Fellows

Twelve members of The American Phytopathological Society were elected Fellows of the Society at the 1990 Annual Meeting in Grand Rapids, Michigan. 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.

Tseh An Chen

Tseh An Chen was born on October 26, 1918, in Shanghai, China. He attended Nanjing University and received a B.Sc. degree from National Taiwan University in 1951. He continued his studies in the United States, obtaining an M.S. degree in horticulture at the University of Wisconsin in 1953 and a Ph.D. degree in plant pathology at the University of New Hampshire in 1962. In his doctoral dissertation, he investigated strawberry root rot and became interested in parasitic nematodes that predisposed roots to fungal infection.

From 1962 to 1967, he held research appointments at Cornell University, Fairleigh Dickinson University, and Boyce Thompson Institute of Plant Research, respectively. In 1969, he was appointed to the tenured faculty of Rutgers University where he initiated a nematology program in the Department of Entomology at Cook College. He transferred to the Plant Pathology Department in 1973 where he developed an interest in plant mycoplasmas (MLOs).

Dr. Chen has received world-wide recognition for his research in two areas: nematode ultrastructure and plant mycoplasmas. He pioneered research on the ultrastructure of nematodes and it resulted in the first detailed description of the feeding apparatus believed to contain certain plant viruses. Other scientists, armed with this information, were more easily able to demonstrate the presence of these viruses within the feeding apparatus. Because of his enthusiasm, high standards, and ongoing interest in nematodes as plant virus vectors, he continues to attract many excellent nematology students. Many of his former students are now forging outstanding careers in academia, private enterprise, and government in the United States and in foreign countries.

Dr. Chen is also one of the pioneers in researching the more recently recognized group of plant disease-producing organisms, the plant mycoplasmas. He was the first to develop media for the long term in vitro maintenance of the corn stunt spiroplasma. He and his students were among the first to culture the corn stunt spiroplasma; he also fulfilled Koch's postulates with it. He developed a simple medium for the isolation and cultivation of spiroplasmas; it is still the most widely used medium. He also developed the first chemically defined culture medium for spiroplasmas, thus facilitating in-depth nutritional studies of these organisms. He and his students were the first to develop monoclonal antibodies against *Spiroplasma citri* (citrus stubborn disease) and the corn stunt spiroplasma.

He recently developed the first monoclonal antibodies against the aster yellows agent, one of the most economically important, non-cultivable mycoplasma-like organisms causing world-wide plant disease. This is a significant break-through in plant MLO research and he currently has a patent pending on this important discovery. His laboratory currently may be the first to develop nine monoclonal antibodies and gene probes as diagnostic tools to identify certain fastidious phloem-limited plant pathogens. Dr. Chen's extensive knowledge of mycoplasma-like organisms and their plant diseases, his productivity, and his warm personality continue to attract many graduate students and experienced scholars from all over the world to his laboratory. In 1986, Rutgers University elevated him to the rank of distinguished professor.

Dr. Chen's research accomplishments have clearly been the key to his appointment on several prestigious committees on the nomenclature of mycoplasmas. He has held membership on the Mycoplasma Taxonomy Committee of the American Society for Microbiology, the Subcommittee on Taxonomy of Mollicutes of the International Organization of Mycoplasmology, and the Working Committee on Plant and Insect Mycoplasmas of the World Health Organization.

He was one of the key figures in the organization of two symposia: a US-ROC Cooperative Science Symposium on Plant and Insect Mycoplasmas, and a symposium and workshop on "Hybridoma Techniques in Agriculture." He was a member of the Planning Committee for the 5th International Congress of Mycoplasmology (Jerusalem, Israel). He is one of six instructing participants in an intensive five-day workshop on mycoplasma, sponsored by the American Type Culture Collection. Dr. Chen was elected a member of the National Research Council of the Republic of China in 1976. An indefatigable and dedicated scientist, he has given invitational lectures, symposia, or seminars at numerous national and international universities, institutes, and congresses for three decades. He has been a highly successful cooperator in international research projects in the US-ROC Cooperative Science Research Program, and in a Cooperative Research Project between the Department of Plant Protection, Nanjing Agricultural University, PRC and the Department of Plant Pathology, Rutgers University.

William O. Dawson

William O. Dawson was born in Rome, GA, in 1944. He received a B.S. degree in chemistry in 1966 and a Ph.D. degree in plant pathology in 1971 from the University of Georgia. After a year of postdoctoral training at the University of California, Berkeley, he joined the faculty of the Department of Plant Pathology at the University of California, Riverside, in 1972, where he developed an outstanding plant virus research program. He was promoted to associate professor at that institution in 1978 and to full professor in 1984. Dr. Dawson's research is centered on the molecular biology of tobacco mosaic virus (TMV), especially its replication, gene regulation, and interactions with its hosts.

Early in his career, Dr. Dawson made significant contributions to plant virus research by developing conditionally-lethal, temperature-sensitive mutants to study virus replication. He investigated the effects of high temperature on plant virus replication and contributed significantly to research on viral chemotherapy.

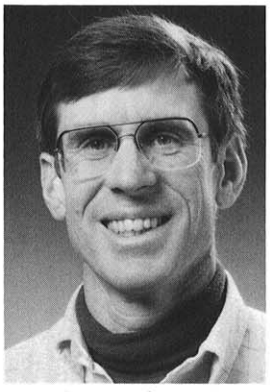
His creative approaches to studying the basic biology of TMV led to extraordinary contributions, including the first cloning of full-length, infectious transcripts. This allowed him and his

colleagues to manipulate the TMV genome in vitro, thus providing an extremely powerful method to study gene function and regulation in this economically important virus. He subsequently identified specific regions of the genome that affect virulence, cell-to-cell movement, and the capacity to elicit hypersensitivity in tobacco.

His most recent research has led to a major breakthrough in our understanding of the signalling processes that elicit plant hypersensitive responses. By using appropriate strains of TMV and *Nicotiana sylvestris*, which contain the N′ gene for disease resistance (hypersensitivity), Dr. Dawson's group demonstrated that the TMV coat protein by itself functions as a specific elicitor of the hypersensitive reaction in *N. sylvestris*. This was convincingly shown by genetically transforming plants with wild type and mutant TMV coat protein genes and observing that only the expected coat protein induced the hypersensitive reaction in such plants. In further experiments, Dr. Dawson and his group have demonstrated that TMV coat protein, besides encapsidating genomic RNA, is multi-functional: the carboxyl terminus is involved in the induction of yellowing symptoms and other regions are involved in regulating necrosis and cell-to-cell movement of the virus. Recent research has emphasized the role of translation-start codons in gene expression; mutants, which underwent delayed expression of the nonstructural 30-kilodalton protein gene for a "movement" or "transport" protein, were defective in cell-to-cell spread.

Dr. Dawson is internationally recognized for his contributions to basic plant virology. He has been invited to present his research results at numerous seminars and symposia. His research has been funded by many NSF and USDA research grant awards and he has served on both USDA and NSF advisory panels for competitive grants. He served on the APS Plant Virology Committee. He has served as a consultant for several biotechnology firms, and has represented the Riverside campus for the University of California Biotechnology Research and Education Program. He developed a comprehensive graduate course on the molecular biology, biochemistry, and biophysical properties of viruses. He also contributes significantly to an introductory course on plant viruses. Dr. Dawson has trained 12 graduate students and eight postdoctoral fellows. He is an active member of an interdepartmental graduate program in genetics and is currently leading the drive to create an interdisciplinary graduate program in environmental biotechnology. He was a founder and president of the Riverside Chapter of Gamma Sigma Delta, the agricultural honor society.

William E. Fry



William E. Fry was born in Lincoln, NE, in 1944. He attended Nebraska Wesleyan University, where he received a B.A. degree with high distinction in the field of chemistry in 1966. In 1966, Dr. Fry entered graduate school for plant pathology at Cornell University. His thesis research concerned tolerance of *Stemphyllium loti* for cyanide, which is released by its host, birdsfoot trefoil, in response to infection or mechanical injury. In this work, Dr. Fry discovered a new enzyme that the fungus uses to detoxify hydrogen cyanide. This represented one of the few cases in which the molecular basis for disease reaction was clearly demonstrated.

After receiving a Ph.D. degree from Cornell in 1970, Dr. Fry joined the faculty of Central Connecticut State College as an assistant professor in the Biology Department. In 1971, he returned to Cornell as assistant professor of plant pathology. At Cornell, he resumed his interest in the physiology of disease in cyanogenic plants, this time studying the pathogens of sorghum.

His primary research and teaching responsibilities, however, were in epidemiology and management of plant diseases. His attention soon became focused on potato late blight as an ideal model system in which to concentrate those research efforts. He rapidly became an internationally respected authority on potato late blight and on plant disease epidemiology and disease management in general. His research combines both experimental and modeling approaches. Among his outstanding contributions is the characterization of partial resistance in terms of the amount of fungicide required to achieve equivalent suppression of potato late blight epidemics in the field. This concept of fungicide equivalents as a measure of partial resistance has been applied widely to other crops and diseases in order to improve disease management while reducing the number of necessary fungicide applications.

Dr. Fry recruited and directed a team that developed an outstanding simulation model for potato late blight. He then used the model in innovative evaluations of the effectiveness of disease forecasting system and fungicide resistance management tactics, and analyses of optimization of fungicide use. His most recent contributions in epidemiology have been in modeling potato yield and tuber blight, and in modeling simultaneous epidemics of early blight and late blight in potatoes in order to determine how to manage both diseases most efficiently. The strength of his program lies in the extensive field experimentation that he has done to validate the modeling approach and in his effective use of the models to address important management problems.

In addition to epidemiology, Dr. Fry has made breakthroughs in the genetics of *P. infestans* through controlled crosses and analysis of progeny for isozyme variation and virulence to potato and tomato cultivars with various resistance genes. He has been a leader in the field of population genetics of plant pathogens with his work on isozyme and RFLP (restriction fragment length polymorphism) variation in populations of *P. infestans*.

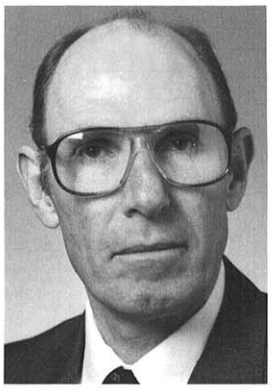
While conducting a very active research program, Dr. Fry has also excelled in the classroom. He brings a keen intellect, strong motivation, and sincere dedication to this teaching. His textbook, *Principles of Plant Disease Management*, is a unique contribution to the field of plant pathology. In addition, he co-edited two volumes of *Plant Disease Epidemiology*, which have become premier resources for teaching advanced epidemiology. Outside the classroom, Dr. Fry offers extraordinary guidance and leadership to graduate students in his laboratory as well as in other programs at Cornell. With his enthusiasm, unselfishness, and hard work, he provides an outstanding role model for young plant pathologists.

Just ten years into a highly acclaimed and internationally recognized research and teaching career, Dr. Fry was asked to assume the chairmanship of the Department of Plant Pathology at Cornell University. He became chairman at a time of change, when a diverse faculty could easily have become divided. Through his good judgment and patient leadership which focused on commonalities rather than differences, he instilled respect and confidence in the administration. His exceptional leadership added strength to the department by developing new directions in research yet maintaining existing strengths and keeping the department on a path of excellence. Through it all, he maintained a highly productive and acclaimed research program in his own right.

Dr. Fry has devoted his time and energy to APS; he chaired several key committees, including the Teaching Committee, Epidemiology Committee, Special Committee on Pest Management, and the Plant Disease Management Coordinating Committee. From 1986 to 1989, Dr. Fry served as a councilor-at-large of APS. In addition to serving APS, Dr. Fry has willingly given his time and energy to numerous college and university committees. He is currently active on the AESCOP Technical Committee on IPM and serves on the editorial board of *Plant Pathology*, the journal of the British Society for Plant Pathology.

Dr. Fry's keen mind, his quiet effectiveness, his impeccable integrity, and his good humored sincerity have won him the admiration and friendship of all who have worked with him.

Alan L. Jones



Alan L. Jones was born on June 23, 1939, in Albion, NY, and received a B.S. degree in pomology in 1961 and an M.S. degree in plant pathology in 1963, both from Cornell University. His interest in plant pathology, which grew from his undergraduate contact with Professor Roy L. Millar, and his decision to focus on tree fruit pathology was influenced by his background and association with Professor K. G. Parker. After receiving a Ph.D. degree in 1968 from North Carolina State University, he joined the Department of Botany and Plant Pathology, Michigan State University, where he has been assistant professor, associate professor, and, since 1977, professor of plant pathology. In 1978, Dr. Jones became a member of the Pesticide Research Center at Michigan State University. His sabbaticals have been to the USDA Plant Protection Institute, Beltsville, MD (1974), Bayer AG Institut fur Pflanzenkrankheiten, Leverkusen, West Germany (1982), and at the New York Agricultural Experiment Station, Cornell University, Geneva, NY, (1989).

Dr. Jones has been recognized as one of the most innovative and productive researchers in fruit pathology in the world. His basic and applied research and his commitment to practical agriculture, through 50% appointment to Cooperative Extension Service, has lead directly to control and management practices that are used commercially at state, national, and international levels. One of his major scientific contributions has been on the etiology and epidemiology of apple scab caused by *Venturia inaequalis*. Dr. Jones' collaboration with electrical engineers and his improvement of algorithms for epidemiological prediction of infection periods were significant developments in the evolution of the microprocessor from a theoretical to a field-application instrument. Information obtained from the predictor allows growers to determine whether to continue with a protective fungicide or to switch to a curative one if the weather suddenly changes. His basic studies on the factors influencing the uptake by and the protective and curative properties of sterol biosynthesis inhibiting (DMI) fungicides on apple leaves and on the value of adjuvants resulted in specific recommendations of application rates and spray intervals. He also was the first to discover sterol biosynthisis inhibiting fungicide- and benzimidazole-resistant scab strains, a finding which served as an early warning to users, and indicated that the exclusive use of these major classes of fungicides was potentially unsafe for long-term scab control in North America.

His current research is directed toward genetics of resistance of *V. inaequalis* to the benzimidazole fungicides. Additionally, Dr. Jones has made important contributions to our understanding of several important diseases of cherries, including cherry leaf spot caused by *Blumeriella jaapii*, bacterial canker caused by *Pseudomonas syringae* pv. *morsprunorum* and *P. syringae* pv. *syringae*, X-disease of peach and cherries, the Armillaria root rot complex, and the in vitro and in planta transfer of copper resistance plasmids in *P. syringae* pv. *syringae*. Recently he identified and described a new canker disease, caused by the fungus *Leucostoma cincta*, in apple in North America. These research efforts are important examples of how basic field, greenhouse, and laboratory studies can be integrated to provide information of practical significance to growers and other disease management specialists. He has published 76 research publications, 50 extension bulletins and popular articles, 12 review articles and book chapters, including the recently completed *Compendium of Apple and Pear Diseases* co-edited with Dr. H. Aldwinckle. His bulletin on tree fruit diseases, co-authored with Dr. T. B. Sutton, is widely used for extension and teaching in other states and regions. Now in a third edition, over 75,000 copies of this bulletin have been distributed since the first edition in 1971.

Dr. Jones has served on APS committees, and is currently associate editor for the *Canadian Journal of Phytopathology*. He served as a member of the USDA-SEA National Assessment Team for Captan/Folpet/Captafol, and is a frequent member of the USDA-CSRS peer review panel for the Apple IPM grant programs. He has been active in the Deciduous Tree Fruit Disease Workers Group since it was formed in the early 1970s.

The research accomplishments of Dr. Jones have attracted scientists from throughout the world to his laboratory, and he has been an invited speaker at many national and international conferences and symposia. In 1978, he was presented the Ciba-Geigy Award from The American Phytopathological Society. In 1987, he received the Distinguished Service Award from the Michigan State Horticultural Society, the highest award given by the Society, in recognition of his research and scientific counsel to the Michigan Fruit Industry.

Michael J. Jeger

Michael J. Jeger was born on May 2, 1945, in Brackley, Northamptonshire, United Kingdom, and received his early education at Magdaline College School at Brackley. In 1975, while employed in the Agricultural Engineering Industry, he completed a B.A. degree in biology and mathematics at Open University, U.K. He enrolled in the University of York, where he received an M.Sc. degree in biological computation in 1976. In the same year, he received a research scholarship from the U.K. Ministry of Agriculture, Fisheries and Food to support a Ph.D. degree program at the University College of Wales, Aberystwyth, under the supervision of Drs. Ellis Griffiths and D. Gareth Jones in the Department of Agricultural Botany. Dr. Jeger's research thesis on the epidemiology of the nonspecialized pathogens, *Septoria nodorum* and *Rhynchosporium secalis* in heterogeneous strands of cereals, was truly outstanding. From that research, for which he received the Ph.D. degree in 1979, Dr. Jeger published 10 papers in scientific journals and one book chapter.

In 1978, Dr. Jeger was appointed to the Plant Pathology Department at the East Malling Research Station (now the Institute of Horticulture), Maidstone, Kent, to work on the epidemiology and control of orchard diseases, particularly apple scab and powdery mildew. In 1983, he moved to the Department of Plant Sciences (now the Plant Pathology and Microbiology Department) at Texas A&M University, where he worked on the epidemiology of soilborne pathogens and taught graduate courses in epidemiology and disease management. While at Texas A&M, Dr. Jeger published articles on diseases caused by *Phymatotrichum omnivorum*, *Macrophomina phaseolina*, *Rhizoctonia solani*, *Peronosclerospora sorghi*, and root knot nematodes.

In 1986, Dr. Jeger returned to the United Kingdom to become head of the Fruit, Vegetable and Root Crop Section of the Overseas Development Natural Resources Institute. This section's work includes research on pre-and post-harvest anthracnose of tropical fruits, *Aspergillus niger* in tropical onions, and the crown rotting complex of banana and plantain. Recently Dr. Jeger became head of the newly formed Department of Plant Pathology at the Institute.

Throughout his professional career, Dr. Jeger has been concerned with consolidating and further developing the theoretical basis of plant disease epidemiology. His mathematical approach to plant pathology is exemplified by his development of mathematical models that serve as problem-solving tools, his rigorous examination of the underlying assumptions about plant disease epidemics, and his powerful insights into the key factors determining the occurrence and severity of epidemics. Early in his

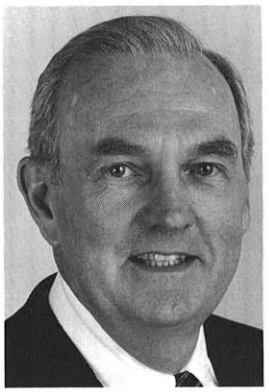
career, he was recognized as one of the foremost quantitative plant disease epidemiologists in the world. In addition to 50 scientific papers and 10 book chapters, Dr. Jeger has edited a multi-authored book, *Spatial Components of Plant Disease Epidemics*, and written a book, *The Theory of Plant Disease Epidemics*.

Dr. Jeger's main research achievements can be summarized as follows: (1) He has shown by mathematical models and experimentation that host plant mixtures can reduce severity of epidemics caused by non-specialized pathogens. (2) He used epidemiological models and principals to develop a robust disease management strategy to integrate host resistance and fungicide applications for optimal control of apple scab in England. (3) His mathematical analysis and modeling of diseases caused by soilborne pathogens, which take into account the dynamics of inoculum, root growth, and disease progress, are helping to bring epidemiological theory for those diseases up to the status achieved for epidemiology of foliar diseases. (4) He has given a rigorous mathematical basis to J. E. Vanderplank's revolutionary epidemiological insights, such as the threshold theorem of plant disease epidemics and the asymptotic approach to maximum disease severity in epidemics. He has shown how Vanderplank's differential-difference equations are related to systems of differential equations that permit more flexible analysis, so that it is now possible to deal with plant disease epidemics as a special case of more general types of epidemics, using the context and terminology of theoretical population ecology.

Dr. Jeger is an active participant in the International Society for Plant Pathology's Committee on Epidemiology, Crop Loss and Production Constraints. In APS, he has been associate editor of *Phytopathology* and chairman of the Epidemiology Committee. He has served on the Council of the British Society for Plant Pathology since 1987, and is currently the senior editor of their journal, *Plant Pathology*.

Dr. Jeger's career is characterized by the rare combination of a very active program of practical applications of epidemiological principles to solve agricultural problems and the maintenance of an extremely productive research effort at the forefront of theoretical population ecology of host-pathogen interactions. His accomplishments in theoretical epidemiology have revolutionized the field and will influence experimental and theoretical research in epidemiology and disease management for years to come.

Edgar L. Kendrick



Edgar L. Kendrick was born on March 23, 1928, in Davis, CA, where his father served as a faculty member and as chairman of the Plant Pathology Department at the University of California. He received a B.A. degree in botany and genetics from the University of California, Berkeley, in 1950, and a Ph.D. degree in plant pathology and mycology from the University of Wisconsin in 1954. He was appointed research plant pathologist, Crops Research Division, USDA-ARS, in Pullman, WA, in 1953, where he also became a member of the graduate faculty of Washington State University. There, he spent 12 years working on common and dwarf bunt of wheat in the U.S. Pacific Northwest, with a particular focus on the physiology of *Tilletia caries* and its interactions with environment, hosts, and ecological factors that affect disease severity and management.

For the next 20 years, from 1965 to 1985, Dr. Kendrick distinguished himself as an outstanding administrator and leader with the U.S. Department of Agriculture, first within the Agricultural Research Service and then with the Science and Education Administration. He started this aspect of his career as assistant branch chief, Crops Research Division of ARS, where he performed a number of administrative functions designed to improve the operating efficiency of ARS and upgrade research productivity. From 1972 to 1976, he worked in Tucson, AZ, as area director for the Arizona-New Mexico area in the USDA-ARS western region. He then served in New Orleans, LA, first as associate deputy administrator and then as deputy administrator of the southern regional area of the USDA-ARS. He administered wide-ranging research programs of regional and national significance. His exemplary performance as the USDA-ARS southern regional administrator led to his promotion to the Senior Executive Service of Science and Education, USDA, in Washington, D.C. In 1983, he became the administrator of the Office of Grants and Program Systems, Science and Education, USDA, where he established the operating style for the Competitive Research Grants Program, a new activity in the USDA at that time. Dr. Kendrick retired from the USDA in 1985.

During his tenure, he received a number of awards, including the Presidential Rank Award, four Senior Executive Service awards, and the USDA Distinguished Service Award. Throughout his tenure as a USDA administrator, Dr. Kendrick was highly respected and admired for his skills in relating personally to people at all levels in the organization and for helping employees recognize and reach their own career goals.

In 1987, after retiring to his home in Tucson, AZ, Dr. Kendrick accepted an appointment as acting director of the School of Renewable Natural Resources in the College of Agriculture, University of Arizona. He was appointed director in 1988 and, in typical fashion, revitalized and expanded the activities of this school in the areas of natural resource management and land use planning. He also holds an appointment as adjunct professor in the Department of Plant Pathology.

Dr. Kendrick's career continues to be a truly distinguished one of strong working relationships with his professional colleagues and quality administrative leadership in the broad arena of agriculture research. Throughout his career, Dr. Kendrick has been active in The American Phytopathological Society, serving on several committees and as treasurer of APS for six years, 1976–1982. During his tenure as treasurer, Dr. Kendrick was instrumental in the successful launching of *Plant Disease*, the second journal to be published by APS, and in establishing this Society's book publishing program. These ventures have solidified the position of APS as the pre-eminent source for plant disease-related literature in the world and have added financial security to our Society.

Wen-hsiung Ko

Wen-hsiung Ko was born in Chao Chow, Taiwan, on May 14, 1939. He received a B.S. degree from National Taiwan University in 1962, served in the Taiwan army during 1962–1963, and earned the Ph.D. degree in plant pathology at Michigan State University in 1966. He was a postdoctoral research associate at Michigan State from 1966 to 1969, and was then appointed to assistant professor in the Department of Plant Pathology at the University of Hawaii's Beaumont Agricultural Research Center in Hilo in 1969. He was promoted to the rank of associate professor in 1972, and to professor in 1976.

Dr. Ko has made numerous and significant contributions to plant pathology through research, teaching, and public service. His contributions in basic research encompass soil microbiology, microbiology, and fungal physiology. Those in applied research include diseases of papaya, macadamia, guava, banana, litchi, tea, and ohia.

Dr. Ko made important contributions to our understanding of the role of nutrient deprivation in soil fungistasis and the autolysis of mycelium of fungi in soil. He was the first to isolate and identify fungistatic substances from alkaline soil (ammonia) and acid soil (aluminum), but showed that these substances differed from the properties of the widespread soil fungistasis. By use of antibiotic-resistant mutants, he produced the clearest evidence to date that the growth of bacteria in soil is restricted in a manner similar to that of fungi, and thus has contributed to the broadened concept of microbiostasis in soils. Using fungistasis assays of soils, he showed that pathogen suppressiveness may vary widely among small localized areas in the field, and he identified soils suppressive to *Fusarium oxysporum*, *Rhizoctonia solani*, *Pythium splendens*, *Phytophthora capsici*, and *Phytophthora cinnamomi*. His finding that *P. splendens*-suppressive soils have a high Ca content (unrelated to pH) and a high microbial population has led to a practical method, mixing lime and alfalfa meals with soil, for controlling damping-off of cucumber in Hawaii.

Dr. Ko has made exceptional contributions to the solution of several intractable plant disease problems in Hawaii. The papaya replant problem caused by *Phytophthora palmivora* had defied numerous control attempts that were based primarily on applications of fungicides and fumigants. His greenhouse-tests confirmed field observations that the roots of papaya were susceptible only up to the age of three months. Recognizing the fungistatic nature of soil, he planted papaya seeds in natural pathogen-free soil placed in the planting holes, and achieved complete control. This simple method for replanting papaya fields was recognized as the most outstanding agricultural achievement in Hawaii in 1973. He also showed that a decline of native ohia trees in the forests, previously attributed to fungal disease or insect infestation, was caused by nutrient deficiency. His results supported the hypothesis of a plant ecologist: the decline was due to natural ecological succession in which pioneer species of trees were being replaced by more competitive tree species. A serious decline of macadamia had been attributed to nutrient deficiency, but when the trees did not respond to applications of fertilizer, Dr. Ko showed instead that 80% of the trees were declining because of extensive root decay caused by the Ascomycete *Kretzschmeria clavus*.

Dr. Ko's research has been characterized by an unusual ability to gain insight of a problem and to systematically and efficiently work to find its solution. For example, the observations that sexual reproduction in *Phytophthora* can sometimes occur in matings of different species suggested to him that chemical (hormonal) stimulation rather than heterothallic mating was the cause of oospore formation. This was proved by pairing different mating types of several *Phytophthora* species on opposite sides of a polycarbonate membrane filter barrier, which allowed the passage of hormonal substances but not mycelium. This innovative work has forced a reinterpretation of sexuality and the genetics of mating type in *Phytophthora* and lead to Dr. Ko's receiving the APS Ruth Allen Award in 1984.

For many years, Dr. Ko has been involved in cooperative projects in Taiwan, applying the same insightful analysis he has brought to solving agricultural problems in Hawaii. His problem solving techniques led to the following: Marginal scorch of banana was found due to fluoride toxicity from HF emitted from brick and tile factories, twig die-back of tea was found due to infection by *Macrophoma theicola*, and anthracnose blight of tea cuttings was almost completely controlled by spraying stock plants with benomyl prior to taking cuttings, whereas the standard practice of dipping or spraying cuttings was not effective. In these three instances, Dr. Ko's research led to practical control measures that are used by growers. He also assisted researchers in the search for somaclonal variants of Cavendish banana, produced from meristem cultures, that are resistant to race 4 of *F. oxysporum* f. sp. *cubense*. Several apparently resistant variants have been identified.

Dr. Ko made annual consulting visits to Taiwan from 1972 to 1984, and twice-yearly visits since; he has made annual consulting visits to China since 1986. He has presented lectures in Taiwan, China, Korea, Japan, the Philippines, and Malaysia.

Among his other research contributions are: the use of the vertical illumination microscope for direct observation of fungal activity on soil, the microsyringae method for determining concentrations of fungal propagules in suspensions, a special technique of placing soil clumps on a selective medium for the determination of soil populations of *R. solani*, and a fundamental inverse relationship ($r = 0.95$) between the logarithms of population densities of plant pathogens in soil and propagule size.

Dr. Ko is a member of APS, the International Society of Plant Pathology, the Phytopathological Society of Japan, the Taiwan Plant Protection Society, the Taiwan Plant Pathology Society, and the Mycolgical Society of America. He has served APS as associate editor of *Phytopathology* (1980–1982), and as a member of the Soil Microbiology Committee (1972–1974) and the Biological Control Committee (1980–1982). He is presently associate editor of *Plant Disease*, a member of the Editorial Board of the *Botanical Bulletin of Academia Sinica* (Taiwan), and a member of the ISPP working group on *Phytophthora*.

Yeshwant L. Nene

Yeshwant Laxman Nene was born in Gwalior, India, on November 24, 1936. He received the B.Sc. and M.Sc. degrees from Agra University, India, in 1955 and 1957, respectively, and was awarded the Ph.D. degree by the University of Illinois in 1960 for his work on plant viruses, done under the supervision of Dr. H. H. Thornberry. Dr. Nene's contributions to plant pathology and international agriculture are diverse and many. He began his career as a teacher in a one-man department in a new university in Pantnagar, India, in 1960. Through his leadership, his position developed into a department of plant pathology known for its excellent research, teaching, and extension programs. The department was the first in India to have a Plant Disease Diagnostic Clinic. Dr. Nene is a much admired teacher who has successfully guided the thesis works of 11 Ph.D. and 14 M.S. degree students. Dr. Nene achieved recognition for pioneering work on viral diseases of pulse crops and biological control of virus insect vectors. This work was completely funded by a PL-480 grant. Dr. Nene's work on the cause and control of a mystery disease of rice called *Khaira* earned him the FAO International Rice Research Prize in 1967. This and his other work on wheat diseases were recognized by Dr. N. Borlaug and Dr. R. G. Anderson in 1971 through a Silver Medal instituted by the Government of Mexico.

In 1974, Dr. Nene joined ICRISAT where he resolved the vexing problem of the "wilt complex" of chickpea. His work on chickpea diseases was summarized in a bulletin that has become a standard for breeders and pathologists in India, Pakistan, and the United States. Dr. Nene developed many simple but effective laboratory and field screening techniques for identifying resistance to diseases of chickpeas and pigeonpeas. Because of their simplicity these techniques are today used routinely by researchers in India, Ethiopia, Mexico, Nepal, Pakistan, Syria, Tunisia, and the United States. He made decisive inputs in identifying breeding lines resistant to the major diseases of chickpeas and pigeonpeas. Notable among these were pigeonpeas resistant to sterility mosaic and Phytophthora blight, and chickpeas resistant to fusarium wilt and dry root rot.

In 1980, he was appointed leader of the Pulses Improvement Program and later (1987) program director for legumes at the center. His successful administration of this program led to his appointment as deputy director general of ICRISAT in 1989. As deputy director general, he now coordinates all of the

ICRISAT global research programs for improvement of sorghum, pearl millet, peanut, pigeonpea, and chickpea, as well as works on resource management and genetic preservation.

Dr. Nene has received many national and international awards and honors. He became Fellow of the Indian Phytopathological Society (IPS) in 1980 and received the Jeersanidhi Award from IPS for outstanding contributions to Indian phytopathology. In 1986, he was elected president of IPS.

Dr. Nene has authored, edited, or coauthored over 300 publications resulting from his research, teaching, and advisory activities. He is the author of *Fungicides in Plant Disease Control*, a textbook popular in many tropical countries. He has served on many international committees, including the ISPP Committee on Durable Resistance, the International Advisory Board for the International Food Legume Research Conference, and the International Working Group on Legume Viruses. He is a methodical, disciplined, and unassuming man, deeply respected by his peers—truly an outstanding plant pathologist.

Harry R. Powers, Jr.

Harry R. Powers, Jr. was born on July 25, 1923, in Suffolk, VA. After his enrollment at Virginia Polytechnic Institute was interrupted by World War II, he attended North Carolina State University where he graduated with high honors in forestry in 1949. He received an M.S. degree in forestry from Duke University in 1950 and a Ph.D. degree in plant pathology from North Carolina State University in 1953. Dr. Powers then served as plant pathologist in the USDA-ARS in Beltsville, MD, where he conducted research on genetics of host-parasite relations in powdery mildew and stem rust of wheat from 1953 to 1959.

In 1959, Dr. Powers became project leader of the Forest Disease Survey for the USDA Forest Service stationed in Ashville, NC, where he rose to assistant division chief and then chief of the Division of Forest Disease Research in 1962. He developed and led disease surveys on oak wilt and annosus root rot. His work defined the status of annosus root rot in the Southeast and provided the basis for subsequent research on the pathogen's biology and on the development of effective management practices. Another early accomplishment was his critical evaluation of the use of antibiotics for control of pine rusts. Several years of careful research showed that the antibiotics recommended for rust control were ineffective. Based on Dr. Powers' results, the large scale spray program against white pine blister rust in the Pacific Northwest was suspended, saving the U.S. taxpayers millions of dollars.

Following an administrative reorganization in 1964, Dr. Powers moved to the University of Georgia as leader of the USDA, Forest Service Project on Rusts of Southern Pines. He also served as program manager for the evaluation of rust resistance, and is currently project leader for the work on diseases of southern pine plantations and seed orchards.

As a leader of research on fusiform rust of southern pines, Dr. Powers adapted the wheat rust technology to forest pathologists' needs. He helped to develop the concentrated basidiospore spray system, which was the first method to allow reliable greenhouse testing of large numbers of pine progeny for resistance to fusiform rust. This system, employed at the Research Screening Center in Ashville, is widely used by researchers and industry, and has been adopted for similar rust diseases both in the United States and abroad.

In cooperation with the Georgia Forestry Commission, Dr. Powers started a seed orchard of rust resistant pines, using both the traditional grafted clones and also selected resistant seedlings in order to incorporate a wide range of diversity in the orchard. His foresight and determination are now paying off in the production of rust resistant seedlings to protect commercial plantings. Seed production from the rust resistant seed orchard will eventually yield 15 million improved, rust resistant slash and loblolly pine seedlings per year. In addition, his seed orchard is the largest and most diverse collection of rust resistant pines for both research and further improvement of disease control in the world.

In studies of pathogenic variability in the fusiform rust fungus, Dr. Powers demonstrated a high degree of pathogenic variability in the fungus, showing that highly virulent strains occur in certain geographical regions. His research has contributed to breeding and deployment strategies to best use the genetic base for resistance presently available in slash and loblolly pines and to design new approaches to use an expanded range of resistant germ plasm in the future. Dr. Powers is also using rust resistant pine selections to extend his research into mechanisms of resistance and host-parasite specificity. These studies should ultimately lead to identification of pine selections with a wide range of genetic resistance and make possible the prediction of changes in the pathogen population.

Dr. Powers' leadership skills have been demonstrated in many ways. He has ably filled administrative positions throughout his Forest Service career. Within the Forest Service, he has been a diligent spokesman for plant pathology. Dr. Powers was a leader in establishing the regional Southwide Forest Disease Workshop, which has provided a forum for exchange of information among forest pathologists in the south since 1959. He formed the working party on rusts of hard pines within the International Union of Forest Researchers Organization, and he served as its chairman for 10 years. In 1984, the Southern Forest Disease Workshop awarded him their highest honor, the Southern Forest Pathologist Achievement Award. He also received two USDA Certificates of Merit for leadership in research and affirmative action programs within the agency.

Dr. Powers is currently a member of The American Phytopathological Society, the Society of American Foresters, and the Georgia Association of Forest Pathologists. He has been associate editor of *Plant Disease Reporter* and *Phytopathology*, and he was chairman of both the Forest Pathology and the Publication committees of APS. He has proven an able ambassador for our science, as shown by his participation in national and international meetings and his many invitations to consult with forest pathologists in Australia, Italy, Korea, Japan, Poland, the Netherlands, and England

Throughout his career, Dr. Powers has proven a valuable mentor to a whole generation of forest pathologists.

Kenneth J. Scott

Kenneth J. Scott was born June 15, 1933. During his professional career, he has held appointments at numerous research institutes and universities, including Waite Agricultural Research Institute, Brookhaven National Laboratory, University of Sidney, University of Queensland, University of Cambridge, and Nagoya University. He obtained the B.S. (Hons I) and M.S. degrees from the University of Sidney, Australia, and a Ph.D. degree from Queens University, Canada. He is now professor of biochemistry at the University of Queensland, Australia. He served as head of his department from 1976 to 1984, and as president of the Australian Plant Pathology Society from 1985 to 1987. He is a Fellow of the Australian Institute of Biology and has been on the advancing edge of research on the host-pathogen interactions of rust and

mildew on cereals since the mid-1950s.

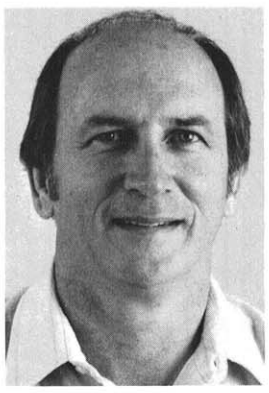
In 1965, Dr. Scott initiated a project on the axenic culture of wheat stem rust and invited P. G. Williams to join him. Their collaboration resulted in the first successful culture of the rust fungus from uredisopores. Rust mycelium grown in culture produced urediospores and teliospores and was pathogenic on wheat. This work received widespread international acclaim after its initial rejection by *Nature*. The work was followed by extensive studies on the carbohydrate and amino acid requirements of the rust fungus, which proved to have an obligatory requirement for sulphur-containing amino acids. In pioneering studies on intermediary metabolism in mildewed barley, he and his co-workers reported a specific degradation of chloroplast polysomes in susceptible but not in resistant barley leaves after inoculation and incubation with the powdery mildew fungus. This appears to be a crucial event in the establishment of a compatible reaction between host and pathogen and to be triggered by the induction of specific host ribonucleuses.

More recently, Dr. Scott and his co-workers have shown that the resistance of barley to the powdery mildew fungus is associated with the induction of a number of novel host proteins and their mRNA. Clones of cDNA have been outlined for some of the latter. Sequence homology studies have shown that one of the clones encodes a β-1-3 glucanase, an enzyme of known antifungal activity. The genes encoding the induced mRNAs appear to constitute a multicomponent defense mechanism against phytopathogenic fungi. This may represent a general mechanism of resistance in cereals to infection with phytopathogenic fungi.

In an important advance to facilitate the genetic engineering of cereals, Dr. Scott's groups have succeeded in developing a cell culture line using the epiblast of immature embryos of wheat as starting material. This line is derived from relatively few cells on the embryo, and the callus formed is highly meristematic in liquid or agar culture. Further, it is highly embryogenic and readily regenerates fertile plants. This cell line represents an ideal target for genetic engineering. Dr. Scott's expertise in this area has recently been recognized by his receipt of the $200,000 Bicentennial Award of the Alumni Association of the University of Queensland and by receipt of a major research excellence grant from the University to develop microprojectile systems for the genetic engineering of wheat embyro systems.

In addition to his numerous research papers, Dr. Scott has co-authored or authored a series of important and stimulating reviews on respiratory and intermediate metabolism in diseased tissue, the growth of rusts in vitro, and obligate parasitism. He is the senior editor of the text, *The Rust Fungi*. He has been active in guiding many graduate students and postdoctorates who continue his tradition of scientific excellence in important positions throughout the world.

Hans D. VanEtten



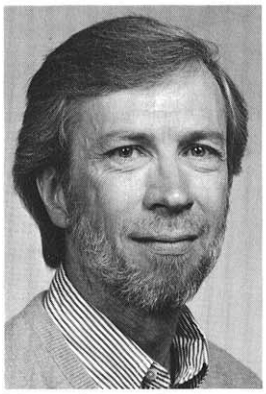
Hans D. VanEtten was born on September 16, 1941, and spent his early years in East Peoria, IL. He received a B.A. degree in botany/chemistry at Wabash College in 1963, an M.S. degree in plant pathology/organic chemistry in 1966, and the Ph.D. degree in plant pathology/plant physiology in 1971 from Cornell University. He was appointed assistant professor of plant pathology at Cornell in 1970. He continued his research on physiological aspects of host-pathogen interactions as a faculty member at Cornell.

Dr. VanEtten's research has been characterized by the application of the most up-to-date science appropriate to his research. His extensive background in chemistry and physiology as well as plant pathology provided the foundation for his subsequent accomplishments in revealing some of the basic mechanisms involved in host-pathogen interaction. His ability to manage collaborative relationships with a wide variety of scientists has been important to his successful search for the fundamental molecular explanations of plant disease processes. His work has extended from the chemistry of the various chemical compounds that make up the phytoalexin to their significance in disease, the genetics of their production, and their role in host-pathogen interactions. The rapid development of molecular biology techniques during the 1970s and 1980s led to a variety of new experimental approaches to aid in the elucidation of the significance and function of phytoalexins. His research led to the discovery of a fungal enzyme that detoxifies the phytoalexin pisatin. During this pioneer research, many new techniques were successfully applied to research on fungal plant pathogens. Many "firsts" resulted, such as the first fungal pathogen gene to be cloned and its function recognized, transformation of fungal plant pathogens, and the helping to establish the significance of pathogen-induced plant compounds in disease. Dr. VanEtten has participated in many conferences and symposia in plant molecular biology, biochemistry, and plant pathology. He also is frequently in demand as a seminar speaker at a variety of university departments and other institutions.

Dr. VanEtten was promoted to associate professor in 1976 and full professor of plant pathology at Cornell in 1984. In 1989, he accepted an appointment as professor of plant pathology in the Department of Plant Pathology, University of Arizona, with a joint appointment in molecular and cellular biology. He will continue his leadership in research on fungal biology, focusing on fungal-plant interactions as they relate to soilborne disease and rhizosphere biology.

He is a member of several professional societies and is very active as an associate editor of the APS journal, *Molecular Plant-Microbe Interactions*. He has been awarded NDEA, Alexander van Humboldt, and Fulbright Hayes fellowships. His sabbatical and study leaves have taken him to Sweden, Germany, and California, during which he worked in plant biochemistry, genetics, and fungal molecular biology. He has organized and taught courses in molecular plant pathology. The numerous postdoctorate and graduate students from his laboratory continue and expand his research program in the molecular regulation of plant-pathogen interaction.

Olen C. Yoder



Olen C. Yoder was born in Fairview, MI, on January 26, 1942. He received a B.A. degree from Goshen College in 1964, and M.S. and Ph.D. degrees from Michigan State University in 1968 and 1971. His thesis director was R. P. Scheffer. He has been a member of the faculty in the Department of Plant Pathology at Cornell University since 1971, and currently holds the rank of professor. He has taken a sabbatical leave to Stanford University to work with David Perkins, and a study leave to the Whitehead Institute of the Massachusetts Institute of Technology to work with Gerald Fink. In both cases, he used these leaves effectively to enhance his knowledge of and experience in molecular biology.

Dr. Yoder's laboratory is perhaps best known for its studies on fungal pathogenesis. He has been a strong advocate of the consorted use of conventional and molecular approaches to studies on the mechanism(s) of pathogenicity.

His early studies evaluated the roles of fungal toxins in plant pathogenesis and provided proof that some of them are necessary factors in disease development. He showed that host-specific

toxins can be either pathogenicity factors or virulence factors. Dr. Yoder helped define the question: "Why do certain pathogenic fungi produce toxins since toxin minus strains as well as toxin plus strains seem to successfully survive in nature?" This has led to a consideration of the pathway(s) of toxin biosynthesis and eventually to the definition of the genes that control toxin biosynthesis.

More recently, Dr. Yoder's laboratory developed transformation vectors carrying markers that are selectable in wildtype fungal cells so that a mutation is not needed in the recipient strain before it can be transformed, a feature important for the molecular manipulation of fungal plant pathogens. These vectors have been used to achieve transformation for a wide array of filamentous fungi, including many that are pathogenic. Research in his laboratory has also contributed to an understanding of the mechanism of plasmid integration into fungal chromosomes and has demonstrated that it can be either by homologous recombination or by nonhomologous means. The former can be used for gene disruption or gene replacement, both being powerful analytical tools available to prove or disprove the role of a gene or its product in a biological process. With Dr. H. VanEtten, he demonstrated that fungal transformation can be used to isolate genes from pathogenic fungal genomes, to disrupt a particular gene, and to insert DNA sequences, either prokaryotic or eukaryotic, into the fungal genome and have them functionally express. Dr. Yoder's group was responsible for the first isolation and cloning of the mating type locus from a pathogenic Ascomycete, and also the demonstration that an organism, which is normally heterothallic, can be made homothallic by transforming it with the gene of opposite mating type.

Dr. Yoder has served The American Phytopathological Society well, as member and chairman of the Disease and Pathogen Physiology Committee and the Genetics Committee. He was also a member of the Post Harvest Pathology Committee and the Plant Disease Management Coordinating Committee, and he served as senior editor of *Molecular Plant-Microbe Interactions*. Outside of the Society, Dr. Yoder has served on a number of grant panels and editorial boards, and he was the program manager of the biological stress program of the USDA Competitive Grants Program in 1985–1986.