

**SECOND APPENDIX TO
THE SIXTH
EDITION OF DANA'S
SYSTEM OF MINERALOGY**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649463947

Second Appendix to the Sixth Edition of Dana's System of Mineralogy by Edward S. Dana & William E. Ford

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

EDWARD S. DANA & WILLIAM E. FORD

**SECOND APPENDIX TO
THE SIXTH
EDITION OF DANA'S
SYSTEM OF MINERALOGY**

DANA'S SERIES OF MINERALOGIES.

New "System of Mineralogy."

Embodying the results of the last twenty-four years of active progress. Containing more than half more matter than the former edition, and the page increased one-fifth in size. Not merely revised but entirely rewritten. Sixth edition, 1892. With Appendices I and II, completing the work to 1909. \$12.50

First Appendix to the Sixth Edition of Dana's System of Mineralogy.

Completing the work to 1899. Cloth, \$1.00

Second Appendix to the Sixth Edition of Dana's System of Mineralogy.

Completing the work to 1909. Cloth, \$1.50

Manual of Mineralogy and Petrography.

Containing: the Elements of the Science of Minerals and Rocks, for the use of the Practical Mineralogist and Geologist, and for instruction in Schools and colleges. By the late Jas. D. Dana, L.L.D. Twelfth edition. Illustrated with numerous woodcuts. 12mo, cloth, \$2.00

A Text-book of Mineralogy.

With an Extended Treatise on Crystallography and Physical Mineralogy. By Edward Salisbury Dana, Professor of Physics and Curator of Mineralogy, Yale University. New edition, entirely rewritten and reset. With nearly 1000 figures and a colored plate. 8vo, cloth, \$4.00

Minerals, and How to Study Them.

A book for beginners in Mineralogy. By Prof. E. S. Dana. 12mo, cloth, \$1.50

ALSO

A Text-book of Elementary Mechanics.

For the use of Colleges and Schools. By Prof. E. S. Dana. 12mo, cloth, \$1.00

SECOND APPENDIX
TO THE
SIXTH EDITION
OF
DANA'S SYSTEM OF MINERALOGY

BY
EDWARD S. DANA
PROFESSOR OF PHYSICS AND CURATOR OF MINERALOGY, YALE UNIVERSITY
AND
WILLIAM E. FORD
ASSISTANT PROFESSOR OF MINERALOGY, SHEFFIELD SCIENTIFIC SCHOOL OF
YALE UNIVERSITY

COMPLETING THE WORK TO 1909

NEW YORK
JOHN WILEY & SONS
LONDON: CHAPMAN & HALL, LIMITED

1909

*

PREFATORY NOTE

THIS Second Appendix to the Sixth Edition of the System of Mineralogy issued in 1892 is designed to make the work complete up to the beginning of 1909. Its preparation was begun by the Senior Editor soon after the publication of the First Appendix in 1899, and carried forward at intervals down to 1906, when he was finally compelled to relinquish it. The work was resumed by the Junior Editor in 1907 and carried through to completion.

During the ten years of mineralogical investigation which this appendix covers, a large amount of material has been published. An evidence of this is to be found in the two hundred new names which are given in the classified list in the Introduction. About sixty of these new names on account of the completeness of their descriptions seem to have a warrant for their acceptance as new species. The other names are either of imperfectly described minerals or variety names of well-recognized species.

The descriptions of the new species included in this book are given concisely but completely. It was found, however, impracticable to follow the plan adopted in the System and the First Appendix of recalculating all the angles and crystal constants of the new species. This has been done in a few cases, but in the majority of the descriptions the figures of the authors have been accepted without verification. In the cases of some of the new species with complex crystals it has been impossible to give the complete lists of the forms identified upon them. The method followed has been to give the more common and prominent forms and to indicate the number of those not listed.

For an explanation of the *Abbreviations* made use of in the case of periodicals, also of the crystallographical, optical and chemical symbols employed, reference is made to the Introduction to the System (1892), pp. xiv-li and pp. xiii-xi. General abbreviations are explained on pp. lxi-lxiii.

The bibliography, while not intended to be exhaustive, contains, it is thought, the titles of all the important volumes published between 1899 and 1909.

YALE UNIVERSITY,
NEW HAVEN, CONN., July 1, 1909.

BIBLIOGRAPHY.

BIBLIOGRAPHY.

- D'ACHIARDI, A. Guida al Corso di Mineralogia. 310 pp. Pisa, 1899.
- AIGNER, A. Die Mineralschätze der Steiermark. 291 pp. Vienna, 1907.
- BAUER, M. Lehrbuch der Mineralogie. 2d ed. 924 pp. Stuttgart, 1904.
- BAUMHAUER, H. Die neuere Entwicklung der Kristallographie. 184 pp. Braunschweig, 1905.
- BECKER, A. Krystalloptik. 362 pp. Stuttgart, 1903.
- BÖGGILD, O. B. Mineralogia Groenlandica. 625 pp. Copenhagen, 1905.
- BRAUNS, R. Das Mineralreich. 444 pp., 82 pls. Stuttgart, 1903.
- Mineralogie. 3d ed. 134 pp. Leipzig, 1905.
- BRÖGGER, W. C. Die Mineralien der Sudnorwegischen Granitpegmatitgänge. I. Niobate, Tantalate, Titanate und Titanioabate. 136 pp. Christiania, 1906.
- BRUNNS, W. Elemente der Krystallographie. 211 pp. Leipzig and Vienna, 1902.
- BUTLER, G. M. A Pocket Handbook of Minerals. 298 pp. New York, 1908.
- CLARKE, F. G. The Data of Geochemistry. 716 pp. Bull. No. 330, U. S. G. S. Washington, 1908.
- DOELTER, C. Physikalisch-Chemische Mineralogie. 272 pp. Leipzig, 1905.
- DUPARC, L., and PEARCE, F. Traité de Technique Minéralogique et Pétrographique. Première Partie. Les Méthodes Optiques. 483 pp. Leipzig, 1907.
- EAKLE, A. S. Mineral Tables for the Determination of Minerals by their Physical Properties. 73 pp. New York, 1904.
- FARRINGTON, O. C. Gems and Gem Minerals. 223 pp. Chicago, 1903.
- FUCHS, C. W. C. Anleitung zum Bestimmen der Mineralien. 5th ed. 220 pp. Giessen, 1907.
- GAUBERT, P. Minéralogie de la France. 210 pp. Paris, 1907.
- GONNARD, F. Minéralogie des Départements du Rhone et de la Loire. 122 pp. Lyon and Paris, 1906.
- GROTH, P. Einleitung in die Chemische Krystallographie. 80 pp. Leipzig, 1904.
- Physikalische Krystallographie. 4th ed. 820 pp. Leipzig, 1905.
- Chemische Krystallographie. Vol. 1, 626 pp., 1906; vol. 2, 914 pp., Leipzig, 1908.
- HEDDLE, M. F. The Mineralogy of Scotland. 2 vols., 212 pp., 103 pls. Edinburgh, 1901.
- HILTON, H. Mathematical Crystallography and the Theory of Groups of Movements. 262 pp. Oxford, 1903.
- HINTZE, C. Handbuch der Mineralogie. Vol. 1, pp. 321-1920. Leipzig.
- IDDINGS, J. P. Rock Minerals. 548 pp., New York, 1906.
- Igneous Rocks. Vol. 1, Composition, Texture and Classification. 464 pp., New York, 1909.
- JOHANNSEN, A. Determination of Rock-Forming Minerals. 542 pp. New York, 1908.
- KLOCKMANN, F. Lehrbuch der Mineralogie. 622 pp. 4th ed. Stuttgart, 1907.
- KOBELL-OEBBEKE. Tafeln zur Bestimmung der Mineralien. 15th ed. Munich, 1907.
- KRAUS, E. H. Essentials of Crystallography. 162 pp. Ann Arbor, 1906.
- LACROIX, A. Minéralogie de la France. Vol. 3, Part 1. 400 pp. Paris, 1901.
- LANDAUER, J. Die Löthrohranalyse. 3d ed. 183 pp. Berlin, 1908.
- LAPPARENT, A. DE. Précis de Minéralogique. 5th ed. 424 pp. Paris, 1907.

- LEHMANN, O. Flüssige Krystalle, sowie Plasticität von Krystallen im Allgemeinen, molekulare Umlagerungen und Aggregatzustandsänderungen. 262 pp. 1904.
- Flüssige Krystalle und die Theorie des Lebens. 55 pp. Leipzig, 1907.
- LETEUR, F. *Traité Élémentaire de Minéralogie Pratique*. 152 pp. Paris, 1907.
- LEWIS, W. J. *A Treatise on Crystallography*. 612 pp. Cambridge, 1899.
- MERRILL, G. P. *The Non-metallic Minerals: Their Occurrence and Uses*. 414 pp. New York, 1904.
- MEERS, H. A. *Mineralogy*. 584 pp. London, 1902.
- ✓MILLER, W. G. *Minerals and How They Occur*. 252 pp. Toronto, 1906.
- MIRAMON, A. G. *Determinacion de Minerales*. 287 pp. Madrid, 1905.
- ✓MOSES, A. J., and PARSONS, C. L. *Elements of Mineralogy, Crystallography and Blowpipe Analysis from a Practical Standpoint*. 3d ed. 414 pp. New York, 1906.
- NIES, A., and DOLL, E. *Lehrbuch der Mineralogie und Geologie*. 322 pp. Stuttgart, 1905.
- ✓PENFIELD, S. L. *Tables of Minerals*. 88 pp. New York, 1907.
- ✓PIRSON, L. V. *Rocks and Rock Minerals*. 414 pp. New York, 1908.
- ✓PLATTNER-KOLBECK, *Probierkunst mit der Löthrohre*. 7th ed. 514 pp. Leipzig, 1907.
- ✓POCKELS, F. *Lehrbuch der Kristalloptik*. 519 pp. Leipzig, 1906.
- ✓PRENDER, W. *Mineralien-Sammlungen*. I Part. 220 pp. Leipzig, 1908.
- RAU, W. *Edelsteinkunde*. 152 pp. Leipzig, 1907.
- ✓REEKS, M. *Hints for Crystal Drawing*. 148 pp. London, 1908.
- ✓RENARD, A. F., and STÖBER, F. *Notions de Minéralogie*. 374 pp. Ghent, 1900.
- RICCI, O. *Cristallografia geometrica*. 104 pp. Jesi, 1906.
- ✓RICHARDS, R. W. *Synopsis of Mineral Characters, alphabetically arranged for laboratory and field use*. 99 pp. New York, 1907.
- ROENBUSCH, H. *Mikroskopische Physiographie der Mineralien und Gesteine*. 4th ed., 1904—1908. Stuttgart.
- *Elemente der Gesteinslehre*. 2d ed. 565 pp. Stuttgart, 1901.
- RUTLEY, F. *Mineralogy*. 12th ed. 240 pp. London, 1900.
- ✓SAUER, A. *Mineralogie und Kristallographie*. I Abteilung. Stuttgart, 1905.
- ✓SCHENCK, R. *Kristallinische Flüssigkeiten und flüssige Krystalle*. 159 pp. Leipzig, 1905.
- ✓SCHMID, B. *Lehrbuch der Mineralogie und Geologie*. I. Mineralogie. 143 pp. Esslingen, 1904.
- ✓SCHROEDER VAN DER KOLK, J. L. C. *Tabellen zur mikroskopischen Bestimmung der Mineralien nach ihren Brechungsindex*. 2d ed. 67 pp. Wiesbaden, 1906.
- ✓SCHWALBE, B. *Grundriss der Mineralogie und Geologie*. 766 pp. Braunschweig, 1903.
- ✓SIGMUND, A. *Die Minerale Niederösterreichs*. 194 pp. Vienna and Leipzig, 1909.
- ✓SOMMERFELD, E. *Geometrische Kristallographie*. Leipzig, 1906.
- ✓— *Physikalische Kristallographie vom Standpunkt der Strukturtheorie*. 132 pp. Leipzig, 1907.
- ✓TSCHERMAK, G. *Lehrbuch der Mineralogie*. 6th ed. 1905.
- ✓VIOLA, C. M. *Grundsätze der Kristallographie*. 389 pp. Leipzig, 1904.
- VOGT, J. H. L. *Die Silikatschmelzlösungen*. I. Über die Mineralbildung in Silikatschmelzlösungen. 161 pp. 1903. II. Über die Schmelzpunkt-Erniedrigung der Silikatschmelzlösungen. 235 pp. Christiania, 1904.
- ✓VORLÄNDER, D. *Kristallinischflüssige Substanzen*. 82 pp. Stuttgart, 1908.
- WADA, T. *Minerals of Japan*. 144 pp. Tokyo, 1904.
- WALLERANT, F. *Cristallographie*. 523 pp. Paris, 1909.
- WEINSCHENK, E. *Die gesteinbildenden Mineralien*. 146 pp. Freiburg, 1901.
- WEISBACH, A. *Tabellen zur Bestimmung der Mineralien mittels ausserer Kennzeichen*. 7th ed. by F. Kolbeck. 120 pp. Leipzig, 1906.
- ✓WINCHELL, N. H., and WINCHELL, A. N. *Elements of Optical Mineralogy*. 502 pp. New York, 1908.
- ZIMMERMAN, R. *Die Mineralien*. 120 pp. 1904.

CLASSIFIED LIST OF NEW NAMES.

I. NATIVE ELEMENTS, Min. pp. 2-32.

- Arsensulfurite (p. 9). Var. Sulphur, Min. p. 8.
QUISQUETTE (p. 87). Chiefly C and S.
Souesite (p. 11). Nickel-iron alloy, near Awaruite, Min. p. 29.

II. SULPHIDES, TELLURIDES, ARSENIDES, ETC., Min. pp. 33-108.

- ARSENSCHWEFEL (p. 9), $As_2S_3 + H_2O$.
PATRONITE (p. 79), VS_4 (?).
Keweenawite (p. 59), $(Cu,Ni,CO)_2As$.
Stibiodomeykite (p. 97). Var. of Domeykite, Min. p. 44.
MOHAWKITE (p. 70), $(Cu,Ni,CO)_2As$.
LEDOUXITE (p. 62), Cu_4As .
Richardite (p. 89), Sanfordite (p. 90), Cu_4Te_2 .
KALGOORLITE (p. 58), $HgAu_2Ag_2Te_2$.
Coolgardite (p. 31). Telluride of Au, Ag, Hg. Probably a mixture.
Chalmersite (p. 27), $Cu_2S.Fe_2S_2$. Near Chalcocite, Min. p. 55.
Tellite (p. 104), $PbS.SnS_2$.
Bravoite (p. 19). Nickeliferous Pyrite, Min. p. 84.
BADENITE (p. 12), $(Co,Ni,Fe)_2(As,Bi)_2$.
Speculite (p. 95). A silver, gold telluride near Sylvanite, Min. p. 103.
VON DIESTITE (p. 110). Telluride of silver and bismuth.

III. SULPHO-SALTS, Min. pp. 109-151.

- HISTRIXITE (p. 52), $7Bi_2S_7.2Sb_2S_7.5CuFeS_4$.
Hutchinsonite (p. 53), $(Ti,Ag,Cu)_2S.As_2S_3 + PbS.As_2S_3$ (?).
Trechmannite (p. 107), $Ag_2S.As_2S_3$ rhombohedral.
Smithite (p. 95), $Ag_2S.As_2S_3$, monoclinic.
LIVEINGITE (p. 64), $5PbS.4As_2S_3$.
Baumhauerite (p. 13), $4PbS.3As_2S_3$.
SELIGMANNITE (p. 92), $Cu_2S.2PbS.As_2S_3$ (?) Near Bournonite, Min. p. 126.
LENGENBACHITE (p. 62), $6PbS.(Ag,Cu)_2S.2As_2S_3$ (?).
Antimon-luzonite (p. 7). Var. Enargite, Min. p. 147.
SULVANITE (p. 101), $3Cu_2S.V_2S_5$.

IV. CHLORIDES, BROMIDES, IODIDES, Min. pp. 152-182.

1. ANHYDROUS CHLORIDES, ETC.

- Kleinite** (p. 59). Mercury ammonium chloride.
Chlornatrokaliite (p. 28). A mixture of Halite, Min. p. 154, and Sylvite, Min. p. 156.
Chlormanganokalite (p. 28), $4KCl.MnCl_2$.
Chloragyrite (p. 28). Same as Ceragyrite, Min. p. 158.