ACS 1991 Award Winners

Following are vignettes of the first 10 recipients of awards administered by ACS. Most of the awards are scheduled for presentation at the spring ACS national meeting in Atlanta. The Arthur C. Cope Award, Arthur C. Cope Scholar awards, and the newly established Award in Industrial Chemistry are scheduled for presentation at the 1991 fall national meeting in New York City. The Award for Creative Work in Fluorine Chemistry will be presented during the 10th Winter Fluorine Conference, Jan. 28–Feb. 2, St. Petersburg, Fla. The Roger Adams Award in Organic Chemistry will be presented during the 32nd Biennial National Organic Chemistry Symposium, June 16–20, Minneapolis. The Charles Lathrop Parsons Award will be presented at special ceremonies to be announced later.

Vignettes of the remaining awardees will appear in successive October and November issues of C&EN.

Alfred Bader Award in Bioinorganic or Bioorganic Chemistry

ROBERT H. ABELES, professor of biochemistry, Brandeis University, is widely acclaimed as one of the world's leading enzymologists. "Throughout his career," says a colleague, "Abeles has emphasized the chemical aspects of enzyme action, and he has carefully applied chemical principles to the solution of these problems."

Abeles' accomplishments include the first identification and explanation of the mechanism for inhibition by transition-state analogs (proline racemase); synthesis of fluoroketone inhibitors for hydrolytic enzymes (elastase, acetylcholine esterase, and angiotensin-converting enzymes); establishing the mode of action of enzymes that catalyze coenzyme B_{12}-dependent isomerization reactions; and explaining what causes the favorable entropic binding of the drug compactin to β-hydroxy-β-methylglutaryl CoA reductase.

The award winner is primarily responsible for demonstrating and developing "suicide" inactivators of enzymes, compounds that are based on the mechanism of action of an enzyme. (In an early example he showed that in the specific inactivation of dioldehydrase by glycolaldehyde, the substrate undergoes the first steps of the enzymatic reaction, but the resulting intermediate causes irreversible destruction of coenzyme.) The "suicide" approach has led to a new and rational method for the design of pharmacologically active drugs. Ensuing work has had an impact on areas including neuropharmacology (inhibitors of neurotransmitter synthesis, uptake, or degradation), cell biology (for example, peptide glycosylation mechanisms and inhibitors), and cancer biology (selective inhibitors of transmethylation reactions, and others).

Abeles received an M.S. degree from the University of Chicago (1950) and Ph.D. from the University of Colorado (1955). From 1955–57 he pursued postdoctoral studies at Harvard University under Frank Westheimer. Abeles' awards include the Edward E. Smissman-Bristol Myers Award in Medicinal Chemistry (1987) and the Repligen Award in Biological Chemistry (1988). He is a member of the National Academy of Sciences, the American Academy of Arts & Sciences, the American Chemical Society, and the Federation of American Societies for Experimental Biology.

ACS Award for Nuclear Chemistry

For three decades, **JOHN ALEXANDER,** professor of chemistry at the State University of New York, Stony Brook, has through the originality, depth, and persistence of his research efforts made significant scientific contributions to nuclear reaction research and to the understanding of hot nuclei.

Along with his research colleagues, he was one of the early investigators of heavy ion nuclear reactions. He helped provide the first extensive observations of the angular momentum dependence of neutron and photon emission from compound nuclei produced by heavy ion reactions along with systematics of first neutron energies and total γ-ray energies. These findings aided the theoretical development of statistical models that incorporate explicit treatments of angular momentum effects.

Alexander was the first to demonstrate the occurrence of incomplete fusion reactions along with complete fusion. More recently, he and his French colleagues have also studied the limits of energy deposition and thermalization into composite nuclei. In their recent work, they have used extensive particle emission studies and sophisticated model simulations to probe the nature of the hot nucleus and the range of applicability of statistical model descriptions of the deexcitation of such a nucleus. He and his coworkers have also led in the development of the probes of the extremely short lifetimes ($\approx 10^{-20} - 10^{-22}$ second) for particle emission from very hot nuclei.

Alexander obtained a B.S. degree in math and chemistry from Davidson College, in North Carolina, in 1953 and a Ph.D. degree in physical and nuclear chemistry from Massachusetts Institute of Technology in 1956. After stints as a research associate at MIT and research chemist at Lawrence Berkeley Laboratory, he joined the staff of SUNY Stony Brook as associate professor of chemistry in 1963. He was made full professor in 1968 and served as chairman of the department of chemistry in 1970–72.

Alexander has also served as a visiting professor at the Centre d'Etudes Nucléaires de Bordeaux-Gradignan and the Institut de Physique Nucléaire in Orsay, France. He was also a Guggenheim fellow

at the Laboratoire de Chimie Nucléaire in Orsay, and is currently collaborating with groups at the Institut des Sciences Nucléaires at Grenoble.

E. V. Murphree Award in Industrial & Engineering Chemistry

sponsored by Exxon Research & Engineering Co. and Exxon Chemical Co.

Abeles

Alexander

Alkire

RICHARD ALKIRE, head of the department of chemical engineering at the University of Illinois, Urbana, has played a major role in helping establish electrochemical engineering as an active field of chemical engineering and in enhancing understanding of electrochemical processes. One key contribution has been helping to bridge the gap between basic science and full-scale industrial processing.

His research efforts have addressed broad-ranging areas, covering electrodeposition, electrochemical reactor design, electroorganic processing, corrosion, electrochemical design, and plasma etching. Alkire is particularly known for his investigations of current and potential distribution phenomena. His investigation of transport in porous and tubular electrodes led to a pioneering paper dealing with electrodeposition of circuit board patterns.

In the area of crevice corrosion, his research established a new hypothesis for the mechanism that led to quantitative criteria for designing corrosion avoidance into structures that contain crevices.

Other research has clarified the complex relationship between corrosion processes and underlying fundamentals of potential field, mass transport, and surface phenomena.

Alkire received an undergraduate degree from Lafayette College in 1963 and a Ph.D. degree from the University of California, Berkeley, in 1968. He started his career at the University of Illinois, Urbana-Champaign, as assistant professor, and has been head of the department of chemical engineering there since 1986. He also has been principal investigator at Urbana's materials research lab since 1976.

Among Alkire's awards are the Carl Wagner Memorial Award (1985) from the Electrochemical Society; the Professional Progress Award (1985) from the American Institute of Chemical Engineers; and two Teaching Excellence Awards (1982, 1988) from the University of Illinois School of Chemical Sciences.

Another honor is his election to the National Academy of Engineering in 1988. And in 1985-86, he served as president of the Electrochemical Society. Currently he is serving a three-year term as director of the American Institute of Chemical Engineers.

Ralph F. Hirschmann Award in Peptide Chemistry

sponsored by Merck Sharp & Dohme Research Laboratories

Long recognized as an innovative researcher with a flair for leadership and administration, **ELKAN R. BLOUT,** director of the division of biological sciences of Harvard School of Public Health, has devoted most of his more than 40 years in research to teasing out an understanding of proteins. More specifically, he has derived the conformations of polypeptides, synthesized polypeptides to molecular weights comparable to globular proteins, and correlated spectroscopic parameters with peptide/protein structural features.

A native of New York City, Blout received a B.A. degree from Princeton University in 1939 and, in 1942, a Ph.D. degree in chemistry from Columbia University. He began his scientific studies while a research assistant at Columbia University in 1939, publishing his first paper on side-chain structures of cardiac aglycones, a nonsugar component of glycosides, in 1941. Following work in the chemistry department at Harvard University, Polaroid Corp., and Boston's Children's Hospital Medical Center, Blout moved to Harvard Medical School as professor in 1962. In 1964, he was appointed the Edward S. Harkness Professor of Biological Chemistry at Harvard Medical.

Blout's career with Harvard's School of Public Health began with his appointment as dean for academic affairs in 1978, a position he held until 1989. He has held his current position since 1987.

In addition to his work with proteins and peptides, Blout has pursued the chemistry of photography. He holds more than 50 patents in the field of color process/instant photography and is an elected fellow of the Optical Society of America.

Because of his abilities as an administrator and his well-recognized skills in dealing with the financial side of science, Blout has been and is a member of a wide range of boards and advisory committees. Among the groups he has been a part of are: the board of directors of the National Health Research Foundation, the research advisory committee for the Children's Hospital Medical Center, Boston, the advisory council of the department of biology of Princeton University, and the Council of the National Academy of Sciences. Currently, Blout is serving as NAS treasurer.

Blout

Casey

Chambers

Collman

ACS Award in Organometallic Chemistry

sponsored by Dow Chemical Co. Foundation

CHARLES P. CASEY's research "is notable for the careful in-depth understanding of mechanistic organometallic chemistry," notes a colleague. Casey is a professor of chemistry at the University of Wisconsin, Madison.

Casey's group was the first to make an isolable, stable metal-carbene complex–(diphenylcarbene)pentacarbonyltungsten(0)–that did not contain stabilizing heteroatom substituents. This system was pivotal to studies that implicated metal carbenes in olefin metathesis. In Fischer-Tropsch and water gas shift chemistry, the award winner showed that hydride reagents can reduce coordinated CO to formyl ligands, providing the first generally useful method for preparing these compounds. His research on nitrosyl-rhenium compounds from which carboxy, formyl, and hydroxymethyl compounds can be isolated opened the way for mechanistic studies on well-defined systems for studying reduction of CO to hydrocarbons. In work on ring slippage reactions, Casey found that pentahaptocyclopentadienyl groups are converted to tri- and mono-hapto species and ultimately to a noncoordinated cyclopentadienyl counterion.

In recent work, the award winner has investigated heterobimetallic complexes as potential catalysts for the reduction of CO. This work has led to reduction of coordinated CO, and also to new synthetic methodology involving addition of a metal hydride to a platinum(0) species, to zirconium-diruthenium compounds that can expel a Ru-H species, and to a rhenium-platinum dihydride that reduces alkynes to alkene complexes.

Casey and coworkers are active in research on diiron complexes, investigating various reactions of $[Cp(CO)Fe]_2(\mu\text{-}CO)(\mu\text{-}CR)^+$, a cationic species having an alkylidyne bridge. Among their discoveries: a new means of C-C bond formation via a hydrocarbation reaction that involves addition to olefins of the C-H group in the methylidyne species. Casey received a B.S. degree in chemistry from St. Louis University in 1963 and a Ph.D. degree in organic chemistry from Massachusetts Institute of Technology in 1967. He has been adviser to 11 M.S. degree and 29 Ph.D. recipients and directed 22 postdoctoral research associates.

Award for Creative Work in Fluorine Chemistry

sponsored by PCR Inc.

A colleague of **RICHARD D. CHAMBERS,** professor of chemistry, University of Durham, U.K., calls him "one of the most notable ambassadors of fluorine chemistry it is my pleasure to know." Chambers, whose mentor was William Kenneth Rogerson Musgrave, has made a major contribution to the literature of organofluorine chemistry.

He was educated at the University of Durham, where he received a bachelor's degree in 1956, Ph.D. in 1959, and D.Sc. in 1968. From 1959 to 1960, he conducted postdoctoral research at the University of British Columbia, Vancouver.

In 1966–67 he took a sabbatical leave from his position as lecturer in chemistry at the University of Durham to pursue his work as a Fulbright Scholar and visiting lecturer at Case-Western Reserve University, Cleveland. There he did research in collaboration with George Olah, who persuaded him to write a monograph on organic fluorine chemistry. He has since written various review articles and chapters for books and published some 200 research papers. In 1973 his book, "Fluorine in Organic Chemistry," was published by Wiley-Interscience.

Chambers was appointed professor of chemistry at the University of Durham in 1976, and was chairman and head of the department of chemistry from 1983 to 1986. In 1988–89 he was named Sir Derman Christopherson research fellow.

Chambers' many contributions have helped to integrate the chemistry of fluorine-containing compounds with the rest of organic chemistry. His accomplishments include the synthesis and study of a whole class of new fluorinated nitrogen heterocyclic compounds and the synthesis of unique strained structures stabilized by fluorocarbon groups. He has also been instrumental in developing a mirror-image chemistry, which contrasts the properties of fluorocarbons with unsaturated hydrocarbons, and has described novel organometallic compounds and other reactive intermediates. He holds 10 patents on various aspects of fluorine chemistry and has served on committees of the Science & Engineering Research Council, the Royal Society of Chemistry, and the U.K.'s Research Corp. Trust Panel.

Cooks

Debnam

DeStevens

ACS Award for Distinguished Service in the Advancement of Inorganic Chemistry

sponsored by Mallinckrodt Inc.

JAMES P. COLLMAN is "one of the most creative, enterprising, and productive chemists on the world scene," whose "major contributions have stood the test of time," says a distinguished colleague of this Stanford University chemist. From his early work on the aromatic properties of certain metal chelates to his recent efforts at investigating the properties of superconducting ceramics, Collman's more than 200 papers indicate the breadth of his endeavors and interests.

Born in Beatrice, Neb., Collman received undergraduate and M.S. degrees from the University of Nebraska, Lincoln, in 1954 and 1956, respectively. In 1958, he received a Ph.D. degree in chemistry from the University of Illinois, Urbana-Champaign. From 1958 to 1967, Collman worked at the University of North Carolina, first as an instructor and finally as a full professor of organic and inorganic chemistry. From there, he moved to Stanford University, where, in 1980 he was appointed the George A. & Hilda M. Daubert Professor of Chemistry.

Collman's work has been pioneering in many areas. His early work using cobaltammines for the selective hydrolysis of *N*-terminal peptide bonds served to illuminate the role metal ions play in hydrolytic enzymes. Collman also designed and prepared metal porphyrin compounds—so-called picket-fence porphyrins—that imitate both the structure and function of heme proteins such as hemoglobin, and the enzymes, cytochrome-c oxidase and cytochrome P-450. The structural work associated with this research helped to settle long-standing arguments about the geometric arrangement of O_2 vis-à-vis the porphyrin's metal center.

In research that has been referred to as a tour-de-force in synthesis, Collman produced a class of face-to-face porphyrins—work that not only serves as a strong example of the molecular engineering approach to catalysis but also provides a significant advance toward producing an efficient oxygen cathode in a fuel cell.

A member of the National Academy of Sciences and the American Academy of Arts & Sciences, Collman is an active lecturer and extensively involved in the education of the next generation of inorganic chemists. His graduate student text on organometallic chemistry is considered the dominant text in the subject.

Frank H. Field and Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry

sponsored by Extrel Corp.

Inventor, author, and professor **R. GRAHAM COOKS** has made contributions to the field of mass spectrometry that have extended beyond his own work to advance the work of others.

Cooks' role as inventor is evident in the types of spectrometers his group has built to accomplish its research work. Cooks pioneered the method of tandem mass spectrometry for the analysis of complex mixtures. In this connection, his group built various types of tandem mass spectrometers that have contributed to the understanding of the energy transfer processes that underlie this method.

The group also introduced and exploited the technique of angle-resolved mass spectrometry and used it for studies of ion structure. The reactive and inelastic processes that accompany collisions of polyatomic ions at surfaces have been elucidated and incorporated into mass spectrometry. The studies of Cooks and his colleagues on the ion trap mass spectrometer have helped convert this instrument into a high-performance mass spectrometer capable of great sensitivity and high mass range. Cooks' group also has applied mass spectrometry to the discovery and structural characterization of new natural products, to the on-line analysis of organic compounds in reactors, and to the quantitative analysis of chemical modifications that occur upon alkylation of DNA.

Cooks is coauthor or editor of the well-known books "Metastable Ions" and "Collision Spectroscopy," and is coauthor of numerous journal papers.

Currently, Cooks is Henry Bohn Hass Distinguished Professor of Chemistry at Purdue University, where he is also head of the chemistry department's analytical division. Prior to joining Purdue as director of the Mass Spectrometry Center in 1973, he was an assistant professor in the chemistry department at Kansas State University.

Cooks received both B.S. and Ph.D. degrees from the University of Natal, South Africa, in the 1960s; he received another Ph.D. from Cambridge University in England in 1967 and served there as a postdoctoral fellow until 1968.

Among Cooks' other awards and honors are Fulbright Senior Fellow, University of Warwick, 1981; ACS Analytical Division Award in Chemical Instrumentation, 1984; Thomson Medal for contributions to international mass spectrometry, 1985; and honorary member of the Chinese Mass Spectrometry Society, 1987.

James T. Grady-James H. Stack Award for Interpreting Chemistry for the Public

BETTY GLASS DEBNAM, editor of "The Mini Page," combines her experience as a grade school teacher and children's journalist to "create material that is timely, educational, and easy to understand," says a colleague. "The Mini Page" is a nationally syndicated feature for children, appearing in more than 450 newspapers.

Each week Debnam chooses a subject, and working closely with experts in that field, interprets the material in terms that are easy to understand. Of particular interest to chemists is "The Mini Page" edition titled "The Science of Everything: Chemistry." Using language understandable to young readers, Debnam describes atoms, molecules, and even chemical bonds. She relates chemicals to products that are familiar in everyday life, thereby teaching children that chemistry is an integral part of their lives.

To further this concept, she devotes an entire page to chemists at work. She describes what chemists do, the skills they need, and some of the places they work. Activities that children perform at home are pictured along with an explanation of how the activity is related to chemistry—such as washing dishes using soap. She even includes a chemistry experiment children can try at home: blowing bubbles using dishwashing liquid.

Other chemistry-related editions include "How Water Works," "Help Wanted: Scientists," "Women in Science," and "Air Pollution."

Born in Norfolk, Va., Debnam received a bachelor's degree in political science at the University of North Carolina and a master's degree in education at Duke University. As a grade school teacher, she realized that children could and would read the newspaper if there was something in it expressly for them. She went to the *Raleigh News & Observer* with her idea, and "The Mini Page" began publication in 1969. In 1977, Universal Press Syndicate picked it up and now "The Mini Page" appears in hundreds of newspapers nationwide.

Debnam has been recognized for her work by the Educational Press Association, International Reading Association, Freedom Foundation, the American Library Association, and Children's National Medical Center, Washington, D.C.

E. B. Hershberg Award for Important Discoveries in Medicinally Active Substances

sponsored by Schering-Plough Corp.

Adding to a long list of firsts accomplished during his career, **GEORGE DE STEVENS** is also first to receive this distinguished award.

DeStevens has been a research professor of chemistry at Drew University, Madison, N.J., since 1979. But his career took off at Ciba Pharmaceutical Co., Summit, N.J., in the mid-1950s, when he discovered two widely used diuretics—hydrochlorothiazide, the most-prescribed drug of its kind throughout the world for the treatment of high blood pressure, and cyclopenthiazide.

His rise in the Ciba organization was rapid, and with the merger of Ciba and Geigy in 1969, deStevens was appointed executive vice president and director of research. During this time he led research teams whose developments included Rimactane, a cure for tuberculosis; Celospor, a broad-spectrum antibiotic; Slow-K, for potassium deficiencies in cardiovascular disorders; Liroesal, an antispastic agent; Tegretol, for the treatment of epilepsy; Rengasil, for the treatment of arthritis; and Lopressor, a widely used antihypertensive. He also pioneered the establishment of a new drug delivery system research group, which, in collaboration with Alza Corp., Palo Alto, Calif., led to the development of Transderm-Nitro, for the treatment of angina.

At Drew University, deStevens has continued to make major contributions to medicinal chemistry. In 1980 he founded and has remained editor-in-chief of the journal *Medicinal Research Reviews.* The first Residential School on Medicinal Chemistry was realized in 1986 with deStevens as cochairman of the organizing committee, and has drawn an outstanding faculty of medicinal chemists from both academia and industry. DeStevens also founded and is director of the Charles A. Dana Research Institute for Scientists Emeriti on the campus, allowing formally retired medicinal chemists to continue research activities.

DeStevens received B.S., M.S., and in 1953 Ph.D. degrees in chemistry from Fordham University, N.Y. He is author of two books, "Diuretics, Chemistry and Pharmacology" and "Analgetics," and editor of a series of monographs on medicinal chemistry. In addition, he is author or coauthor of 110 published papers and 100 patents in the field of synthetic organic chemistry and medicinal research.

Well respected in his field, deStevens is also well traveled, having given numerous lectures on drug research at universities in this country and in Europe, India, Japan, and Africa. He is a Woodrow Wilson Visiting Fellow. In 1979 he was honored by the University of North Carolina with the Walter H. Hartung Memorial Award for outstanding contributions in medicinal research. □

ACS News

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ed that there is no scientific basis for determining that microorganisms modified by established procedures, such as chemical or physical mutagenesis, pose less of a risk than those modified by other genetic processes, such as genetic engineering. Rather than excluding some processes from regulations, ACS suggested that OSTP concentrate on developing test methods and protocols for assessing risk so that the public and federal officials can be sure an organism is "safe."

In a second communication to OSTP concerning the report on emerging technologies being put together by the national critical technologies panel, ACS pointed out that a strong chemical sciences and engineering base will provide both the specific and generic know-how to advance many of the key technol-

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