

# James J. Carberry

## OF NOTRE DAME

*Prepared by the Faculty of the Department of Chemical Engineering*

**“WE ARE LIKE DWARFS** seated on the shoulders of giants; we see more things than the ancients and things more distant, but this is due neither to the sharpness of our own sight, nor to the greatness of our own stature, but because we are raised and borne aloft on that giant mass.” So wrote Bernard of Chartres in the 12th century. Jim Carberry is rather fond of that quotation. How else could he have risen, in the words of his friend Rutherford Aris, “from the low tables of Morris to the high table of Trinity, Cambridge.”\*

### BROOKLYN BEGINNINGS

**A** NATIVE OF BROOKLYN, Jim managed to graduate from the famed Brooklyn Technical High School at which site he achieved absolute mediocrity as a single-wing halfback. “Brooklyn Tech” recalls Carberry “was somewhat more than absolutely competitive.” Several classmates invented radar some eleven months prior to Great Britain’s discovery of that toy. Carberry’s qualifications impressed President F. D. Roosevelt, who immediately appointed him an Apprentice Seaman in the U. S. Navy. Japanese intelligence learned of this and thus they assaulted Midway with supreme confidence. As Jim was at that moment interned at Torpedomen’s School at Great Lakes, Illinois, the Japanese lost the Battle of Midway.

Appropriately inspired by the quality of life aboard a U. S. Navy Light Cruiser, Carberry surrendered unconditionally in 1946 and, armed with the G. I. Bill, enrolled as a chemical engineering major at Notre Dame. He notes “there is nothing quite like sea duty amidst grunting ‘deck apes’ to inspire the lowliest of citizens to seek the highest

\*Citation in U of Minn. “Semisesquiennial Wet Test Meter Award.” Carberry was first and last recipient of this noble award.



Now we must get on with our task—applied Chemistry.

of goals—outside the Navy.” At Notre Dame, he struggled with chemical engineering, played quarterback in its intramural tackle football program (said John Lujack, “a quarterback should hide the ball, but in Carberry’s case, it hides him”), helped classmate Leon Hart win the Heisman Trophy; while Leon tutored Jim in Physics I through IV. Somewhat less than inspired by the traditional chemical engineering program (“I haven’t been confronted with a plate and frame filter press since I burned my copy of Walker, Lewis, and McAdams at a cocktail party in 1949”), Jim minored in English Literature and, informally, Italian opera. “I was destined, I believed, to be a Literary-Musical critic for the now deceased Brooklyn Eagle—but John Treacy saved literature and music by introducing me to chemical kinetics in my senior year. My medieval mind prompts me to envision my ultimate paper “Nth-Order Adiabatic Reaction in a Plate & Frame Filter Press.”

### INDUSTRIAL CONTACTS

**J**IM JOINED THE EXPLOSIVES Department of the du Pont Company in 1951 as a process engineer, at which post (Eastern Laboratory, Gibbstown) he labored happily under the mentorship of Bill Kirst, Bob Cavanaugh, Win Johnson, and John Vyverberg. Johnson, a former student of B. F. Dodge encouraged Jim to seek a Ph.D. at Yale. At Yale Jim worked under R. H. Bretton on

axial dispersion in fixed beds, talked endlessly with Jon Olson (now at University of Delaware) on topics ranging from Aquinas to Zeus, presented numerous impromptu seminars at Smith and Vassar Colleges, confounded B. F. Dodge by attending Barney's 8 a.m. class clad in p.j.'s, and worshipped R. Harding Bliss. "He, Harding, was a gentleman and a scholar." He feels he learned much from that Yale faculty—a logical consequence of his student days at Notre Dame under Treacy and Wilhelm, (then of the chemical engineering faculty) and Burton and Hamill of Notre Dame's Chemistry Department. "One likes to think that the Professor-Student relationship be mutually respectful yet informal, as it was between Wilhelm, Treacy (of Notre Dame), Dodge, Bliss, Bretton, Walker (of Yale) and me."

Jim returned to the Engineering Department of the du Pont Company as a research engineer at the Engineering Research Laboratory (ERL), a site famed by Chilton, Colburn, Drew, Pigford, Marshall, etc. Tom Chilton directed Carberry into catalysis: du Pont sent Jim to Johns Hopkins to take Paul Emmett's cosmic course "Catalysis" in 1959-60. "Between Paul's course and numerous discussions with Sir Hugh Taylor, I felt as would an altar-boy at the feet of Augustine and Aquinas." The four years at ERL proved most stimulating to Carberry. His mentors Von Wettberg, Rush, and Roberts, he notes "were most tolerant and therefore encouraging." His colleagues at ERL were most stimulating—humble Steve Whitaker, placid Forest Mixon. Marty Wendel shared his office and taught him all manner of things about wit and numerical analysis (namely there is a synergism there somewhere). In moments of scientific-technological terror, a fellow Brooklynite, Sheldon Isakoff, reminded Jim that "the sun never sets on Sheepshead Bay, Brooklyn."

#### RETURN TO ACADEMIA

**T**AKING THE CLOTH, as it were, Jim returned to Notre Dame in 1961 as Assistant

Professor of Chemical Engineering. Dr. J. T. Banchero of Michigan had then assumed the Chairmanship of Chemical Engineering at Notre Dame and immediately set about the task of developing a graduate program in chemical engineering. Notre Dame's president, Father Heshburgh and then Dean of Engineering, Harry Saxe and later Norman Gay encouraged and sustained developments which created the chemical engineering Ph.D. program. "That indeed was a most fruitful period of maturation for our department. Without the energetic support of Father Heshburgh, Deans Saxe and Gay, Banky, Jim Kohn, and that wise man, Ernest Thiele, naught would



... he ... helped Leon Hart win the Heisman trophy.

have been reaped. We were, of course, not eligible for the first Carter Report rating since we had not granted a chemical engineering Ph.D. prior to '59. Yet in the second, our first, evaluation, we were judged as "Good"—a judgment both encouraging and challenging. I attribute this to the wise vitality of our administration, faculty, staff and students."

"Since those formative years, we've retained excellent people in Luks (Minn.) and Verhoff and Smith (Mich.). One can only hope that the present Engineering College administration will be cognizant of whose shoulders sustain us now."

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In his twelve years at Notre Dame, Jim has directed research in Chemical Reaction Engineering and Heterogeneous Catalysis. The now-universally employed "swirling basket catalytic reactor" or "Carberry Reactor," which Jim prefers to term the "Notre Dame CSTCR" was conceived and developed in 1964. The key experimental work was carried out by then Ph.D. candidate Dan Tajbl (now at Mobil Oil) who came to Notre Dame from Northwestern "a year before Ara made a move equally beneficial to Notre Dame" as Jim puts it.

#### ACCLAIM AND ALLEGIANCE

**I**N 1965-66, CARBERRY was awarded an NSF Senior Postdoctoral Fellowship at Cambridge University, England where he thrived upon dialogues with Danckwerts, Pearson, Davidson, Turner, Bridgwater, et al. Between "teas" he managed to lecture at various posts between Warsaw and Haifa. Thus it was that he, the devotee of Verdi and Puccini, found Italy. "It is asserted that I am of Anglo-Irish derivation. So be it with respect to my blood chemistry, but I do declare that my heart is Italian," declares Giacomo Carberri. This Spring (1974) Commendatori Carberri will again be in Italy as a Senior Fulbright Scholar at the University of Rome.

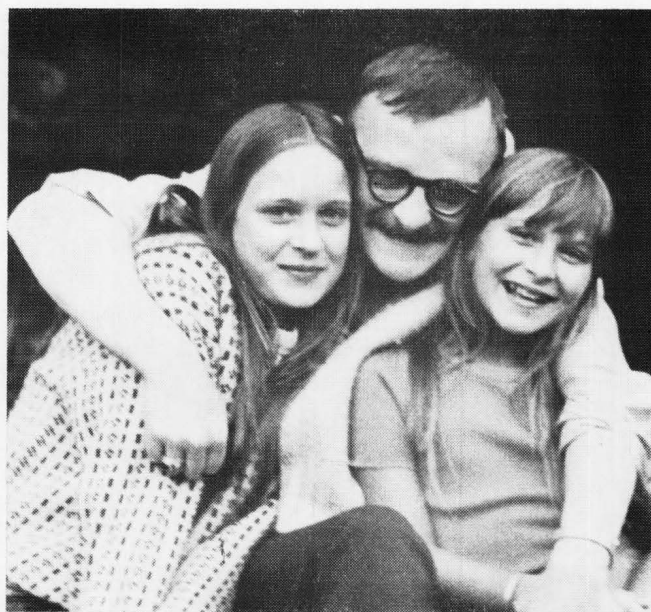
In 1968, Jim received the Yale Engineering Association Award for Advancement of Basic and Applied Sciences, and he fondly hopes that in 1974 he will once again be recipient of the Interhall Football Coach Trophy at Notre Dame. For the "ole" Brooklyn Tech scrub halfback has been coaching intramural eleven man contact ("collision") football on the Notre Dame campus for over a decade. Says he, "oh, for the pre-Ara days when I could boast as being the only winning football coach on campus. But, alas, no threat to Ara am I."

Off-season, Carberry preoccupies himself with research in surface catalysis in association with his solid-state physicist colleague George Kuczyn-

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Carberry and his daughters.

ski and teaching both graduate and ("most importantly") undergraduate Reaction Engineering. He is now co-editor of *Catalysis Reviews* and a member of the U.S.-Soviet Working Group on Catalysis.

He harbors rather firm views regarding the future of Chemical Engineering and society in general. A Stevensonian Democrat, in typical eclectic fashion, Carberry is a devoted admirer of William F. Buckley, Jr. and his *National Review*. Given his studied dedication to Aquinas, Dante, and Maritain, the seeming paradox may be illusionary. He believes in civilized society, which signifies civilized discourse amongst civilized men, phrased in civilized form and spirit. "I am the enemy of the 'you know' generation, who are poised before bronze calves, mesmerized by a cacophony, miscoined by morons and idiotic soothsayers as meaningful, relevant, and true because it feels right."

Explaining how he views chemical engineering, Carberry relates "Olaf Hougen put it all in perspective—our roots reside in chemistry—at a particular stage the Hougen's, McAdam's, etc. put order into transport processes. Now we must get on with our true task—applied chemistry. This may well mean divorce with respect to general engineering. Che sara', sara'. Remember those shoulders which sustain us all." □