Fellows

Thirteen members of The American Phytopathological Society are honored as Fellows of the Society at the 1991 Annual Meeting in St. Louis, Missouri. Election as a Fellow is a reflection of the high esteem in which a member is held by his or her colleagues. The award is given in recognition of outstanding contributions in extension, research, teaching, or other activity related to the science of plant pathology, to the profession, or to the Society.

Salomon Bartnicki-Garcia

Salomon Bartnicki-Garcia was born in Mexico City on May 18, 1935. He received his B.S./M.S. degree in microbiology from the National Polytechnic Institute in Mexico City in 1957 and a Ph.D. in microbiology from Rutgers University in 1961 under the direction of Professor W. J. Nickerson.

Dr. Bartnicki-Garcia joined the faculty of the Department of Plant Pathology at the University of California-Riverside in 1962 as assistant microbiologist and lecturer. He was promoted to associate professor in 1968 and professor of plant pathology and microbiology in 1971. He was appointed chairman of the Department of Plant Pathology in 1989 and continues to serve in that capacity. Bartnicki-Garcia's research and teaching have been in the area of physiology of fungi with emphasis on cell wall chemistry and morphogenesis.

Bartnicki-Garcia's research over a 25-year period has clarified many aspects of the structure and biosynthesis of the cell walls of fungi. Early in his career he intensively studied dimorphic growth in *Mucor* species, which showed that under certain O_2/CO_2 conditions filamentous cells changed into a yeast phase. This research led him to recognize the role of the cell wall and its biosynthesis in determining fungal morphology. Using biochemical and ultrastructural techniques, he identified the cell wall polymers in fungi, as well as storage carbohydrates and glycoprotein components of the cell walls. His research has contributed to our knowledge of the basic biochemistry and ultrastructure of the genus *Phytophthora* and evolutionary trends in fungi.

Bartnicki-Garcia's contributions to the biosynthesis of chitin in fungal cell walls and elucidation of the role of the chitosomes and subcellular vesicles in this process are among his most outstanding contributions to microbiology. Most recently, in conjunction with colleagues in the Mathematics and Computer Science Department at Riverside, he has proposed a new mathematical model for fungal morphogenesis that helps explain how fungal cells acquire their characteristic shapes.

Major publications in Bartnicki-Garcia's career include "Cell wall chemistry, morphogenesis, and taxonomy of fungi," *Annual Review of Microbiology*, 1968 (this paper was identified by the Institute of Scientific Information as a Citation Classic); "Synthesis of cell wall microfibrils in vitro by a 'soluble' chitin synthetase from *Mucor rouxii*" (with J. Ruiz-Herrera), *Science*, 1974 (the paper was a cover feature article and earned the authors the Paper of the Year Award from the Botanical Society of America); "Structure and transformation of chitin synthetase particles (chitosomes) during microfibril synthesis in vitro" (with C. E. Bracker and J. Ruiz-Herrera), *Proceedings of the National Academy of Science of the United States*, 1976 (this work was the basis for the Ruth Allen Award); *Phytophthora: Its Biology, Taxonomy, Ecology, and Pathology* (coedited with D. C. Erwin and P. H. Tsao), 1983, APS (the first modern comprehensive treatise on these fungi); and "Computer simulation of morphogenesis: Mathematical basis for the hyphal (tip) growth" (with F. Hergert and G. Gierz), *Protoplasma*, 1989 (a recent novel contribution).

Bartnicki-Garcia has contributed significantly to several professional societies representing biochemistry, microbiology, and plant pathology, notably, the Mycological Society of America and APS, in which he has actively participated since 1964. He has been a member of the APS Mycology Committee since 1983 and was chairman of the committee in 1986. He has served as a member of the editorial board of *Mycologia* (1974–1979) and the editorial board of *Microbiological Reviews* (1976–1979). He was a cofounder and senior editor of *Experimental Mycology* (1977–1982). His reputation in the field of microbiology is attested by the fact that he has given 140 invited lectures in 18 different countries throughout the world over the past 30 years.

Bartnicki-Garcia is recognized as one of the outstanding biochemical mycologists of his generation. His work has been recognized by citations from the Botanical Society of America and the Mycological Society of America. He was a recipient of a Senior Fellowship from the European Molecular Biology Association and was elected Fellow of the American Association for the Advancement of Science and honorary member of the British Mycological Society. In 1983 he was awarded the Ruth Allen Award (with two collaborators) for elucidation of the role of chitosomes and subcellular vesicles in the synthesis of chitin in the cell walls of fungi.

Bartnicki-Garcia's research has contributed greatly to our understanding of fungal development, and he has stimulated progress in related research on plant infection and mechanism of fungicide action.

Marvin K. Beute

Marvin K. Beute was born in Jenison, MI, on March 3, 1935. After high school graduation in 1953, he worked for a number of years, eventually becoming owner and operator of his own small business. These practical work experiences were invaluable in the development of innovative experiments as his research career developed in later years. He graduated in 1963 from Calvin College, Grand Rapids, MI, with an A.B. degree in education, and earned his Ph.D. degree from Michigan State University, where he conducted research under the direction of Dr. John Lockwood. As a graduate student at Michigan State, he received the Ernst A. Bessey Award in recognition of outstanding scholarship.

Dr. Beute accepted a position as assistant professor in the Department of Plant Pathology at North Carolina State University in 1968. From 1968 to 1970, he was stationed at the Horticultural Crops Research Station, Castle Hayne, with extension and research responsibilities on diseases of ornamental bulbs. Upon the retirement of Dr. W. E. Cooper, he was assigned to a research program on diseases of peanut, together with instructional responsibilities on the main campus at Raleigh.

Within a very short time, Beute organized and had under way a highly productive research program on soilborne diseases of peanut. His progress was augmented by the contributions of outstanding graduate students whose research he very capably directed. He was also soon recognized as one of the outstanding teachers on campus. The Agronomy Club named him outstanding instructor in the School of Agriculture and Life Sciences in 1971, based upon his performance in the principal undergraduate course in plant pathology. Moreover, his graduate course, Epidemiology and Plant Disease, receives high course evaluation ratings and attracts large numbers of students, particularly non-plant pathology majors. Beute was an invited speaker at the Epidemiology Teach-In at the 1981 APS meeting and a research leader for the 1981 Research Apprenticeship Program (USDA Office of Higher Education, Science and Education Administration) for minority high school youth. Beute has also served on the NCSU College of Agriculture's Teaching Improvement Committee and has planned and chaired a Teaching Effectiveness Seminar and Workshop.

While emphasis of his research and that of his students has focused on the soilborne pathogens of peanut, particularly those of Cylindrocladium black rot, southern stem rot (*Sclerotium rolfsii*), Sclerotinia blight (*Sclerotinia minor*), and pod rot (*Pythium myriotylum*), he has also provided leadership for developing germ plasm and cultivars resistant to *Aspergillus* (aflatoxin production) and the peanut stripe and tomato spotted wilt virus diseases. His use of spatial analysis of *Cylindrocladium* inoculum in the soil has been essential in allowing the successful, long-term use of partial resistance to this disease. More recently, pathogenicity, resistance, and inheritance studies have been conducted on the leaf spot diseases of peanut caused by *Cercosporidium personatum* and *Cercospora arachidicola*. His biological and epidemiological research undergirds an equally strong and productive plant breeding program, in which he is a principal collaborator. This collaboration has resulted in one of the foremost peanut breeding programs in the country.

Beute and his colleagues have made significant contributions in elucidating the effects of environmental stresses on expression of disease resistance and determining how disease resistance can be enhanced through the use of suppressive soil phenomena induced by cropping rotations and resistant cultivars and species. He has identified innovative management practices for improved disease control, characterized and quantified rate-reducing resistance in advanced breeding lines, investigated the stability of resistance under various inoculum densities and temperature regimes, and determined the efficacy of currently available chemicals used in combination with resistance and cultural practices.

Although Beute's research and that of his students is directed toward conceptual understanding of basic biological and epidemiological principles, his objectives always concern the practical application of these principles to minimizing plant disease in commercial agriculture. In recent years he has contributed to the peanut portion of a Collaborative Research Support Program. He is considered one of the world's leading peanut disease epidemiologists.

Beute was promoted to professor in 1978 and during that same year he took a study leave at Auburn University, where he and Dr. R. Rodríguez-Kábana collaborated to study factors affecting germination of sclerotia and growth of the southern stem rot fungus, *Sclerotium rolfsii*. In 1982, he and his plant breeder colleagues, Drs. J. C. Wynne and H. T. Stalker, received substantial support over a 5-year period from US-AID for peanut varietal improvement in Thailand and the Philippines. This grant was extended at the same level of funding through 1990.

Beute is a member of APS, the American Peanut Research and Education Association, the North Carolina Academy of Science, the Southern Association of Agricultural Scientists, and Gamma Sigma Delta. He has served the American Peanut Research and Education Association as its Finance Committee chairman and on numerous subject matter and program committees. He has served as associate editor of *Phytopathology*, *Plant Disease*, and *Peanut Science*.

Ilan Chet

Ilan Chet was born on April 12, 1939, in Haifa, Israel. He obtained a B.S. in 1962, an M.S. in 1964, and a Ph.D. in 1968, all from the Hebrew University of Jerusalem. In 1967 he was appointed instructor in microbiology, and in 1969 and 1972 he was named lecturer and senior lecturer in agricultural microbiology, respectively. He continued up the academic ladder and was promoted to associate professor of agricultural microbiology in 1975 and professor of microbiology in 1978 at the Hebrew University of Jerusalem. Dr. Chet served as department head and later as dean of the Faculty of Agriculture of the Hebrew University of Jerusalem from 1986 to 1990.

Chet is a plant pathologist specializing in microbial interactions in the soil and is an international authority on fungal physiology and biological control of plant diseases.

He was one of the first to demonstrate the involvement of sulfhydryl groups and sulfhydryl-blocking agents in the morphogenetic process of sclerotia formation. His group reported the effect of L-threonine on carbohydrate metabolism and changes in cyclic AMP in the fungus *Sclerotium rolfsii*. This led to the discovery of the essential role of oxalic acid in pathogenicity. Some of his earlier research included studies on the composition of fungal cell walls and how they can be degraded by lytic enzymes, as well as novel ways of inducing resistance in plants by lytic enzymes, and naturally occurring phenols.

These studies, as well as his work on fungal cellular biology, led to his major research area in biological control. In this research, Chet's uniqueness lies in his integration of various approaches, from the ecology of fungi in the soil to the isolation of potential biocontrol agents. He has worked extensively with *Trichoderma* species: their fermentation, their formulation, and the application and study of their mechanism of action. He developed a semisolid fermentation for *Trichoderma*, which is now used in many laboratories. He early recognized the involvement of lectins in fungal interactions, and this led to a greater understanding of the basis of *Trichoderma* specificity. Chet's widely accepted theory that mycoparasitism is a complex process involving chemotropic growth recognition, attachment, and lysis has been internationally recognized. A large program on the application of biological control is now in progress. Chet recently initiated studies on the genetic manipulation of biocontrol agents and has found new strains of *Trichoderma* derived from protoplast fusion.

In collaboration with his colleagues, he cloned a gene coding for chitinase into *Escherichia coli* and demonstrated a role for chitinase in biological control. Moreover, Chet has championed the integration of biological control with sublethal doses of fungicides for controlling disease. Most of Chet's work is original in concept and combines biochemical with ecological approaches. Recently, he has devoted much time to developing several new programs of biotechnology at the Hebrew University. He was recently elected chairman of the Committee for Special Projects of the International Society of Plant Protection. Chet was one of the initiators and founders and later the chairman of the new Otto Warbug Center for Biotechnology in Agriculture, in Rehovot.

Chet has supervised 60 M.S. and Ph.D. students and has published extensively in international journals and books. He edited a book entitled "Innovative Approaches to Plant Disease Control," which received excellent reviews in various international journals, including Dr. Deacon's, which states, "few technical books can be read from cover to cover with interest and fascination, but this book achieves this feat."

Chet has been invited as visiting professor to Harvard and Colorado State universities and also to Lund University, in Lund, Sweden. He was appointed Richard Merton Professor and DFG

Professor in Göttingen, Germany, and has received three prestigious Israeli prizes for plant protection, as well as the Heinrich Christian Burckhardt Medal for distinguished research from the Georg-August University, Göttingen. Recently, he received an honorary doctorate from Lund University. He is recognized by his colleagues as both a research scientist and an educator.

Richard H. Converse

Richard Hugo Converse was born on September 18, 1925, in Greenwich, CT, and spent his first 5 years in Japan, where his parents were missionaries. He went through primary and secondary schools in Tucson, AZ, and completed the B.S. degree in plant pathology (one of two that year in a class of 5,000) in 1947 at the University of California in Berkeley. The following year he completed an M.S. degree in agronomy at the University of California at Davis. He then continued at Davis, in the Department of Plant Pathology, to obtain the Ph.D. degree in 1951, working on the nutrition of the barley stripe fungus (*Pyrenophora graminea*) under the direction of Dr. Byron Houston.

After a 2-year assignment as assistant professor of plant pathology at South Dakota State University in Brookings, teaching plant pathology and working on sorghum diseases, Dr. Converse accepted an assignment with the USDA at Oklahoma State University in Stillwater to work on pecan diseases. He developed the first use of eradicant fungicides for controlling the overwintering stage of scab disease of pecan (*Cladosporium caryigenum*), together with new information on its sporulation.

It is for his contribution to small fruit pathology, beginning at Beltsville in 1957 and continuing at Corvallis from 1967, that he is best known. His work on small fruit diseases has ranged from studies on *Phytophthora* species in strawberry and raspberry to studies of viral diseases in strawberry, *Rubus* species, and blueberry. His general approach has been to elucidate the complex etiology of the diseases and to develop diagnostic tools and procedures to understand their epidemiology and ecology, thus leading to the elaboration of control methods. His contributions in strawberry virology include the discovery of tobacco streak virus, tomato ringspot virus, and strawberry lethal decline as significant problems in Oregon and, with Dr. Sara Spiegel, the first report of tobacco streak virus in Israel. With several cooperators he has also helped to unravel the complexity of a number of intractable strawberry virus diseases, of which the detailed etiology remains obscure. With Dr. R. R. Martin he partially purified and characterized an isometric viruslike particle associated with the strawberry mild yellow edge disease, and with Martin and others, including Dr. S. Spiegel and Dr. W. Jelkmann, his work was instrumental in the discovery of a potexvirus also associated with this complex. More specifically, in work with Dr. Ruperto Hepp, he was able to show a causal relationship between a sap-transmissible virus and the strawberry mottle disease, and some chemical and physical properties of this virus were later determined in collaborations with Dr. Nobuyuki Yoshikawa. In additional work with Dr. Hepp, Converse established that strawberry pseudo mild yellow edge virus, previously known only in the United States, also occurs in Japan, and that the occurrence of specific dsRNA species was diagnostic for the strawberry pallidosis agent. New records established by Converse in relation to the epidemiology and ecology of strawberry viruses also include the first report of the occurrence of their major vector in Costa Rica.

In *Rubus* disease research, Converse cooperated with Dr. C. D. Schwartze to identify *Phytophthora erythroseptica* as a cause of a root rot condition in red raspberries in the Pacific Northwest. He has also made numerous contributions to *Rubus* virology. His "firsts" for the United States include the discovery (with Dr. B. Y. Endo) of tomato ringspot virus in red raspberry in Maryland, the discovery that raspberry bushy dwarf virus occurs in red and black raspberry in Oregon, and, with colleagues, the discovery of a mycoplasmalike agent associated with a lethal witches'-brooming disease of black raspberry. His work on the etiology, diagnosis, and vectors of the raspberry mosaic virus complex in the eastern United States and especially his application of heat therapy to their elimination from stock plants laid the foundation for nursery production of certified virus-tested raspberries based on indexed mother plants. Converse was one of the first in North America to make use of enzyme-linked immunosorbent assay (ELISA), successfully developing and applying ELISA tests for a variety of viruses of small fruits.

Insofar as the profession of plant pathology is dedicated to elucidating the basic information regarding plant pathogens on which to construct sound methods for their management and control, Converse's career has been exemplary. His work has always maintained relevance to growers' needs, and, over the period 1969–1990, he cooperated with grower groups and state departments of agriculture in Oregon and Washington to develop certification programs for the production of certified nursery stock of strawberry, raspberry, and blackberry from indexed mother plants. He has also developed clones of the major Pacific Northwest cultivars of these crops and of highbush blueberry, freeing them of viruses, as necessary, by a combination of thermotherapy and tissue culture. These stock are distributed annually to requesting state departments of agriculture for distribution to their participating nurseries.

Converse has attracted and trained many graduate students and postdoctoral associates over the years, and his infectious enthusiasm for his profession has also attracted many colleagues to his laboratory for collaborative work. He has also given unstintingly of his time to enriching the profession in such ways as conducting national and international workshops, training visits, and seminars and serving on committees. He has edited or contributed very substantially to such standard resources as the USDA handbook "Virus Diseases of Small Fruits" (No. 631, 1987), the new APS laboratory manual "Serological Methods" (1990), and the forthcoming APS "Compendium of Raspberry and Blackberry Diseases and Insects," as well as several book chapters elsewhere. His numerous contributions to APS include service on several committees and editorial service to *Phytopathology* and *Plant Disease*.

Richard E. Ford

Richard E. Ford was born in Des Moines, IA, on May 25, 1933. He was raised on a 200-acre crop and livestock farm in central Iowa, received a B.S. degree in botany from Iowa State University in 1956, and completed his M.S. and Ph.D. degrees in 1959 and 1961, respectively, in the Department of Plant Pathology at Cornell University. From 1961 to 1965, Dr. Ford was a USDA research plant pathologist and assistant professor at Oregon State University, where he worked on viral diseases of pea. In 1965, Ford joined the faculty of Iowa State University as an associate professor, specializing in corn and soybean viruses; he advanced to professor in 1969. In 1972, Ford was appointed head of the Department of Plant Pathology, University of Illinois.

Ford has served APS in nearly every capacity. He has served on 13 standing committees, serving twice on the editorial board

of *Phytopathology*. He was councilor and president of the North Central Division and secretary of APS. His contributions in these capacities led to his election as president of APS. In 1983, Ford presided over the Diamond Jubilee 75th annual meeting at his alma mater, Iowa State, where in his presidential address he challenged members to "aim for the highest common denominator."

During his administration at Illinois, Ford has directed a dynamic and expanding department, which developed to its present stature primarily through his guidance. Seventeen of the current faculty were appointed during his tenure. Largely through his efforts, seven new faculty and six new support staff positions were created. He directed the move into a new building in 1979, and, partly through his endeavors, a new field laboratory and new greenhouse facilities were added.

Ford emphasizes interdepartmental cooperation. In the early 1970s, Ford was the primary architect and promoter of the interdepartmental Plant Clinic at Illinois, where specialists from all disciplines of the plant sciences cooperate in diagnosing problems. He was also instrumental in developing the interdepartmental undergraduate major in crop protection. Since its inception, B.S. degrees have been awarded to nearly 100 undergraduates, several of whom have continued their education to obtain M.S. and Ph.D. degrees in plant pathology. Likewise, Ford has championed interdisciplinary research. For example, he cochaired a multimillion dollar soybean integrated pest management (IPM) program that was one of four crop components of a 17-university consortium of IPM. This program led directly to the development of the current regional organization of IPM research by the experiment stations within the land-grant system.

In addition to his administrative accomplishments, Ford has made significant research contributions to plant virology. He is the author of 80 scientific articles in refereed journals, 35 of which have been published since he assumed administrative duties at Illinois. Of his research at Iowa State, M. H. V. Van Regenmortel wrote, "Ford pioneered plant virus-plant root research." Ford's studies of maize dwarf mosaic virus (MDMV) probed basic areas, such as how chloroplasts were involved in virus replication, and applied areas, such as the epidemiology of MDMV in sweet corn and the incorporation of resistance to MDMV. Recently, Ford, with co-workers, used new biotechnological methods to study the viral RNA genome, especially the N-terminal portion of the coat protein, which allowed them to establish a new taxonomy for the sugarcane mosaic group of potyviruses. Ford's research has revealed new information, especially in purification and characterization, on 16 different plant viruses.

Because of his breadth of knowledge, reputation for hard work, and ability to work in harmony with others, Ford is frequently asked to serve international and national organizations, such as the International Society for Plant Pathology, the Rockefeller Foundation, the Consortium for International Crop Protection (current chairman of the board), various USDA IPM programs, numerous USDA-CSRS review panels, and the American Soybean Association, and statewide on scientific boards, advisory to the Illinois Soybean Program Operating Board, the Illinois Crop Improvement Association, and Illinois Foundation Seeds, Inc.

Ford is a member of several professional societies. He has been honored as a Fellow of the American Association for the Advancement of Science and the Indian National Academy of Sciences. In 1989, he received an award of merit from the Iowa State University Alumni Association. In 1990, he received the APS North Central Division Distinguished Service Award.

Dedicated service to others, foresight to plan and initiate new ideas and programs, and a keen competitive spirit to excel are fundamental elements of Ford's character. Ford has zealously devoted his career to the advancement of our science and professional societies. Ford's pursuit of excellence and his work ethic are summed up best in the closing remarks of his presidential address to APS, "There is no shortcut. To be good is demanding, exhausting, and fatiguing, and it takes as much perspiration as it does inspiration."

Dennis Gonsalves

Dennis Gonsalves was born on April 2, 1943, in Kohala, on the island of Hawaii. He received a B.S. degree in horticulture in 1965 and an M.S. degree in plant pathology in 1968 from the University of Hawaii. He obtained his Ph.D. degree in plant pathology at the University of California at Davis in 1972. He was appointed assistant professor of plant pathology, Agricultural Research and Education Center, in Lake Alfred, FL, in 1972, and promoted to the rank of associate professor in 1977. Gonsalves joined the Department of Plant Pathology, New York State Agricultural Experiment Station, Cornell University, Geneva, in 1977 as an associate professor and was promoted to professor in 1986.

Gonsalves is one of those rare scientists who have made outstanding contributions through the complete spectrum of basic to highly practical applied research. Equally at home in a molecular biology laboratory or in a jungle farm patch, Gonsalves has demonstrated a superb ability to recognize disease problems and to design effective and imaginative research programs to solve them.

Gonsalves' interest in plant viruses began when he was a research assistant at the Kauai Branch Station. He identified tomato spotted wilt virus in papaya and continued to investigate this virus in tomato for his M.S. degree. His interest in viruses continued with research on pea enation mosaic for his Ph.D. thesis.

A major contribution during his 6 years in Florida was the purification of citrus tristeza virus and the development of specific antisera. In collaboration with other researchers, his findings substantially contributed to the development of reliable serological procedures for large-scale detection and diagnosis of this virus. Millions of citrus trees have been indexed with this antiserum. In 1977, he shared the Best Paper Award of the Florida State Horticultural Society, and in 1981 he was awarded the Lee M. Hutchins Award (with Garnsey, Purcifull, Clark, and Bar-Joseph). He also established that citrus leaf rugose virus has a multipartite genome and that RNAs 1, 2, and 3 are infective only if the coat protein of the virus is added to the RNA mixture. This phenomenon, termed *protein activation*, had been demonstrated for alfalfa mosaic virus, but Gonsalves showed that it occurs also for prunus necrotic ringspot, rose mosaic, and citrus variegation.

At Geneva, Gonsalves has worked with a variety of fruit and vegetable crops to attack viral problems that are of economic importance, but for which no adequate control measures are available. In the last 12 years, his significant contributions in basic and applied virology have won international respect and admiration. He confirmed the importance of tomato ringspot virus as a fruit crop pathogen, developed rapid and reliable detection methods, and identified resistant rootstocks and cultivars of apples and grapes. Five serotypes of TRSV have been identified and a number of strains have been characterized under his guidance.

His research has greatly advanced our knowledge of leafroll, corky bark, and rupestris stem pitting diseases of grapes, and rapid detection methods developed have contributed significantly toward streamlined indexing programs. Specific antisera to grape viruses developed in Gonsalves' laboratory are also used worldwide. He received a certificate of recognition in 1985 for his grapevine leafroll work from the New York State Department of Agriculture and Markets.

Gonsalves has been a leader in research on control of plant viruses by cross protection. A chemically induced attenuated mutant of papaya ringspot virus (PRV) and a naturally occurring mild strain of zucchini yellow mosaic virus (ZYMV) from France have been used to vaccinate thousands of papaya and squash seedlings against the disastrous effects of PRV and ZYMV. Very

satisfactory results were obtained in field trials in Hawaii, Taiwan, Thailand, Florida, and the Bahamas with PRV and in Hawaii, France, and Taiwan with ZYMV. Recently, he has continued his efforts to genetically engineer plants for virus resistance. In cooperation with other scientists, papaya, cucumber, melon, and summer squash have been successfully transformed with PRV, cucumber mosaic virus (CMV), watermelon mosaic virus, or ZYMV coat protein genes. Transgenic plants have performed well in greenhouse and field trials.

Gonsalves has also done extensive research on CMV. The unusual white leaf disease of tomato was found to be caused by CMV and one of its satellites, and the white leaf satellite has served as a model system for genetic analysis. Gonsalves has also actively participated in a multidisciplinary approach for the control of tomato and lettuce diseases caused by tomato spotted wilt virus in Hawaii.

Gonsalves has been consulted by a number of countries to investigate virus problems and to establish practical programs for detection and control of viruses affecting cardamom, papaya, citrus, and grapevine. He is a technical advisor to the Tianjin Academy of Agricultural Sciences. The international scope of his research programs and his exceptional ability to communicate and teach have attracted researchers and graduate students from throughout the world to his laboratory.

Gonsalves has published extensively. He has served APS as a member of the Virology and Tropical Plant Pathology committees and as an associate editor of *Plant Disease* and *Phytopathology*.

Recently, Gonsalves was selected as the outstanding alumnus for 1991 by the College of Tropical Agriculture and Human Resources, University of Hawaii.

Richard S. Hussey

Richard Sommers Hussey was born on December 18, 1942, in Wheeling, WV. He received a B.A. degree from Miami University, Oxford, OH, in 1965, and M.S. and Ph.D. degrees from the University of Maryland in 1968 and 1970, respectively. From 1970 to 1973, Dr. Hussey worked as a research associate at North Carolina State University, and in 1973 he was the first chief nematologist with the North Carolina Department of Agriculture. He joined the University of Georgia Department of Plant Pathology in 1974 as an assistant professor, becoming professor in 1982.

Hussey's research is providing new information and understanding that are serving as models and catalysts for enhancing modern experimentation and advances in plant nematology. The commitment by Hussey to basic and applied research is evidenced by 70 refereed journal articles, 12 book chapters and invited reviews, and more than 100 other publications. A primary component of his current research program is directed toward characterization of the molecular biology of nematode-host interactions. Of particular interest is the elucidation of the roles played by esophageal secretions of *Meloidogyne* species and their molecular interactions within the host cells. By using monoclonal antibodies to secretory granules, he has shown that the dorsal esophageal gland of these pathogens secretes a glycoprotein that is involved in the host-parasite interaction. An understanding of the processes through which these nematodes are able to alter genomic replication and induce giant cells in host roots is fundamental to nematology, plant pathology, and the study of cellular regulation.

In pursuing practical means of nematode management on cotton and soybean, Hussey developed an interest in the interactions between plant-parasitic nematodes and endotrophic mycorrhizal fungi. He and co-workers demonstrated the important role that these fungi have in enhancing crop tolerance to plant-parasitic nematodes. They documented that certain of these mycorrhizal fungi, such as *Gigaspora margarita* or *Glomus etunicatum*, enhance plant growth and often suppress nematode reproduction.

Hussey developed a method for collecting root-knot nematode egg inoculum that is considered a major contribution to methodology in nematology. This method is now the standard inoculation procedure in root-knot nematode research and forms the basis of screening for root-knot resistance in many plant breeding programs.

Realizing that chemical control options were becoming more limited and less economically feasible, Hussey launched a major collaborative research program on resistance and tolerance in soybean to three root-knot nematode species and *Heterodera glycines*. This joint program, with Dr. H. R. Boerma, has released several new high-yielding cultivars with multiple resistance to these important species of plant-parasitic nematodes. In addition, he has identified commercially available cultivars and plant introductions with tolerance to the soybean cyst nematode and is promoting the concept that tolerant cultivars will enable sustained soybean yields to be attained in soybean rotation programs on nematode-infested land. He and co-workers also showed that compensatory root growth in response to nematode infection is related to tolerance in soybean.

In addition to Hussey's imaginative and successful research program, he has been an effective teacher. Some 13 students have received advanced degrees under his guidance. He has also served on numerous student advisory committees, especially for individuals with research problems on host resistance or tolerance and mycorrhizal fungi-nematode interactions. His dynamic and exciting research program has attracted seven postdoctorate fellows as well as numerous visiting scientists.

The importance of Hussey's accomplishments has been recognized by many groups. The University of Georgia College of Agriculture presented Hussey with three certificates of merit for his research and related extramural support. He was also honored by the university's Agricultural Alumni Association with the 1990 Distinguished Faculty Award for Research. Hussey has served the scientific community with distinction. He was treasurer and has been on numerous committees for the Society of Nematologists, including a term as chairman of the Honors and Awards Committee. He has given his time as a member of the editorial or review boards for the *Journal of Nematology, Phytopathology, Plant Disease*, and *Nematologica*.

Andrew O. Jackson

Andrew O. Jackson was born on April 14, 1941, in Enterprise, AL. He completed his B.S. degree at Oklahoma State University in botany and plant pathology in 1964, and obtained an M.S. degree in plant pathology in 1967 under the direction of Dr. H. C. Young, Jr. He received his Ph.D. degree in plant pathology and physiology from the University of Manitoba in 1970 under the guidance of Drs. D. J. Samborski and Roland Rohringer.

Jackson began his research career in virology as a postdoctoral fellow in the laboratory of Drs. Albert Siegel and Milton Zaitlin, who were then in the Department of Agricultural Biochemistry at the University of Arizona. He joined the Plant Pathology Department at the University of Nebraska in 1971 as a postdoctoral researcher in Dr. Myron K. Brakke's laboratory. He was appointed assistant professor of plant pathology at Purdue University in 1973 and was promoted to associate professor in 1978 and full professor in 1985. He then accepted his current position as professor in

the Department of Plant Pathology at the University of California, Berkeley. During 1981–1982, he took a sabbatical leave as a visiting professor in the Department of Virus Research at the John Innes Institute in Norwich, England.

Although trained in the physiology of fungal pathogens, Jackson's major research contributions have been in plant virology. His earliest studies on the replication of tobacco mosaic virus, published in 1971 and 1972 while he was a postdoctoral fellow with Albert Siegel and Milton Zaitlin, are now considered classics. This work provided some of the first clues on the synthesis of subgenomic messenger RNAs and expression of the genome of TMV. While at Arizona, he and Richard Francki, a visiting professor, also used a novel serological assay for double-stranded RNAs to confirm that Fiji disease virus is a dsRNA virus and is a member of the phytoreoviruses. This serological procedure was subsequently adapted by others to screen fungal isolates for the presence of dsRNA mycoviruses and became the method of choice for this purpose.

At Nebraska, Jackson initiated studies with Myron Brakke on barley stripe mosaic virus. Their discovery of the multicomponent nature of BSMV in 1973 was a landmark contribution in a sustained research program that qualifies Jackson as the world's leading authority on plant hordeiviruses. Notable contributions include the first identification of multiple BSMV replicative RNAs, the application of cDNA cloning to unravel the genome complexity of BMSV, and determination of the complete nucleotide sequence of the virus in collaboration with Gary Gustafson, a former graduate student. Together with his colleagues at Berkeley, he has recently carried out the first successful construction of the complete BSMV cDNA clones, which yield infectious RNA transcripts suitable for genetic analyses. Jackson's research has made the BSMV system a model for molecular genetic analysis of the hordeiviruses, and his research continues to define determinants for host range variability and disease phenotypes.

Jackson has also stimulated advances in knowledge of the physicochemical properties and the molecular biology of the plant rhabdoviruses. This work was initiated in 1977 with the development of a purification procedure for Sonchus yellow net virus, which has also been applied to many different members of the plant rhabdovirus group. Subsequently, the first cDNA cloning and genome expression studies of the plant rhabdoviruses were carried out in his laboratory. These studies and ensuing sequence analyses have provided the only detailed information available on the structure of plant rhabdovirus genomes. These unique contributions have provided an important foundation for understanding the evolutionary and ecological relationships of plant-infecting rhabdoviruses. In addition, Jackson has made contributions on the detection and characterization of several different cereal viruses and on the structure and relationships of satellite viruses and satellite RNAs. His involvement in devising procedures for isolation of polyribosomes from plant tissues has also expedited research on the molecular biology of plants and their fungal pathogens.

Jackson has been active on national and international committees throughout his 25-plus years of APS membership. He served on the APS Virology Committee, served as a member of the ATCC Plant Virus Advisory Committee, and currently serves as a council member for the American Society for Virology. He has contributed to the administration of the USDA Competitive Research Grants, where he was co-program manager for the Plant Genetics Program in 1984 and the Biotechnology Program in 1985. He has also served as a plant pathology panel member for CRGO and on the NSF Genetic Biology Program Panel. In addition, Jackson has been very active as an editor of several journals. He is currently a coeditor of *The Plant Cell*, has served since 1978 as both an associate editor and interim editor of *Virology*, and has also been an associate editor of *Intervirology, Journal of General Virology, Phytopathology*, and *Plant Disease*.

In addition to Jackson's research record, which unquestionably qualifies him as a pioneer in plant molecular virology, he has provided excellent training for several graduate students and postdoctoral fellows. His enthusiasm for research and his demands for quality in research contributions have had an important impact on development of molecular plant virology and on the education of students who have been associated with his laboratory.

Jaacov Katan

Jaacov Katan was born in Baghdad, Iraq, in 1936. He immigrated to Israel in 1951 and attended the Miqve-Israel Agricultural High School, from which he graduated in 1954. He attended the Hebrew University of Jerusalem and studied with Dr. Isaac Whal in the Faculty of Agriculture for his M.S. and Ph.D. degrees. In 1965, he did research with Professor A. Burges on soil fungi at the Hartley Botanical Laboratories, University of Liverpool. Later he received a Fulbright Grant and studied with Dr. J. L. Lockwood at Michigan State University on the effect of pesticides on soil microorganisms. He also did research during sabbaticals with Dr. E. P. Lichtenstein (University of Wisconsin) and with Dr. D. D. Kaufman (USDA, Beltsville).

Katan was appointed an instructor in plant pathology in 1966, in the Department of Plant Pathology at the Hebrew University of Jerusalem, Rehovot. In the following years he was promoted to lecturer, senior lecturer, and associate professor and in 1979 to professor of plant pathology. In 1986 he was elected head of the Department of Plant Pathology and Microbiology at the Hebrew University. Among his teaching assignments, Katan is responsible for three formal courses: Introduction to Plant Pathology (partially), Diseases of Vegetable Crops, and Biology of Soilborne Diseases. Included among his other activities related to teaching is service on committees, such as being the chairman of the Plant Protection Interdepartmental Teaching Studies, chairman of the Graduate Student Committee, and a member of the Central Committee for Planning Life Sciences Studies in the Hebrew University. Since his appointment as lecturer in 1969, Katan has supervised 38 M.S. students and 13 Ph.D. students.

In research, he is recognized for outstanding contributions on the effects of herbicides in relation to the predisposition of plants to disease and to the induction of disease resistance mechanisms. He has also made significant contributions regarding the behavior and degradation of pesticides in soil and the biology and control of soilborne pathogens. Katan has published over 140 scientific papers (articles in refereed journals, chapters, and review articles), in addition to other publications. Among his most noteworthy contributions are those on soil solarization. His paper on solar heating of soil in 1976 in *Phytopathology*, which was published with graduate students and colleagues, stands as a milestone in the literature of plant pathology; it was a signal contribution that focused on the nonchemical control of several of the most serious soilborne plant pathogens and pests. This work stimulated the interest of scientists in at least 39 countries and a cascade of over 300 papers dealing with the control of many additional plant pathogens and pests followed. The principles and mechanisms of soil solarization, including those relating to biological control organisms and the increased growth response of plants in solarized soil, were studied. This also led to international meetings, such as the Symposium on New Applications of Solar Energy in Agriculture in 1989 in Italy and the First International Conference on Solarization in Amman, Jordan, with over 100 scientists from 20 countries attending. The proceedings of the conference are being published by the FAO in Rome. A book on soil solarization, coedited by Katan and J. E. DeVay, is due to be printed in 1991.

Katan is a member of APS; the Israel Phytopathological Society, of which he served as president in 1977–1979; the

Mediterranean Phytopathological Union; and the International Society of Horticultural Sciences. He has served on the editorial board of four scientific journals. He has also served on many national and international committees concerned with broad issues in education, scientific research and development, and other agricultural programs.

Among the honors received by Katan are his appointment by the president of Israel to the Council of Higher Education; his election as president of the Israel Phytopathological Society; his election as Distinguished Teacher by the students at the Faculty of Agriculture in the Hebrew University; his election to the Board of the Mediterranean Phytopathological Union; the Cohen Award for his research on soil solarization; and his appointment to the Buck Family Chair in Plant Pathology.

Noel T. Keen

Noel T. Keen was born in Marshalltown, IA, in 1940. He received a B.S. degree in botany in 1963 and an M.S. degree in plant pathology in 1965 from Iowa State University. In 1968 he completed his Ph.D. degree in plant pathology at the University of Wisconsin-Madison, under the direction of Dr. Paul Williams. He joined the faculty of the Department of Plant Pathology at the University of California, Riverside, in 1968, as an assistant professor and was promoted to associate professor in 1972 and professor in 1978. From 1983 to 1989 he served as chairman of the department.

Dr. Keen's early work was with enzymes elaborated by phytopathogenic microorganisms and their role in the physiology of disease. During this period at Riverside, he studied the physiology of the interaction of cotton with *Verticillium dahliae*. His research led to the isolation of a protein-lipopolysaccharide complex produced by the fungus that mimicked the symptoms caused by the fungus. His research then shifted to studies of the role of phytoalexins in resistance, and he isolated and identified phytoalexins in numerous plants, including soybean, cotton, chickpea, cowpea, and *Arachis hypogaea*. He is considered one of the foremost authorities on the role of phytoalexins in disease resistance and delivered the plenary lecture at a recent symposium in Germany commemorating the 50th anniversary of the phytoalexin concept.

In 1977 he was the first to report heterokaryon formation in *Phytophthora megasperma* var. *sojae* by the use of drug resistance and amino acid requirement markers. This and other genetic evidence supported the now accepted concept of diploidy. His interest in the nature of resistance led to a study of single-gene resistance of soybean to the bacterial pathogen *Pseudomonas syringae* pv. *glycinea*. Subsequently, a long line of papers on this system, which involves elicitation of the phytoalexin glyceollin, have been reported. He was one of the first to propose the elicitor-receptor hypothesis to explain the gene-for-gene theory.

In the early 1980s, Keen became interested in the area of molecular biology and gene cloning to study the nature of resistance to bacteria. He rapidly became proficient in this new area and has become a leader in the application of molecular biology technology to plant pathology and an innovator in designing and constructing recombinant DNA vectors to suit unique requirements for research with plant pathogens; many of these vectors are now in common use in other laboratories. In collaboration with Dr. Brian Staskawicz of the University of California, Berkeley, Keen cloned and characterized avirulence (*avr*) genes from bacterial pathogens. This work precipitated what is presently a major effort in laboratories throughout the world to characterize *avr* genes from plant pathogens and to define the pathogen-host interaction that induces host resistance mechanisms. Keen continues to be a leader in this field, having characterized several other *avr* genes. This innovative molecular approach has allowed Keen and others to rigorously test the role of *avr* gene products in host-pathogen recognition; the results have fundamentally influenced the conceptual view of the gene-for-gene interaction.

Keen has also been a pioneer in the study and application of molecular biology techniques to rigorously determine the functional role of specific genes and their products in pathogenicity. His publication on the cloning of pectate lyase genes from *Erwinia chrysanthemi* represented one of the early applications of recombinant DNA technology to plant pathology. He has been a leader in the further characterization of these genes, their regulation, and the structure of their enzyme products.

His research reports attest to the fact that he has generously shared his knowledge and understanding of physiological plant pathology not only with scientists in the department and students in adjacent fields but also with scientists in other areas of the United States and abroad. He has served as associate editor of numerous journals, including *Phytopathology, Journal of Phytopathology, Plant Physiology*, and *Molecular Plant-Microbe Interactions*, and he chaired the APS Biochemistry, Physiology, and Molecular Biology Committee.

Keen's ability to combine ideas and technology from several disciplines, including plant pathology, physiology, biochemistry, and molecular biology, has contributed to his continued presence at the cutting edge of his discipline. He has earned a worldwide reputation as an innovative and productive scientist as well as an outstanding teacher and lecturer on the subject of physiological plant pathology.

Elliot W. Kitajima

Elliot W. Kitajima was born on August 12, 1936, in Registro, São Paulo, Brazil. He earned a B.S. degree in agronony in 1958 and a doctoral degree in 1967 from the University of São Paulo. From 1959 to 1973, he was a research scientist with Dr. A. S. Costa in the Virology Department, Instituto Agronomico, in Campinas.

Dr. Kitajima joined the Department of Cell Biology in the University of Brasília as a full professor in 1973. During his tenure at the university, Kitajima has assumed several administrative positions in addition to his normal teaching and research assignments. These include vice-director of the Institute of Biological Sciences, head of the Department of Cell Biology, and coordinator for the graduate program in molecular biology. He has spent study leaves with Dr. H. Swift at the University of Chicago in 1968, with Dr. K. S. Kim at the University of Arkansas on a Fulbright Fellowship in 1982, and in the laboratory of Dr. D. Peters at the Agricultural University in Wageningen, the Netherlands, in 1989.

Kitajima has achieved international recognition for research in many areas, including virus morphology, cytopathology, virus diseases of vegetable and tropical fruit crops, mycoplasmalike and rickettsialike organisms, *Phytomonas*, plant cell biology, and insect cytology. In recent years, he has devoted part of his time to identifying viruses of insects with potential for biological control. He motivated interest in viroids in Latin America by organizing an international course on viroids at Brasília in 1988.

Kitajima's accomplishments in research are reflected in 201 refereed journal papers. He is best known for his work in virus morphology and cytopathology. In 1964, he and co-workers

demonstrated the first association of threadlike particles with citrus tristeza disease. This finding was instrumental in the subsequent characterization of this important closterovirus. In the following year, he and Dr. A. S. Costa published a paper on the morphology and developmental stages of a *Gomphrena* virus, which became the model for morphological study of plant rhabdoviruses. He was among the first to show plant virions in plasmodesmata.

Kitajima is a superb electron microscopist and has established the best laboratory of electron microscopy in Brazil, with two transmission microscopes and one scanning electron microscope. His artistic electron micrographs have appeared on the covers of such reputable journals as *Cytobiologie, Intervirology, Journal of Ultrastructure Research*, and *Naturwissench.*

In cooperation with co-workers, former students, and scientists in other parts of Brazil, Kitajima has reported the first occurrence of many virus and viruslike diseases in Brazil. Some of them, such as bamboo mosaic virus, Cassia mild mosaic virus, and passionfruit yellow mosaic virus, were unknown elsewhere. In 1986, he compiled a useful list of publications on virus and viruslike diseases in Brazil, covering the period from 1911 to 1985. This monograph was published by the Brazilian Phytopathological Society and is a valuable reference for plant pathologists.

Kitajima is a creative teacher, and his classes include an undergraduate course in cell biology and graduate courses in plant virology and cell ultrastructure. Perhaps his most valuable contributions have been motivating innumerable youngsters toward studying plant pathology, guiding graduate student theses, and training postgraduate researchers from all parts of Latin America. Kitajima has directed one doctoral and 14 M.S. dissertations and has served on many other research committees.

Kitajima is a skilled linguist (he speaks Portuguese, English, Spanish, and Japanese), which has facilitated his cooperation with scientists in many parts of the world. Kitajima has organized and participated in many national and international symposia, workshops, and colloquia in plant virology and cell biology and has received many invitations to conferences and seminars throughout Latin America. He has served as a referee for many scientific journals and has served as a consultant to various agencies, such as the FAO, the Ministry of Education, the Ministry of Agriculture, the Brazilian National Research Council, FINEP, and EMBRAPA.

Kitajima is highly regarded by his fellow plant pathologists in Brazil as an efficient and skillful writer and has been the editor-in-chief of *Fitopatologia Brasileira*, the official journal of the Brazilian Phytopathological Society, since 1976.

Douglas P. Maxwell

Douglas P. Maxwell was born in Norfolk, NE, in 1941. He received a B.A. in biology with highest distinction at Nebraska Wesleyan University in 1963 and went on to graduate school at Cornell University. He completed his Ph.D. in plant pathology at Cornell in 1968. His thesis research on glucose catabolism and biosynthesis of oxalic acid in *Sclerotium rolfsii* was done under the direction of Dr. Durward Bateman. Dr. Maxwell joined the faculty of the Department of Plant Pathology at the University of Wisconsin-Madison in 1968.

Maxwell has been an outstanding teacher of introductory plant pathology at Wisconsin. He is a born teacher and devotes heart, body, and soul to teaching during the time that his course is in progress. In recognition of his teaching effort and accomplishment, he was named the Gamma Sigma Delta Outstanding Teacher in the College of Agriculture and Life Sciences at the University of Wisconsin in 1975. He began teaching the introductory plant pathology course in 1975 and carried full or shared responsibility for teaching it through 1984, even while serving as chairman of the Department of Plant Pathology. During 1975–1984, he taught well over 100 students per year in the introductory course. In addition, he also coordinated an advanced course in disease physiology and served as seminar organizer.

Maxwell's research has been particularly eclectic, with major contributions in such dissimilar areas as disease physiology, inheritance and mechanisms of disease resistance in forage crops, fungal taxonomy, ultrastructure and biochemistry of fungi, and molecular and epidemiological virology. He and his co-workers pioneered the use of isozymes and molecular analyses to clarify the relationships among groups of fungi that had been lumped together in the "species" *Phytophthora megasperma.* In the mid-1980s, his lab had applied isozyme analysis to this complex of fungi and helped to clarify the confusion concerning phylogenetic relationships within this very difficult group. This lab was also one of the first to investigate the use of restriction fragment length polymorphisms of mitochondrial DNA to sort out phylogenetic relationships in plant-pathogenic fungi. The clear conclusion from this work is that the old delineation of *P. megasperma* as a species embraced some quite dissimilar groups of *P. megasperma.* Individual groups within *P. megasperma* often differed as much among themselves as they differed from other *Phytophthora* species.

His contribution will long be remembered as especially significant, not only because of its importance in understanding the biology of *Phytophthora*, but also because it illustrated the usefulness of isozymes and molecular analyses in unraveling important questions in fungal taxonomy.

In recent years, Maxwell has developed a vigorous new research program on the biology and control of geminiviruses of beans. Geminiviruses seriously curtail bean production in Central and South America. To meet this threat, Maxwell and his associates initiated integrated collaborative studies of the epidemiology, genetic diversity, and replication of these viruses. They constructed and sequenced complete clones of both DNA components from four different bean geminivirus isolates from diverse geographic sources. They also have partial clones and sequences of several more isolates. In the process of this work, Maxwell's group demonstrated that the bean golden mosaic syndrome can be caused by viruses of unexpected genetic diversity. In addition, they generated general and virus-specific hybridization and PCR probes for use in epidemiological studies. Maxwell is currently leading efforts to develop and apply strategies of genetically engineered resistance against viruses of bean.

Through his association with the Bean/Cowpea Cooperative Research Support Program, Maxwell has become heavily involved in international agriculture. He cooperates with a network of Latin American scientists to investigate methods for suppressing diseases caused by geminiviruses. In addition, his lab hosts many scientists and students from around the world. One of their goals is to prepare recombinant plants that are resistant to geminiviruses.

Maxwell served as chairman of the Department of Plant Pathology from 1980 to 1990. During this time the department prospered. Maxwell helped to maintain it as one of the leading departments in the College of Agricultural and Life Sciences at the University of Wisconsin-Madison. His wisdom, dedication, and innovative leadership were crucial for maintaining a balance between teaching, research, and extension activities during this period of reduced budgets and downsizing of academic departments. During his decade of leadership, nine faculty members were added to the department to replace retirees. Maxwell's thorough understanding of teaching, research, and extension allowed him to be an excellent leader for his department. His dedicated service and long hours at work were appreciated greatly by faculty, staff, and students and will long be remembered.

He has been active in the International Society for Plant Pathology. He has been a member of the Teaching Committee and the *Phytophthora* Working Group, and he served as editor of the *Phytophthora Newsletter* from 1979 to 1982.

Derald A. Slack

Derald A. Slack was born on December 22, 1924, in Cedar City, UT. He attended Utah State University and received his B.S. and M.S. degrees in 1949 and 1950, respectively, majoring in botany and plant pathology. In 1952, he received the Ph.D. degree in plant pathology from the University of Wisconsin-Madison, where he worked under the supervision of George W. Keitt and J. Duane Moore on the X-disease of stone fruits. He served as a bombardier in the U.S. Air Force from 1943 to 1946. He began his professional career in 1952 as an assistant professor in the Department of Plant Pathology, University of Arkansas, Fayetteville, and he rose to the ranks of associate professor in 1954 and professor in 1959. He became head of the department in 1964 and retired in December 1990 as emeritus professor.

Dr. Slack is recognized for his distinguished contributions in plant pathology over the past 39 years through his research, teaching, administration, and service in the profession at the national, regional, and state levels. He is the father of Dr. Steven Slack, who is a plant pathologist now at Cornell University and previously at the University of Wisconsin.

He is highly esteemed for his lifelong research and extension achievements in diseases of apples, peaches, alfalfa, strawberries, soybeans, grapes, and blackberries. His seminal research was on the mechanisms of survival of the soybean cyst nematode. He is noted also for his efforts in development of disease control strategies, with emphasis on seed certification, nursery and plant inspection, and pesticide registration programs of the Arkansas State Plant Board. In 1961 he received the Distinguished Faculty Award for research and, in 1980, the Arkansas Agricultural Pesticide Association's Outstanding Service Award.

For years, Slack taught Principles of Plant Pathology and Diseases of Fruits and Vegetables and is highly regarded by students for his dedicated, effective teaching of plant pathology at the undergraduate and graduate levels. He played a major role in development of a laboratory manual used in teaching plant pathology courses. His interest in the welfare of young people is exemplified by his working with the FarmHouse Fraternity as chapter advisor and his service as its secretary-treasurer and president. Alpha Zeta recognized his contributions to teaching by giving him the Outstanding Instructor Award and the Faculty Advisor Award.

On the administrative level, he served APS as its secretary and as a councilor-at-large. He was instrumental in establishing the Society of Nematologists, is a charter member, and served as a member of the Executive Committee for 4 years. In 1989, he was honored by the Southern Division of APS for his leadership as its president and for serving on its many committees, including service as the chairman of the Local Arrangements Committee for organizing the APS national meetings in Hot Springs, AR. He served the University of Arkansas with distinction in many leadership positions, such as chairman of the Faculty Senate and the Faculty Advisory Committee of the University President and head of the Department of Plant Pathology since 1964. Because of his administrative acumen, this diverse, active department doubled in size and has nationally and internationally recognized centers of excellence in nematology, virology, and the biological control of weeds. He is a member of the American Institute for Biological Sciences, the Arkansas Academy of Science, the Helminthological Society of Washington, the Arkansas State Horticultural Society, the Arkansas Pesticide Association, Gamma Sigma Delta, and the Canadian Phytopathological Society and was secretary and president of the Arkansas Chapter of Sigma Xi.

Extension Award

This award was established in 1988 by the APS Council in recognition of excellence in extension plant pathology. The award is presented to those involved in formal plant pathology extension with recognized superior contributions in developing or implementing leadership roles in local, regional, or national honor societies or professional organizations.

Malcolm C. Shurtleff

Malcolm C. Shurtleff was born in 1922 in Fall River, MA. He received his B.S. degree in 1943 from the University of Rhode Island and his M.S. and Ph.D. degrees from the University of Minnesota in 1950 and 1953, respectively. He served as assistant extension professor of plant pathology and entomology at the University of Rhode Island from 1950 to 1954 and as assistant and associate extension professor in the Department of Botany and Plant Pathology, Iowa State University, from 1954 to 1961; he has been extension professor at the University of Illinois from 1961 to the present. Dr. Shurtleff is a most prolific writer, known for his originality, creativity, and excellence as an extension specialist. Professor Shurtleff has written four books and two compendia and has over 1,000 extension and research publications to his credit. It is noteworthy that his book "How to Control Plant Diseases in Home, Yard and Garden" in its two editions was chosen as the Garden Book of the Month by the American Garden Guild. Other books and compendia he has written or edited include "How to Control Lawn Diseases and Pests," "How to Control Tree Diseases and Pests," two editions of the "Compendium of Corn Diseases," the first edition of the "Compendium of Soybean Diseases," and "Controlling Turfgrass Pests." Shurtleff has written the plant disease section for four editions of the Encyclopaedia Britannica and for four other encyclopedias and the plant disease chapters for the "Better Homes and Gardens Garden Book," the Illinois Field Crop Scout Handbook, and the Illinois Plant Pest Profiles.

Shurtleff is generally recognized as one of the preeminent extension plant pathologists in the world. He was selected as the first chairman of the Extension Committee of the International Society of Plant Pathology and was the first state extension specialist elected Fellow of APS (1971). He was the only extension specialist recognized with the Adventurers in Agricultural Science Award of Distinction, presented by U.S. Secretary of Agriculture Bob Bergland at the Ninth International Congress of Plant Protection in 1979. His creativity has been recognized by the University of Illinois with the College of Agriculture Paul A. Funk Award for excellence in service to agriculture (1975). Illinois State Senate Resolution No. 176 honored Drs. Shurtleff and

Hooker during the southern leaf blight epidemic of 1970–1971 for their "objectivity in a situation which verged on panic . . . that was in the very best tradition of public service." Shurtleff received the prestigious USDA Distinguished Service Award in 1986, the only plant pathologist extension specialist to ever receive this honor. Perhaps the top honor today for Shurtleff was his selection as a Senior University Scholar by the University of Illinois Foundation in 1987, the only extension specialist to receive this honor to date.

Professor Shurtleff has served APS as councilor-at-large and was the first editor-in-chief of both *Phytopathology News* and *Plant Disease*. His leadership and originality helped spawn the plant disease compendium series, plant disease profiles, plant disease slide sets, and the national corn and soybean monitoring plots concept.

In summary, Shurtleff is nationally and internationally recognized for his voluminous works, distinguished and creative authorship, unusual competence in emergencies, and untiring efforts in service to agriculture.

Ruth Allen Award

The Ruth Allen Memorial Fund was established in 1965 by means of gifts from the estate of Dr. Ruth Allen through the generosity of her heirs: Sam Emsweller, Mabel Nebel, Hally Sax, and Evangaline Yarwood. The award, consisting of a certificate and income from the invested fund, is given for outstanding contributions to the science of plant pathology.

George E. Templeton

George Earl Templeton was born in Little Rock, AR, on June 27, 1931. He attended the University of Arkansas, Fayetteville, and received his B.S.A. and M.S. degrees in 1953 and 1954, respectively, majoring in agriculture and plant pathology. He served 2 years at the Fort Detrick Biological Warfare Center in the U.S. Chemical Corps from 1954 to 1956. He then entered the University of Wisconsin-Madison, where he received the Ph.D. degree in 1958 for research on the effect of toxic metabolites from *Fusarium moniliforme* on germination of barley. He began his professional career as an assistant professor in the Department of Plant Pathology, University of Arkansas, Fayetteville, and rose to the ranks of associate professor in 1962, professor in 1967, university professor in 1984, and distinguished professor in 1991.

Dr. Templeton is honored for his role in establishing the concept that indigenous plant pathogens can be successfully used for biological control of weeds. He has received wide acclaim for his pioneering research on an anthracnose disease of northern joint-vetch, a serious leguminous weed of rice and soybeans, which illustrates the biological, technical, regulatory, and commercial feasibility of controlling weeds with native plant pathogens. His research on developing fungal pathogens as mycoherbicides for biological control of weeds is innovative and has resulted in new concepts in plant pathology, fermentation science, and weed management.

Templeton, with his students and colleagues, recognized the potential of indigenous endemic pathogens for biological control of weeds in annual crops. The innate limitations in dispersing these pathogens were overcome by applying them in the manner of postemergence chemical herbicides. They termed this the bioherbicide tactic, or (more specifically for fungal pathogens) the mycoherbicide tactic. A U.S. patent was issued for the process in 1973. The feasibility of the mycoherbicide tactic for weeds in annual crops was demonstrated in a 12-year effort culminating in 1982 with registration by the Environmental Protection Agency and commercial sale of COLLEGO by the Upjohn Company. COLLEGO continues to be the alternative of choice for control of this serious weed in rice and soybean fields.

COLLEGO, a dry formulation of conidia of *Colletotrichum gloeosporioides* f. sp. *aeschynomene*, established a number of firsts in plant pathology. It was the first endemic pathogen to undergo the rigors of long-term testing leading to commercial development. The first patent issued for a fungus to be used as a mycoherbicide was issued for this fungus. The first Experimental Use Permit issued by the Environmental Protection Agency for a mycoherbicide was also issued for this fungus. It represents an effective model for interdisciplinary, multiagency, public-private sector collaboration necessary for the innovation of practical biological control agents. This research thus led to a highly selective, environmentally compatible product at lower costs than conventional organic chemicals. This work has had a major impact in encouraging others in biological control research and applications.

In related herbicide research, Templeton has also contributed significantly through his work with tentoxin, a cyclic peptide, which is a chlorosis-inducing toxin of *Alternaria alternata*. He and his colleagues discovered, purified, and characterized tentoxin, which is one of a few microbial toxins with potential as herbicides. A Canadian patent has been issued for its use as a herbicide. Basic interest in the mode of action of tentoxin worldwide has led to a significant body of knowledge contributing to the understanding of chloroplast development. Tentoxin has also been used as a means of determining the cytoplasmic parent in somatic hybrids between resistant and susceptible plant lines.

Templeton's awards are several. He was co-author of a paper judged to be the outstanding contribution to *Weed Science* in 1973, was awarded the John W. White Award for excellence in Agricultural Research by the University of Arkansas (1979), was named a Fellow of APS (1984), received the Distinguished Award in Research from the University of Arkansas Alumni Association (1987), received the University of Arkansas Burlington Northern Award as the Outstanding Faculty-Scholar in Research (1988), and was recognized by the USDA with a Superior Service Award (1990).

Ciba-Geigy Award

Sponsored by the Ciba-Geigy Corporation, this award is given to individual plant pathologists who have made significant contributions to the advancement of knowledge of plant diseases or their control. The award consists of a trophy and an expense-paid trip to Basel, Switzerland.

Margaret E. Daub

Margaret E. Daub was born in 1952 in Tokyo, Japan, but received most of her elementary and secondary education in the United States. She attended Wooster College, in Wooster, Ohio, where she graduated with honors in 1974. She entered graduate school at the University of Wisconsin and received her Ph.D. in plant pathology under the direction of Dr. D. J. Hagedorn. Her thesis research dealt with the mechanisms of resistance in beans to *Pseudomonas syringae* (*Phytopathology* 69:946-951; 71:547-550). From 1979 to 1982, Dr. Daub worked as a postdoctoral associate in Peter Carlson's lab at Michigan State University, where she began her research on mechanisms of action of the photosensitizing phytotoxin cercosporin.

Daub joined the faculty of the Department of Plant Pathology at North Carolina State University as assistant professor in 1983. She conducts basic research on mechanisms of pathogenesis and pursues both basic and applied approaches to the development of disease resistance in tobacco and other crops.

Daub has explored the use of somaclonal variation in improving resistance of high-quality flue-cured tobacco cultivars. From several thousand plants regenerated from isolated protoplasts, she found somaclonal progeny with elevated levels of resistance to Granville wilt, caused by *P. solanacearum* (*Phytopathology* 79:600-605). Through judicious choice of the cell culture methods, Daub was able to maintain the morphological and leaf quality characteristics of the original cultivars in these somaclonal lines.

Daub has also utilized protoplast fusion for practical application in tobacco germ plasm improvement (*Phytopathology* 80:1069). Her objective was to transfer resistance to tobacco mosaic virus and to several species of root-knot nematodes from the wild species *Nicotiana repanda* into cultivated tobacco. *N. repanda* had resistance to more tobacco diseases than any other *Nicotiana* species, but genes from this species have never been successfully incorporated into a tobacco cultivar. Using parental lines transformed for resistance to different antibiotics, Daub was able to select for rare fusion hybrids using a dual antibiotic selection scheme. Plants have been regenerated from these cultures, and their hybrid nature confirmed by isozyme analysis. The fusion hybrids are resistant to TMV. The plants are male-sterile but have been successfully backcrossed to the *N. tabacum* parent. The backcross progeny are currently being tested for nematode resistance.

Daub's current efforts are directed at developing resistance to tomato spotted wilt virus, which has become an increasingly serious problem on tobacco and other crops in the southeastern United States. This work has emphasized transformation of tobacco cultivars for expression of the viral nucleocapsid gene.

Some of Daub's most interesting and significant research is with the phytotoxin cercosporin. Cercosporin is produced by many members of the fungal genus *Cercospora* and appears to play a critical role in the ability of these fungi to parasitize plants. Daub showed that cercosporin is a photosensitizing compound. It absorbs light to produce both singlet oxygen and superoxide ions that are extremely toxic to cells (*Phytopathology* 72:370-374; *Plant Physiology* 73:855-857). Plants, bacteria, many fungi, and even mice are killed by cercosporin when exposed to light. Daub elucidated the mechanism of action of cercosporin on plant cell membranes (*Plant Physiology* 69:1361-1364; 71:763-766). When efforts to use in vitro selection to select resistant plant cells were unsuccessful, she initiated studies on the mechanisms of resistance of the *Cercospora* fungi themselves, virtually the only organisms that are resistant to cercosporin. These efforts led to the discovery that cercosporin resistance is strongly correlated with the production of reducing power by resistant fungi (*Phytopathology* 80:960). She is currently investigating the hypothesis that reducing power protects resistant fungi by a transient reduction and detoxification of the cercosporin molecule. The goal of this research is to improve control of plant diseases caused by *Cercospora*. This may be accomplished by the possible expression of fungal genes in plants or perhaps through the utilization of strategies aimed at disruption of fungal resistance mechanisms, rendering them vulnerable to their own toxin.

Daub has also contributed to the teaching program at North Carolina State University. She reorganized the material in the introductory plant pathology course to emphasize principles and concepts of plant pathology to complement the emphasis on specific diseases covered in accompanying laboratory courses. Most recently, she has developed a graduate course on fungal genetics and physiology, emphasizing theoretical and experimental approaches to the study of plant pathogenic fungi.

She is a member of the honorary societies Phi Beta Kappa, Phi Kappa Phi, Sigma Xi, and Gamma Sigma Delta. She has served as member and chair of the APS Biochemistry, Physiology, and Molecular Biology Committee. At the 1990 APS meetings she organized and chaired the session "Role of Light-Activated Compounds and Free Radicals in Host-Parasite Interactions." She is currently an associate editor of *Phytopathology*.

Lee M. Hutchins Award

The Lee M. Hutchins Fund was established in 1979 by means of gifts from the estate of Dr. Lee M. Hutchins. The award, consisting of a certificate and income from the invested fund, is made for the best contribution to basic or applied research on diseases of perennial fruit plants (tree fruits, tree nuts, small fruits and grapes, including tropical fruits but excluding vegetables). The results of the research must have been published in an official journal of the Society.

Roger C. Pearson and David M. Gadoury

Roger C. Pearson was born in Kingsburg, CA, in 1946. His association with agriculture began early in life on his family's small farm, where they raised grapes and peaches. He received his B.S. degree in biological sciences and M.S. and Ph.D. degrees in plant pathology from the University of California at Davis in 1968, 1969, and 1973, respectively. After working as a research associate for two years at Cornell University's Hudson Valley Laboratory, he was appointed assistant professor of plant pathology in 1975. In 1977, Dr. Pearson moved from the Hudson Valley Laboratory to the New York State Agricultural Experiment Station at Geneva and changed the emphasis of his research program from diseases of tree fruits to diseases of grapes. He was promoted to associate professor in 1981 and professor in 1990.

Dr. Pearson and co-workers in his research and extension program consistently attack problems and produce results that are of great use to plant pathologists and farmers. Examples include determination of the temperature and moisture requirements for teliospore germination, basidiospore formation and release, and infection of apple by the cedar apple rust pathogen, *Gymnosporangium juniperi-virginianae* and the identification of the critical period for infection of grape berries by *Phomopsis viticola*. Pearson identified a new disease of grapevine, angular leaf scorch, caused by a previously undescribed fungus (*Pseudopezicula tetraspora*), and conducted the first studies of the epidemiology of this disease. He has also contributed significantly to the understanding and control of grape diseases caused by *Eutypa lata* and *Botrytis cinerea*. Pearson's knowledge of control of grape diseases, his close collaboration with grape pathologists throughout the world, and his service as an author and coeditor of the APS "Compendium of Grape Diseases" exemplify his devotion to plant pathology and the grape industry.

David M. Gadoury was born in Providence, RI, in 1954, and was raised in Scituate, one of the few remaining rural areas of the state. He received the B.S. degree in agricultural technology from the University of Rhode Island in 1978 and M.S. and Ph.D. degrees in botany from the University of New Hampshire in 1981 and 1984, respectively. Dr. Gadoury remained at the University of New Hampshire as a research associate until 1985 and then joined Pearson's program at Geneva. At Geneva he assumed major responsibilities in Pearson's ongoing study of the biology and ecology of *Uncinula necator* and the epidemiology of grape powdery mildew. In 1990 he joined Dr. Robert Seem's research program on the epidemiology of fruit diseases and was promoted to research associate III.

Gadoury has specialized in the study of plant pathogens during the intercrop period and in the development, survival, and dispersal of primary inoculum. Gadoury is best known for his work, in collaboration with Dr. William MacHardy at the University of New Hampshire, on the apple scab pathogen, *Venturia inaequalis*. This work has ranged from very pragmatic descriptions of techniques for the assessment of ascospore maturity to seemingly esoteric studies of geotropism in ascocarp formation. Over a period of 10 years, Drs. Gadoury and MacHardy (and several cooperators) assembled each piece of new information to develop a management program for apple scab that has had a major impact upon the control of this disease in the northeastern United States. In recent years, he has worked to integrate the disease and insect management programs for apples and to develop a unified program to simultaneously control the major fungal diseases of grape.

Drs. Pearson and Gadoury are both recognized for their work on the role of cleistothecia of *U. necator* in the epidemiology of grape powdery mildew (*Phytopathology* 77:1509-1514). Many previous investigations had indicated that ascocarps were often nonfunctional and were of minor or no importance in the epidemiology of this disease. Although the winter survival of *U. necator* in dormant infected buds is common in most other viticultural regions, Drs. Pearson and Gadoury could not confirm its occurrence in New York, nor did the spatial pattern of epidemics of grape powdery mildew fit the focal pattern of disease that would be expected to arise from "flag shoots," the result of this form of overwintering. Instead, they found the first infections on the undersides of leaves near the trunk of the vine. An examination of bark from grapevines revealed the presence of viable cleistothecia trapped in bark crevices. Further studies demonstrated that ascospores from these cleistothecia were infectious and that airborne ascospores of *U. necator* were present in vineyards before the detection of conidia.

Gadoury and Pearson subsequently found that cleistothecia were selectively dispersed by rain to the bark of the vine as they matured (*Phytopathology* 78:1413-1421). Initially, the ascocarps are attached to the mildew colony by anchorage hyphae, which necrose as the cleistothecium reaches morphological maturity. This allows the mature ascocarps to be dispersed by rain to their winter residence on the bark of the vine. At leaf fall, most cleistothecia remaining upon mildew colonies on leaves, canes, and rachises are immature and die during winter. Heterothallism of *U. necator* from grapevine was demonstrated, and the relationship between disease incidence and the probability of pairing of compatible mating types was shown to be the principal determinant of when ascocarps form in vineyards.

The mechanism of ascocarp dehiscence and ascospore discharge was reported by Drs. Pearson and Gadoury in *Phytopathology* 80:393-401. Cleistothecia would only dehisce when a circumscissile thin zone developed in the wall of the overwintered ascocarp. The thin zone in the ascocarp wall developed as lipids in the cytoplasm were metabolized during overwintering and the water potential of the ascospore cytoplasm decreased. Unlike other ascomycetes, conversion of glycogen did not appear to be involved in ascospore discharge. This work not only reported on the mechanism of dehiscence and spore release but also described the relationship between rainfall, temperature, and ascospore discharge.

Although free water was required for ascocarp dehiscence and ascospore release, previous reports had often noted that ascospores frequently burst in water. Drs. Gadoury and Pearson showed in *Phytopathology* 80:1198-1203 that the water potential

of ascospore cytoplasm changed substantially during overwintering and that changes in water potential and strength of the ascospore wall were correlated with the ability of the ascospores to survive, germinate, and infect leaf surfaces. They also found that germination of naturally released ascospores was favored by saturated atmospheres and free water. Thus, unlike its xerophytic anamorph, the teleomorph of *U. necator* was dependent upon rain events for release of inoculum, and infection was favored by those conditions most likely to follow rain. This work also established the fundamental temperature and moisture conditions for germination of ascospores and infection of grape by ascospores of *U. necator*.

The impact of this research upon management programs for grape powdery mildew was significant and has also led to several other investigations. The presence of a functional sexual stage of *U. necator* has important implications in regard to pathogenic specialization, in breeding for disease resistance, and in the development of resistance to fungicides. The identification of ascocarps on the bark of the vine as the sole source of primary inoculum in New York vineyards has led to treatments that have successfully eradicated the overwintering inoculum in dormant vineyards and greatly delayed the development of powdery mildew epidemics. Drs. Pearson and Gadoury have applied their findings on ascocarp dehiscence and ascospore discharge, germination, and infection to develop forecasting systems for primary infection by *U. necator*. Finally, the selective dispersal of mature ascocarps to secondary substrates in *U. necator* may prove to be a model system for the survival of cleistothecia of powdery mildews of several deciduous perennial hosts.

Distinguished Service Award

Awarded only once before in APS history, the Distinguished Service Award honors individuals who have provided sustained outstanding leadership to the Society, while also furthering the science of plant pathology.

Raymond J. Tarleton

Raymond J. Tarleton was born in Shreveport, LA, in 1925. He spent his early years in Dallas, TX, but attended five high schools in four different cities before his graduation. He developed a strong interest in science while in grade school, and this continued throughout his life, although his final career choice was that of a scientist's right-hand man.

He entered the University of Minnesota in 1943 with the intention of becoming a chemist. He received a B.A. degree in chemistry from Minnesota in 1948 but unknowingly established the basis for his professional career by choosing a group of subject electives far removed from science.

In addition to his major in chemistry, he received a minor in journalism, with a substantial number of business credits. Still pursuing his dream of becoming a research chemist, he entered graduate school at Minnesota, switched to biochemistry, and ultimately became involved with the journal *Cereal Chemistry*, which at that time was being edited by the chairman of the Department of Agricultural Biochemistry.

Soon after completing his course work for a Ph.D. in biochemistry, he was offered a part-time position as technical editor of *Cereal Chemistry*. In the fall of 1950, he was offered a full-time position as business manager and technical editor of *Cereal Chemistry* and business manager of the American Association of Cereal Chemists, with an office in Snyder Hall, the home of the biochemistry department of the University of Minnesota's St. Paul campus. He was also given an opportunity to complete his graduate degree work while serving the association, which he did, receiving an M.A. degree in journalism and biochemistry in 1952.

His first major contribution to AACC was the establishment of a new journal for that society in 1956, planning both the concept and the design. The original title was *Cereal Science Today*, and it depended upon both invited feature articles and short research submissions, all of a highly applied nature. The journal continues today as a monthly applied journal received by all members of AACC. It has an in-house editorial and advertising sales staff and generates 25% of the total AACC income.

During his tenure on the St. Paul campus, Tarleton met Dr. Helen Hart, who was then editor-in-chief of *Phytopathology*. Over a period of several years, he provided advice on production problems associated with the publication of *Phytopathology* and assisted with the evaluation of commercial printers for that journal. It was through his association with Dr. Hart that he met other officers of APS and gained knowledge of the society.

In 1962, Tarleton and a partner formed Association Services, a small firm specializing in editorial and production services for nonprofit organizations in the Minneapolis/St. Paul area. He had received permission from AACC to enter this arrangement on the understanding that his contribution would be after hours, on a moonlighting basis. In 1963, Dr. Thor Kommedahl was appointed editor-in-chief of *Phytopathology* and contracted with Association Services to serve as the journal's editorial office. At the beginning, Tarleton personally edited *Phytopathology* in the evenings and on weekends, and he and his wife, Andy, would proofread galleys and final page proofs. This work was turned over to other technical editors as the firm gained financial stability.

As AACC grew over the next 4 years and required increasing time for travel, Tarleton found it necessary to resign from the Association Services partnership in the spring of 1967. This was the last year of Dr. Kommedahl's term as editor-in-chief, as well as the ending term of the APS business manager, Dr. David Marsden. Under the leadership of President Arthur Kelman, the APS Council approached AACC about sharing its editorial and business staff with APS.

Thus, in June 1967, the editorial office of APS was transferred to the AACC headquarters, and in November the final transfer of the business office took place. Tarleton became the executive vice president of the Society.

Since that time, Tarleton has shepherded the administration of the society through a series of dramatic, and occasionally traumatic, changes. A devastating fire in October 1968 destroyed the headquarters office. Tarleton and the rest of the headquarters staff, in their customary efficient manner, got the operations for both APS and AACC up and running again in a very short time.

Tarleton was instrumental in assisting APS with its purchase of land for, and subsequent construction of, a new headquarters building for the Society in 1971 and with the expansion of the facility in 1989. He was active in the planning and design stages of *Phytopathology News*, working closely with Dr. Malcolm

Shurtleff in 1967. A few years later, he again cooperated with Dr. Shurtleff in publishing the Society's first compendium (corn) in 1973 and in 1979 assisted in the planning and production of *Plant Disease*. Tarleton, in close cooperation with Dr. Luis Sequeira, has been responsible for the financial planning and execution of APS's newest journal, *Molecular Plant-Microbe Interactions* (*MPMI*).

Throughout his career, Tarleton has been involved with numerous professional societies and groups. He served as nutrition consultant to the Agency for International Development and held terms as secretary, vice president, and president of the League for International Food Education (LIFE). He was also one of the group's founding members. Today, Tarleton continues to serve as treasurer and executive officer of the Intersociety Consortium for Plant Protection.

After 25 years of exceptional and dedicated service to APS and its members, Tarleton will retire from his position as executive vice president effective December 31, 1991.

AWARDS

Award of Distinction

1967 E. C. Stakman*
1969 J. C. Walker
1972 J. G. Horsfall
1980 H. H. Flor
1983 A. Kelman
1983 G. A. Zentmyer
1987 R. G. Grogan
1988 M. K. Brakke

Ruth Allen Award

1966 H. H. Flor
1967 F. O. Holmes*
1968 M. K. Brakke
1969 W. C. Snyder*
1970 J. B. Bancroft
1971 Hidefumi Asuyama
1971 Yoji Doi
1971 Tatsuji Ishiie
1971 Michiaki Teranaka
1971 Kiyoshi Yora
1972 R. L. Steere
1973 F. M. Latterell
1973 H. H. Luke
1974 A. C. Goheen
1974 W. B. Hewitt
1974 D. J. Raski
1975 I. A. M. Cruickshank
1976 T. O. Diener
1977 J. W. Gerdemann
1977 D. H. Marx
1978 L. M. Black
1979 J. E. Vanderplank
1980 H. H. Murakishi
1981 R. J. Shepherd
1982 Allen Kerr
1983 S. Bartnicki-Garcia
1983 C. E. Bracker
1983 J. Ruiz-Herrera
1984 Wen-Hsiung Ko
1985 W. F. Rochow
1986 Richard M. Lister
1987 Deane C. Arny
1987 Steven E. Lindow
1987 Christen D. Upper
1988 Paul G. Ahlquist
1989 Thomas P. Pirone
1990 Roger N. Beachy

Campbell Award

1974 R. D. Berger
1976 Karen Kearney
1976 Joseph Kuc
1976 Gary Shockley
1978 J. F. Shepard
1978 R. E. Totten
1980 B. J. Jacobsen
1980 H. J. Hopen

CIBA-Geigy Award

1975 D. J. Hagedorn
1975 A. L. Shigo
1976 W. W. Hare
1977 G. S. Abawi
1978 A. L. Jones
1979 A. A. MacNab
1980 W. J. Moller*
1981 S. M. Mircetich
1982 J. M. Duniway
1983 G. R. Safir
1984 R. C. Rowe
1985 S. E. Lindow
1986 T. J. Burr
1987 M. A. Ellis
1988 C. T. Stephens
1989 L. V. Madden
1990 J. J. Marois

Lee M. Hutchins Award

1980 D. C. Ramsdell
1981 M. Bar-Joseph
1981 M. F. Clark
1981 S. M. Garnsey
1981 D. Gonsalves
1981 D. E. Purcifull
1982 J. W. Randles
1983 S. M. Mircetich
1988 G. I. Mink
1989 T. B. Sutton
1990 T. J. Burr

Special Award

1983 John F. Fulkerson*

Distinguished Service Award

1984 Thor Kommedahl

Extension Award

1989 Walter R. Stevenson
1990 José M. Amador

Teaching Award

1989 Harold S. McNabb, Jr.
1990 Lafayette Frederick

APS FELLOWS

1965 H. W. Anderson*
1965 H. P. Barss*
1965 A. C. Braun*
1965 C. Chupp*
1965 G. H. Coons*
1965 J. H. Craigie
1965 C. W. Edgerton*
1965 G. W. Fisher
1965 H. H. Flor
1965 M. W. Gardner*
1965 J. G. Harrar
1965 Helen Hart*
1965 W. B. Hewitt
1965 C. S. Holton*
1965 J. G. Horsfall
1965 L. M. Hutchins*
1965 J. H. Jensen
1965 G. W. Keitt*
1965 G. C. Kent
1965 J. G. Leach*
1965 L. D. Leach*
1965 G. L. McNew
1965 I. E. Melhus*
1965 P. R. Miller*
1965 J. W. Oswald
1965 G. S. Pound
1965 A. J. Riker*
1965 H. A. Rodenhiser*
1965 E. C. Stakman*
1965 W. M. Stanley*
1965 Gerald Thorne*
1965 W. D. Valleau*
1965 J. C. Walker
1965 G. F. Weber*
1965 C. E. Yarwood*

1966 C. W. Bennett*
1966 L. M. Black
1966 V. W. Cochrane*
1966 A. E. Dimond*
1966 Charles Drechsler*
1966 David Gottlieb*
1966 G. H. Hepting*
1966 F. O. Holmes*
1966 Thorvaldur Johnson*
1966 R. A. Ludwig
1966 S. E. A. McCallan*
1966 K. O. Muller
1966 W. C. Snyder*
1966 E. E. Wilson*
1966 R. A. Young
1966 W. J. Zaumeyer

1967 R. M. Caldwell*
1967 F. L. Howard
1967 H. H. McKinney*
1967 J. S. Niederhauser
1967 Saul Rich
1967 Ikuzo Uritani

1968 J. S. Boyce*
1968 A. F. Ross*
1968 W. N. Takahashi
1968 F. A. Wolf*
1968 G. A. Zentmyer

1969 D. L. Bailey*
1969 K. F. Baker
1969 R. G. Grogan
1969 J. W. Heuberger*
1969 Arthur Kelman
1969 W. C. Price
1970 L. J. Alexander*
1970 D. F. Bateman
1970 C. M. Christensen
1970 E. E. Clayton*
1970 R. W. Fulton
1970 W. F. Rochow
1970 J. E. Vanderplank
1970 P. E. Waggoner
1970 J. M. Wallace*
1970 H. E. Wheeler

1971 A. W. Dimock*
1971 M. E. Gallegly, Jr.
1971 W. Q. Loegering*
1971 Karl Maramorosch
1971 R. R. Nelson
1971 Luis Sequeira
1971 M. C. Shurtleff

1972 M. K. Brakke
1972 J. R. Christie*
1972 J. E. DeVay
1972 J. Galindo Alonso
1972 L. J. Klotz*

1972 E. S. Luttrell*
1972 A. G. Plakidas*
1972 R. L. Steere
1972 H. D. Thurston
1972 R. K. S. Wood

1973 E. V. Abbott
1973 G. M. Armstrong*
1973 G. A. Brandes
1973 T. O. Diener
1973 R. M. Lister
1973 R. L. Millar
1973 Michael Shaw
1973 R. J. Shepherd
1973 H. D. Sisler
1973 A. J. Ullstrup*
1973 Cynthia Westcott*

1974 G. W. Bruehl
1974 Stephen Diachun
1974 R. N. Goodman
1974 A. L. Hooker
1974 T. A. Shalla
1974 J. T. Slykhuis
1974 F. L. Wellman
1974 Stephan Wilhelm

1975 J. G. Bald
1975 A. A. Bitancourt*
1975 J. M. Daly
1975 J. F. Fulkerson*
1975 J. W. Gerdemann
1975 W. F. Mai
1975 P. P. Pirone
1975 M. N. Schroth

1976 Antonio Ciccarone*
1976 R. H. Daines*
1976 J. P. Fulton
1976 D. J. Hagedorn
1976 Tsune Kosuge*
1976 H. H. Luke
1976 C. J. Nusbaum*
1976 J. G. ten Houten

1977 E. C. Calavan
1977 E. B. Cowling
1977 P. R. Day
1977 J. L. Lockwood
1977 G. C. Papavizas
1977 R. H. Stover
1977 Kohei Tomiyama

1978 A. H. Ellingboe
1978 C. J. Gould
1978 J. E. Mitchell
1978 Shu-Huang Ou
1978 Albert Siegel
1978 F. A. Todd
1978 S. D. Van Gundy
1978 Milton Zaitlin

1979 Robert Aycock
1979 V. H. Dropkin
1979 J. B. Rowell
1979 R. P. Scheffer
1979 I. R. Schneider
1979 J. S. Semancik
1979 W. L. Smith, Jr.*
1979 P. H. Williams

1980 Ralph Baker
1980 K. R. Barker
1980 J. A. Browning
1980 R. J. Cook
1980 R. J. Green, Jr.
1980 W. J. Hooker
1980 M. F. Kernkamp*
1980 T. Kommedahl
1980 T. P. Pirone
1980 L. F. Roth
1980 A. F. Sherf*
1980 A. L. Shigo

1981 J. B. Bancroft
1981 J. A. Kuc
1981 C. Leben
1981 George Nyland
1981 A. O. Paulus
1981 C. O. Person
1981 S. P. Raychaudhuri
1981 R. E. Stall

1982 J. E. Duffus
1982 M. C. Heath
1982 L. H. Purdy
1982 R. Stace-Smith
1982 A. R. Weinhold

1983 G. N. Agrios
1983 G. W. Bird
1983 J. Bird-Pinero
1983 J. Dekker
1983 C. J. Delp
1983 R. I. B. Francki*
1983 Y. Henis
1983 K. J. Leonard
1983 C. J. Mirocha
1983 D. E. Munnecke
1983 D. J. Samborski*
1983 E. L. Sharp
1983 A. K. Vidaver

1984 W. R. Bushnell
1984 P. P. F. M. deNeergaard*
1984 R. D. Durbin
1984 G. E. Galvez-Enriquez
1984 C. W. Roane
1984 A. F. Schmitthenner
1984 M. D. Simons
1984 R. C. Staples
1984 J. F. Tammen
1984 G. E. Templeton
1984 S. A. Tolin

1985 R. D. Berger
1985 R. J. Campana
1985 R. E. Davis
1985 J. W. Eckert
1985 D. C. Erwin
1985 R. I. Hamilton
1985 J. Kranz
1985 H. H. Murakishi
1985 P. E. Nelson
1985 W. E. Sackston
1985 F. A. Wood*

1986 George E. Bruening
1986 Arun K. Chatterjee
1986 Elroy A. Curl
1986 W. Harley English
1986 Anton J. Novacky
1986 Joseph M. Ogawa
1986 Rosario Provvidenti
1986 Alan P. Roelfs
1986 Norman C. Schenck
1986 Peter H. Tsao
1986 Isaak Wahl

1987 Horace L. Barnett
1987 Michael G. Boosalis
1987 Richard A. Frederiksen
1987 Stephen M. Garnsey
1987 A. Morgan Golden
1987 Cedric W. Kuhn
1987 Frances M. Latterell
1987 Roger H. Lawson
1987 Gino Malaguti
1987 Srecko M. Mircetich
1987 Nathaniel T. Powell
1987 Albert D. Rovira

1988 Alois A. Bell
1988 Douglas W. Burke
1988 Urban L. Diener
1988 Eddie Echandi
1988 Gian L. Ercolani
1988 Chuji Hiruki
1988 Sung M. Lim
1988 Gad Loebenstein
1988 Donald C. Ramsdell
1988 John F. Schafer
1988 Hong-ji Su
1988 Ivan J. Thomason
1988 Billy G. Tweedy

1989 Carl H. Beckman
1989 Eileen Brennan
1989 John M. Duniway
1989 David W. French
1989 C. Wendell Horne
1989 John G. Moseman
1989 Rodrigo Rodríguez-Kabana
1989 Gregory E. Shaner
1989 Malcolm R. Siegel
1989 Jui-Chang Tu
1989 James Van Etten
1989 Robert K. Webster
1989 Homer D. Wells
1989 Gayle L. Worf

1990 Tseh An Chen
1990 William O. Dawson
1990 William E. Fry
1990 Alan L. Jones
1990 Michael J. Jeger
1990 Edgar L. Kendrick
1990 Wen-hsiung Ko
1990 Yeshwant L. Nene
1990 Harry R. Powers, Jr.
1990 Kenneth J. Scott
1990 Hans D. VanEtten
1990 Olen C. Yoder

*Deceased