Jahrbuch d. naturhist. Landmuseums von  
Karnthen.  
Jahresbericht über die Fortschritte der Chemie,  
Giessen.  
Jahresbericht des physikalischen Vereins zu  
Frankfurt am Rhein.  
Jahresbericht über die Fortschritte der chemi-  
schen Technologie, Wagner ; Leipzig.  
Journal of the Chemical Society, London.  
Journal für praktische Chemie, Erdmann.  
Journal de Pharmacie et de Chimie, Paris.  
Krystallographische Untersuchungen, Grailich ;  
Wien and Olmütz, 1858.  
Les Mondes, Moigno ; Paris.  
Le Technologiste, Paris,  
Jahrbuch für Mineralogie, Geognosie, etc., Leon-  
hard ; Heidelberg.  
London Journal of Arts and Sciences, Newton ;  
London.  
Grundriss der Mineralogie, Mohs.  
Moniteur de la teinture, Paris.  
Nouvelles archives des sciences physiques et  
naturelles, Genève.  
Neues Jahrbuch für Pharmacie. Speyer.  
Nova Acta Reg. Soc. Sci. Upsal., Third Series,  
Upsala, 1868.  
Oefversigt af Kongl. Vetenskaps-Akademiens  
Forhandlingar ; Stockholm.  
Bulletin de l'Académie des Sciences de St. Pe-  
tersbourg.  
Pharmaceutisches Centralblatt, Leipzig.  
London, Edinburgh, and Dublin Philosophical  
Magazine, London.  
Philosophical Transactions of the Royal Society  
of London.  
Annalen der Physik and Chemie, Poggendorff ;  
Berlin.  
Polytechnisches Centralblatt.  
Polytechnisches Notizblatt.  
Proceedings of the American Academy of Scien-  
ces, Boston.  
Proceedings of the Philadelphia Academy of  
Natural Sciences, Philadelphia.  
Proceedings of the Royal Society of London.  
Handb. der Mineralchemie, Rammelsberg, 1860,

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|------------------------------------|---------------------------------------------------------------------------------------------------------|
| Reimann's Färberzeitung            | Reimann's Färberzeitung.                                                                                |
| Rép. chim. appl.                   | Répertoire de chimie appliquée, Paris.                                                                  |
| Rép. chim. pure.                   | Répertoire de chimie pure et appliquée, Paris                                                           |
| Roscoe's Spect. Anal.              | Spectrum Analysis, H. E. Roscoe; Third Edition, 1873, London.                                           |
| Schweigg.                          | Journal für Chemie und Physik, Schweigger; Nürnberg.                                                    |
| Textile Colorist.                  | Textile Colorist, Chas. O'Neill; Manchester.                                                            |
| Thoms., Outlines.                  | Outlines of Mineralogy, T. Thomson.                                                                     |
| Verh. d. min. Ges. St. Petersburg. | Verhandlungen der Russisch-Kaiserlichen Mineralogischen Gesellschaft zu St. Petersburg.                 |
| Vetensk. Acad. Handl.              | Kongl. Svenska Vetenskaps Academiens Handlingar, Stockholm.                                             |
| Vierteljahres. Pharm.              | Vierteljahresschrift für praktische Pharmacie, Wittstein; München.                                      |
| Wien. Akad. Ber.                   | Sitzungsberichte der naturwissenschaftliche Classe der Kaiserliche Academie der Wissenschaften zu Wien. |
| Z. C.                              | Zeitschrift für Chemie, Göttingen.                                                                      |
| Z. C. P.                           | Zeitschrift für Chemie und Pharmacie, Erlangen.                                                         |
| Z. anal. C.                        | Zeitschrift für analytische Chemie, Fresenius; Wiesbaden.                                               |
| Zürich naturf. G.                  | Vierteljahresschrift der naturforschenden Gesellschaft in Zurich, R. Wolf.                              |



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<https://doi.org/10.1111/j.1749-6632.1879.tb55118.x>.

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