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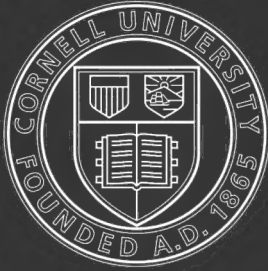
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A RECORD OF THE DOCTORS IN BOTANY

OF THE

UNIVERSITY OF CHICAGO

1897-1916

PRESENTED TO

JOHN MERLE COULTER

PROFESSOR AND HEAD OF THE DEPARTMENT OF BOTANY

BY THE

DOCTORS IN BOTANY

AT THE QUARTER-CENTENNIAL OF THE UNIVERSITY

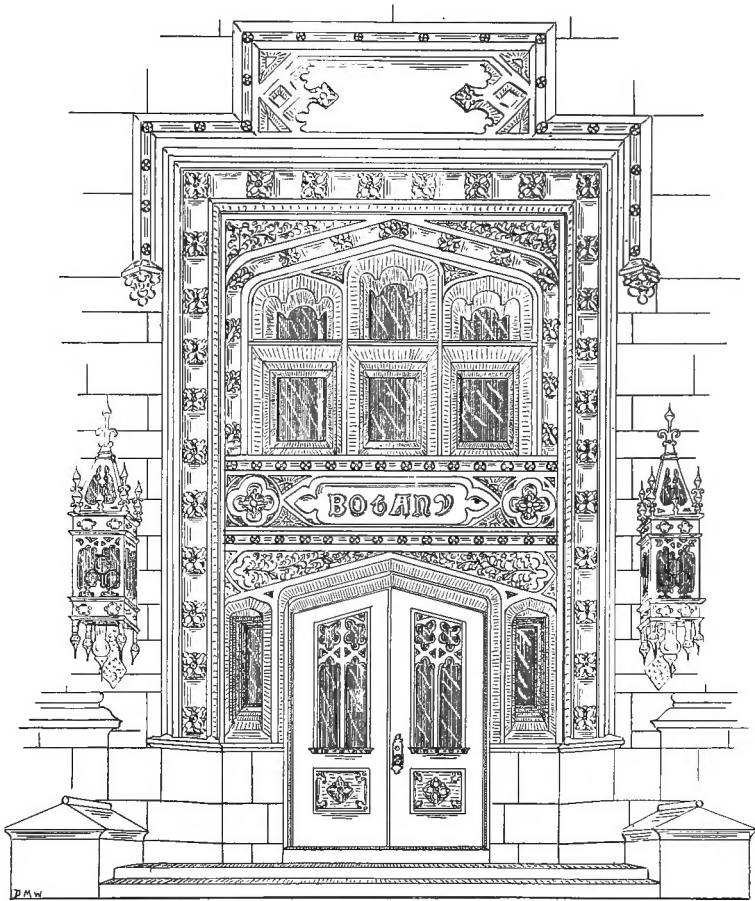
JUNE, 1916

CHICAGO

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TO PROFESSOR JOHN MERLE COULTER

The achievements of the Department of Botany of the University of Chicago are your achievements; they had their origin in your consciousness and have attained reality under your far-seeing guidance. We, the Doctors in Botany, prize the honor of being a living part of these achievements, for your ideas and ideals find themselves reflected in us and in our work. Our interest and faith in a progressive science have been aroused and encouraged by your enthusiasm for the advance of scientific knowledge, and we venture to hope that the paths followed by our individual strivings, toward research, toward the spread of knowledge, and toward well-ordered human life, may be increasingly worthy of being regarded as extensions of the paths—already familiar to you—that have led to us and to the other products of your Department.

Following your lead, we take it as our part to press forward in the advance of scientific thought, and to bring whatever of intelligence and power may lie in us to bear upon progressive readjustment, both in things botanical and in such other fields as opportunity may present. Especially have you led us to recognize the paramount importance of mutual respect, sympathy and true coöperation among intellectual workers, and the need for toleration in the disagreements that arise from the incompleteness of human knowledge and from our inadequate appreciation of the complex of things about us.

We have desired to express to you the high esteem in which we hold you and your work, and this Quarter-Centennial of the University has seemed to us to offer a fitting occasion for the gratification of this desire. We have therefore tried to symbolize our great regard for you and our appreciation of what you have done for us, in the form of this volume, which we wish to present to you as a token of these things. Here is an incomplete record of your own work and a record representing each one of the Chicago Doctors in Botany. We hope you will look upon these sheets as our individual expressions of esteem and regard, and we also hope that they may bring you some pleasure in the thought that the aims that have led you in the upbuilding of this Department of Botany are being carried out still further, at many places and in many directions, in the activities of eighty-one different persons.

We place the book in your hands with the wish that your work may continue for many pleasant and profitable years, and that your Department may add many more members to our group of

THE DOCTORS IN BOTANY
OF THE UNIVERSITY OF CHICAGO

*Chicago, June the Fifth,
Nineteen Hundred and Sixteen.*

JOHN MERLE COULTER

A.B., Hanover College, Hanover, Indiana, 1870; A.M., 1873; Ph.D., Hanover College and Indiana University, Bloomington, Indiana, 1882

PROFESSOR AND HEAD OF THE DEPARTMENT OF BOTANY,
THE UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS

Botanist, Hayden Survey of the Territories, 1872-74; Professor of Natural Science, Hanover College, Hanover, Indiana, 1874-79; Professor of Biology, Wabash College, Crawfordsville, Indiana, 1879-91; President, and Professor of Botany, Indiana University, 1891-93; President, Lake Forest University, Lake Forest, Illinois, 1893-96; Professor and Head of the Department of Botany, The University of Chicago, 1896—.

Member: Amer. Acad. Arts and Sci. (Associate Fellow), Amer. Assoc. Adv. Sci. (Fellow; Vice-President, 1891), Amer. Soc. Nat., Bot. Soc. Amer. (President, 1897, 1915), Bot. Soc. Edinburgh (Corresponding Fellow), Botanists Cent. States, Chicago Acad. Sci. (President, 1915), Illinois Acad. Sci. (President, 1910), Indiana Acad. Sci. (President, 1886), Linn. Soc. London (Foreign Member), National Acad. Sci., Washington Acad. Sci.

Founder of the *Botanical Gazette*, 1875; Editor of the same, 1875—.

Coulterella, a genus of *Compositae*, named in honor of John Merle Coulter. Vasey, G. R., and Rose, J. N., *Contrib. U. S. National Herb.* **1**: 71. 1890.

Couiterophytum, a genus of *Umbelliferae*, named in honor of John Merle Coulter. Robinson, B. L., *Proc. Amer. Acad. Arts and Sci.* **27**: 168. 1892.

JOHN MERLE COULTER

PUBLICATIONS

Books

- Manual of the botany of the Rocky mountain region. 8vo., 452 pp. New York, 1885.
- An analytical key to some of the common wild and cultivated species of flowering plants. 8vo., 93 pp. New York, 1900.
- Plant relations. 8vo., vii + 266 pp., 214 figs. New York, 1901.
- Plant structures. 8vo., vii + 348 pp., 289 figs. New York, 1904.
- Plant studies. 8vo., vii + 392 pp., 336 figs. New York, 1904.
- A text-book of botany. 8vo., vii + 365 pp., 320 figs. New York, 1906.
- New manual of Rocky mountain botany. 8vo., 646 pp. New York, 1909.
- Elementary studies in botany. 8vo., vii + 461 pp., 97 figs. New York, 1913.
- Fundamentals of plant-breeding. 8vo., xiv + 347 pp., 109 figs. New York, 1914.
- The evolution of sex in plants. 8vo., ix + 140 pp., 46 figs. Chicago, 1914.
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BOOKS IN COLLABORATION

- Synopsis of the flora of Colorado. (Thomas C. Porter and John M. Coulter.) U. S. Geol. Survey, Miscel. Pub. no. 4, 180 pp. Washington, 1874.
- Morphology of spermatophytes. (John M. Coulter and C. J. Chamberlain.) 8vo., 188 pp., 105 figs. New York, 1901.
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- New manual of Rocky mountain botany. (John M. Coulter and Aven Nelson.) 8vo., 648 pp. New York, 1909.
- Morphology of gymnosperms. (John M. Coulter and C. J. Chamberlain.) 8vo., 458 pp., 462 figs. Chicago, 1910.
- Text-book of botany, Vol. I. Morphology and physiology. (John M. Coulter, C. R. Barnes and H. C. Cowles.) 8vo., viii + 484 pp., 699 figs. New York, 1910.
- Heredity and eugenics. (W. E. Castle, John M. Coulter, C. B. Davenport, E. M. East, and W. L. Tower.) 8vo., vii + 315 pp., 98 figs. Chicago, 1912.

MISCELLANEOUS PUBLICATIONS

- Catalogue of the phaenogamous and vascular cryptogamous plants of Indiana. (By Editors of Botanical Gazette and C. R. Barnes.) iii + 38 pp. 1 map. Crawfordsville, Ind., 1881.
- Development of a dandelion flower. Amer. Nat. 17: 1211-1217. 1883.
- Revision of North American Hypericaceae. I. Bot. Gaz. 11: 78-112. 1886.
- Synopsis of North American pines, based upon leaf anatomy. I and II. (With J. N. Rose.) Ibid. 11: 256-309; pl. 8. 1886.
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JOHN MERLE COULTER

- Revision of North American Umbelliferae. (*With J. N. Rose.*) 144 pp. 9 pls. Crawfordsville, Ind., 1888.
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- Botany of western Texas. Contrib. U. S. National Herb. **2**: 1-588. 1891-94.
- Preliminary revision of the North American species of Cactus, Anhalonium, and Lophophora. *Ibid.* **3**: 91-132. 1894.
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- A synopsis of Mexican and Central American Umbelliferae. (*With J. N. Rose.*) Proc. Wash. Acad. Sci. **1**: 111-159; pls. 3-13, figs. 1-8. 1900.
- Monograph of North American Umbelliferae. (*With J. N. Rose.*) Contrib. U. S. National Herb. **7**: 9-256; pls. 1-9, figs. 1-65. 1900.
- The phylogeny of angiosperms. Decennial Pub. Univ. Chicago, Series I. **10**: 191-194. Chicago, 1903.
- The embryogeny of Zamia. (*With C. J. Chamberlain.*) Bot. Gaz. **35**: 184-194. 1903.
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JOHN MERLE COULTER

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CHARLES JOSEPH CHAMBERLAIN

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Member: Amer. Assoc. Adv. Sci. (Fellow), Assoc. Internat. Bot., Bot. Soc. Amer., Deutsch. Bot. Ges., Natur-forsch. Ges. Univ. Kiew (Honorary), Sigma Xi. American Editor of Plant Cytology for *Bot. Centralbl.*, 1902.

PUBLICATIONS

BOOKS. Methods in plant histology. Chicago, 1901. 2nd Ed., 1905. 3rd Ed., 1915.—Morphology of spermatophytes. (*With J. M. Coulter.*) New York, 1901.—Morphology of angiosperms. (*With J. M. Coulter.*) New York, 1903.—Morphology of gymnosperms. (*With J. M. Coulter.*) New York, 1910.

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HENRY CHANDLER COWLES

A.B., Oberlin College, Oberlin, Ohio, 1893; Ph.D. (Botany and Geology), Chicago, April, 1898

PROFESSOR OF PLANT ECOLOGY, THE UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS

Assistant in Botany, The University of Chicago, 1898-01; Associate, 1901-02; Instructor, 1902-07; Assistant Professor of Plant Ecology, 1907-11; Associate Professor, 1911-15; Professor, 1915—

Member: Amer. Assoc. Adv. Sci. (Fellow; Vice-President for Botany, 1913), Assoc. Amer. Geog. (President, 1910), Bot. Soc. Amer., Ecol. Soc. Amer., Gamma Alpha, Sigma Xi.

PUBLICATIONS

Outline of lectures on ecology. 6 pp. Milwaukee, 1898.—The ecological relations of the vegetation on the sand dunes of Lake Michigan. *Bot. Gaz.* **27**: 95-117, 167-202, 281-308, 361-391. 1899. The physiographic ecology of northern Michigan. *Science N. S.* **12**: 708-709. 1900.—The physiographic ecology of Chicago and vicinity. *Bot. Gaz.* **31**: 73-108, 145-182. 1901.—The plant societies of Chicago and vicinity. 76 pp. Chicago, 1901.—The influence of underlying rocks on the character of the vegetation. *Bull. Amer. Bur. Geog.* **2**: 1-26. 1901.—The work of the year 1903 in ecology. *Science N. S.* **19**: 879-885. 1904.—A remarkable colony of northern plants along the Apalachicola river, Florida, and its significance. *Rept. 8th. Internat. Geog. Cong.* (1904) p. 599. Importance of the physiographic standpoint in plant geography. *Ibid.* (1904) p. 600.—An ecological aspect of the conception of species. *Amer. Nat.* **42**: 265-271. 1908.—The response of plants to soil and climate. (*In Salisbury's Physiography for High Schools*, pp. 462-473.) New York, 1908.—The trend of ecological philosophy. *Amer. Nat.* **43**: 356-368. 1909.—The fundamental causes of succession among plant associations. *Rept. Brit. Assoc. Adv. Sci.* **1909**: 668-670. 1910.—Charles Reid Barnes. *Science N. S.* **31**: 532-533. 1910.—A fifteen year study of advancing sand dunes. *Rept. Brit. Assoc. Adv. Sci.* **1911**: 565. 1912.—Causes of vegetative cycles. *Bot. Gaz.* **51**: 161-183. 1911.—Conservation of our forests. *Trans. Ill. Acad. Sci.* **5**: 48-53. 1912.—A textbook of botany. Vol. II, Ecology. 8vo., x + 480 pp. New York, 1912.—The causes of vegetational cycles. *Ann. Assoc. Amer. Geog.* **1**: 3-20. 1912.—Impressions of the international phytogeographical excursion in the British Isles. *New Phytol.* **11**: 25-26. 1912.—The international phytogeographical excursion in the British Isles. *Plant World* **15**: 46-48. 1912.—The international phytogeographic excursion in America. Excursion program. 60 pp. Chicago, etc., 1913.—The economic trend of botany. *Science N. S.* **41**: 223-229. 1915.—A spring flora for high schools. (*With J. G. Coulter.*) 144 pp. New York, 1915.

WILLIAM L. BRAY

B.A., Indiana University, 1893; Ph.D. (Botany and Zoölogy),
Chicago, July, 1898

PROFESSOR OF BOTANY AND HEAD OF THE DEPARTMENT OF BOTANY,
SYRACUSE UNIVERSITY, SYRACUSE, NEW YORK

Adjunct Professor of Botany, University of Texas, 1897-98; Associate Professor, 1898-02; Professor, 1902-07; Professor of Botany, Syracuse University, 1907-; Chief, Division of Forestry, Texas World's Fair Commission, 1903-04; Acting Dean, New York State College of Forestry, 1911-12.

Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., Ecol. Soc. Amer.

PUBLICATIONS

The geographical distribution of the Frankeniaceae considered in connection with their genetic relationships. *Jahrb. Syst. Pflanzengeschichte u. Pflanzengeogr.* **24**: 395-417. 1897.—On the relation of the flora of the lower Sonoran Zone in North America to the flora of the arid zones in Chili and Argentine. *Bot. Gaz.* **26**: 121-147. 1898.—The ecological relations of the vegetation of Western Texas. *Ibid.* **32**: 99-217, 262-291. 1901.—Destruction of timber by the Galveston storm. *The Forester* **7**: 53-56. 1901.—Texas forests and the problem of forest management for the long-leaf pine lands. *Ibid.* **7**: 131-138. 1901. The tissues of some plants of the Sotol-Region in Texas. *Bull. Torr. Bot. Club* **30**: 621-633. 1903.—Forest resources of Texas. U. S. Dept. Agric., Bur. Forestry Bull. 47. 1904.—The timber of the Edwards Plateau in Texas. *Ibid.* Bull. 40: 1904.—The vegetation of the Sotol Country in Texas. *Univ. Texas. Bull.* 60. 1905.—Distribution and adaptation of the vegetation of Texas. *Ibid.* Bull. 82. 1906.—The mistletoe pest in the Southwest. U. S. Dept. Agric., Bur. Plant Ind. Bull. 166. 1908.—The development of the vegetation of New York State. *N. Y. State Coll. Forestry, Techn. Pub. No. 3.* 1915.

OTIS WILLIAM CALDWELL

B.S., Franklin College, Franklin, Indiana, 1894; Ph.D. (Botany and Bacteriology), Chicago, July, 1898

PROFESSOR OF BOTANY, SCHOOL OF EDUCATION, THE UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS

Assistant in Botany, The University of Chicago, 1898-99; Professor of Botany, Eastern Illinois State Normal School, Charleston, Illinois, 1899-1907; Associate Professor of Botany, The University of Chicago, 1907-15; Professor, 1915—. Dean, University College, The University of Chicago, 1913—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Soc. Nat., Bot. Soc. Amer., Sigma Xi.

PUBLICATIONS

BOOKS. Practical botany. ((*With J. Y. Bergen.*) *Svo.* Boston, 1911.—Introduction to botany. (*With J. Y. Bergen.*) *Svo.* Boston, 1914.—Elements of general science. (*With W. L. Eikenberry.*) *Svo.* Boston, 1914.—Laboratory manual of general science. (*With W. L. Eikenberry and C. J. Pieper.*) Boston, 1915.—Essentials of agriculture. (*With H. J. Waters.*) Boston, 1915.

PAPERS. On the life-history of *Lemna minor*. *Bot. Gaz.* **27**: 37-66. 1899.—The identity of *Microcycas calocoma*. (*With C. F. Baker.*) *Ibid.* **43**: 330-335. 1907.—*Microcycas calocoma*. *Ibid.* **44**: 118-141. 1907.—The teaching of botany in the high school. *School Rev.* **15**: 661-670. 1907.—The criteria of selection of material for teaching of nature-study and geography. *Nature-Study Rev.* **3**: 252-259. 1907.—The school garden. *Eastern Illinois state Normal School Bull.* **20**. 1908.—The high-school course in botany. *Wisconsin, Office of State Supt. of Public Instruction, Bulletin.* **1908**: 1-8. 1908.—The relation of the doctorate to teaching. *Univ. of Chicago Mag.* **1**: 58-64. 1908.—The course in botany. *School Sci. and Math.* **9**: 54-66. 1909. A study of *Microcycas calocoma*. *Estacion Central Agronomica, Cuba, Reports* **1909II**: 122-132. 1909.—An investigation of the teaching of biological subjects in secondary schools. *School Sci. and Math.* **9**: 581-597. 1909.—Natural history in the grades. (*Seven papers.*) *Elem. School Teacher* **10-11**: 1-50. 1909-10.—General science for the first year of the high school. *Proc. Cent. Assoc. Sci. and Math. Teachers* **1909**: 115-27. 1909.—Botany in the schools. *Amer. Cyclop. Education* **1**: 429-433. 1911.—The product of our botanical teaching. *Science N. S.* **33**: 639-642. 1911.—Should the nature-study course be organized with definiteness? *Nature-Study Rev.* **6**: 187-189. 1910.—Organization in the course in nature-study. *Ibid.* **7**: 87-90. 1911.—The laboratory method and high-school efficiency. *Pop. Sci. Monthly* **82**: 243-251. 1913.—The Illinois State Academy of Science. *Science N. S.* **37**: 496-498. 1913.—A unified high-school science course. *School Sci. and Math.* **14**: 165-169. 1914.—The course in botany. *Proc. Illinois High School Conference* **1913**: 89-92. 1913.—Rural extension. *Jour. Home Economics* **6**: 99-109. 1914.—The unified high-school science course. *Proc. Cent. Assoc. Sci. and Math. Teachers* **1914**: 18-21. 1914.—Investigations regarding general science. *High-School Quarterly* **4**: 94-101. 1916.—Preparation of the teacher of biology. *School Sci. and Math.* **16**: 385-392. 1916.—The four-year high-school science course. *Ibid.* **16**: 393-399. 1916.

WILLIAM DAYTON MERRELL

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PUBLICATIONS

A contribution to the life-history of *Silphium*. *Bot. Gaz.* **29**: 99-133. 1900.—
Advantages of a year's course in biology (zoölogy, physiology, botany). *School Rev.*
12: 216-223. 1904.

ROBERT WILSON SMITH

B.A., McMaster University, Toronto, Canada, 1895; Ph.D. (Botany and Zoölogy), Chicago, April, 1899

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Member: Bot. Soc. Amer., Royal Canadian Institute.

PUBLICATIONS

A contribution to the life-history of the Pontederiaceae. *Bot. Gaz.* **25**: 324-337. 1898.—Structure and development of the sporophylls and sporangia of Isoetes. *Ibid.* **29**: 225-258, 323-346. 1900.—The achromatic spindle in the spore mother cells of *Osmunda regalis*. *Ibid.* **30**: 361-377. 1900.—The floral development and embryogeny of *Eriocaulon septangulare*. *Ibid.* **49**: 281-289. 1910.—The tetranucleate embryo sac of *Clintonia*. *Ibid.* **52**: 209-217. 1911.

NELS L. T. NELSON

B.S., Carlton College, Northfield, Minnesota, 1891; Ph.D. (Botany and Animal Histology),
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PROFESSOR OF BOTANY, UNIVERSITY OF FLORIDA, GAINESVILLE, FLORIDA

Professor of Natural Science, Defiance College, Defiance, Ohio, 1900-01; Teacher of Botany, Central High School, St. Louis, Missouri, 1901-09; Professor of Biology and Geology, Des Moines College, Des Moines, Iowa, 1909-12; Professor of Science, Presbyterian College of South Carolina, Clinton, South Carolina, 1912-14; Professor of Botany, University of Florida, 1914—.

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DISSERTATION: Revision of the North American species of Solanum.

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A.B., Lake Forest University, Lake Forest, Illinois, 1895; Ph.D. (Botany and Geology),
Chicago, December, 1900

EDITOR, SCHOOL SCIENCE SERIES, BLOOMINGTON, ILLINOIS

Instructor in Botany, Syracuse University, Syracuse, New York, 1899-1901; Botanist,
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PUBLICATIONS

Notes on Philippine botany. Manila, 1903.—Nature-Study for the Philippines.
New York, 1904.—Practical nature-study. New York, 1908.—Plant life and plant uses.
New York, 1913.—Spring flora for high schools. (*With H. C. Cowles.*) 144 pp. New
York, 1915.—Laboratory manual of botany. New York, 1915.—Notes on notebooks.
School Sci. and Math. April, 1915.—Biology in high schools. *Ibid*, April, 1916.—The
training of elementary science teachers. School Rev. Jan., 1916.—Status of science
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Dec., 1915.—A four-year course in science in the high school. School and Soc. Feb.
13, 1915.—Opportunities in Botany. Science N. S. **27**: 873-876. 1908.—Various
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PUBLICATIONS

Books. Agriculture for beginners. (*With C. W. Burkett and D. H. Hill.*) Boston.—Diseases of economic plants. (*With J. G. Hall.*) 12mo, 532 pp., 213 figs. New York, 1910, 1913, 1915.—The fungi which cause plant disease. 8vo., 754 pp., 449 figs. New York, 1913.—The Hill readers. (*With D. H. Hill and C. W. Burkett.*) Boston.—The practical arithmetic. (*With T. Butler and A. C. Stevens.*) New York.

PAPERS. The effect of aqueous solutions upon the germination of fungus spores. *Bot. Gaz.* **26**: 377-406. 1898.—A peculiar case of spore distribution. *Ibid.* **27**: 138-139. 1899.—The compound oosphere of *Albugo bliti*. *Ibid.* **28**: 149-176, 225-245. 1899.—Die Gametogenese und Befruchtung bei *Albugo*. *Ber. deutsch. Bot. Ges.* **19**: 171-176. 1901.—Gametogenesis and fertilization in *Albugo*. *Bot. Gaz.* **32**: 77-98, 157-169, 238-261. 1901.—Some improvements upon apparatus for water analysis. (*With W. G. Sackett.*) *Jour. Applied Microscopy and Lab. Meth.* **5**: 1918-1919. 1902.—Studies in the fertilization of *Phycomycetes*, *Sclerospora graminicola* (Sacc.) Schroet. *Bot. Gaz.* **34**: 420-425. 1902.—Notes on *Sclerospora graminicola*. *Jour. Mycol.* **9**: 13. 1903.—Fungous enemies of the apple, pear, and quince, with methods of treatment. *North Carolina Agric. Exp. Sta. Bull.* **183**: 64-82. 1903.—Mutation in *Bidens* and other genera. *Bot. Gaz.* **35**: 363-366. 1903.—Poisoning by *Lepiota morgani* Pk. *Jour. Mycol.* **9**: 220-222. 1903.—Mitosis of the primary nucleus in *Synchytrium decipiens*. (*With A. C. Stevens.*) *Bot. Gaz.* **35**: 405-415. 1903.—Fungous enemies of the peach, plum, cherry, fig, and persimmon. *North Carolina Agric. Exp. Sta. Bull.* **186**: 23-46. 1903.—The Granville tobacco wilt. (*With W. G. Sackett.*) *Ibid.* **188**. 1903.—The history of the tobacco wilt in Granville county, North Carolina. *U. S. Dept. Agric., Office Exp. Sta., Bull.* **142**: 166-168. 1904.—Notes on cooperative experiments. *Ibid.* **142**: 164-166. 1904.—Oögenesis and fertilization in *Albugo ipomoeae-panduratae*. *Bot. Gaz.* **38**: 300-302. 1904.—Report of the Biologist. *Ann. Rept. North Carolina Agric. Exp. Sta.* **26** (1902-3). 1904.—Nature study and agriculture. *Nature-Study Rev.* **1**: 12-13. 1905.—A nature-study lesson with molds. *Ibid.* **1**: 76-77. 1905.—Purity of Raleigh's milk supply. Report submitted to the committee appointed by the Raleigh Board of Aldermen, Raleigh, North Carolina. Pages 1-7. 1905.—Potato blight in central New York. *Rural New Yorker* **44**: 470. 1905.—Report of the Biologist. *Ann. Rept. North Carolina Agric. Exp. Sta.* **27** (1903-4). 1905.—Nature-study and agriculture. *Nature-Study Rev.* **1**, No. 4. 1905.—The science of plant pathology. *Pop. Sci. Monthly* **67**: 399-408. 1905. Also, *Jour. Mitchel. Soc.* **21**: 61-75. 1905.—Course in nature-study for the teacher. (*With A. C. Stevens.*)

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PUBLICATIONS

Parthenogenesis in *Thalictrum purpurascens*. Bot. Gaz. **33**: 363-375. 1902.—
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274-283. 1904.—Ueber Reduktionsteilung in den Pollenmutterzellen einiger Dykoty-
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sap-flow. Bot. Gaz. **51**: 28-63, 102-120. 1911.—Artificial parthenogenesis in *Fucus*.
Science N. S. **37**: 841-844. 1913.

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PUBLICATIONS

Some observations on the development of the karyokinetic spindle in the pollen-mother-cells of *Cobaea scandens* Cav. *Proc. Calif. Acad. Sci. Bot.* III, 1: 169–188. 1898. —Origin of the cones of the multipolar spindle in *Gladiolus*. *Bot. Gaz.* 30: 145–153. 1900. On the relationship of the nuclear membrane to the protoplast. *Ibid.* 35: 305–319. 1903.—Studies in spindle formation. *Ibid.* 36: 81–100. 1903.—The gametophytes, archegonia, fertilization and embryo of *Sequoia sempervirens*. *Ann. Bot.* 18: 1–28. 1904.—The gametophytes, fertilization and embryo of *Cryptomeria japonica*. *Ibid.* 18: 417–444. 1904.—The gametophytes, fertilization and embryo of *Cephalotaxus drupacea*. *Ibid.* 21: 1–23. 1907.—The gametophytes and embryo of the Cupressineae with special reference to *Libocedrus decurrens*. *Ibid.* 21: 281–301. 1907.—The gametophytes and embryo of *Pseudotsuga douglasii*. *Ibid.* 23: 163–180. 1909.—The gametophytes and embryo of *Sciadopitys verticillata*. *Ibid.* 24: 403–421. 1910.—Nuclear osmosis as a factor in mitosis. *Ibid.* 48: 137–161. 1911. The phase of the nucleus known as synapsis. *Ibid.* 47: 591–604. 1911.—A study in chromosome reduction. *Trans. Roy. Soc. Edinburgh.* 48: 601–627. 1912.

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PUBLICATIONS

A contribution to the life history of *Euphorbia corollata*. *Bot. Gaz.* **25**: 418-426. 1898.—A study of the sporangia and gametophytes of *Selaginella apus* and *Selaginella rupestris*. *Ibid.* **32**: 124-141, 170-194. 1901.—Two megasporangia in *Selaginella*. *Ibid.* **36**: 308. 1903.—The evolution of the sex organs of plants. *Ibid.* **37**: 280-293. 1904.—Another seed-like characteristic of *Selaginella*. *Ibid.* **40**: 73. 1905.—The spore coats of *Selaginella*. *Ibid.* **40**: 285-295. 1905.

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Assistant in Plant Physiology, University of Chicago, 1902-1904; Associate, 1904; Collaborator, U. S. Bureau of Forestry, Washington, D. C., Michigan Geological Survey and Michigan Forestry Commission, Lansing, Michigan, 1902; Research Assistant, Carnegie Institution of Washington, 1904; Soil Expert, U. S. Department of Agriculture, Bureau of Soils, Washington, D. C., 1905-06; Member of Staff of Desert Laboratory, Carnegie Institution of Washington, Tucson, Arizona, 1906-09; Professor of Plant Physiology, The Johns Hopkins University, Baltimore, Maryland, 1909-14; Professor of Plant Physiology and Director of the Laboratory of Plant Physiology, 1914—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Chem. Soc., Amer. Soc. Nat., Bot. Soc. Amer., Ecol. Soc. Amer., Sigma Xi. Walker Prize, Boston Soc. Nat. Hist., 1903. Managing Editor, *Physiological Researches*; Member, Plant World Association.

PUBLICATIONS

On the nature of the stimulus which causes the change of form in polymorphic green algae. *Bot. Gaz.* **30**: 289-317. 1900.—Further notes on the physiology of polymorphism in green algae. *Ibid.* **32**: 292-302. 1901.—The distribution of the plant societies of Kent County, Michigan. *Ann. Rept. Mich. State Board Geol. Surv.* **1901**: 81-103. 1902.—The distribution of the upland plant societies of Kent County Michigan, *Bot. Gaz.* **35**: 36-55. 1903.—The effect of the osmotic pressure of the medium upon the growth and reproduction of organisms. Role of diffusion and osmotic pressure in plants, Chap. IV. (*Preprinted from the next.*) Chicago, 1903.—The role of diffusion and osmotic pressure in plants. *Decenn. Pub. Univ. Chicago. Second Series, Vol. VIII.* Chicago, 1903.—The soils and vegetational possibilities of the Michigan Forestry Reserve. *Ann. Rept. Mich. Forestry Commission* **1902**: 38-40. 1903.—Physical properties of bog water. *Bot. Gaz.* **37**: 383-385. 1904.—An experiment on the relation of soil physics to plant growth. (*With H. G. Jensen.*) *Ibid.* **38**: 67-71. 1904.—The relation of soils to natural vegetation in Roscommon and Crawford counties, Michigan. *Ibid.* **39**: 22-41. 1905.—Chemical stimulation of a green alga. *Bull. Torr. Bot. Club* **32**: 1-34. 1905.—The relation of soils to natural vegetation in Roscommon and Crawford counties, Michigan. *Ann. Rept. Mich. State Board Geol. Surv.* **1903**: 9-30. 1904.—Notes on the physiology of *Stigeoclonium*. *Bot. Gaz.* **39**: 297-300. 1905.—Physiological properties of bog water. *Ibid.* **39**: 348-355. 1905.—Studies on the properties of an unproductive soil. (*With J. C. Britton and F. R. Reid.*) U. S. Dept. Agric., Bur. Soils, Bull. 28. Washington, 1905.—Relation of transpiration to growth in wheat. *Bot. Gaz.* **40**: 178-195. 1905.—Note on the relation between the growth of roots and of tops in wheat. *Ibid.* **41**: 139-143. 1906.—A simple method for experiments with water cultures. *Plant World* **9**: 13-16. 1906.—Paraffined wire pots for soil cultures. *Ibid.* **9**: 62-66. 1906.—The relation of desert plants to soil moisture and to evaporation. *Carnegie Inst. Wash. Pub.* 50. Washington, 1906.—Relative transpiration in cacti. *Plant World* **10**: 110-114. 1907.—Further studies on the properties of unproductive soils. (*Assisted by C. A. Jensen, J. F. Breazeale, F. R. Pember and J. J. Skinner.*) U.S. Dept. Agric., Bur. Soils, Bull. 36. Washington, 1907.—Evaporation as a climatic factor influencing vegetation. (*Proc. Internat. Confer. on Plant Hardiness and Acclimatization, Oct., 1907.*) *Hort. Soc. N. Y. Memoirs* **2**: 43-54. 1910.—Evaporation and plant de-

velopment. *Plant World* **10**: 269-276. 1907.—Evaporation and plant habitats. *Ibid.* **11**: 1-9. 1908.—A simple atmometer. *Science N. S.* **28**: 319-320. 1908. A method for controlling plant moisture. *Plant World* **11**: 39-40. 1908.—The botanical garden of Florence. *Ibid.* **11**: 86-88. 1908.—Evaporation and centers of plant distribution. *Ibid.* **11**: 106-112. 1908.—The botanical garden at Pisa. *Ibid.* **11**: 156-157. 1908.—A new method for cultures of algae and mosses. *Ibid.* **11**: 183-184. 1908.—Soils of the Desert Laboratory domain. (In: *Spalding, Distribution, etc., of desert plants*. Carnegie Inst. Wash. Pub. 113. Pages 83-93.) 1909.—Present problems of physiological plant ecology. *Amer. Nat.* **43**: 369-378. 1909.—Present problems of physiological plant ecology. *Plant World* **12**: 41-46. 1909.—Rôles of the soil in limiting plant activities. *Ibid.* **12**: 49-53. 1909.—A repeated cycle in assimilation. *Ibid.* **12**: 66-67. 1909.—Stomata and transpiration in *Tradescantia zebrina*. *Science N. S.* **29**: 269-270. 1909.—The heath of Lüneburg. *Plant World* **12**: 231-237. 1909.—A rain-correcting atmometer for ecological instrumentation. *Ibid.* **13**: 79-82. 1910.—Operation of the porous cup atmometer. *Ibid.* **13**: 111-118. 1910.—Relation of soil moisture to desert vegetation. *Bot. Gaz.* **50**: 241-256. 1910.—A radio-atmometer for comparing light intensities. *Plant World* **14**: 96-99. 1911.—The relation of the osmotic pressure of the cell sap in plants to arid habitats. *Ibid.* **14**: 153-164. 1911.—Light intensity and transpiration. *Bot. Gaz.* **52**: 417-438. 1911.—A study of the relation between summer evaporation intensity and centers of plant distribution in the United States. *Plant World* **14**: 205-222. 1911.—Paper atmometers for studies in evaporation and plant transpiration. *Ibid.* **14**: 281-289. 1911.—Relation of the daily march of transpiration to variations in the water content of foliage leaves. (*With W. H. Brown.*) *Bot. Gaz.* **53**: 309-330. 1912.—Observations on the degree of stomatal movement in certain plants. (*With A. H. Estabrook.*) *Bull. Torr. Bot. Club.* **39**: 15-22. 1912.—Present problems in soil physics as related to plant activities. *Amer. Nat.* **46**: 294-301. 1912.—The choosing of a problem for research in plant physiology. *Plant World* **15**: 73-82. 1912.—A rotating table for standardizing porous cup atmometers. *Ibid.* **15**: 157-162. 1912.—A schematic representation of the water relations of plants, a pedagogical suggestion. *Ibid.* **15**: 214-218. 1912.—The resistance offered by leaves to transpirational water loss. *Ibid.* **16**: 1-35. 1913.—Adaptation in the living and non-living. *Amer. Nat.* **47**: 72-82. 1913.—Osmotic pressure and related forces as environmental factors. *Plant World* **16**: 165-176. 1913.—Climatic areas of the United States as related to plant growth. *Proc. Amer. Phil. Soc.* **52**: 257-275. 1913.—Temperature coefficients in plant geography and climatology. (*With G. J. Livingston.*) *Bot. Gaz.* **56**: 349-375. 1913.—The relation of atmospheric evaporating power to soil moisture content at permanent wilting in plants. (*With J. W. Shive.*) *Plant World* **17**: 81-121. 1914.—Influence of humidity and illumination on transpiration. *Ibid.* **17**: 216-219. 1914.—On the water-supplying power of the soil as indicated by osmometers. (*With H. E. Pulling.*) Carnegie Inst. Wash. Pub. **204**: 5-48. Washington, 1915.—The water-relation between plant and soil. (*With L. A. Hawkins.*) Carnegie Inst. Wash. Pub. **204**: 49-84. Washington, 1915.—Atmometry and the porous cup atmometer. *Plant World* **18**: 21-30, 51-74, 95-111, 143-149. 1915.—Atmospheric influence upon evaporation and its direct measurement. *Monthly Weather Rev.* **43**: 126-131. 1915.—A modification of the Bellani porous-plate atmometer. *Science N. S.* **41**: 872-874. 1915.—Physiological temperature indices for the study of plant growth in relation to climate. *Physiol. Res.* **1**: 399-420. 1916.—A single index to represent both moisture and temperature conditions as related to plant growth. *Physiol. Res.* **1**: 421-440. 1916.—The daily march of transpiring power as indicated by the porometer and by standardized hygrometric paper. (*With S. F. Trelease.*) *Jour. Écol., in press.*—Measurement of evaporation rates for short time intervals. (*With E. S. Johnston.*) *Plant World, in press.*

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PUBLICATIONS

BOOKS. A key to the families of Washington plants. (*With Engstrom.*) 19 pp. Seattle, 1908.—Laboratory exercises in elementary botany. (*With G. B. Rigg.*) 75 pp. Seattle, 1909.—2nd Ed. 139 pp. Boston, 1911.—Northwest flora. (*With G. B. Rigg.*) 454 pp. Seattle, 1912.—The ferns of Washington. (*With Jackson.*) 59 pp. Seattle, 1914.—Elementary flora of the Northwest. (*With G. B. Rigg.*) 254 pp. New York, 1914.

PAPERS. Development of the pollen in some Asclepiadaceae. *Bot. Gaz.* **22**: 325-331. 1901.—A morphological study of certain Asclepiadaceae. *Ibid.* **24**: 389-413. 1902.—The embryo sac of *Casuarina stricta*. *Ibid.* **36**: 101-113. 1903.—High school herbaria. *Northwest Jour. Ed.* **15**: 14-16. 1904.—A contribution to the life history of *Apocynum androsaemifolium*. (*With Blodgett.*) *Bot. Gaz.* **40**: 49-53. 1905.—*Nereocystis luetkeana*. *Ibid.* **42**: 143-146. 1906.—Clams and clam diggers. *Washington Mag. (Seattle)* **1**: 478-480. 1906.—Note on *Catharinea rosulata*. *Bryologist* **10**: 53-54. 1907.—Thallophytes and bryophytes from the Olympic mountains. *The Mountaineer* **1**: 117-138. 1908.—A few lichens and bryophytes from Mount Hood. *Bryologist* **12**: 6-7. 1909.—Peculiarity in *Neckera mensiesii*. *Ibid.* **12**: 52-53. 1909.—*Grimmia olympica*, a new species. *Ibid.* **13**: 58-59. 1910.—The Polytrichaceae of western North America. (*With Waddingham.*) *Proc. Wash. Acad. Sci.* **12**: 271-328. 1910.—Height and dominance of the Douglas fir. *Forestry Quart.* **8**: 465-470. 1910.—Flora characteristic of the different soils. (In: *Soil survey of Puget Sound.* U. S. Dept. Agric., Bur. Soils. Pages 34-40.) 1911.—The ferns of Washington. (*With Jackson.*) *Amer. Fern Jour.* 1913.—*Hormiscia tetraciliata*, *sp. nov.* (*With Zeller.*) *Puget Sound Marine Sta. Pub.* **1**: 9-13. 1915.—The kelp beds of southeast Alaska. U. S. Dept. Agric. Rept. **100**: 60-104. 1915.—The size of kelps on the Pacific coast of North America. (*With Rigg and Crandall.*) *Bot. Gaz.* **60**: 473-482. 1915.—Gas pressure in *Nereocystis*. *Puget Sound Marine Sta. Pub.* **1**: 85-88. 1916.

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PUBLICATIONS

The life history of *Ricciocarpus natans*. *Bot. Gaz.* **37**: 161-177. 1904.—Di-
morphism in *Blissus leucopterus*. *Biol. Bull.* **5**: 330-335. 1903.

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Instructor in Botany and Physiography, Central High School, St. Louis, Missouri, 1903—; Professor of General and Medical Biology, National University of Arts and Sciences, St. Louis, Missouri, 1911—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Engelmann Bot. Soc. (St. Louis), St. Louis Biol. Soc., St. Louis Civic League.

PUBLICATIONS

Ovule and embryo of *Potamogeton natans*. Bot. Gaz. **31**: 339–346. 1901.—The archegonium of *Mnium cuspidatum*. *Ibid.* **37**: 106–126. 1904.—Beautiful surroundings of St. Louis. Physiographic Series, St. Louis Globe-Democrat, 1906.

HARRY NICHOLS WHITFORD

B.S., Kansas State Agricultural College, Manhattan, Kansas, 1890; M.S., 1900;
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ASSISTANT FORESTER, COMMISSION OF CONSERVATION, OTTAWA, CANADA

Botanist and Forester, Philippine Forest Service, 1904-12; Assistant Forester, Commission of Conservation, Ottawa, Canada, 1913—
Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., Canadian Forestry Assoc., Ecol. Soc. Amer., Forestry Club of British Columbia, Soc. Amer. Foresters.

PUBLICATIONS

The genetic development of the forests of northern Michigan, a study in physiographic ecology. *Bot. Gaz.* **31**: 289-325. 1901.—The forests of the Flathead valley, Montana. *Ibid.* **39**: 99-122, 194-218, 276-296. 1905.—The vegetation of the Lamao Forest Reserve. *Philippine Jour. Sci.* **1**: 373-429, 637-682. 1906.—A preliminary working plan for the Public Forest Tract of the Insular Lumber Co., Negros Occidentalis, P. I. (*With H. D. Everett.*) *Philippine Bur. Forestry Bull.* **5**: 1-53. 1906.—A preliminary working plan for the public forest tract of the Mindoro Lumber and Logging Co., Bongabon, Mindoro, P. I. (*With M. L. Merritt.*) *Ibid.* **6**: 1-55. 1906.—A preliminary check list of the principal commercial timbers of the Philippine Islands. *Ibid.* **7**: 1-45. 1907.—Studies on the vegetation of the Philippines. I. The composition and volume of the dipterocarp forests of the Philippines. *Philippine Jour. Sci.* **4**: 699-724. 1909.—The forests of the Philippines. *Philippine Bur. Forestry Bull.* **10**: 1-113. 1911.—The forests of British Columbia. *In press.*

GEORGE HARRISON SHULL

B.S., Antioch College, Yellow Springs, Ohio, 1901; Ph.D. (Botany and Zoölogy),
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Botanical Investigator, Station for Experimental Evolution of the Carnegie Institution of Washington, Cold Spring Harbor, Long Island, New York, 1904-15; Professor of Botany and Genetics, Princeton University, 1915-.

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Breeders' Assoc. (Life Member), Amer. Soc. Nat. (Vice-Pres., 1911), Assoc. Internat. Bot., Bot. Soc. Amer., Brooklyn Inst. Arts Sci., Deutsch. Bot. Ges., Ecol. Soc. Amer., National Geog. Soc., Roy. Hort. Soc., Wash. Acad. Sci. Editor, *Genetics*.

PUBLICATIONS

Place-constants for *Aster prenanthoides*. *Bot. Gaz.* **38**: 333-375. 1904.—Mutants and hybrids of the *Oenotheras*. (*With D. T. MacDougal, A. M. Vail and J. K. Small.*) Carnegie Inst. Wash. Pub. **24**: 1-57. Washington, 1905.—Galtonian regression in the "pure line." *Torreya* **5**: 21-25. 1905.—Stages in the development of *Sium cicutaefolium*. Carnegie Inst. Wash. Pub. **30**: 1-28. Washington, 1905.—*Ascidia* in *Fraxinus*. *Science N. S.* **23**: 201. 1906.—Elementary species and hybrids of *Bursa*. *Ibid.* **15**: 590-591. 1907.—The significance of latent characters. *Ibid.* **15**: 792-794. 1907.—Some latent characters of a white bean. *Ibid.* **15**: 828-832. 1907.—Mutations, variations, and relationships of the *Oenotheras*. (*With D. T. MacDougal and A. M. Vail.*) Carnegie Inst. Wash. Pub. **81**: 1-92. Washington, 1907.—Importance of the mutation theory in practical breeding. *Proc. Amer. Breeders' Assoc.* **3**: 60-67. 1907.—Some new cases of Mendelian inheritance. *Bot. Gaz.* **45**: 103-116. 1908.—The pedigree culture; its aims and methods. *Plant World* **11**: 21-28, 55-64. 1908.—A new Mendelian ratio and several types of latency. *Amer. Nat.* **42**: 432-451. 1908.—The composition of a field of maize. *Proc. Amer. Breeders' Assoc.* **4**: 296-301. 1908.—Doctor Baur on variegation. *Plant World* **11**: 147-151. 1908.—A pure-line method in corn-breeding. *Proc. Amer. Breeders' Assoc.* **5**: 51-59. 1909.—The "presence and absence" hypothesis. *Amer. Nat.* **43**: 410-419. 1909.—*Bursa bursa-pastoris* and *Bursa heegeri*: Biotypes and hybrids. Carnegie Inst. Wash. Pub. **112**: 1-57. 1909.—A simple chemical device to illustrate Mendelian inheritance. *Plant World* **12**: 145-153. 1909.—Color inheritance in *Lychnis dioica* L. *Amer. Nat.* **44**: 83-91. 1910.—Inheritance of sex in *Lychnis*. *Bot. Gaz.* **49**: 110-125. 1910.—Results of crossing *Bursa bursa-pastoris* and *Bursa heegeri*. *Proc. Seventh Internat. Zool. Cong.* Pp. 403-408. 1910.—Germinal analysis through hybridization. *Proc. Amer. Phil. Soc.* **49**: 281-290. 1910.—Hybridization methods in corn-breeding. *Amer. Breeders' Mag.* **1**: 98-107. 1910.—Defective inheritance-ratios in *Bursa* hybrids. *Verhandl. Naturforsch. Ver. Brünn* **49**: 157-168. 1910.—The genotypes of maize. *Amer. Nat.* **45**: 234-252. 1911.—Reversible sex-mutants in *Lychnis dioica*. *Bot. Gaz.* **52**: 328-368. 1911.—"Genotypes," "biotypes," "pure lines," and "clones." *Science N. S.* **35**: 27-29. 1912.—"Phenotype" and "clone." *Ibid.* **35**: 182-183. 1912.—Experiments with maize. *Bot. Gaz.* **52**: 480-485. 1911.—"Genes" or "Gens?" *Science N. S.* **35**: 819. 1912.—Inheritance of the heptandra-form of *Digitalis purpurea* L. *Zeitsch. induct. Abstam. und Vererbungslehre* **4**: 257-267. 1912.—A pilgrimage to Brünn. *The Antiochian*. 1912. (Reprinted, *Amer. Jour. Pharm.* **87**: 69-75. 1915.)—The primary color-factors of *Lychnis* and color inhibitors of *Papaver rhoeas*. *Bot. Gaz.* **54**: 120-135. 1912. Hermaphrodite females in *Lychnis dioica*. *Science N. S.* **34**: 482-483. 1912.—Duplicate genes for capsule-form in *Bursa bursa-pastoris*. *Zeitsch. induct. Abstam. und Vererbungs-*

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lehre **12**: 97–120. 1914.—Ueber die Vererbung der Blattfarbe bei *Melandrium*. Ber. Deutsch. Bot. Ges. **31**: 40–80. 1914.—Sex-limited inheritance in *Lychnis dioica* L. Zeitschr. induct. Abstam. und Vererbungslehre **12**: 265–302. 1914. A peculiar negative correlation in *Oenothera* hybrids. Jour. Genetics **4**: 83–102. 1914.—The longevity of submerged seeds. Plant World **17**: 329–337. 1914.—Genetic definitions in the New Standard Dictionary. Amer. Nat. **49**: 52–59. 1915.

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1915-16.

Member: Amer. Assoc. Adv. Sci. (Fellow), Assoc. Collegiate Alumnae, Bot. Soc. Amer.,
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PUBLICATIONS

Some notes on the ecology of the Delaware coast. *Bot. Gaz.* **34**: 284-306.
1902.—The microcosm of the drift line. *Amer. Nat.* **36**: 855-864. 1902.—The devel-
opment of root hairs. *Bot. Gaz.* **40**: 12-48. 1905.—Progressive and retrogressive
changes in the plant associations of the Delaware coast. *Ibid.* **55**: 45-55. 1912.—A
simple method for filling an osmometer. *Science N. S.* **40**: 208. 1914.—Contribu-
tions to the knowledge of the diaphragms of water plants. I. *Scirpus validus*. *Bot.*
Gaz. **58**: 495-517. 1914.

WILLIAM JESSE GOAD LAND

S.B., The University of Chicago, 1903; Ph.D. (Plant Morphology and Plant Physiology), September, 1904

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Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Microsc. Soc., Bot. Soc. Amer., Deutsch. Bot. Ges., Illinois Acad. Sci.

PUBLICATIONS

Double fertilization in Compositae. *Bot. Gaz.* **30**: 252-260. 1900.—A morphological study of Thuja. *Ibid.* **34**: 249-259. 1902.—Spermatogenesis and oögenesis in Ephedra trifurca. *Ibid.* **38**: 1-18. 1904.—Gametophytes and embryo of Torreya taxifolia. (*With J. M. Coulter.*) *Ibid.* **39**: 161-178. 1905.—The origin of air chambers. *Ibid.* **44**: 197-213. 1907.—Fertilization and embryogeny in Ephedra trifurca. *Ibid.* **44**: 273-292. 1907.—The origin of the cupule of Marchantia. *Ibid.* **46**: 401-409. 1908.—An American Lepidostrobus. (*With J. M. Coulter.*) *Ibid.* **51**: 449-453. 1911.—An electrical constant temperature apparatus. *Ibid.* **52**: 391-399. 1911.—A protocorm of Ophioglossum. *Ibid.* **52**: 478-479. 1911.—Vegetative reproduction in Ephedra. *Ibid.* **55**: 439-445. 1913.—The origin of monocotyledony. (*With J. M. Coulter.*) *Ibid.* **57**: 409-519. 1914.—A method of controlling the temperature of the paraffin block and microtome knife. *Ibid.* **57**: 520-523. 1914.—Microtechnical methods. *Ibid.* **59**: 397-401. 1915.—Chloroform as a paraffin solvent in the imbedding process. *Ibid.* **61**: 253. 1916.

WILLIAM BURNET MCCALLUM

B.S. Agric., University of Toronto, Toronto, Canada, 1894; Ph.D. (Plant Physiology and Plant Morphology), Chicago, September, 1904

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Assistant in Plant Physiology, The University of Chicago, 1905-06; Associate Professor of Botany, University of Arizona and Arizona Agricultural Experiment Station, Tucson, Arizona, 1907-10; Chief Botanist, International Rubber Company, 1910—.
Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer., Ecol. Soc. Amer.

PUBLICATIONS

On the nature of the stimulus causing the change of form and structure in *Proserpinaca palustris*. *Bot. Gaz.* **34**: 93-108. 1902.—Regeneration in plants. *Ibid.* **40**: 97-120, 241-263. 1905.—The reciprocal influence of scion and stock. *Plant World* **12**: 281-286. 1909.

ROBERT BRADFORD WYLIE

B.S., Upper Iowa University, Fayette, Iowa, 1897; Ph.D. (Plant Morphology and Plant Physiology), Chicago, September, 1904

PROFESSOR OF MORPHOLOGICAL BOTANY, STATE UNIVERSITY OF IOWA, IOWA CITY, IOWA

Professor of Biology, Morningside College, Sioux City, Iowa, 1904-06; Assistant Professor of Botany, State University of Iowa, Iowa City, Iowa, 1906-08; Professor of Morphological Botany, 1908—; Member, Staff of Instruction, Puget Sound Marine Laboratory, Friday Harbor, Washington, 1908, 1913; Member, Staff of Instruction, Iowa Lakeside Laboratory, Lake Okoboji, Iowa, 1909-12; Member, Kelp Expedition to Alaska, U. S. Bureau of Soils, 1913; Acting Director, Iowa Lakeside Laboratory, 1915.

Member: Amer. Assoc. Adv. Sci. (Fellow); Bot. Soc. Amer.; Iowa Acad. Sci. (Fellow).

PUBLICATIONS

The morphology of *Elodea canadensis*. *Bot. Gaz.* **37**: 1-22. 1904.—The problem of the small town. *Proc. Iowa Forestry and Park Assoc.* 1906.—Botany in the Iowa high schools. *Proc. Iowa State Teachers' Assoc.* **55**: 215-219. 1909.—The flora of Iowa Rock. *Proc. Iowa Acad. Sci.* **16**: 99-101. 1909.—The staminate flower of *Elodea*. *Ibid.* **17**: 80-82. 1910.—Notes on *Heteranthera dubia*. *Ibid.* **19**: 131-132. 1912.—A long-stalked *Elodea* flower. *Bull. Labs. Nat. Hist., State Univ. Iowa* **6**: 45-52. 1913.—A hybrid rag-weed. *Proc. Iowa Acad. Sci.* **22**: 127-128. 1915.

MINTIN ASBURY CHRYSLER

B.A., University of Toronto, Toronto, Canada, 1894; Ph.D. (Plant Morphology and Plant Physiology), Chicago, December, 1904

PROFESSOR OF BIOLOGY, UNIVERSITY OF MAINE, ORONO, MAINE

Instructor in Botany, Harvard University, 1905-07; summers, 1906-08; Botanical Survey of Maryland (Maryland State Weather Service), summer, 1905; Associate Professor of Botany, University of Maine, Orono, Maine, 1907-10; Professor of Botany, 1910-11; Professor of Biology, 1911—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Soc. Nat., Bot. Soc. Amer., Josselyn Bot. Soc., New England Bot. Club.

PUBLICATIONS

Anatomical notes on certain strand plants. *Bot. Gaz.* **37**: 461-464. 1904.—The development of the central cylinder of Araceae and Liliaceae. *Ibid.* **38**: 161-184. 1904.—Regeneration in *Zamia*. (*With J. M. Coulter.*) *Ibid.* **38**: 452-458. 1904.—Reforestation at Woods Hole, Massachusetts. *Rhodora* **7**: 121-129. 1905.—The nodes of grasses. *Bot. Gaz.* **41**: 1-16. 1906.—On cretaceous *Pityoxyla*. (*With E. C. Jeffrey.*) *Ibid.* **42**: 1-15. 1906.—The lignites of Brandon. (*With E. C. Jeffrey.*) Fifth Ann. Rept. Vermont State Geologist. 1906.—The microgametophyte of the Podocarpaceae. (*With E. C. Jeffrey.*) *Amer. Nat.* **41**: 355-364. 1907.—The structure and relationships of the Potamogetonaceae and allied families. *Bot. Gaz.* **44**: 161-188. 1907.—Tyloses in the tracheids of conifers. *New Phytol.* **7**: 198-204. 1908.—The nature of the fertile spike in Ophioglossaceae. *Ann. Bot.* **24**: 1-18. 1910.—The ecological plant geography of the coastal zone, west shore district, of Maryland. The plant life of Maryland, Maryland State Weather Service **3**: 149-193. 1910.—The origin of the erect cells in the phloem of the Abietineae. *Bot. Gaz.* **56**: 36-50. 1913.—The medullary rays of *Cedrus*. *Ibid.* **59**: 387-396. 1915.

CLIFTON DURANT HOWE

A.B., University of Vermont, 1898; M.S., 1901; Ph.D. (Plant Ecology and Plant Morphology),
Chicago, December, 1904

ASSISTANT PROFESSOR OF BOTANY AND FORESTRY, UNIVERSITY OF TORONTO, TORONTO, CANADA

Instructor in Dendrology, Biltmore Forest School, Biltmore, North Carolina, 1905;
Assistant Director, 1906-08; Lecturer in Botany and Forestry, University of Toronto,
Toronto, Canada, 1908-13; Assistant Professor, 1913—.

Member: Bot. Soc. Amer., Canadian Soc. Forest Engineers, Ecol. Soc. Amer., Roy.
Canadian Inst. (Chairman, Biological Section), Soc. Amer. Foresters. Associate Editor,
Forestry Quarterly.

PUBLICATIONS

The reforestation of sand-plains in Vermont. *Bot. Gaz.* 49:126-148. 1910.—
Distribution and reproduction of the forest in relation to underlying rocks and soils.
(In: *Forest conditions in Nova Scotia*. Commission of Conservation.) Ottawa, 1912.
—Trent Watershed survey. (With J. H. White.) *Ibid.* 1913.—The effect of repeated
forest fires upon the reproduction of commercial species in Peterborough county,
Ontario. (In: *Forest protection in Canada, 1913-14.*) *Ibid.* 1915.—The reproduction of
commercial species in the southern coastal forests of British Columbia. (In: *Forest
protection in Canada, 1913-14.*) *Ibid.* 1915.

HEINRICH HASSELBRING

B.S. Agric., Cornell University, Ithaca, New York, 1899; Ph.D. (Botany and Chemistry),
Chicago, June, 1905

PHYSIOLOGIST, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT
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Jefe del Departamento de Botanica, Estacion Central Agronomica, Santiago de las
Vegas, Cuba, 1907-09; Physiologist, Bureau of Plant Industry, U. S. Department of Agri-
culture, Washington, D. C., 1909—

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Phytopath. Soc., Bot. Soc. Amer.,
Bot. Soc. Wash., Sigma Xi.

PUBLICATIONS

Comparative study of the development of *Trichurus spiralis* and *Stysanus stemonites*. *Bot. Gaz.* **29**: 312-322. 1900.—A new species of *Globulina*. *Bull. Torr. Bot. Club.* **2**: 402-404. 1900.—The bitter rot and its control. *Trans. Illinois Hort. Soc.* **36**: 348-352. 1902.—Canker of apple trees. *Univ. Illinois Agric. Exp. Sta. Bull.* **70**. 1902.—The appressoria of the anthracnoses. *Bot. Gaz.* **42**: 135-142. 1906.—Gravity as a form-stimulus in fungi. *Ibid.* **43**: 251-258. 1907.—The carbon assimilation of *Penicillium*. *Ibid.* **45**: 176-193. 1908.—Types of Cuban tobacco. *Ibid.* **53**: 113-126. 1912.—The effect of shading on the transpiration and assimilation of the tobacco plant in Cuba. *Ibid.* **57**: 257-286. 1914.—The relation between the transpiration stream and the absorption of salts. *Ibid.* **57**: 72-73. 1914.—Efectos de la sombra sobre la transpiracion y la asimilacion de la planta del tabaco en Cuba. *Estac. Exp. Agron., Cuba, Bol.* **24**. 1915.—Tipos de tabaco Cubano. *Ibid.* **Bol.** **23**. 1915.—Physiological changes in sweet potatoes during storage. (*With L. A. Hawkins.*) *Jour. Agric. Res.* **3**: 331-342. 1915.—Respiration experiments with sweet potatoes. (*With L. A. Hawkins.*) *Ibid.* **5**: 509-517. 1915.—Carbohydrate transformations in sweet potatoes. (*With L. A. Hawkins.*) *Ibid.* **5**: 543-560. 1915.—Iris, and other articles, in *Bailey's Cyclopedia of Amer. Hort.*—Revision of same, in *Standard Cyclopedia of Hort.*

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Instructor in Botany, Evanston High School, Evanston, Illinois, 1905-06; Assistant in Botany, Northwestern University, Evanston, Illinois, 1905-06; Assistant Professor of Biology, in charge of Department of Biology, Western College for Women, Oxford, Ohio, 1906-07; In charge of Department of Biology, Manual Training High School, Indianapolis, Indiana, 1907-11; In charge, Employment and Welfare Departments, Fred Harvey System, Chicago, Illinois, 1911—.

Member: The Cordon (Charter Member), Social Sci. Club (Chicago).

PUBLICATION

A morphological study of *Sargassum filipendula*. *Bot. Gaz.* **41**: 161-182. 1906.

WILLIAM CROCKER

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Assistant in Plant Physiology, The University of Chicago, 1906-07; Associate, 1907-08; Instructor, 1909-11; Assistant Professor, 1911-15; Associate Professor, 1915—.
Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer.

PUBLICATIONS

Rôle of seed coats in delayed germination. *Bot. Gaz.* **42**: 265-91. 1906.—Germination of seeds of water-plants. *Ibid.* **44**: 375-380. 1907.—Effect of illuminating gas and ethylene upon flowering carnations. (*With L. I. Knight.*) *Ibid.* **46**: 259-276. 1908.—Effect of illuminating gas and its constituents on flowering carnations. (*With L. I. Knight.*) *Plant World* **12**: 83-88. 1909.—Longevity of seeds. *Bot. Gaz.* **47**: 69-72. 1909.—A new method of detecting traces of illuminating gas. (*With L. I. Knight and R. C. Rose.*) *Science N. S.* **31**: 636. 1910.—Toxicity of smoke. (*With L. I. Knight.*) *Bot. Gaz.* **55**: 337-371. 1913.—The peg of Cucurbitaceae. (*With L. I. Knight and Edith A. Roberts.*) *Ibid.* **50**: 321-339. 1910.—The effects of advancing civilization upon plants. *School Sci. Math.* **13**: 277-289. 1913.—Delayed germination in the seed of *Alisma plantago*. (*With W. E. Davis.*) *Bot. Gaz.* **58**: 285-321. 1914.—A method of prophesying the life duration of seeds. (*With J. F. Groves.*) *Proc. Nat. Acad. Sci.* **1**: 152-155. 1915.—Mechanics of dormancy in seeds. *Amer. Jour. Bot.* **3**: 99-120. 1916.

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University School of Pharmacy, Chicago, Illinois, 1903-06; Assistant Professor, 1906-09;
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Pharmacognosy, State College of Washington, Pullman, Washington, 1914—
Member, Bot. Soc. Amer.

PUBLICATIONS

An experiment on the relation of soil physics to plant growth. (*With B. E. Livingston.*) *Bot. Gaz.* **38**: 67-71. 1904.—Toxic limits and stimulation effects of some salts and poisons on wheat. *Ibid.* **43**: 11-44. 1907.—The morphology of the wheat grain. *Washington State Coll. Bulletin.* *In press.*

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Instructor in Botany, Smith College, Northampton, Massachusetts, 1905-11. Associate Professor, 1911—.
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PUBLICATIONS

Morphology of the trunk and development of the Microsporangium of cycads. *Bot. Gaz.* **43**: 187-205. 1907.—Development of the ovulate strobilus and young ovule of *Zamia floridana*. *Ibid.* **50**: 128-141. 1910.

SHIGEO YAMANOUCHI

Ph.D. (Plant Morphology and Plant Physiology),
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Technical Assistant in Botany, The University of Chicago, 1907-08; Assistant in Botany, 1908-09; Professor of Botany, Tokyo Teachers' College, 1909-11; Sc.D. Rigakuhakushi, Tokyo Teachers' College, Tokyo, Japan, 1911; Assistant in Botany, The University of Chicago, 1911-12; Professor of Botany, Tokyo Teachers' College, Tokyo, Japan, 1912-.

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer., Deutsch. Bot. Ges., Sigma Xi.

PUBLICATIONS

The life history of *Polysiphonia violacea* Grev. (Preliminary note.) *Bot. Gaz.* **41**: 425. 1906.—The life history of *Polysiphonia*. *Ibid.* **42**: 401-449. 1906.—Apogamy in *Nephrodium*. *Ibid.* **44**: 142-146. 1907.—Sporogenesis in *Nephrodium*. *Ibid.* **45**: 1-30. 1908.—Spermatogenesis, oögenesis and fertilization in *Nephrodium*. *Ibid.* **45**: 145-175. 1908.—Apogamy in *Nephrodium*. *Ibid.* **45**: 289-318. 1908.—Mitosis in *Fucus*. *Ibid.* **47**: 173-197. 1909.—Cytology of *Cutleria* and *Aglaozonia*. *Ibid.* **48**: 380-387. 1909.—Chromosomes in *Osmunda*. *Ibid.* **49**: 1-12. 1910.—The life history of *Cutleria*. *Ibid.* **54**: 441-502. 1912.—*Hydrodictyon africanum*, a new species. *Ibid.* **55**: 74-79. 1913.—The life history of *Zanardinia*. *Ibid.* **56**: 1-34. 1913.

REINHARDT THIESSEN

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Member: Amer. Assoc. Adv. Sci. (Fellow), Biol. Soc. Wash., Bot. Soc. Amer., National Geog. Soc.

PUBLICATIONS

The vascular anatomy of the seedling of *Dioon edule*. *Bot. Gaz.* **46**: 357-380. 1908.
—Origin of coal. *U. S. Bur. Mines Bull.* 38. 1914.—On the constitution and genesis of certain lignites and sub-bituminous coals. *Eighth Internat. Cong. Applied Chem.* **25**: 203. 1912.

LULA PACE

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1912—. Student, University of Bonn (Germany), 1910-11.
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PUBLICATIONS

Fertilization of *Cypripedium*. *Bot. Gaz.* **44**: 353-374. 1907.—The gametophyte of *Calopogon*. *Ibid.* **48**: 126-137. 1909.—Some peculiar fern prothallia. *Ibid.* **50**: 49-58. 1910.—*Parnassia* and some allied genera. *Ibid.* **54**: 306-329. 1912.—Apogamy in *Atamosco*. *Ibid.* **56**: 376-394. 1913.—Two species of *Geostachys*. *Baylor Univ. Bull.* **17**: 1-16. 1914.

LEONAS LANCELOT BURLINGAME

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Professor of Biology and Geology, Ohio Northern University, Ada, Ohio, 1902-04; Assistant in Botany, The University of Chicago, 1906-08; Instructor in Biology, Eastern Illinois State Normal School, Charleston, Illinois, 1906 (summer); Instructor in Botany, Leland Stanford Junior University, 1908-09; Assistant Professor, 1909-16; Associate Professor, 1916—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Assoc. College Professors, Amer. Genetic Assoc., Biol. Soc. Pacific (Secretary, 1913-14), Bot. Soc. Amer., California Acad. Sci., Phi Beta Kappa, Sigma XI, Western Nat.

PUBLICATIONS

The sporangium of the Ophioglossales. *Bot. Gaz.* **44**: 34-56. 1907.—The staminate cone and male gametophyte of *Podocarpus*. *Ibid.* **46**: 161-178. 1908.—The morphology of *Araucaria braziliensis*. I. The staminate cone and male gametophyte. *Ibid.* **50**: 97-114. 1913.—Same title. II. The ovulate cone and female gametophyte. *Ibid.* **57**: 490-508. 1914.—Same title. III. Fertilization, the embryo, and the seed. *Ibid.* **59**: 1-39. 1915.—The origin and relationships of the araucarians. *Ibid.* **60**: 1-26, 89-114. 1915.—Labelling microscopic slides. *Science N. S.* **39**: 250-251. 1914.—Embedding trays for paraffine work. *Ibid.* **40**: 355. 1914.—Turpentine as a laboratory reagent. *Ibid.* **40**: 356. 1914.

REGINALD RUGGLES GATES

B.A., Mt. Allison University, Sackville, New Brunswick, Canada, 1903; Ph.D. (Botany and Zoölogy), Chicago, June, 1908

ACTING ASSOCIATE PROFESSOR OF ZOOLOGY, UNIVERSITY OF CALIFORNIA, BERKELEY, CALIFORNIA

Assistant in Botany, The University of Chicago, Chicago, Illinois, 1908-09; Assistant in Algae, Marine Biological Laboratory, Woods Hole, Massachusetts, Summer, 1909; Member of Staff of Missouri Botanical Garden, 1909-11; Lecturer in charge of Biology, St. Thomas's Hospital, London, England, 1911-14; Special Lecturer on Mutations, Royal College of Science, London, England, 1912; Lecturer in Cytology, Bedford College, University of London, England, 1913-14; Special Lecturer on Heredity in Relation to Cytology, Oxford University, England, 1914; Acting Associate Professor of Zoölogy, University of California, Berkeley, California, 1915-16.

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Soc. Nat., Bot. Soc. Amer., British Assoc. Adv. Sci., Linn. Soc. London (Fellow), Nova Scotian Inst. Sci., Roy. Bot. Soc.—Huxley Medal and Prize, Imp. Coll. Sci., London, 1913.

PUBLICATIONS

Nova Scotia fungi (Introduction). Proc. and Trans. Nova Scotian Inst. Sci. **11** (1902): 115-121. 1905.—Fungi of Nova Scotia, first supplementary list. (*With A. H. MacKay and others.*) *Ibid.* **12** (1905): 119-138. 1908.—Preliminary note on pollen development in *Oenothera lata* de Vries, and its hybrids. Science N. S. **25**: 259-260. 1907.—Pollen development in hybrids of *Oenothera lata* × *Oe. lamareckiana*, and its relation to mutation. Bot. Gaz. **43**: 81-115. 1907.—Hybridisation and germ cells of *Oenothera* mutants. *Ibid.* **44**: 1-21. 1907.—Further studies on the chromosomes of *Oenothera*. Science N. S. **27**: 335. 1908.—A study of reduction in *Oenothera rubrinervis*. Bot. Gaz. **46**: 1-34. 1908.—The chromosomes of *Oenothera*. Science N. S. **27**: 193-195. 1908.—A preliminary account of studies in the variability of a unit character in *Oenothera*. Science N. S. **27**: 209. 1908.—A litter of hybrid dogs. Science N. S. **29**: 744-747. 1909.—The stature and chromosomes of *Oenothera gigas* de Vries. Arch. f. Zellforsch. **3**: 525-552. 1909.—An analytical key to some of the segregates of *Oenothera*. Ann. Rept. Missouri Bot. Gard. **20**: 123-137. 1909.—Further studies of *Oenothera* cytology. Science N. S. **29**: 269. 1909.—The behaviour of the chromosomes in *Oenothera lata* × *Oe. gigas*. Bot. Gaz. **48**: 179-199. 1909.—Some variations and hybrids of *Oenothera*. Science N. S. **29**: 906. 1909.—Apogamy in *Oenothera*. Science N. S. **30**: 691-694. 1909.—Studies of inheritance in the evening primrose. (6 pp.) Chicago Med. Rec. 1909.—The chromosomes of *Oenothera* mutants and hybrids. Proc. 7th Internat. Zoöl. Congress (1907). (4 pp.) 1910.—The material basis of Mendelian phenomena. Amer. Nat. **44**: 203-213. 1910.—The earliest description of *Oenothera lamareckiana*. Science N. S. **31**: 425-426. 1910.—Abnormalities in *Oenothera*. Rept. Missouri Bot. Gard. **21**: 175-184. 1910.—Chromosome reduction in *Oenothera*. Bot. Gaz. **44**: 64-66. 1910.—Some effects of tropical conditions on the development of certain English *Oenotheras*. Rept. Brit. Assoc. Adv. Sci. **1909**: 677-678. 1910.—Twin hybrids in *Oenothera*, with a suggestion concerning their explanation. Science N. S. **33**: 262. 1911.—Studies on the variability and heritability of pigmentation in *Oenothera*. Zeitsch. induct. Abstam. und Vererbungslehre **4**: 337-372. 1911.—Pollen formation in *Oenothera gigas*. Ann. Bot. **25**: 909-940. 1911.—Mutation in *Oenothera*. Amer. Nat. **45**: 577-606. 1911.—Early historico-botanical records of the *Oenotheras*. Proc. Iowa Acad. Sci. **1910**: 85-124. 1911.—The mode of chromosome reduction. Bot. Gaz. **51**: 321-344. 1911.—Parallel mutations in *Oenothera biennis*. Nature **89**: 659-660. 1912.—Somatic mitoses in *Oenothera*. Ann. Bot. **26**: 993-1010. 1912.—An onagraceous stem without internodes. New Phytol. **11**: 50-53.

REGINALD RUGGLES GATES

1912.—Mutations in plants. *Bot. Jour.* **2**: 84–87. 1912.—A new *Oenothera*. *Rhodora* **15**: 45–48. 1913.—A contribution to a knowledge of the mutating *Oenotheras*. *Trans. Linn. Soc. London II, Bot.*, **81**: 1–67. 1913.—Tetraploid mutants and chromosome mechanisms. *Biol. Centralbl.* **33**: 92–99, 113–150. 1913.—*Oenothera* and climate. *Science N. S.* **37**: 155–156. 1913.—Reduction divisions (?) in somatic tissue. *Rept. Brit. Assoc. Adv. Sci.* **1912**: 681. 1913.—The mutations of *Oenothera*. *Nature* **91**: 647–648. 1913.—Recent papers on *Oenothera* mutations. *New Phytol.* **12**: 290–302. 1913.—On the apparent absence of apogamy in *Oenothera*. *Science N. S.* **39**: 37–38. 1914.—Evidence which shows that mutation and Mendelian splitting are different processes. *Proc. Brit. Assoc. Adv. Sci.* **1913**: 716. 1914.—A cytological study of *Oenothera mut. lata* and *Oe. mut. semilata* in relation to mutation. (*With Nesta Thomas.*) *Quart. Jour. Microsc. Sci.* **59**: 523–571. 1914.—Breeding experiments which show that hybridisation and mutation are independent phenomena. *Zeitschr. induct. Abstam. und Vererbungslehre* **11**: 209–279. 1914.—Recent aspects of mutation. *Nature* **94**: 296–299. 1914.—Galton and discontinuity in variation. *Amer. Nat.* **48**: 697–699. 1914.—On the nature of mutations. *Jour. Hered.* **6**: 99–108. 1915.—Some *Oenotheras* from Cheshire and Lancashire. *Ann. Missouri Bot. Gard.* **1**: 383–400. 1915.—A Texan species of *Megapterium*. *Ann. Missouri Bot. Gard.* **1**: 401–404. 1915.—On the origin and behaviour of *Oenothera rubricalyx*. *Jour. Genetics* **4**: 353–360. 1915.—On the modification of characters by crossing. *Amer. Nat.* **49**: 562–569. 1915.—On successive duplicate mutations. *Biol. Bull.* **29**: 204–220. 1915.—Mutation concepts in relation to organic structure. *Monist* **25**: 531–555. 1915.—An anticipatory mutationist. *Amer. Nat.* **49**: 645–648. 1915.—The mutation factor in evolution. *8vo.*, xiv + 353 pp., 114 figs. London, 1915.—Teratology and phylogeny in the genus *Trillium*. *Science N. S.* **42**: 879. 1915.—Heredity and mutation as cell phenomena. *Amer. Jour. Bot.* **2**: 519–528. 1910.—Huxley as a mutationist. *Amer. Nat.* **50**: 126–128. 1916.—On pairs of species.—*Bot. Gaz.* **61**: 177–212. 1916.

LEROY HARRIS HARVEY

B.S., University of Maine, Orono, Maine, 1901; Ph.D. (Plant Ecology, Plant Physiology and Plant Morphology), Chicago, June, 1908

IN CHARGE, DEPARTMENT OF BIOLOGY, WESTERN STATE NORMAL SCHOOL, KALAMAZOO, MICHIGAN

Present position, 1908—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Nature-Study Soc., Botanists Cent. States, Bot. Soc. Amer., Ecol. Soc. Amer., Mich. Acad. Sci., Mich. Nature-Study and School Garden Assoc., School Garden Assoc. Amer.

PUBLICATIONS

Pogonia pendula Lindl. in Maine. *Rhodora* **2**: 211-212. 1900.—Further notes on *Solanum rostratum* and *Hieracium praealtum*. *Rhodora* **4**: 151-152. 1902.—The dwarf mistletoe at Mount Ktaadn. *Plant World* **5**: 226. 1902.—An ecological excursion to Mount Ktaadn. *Rhodora* **5**: 41-52. 1903.—A study of the physiographic ecology of Mount Ktaadn, Maine. *Univ. Maine Studies* **1903**: 1-50. 1903.—Floral succession in the prairie-grass formation of southeastern South Dakota. *Bot. Gaz.* **46**: 81-108, 277-298. 1908.—The floristic composition of the vascular flora of Mount Ktaadn. *Rept. Mich. Acad. Sci.* **1909**: 37-47. 1909.—School gardening a fundamental factor in education. *Kalamazoo Normal Record* **3**: 97-100. 1912.—Science and society. *Ibid.* **4**: 381-384. 1914.—Mendelism and its meaning. *Jour. Mich. State Med. Soc.* **13**: 698-704. 1914.—The nature of man. *Kalamazoo Normal Record* **5**: 133-142. 1915.—Elementary science in the high school. *Jour. Mich. Schoolmasters' Club* **1915**: 41-46. 1915.—School gardening a fundamental factor in education. *Nature-Study Rev.* **12**: 179-183. 1916.

CHARLES HOUSTON SHATTUCK

B.S., Campbell College, Holton, Kansas, 1894; Ph.D. (Plant Morphology and Plant Physiology),
Chicago, June, 1908

**PROFESSOR OF FORESTRY AND BOTANICAL MORPHOLOGY, AND DEAN
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OF IDAHO, MOSCOW, IDAHO**

Professor of Botany and Forestry, Clemson College, South Carolina, 1908; Professor of
Forestry and Botanical Morphology, University of Idaho, Moscow, Idaho, 1909—
Member: Amer. Forestry Assoc., Bot. Soc. Amer., Sigma Xi, Soc. Amer. Foresters.

PUBLICATIONS

A morphological study of *Ulmus americana*. Bot. Gaz. **40**: 209-223. 1904.—A
fossil forest in Jackson county, Kansas. Proc. Kans. Acad. Sci. **19**: 107-109. 1905.—
The origin of heterospory in *Marsilia*. Bot. Gaz. **49**: 19-40. 1910.

ALMA GRACEY STOKEY

A.B., Oberlin College, Oberlin, Ohio, 1904; Ph.D. (Plant Morphology and Plant Physiology),
Chicago, August, 1908

ASSOCIATE PROFESSOR OF BOTANY, MT. HOLYOKE COLLEGE, SOUTH
HADLEY, MASSACHUSETTS

Instructor in Botany, Mt. Holyoke College, South Hadley, Massachusetts, 1908-11;
Associate Professor, 1911—.

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer., Sullivant Moss. Soc.

PUBLICATIONS

The roots of *Lycopodium pithyoides*. *Bot. Gaz.* **44**: 34-56. 1907.—The sporangium of *Lycopodium*. *Ibid.* **50**: 218-219. 1910.—The anatomy of *Isoetes*. *Ibid.* **47**: 311-335. 1909.

WANDA MAY PFEIFFER

S.B., The University of Chicago, Chicago, Illinois, 1904; Ph.D. (Plant Morphology and Plant Physiology), Chicago, August, 1908

**INSTRUCTOR IN PLANT PATHOLOGY, THE UNIVERSITY OF CHICAGO,
CHICAGO, ILLINOIS**

Assistant in Botany, The University of Chicago, Chicago, Illinois, 1909-14; Instructor in Plant Pathology, 1914-
Member, Bot. Soc. Amer., Sigma Xi.

PUBLICATIONS

Differentiation of sporocarps in *Azolla*. *Bot. Gaz.* **44**: 445-454. 1907.—The morphology of *Leitneria floridana*. *Ibid.* **53**: 189-202. 1912.

SISTER HELEN ANGELA DORETY

B.A., College of Saint Elizabeth, Convent Station, New Jersey, 1903; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, March, 1909

PROFESSOR AND HEAD OF THE DEPARTMENT OF BOTANY, COLLEGE OF SAINT ELIZABETH, CONVENT STATION, NEW JERSEY

Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., Phi Beta Kappa.

PUBLICATIONS

The embryo of *Ceratozamia*: a physiological study. *Bot. Gaz.* **45**: 412-415. 1908.—The seedling of *Ceratozamia*. *Ibid.* **46**: 203-220. 1908.—Vascular anatomy of the seedling of *Microcycas calocoma*. *Ibid.* **47**: 139-147. 1909.—The extrafascicular cambium of *Ceratozamia*. *Ibid.* **47**: 150-152. 1909.

NIELSINE JOHANNA KILDAHL

B.A., University of North Dakota, University, North Dakota, 1898; M.A., 1900; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, March, 1909

ADDRESS: MAZA, NORTH DAKOTA

Member: Bot. Soc. Amer., National Geog. Soc., Sigma Xi.

PUBLICATIONS

Development of the walls in the proembryo of *Pinus laricio*. *Bot. Gaz.* **44**: 102–107. 1907.—The morphology of *Phyllocladus alpinus*. *Ibid.* **46**: 339–347. 1908.—Affinities of *Phyllocladus*. *Ibid.* **46**: 464–465. 1908.

EDITH MINOT TWISS

B.A., Ohio State University, Columbus, Ohio, 1895; S.M., The University of Chicago, 1907; Ph.D. (Botany and Bacteriology), Chicago, September, 1909

PROFESSOR OF BOTANY AND HEAD OF THE DEPARTMENT OF BOTANY,
WASHBURN COLLEGE, TOPEKA, KANSAS

Teacher of Botany, High School of Commerce, Cleveland, Ohio, 1909-10; Assistant Professor of Botany, Washburn College, Topeka, Kansas, 1910-12; Acting Head of the Department of Botany, 1912-13; Dean of Women, 1911-12; Professor of Botany and Head of the Department of Botany, 1913—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Genetic Assoc., Bot. Soc. Amer., Kansas Acad. Sci., Sigma Xi.

PUBLICATION

The prothallia of *Aneimia* and *Lygodium*. Bot. Gaz. **49**: 168-181. 1910.

CHARLES ORVAL APPLEMAN

Ph.B., Dickinson College, Carlisle, Pennsylvania, 1903; Ph.D. (Botany and Bacteriology),
Chicago, September, 1910

PLANT PHYSIOLOGIST, MARYLAND AGRICULTURAL EXPERIMENT
STATION, COLLEGE PARK, MARYLAND

Present position, 1910—. Chairman, Committee on Projects, Maryland Agricultural
Experiment Station, 1915—.
Member: Amer. Assoc. Adv. Sci., Amer. Chem. Soc., Bot. Soc. Amer., Bot. Soc., Wash.

PUBLICATIONS

Some observations on catalase. *Bot. Gaz.* **50**: 182-192. 1910.—Physiological behavior of enzymes and carbohydrate transformations in after-ripening of the potato tuber. *Ibid.* **52**: 306-315. 1911.—Metabolic changes in potatoes during sprouting. *Science N. S.* **39**: 293. 1914.—Changes in potatoes during storage. *Maryland Agric. Exp. Sta. Bull.* **167**: 329-334. 1912.—Study of rest period in potato tubers. *Ibid.* **183**: 181-226. 1914.—Concerning the measurement of diastase activity in plant extracts. *Science N. S.* **41**: 175. 1915.—Relation of catalase and oxidases to respiration in plants. *Maryland Agric. Exp. Sta. Bull.* 191. 1915.

GRACE MIRIAM CHARLES

B.S., Oberlin College, Oberlin, Ohio, 1900; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, September, 1910

ASSISTANT PROFESSOR OF BOTANY, UNIVERSITY OF KANSAS,
LAWRENCE, KANSAS

Instructor in Botany, University of Kansas, Lawrence, Kansas, 1911-15; Assistant Professor, 1915—.

Member: Amer. Assoc. Adv. Sci., Amer. Genetic Assoc., Bot. Soc. Amer.

PUBLICATION

The anatomy of the sporeling of *Marattia alata*. *Bot. Gaz.* **51**: 81-101. 1911.

MARY SOPHIE YOUNG

B.A., Wellesley College, South Hadley, Massachusetts, 1895; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, September, 1910

INSTRUCTOR IN BOTANY, UNIVERSITY OF TEXAS,
AUSTIN, TEXAS

Tutor in Botany, University of Texas, 1910-11; Instructor, 1911—.

PUBLICATIONS

The male gametophyte of *Dacrydium*. *Bot. Gaz.* **44**: 189-196. 1907.—The morphology of the Podocarpaceae. *Ibid.* **50**: 81-100. 1910.

WILLIAM SKINNER COOPER

B.S., Alma College, Alma, Michigan, 1906; Ph.D. (Botany and Geology),
Chicago, June, 1911

INSTRUCTOR IN PLANT PHYSIOLOGY AND ECOLOGY,
UNIVERSITY OF MINNESOTA, MINNEAPOLIS,
MINNESOTA

Lecturer in Ecology, Leland Stanford Junior University, Stanford University, California, 1914-15; Instructor in Plant Physiology and Ecology, University of Minnesota, 1915—

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer., Ecol. Soc. Amer.

PUBLICATIONS

Alpine vegetation in the vicinity of Long's Peak, Colorado. *Bot. Gaz.* **45**: 319-337. 1908.—Reproduction by layering among conifers. *Ibid.* **52**: 369-379. 1911.—The ecological succession of mosses as illustrated upon Isle Royale, Lake Superior. *Plant World* **15**: 197-213. 1912.—A list of mosses collected upon Isle Royale, Lake Superior. *Bryologist* **16**: 3-8. 1913.—The climax forest of Isle Royale, Lake Superior, and its development. *Bot. Gaz.* **55**: 1-44, 115-140, 189-235. 1913.

GRACE LUCRETIA CLAPP

B.A., Smith College, Northampton, Massachusetts, 1905; Ph.D. (Plant Morphology and Plant Physiology), Chicago, September, 1911

INSTRUCTOR IN BOTANY, SMITH COLLEGE, NORTHAMPTON, MASSACHUSETTS

Teacher of Botany, Manual Training High School, Indianapolis, Indiana, 1911-14;
Instructor in Botany, Smith College, 1914—.

PUBLICATIONS

A quantitative study of transpiration. *Bot. Gaz.* **45**: 254-267. 1908.—The life history of *Aneura pinguis*. *Ibid.* **54**: 177-192. 1912.

SOPHIA HENNION ECKERSON

A.B., Smith College, Northampton, Massachusetts, 1905; A.M., 1907; Ph.D. (Plant Physiology and Plant Morphology), Chicago, September, 1911

ASSISTANT IN PLANT PHYSIOLOGY, THE UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS

Fellow in Botany, Smith College, Northampton, Massachusetts, 1905-06; Demonstrator, 1906-07; Assistant, 1907-09; Assistant in Plant Physiology, The University of Chicago, 1911—

Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., Women's Agric. and Hort. Assoc.

PUBLICATIONS

The physiological constants of plants commonly used in American botanical laboratories. I. Chlorophyll spectrum. *Bot. Gaz.* **40**: 302-305. 1905.—II. Root pressure and exudation. *Ibid.* **46**: 50-54. 1908.—III. The number and size of stomata. *Ibid.* **46**: 221-224. 1908.—IV. On the demonstration of the formation of starch in leaves. *Ibid.* **48**: 224-228. 1909.—A physiological and chemical study of after-ripening. *Ibid.* **55**: 286-299. 1913.—Thermotropism of roots. *Ibid.* **58**: 254-263. 1914.

ANNA MORSE STARR

A.B., Oberlin College, Oberlin, Ohio, 1906; A.M., 1907; Ph.D. (Plant Ecology and Plant Morphology),
Chicago, September, 1911

INSTRUCTOR IN BOTANY, MOUNT HOLYOKE COLLEGE,
SOUTH HADLEY, MASSACHUSETTS

Present position, 1911—.

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer., Ecol. Soc. Amer., National Geog.
Soc.

PUBLICATIONS

The microsporophylls of Ginkgo. Bot. Gaz. **49**: 51-54. 1910.—Comparative anatomy of dune plants. *Ibid.* **54**: 265-305. 1912.—A Mexican Aytonia. *Ibid.* **59**: 48-58. 1916.

MELVIN AMOS BRANNON

B.A., Wabash College, Crawfordsville, Indiana, 1899; A.M., 1899; Ph.D. (Plant Morphology, Plant Ecology and Plant Physiology), Chicago, June, 1912

PRESIDENT, UNIVERSITY OF IDAHO, MOSCOW, IDAHO

Dean, College of Liberal Arts, University of North Dakota, University, North Dakota, 1911-14; President, University of Idaho, 1914—.

PUBLICATIONS

Osmotic pressure in potatoes. *Bot. Gaz.* **56**: 433-438. 1913.—The action of Salton sea water on vegetable tissues. *Carnegie Inst. Wash. Pub.* **193**: 71-78. 1913.—Fasciation. *Bot. Gaz.* **58**: 518-526. 1914.

LAURA CAMPBELL GANO

Ph.B., Earlham College, Richmond, Indiana, 1893; S.B., The University of Chicago, Chicago, Illinois, 1898; M.S. Agric., Cornell University, Ithaca, New York, 1906; Ph.D. (Plant Ecology, Plant Physiology and Plant Morphology), Chicago, June, 1912

ADDRESS: RICHMOND, INDIANA

Member: Bot. Soc. Amer., Women's National Agric. and Hort. Assoc.

DISSERTATION: The physiographic ecology of northern Florida.

STELLA MARY HAGUE

B.S., Indiana University, Bloomington, Indiana, 1893; Ph.D. (Plant Morphology and Plant Physiology), Chicago, June, 1912

INSTRUCTOR IN BOTANY, UNIVERSITY OF ILLINOIS,
URBANA, ILLINOIS

Assistant in Botany, University of Illinois, 1912-13; Instructor, 1913—.
Member, Bot. Soc. Amer.

PUBLICATION

A morphological study of *Diospyros virginiana*. Bot. Gaz. **52**: 34-44. 1911.

ANSEL FRANCIS HEMENWAY

A.B., University of Oregon, Eugene, Oregon, 1902; A.M., 1904; A.M., Harvard University, Cambridge, Massachusetts, 1909; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, June, 1912

PROFESSOR OF BIOLOGY, TRANSYLVANIA COLLEGE, LEXINGTON,
KENTUCKY

Present position, 1912—.

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer., Botanists Cent. States, Sigma Xi.

PUBLICATIONS

Botanists of the Oregon country. *Oreg. Hist. Soc. Quart.* **5**: 207–214. 1902.—
Studies on the phloem of the Dicotyledons. I. Phloem of Juglandaceae. *Bot. Gaz.*
51: 131–135. 1911.—II. The evolution of the sieve tube. *Ibid.* **55**: 236–243. 1913.

LESTER WHYLAND SHARP

S.B., Alma College, Alma, Michigan, 1908; Ph.D. (Plant Morphology and Plant Physiology),
Chicago, June, 1912

ASSISTANT PROFESSOR OF BOTANY, NEW YORK STATE COLLEGE
OF AGRICULTURE, CORNELL UNIVERSITY,
ITHACA, NEW YORK

Research, University of Louvain, Belgium, 1912-13; Research, The University of Chicago,
1913-14; Instructor in Botany, New York State College of Agriculture, 1914-15; Assistant
Professor, 1915—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., Gamma Alpha, Phi Beta
Kappa, Sigma Xi.

PUBLICATIONS

The closing response in *Dionaea*. (*With W. H. Brown.*) *Bot. Gaz.* **49**: 290-302
1910.—The embryo sac of *Epipactis*. (*With W. H. Brown.*) *Ibid.* **52**: 439-452.
1911.—The embryo sac of *Physostegia*. *Ibid.* **52**: 218-225. 1911.—Spermatogenesis
in *Equisetum*. *Ibid.* **54**: 89-119. 1912.—The orchid embryo sac. *Ibid.* **54**: 372-385.
1912.—Somatic chromosomes in *Vicia*. *La Cellule* **29**: 297-331. 1913.—Spermato-
genesis in *Marsilia*. *Bot. Gaz.* **58**: 419-431. 1914.—Maturation in *Vicia*. (*Prelimi-
nary note.*) *Ibid.* **57**: 531. 1914.

WINFRED MCKENZIE ATWOOD

A.B., Cornell College, Mount Vernon, Iowa, 1907; Ph.D. (Plant Physiology and Plant Morphology), Chicago, August, 1913

ASSOCIATE PROFESSOR IN THE DEPARTMENT OF BOTANY
AND PLANT PATHOLOGY, OREGON AGRICULTURAL
COLLEGE, CORVALLIS, OREGON

Instructor in Botany, Oregon Agricultural College, 1913-15; Associate Professor, 1915—. Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., Sigma Xi.

PUBLICATION

A physiological study of the germination of *Avena fatua*. Bot. Gaz. **57**: 386-414. 1914.

JOHN BENJAMIN HILL

B.S.Agric., University of Missouri, Columbia, Missouri, 1908; A.B., Cornell University, Ithaca, New York, 1909; Ph.D. (Plant Morphology and Plant Physiology), Chicago, August, 1913

ASSOCIATE PROFESSOR OF BOTANY, PENNSYLVANIA STATE COLLEGE, STATE COLLEGE, PENNSYLVANIA

Assistant Professor of Botany, Pennsylvania State College, 1913-15; Associate Professor, 1915—.

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer., Sigma Xi.

PUBLICATION

The anatomy of six epiphytic species of *Lycopodium*. Bot. Gaz. 58:61-85. 1911-1914.

LEE IRVING KNIGHT

A.B., University of Illinois, Urbana, Illinois, 1902; S.B., The University of Chicago, Chicago, Illinois, 1909;
Ph.D. (Plant Physiology and Plant Ecology), Chicago, August, 1913

INSTRUCTOR IN PLANT PHYSIOLOGY, THE UNIVERSITY OF CHICAGO,
CHICAGO, ILLINOIS.—PLANT PHYSIOLOGIST, WEST VIRGINIA
EXPERIMENT STATION, MORGANTOWN, WEST VIRGINIA

Present positions, 1913—.

Member: Amer. Assoc. Adv. Sci., Gamma Alpha.

PUBLICATIONS

Effect of illuminating gas and ethylene upon the flowering carnation. (*With W. Crocker.*) *Bot. Gaz.* **46**: 256–276. 1906.—The peg of the Cucurbitaceae. (*With W. Crocker and Edith Roberts.*) *Ibid.* **50**: 321–339. 1910.—Effects of various gases and vapors upon etiolated seedlings of the sweet pea. (*With W. Crocker and R. C. Rose.*) *Science N. S.* **31**: 635–636. 1910.—Toxicity of smoke. (*With W. Crocker.*) *Bot. Gaz.* **55**: 337–371. 1913.

JOHN NATHAN MARTIN

A.B., Indiana University, Bloomington, Indiana, 1907; Ph.D. (Plant Morphology and Plant Physiology),
Chicago, August, 1913

ASSOCIATE PROFESSOR OF BOTANY, IOWA STATE COLLEGE,
AMES, IOWA

Present position, 1913—

Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., Iowa Acad. Sci.

PUBLICATIONS

The physiology of the pollen of *Trifolium pratense*. *Bot. Gaz.* **56**: 113-126. 1913.
—Comparative morphology of some Leguminosae. *Ibid.* **58**: 154-167. 1914.—Red
clover seed production. (*With J. M. Westgate and H. S. Coe.*) U. S. Dept. Agric.
Bull. 289. 1915.—Relation of moisture to seed-production in alfalfa. Iowa State
College Research Bull. 23. 1915.

LOREN CLIFFORD PETRY

B.S., Earlham College, Richmond, Indiana, 1907; B.S., Haverford College, Haverford, Pennsylvania, 1908;
Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, August, 1913

INSTRUCTOR IN BOTANY, SYRACUSE UNIVERSITY,
SYRACUSE, NEW YORK

Research, The University of Chicago, 1913-14; Instructor in Botany, Syracuse University, 1914—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer.

PUBLICATIONS

Branching in the Ophioglossaceae. *Bot. Gaz.* **59**: 345-365. 1915.—The anatomy of *Ophioglossum pendulum*. *Ibid.* **57**: 169-192. 1914.

NORMA ETTA PFEIFFER

S.B., The University of Chicago, Chicago, Illinois, 1909; Ph.D. (Plant Morphology and Plant Physiology),
Chicago, August, 1913

ASSISTANT PROFESSOR OF BOTANY, UNIVERSITY OF NORTH DAKOTA,
UNIVERSITY, NORTH DAKOTA

Instructor in Botany, University of North Dakota, 1913-15; Assistant Professor, 1915—.
Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., North Dakota Acad. Sci.

PUBLICATIONS

Abnormalities in prothallia of *Pteris longifolia*. *Bot. Gaz.* **53**: 436-438. 1912.—
Morphology of *Thismia americana*. *Ibid.* **57**: 122-135. 1914.—Undiscovered plants.
Quart. Jour. Univ. North Dakota **5**: 43-48. 1914.—The gametophyte of *Ophioglossum*
vulgatum. *Bot. Gaz.*, *in press*.

GEORGE SMITH BRYAN

A.B., Furman University, Greenville, South Carolina, 1900; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, June, 1914

INSTRUCTOR IN BOTANY, UNIVERSITY OF WISCONSIN,
MADISON, WISCONSIN

Present position, 1914—.

Member: Bot. Soc. Amer., Wisconsin Acad. Sci. Arts and Letters.

PUBLICATION

The archegonium of *Sphagnum subsecundum*. Bot. Gaz. **59**: 40-56. 1915.

EDWARD MARIS HARVEY

A.B., Friends' University, Wichita, Kansas, 1910; Ph.D. (Plant Physiology, Plant Ecology and Plant Morphology), Chicago, June, 1914

SCIENTIFIC ASSISTANT, U. S. DEPARTMENT OF AGRICULTURE, BUREAU
OF PLANT INDUSTRY, FRUIT DISEASE INVESTIGATIONS,
WATSONVILLE, CALIFORNIA

Present position, 1914—

Member: Amer. Assoc. Adv. Sci. (Fellow), Amer. Ecol. Soc., Bot. Soc. Amer., National Geog. Soc.

PUBLICATIONS

The action of the rain-correcting atmometer. *Plant World* **16**: 89-93. 1913.—
The castor-bean plant and laboratory air. *Bot. Gaz.* **56**: 439-442. 1913.—Evapora-
tion and soil moisture on the prairies of Illinois. *Trans. Illinois Acad. Sci.* **6**: 92-99.
1913.—The effects of illuminating gas on root systems. (*With R. C. Rose.*) *Bot. Gaz.*
60: 27-44. 1915.—Some effects of ethylene on the metabolism of plants. *Ibid.* **60**:
193-214. 1915.

FLORENCE ANNA McCORMICK

A.B., University of Tennessee, Knoxville, Tennessee, 1897; M.S., 1900; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, June, 1914

ASSISTANT PROFESSOR OF AGRICULTURAL BOTANY, UNIVERSITY OF
NEBRASKA, LINCOLN, NEBRASKA

Present position, 1914—
Member, Bot. Soc. Amer.

PUBLICATIONS

A study of *Symphyogina aspera*. Bot. Gaz. 58: 401-418. 1914.—Some notes on the anatomy of the tuber of *Ipomoea batatas*. *Ibid.*, *in press*.

HANNA CAROLINE AASE

A.B., University of South Dakota, Vermilion, South Dakota, 1906; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, August, 1914

INSTRUCTOR IN BOTANY, WASHINGTON STATE COLLEGE,
PULLMAN, WASHINGTON

Present position, 1914—.
Member, Bot. Soc. Amer., Sigma Xi.

PUBLICATION

Vascular anatomy of the megasporophylls of conifers. Bot. Gaz. **60**: 277-313.
1915.

JOSEPH STUART CALDWELL

B.A., Maryville College, Maryville, Tennessee, 1902; M.A., The University of Chicago, Chicago, Illinois, 1904; Ph.D. (Plant Physiology and Plant Morphology), Chicago, August, 1914

BIOCHEMIST IN CHARGE OF FRUIT BY-PRODUCTS UTILIZATION INVESTIGATIONS, WASHINGTON AGRICULTURAL EXPERI- MENT STATION, PULLMAN, WASHINGTON

Professor of Plant Physiology and Head of Department of Botany, Alabama Polytechnic Institute, Auburn, Alabama, 1912-1916; Alabama State Botanist, Alabama Agricultural Experiment Station, Auburn, Alabama, 1912-1916; Biochemist in charge of Fruit By-Products Investigations, Washington Agricultural Experiment Station, 1916—

Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer., Botanists Cent. States, Phi Beta Kappa, Sigma Xi.

PUBLICATIONS

Effect of toxic agents upon the action of bromelin. *Bot. Gaz.* **39**: 409-419. 1905.—
A primer of hygiene. (*With J. W. Ritchie.*) 1910.—The relation of environmental
conditions to the phenomena of permanent wilting in plants. *Physiol. Res.* **1**: 1-56.
1913.—Some new conceptions of soil infertility. *Proc. Alabama State Hort. Soc.* **9**:
44-59. 1914.—A study of antagonism. *Bot. Gaz.*, *in press.* Chemical changes in the
apple induced by the brown-rot fungus (*Sphaeropsis malorum*). *Jour. Agric. Res.*, *in*
press.—The evaporation of apples and berries. *Washington Agric. Exp. Sta. Tech.*
Bull., *in press.* Physiological role and chemical composition of certain cactus mucilages.
Bot. Gaz., *in press.*

GEORGE BURTON RIGG

B.S., University of Iowa, Iowa City, Iowa, 1896; M.A., University of Washington, Seattle, Washington, 1909; Ph.D. (Plant Physiology and Plant Ecology), Chicago, August, 1914

ASSISTANT PROFESSOR OF BOTANY, UNIVERSITY OF WASHINGTON,
SEATTLE, WASHINGTON

Present position, 1914—.

Member: Amer. Assoc. Adv. Sci. (Fellow), Bot. Soc. Amer.

PUBLICATIONS

Laboratory exercises in elementary botany. (*With T. C. Frye.*) Boston, 1909.—A method of preparing the larger algae. *Plant World* **8**: 202. 1911.—Notes on the ecology and economic importance of *Nereocystis luetkeana*. *Plant World* **15**: 84–92. 1912.—Northwest flora. (*With T. C. Frye.*) Seattle, 1912.—A note on the generations of *Polysiphonia*. (*With A. D. Dalgity.*) *Bot. Gaz.* **54**: 164–165. 1912.—Ecological and economic notes on Puget Sound kelps. U. S. Senate Documents **190**: 179–193. 1912.—The effects of some Puget Sound bog waters on the root-hairs of *Tradescantia*. *Bot. Gaz.* **55**: 314–326. 1913.—Is salinity a factor in the distribution of *Nereocystis luetkeana*? *Bull. Torr. Bot. Club* **42**: 337–342. 1913.—The distribution of *Macrocystis pyrifera* along the American shore of the Strait of Juan de Fuca. *Torreyia* **13**: 158–159. 1913.—Forest distribution in the San Juan de Fuca Islands. *Plant World* **16**: 177–182. 1913.—Elementary flora of the Northwest. (*With T. C. Frye.*) New York. 1914.—Notes on the flora of some Alaska sphagnum bogs. *Plant World* **17**: 167–182. 1914.—The effect of the Katmai eruption on marine vegetation. *Science N. S.* **40**: 509–513. 1914.—The kelp beds of Puget sound. U. S. Dept. Agric. Rept. **100**: 50–59. 1915.—The kelp beds of western Alaska. *Ibid.* **100**: 105–122. 1915.—The size of kelps on the Pacific coast of North America (*With T. C. Frye and W. C. Crandall.*) *Bot. Gaz.* **60**: 473–482. 1915.—Physical conditions in sphagnum bogs. *Ibid.* **61**: 159–163. 1916.

EVA ORMENTA SCHLEY

S.B., The University of Chicago, Chicago, Illinois, 1908; Ph.D. (Plant Physiology and Plant Morphology),
Chicago, August, 1914

ADDRESS: LOS ANGELES, CALIFORNIA

Assistant in Plant Physiology, The University of Chicago, Chicago, Illinois, 1914-15.

PUBLICATION

Chemical and physical changes in geotropic stimulation and response. *Bot. Gaz.*
56: 480-489. 1913.

JAMES PALM STOBER

B.E., First Pennsylvania State Normal School, Millersville, Pennsylvania, 1893; S.B., Bucknell University, Lewisburg, Pennsylvania, 1898; M.S., 1900; Ph.D. (Botany and Zoölogy), Chicago, August, 1914

PROFESSOR OF BIOLOGY, ALBRIGHT COLLEGE,
MYERSTOWN, PENNSYLVANIA

Present position, 1914—.

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer., Sigma Xi.

PUBLICATIONS

Laboratory studies of plants. Myerstown, Pa., 1905.—Plant descriptions. Myerstown, Pa., 1905.—A comparative anatomical study of winter and summer leaves of certain herbaceous plants. *Bot. Gaz.*, *in press*.

HERMANN BACHER DEUTSCH

S.B., The University of Chicago, Chicago, Illinois, 1910; Ph.D. (Plant Morphology,
Plant Physiology and Plant Ecology), Chicago, June, 1915

ASSISTANT EDITOR, CIVIL SERVICE NEWS, CHICAGO, ILLINOIS

PUBLICATION

A study of *Targionia hypophylla*. Bot. Gaz. **53**: 492-503. 1912.—Dissertation:
The effect of light upon the germination of the spores of the true ferns.

JAMES FREDERICK GROVES

A.B., Ewing College, Ewing, Illinois, 1906; Ph.D. (Plant Physiology and Plant Ecology),
Chicago, June, 1915

ASSISTANT PROFESSOR OF BIOLOGY, UNIVERSITY OF WYOMING,
LARAMIE, WYOMING

Present position, 1915—
Member, Amer. Assoc. Adv. Sci.

PUBLICATIONS

Evaporation and soil moisture in cultivated fields. Trans. Illinois Acad. Sci. 1914.
In press.—Life duration of seeds. (With W. Crocker.) Proc. National Acad. Sci.—1:
152. 1915.—A method of prophesying the life duration of seeds. Bot. Gaz. 1916.
In press.

ANDREW HENDERSON HUTCHINSON

B.A., McMaster University, Toronto, Canada, 1909; M.A. Ed., 1911; M.A. Bot., 1913; Ph.D. (Plant Morphology, Plant Physiology and Plant Ecology), Chicago, June, 1915

ASSISTANT PROFESSOR OF BOTANY, AGRICULTURAL AND MECHANICAL
COLLEGE OF TEXAS, COLLEGE STATION, TEXAS

Present position, 1915—.

Member: Bot. Soc. Amer., Gamma Alpha, Sigma Xi.

PUBLICATIONS

The male gametophyte of *Abies balsamea*. *Bot. Gaz.* **57**: 148–153. 1914.—The male gametophyte of *Picea canadensis*. *Ibid.* **59**: 287–300. 1915.—The gametophyte of *Pellia epiphylla*. *Ibid.*, **60**: 134–143. 1915.—Fertilization in *Abies balsamea*. *Ibid.* **60**: 457–472. 1915.—*Keteleeria fortunei*, a conifer endemic of central China. *Ibid.*, *in press*.

RACHEL EMILIE HOFFSTADT

B.S., Hanover College, Hanover Indiana, 1908; Ph.D. (Plant Morphology, Plant Ecology and Plant Physiology), Chicago, September, 1915

INSTRUCTOR IN BOTANY, MILWAUKEE-DOWNER COLLEGE,
MILWAUKEE, WISCONSIN

Present position, 1915—.
Member, Bot. Soc. Amer.

DISSERTATION: The vascular anatomy of *Piper methysticum*.

MILLARD S. MARKLE

B.S., Earlham College, Richmond, Indiana, 1910; Ph.D. (Plant Ecology, Plant Physiology and Plant Morphology), Chicago, September, 1915

PROFESSOR OF BOTANY, EARLHAM COLLEGE,
RICHMOND, INDIANA

Present position, 1915—.

Member: Indiana Acad. Sci., Sigma Xi.

PUBLICATIONS

The root systems of certain desert plants. *Bot. Gaz.*, *in press.*—Peat bogs in the vicinity of Richmond, Indiana. *Proc. Indiana Acad. Sci.*, *in press.*

MABEL LEWIS ROE

A.B., Vassar College, Poughkeepsie, New York, 1903; Ph.D. (Plant Morphology and Plant Ecology),
Chicago, September, 1915

ADDRESS: HULL BOTANICAL LABORATORY, THE UNIVERSITY OF CHICAGO,
CHICAGO, ILLINOIS

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer.

PUBLICATION

The development of the conceptacle of *Fucus*. Bot. Gaz. **61**: 231-246. 1916.

CHARLES ALBERT SHULL

S.B., The University of Chicago, Chicago, Illinois, 1905; Ph.D. (Plant Physiology, Plant Morphology and Plant Ecology), Chicago, September, 1915

ASSOCIATE PROFESSOR OF PLANT PHYSIOLOGY AND GENETICS,
UNIVERSITY OF KANSAS, LAWRENCE, KANSAS

Present position, 1915—.
Member: Amer. Genetic Assoc., Bot. Soc. Amer., Botanists Cent. States, Ecol. Soc.
Amer. National Geog. Soc.

PUBLICATIONS

Oxygen pressure and the germination of *Xanthium* seeds. *Bot. Gaz.* **48**: 387-391. 1909.—The oxygen minimum and the germination of *Xanthium* seeds. *Ibid.* **52**: 453-477. 1911.—Semipermeability of seed-coats. *Ibid.*, **56**: 169-199. 1913.—Luther Burbank and his work. *Trans. Kansas State Hort. Soc.* **32**: 222-230. 1913.—The role of oxygen in germination. *Bot. Gaz.* **57**: 64-69. 1914.—Physiological isolation of types in the genus *Xanthium*. *Ibid.* **59**: 474-483. 1915.—Measurement of the internal forces of seeds. *Trans. Kansas Acad. Sci.* **27**: 65-70. 1915.

ARTHUR GIBSON VESTAL

A.B., University of Illinois, Urbana, Illinois, 1911; Ph.D. (Botany and Zoölogy),
Chicago, September, 1915

TEACHER OF BOTANY, EASTERN ILLINOIS STATE NORMAL SCHOOL,
CHARLESTON, ILLINOIS

Present position, 1915—.

Member: Bot. Soc. Amer., Ecol. Soc. Amer., Sigma Xi.

PUBLICATIONS

An associational study of Illinois sand prairie. Illinois State Lab. Nat. Hist. Bull. **10**: 1-96. 1913.—Local distribution of grasshoppers in relation to plant associations. Biol. Bull. **25**: 141-180. 1913.—Internal relations of terrestrial associations. Amer. Nat. **48**: 413-445. 1914.—A black-soil prairie station in northeastern Illinois. Bull. Torr. Bot. Club **41**: 351-363. 1914.—Prairie vegetation of a mountain-front area in Colorado. Bot. Gaz. **58**: 377-400. 1914.—Foothills vegetation in the Colorado Front Range. *Ibid.*, *in press*.

SARAH LINCOLN DOUBT

B.S., University of Nebraska, Lincoln, Nebraska, 1903; Ph.D. (Plant Physiology, Plant Ecology and Plant Morphology), Chicago, December, 1915

ADDRESS: HULL BOTANICAL LABORATORY, THE UNIVERSITY OF CHICAGO,
CHICAGO, ILLINOIS

DISSERTATION: Response of plants to gas.

GEORGE KONRAD KARL LINK

S.B., The University of Chicago, Chicago, Illinois, 1910; A.M., University of Nebraska, Lincoln, Nebraska
1912; Ph.D. (Plant Physiology and Plant Ecology), Chicago, March, 1916

ASSOCIATE PROFESSOR OF AGRICULTURAL BOTANY, UNIVERSITY OF
NEBRASKA, AND ASSISTANT IN BOTANY IN THE NEBRASKA
AGRICULTURAL EXPERIMENT STATION,
LINCOLN, NEBRASKA

DISSERTATION: A physiological study of Fusarium in relation to potato disease.

EDITH ADELAIDE ROBERTS

A.B., Smith College, Northampton, Massachusetts, 1905; S.M., The University of Chicago, Chicago, Illinois, 1911; Ph.D. (Plant Ecology and Plant Physiology), Chicago, March, 1916

ASSOCIATE PROFESSOR OF BOTANY, MOUNT HOLYOKE COLLEGE,
SOUTH HADLEY, MASSACHUSETTS

PUBLICATIONS

The peg of the Cucurbitaceae. (*With W. Crocker and L. I. Knight.*) *Bot. Gaz.* **50**: 321-339. 1910.—The plant successions of the Holyoke range. *Ibid.* **58**: 432-444. 1914.—The distribution of beach plants. *Ibid.* **60**: 406-411. 1915.—The epidermal cells of roots. *Ibid.*, *in press.*

FRANK EARL DENNY

A.B., University of Nebraska, Lincoln, Nebraska, 1906; Ph.D. (Plant Physiology, Plant Morphology, Plant Ecology and Physical Chemistry), Chicago, June, 1916

ADDRESS: HULL BOTANICAL LABORATORY, THE UNIVERSITY OF CHICAGO,
CHICAGO, ILLINOIS

Member: Bot. Soc. Amer., Phi Beta Kappa, Sigma Xi.

DISSERTATION: Permeability of certain plant membranes.

ALPHAEUS WILLIAM DUPLER

A.B., Juniata College, Huntingdon, Pennsylvania, 1911; Ph.D. (Plant Morphology and Plant Ecology),
Chicago, June, 1916

PROFESSOR OF BOTANY (ELECT), LAWRENCE COLLEGE,
APPLETON, WISCONSIN

Member: Amer. Assoc. Adv. Sci., Bot. Soc. Amer.

DISSERTATION: The gametophytes of *Taxus canadensis* Marsh.

LESLIE ALVA KENOYER

A.B., Campbell College, Holton, Kansas, 1906; A.M., University of Kansas, Lawrence, Kansas, 1908; Ph.D. (Plant Ecology, Plant Physiology and Plant Morphology), Chicago, June, 1916

PROFESSOR OF BIOLOGY, EWING CHRISTIAN COLLEGE,
ALLAHABAD, INDIA

Member: Bot. Soc. Amer., Iowa Acad. Sci., Phi Kappa Phi, Sigma Xi.

DISSERTATION: Environmental influences on nectar secretion.

