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LEWIS RALPH JONES

1864—1945

A Biographical Memoir by

J. C. WALKER AND A. J. RIKER

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Biographical Memoir

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L. R. Jones

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December 5, 1864—April 1, 1945

BY J. C. WALKER AND A. J. RIKER

THE LIFE of Lewis Ralph Jones coincides with a period in American history during which agriculture rose to the status of a well-established science. He was born at Brandon, Wisconsin, on December 5, 1864, about two years after President Lincoln signed the Morrill Act. This provided land grants to each state, the proceeds of which were to establish instruction in agriculture and mechanical arts. When Jones died in his eighty-first year, on April 1, 1945, at Orlando, Florida, agricultural science had reached a high level in the United States. His chosen sector in that field, plant pathology, shared a leading role with other branches of plant science.

His father, David Jones, a native of the borderland of England and Wales, moved to America in 1828, and eventually settled on a tract of land acquired from the U. S. Government in Metomen township of Fond du Lac County, Wisconsin. His mother, Lucy Jane Knapp, was born at Starksboro, Vermont, and at an early age moved, with her parents, into the same community, where the village of Brandon was later established. This couple was married in 1856. Lewis Ralph was the third of six children. His mother, before marriage, had taught in a local rural school. Her interests in nature, in culture, and in religion were impressed upon her children. When she recognized the scholarly aptitudes in Ralph, she used her strong influence and made the necessary sacrifices to encourage his intellectual development. After completion of his elementary education in the rural school, he entered high school at Brandon. Here he came under the influence of a gifted educator, Kirk Spoor, who, as principal of the school,

promptly recognized the intrinsic talent of this young man. All through his life, Jones had the highest respect for and a deep sense of gratitude to Spoor for the encouragement and inspiration he received from him. Today one may find a memorial to this man on the grounds of Brandon High School. It was placed there at the instigation of Jones who, characteristically, remained in the background even while the unveiling of the tablet was carried out by the local citizenry. To the casual observer, it is the tribute of a grateful community to an outstanding local educational leader. To the better informed, it is Jones's tribute to the man whose encouragement, with that of Jones's mother, started him on an outstanding career in plant science.

Ripon College, located a few miles from Brandon, was a pioneer private institution sponsored by the Congregational Church in this rapidly developing agricultural frontier. It was natural that Jones should begin his college career in 1883 at Ripon. Here he benefited from association with C. Dwight Marsh, Professor of Chemistry and Biology. After three years, he was encouraged to transfer to the University of Michigan. This decision was, no doubt, influenced by a natural leaning toward biology and specifically toward medicine. At this time the University of Michigan was an outstanding center of training in medicine in the middle west. Fortunately, in those days medical students were exposed early to botany. At Michigan, Jones came into contact with Volney M. Spalding, Professor of Botany, as well as with Victor C. Vaughan and Frederick G. Novy, professors of physiological chemistry. Although these three outstanding leaders in their respective fields were busy men, they recognized the promise and encouraged the talent of undergraduate Jones.

After a year at Michigan, Jones found it necessary to replenish his exchequer by teaching natural science at Mt. Morris Academy in Illinois for nearly two years, in 1887 and 1888. It was here that his interest in biological science was broadened and his abilities with students were tested. His outstanding career as a teacher had begun. The need for better understanding was a challenge to clarify basic prin-

ciples. He could transmit this urge to his students so that long hours in the laboratory or the library were a thrilling and rewarding experience. When he returned to Michigan for his senior year, future plans had been formulated. He abandoned a safer livelihood in medicine for a more enticing and satisfying one in botany. When he completed his Ph.B. in 1889, he received an appointment at the University of Vermont as Instructor in Natural History and Botanist of the Vermont Agricultural Experiment Station.

It is well worth the space to scan briefly the setting which surrounded Jones as he embarked upon his professional career at the turn of the last decade of the nineteenth century. From the standpoint of pathology, the previous eight decades had been a period of controversy and struggle over the nature of infectious diseases in plants and animals. In 1807, Prevost in France had published the first sound evidence of disease incitation by a parasitic microorganism. He dealt primarily with the bunt or stinking smut of wheat. His work was opposed or ignored during four decades until about 1850, when the Tulasne brothers in Paris and twenty-two-year-old Anton DeBary in Berlin revived, accepted, and promoted Prevost's conclusions. The fruitful and influential career of DeBary had brought general acceptance of fungus pathogenicity by the time of his death in 1884. In the 1870s, Burrill at the University of Illinois had established the pathogenicity of bacteria as incitants of fire blight in pear, while Koch in Germany had done the same for anthrax in sheep. In the 1880s, Mayer, in Holland, demonstrated the first transmission of an infectious virus in his classical work on tobacco mosaic, while Erwin F. Smith, in the United States, demonstrated the transmissibility of the peach yellow virus. In this same decade the ravages of the vine downy mildew in the vineyards of France were attracting almost as much public attention as the Irish potato late blight epidemics had done in Europe and in America in the 1840s. The more or less accidental discovery of Bordeaux mixture announced by Millardet in France in 1885 as a successful preventive for the grape disease was equally exciting news. If this were not enough to attract the attention of the

young biologist, still more evidence of public interest in agricultural science was shown by the establishment of a section of mycology in the United States Department of Agriculture in 1886. This was stimulated, no doubt, by the public pressure for research on plant diseases. In 1887, Congress passed the Hatch Act which provided funds to establish an agricultural experiment station in every state in the Union. It was the new experiment station in Vermont which called Jones to assume the post of Botanist.

Erwin F. Smith was ten years older than L. R. Jones. After a relatively long, informal period of schooling, he had entered the University of Michigan where he graduated in 1886, a few months before Jones matriculated. In the succeeding three years, he was beginning his long career in the United States Department of Agriculture, working specifically on the nature of the virus disease of peach, known as yellows. In the spring of 1889, he presented his research in the form of a doctor's thesis at Michigan and appeared for his formal oral examination. Jones had returned to the campus the previous autumn and was approaching the close of his Ph.B. curriculum. Whether or not it was an intuitive impulse on the part of Professor Volney Spalding when he invited young Jones to sit in on the examination we do not know. In any case, it was a fortuitous event for Jones, who referred to this privilege often in later years. This was the beginning of a lifelong friendship between the two men who were to share outstanding leadership in plant pathology for the next four decades. Smith went to Washington and Jones went on to Vermont, but they never lost touch with and deep respect for each other.

The next two decades, spent at the University of Vermont, were clearly a formative period in Jones's development. He married May I. Bennett, a classmate at Ripon College, in 1890. Together they maintained a friendly home, always open to students and friends. She passed away on September 26, 1926, in Madison, Wisconsin.

The state and the institution were both small and the duties were varied and numerous. There was a program of research as Botanist to the Experiment Station to be developed. There were teaching re-

sponsibilities in all phases of botany and forestry. Jones found a group of amateur botanists in the state who, he confessed, knew much more about the native flora of Vermont than he hoped to acquire for some time. Deciding that the best way to speed up the matter was to bring them together for meetings and field excursions, he became the organizer and, for some time, the secretary of the Vermont Botanical Club. Out of these associations came lasting friendships with many New England botanists. More specifically, it resulted in Jones's success in enticing modest and shy Cyrus G. Pringle to abandon his efforts in plant breeding and to become the curator of the University herbarium. Since Pringle was a well-known and successful plant explorer, this appointment resulted in lasting and valuable contacts with the major herbaria of the world.

Interest in forestry, also, Jones found to be scattered and unorganized. He initiated the organization of the Vermont Forestry Association, served for a time as its president, and maintained a vital interest in this field during his entire period in Vermont. He developed the first forest nursery to raise trees for planting. The L. R. Jones State Forest of Vermont is a perpetual tribute to his interest in and service to forestry. It was the first of some fifteen state forests and recreational grounds. One of his students, Anna M. Clark (later to become his second wife), worked with him on trees of Vermont. His research on spring sap flow in sugar maples was especially noteworthy.

While these varied duties and interests led to his recognition as one of the leading American botanists, it is clear from a perusal of his publications that his major attention and scientific growth were concerned with plant pathology. He kept in close contact with Erwin F. Smith who, during the nineties, rose rapidly to world leadership in research in the field of bacterial diseases of plants. During this decade and the early 1900s, Jones spent one or more semester leaves in Washington with Smith, and at Ann Arbor with Spalding. As the subject for his doctor's thesis, to be presented at Michigan later, he chose the bacterial soft rot of vegetables, no doubt with the advice of Smith. The first report of this research was published in German in the

Zentralblatt für Bakteriologie in 1901. The final report was printed as a Vermont Agricultural Experiment Station Bulletin in 1905. On the basis of this work, Jones was awarded the Ph.D. degree at the University of Michigan in 1904. This research was to become a landmark in pathology. It was the first thorough investigation of the mechanisms of infection in bacterial diseases of plants. For more than fifty years, little was added to Jones's painstaking study of exoenzymes in relation to bacterial diseases of plants.

The potato crop was an important one in Vermont. Late blight was the most destructive disease. Much of Jones's time from 1890 to 1910 was devoted to studies of this malady. He, with his associates, confirmed the findings of De Bary, and added new knowledge of the disease cycle. He was one of the first to establish the use of Bordeaux mixture on the crop in America.

About 1900, a new interest was being kindled in disease resistance in plants. W. A. Orton, one of Jones's students, had joined Erwin F. Smith's staff in 1899 and was sent immediately to South Carolina to study the cotton wilt disease which was devastating the sea-island cotton industry. Orton's rapid and phenomenal success in developing wilt-resistant cotton varieties was watched closely by Jones, who visualized a similar solution for the late blight of disease of potatoes. In 1904, in addition to completing his doctor's thesis, he traveled from April to September in Europe. He carried a commission from the United States Department of Agriculture to collect potato varieties of value for late blight resistance. He brought back some ninety such varieties which became the basis of a cooperative study with William Stuart, Horticulturist at the Vermont Experiment Station. As Stuart later joined the United States Department of Agriculture, this collection became one of the foundation stones in the national potato breeding program. For Jones it established a lifelong and deep-seated devotion to the subject of disease resistance in plants.

In 1909, Jones accepted a call to the University of Wisconsin, as Professor of Botany. It was the plan of R. A. Harper, head of the botany department, to develop courses and research in plant pathol-

ogy within the department. This came at a time when national interest in plant pathology was developing rapidly. Jones was, at the time, a leading spirit in the relatively new Botanical Society of America. He served as its vice president in 1910 and as its president in 1913. It was during his presidency that the journal of the Society, *American Journal of Botany,* was established. He served on the editorial committee from 1914 to 1916 and from 1919 to 1921. Shortly after the establishment of the Botanical Society, there also developed a movement for a special society for plant pathologists. Although Jones was not an active member of the organizing group, upon the final organization of the American Phytopathological Society he was elected as its first president in 1909. In 1911, he became the first editor in chief of the society's new journal, *Phytopathology.*

During the first year of Jones's long residence at the University of Wisconsin, which began on February 1, 1910, several new departments were in the making in the College of Agriculture under the able leadership of Dean Harry L. Russell. Among these were departments of Economic Entomology and Experimental Breeding (now Genetics). Russell also sought authority from the Regents to establish a Department of Plant Pathology. This was opposed by Harper. Jones, characteristically, stayed out of the controversy. In the end, it was left to President Charles R. Van Hise to settle the issue. He ruled in favor of a Department of Plant Pathology in the College of Agriculture. Thus, Jones transferred to the latter college in the autumn of 1910 and organized the new department.

Already well grounded in botany in the broad sense and fully appreciative of the scientific needs of agriculture, Jones was well fitted to meet the peculiar needs immediately ahead in plant pathology. He realized that the future growth of plant pathology rested upon the best possible postgraduate training along with high-grade research, and devoted the next twenty-five years of his active life to furthering this objective. His graduate school grew steadily as he drew students from most states and many foreign countries. Gradually, he added to and strengthened his supporting staff.

Jones's success in the development of an outstanding graduate department rested upon several fundamental principles. The first of these was an innate interest in young people and their development. He realized, however, that there was little to be gained in expending his efforts on individuals who were temperamentally or inherently unfit to become good scientists. He felt that a successful teacher of science must be continually on the alert for students whose talents fit them peculiarly for a career in science. This conviction is well illustrated in an anecdote which he told to others more than once. During their Vermont days together, Cyrus Pringle made frequent collecting trips in Mexico and often tried, without success, to get Jones to accompany him. On this particular occasion, as an inducement, Pringle, in his enthusiasm, exclaimed: "Jones, if you will only come along with me, you may even have the thrill of discovering a new plant." Jones's quiet answer was, "Yes, Pringle, and so I might, but while you are in Mexico, I may have the thrill of discovering a new scientist." In spite of this faculty of sizing up and selecting his students carefully, there never was a teacher or adviser who was more patient and sympathetic with his students, nor one who strove harder and with more success in bringing out the best talents of the individual. Many a time he deftly guided a temperamental student or colleague away from personal or selfish ideas and induced him to respond to the fundamental challenge of scientific achievement—a challenge that could be accepted best with teamwork. Such inspiration was so strong that he never had to crack the whip. He maintained smooth cooperation between men and departments by drawing vivid pictures of important goals to be achieved. He once remarked, concerning his great and good friend, Liberty Hyde Bailey, that the latter had the uncanny faculty of "bringing out the Bailey" in those with whom he was associated. Perhaps he little realized his own great talent of "bringing out the Jones" in his own students and associates.

Jones insisted that successful training in plant pathology must be built on a thorough foundation in botany. Thus, most of his students spent more graduate course hours in botany than in plant pathology.

He insisted on having an up-to-date departmental library and directed his courses in such a way that students became familiar with the literature of their special field. His seminars laid strong emphasis on the history of plant pathology, the nature of parasitism and disease resistance, the relation of climatic factors to disease development, and other fundamental topics. An important feature of his educational method was the principle of learning by doing. He insisted on holding the formal course instruction to a minimum in order that each student might have more time for original research.

He believed that the best way to develop the research instincts of the student was to have plenty of research going on about him. Thus, in spite of increasingly heavy administrative duties, he set a pace for his staff and students by always having a number of research problems under way. His long list of scientific papers attests to his continuous productivity as a scientist. At the time of his retirement in 1935, nearly 150 doctor's degrees had been granted to students majoring in his department. However, his world-wide reputation in the field of plant pathology rests as much, if not more, upon the continuous flow of original research papers from his laboratory.

His own researches and those of his graduate students were centered for the most part around two important themes: the relation of environal factors to disease development and the nature of disease resistance. Before he left Vermont, he was keenly aware of the fact that research in plant pathology during the previous fifty years had become predominantly one of describing new diseases and their pathogens, with little attention being given to the importance of environal factors. He initiated in his laboratory at Wisconsin, an intensive study of certain of these factors. He chose soil-inhabiting pathogens for study because it was obviously easier to make initial progress with this group. With his associates he perfected thermostatically controlled equipment in which plants could be grown over a range of constant soil temperatures. This equipment became widely known as the "Wisconsin soil-temperature tank." With this equipment and with supplementary devices, many plant diseases

were studied and the focus of attention on phytopathological research was influenced remarkably under his leadership.

He also recognized that many diseases were not likely to be brought under control by sprays, dusts, or seed treatments, particularly those in which the pathogen concerned was a soil inhabitant. Impressed by the work of Orton with cotton wilt and by that of giving more attention to the development of disease-resistant crop Bolley in North Dakota with flax wilt, he championed the idea of plants.

When he reached Wisconsin in 1910, he witnessed the important cabbage-growing industry being crippled by the devastating disease known as yellows. His phenomenal success in bringing this disease under control within six years by development of a successfully resistant variety attracted wide attention. This stimulated further work along similar lines with other diseases and crops. Although he never turned away from important practical research, he always stressed, at the same time, the need of search for underlying principles. It was characteristic of him that he encouraged and urged everyone around him to seek out the factors which made some plants resistant while others were susceptible. It was insistence on such fundamental studies in his laboratory that added greatly to the foundations of what is today an important phase of remarkable accomplishments in plant improvement.

It is natural that a man of such outstanding ability and leadership should be drafted into many extracurricular activities. While he shunned many such calls within and without the University, he seldom refused to give support to what he considered a worthy cause for which he could wisely spare the time.

His contributions to the Vermont Botanical Club, the Forestry Association of Vermont, the American Phytopathological Society, and the Botanical Society of America have already been noted. He was elected to the National Academy of Sciences in 1920, and was one of the organizers of the Division of Biology and Agriculture of the National Research Council, on which he served as vice-chairman

from 1919 to 1921 and as chairman in 1922. During his period of service on the Council, *Biological Abstracts* was launched on its successful career. The Tropical Research Foundation, of which he was president from 1924 to 1943, was founded during this period. He was on the original board of trustees of the Boyce Thompson Institute for Plant Research and continued to serve for the rest of his life. In 1934, he was appointed by Franklin D. Roosevelt to the President's Science Advisory Board.

Professor Jones was a regular attendant at scientific meetings of plant science societies. He was vice president of Section O of the American Association for the Advancement of Science in 1924, chairman of the Section of Mycology and Plant Pathology of the Fifth International Botanical Congress at Cambridge, England, in 1930, and an honorary president of the Third International Congress of Microbiology in New York City, 1939.

He received many honors. Honorary degrees were conferred upon him by the University of Vermont (1910), Cambridge University (1930), University of Michigan (1935), and University of Wisconsin (1936). He held honorary membership in the following foreign societies: British Association of Applied Biologists, Phytopathological Society of Japan, Société de Pathologie Vegetale et Entomologie Agricole de France, Verein für Angewandte Botanik, Germany.

Professor Jones had many nonprofessional interests. He was a lover of the out-of-doors, who enjoyed long hikes in summer and winter and frequently organized parties of his students to accompany him. In his fifties he took up golf and became an enthusiastic devotee. He was a member and regular attendant of the First Congregational Church of Madison and served a term as deacon. He was a regular and later an honorary member of the Rotary Club of Madison, an association which he greatly enjoyed and which he continued after retirement.

On July 27, 1929, he married Anna M. Clark, who survives him. In 1930, he asked to be relieved of administrative responsibilities and devoted his time to finishing research projects in progress and in

travel. Professor and Mrs. Jones spent several months of 1930 visiting laboratories in the British Isles, western Europe, and Russia, and in attendance at the Fifth International Botanical Congress at Cambridge, England. In 1931, they traveled extensively in Japan, Korea, China, and Hawaii. After his retirement, in 1935, they continued to visit colleagues and friends, with headquarters during the summer at Brookfield, Vermont, and during the winter at Orlando, Florida.

Professor Jones never lost interest in the field of plant pathology to which he had contributed so much. He always welcomed visits and letters from his former students and never ceased to keep up a lively interest in their progress and welfare. It is the privilege of few to contribute so much to human welfare so quietly and with such dignity. As he passed away without illness or pain during the night of March 31, 1945, science lost one of its great pathologists.

KEY TO ABBREVIATIONS

Agr. Sci.=Agricultural Science
Amer. Jour. Bot.=American Journal of Botany
Bot. Gaz.=Botanical Gazette
Bul. Torrey Bot. Club=Bulletin of the Torrey Botanical Club
Commis. Agr. Maine Ann. Rpt.=Annual Report of the Commission of Agriculture of Maine
Contrib. Boyce Thompson Inst.=Contributions from the Boyce Thompson Institute
Jour. Agr. Res.=Journal of Agricultural Research
Jour. Amer. Soc. Agron.=Journal of the American Society of Agronomy
Jour. Bact.=Journal of Bacteriology
Mass. State Bd. Agr. Ann. Rpt.=Annual Report of the Massachusetts State Board of Agriculture
Nat. Acad. Sci. Biogr. Mem.=National Academy of Science Biographical Memoirs
N. Y. State Agr. Exp. Sta. Tech. Bul.=New York State Agricultural Experiment State Technical Bulletin
Peking Nat. Hist. Bul.=Peking Natural History Bulletin
Proc. Amer. Seed Trade Assn.=Proceedings of the American Seed Trade Association
Proc. Assn. Amer. Colls. and Exp. Stas.=Proceedings of the Association of American Colleges and Experiment Stations
Proc. Fifth Internat. Bot. Cong.=Proceedings of the Fifth International Botanical Congress
Proc. Internat. Cong. Plant Sci.=Proceedings of the International Congress of Plant Sciences
Proc. Nat. Acad. Sci.=Proceedings of the National Academy of Sciences
Proc. N. Y. Hort. Soc.=Proceedings of the New York Horticultural Society
Proc. Soc. Prom. Agr. Sci.=Proceedings of the Society for the Promotion of Agricultural Science
Proc. Third Internat. Cong. Microbiol.=Proceedings of the Third International Congress of Microbiology
Trans. Mass. Hort. Soc.=Transactions of the Massachusetts Horticultural Society
Trans. Wis. Acad. Sci., Arts, and Letters=Transactions of the Wisconsin Academy of Sciences, Arts, and Letters
U. S. Dept. Agr. Bur. Plant Indus. Bul.=United States Department of Agriculture Bureau of Plant Industry Bulletin
U. S. Dept. Agr. Farmers' Bul.=United States Department of Agriculture Farmers' Bulletin
U. S. Dept. Agr. Off. Exp. Sta. Bul.=United States Department of Agriculture Office of Experiment Stations Bulletin

Vt. Agr. Exp. Sta. Ann. Rpt.=Annual Report of the Vermont Agricultural Experiment Station
Vt. Agr. Exp. Sta. Bul.=Vermont Agricultural Experiment Station Bulletin
Vt. Bot. Club Bul.=Vermont Botanical Club Bulletin
Vt. Commr. Agr. Rpt.=Vermont Commissioner of Agriculture Report
Vt. State Bd. Agr. Rpt.=Vermont State Board of Agriculture Report
Vt. State Hort. Soc. Ann. Rpt.=Annual Report of the Vermont State Horticultural Society
Wis. Agr. Exp. Sta. Cir.=Wisconsin Agricultural Experiment Station Circular
Wis. Agr. Exp. Sta. Cir. Inf.=Wisconsin Agricultural Experiment Station Circular of Information
Wis. Agr. Exp. Sta. Bul.=Wisconsin Agricultural Experiment Station Bulletin
Wis. Agr. Exp. Sta. Res. Bul.=Wisconsin Agricultural Experiment Station Research Bulletin
Wis. Col. Agr. Ext. Serv. Cir.=University of Wisconsin College of Agriculture Extension Service Circular
Wis. Potato Growers' Assn. Ann. Rpt.=Annual Report of the Wisconsin Potato Growers' Association
Wis. Potato Growers' Assn. Bul.=Wisconsin Potato Growers' Association Bulletin
Wis. State Cranberry Growers' Assn. Ann. Rpt.=Annual Report of the Wisconsin State Cranberry Growers' Association
Wis. State Hort. Soc. Ann. Rpt.=Annual Report of the Wisconsin State Horticultural Society
Zent. f. Bakt.=Zentralblatt für Bakterologie, Parasitenkunde und Infektionskrankheiten

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