

## Fellows of The American Phytopathological Society



**JOHN GRIEVE BALD** was born in Victoria, Australia, September 1, 1905. He attended Scotch College in Melbourne and received the Bachelor of Agriculture Degree from the University of Melbourne in 1928 and a Master's degree from the same institution in 1931. In 1928, Dr. Bald began his scientific studies as Assistant Research Officer for the

Australian Council for Scientific and Industrial Research. He went to England for additional training in 1933 and received the Ph.D. from Cambridge University in 1935.

Returning to Australia in 1937, Dr. Bald was Research Officer for the Australian Council for Scientific and Industrial Research until 1943 when he advanced to Senior Research Officer with the same organization—a position he held until 1948.

In 1948, Dr. Bald accepted a position as Associate Professor with the University of California, Los Angeles. He was advanced to Professor and Plant Pathologist in the Experiment Station in 1952. In 1967, he transferred to the Riverside Campus of the University following termination of agricultural research on the Los Angeles campus. Dr. Bald became Emeritus Professor in July 1973 after 45 years of research, teaching, and service to the field of plant pathology.

Dr. Bald enjoys an international reputation in plant virology. In some of his earliest papers in the 1930's, he and his colleagues developed the first information on the etiology of one of the classical virus diseases, spotted wilt of tomato and other hosts. During his graduate studies at Cambridge University, Dr. Bald combined mathematical models and biological systems to develop quantitative methods for comparing virus concentrations based on production of local lesions. In these studies, the mathematical precision that has characterized Bald's work first became evident. Indeed, throughout his career, he has pioneered in the use of statistics in inoculum potential-host interaction studies.

Other aspects of Dr. Bald's research which have contributed to his reputation in virology are his development of information on the particulate nature of TMV before that virus was visualized with the electron microscope. He has studied symptomless virus diseases and virus latency, and has demonstrated the benefits to be gained by eliminating viruses from propagative stock and by the production of uniform plants for virus studies.

In other basic investigations, Dr. Bald studied viruses at the cellular level and developed efficient staining methods which enabled observation of cytological changes in virus-infected cells. He has studied ecological relationships of virus strains, the genetic origin of viruses, and has purified and characterized various mutants of

TMV. More recently, he developed a novel concept of the 3-D model of TMV based on information from X-ray and chemical analyses and has become interested in the genetic origin of viruses and the taxonomic groupings of plants in relation to their susceptibility to viruses.

In addition to his major interest in basic virology and the control of virus diseases, Dr. Bald has made significant contributions to the control of fungus and bacterial diseases of bulbous ornamentals.

Dr. Bald has made substantial contributions to the teaching program at the University of California, both at Los Angeles and at Riverside. He taught an introductory course in plant pathology, has given lectures in a graduate course on principles of plant pathology, and with G. A. Zentmyer has taught and is still teaching an advanced plant pathology course for graduate students.

Dr. Bald's eminence as a scientist has been widely recognized. He has been awarded a Guggenheim Fellowship on two occasions (1956-57 and 1963-64) and in 1970-71 was the recipient of a Fulbright Research Fellowship for studies in Australia and Asia. He also has presented invitational lectures at international congresses and conferences.

Although he retired from active service in the University of California in 1973, he is still actively and enthusiastically engaged in research on viruses and continues to publish in this area.



**AGESILAU ANTONIO BITANCOURT** was born in Brazil in 1899, but one month later his family moved to Paris where he lived until 1919. After graduating from the Institut National Agronomique and the University of Paris (licencié-ès-science, docteur - ès - science). Back in Brazil, he occupied in succession the posts of assistant plant pathologist of the recently

founded Biological Institute for Plant Protection; professor in charge of botany, phytopathology, and microbiology in the College of Agriculture of the University of São Paulo; director of the Forage Crops Experiment Station of the Ministry of Agriculture of Brazil; head of the plant pathology section, director of the division of plant biology and director general of the Instituto Biológico de São Paulo. He retired in 1969.

He is Servitor Emeritus of the State of São Paulo, an emeritus member of The American Phytopathological Society, member of the Brazilian Academy of Science and of several other scientific and professional societies, corresponding member of the Société Philomatique de France, fellow of the American Association for the Advancement of Science and of the John Simon Guggenheim Foundation (1941-1942). In 1972, the

Caribbean Division of The American Phytopathological Society gave him their Special Award of Merit for Distinguished Service in Tropical Plant Pathology.

His work has included studies of the diseases of citrus and coffee, the spot anthracnose fungi (*Elsinöe* spp. - *Sphaceloma* spp.), and (in recent years) plant cancer and the plant hormones responsible for cancerous growth. He is recognized for some 300 scientific articles appearing in journals in Brazil, the United States of America, France, and other countries. He has traveled world-wide to attend a score of international scientific congresses and meetings.

As director of the Instituto Biologico he organized between 1949 and 1952 the full-time year-long training of plant pathologists and other of its specialists, an activity that was complemented by lectures and conferences in Brazil and several foreign countries, including the United States of America.



**JOSEPH MICHAEL DALY** was born April 9, 1922 in Hoboken, New Jersey. He obtained a B.S. degree in 1944 from the University of Rhode Island where he was one of many who were influenced into plant pathology by F. L. Howard. After receiving his M.S. in 1947 and a Ph.D. in 1952 at the University of Minnesota, he taught biology

for three years at the University of Notre Dame. In 1955, he joined the University of Nebraska as Assistant Professor of Plant Pathology, and was promoted through the ranks to Professor in 1958. From 1962 to 1964 he served as Chairman of Plant Pathology, and in 1964 he moved into the position of Professor of Biochemistry and Nutrition. He was honored by the University of Nebraska in 1966 by being named C. Petrus Peterson Professor of Biochemistry. He served as Interim Director, School of Life Sciences, during 1973-74, the first year after its formation.

Most of Dr. Daly's research has been on the physiology of wheat infected with rust. At successive stages of his career, he has examined rust-free and rusted wheat as to nutrition, respiration, carbohydrate metabolism, the role of hormones, translocation of metabolites, and the role of phenolic compounds and of ethylene in host-parasite interactions. He has also investigated the physiology and biochemistry of rust uredospore germination.

Perhaps as important as the facts Daly uncovered is the rigorous philosophy he brought to physiological investigations of plant diseases. Daly demonstrated that real contributions depend upon careful attention to details, both in biochemical methodology and in control and observation of the disease cycle. A scientific skeptic, Mike Daly demands exacting proof before he will accept a theory, whether his own or that of others. Few are his equal when it comes to finding inconsistencies in logic or flaws in experimental data. Accepting no assumptions as

to reasonable or expected behavior, he tests all possible explanations and frequently disproves his own hypotheses before they see the light of day. He has been known to perform a similar service for the hypotheses of others.

Informed and constructive criticism is one of the most valuable components in the growth of a science and a scientist. By providing it, Dr. Daly has contributed greatly to the growth of physiological plant pathology.

In addition to his research, Dr. Daly has supervised the training of graduate students and postdoctoral associates, and has been an inspiring and dedicated teacher of both undergraduate and graduate students. He has contributed to professional activities outside the University as a consultant and as a reviewer of grant proposals. He is a member of the editorial board of the periodical, *Physiological Plant Pathology*, and has served as a reviewer of books and journal articles for a number of other scientific organizations. He has helped organize and has participated by invitation in a number of national and international conferences and symposia. In addition to APS, he is a member of AAAS, AIBS, American Society of Plant Physiologists, and Society of American Microbiologists.



**JOHN FREDERICK FULKERSON** was born in Los Angeles, California on February 20, 1922. He received the B.S. degree from Case Western Reserve University in 1949, and the M.S. from North Carolina State University in 1951. He served as extension plant pathologist-entomologist for West Virginia University from 1951 to 1953, after which

he returned to North Carolina State University and received the Ph.D. degree in 1957. He then joined the Agricultural Research Service of the USDA and worked on bacterial diseases of legumes until, in 1960, he assumed his present position as Principal Plant Pathologist in the Cooperative State Research Service of the USDA.

Dr. Fulkerson has specialized in research planning, and in coordination and evaluation in plant pathology and nematology in public and private institutions throughout the U.S. He has also been involved in planning and evaluation of regional and national research on all aspects of plant disease control. His unique understanding of local as well as national and international aspects of science has involved him in many special assignments. These have ranged from committee and task force assignments at agency and departmental levels to interagency and university-sponsored assignments. Such activities have been concerned with pesticides, corn blight, mycotoxins, basic research, the international biological programs, research personnel selection systems, biological control of disease, and plant disease loss assessment. In these assignments, Dr. Fulkerson's persuasive and effective efforts to strengthen the

profession and to obtain support for research in plant pathology and nematology are well-known.

Dr. Fulkerson's achievements in research and science administration have received much recognition. He received USDA outstanding performance awards in 1965 and 1970, a Career Education Award from the Ford Foundation-National Institute of Public Affairs in 1965, a USDA Certificate of Merit in 1971, and a USDA Superior Service Award in 1973. He has served APS as a member of several subject-matter and special committees and continues to represent APS in The Agricultural Research Institute of the National Research Council. He is a member of the Editorial Committee of the Annual Review of Phytopathology and has served as an Associate Editor of the Journal of Nematology.

Through a unique blend of administrative ability and a depth of knowledge of plant pathology and biology, Dr. Fulkerson has earned the respect and confidence of his colleagues all over the world.



#### JAMES WESSEL GERDEMANN

was born on November 13, 1921, in Warrenton, Missouri. He received his B.A. and M.A. degrees in botany from the University of Missouri in 1945 and 1946, and his Ph.D. degree in plant pathology from the University of California at Berkeley in 1948. He began work as a plant pathologist at

the University of Illinois in 1948 and advanced through the academic ranks to Professor in the Department of Plant Pathology by 1959. Dr. Gerdemann has been held in high regard at Illinois as a teacher of forest pathology to advanced undergraduate and graduate students. His early research concentrated on root diseases of legume crops and he demonstrated that a species, *Mycoleptodiscus terrestris*, in a new fungal genus was an important cause of a root rot of legumes. During this period he and M. B. Linford studied a cyst-forming nematode attacking clovers in Illinois. Among his other contributions were papers dealing with various soil-borne diseases, stem diseases, and phytoalexins.

His first papers on vesicular-arbuscular (VA) mycorrhizae appeared in 1955, and work on the difficult fungi involved was later to become his major interest. He spent one sabbatical leave in the laboratory of T. H. Nicolson in 1961-62 and another in 1969-70 with J. M. Trappe studying VA mycorrhizae. Dr. Gerdemann's most important research has been on the group of fungi which form such mycorrhizae. The identity of these endophytes had long been a matter of speculation, and their cultivation in cell-free media has yet to be convincingly demonstrated. Dr. Gerdemann played an important role in the accumulation of evidence indicating that these fungi are species of Endogonaceae. His investigations have resulted in major contributions to the evidence that certain diseased plants, severely stunted and chlorotic

(e.g., citrus seedlings in partially sterilized or fumigated soil) can be cured by inoculation with species of Endogonaceae. Such diseased plants were previously considered to be suffering from toxins produced in the soil by prior heat or chemical treatments designed to control pests.

Dr. Gerdemann has described the unique wound-healing process that occurs in the hyphae of certain species of Endogonaceae. He and his associates have adduced convincing evidence that the VA mycorrhizae can greatly increase the uptake of phosphorus from the soil, improve growth, and increase water transport in plants. Key contributions of Dr. Gerdemann have been to dispel the idea that only forest trees can benefit from mycorrhizal associations, and to initiate a realization that mycorrhizal enhancement of growth and yield can be important in agronomic and horticultural crops. His work has also been an important factor in amassing the evidence that mycorrhizal associations are virtually ubiquitous among cultivated plants.

He and his colleagues have raised pertinent questions about the relative importance of root hairs and mycorrhizae in many situations where it is still commonly assumed that the root hairs of the host plant are the only absorbing organs involved. They have also stimulated interest in new approaches to the manner in which phosphorus moves from soil into plants. They clearly demonstrated that "the mycelial network of endomycorrhizal fungi enables plants to remove phosphorus from a larger soil volume, extending beyond the immediate vicinity of the root surface." It is also likely that phosphorus is not the only essential nutrient element which may have its absorption affected by VA mycorrhizae. At present, an increasing assessment of the role of VA mycorrhizae on an increasing number of crop plants is underway in large part because of the work of Dr. Gerdemann and his colleagues.

Dr. Gerdemann has also contributed significantly to the techniques and controls that have been necessary to the advancement of this esoteric field of research; for example, the collection of spores of Endogonaceae from soil by wet-sieving and decanting, the use of washings from spores and crushed spores as controls in spore inoculation, and the increase of inoculum in pot cultures of plants grown in sterilized soil to which selected spores have been added. These techniques adapted for basic research in this area may be expected to be important in the development of possible future commercial applications.

The 1968 review by Dr. Gerdemann entitled "Vesicular-arbuscular mycorrhiza and plant growth" was an important stimulus to research in this field. The Endogonaceae have been a difficult group of fungi to deal with taxonomically and the classification of the Endogonaceae of the Pacific Northwest by Gerdemann and Trappe should be an important aid to future work in this field.

In 1969, Dr. Gerdemann was co-chairman of the First North American Conference on Mycorrhiza. He has served two terms as an associate editor of *Phytopathology*.



**WILLIAM FREDERICK MAI** was born in Greenwood, Delaware, on July 23, 1916. He attended public schools in Delaware and earned his B.S. degree in agriculture at the University of Delaware in 1939. Following completion of studies for the Ph.D. degree at Cornell University in 1945, he served in the U.S. Navy. In 1946, Dr. Mai returned to

Cornell where he advanced to Professor of Plant Pathology in 1952. His outstanding career as a plant nematologist resulted from his imaginative approaches to teaching, from his pioneering research on the golden nematode of potato, and from his balanced interest in extending results of research to the field of growers.

Dr. Mai developed the first course in plant nematology at Cornell in 1955. His enthusiastic contributions to teaching plant nematology have extended to various National and Regional workshops. Most recently, he served as co-director of a nematology workshop in Peru. His "Pictorial Key to Genera of Plant Parasitic Nematodes", a reference work used widely throughout the world, illustrates his original approach to teaching and his desire to simplify presentations. Many of his students now hold responsible positions in the United States and abroad.

Dr. Mai's early work on the golden nematode established the principles on which the U.S. quarantine program for this important pathogen is based. He helped identify sources of resistance to the nematode in potato, and played a key role in coordination of state and federal programs for golden nematode control. His cooperative research efforts with colleagues have resulted in significant improvements in replanting procedures for fruit trees in the Northeast, and for control of nematodes in vegetable crops.

Dr. Mai was co-editor of the two-volume treatise, "Plant Parasitic Nematodes", published in 1971, and he was chairman of the committee that produced "Control of Plant-Parasitic Nematodes" for the National Academy of Sciences in 1968. Because of his expertise in control of nematodes, he is a frequent consultant to companies concerned with nematode problems in the tropics. In 1973, he was a member of a US - AID Pest Management Study Team in Turkey, Iran, Afghanistan, and Pakistan. Currently he is a consultant to the International Potato Center in Peru.

Dr. Mai served the Northeast Division of APS as Secretary, Vice-President, and in 1963 as President. He was APS Councilor for the Northeast Division in 1968. He served as Vice-President and President of the Society of Nematologists in 1968 and 1969, respectively. He has also been an energetic participant in faculty affairs of Cornell University. He is a member of Sigma Xi and Phi Kappa Phi, which he served as Treasurer of the Cornell Chapter in 1971. His broad outlook on the role of nematodes in plant production, his successful merging of basic and applied aspects of plant nematology, and his

deep interest in helping growers overcome problems, have combined to make him an internationally respected plant pathologist.



**PASCAL POMPEY PIRONE** was born October 7, 1907, in Mount Vernon, New York. He received the B.S. degree from Cornell in 1929, pursued graduate studies there as a Farm Bureau Fellow, and received the Ph.D. in plant pathology in 1933. From 1933 to 1934 he served as field assistant and project leader in the Dutch elm disease

eradication program of the U.S. Dept. of Agriculture, Bureau of Plant Industry. In 1934, he was appointed assistant professor of plant pathology at Cornell where he served until 1938 when he was appointed associate professor at Rutgers. In 1947, he became plant pathologist in charge of disease and insect control at the New York Botanical Garden, and for many years he served as Senior Plant Pathologist and Director of Education at the Garden. After he retired from the Garden, he continued to serve as a consultant on trees, shrubs, and landscape maintenance for a large number of major organizations and industrial firms.

In a distinguished career spanning more than forty years, Dr. P. P. Pirone has made outstanding contributions to the practice of, and the dissemination of knowledge about, the prevention and control of plant diseases. Early in his career, while he was at Cornell and Rutgers, he published a number of papers and bulletins on the nature and control of diseases of vegetables, turf, ornamentals, and shrubs. After joining the New York Botanical Garden he became involved in service and educational programs designed to alleviate disease problems in an urban environment.

Dr. Pirone is best known for the books he has written, especially for "Tree Maintenance" now in its fourth edition and "Diseases and Pests of Ornamental Plants" originally coauthored by Dodge and Rickett and now also in its fourth edition. In addition to other books and technical papers, Dr. Pirone has written scores of articles for newspapers and magazines. He has also lectured widely on diseases and pests of trees, shrubs, ornamentals, and vegetables.

In addition to his writing and work at the Botanical Garden, Dr. Pirone is nationally recognized for his work as Consultant on tree and shrub problems and on landscape maintenance. Among the major organizations he has served and continues to serve are: the United Nation's Headquarters, Bethlehem Steel Corp., American Metals Refining (Climax-Molybdenum), International Business Machines, Liberty Mutual Insurance Co., and a half-dozen public utility companies. This service provides further evidence that Dr. Pirone is a recognized authority in his field of specialization.



MILTON N. SCHROTH, born June 25, 1933, in Fullerton, California, received the B.A. degree from Pomona College, Claremont, California, in 1955, and the Ph.D. degree in Plant Pathology from the University of California, Berkeley, in 1961. He joined the staff of the Department of Plant Pathology, University of California, Berkeley, in 1961

and advanced to Professor of Plant Pathology in 1970.

In the early stages of his research career Dr. Schroth demonstrated that root exudates stimulated germination of resting structures of pathogenic fungi in soil; for this and other significant discoveries in this general area, Dr. Schroth (with F. F. Hendricks, Jr.) received the A.I.B.S. Campbell Award for outstanding vegetable research in 1964.

A change in his research responsibilities at the University of California redirected his efforts from diseases caused by fungi to bacterial diseases. During the intervening years Dr. Schroth has become a recognized leader in the field of plant pathogenic bacteria and bacterial diseases and his research has been an outstanding example of the effective interfacing of basic and applied research. Whereas his primary focus had been on the comparative nutrition, physiology, and taxonomy of the genera, *Pseudomonas* and *Erwinia*, his work and that of his associates has resulted in practical means for controlling several major bacterial diseases of important crops in California. For example, a long-term sustained effort to control fireblight disease of pears has resulted in development of methods utilizing a selective medium for monitoring epiphytic populations of *E. amylovora*. Results from these studies are of immediate practical value, because by correlation of bacterial populations with pertinent weather information, accurate predictions of disease occurrences can be made routinely by field personnel; thus, application of bactericides need not be applied by timed schedule, but only when needed. This program is the first of its kind for a bacterial disease and is being used as a model for control of other bacterial diseases. Other work on the fireblight disease demonstrated a frequent occurrence of streptomycin-resistant strains and also that relative susceptibility was related to arbutin-hydroquinone contents of pear blossoms and foliage.

Similar effective work has been done by Dr. Schroth and associates on control of the crown gall disease of fruit trees and other hosts. Through nutritional studies, a selective medium was developed for assay of *Agrobacterium tumefaciens* in field soils and a chemotherapeutic formula was developed and patented for selective elimination of tumorous tissues in infected hosts.

Dr. Schroth and associates have shown that a damaging root rot of sugar beets is caused by an *Erwinia* sp. and that a serious epiphytic resulted from the widespread planting of newer cultivars with a high susceptibility. To control this problem, procedures have been developed for eliminating susceptible breeder stocks so that new releases will have a higher level of resistance.

In a somewhat different type of work Dr. Schroth and associates have cooperated with medical microbiologists to demonstrate that *Pseudomonas aeruginosa*, cause of an important nosocomial (hospital-contracted disease) is commonly present in agricultural soils and can be introduced into hospitals on common food and ornamental plants.

Another important contribution by Schroth and associates is the demonstration that antibiotic-resistance factors (R-factors) can be transferred from *P. aeruginosa* to several plant pathogenic pseudomonads by conjugation. This finding suggests the possibility for conjugative transfer of other characteristics in plant pathogenic pseudomonads.

Dr. Schroth's active and imaginative research program through the years has attracted numerous students and postdoctorates who have worked with him. He has regularly offered a course on bacteria in relation to plant diseases which provides students with a thorough up-to-date introduction to plant-pathogenic bacteria.

Dr. Schroth has distinguished himself not only as a scientist but as university administrator as well. During the six years, he has served as Associate Dean in the College of Natural Resources at Berkeley and also for the past year and one-half as Assistant to the Vice-President of the Division of Agricultural Sciences in the statewide University of California.

Dr. Schroth has served on numerous A.P.S. committees, as an Associate Editor of *Phytopathology*, and has participated in numerous international symposia on plant pathogenic bacteria and plant pathology.