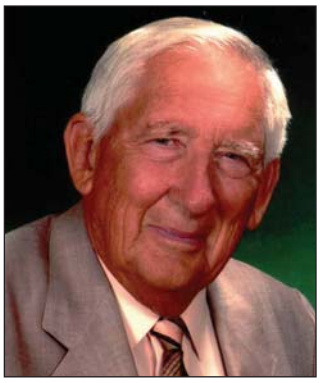
In Memoriam — James Y. Oldshue

Dr. James Young Oldshue died January 16, 2007, at the Sarasota Memorial Hospital in Florida after a brief illness. Oldshue served as AIChE president in 1979, and as treasurer of the Institute from 1983-1989. He was a founder of AIChE's North American Mixing Forum and chaired the Equipment Testing Procedures, International Activities, and Diamond Jubilee committees, along with the Rochester, NY, local section.



A Fellow of AIChE, Oldshue was an internationally renowned chemical engineer and the author of more than 100 publications, including the textbook, *Fluid Mixing Technology*, published by McGraw Hill. He held many patents.

Oldshue completed his BS, MS, and PhD degrees at the Illinois Institute of Technology in Chicago, although his education was interrupted by service on the Manhattan Project at Los Alamos from 1944 to 1945. From 1950 to1992, he worked as vice president and director of research at Lightnin' Mixers in Rochester, NY. He also served as an adjunct professor at the Beijing Institute of Chemical Technology in China.

Among his honors, Oldshue was elected to membership in the National Academy of Engineering for his pioneering work in the fluid mechanics of mixing and its practical applications in industrial and municipal processing. He was chair of the American Association of Engineering Societies in 1985, which later presented him with its Kenneth A. Roe Award. He received the Victor Marquez Award from the Inter-American Confederation of Chemical Engineers in 1983, and served as that group's president in 1995. AIChE honored Oldshue with its Founders, Van Antwerpen, and Service to Society awards.

Additionally, Oldshue served the North American Alliance of Reformed Churches as a member of its Board of Foreign Missions. He worked for the YMCA in Rochester and visited more than 40 different Ys in other countries as part of his work for the national Y organization.

In his last years, Oldshue continued to teach mixing seminars and also taught other seniors in New York, Florida, and Oregon a course, "Science Made Simple," through the O.A.S.I.S. program funded by Lord and Taylor.

He is survived by his wife, Betty, three sons, and seven grandchildren. A memorial service for Oldshue will be held in Sarasota on March 24th.

AIChE Service and Awards

1970-1972	AIChE Director
1979	AIChE President
1981	Founders Award
1983-1989	AIChE Treasurer
1989	Service to Society Award
1992	Mixing Achievement Award
1999	Van Antwerpen Award for Service to the Institute

Detroit Local Section: Honoring Two Distinguished Engineers

Celebrating National Engineers Week, the Detroit AIChE local section and the Engineering Society of Detroit (ESD) will honor the engineering profession. One of the marquee events will be the ESD Affiliate Council's 36th Gold Award Banquet to be held on Feb. 22, where two chemical engineers will be honored for their outstanding achievements and service within their respective technical local organizations.

This year, Dr. Frank Jere has earned the distinguished title of Detroit AIChE "Chemical Engineer of the Year." Since 2004, Jere has worked as a technology engineer in the Technology Business Unit of EES Coke Battery, a subsidiary of DTE Energy. Jere is involved in all aspects of the EES Coke Battery and By-Product areas, including raw material selection, quality monitoring, process optimization and troubleshooting, process safety management, capital project evaluation technology selection, and commercial management. Jere holds a BS from the Univ. of Toledo and a PhD from Michigan State Univ., both in chemical engineering.

The ESD Affiliate Council will be honoring another fellow chemical engineer, Dr. Levi Thompson, as the banquet's Gold Award Winner. Thompson is the director of the Univ. of Michigan's Hydrogen Energy Technology Laboratory. Thompson earned his BChE from the Univ. of Delaware, and MSE degrees in chemical engineering and nuclear engineering, and a PhD in chemical engineering from the Univ. of Michigan.

Thompson's research interests include catalysis and surface science. Current projects focus on early transition metal nitrides and carbides, fuel processing catalysts, fuel cells, sol-gel derived materials and nanostructured films. He is advisor to the Univ. of Michigan chapter of the National Organization of Black Chemists and Chemical Engineers. At the national level, he serves on AIChE's Chemical Engineering Technology Operating Council and has regularly chaired sessions and symposia at national meetings. He has served as president, vice president and secretary-treasurer of the Michigan Catalysis Society.

Centennial Corner

Early Chemical Reactor Design by Computer

as told by Richard Snow

In 1953, a computer class was offered for the first time at Illinois Institute of Technology (IIT), taught by a young engineer from IBM by the name of Charlie Stewart. It was the latest thing, so I decided to enroll. The available computer was an IBM card-programmed calculator. It had less power than today's $3 hand calculator, but it was programmable. Ray Erickson, my supervisor at the IIT Research Institute, suggested I apply for an in-house research grant to fund an example of applying computers to a chemical engineering problem, with a view toward publishing it.

I was also taking a course in process design at IIT. The professor assigned a homework problem from Hougan & Watson's now-classic text. It required designing a propane pyrolysis reactor, which is used by the petrochemical industry to make ethylene from propane. The reactor is a long tube in a gas-fired furnace. Reactor design requires numerically integrating the design equations. The calculations start at the feed end and work in increments down to the product end. They simultaneously solve for pressure drop, heat transfer, reaction rate, and product distribution. The students were only able to complete the first few feet of the laborious calculations. I decided it would make a good computer problem, but I changed the feed to ethane so as not to copy the book example. I also engaged as coauthor, an industry expert, Herman Schutt of Stone and Webster Engineering, to assure that the paper was authoritative. The paper was published in *CEP* in 1956. I believe it was the first published chemical reactor design using a digital computer.

Schutt noted that the results differed slightly from what his experience led him to expect, but "since it was done by computer it must be right." Several years later, a letter to the editor pointed out that I had left out a factor of the gas constant (R=1.987) in the pressure-drop equation, causing the discrepancy. *Today, we are aware that using a computer doesn't necessarily guarantee correct results!* We are also told that we gain more experience from our mistakes than from our successes.

Hougan & Watson's method used an overall chemical reaction with an empirical rate expression. Since I was looking for a PhD thesis topic at the time, I decided that I should repeat the calculation using a more complete reaction mechanism, so the results could fit wider design conditions. In 1937, Rice & Herzfeld had proposed a free-radical mechanism for ethane pyrolysis. This postulated that when ethane is heated, some molecules break into two methyl radicals and others break into one ethyl radical and a hydrogen atom. These radicals can then further react to abstract another hydrogen from ethyl producing ethane and hydrogen molecules, and can also recombine into various other molecules. I programmed this mechanism into the design and found that it fit the experimental data very well. It even predicted the amount of secondary products formed.

In the meantime, a well-known chemist published a paper in the *Proceedings of the Royal Society of London* saying that the reaction mechanism must be a molecular one because Rice & Herzfeld's calculations did not fit the data well. I knew the fit was poor because Rice & Herzfeld had left out some important reactions to simplify their hand calculations. So when I published the more complete reactor design in *AIChE Journal* in 1959, I expected to hear no more about the molecular mechanisms. To my surprise, another paper claiming the molecular mechanism appeared.

I figured that perhaps chemists did not read the *AIChE Journal*, so in 1966, I published another paper in the *Journal of Chemical Physics* describing the free-radical mechanism and the computer integration method that confirmed the Rice & Herzfeld mechanism. Yet again to my surprise, a third paper on the molecular mechanism appeared, so I sent a reprint of my papers to the authors. After that, I heard no more about the molecular mechanism. My paper did get the attention of other chemists though, and within two years, chemists were analyzing mechanisms with as many as 200 simultaneous reactions.

Some 20 years later, I attended a biochemistry conference and overheard scientists from England discussing how they got into biotech. One said that he had been a graduate student working on the mechanism of ethane pyrolysis in the chemistry department of his university, when something came up that stopped the work. He eventually looked across the street and noticed the biology building, so he switched to biology. *I knew what it was that caused him to switch!*

Today, computer design is well established. For example the Aspen system contains modules for design of many chemical engineering operations. And chemistry computer modeling is sophisticated enough to describe even extremely complex biological processes. Computers and chemical engineering have certainly come a long way in a short span of time.

Do you have a story that you would like to share? Please contribute to the Centennial Corner by emailing us at cepedit@aiche.org.

Remembering the Late Walt Howard

by John Birtwistle

I first met Dr. Walt Howard in 1978, when he was investigating an incident at the Monsanto plant in England where I was working. Subsequently, I relocated to St. Louis in 1980 and worked for him in the "Safety and Property Protection" department for about 18 months before he retired in 1981.

Howard's first position at Monsanto was in the Research Dept. at the Texas City Plant. He eventually moved to St. Louis to join the Safety and Property Dept. when it was formed in 1964. He was a strong advocate for process safety and was largely responsible for establishing Monsanto's requirements to conduct safety reviews to identify and address process safety issues on all projects. *In many ways, he was ahead of his time as a leader in fields such as explosion venting, runaway reaction hazard evaluating, and the use of acoustic emission testing as a means to conduct non-destructive testing of equipment and pipework.*

Monsanto has a "Fellows" program to identify personnel who have made exceptional contributions to the company. Howard was identified as such a person and attained the highest ranking of "Distinguished Fellow." He was also very active promoting process safety elsewhere, both in the U.S. and internationally. He was a member of the AIChE 11a committee, which is responsible for organizing the annual loss prevention conferences. For this and his other work promoting process safety, he was made a Fellow of AIChE. Over the years, he presented many papers on subjects ranging from, managerial requirements for process safety, to an explosion protection system he had devised for vapor phase heat transfer fluid systems.

Howard was a long time member of the NFPA, where he was a member of the "Explosion Protection" and "Deflagration Venting" committees. There, he played a key role in introducing new explosion venting technology based on work conducted in Europe, as well as developing other explosion protection methods, some of which were based on work he had initiated during his employment at Monsanto.

Following the Flixbrough vapor cloud explosion in the U.K. in 1974, he helped IChemE form the "Hydrocarbon Oxidation Group," which provided guidance on measures to prevent major industrial accidents. The organization has since been renamed the "International Process Safety Group," and remains active addressing a wide range of process safety issues today.

AIChE Achievements and Contributions

In 1987, received the first-ever *AIChE Safety & Health Div. Norton H. Walton/Russell L. Miller Award*, which recognizes significant contributions to the field of loss prevention and safety.

In 2003, the Safety and Chemical Engineering Education (SAChE) Design Award was renamed the *Walt Howard SAChE Individual Design Award*. The award is presented to an individual for the best application of the principles of chemical process safety in the Annual AIChE National Student Design Competition.

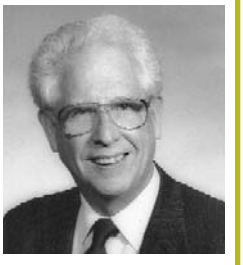
Chairman of the Technical Program Committee in 1965. Established the *Loss Prevention Symposium* (LPS), which was first held in Houston in 1967.

A founder of the *Design Institute for Emergency Relief Systems* (DIERS).

OBITUARIES

Michael M. Abbott, 68, Troy, NY
Ferdinand A. Bagley, Jr., 71, Port Charlotte, FL
Carl R. Branan, 73, El Paso, TX
Kenneth G. Chapman, 79, Mystic, CT
Kenneth J. De Witt, 69, Toledo, OH
Gonzalo C. Docal, 85, Woodbridge, CT
Howard Grace, 69, Turnersville, NJ
Alan Longacre, 87, Whittier, CA
Ralph D. Lee, 48, Hampton, NJ
Galen P. Moffett, 45, Houston, TX
John D. Neidt, 33, Missoula, MT
Clell E. Tyler, 99, St Simons Island, GA

ROBERT M. BROWN (1921-2006)



On March 21, 2006, the chemical engineering profession suffered the loss of Robert M. Brown, 84, of Montclair, NJ. Brown was an AIChE member for over 50 years. He was a graduate of Cornell Univ. and had worked for several firms on a variety of projects. Starting with the Niagara Falls TNT manufacturing operation during WW II (where Bob met his late wife Jean), Bob also worked for B.F. Goodrich, Borden's, Scientific Design and ABB Lummus on a variety of international and domestic projects. Subsequent to retirement at Lummus, he started a second career in residential real estate, which was a 20-year involvement he truly loved. A "big band" and jazz enthusiast, Brown was an active member of the New Jersey Jazz Society. A man with a genuine social conscious, he was a former chairperson of the Essex County Chapter of the ACLU, a Sunday school teacher, a Boy Scout leader, President of the local PTA, an active member of the Progressive Animal Welfare Society, and a contributor to the AIChE Minority Affairs Scholarship Fund of the AIChE. A real "mensch," Brown will be missed by his two sons and daughter, and all of those whose life he so graciously touched. As a memorial to Brown, The North Jersey Section of AIChE has established the Robert M. Brown Memorial Scholarship Fund for seniors attending the Stevens Institute of Technology or the New Jersey Institute of Technology. Scholarship details can be obtained by contacting Edward Bergen, at 908-218-7377 or ebergen@psgus.jnj.com.