

Carnegie-Mellon Alumni News

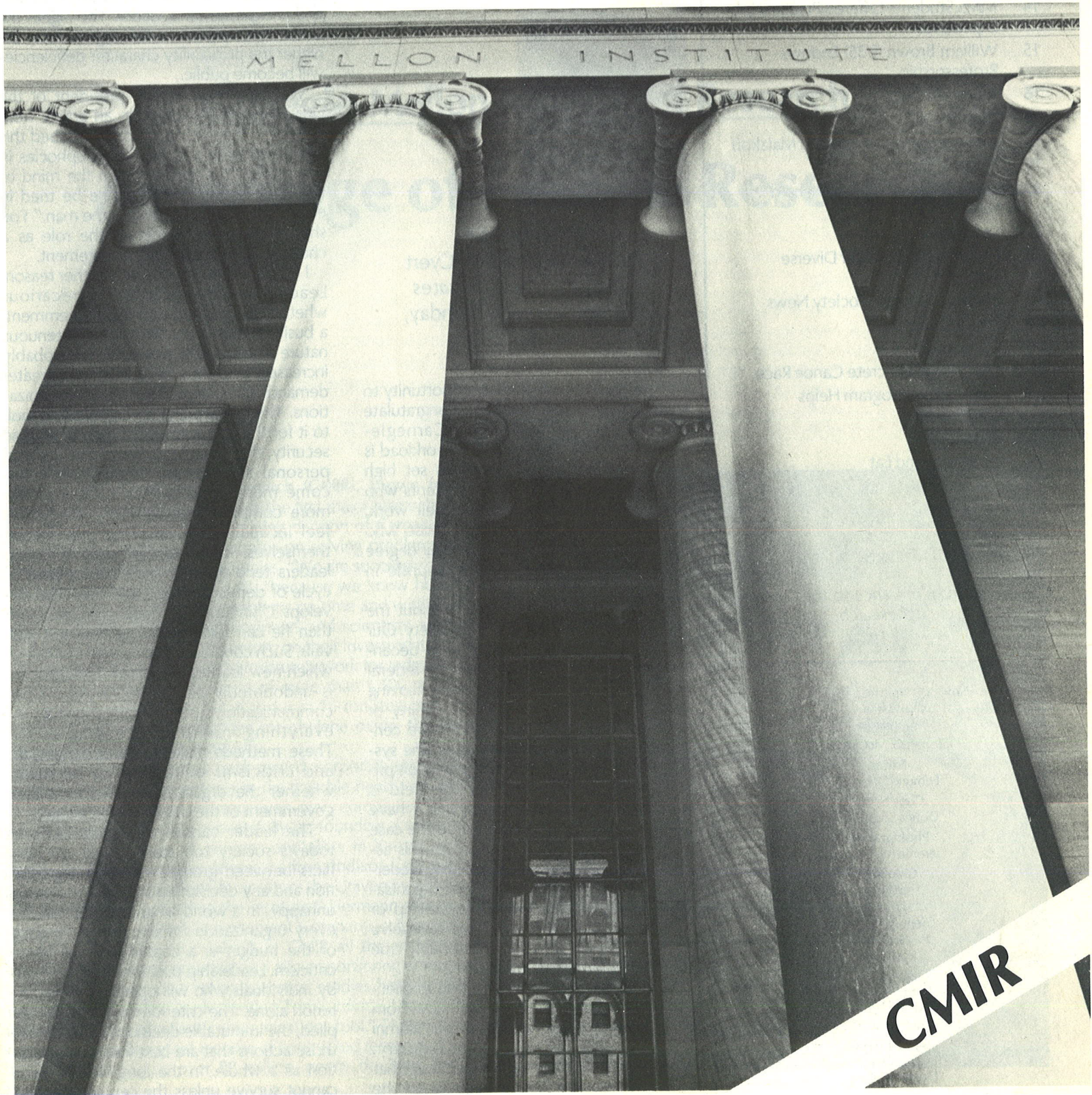
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JUNE 1978



CMIR

Carnegie-Mellon Institute of Research

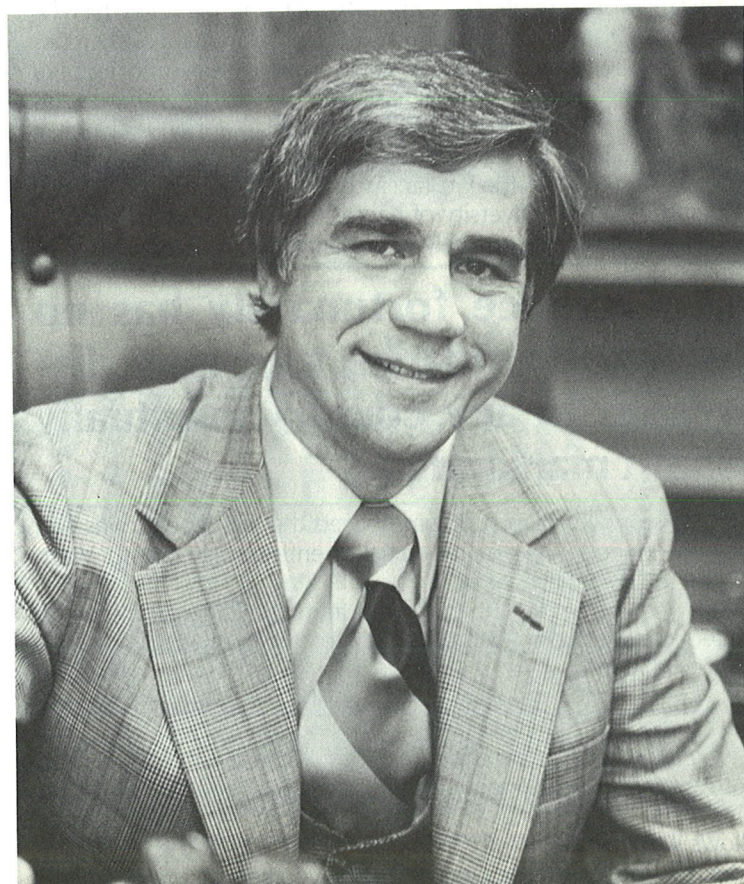
A Heritage of Fruitful Research

Carnegie-Mellon Institute of Research (CMIR), known for many years as the "Mellon Institute," was the first major research institute in the United States. A self-sustaining division of Carnegie-Mellon University, the institute concentrates on solving problems for corporations and governmental agencies. "We are successful," says Dr. Ted Hermann, president of CMIR, "because we know how to use teams to solve goal-oriented problems on time and within budget. With our facilities and noted engineers and scientists, sponsoring companies receive a very large return on their investment at CMIR."

During its 65-year history, the institute's work for industrial sponsors has led to the development of more than 1,500 patents and 700 products ranging from razor blades to 16-ton steel ingots; from non-toxic household insecticides to ethylene oxide, the basis for the nation's petrochemical industry.

Because of the institute's track record, corporate sponsors place technical opportunities entirely in the capable hands of CMIR staff to develop entire divisions and even new companies. Hermann, who came to CMIR after successfully co-founding a series of corporations for a group of venture capitalists in Kansas, has a BS degree in chemistry and mathematics from Indiana Central University and a Ph.D. in chemical physics from the University of Missouri.

"Shortly after I arrived at the institute," Hermann relates, "Tom Baron, president of Shell Development Company, suggested that it would be profitable to establish at CMIR all the major business functions found at a corporation to allow sponsoring companies as well as researchers performing technical studies here to plug into these functions. After implementing Tom's advice, I found that his idea made for an excellent communications tool." The profits speak for themselves. The gross income of contracted research at CMIR in 1977-78 reached just over \$8 million, nearly doubling last year's revenues.



Ted Hermann

ABILITY AND DESIRE

Dealing with big business comes naturally to Hermann. Besides his previous executive experience in his own firms, he has worked with the Applied Science Division of Litton Industries, North Star Research and Development Institute, General Mills, the Midwest Research Institute, and as an advisor and consultant to 20-30 firms and governmental agencies throughout his career.

Explaining his approach to industry, Hermann says: "We convince top executives that we have the ability and desire to convert their changing environment and problems into opportunities for ethical and moral profits." To accomplish this, CMIR offers corporations two types of contracts, both proprietary. With a close-ended contract, a company poses a specific problem which needs to be solved in a limited amount of time, usually one year or longer. With the fellowship or open-ended contract, a company participates directly in ongoing research at the institute; it also profits from interaction with non-fellowship staff and from advancements and discoveries made in other parts of the institute.

One of the many benefactors of the fellowship program at CMIR is the Union Carbide Corporation which has sponsored research at the institute for over 60 consecutive years. After institute researcher Dr. George Curme had made several astounding discoveries in his chemical engineering studies, five small companies, each sponsoring work at the institute, found it profitable to combine into a large new corporation now known as the Union Carbide Company, the pioneer of the nation's present mammoth petrochemical industry.

"YOU NEED A NEW BUILDING"

The history of Mellon Institute and CMIR goes back to the early 1900's when Dr. Robert K. Duncan studied nearly all the major industrial companies in the United States and found that only a few had research staff and facilities. Armed with his degree in physics and chemistry from the University of Toronto and his secondary and university teaching experience, Duncan conceived of the Industrial Fellowship System while a professor of chemistry at the University of Kansas.

Duncan wrote a book, *The Chemistry of Commerce*, in which he claimed that a separate research facility could simultaneously modernize manufacturing practices and advance pure and applied science. Intrigued by these ideas, Andrew W. Mellon and his brother Richard B. Mellon provided the financial support for Duncan to open a research institute at the University of Pittsburgh. Initially Duncan directed both the Pitt facility and a similar institute already in operation at the University of Kansas, but after several years, he transferred his activities entirely to the University of Pittsburgh.

"... science fortunately has no national boundaries, and new discoveries in any country eventually benefit mankind ..."

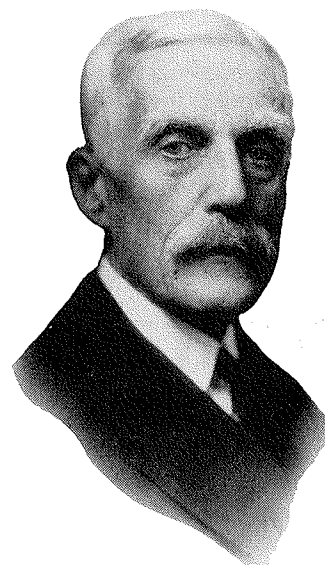
A two-story wooden structure housed the first laboratories and research projects. One of the initial scientists, Clarence C. Vogt, recalled the beginning years:

"Then came the day when the old frame building jammed with eighteen fellowships, a large fraction of them multiple, and the sides of the building bulging with research men, that the mahogany-colored standard limousine of the Mellons stopped in front of the building and Messrs. A.W. and R.B. Mellon came in to see the progress that had been made. The place had been shined up so that nary a cockroach nor a mouse could be seen, and, after going over the building from top to bottom — for there were Fellows working even in the half story at the top of the laboratory — Mr. R.B. said, 'Well, Dr. Duncan, I think you need a new building.' To which Dr. Duncan replied 'So do I, Mr. Mellon.'"

In 1915, one year after Duncan's death, Dr. Edward R. Weidlein and the Mellons dedicated a new six-floor concrete facility which, at the time, was the most modern research laboratory in the nation. Over the doorway was the following inscription:

This building is dedicated to service of American Industry, to young men who destine their lifework to the Industries, which will give to all broader opportunities for purposeful lives.

Twenty-two years later, the Mellons again expressed their interest, satisfaction and support of the institute when they financed the eight-story structure which houses CMIR today.



Andrew W. Mellon

INTERNATIONAL STATURE

In its early years, the institute had been a school at the University of Pittsburgh. In 1927, however, it formally became the Mellon Institute of Industrial Research under a separate charter. The institute remained closely affiliated with Pitt until that university became state-related. In 1967, Mellon Institute merged with Carnegie Institute of Technology creating Carnegie-Mellon University and CMIR.

From 1937 to 1967, the Mellon Institute gained international stature for its excellence and for its unique relationship with industrial firms. It also had a distinguished series of chief executive officers: General Matthew Ridgeway, Dr. Paul Flory (a Nobel Laureate), and Dr. Paul Cross.

As part of his self-chartered goals, Hermann has encouraged "logical" faculty participation in CMIR studies. Nearly 100 faculty members from CMU, Pitt, MIT, and other universities both in this country and in Germany, Egypt, Japan, and other nations, have worked on projects at the institute. Hermann considers this association a definite asset for all concerned — the institute, faculty, and sponsors. "Faculty members," says Hermann, "are specialists who have proven themselves to be excellent stimuli to multi-disciplinary industrial research. Everyones gains!"

Hermann also values the participation the approximately two dozen Carnegie-Mellon graduate students who work at CMIR each year. "Classroom education is important," he says, "but we give students practical experience to equip them for profit-motivated settings. Without exception, sponsoring corporations offer these students extremely good positions when they graduate due to work done at the institute. Bill Baker, President of Bell Laboratories, has referred to the institute as a half-way house of industrial research."

Some 900 people who have worked at the institute are now corporation vice presidents or of higher rank. Hermann points out that 16 former company presidents and vice presidents serve on the current staff; they help to create a unique working environment for the younger staff.

AN EDUCATOR'S DREAM

Following Paul Mellon's observation that "science fortunately has no national boundaries, and new discoveries in any country eventually benefit all mankind," Hermann has broadened CMIR's operational base. After meeting with Mr. Mellon, he established the institute's Information and Management Research Centers, and the Health Technology Center.

One of the nationally prominent projects in Lee Rozelle's Health Technology Center is the study of Sudden Infant's Death Syndrome (SIDS Disease). Jerome Krasner, who directs Medical Science Physiology for Rozelle at a CMIR facility in Boston, has designed a completely new device that uses acoustics to measure infant respirations. This mechanism is far more sensitive than previous equipment that relies on motion to measure these respirations. Krasner, who is collaborating with Ron Krutz, director of CMIR's Microcomputer Research Center, is enthusiastic about the project. "Our discovery," he declares, "is crucial because of the large number of infants who fight to breathe while they are asleep."

The institute's International Education Project Management Center, located in Washington, D.C., and directed by Frank Nowak, is presently designing a new curriculum for an entire university in the Yemen Arab Republic. The total cost of implementing the new curriculum should reach \$7 million. This includes laboratory equipment, at least 200,000 new books and journals, and consulting fees.

CMU staff and faculty who are consultants include: Edward R. Schatz, vice president for Academic Affairs; Lee W. Gregg, associate dean of H&SS; Hugh D. Young, professor of physics; and Robert J. Hodrick and his wife, Katherine Schipper, both assistant professors in the Graduate School of Industrial Administration. "It's an educator's dream come true," Nowak exclaims.

Another internationally-oriented CMIR research center is Metallurgical Processes and Material Technology, directed by Kris Bhat. The center currently conducts two programs of international importance. The first is the Instituto de Pasquis in Sao Paulo, Brazil. It has begun an extensive study on the application of American metallurgical technology to newly emerging industry in Brazil. It relies on CMIR as a sounding board for new concepts, and as a training

base for Brazilian engineers. Bhat considers this program fundamental to future CMIR projects with less developed countries in South America.

The second program concerns the recent channel of communications opened up between CMIR and scientists at the Institute of Kiev in the Soviet Union. CMIR will assist American firms to negotiate with the Russians and to share in the Russian advancements in metallurgy. Bhat's scientific staff will thoroughly evaluate new equipment in the Kiev laboratories and pilot facilities, and relay specific technological information to American companies who have expressed the desire to share in the project.

The incorporation of these Russian advancements by American companies, Bhat predicts, will bring increased employment opportunities. He notes that "CMIR must address itself to current problems which will not only help industry but also open up jobs for the community."

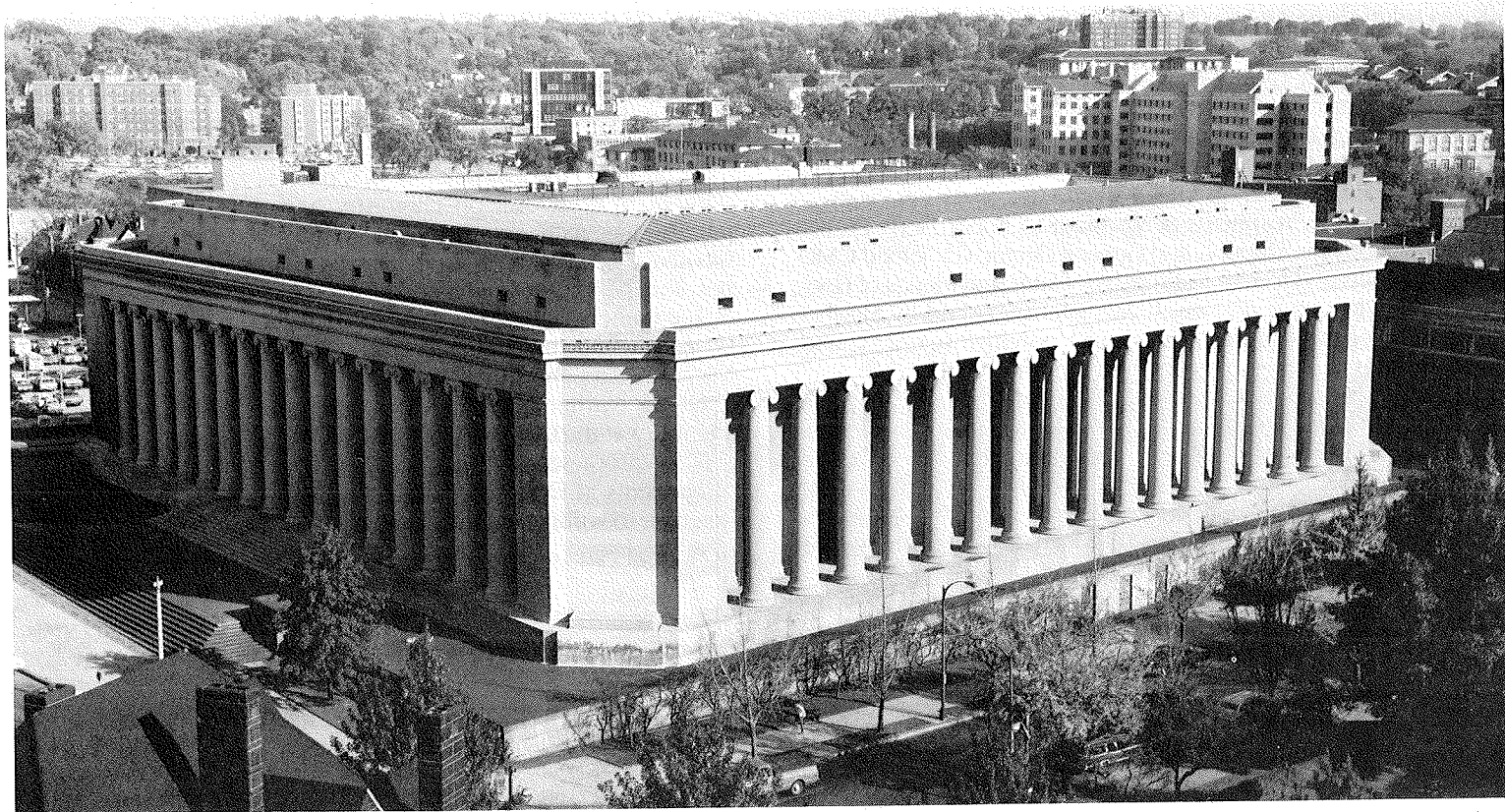
FOCUS ON EXCELLENCE

Hermann proudly notes that CMIR undoubtedly has the finest, and perhaps the largest, toxicology facilities in the United States. CMIR began its chemical toxicology studies in 1937 through the sponsorship of the Union Carbide Corporation; within the past year it has added many other sponsoring corporations (including Gulf and PPG) who wish to determine the effect of chemicals on humans. The research laboratories are located in the Mellon Institute building and on a 230-acre tract at Bushy Run, 22 miles east of Pittsburgh.

Dr. Cyert has emphasized the need for excellence at CMIR, and Hermann heartily agrees. "I have rejected several research programs and terminated others when it was obvious that we would waste our time and our sponsor's money," Hermann says. "Credibility is the name of the game at CMIR."

With this focus on excellence, CMIR has risen, in less than two years, from eleventh to fifth in size among the vast number of research institutes across the nation. "With our continued emphasis on problem-solving, we should become third in size by 1982," Hermann predicts.

— Kathy Prokop



Sixty-two limestone columns, each weighing 60 tons, surround the Carnegie-Mellon Institute of Research building which contains 14 different kinds of marble from Italy, France, Belgium, and various parts of the United States. The fourth floor (entry level) serves as the site for various business and administrative offices as well as the library. The floors above four hold the majority of the research laboratories, over 200 throughout the building. The three floors below the fourth contain conference rooms, auditorium, shops, research services, and special laboratories which require unusual facilities.

Profile



PAUL J. FLORY

Nobel Prize laureate Paul J. Flory was Executive Director of Research at the Carnegie-Mellon Institute of Research, then known as Mellon Institute, from 1957 to 1961. Flory, who received the Nobel Prize for Chemistry in 1974, began his career in research with Dupont Industries.

Flory graduated from Manchester College, Indiana, in 1931 and received his Ph.D. degree in physical science from Ohio State University three years later. His first position placed him alongside Wallace H. Carothers, inventor of nylon and other synthetics. There, Flory started his study of polymers which has led to numerous honors during his career. He has published several books, approximately 300 scientific papers, and over 20 patents, all related to his polymer research.

In 1941, after several years at the University of Cincinnati, Flory moved to the Esso Laboratories where the prospects for research were broader and more optimistic. At Esso he began both experimental and theoretical work in two areas that have retained his attention through the present: the thermodynamic properties of polymer solutions and rubber-like elasticity.

Subsequent polymer research took Flory to Goodyear Tire and Rubber Co. in Akron, Ohio, Cornell University, and Mellon Institute. The noted scientist finally settled at Stanford University where he taught, served as chairman of the department of chemistry, and currently holds the Jackson-Wood professorship.

In 1975 Carnegie-Mellon University held a Polymer Science Achievements and Prospectus Symposium to honor Flory. Executives from Goodyear, Dupont, and General Electric Co. joined CMU faculty members and former institute associates and friends of Flory at the all-day lecture series which was later published by Hershel Markovitz, professor of mechanical and polymer sciences, and Edward F. Casassa, professor of chemistry, both at CMU.

University President Richard M. Cyert presented Flory with a special citation of recognition at a dinner following the symposium. Included among Flory's numerous honors are the Peter Debye Award in Physical Chemistry (1969), the J. Willard Gibbs Medal (1973), and the Priestley Medal (1974), both from the American Chemistry Society, and election to the national Academy of Sciences in 1953.

Profile



DR. EARL L. WARRICK

Dr. Earl L. Warrick (E'33), who received his B.S., M.S., and Doctor of Science degrees in chemical engineering from Carnegie-Mellon between 1933 and 1943, fondly reminisces about his more than twenty-year research work at the Carnegie-Mellon Institute of Research.

He considers the influence of the institute essential to the start of his career. "The freedom to work on subjects of interest and the proximity and existence of people in other fields were the major contributing factors. Also, the general relaxed climate and pace of work contributed a great deal."

Dr. Warrick's research on the Corning Glass Fellowship at the institute played a major role in the decision in 1943 to establish the Dow Corning Corporation for the purpose of manufacturing the world's first silicone products. His work led both to the development of organosilicon rubber and to significant break-throughs in the understanding of the physical properties of silicone rubber.

Leaving the institute in 1957 to become assistant research director at Dow Corning in Midland, Michigan, Dr. Warrick's career advanced rapidly as manager of the Hyper-Pure Silicon Division from 1959 to 1962, general manager of the Electronics Products Division until 1968, manager of the New Products Business through 1971, and senior management consultant until his retirement in 1976.

Dr. Warrick, the author of 42 U.S. patents and numerous foreign patents in organosilicon chemistry and over twenty technical papers, has received the CMU Merit Award and the Charles Goodyear Medal for his contributions in the study of silicone rubber. Both honors were awarded in 1976.

The noted CMU alumnus and his wife, Jean, have two daughters. One lives with her husband and two daughters in Frankenmuth, Michigan, and the other, who spent three years as a missionary teaching mathematics in Africa, will soon receive her M.S. in chemistry at the University of Stanford.

Dr. Warrick says he will occasionally participate in consulting assignments at Dow Corning, but he plans to devote most of his free time to writing additional technical articles on silicone rubber.



Homecoming

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