ChE founder

REMINISCENCES OF BARNETT F. DODGE

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The record of Barnett Fred Dodge's contributions to his profession is clearly evident from his extensive writings on chemical engineering research, education, and practice, and in the list of honors bestowed on him by his fellow chemical engineers and others. He rated the title of expert in chemical engineering thermodynamics (a field in which he wrote *the* book), the behavior of materials and chemical reactions at high pressures, industrial water pollution control, and cryogenic engineering, and published numerous articles on these subjects.

It would be easy to expand on his accomplishments in research, education, administration, and consulting, but these are all in the written record, and I would prefer to turn to a more personal picture of this man.

The primary characteristics which come to mind in thinking about Dr. Dodge are his integrity, a sense of fairness in dealing with others, his openness in personal dealings, and his incredible sense of organization of his own efforts and those of his university and professional societies. We who were privileged to work closely with him learned early in the game that he would always keep us informed as to how we stood with him, that he trusted us to do our best, that we were left to our own devices with only minimum guidance from him, and that his word was as binding as any contract ever written. We learned also that it was entirely possible to engage with him in high-spirited arguments and then go out to a pleasant lunch!

It was quite an educational experience to take a course with Dr. Dodge. The first class meeting usually consisted of a lecture describing some of the aims of the course, some suggestions about reading and the value of books as the best learning aids available, and a few problems to be solved before the second class meeting. His problems seemed characteristically to be simple and straightforward but usually turned out to be neither. They forced his students to search for the basic ideas and concepts which applied to a particular problem, and it wasn't often that they could be solved without one or more false starts. The second class meeting was based on the problem solutions, and from then on there were only occasionally lectures in a formal sense, but there were some very rewarding discussions. He forced his students to think deeply about the subjects he taught, and he expected them to assume a considerable part of the responsibility for their own education. His grading of problem solutions was also part of the educational process since the papers were always returned promptly with helpful comments.

He taught many things other than Chemical Engineering and was particularly effective in demonstrating by his every action the supreme importance of integrity.

Putting all of this on a more personal basis, I remember well arriving at Yale some thirty years ago and "taking" Professor Dodge's graduate course in thermodynamics. I expected a lot because of his reputation. At first it was very puzzling. What kind of teaching was this that

didn't involve polished lectures by the great authority? I must admit that during those first few weeks I sometimes wondered how he developed his reputation. Then I began to notice some things: the thought that had gone into preparing the problems, his mastery of the subject matter, the clarity of his thought in answering questions and in outlining new topics and concepts, and his sense of fairness and integrity. By the end of six weeks it was apparent that Dr. Dodge's teaching method consisted of creating a superb atmosphere for *learning*. He was equally effective in all of his teaching, whether the subject matter was thermodynamics or process design or high-pressure research. (Incidentally, I recently had occasion to survey the accumulation of materials in his office and began to understand his success. Many notebooks of problem solutions were there, some for use in classes and many which he had apparently solved just to be sure he was keeping up with his field).

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He taught many things other than chemical engineering and was particularly effective in demonstrating by his every action the supreme importance of integrity. In dealing with graduate students and colleagues he also taught us that we would get better responses in all that

PROFESSOR DODGE

Professor Dodge was named Dean of the School of Engineering in 1960, and oversaw the conversion of the School into Yale's current Department of Engineering and Applied Science, an integral part of Yale's graduate and undergraduate curricula, the following year.

He was born in Akron, Ohio, on November 29, 1895. He earned his BS degree in chemical engineering from the Massachusetts Institute of Technology in 1917, and a Doctor of Science degree at Harvard University in 1925. Before enrolling at Harvard in 1922, he worked for three years for E. I. duPont deNemours & Co., chiefly on explosives, and two years for the Lewis Recovery Corporation of Boston. From 1921-25 he held lectureships in chemical engineering at Harvard and Worcester Polytechnique Institute. He was appointed to the Yale faculty in 1925 as Assistant Professor, promoted to Associate Professor in 1930, and to full Professor in 1935.

During World War II he was an official investigator for the National Defense Research Council, and helped develop portable oxygen generators for the Navy. He also spent a year on leave from Yale with the Fercleve Corporation working on the Manhattan Project at Oak Ridge, Tenn. There he directed all experimental investigations and plant control work on the separation of uranium isotopes.

During his professional career, Prof. Dodge served as a consultant to many companies and agencies, among them the Osygen Process Corporation of New England, the Connecticut State Water Commission, the Tennessee Valley Authority, the Phillips Petroleum Company, duPont, the H. K. Ferguson Company, Oneida, Ltd., and Brookhaven National Laboratory.

He was a member of the firm of Dodge, Bliss and Walker, consultants on the treatment of factory wastes, since 1951, and had been an editor of Chemical Engineering Science.

As early as 1930, Professor Dodge had devised several means of controlling pollution for the Connecticut State Water Commission, but there was little interest in the processes at the time and his ideas were not implemented. Until his death he was still active in the study of industrial waste control.

He also was widely known as a lecturer both in the United States and abroad. He had spoken in France under Fulbright grants at the University of Toulouse, the University of Lille and the Catholic University of Lille, and in Spain at the University of Barcelona, also under State Department sponsorship. These trips gave him an opportunity to exercise his linguistic ability: in France, he lectured in French, and in Spain, in Spanish.

In 1951 he traveled to Japan as a member of an engineering mission sponsored by the American Society for Engineering Education, and he also was invited several times to the Universidad Central de Venezuela in Caracas.

In 1960 he was a National Sigma Xi Lecturer speaking at colleges and universities in the Midwest and West, and in 1963, Reilly Lecturer at the University of Notre Dame.

Professor Dodge received numerous professional honors besides the Founders Award, the most recent being the Warren K. Lewis Award of the American Institute of Chemical Engineers in 1963. He was elected as the first recipient of the award for his work as an educator and researcher over the past 40 years.

He received the Walker Award of the AIChE in 1950 for his contributions to chemical engineering literature, and was honored as "Man of the Month" by Chemical Engineering magazine in its February, 1954, issue.

He was elected vice-president of the AIChE in 1954, and president in 1955. He was elected a Fellow of the American Academy of Arts and Sciences in 1960, and served as chairman of the Academy's Engineering Committee from 1960-61. He received honorary degrees from Worcester Polytechnic Institute, the University of Toulouse, and the U. Central de Venezuela, Caracas.

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we did if we approached him not simply with a problem but with a problem and our own ideas as to a solution. Then we had his complete attention and benefitted from his helpful comments on our proposed solutions. He was a tolerant man in most respects and was willing to accept limitations of ability, but he was not tolerant of laziness or lack of responsibility.

What else did he do? He pursued a number of hobbies with almost the same intensity and pleasure as were exhibited in his professional work. For one thing, he was a fine photographer, one of those rare people whose color slides and home movies were delights to see. He worked hard at this, and I recall that he once wrote for his own benefit a paper summarizing methods of color photography. During all of his adult life he played tennis (well), swam (capably), and climbed mountains (seriously) all over the world. At age 55 or so he added skiing and ice-skating and became quite proficient at both. There were rumors that he planned to take up golf when he reached age 80, but, alas, this was not to be.

Dr. Dodge "retired" in 1964, but the only change in his habits which we were able to detect was in his office hours. For years they had been 8 AM to 5:30 PM, Monday through Saturday. In retirement they changed to 8:15 AM to 5:30 PM, Monday through Saturday. Among other accomplishments during these retirement years he wrote a book on cryogenic engineering which is now in manuscript form.

Dr. Dodge's widow, Constance Woodbury Dodge, will be known to many chemical engineers who have met her and to others who know from the dedication in his book on thermodynamics, that she is a novelist "who writes more exciting books". Together they created a warm atmosphere in the department, and many former graduate students here will have pleasant memories of Thanksgiving at the Dodge's, where the only thing to avoid was being matched against either of them in ping-pong. She has kindly given his technical library to Yale and has authorized the placing of the contents of his office in the archives at Yale. He is also survived by a daughter, Phillis Dodge Putney, and a son, Richard W. Dodge. □

ChE news

WOMEN ENGINEERS

BOZEMAN, MONTANA — Montana State University will set a record in 1972 in the production of girl chemical engineers. The six girls being graduated there are the largest number of female chemical engineers turned out by any U.S. university in a single year. Included in the group are, from the left, Margaret Striebel of Deer Lodge who is going with Mobil Oil Corporation at Ferndale, Wash.; Lara Larson of Sheridan, going to graduate school at Montana State; Lynn Sherick of Sidney who is married to a philosophy student and who expect a tour of duty with the Peace Corps this summer; Mildred Liknes of Great Falls who is going to Norway for the summer before locating in the petroleum or paper industry of the Pacific Northwest; Sandra Punke of Missoula, going to the West Coast petroleum industry; and Ann Berg of Bozeman who is going to graduate school at Montana State.

NEW EDUCATION SESSION

AIChE NEW YORK MEETING — To stimulate innovation in education the Education Projects and the Undergradute Education Committees of the AIChE are sponsoring a unique experience at the November 26 to 30 meeting in New York.

A minisession on "Free Forum on Teaching Undergraduate Mass and Energy Balance" starts a series of sessions to bring together all those who teach or have a particular interest in a certain topic in education. A second objective is to help each other by sharing experience, problems, laboratory experiments that worked, teaching techniques, information on programmed texts, slide-tape presentations, computer-aided instruction, in-

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