

## University of Massachusetts' *James, the Black,\** *Douglas*

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**T**HE CHEMICAL ENGINEERING Department at the Johns Hopkins University didn't fold while James M. Douglas loitered through his undergraduate years at Hopkins. It was intact even while Stan Middleman wandered through Maryland Hall. It collapsed as we joined forces at the University of Massachusetts. It may well have been Douglas who precipitated the debacle;

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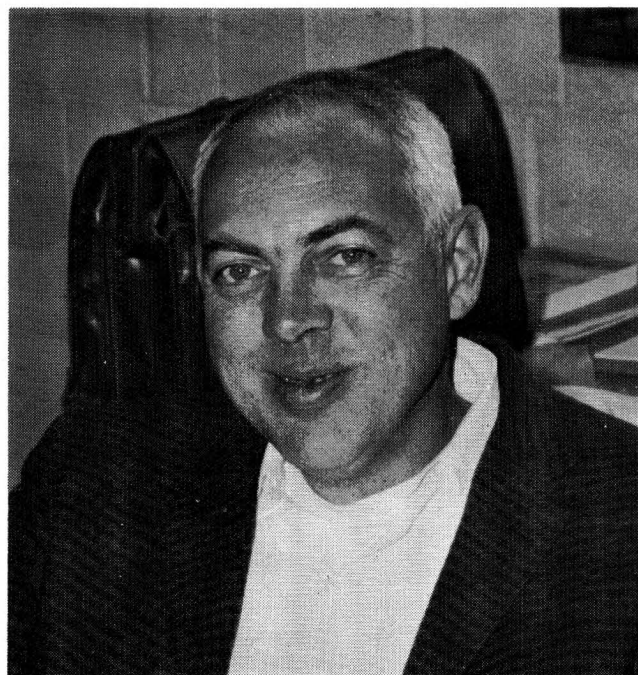
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for that matter a few years at U. Mass. and the Commonwealth nearly folded. The Hopkins days may well have played a large role in the development of our "enfant terrible." Long hard intense nights at poker sharpened his killer instinct. The warm Baltimore spring may well have brought him to Homewood field to watch Morrill and Webster and others show Maryland's Terrapins

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\*The family Douglas, according to Lang (History of Scotland, vol. 1, p. 236), is "a great, turbulent, daring, often treacherous house." After the demise in rapid succession of the first and second earls of Douglas arose an energetic border chief, a zealous protector of the kirk of Scotland, Archibald, the Grim, third earl of Douglas, dit the Black Douglas (1328-1400). A natural son of James "the Good" Douglas, he was the instrument of Hotspur's demise at Otterburn (1388). The house of Douglas developed two distinguished branches—The Black (of Douglasdale), the Red (of Angus). Internecine conflict marked the ascendancies of Red and Black for many years. The Black Douglas most often however wore the white hats.



how to play lacrosse. These athletic talents became nearly as highly developed as his skill in emptying beer cans. In the latter day academic profession, such skill is essential in maintaining communication with students.

At U. Mass/Amherst, a migration occurs from Goessmann Lab nearly every Friday just after 4:00 p.m. The exodus of students (and faculty) grows as they pass down the corridor and among others, Jim Douglas finds his way to the Top of the Campus for the beers and the Friday afternoon advising session. A university, a school, a department must strive to be a community of scholars. They must meet, they must talk, exchange ideas. These sessions are one way towards those goals. These sessions are of finite duration, however; Betsy and the hills of Leverett do need Jim. Robbie, his son, took to downhill skiing this year and Jim, as accomplished a cross-country skier as he is, still had a transition to make. Changes are not new to the Black Douglas. His career has provided enough for him.

A graduate of the John Hopkins University, he migrated the short distance to Newark, Delaware, in the late 50's and served his time as a graduate student in the vigorous Chemical Engineering Department at the University of Delaware. His companions in crime of the time were Forrest Mixon, Marty Wendel, Steve

Whitaker, Bill Abraham, and many others. The tutelage of Bob Pigford did him no harm, but he regrets to this day the anger which preceded disposal of the classic text by Marshall and Pigford.

I can't see Douglas having changed political views in the last 20 years. His intensity may well have mellowed. Douglas, would you believe, served an Army tour. His stories mirror his perennial frustration with ineptitude and red tape, but more on that later.

### **STRONG INDUSTRIAL BACKGROUND**

**W**HEN JOHN ELDRIDGE began to assemble the personnel to build a strong department of Chemical Engineering, his fundamental premise was to provide a sound undergraduate program through a faculty with substantial industrial experience. Jim Douglas was no exception. His experience with Atlantic Refining flavors his senior design course. Jim's interest in design is in some sense counter-cultural. A large fraction of design teaching in chemical engineering has a focus in computer aided design. Although Douglas is aware and used computer aided design, a significant fraction of his teaching and research effort is directed towards *simple* design algorithms . . . in a sense to offer credence to the fabled design engineer who based his designs on years of experience. Such a set of research interests is not at all out of character for Jim. He has managed to attack consistently difficult problems and arrive at simple solutions.

After several years at Atlantic, Jim had an industrial sabbatical at Imperial College (University of London). Contrary to most views, he did use his leave to good purpose. He lived in Wimbledon and did not play tennis. He, Betsy, Lynn, and Robby travelled through Britain, visiting even the Borders of an earlier Douglas. From Jim's work with Dave Rippin (now ETH, Zurich) came periodic operation. He and Rippin showed the marked improvements in performance which

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can be obtained in chemically reacting systems through forced oscillations. This work opened a new research area for him, work which continues.

It was through the work on periodic operation that Jim began his two-volume text on Process Control and Dynamics. The books began as one volume, but finished as two, the mass of information to be distributed having grown continually. His ideas were tested on students, on colleagues, on himself.

Cooling a cup of coffee may not sound like an exciting chemical engineering problem, but it is not unusual to find students in Jim's heat transfer course measuring the temperature history of a cup of coffee. This problem shows Jim's approach to things . . . define a problem in the simplest description possible, make some experimental measurements, and refine your model. This pattern of analysis is what has led to Jim's latest research efforts in simple design algorithms.

Douglas' office is at the back of Middleman's laboratory, populated with aspiring rheologists. They were sufficiently distressed by the frequency of the question, "Is Dr. Douglas in?" that they put up a sign with a movable arrow pointing to In, Out, or Maybe. Another sign was soon necessary to identify whether the first was true or false.

One aspect that students see little of are his continuing efforts in the development of a sense of scholarship in his colleagues. He has not always been successful, but he does keep trying and we all will discover soon that he was right all along. His latest frustration came this spring in the senior design course. Plagued with "senioritis," the class was nearly in rebellion over the workload. They expected to coast while Jim expected them to learn.

I suggested earlier that Douglas has little patience with ineptitude and red tape. "Notre enfant Terrible" mustered the forces of the university administration against him in a valiant attempt to expose the usual ineptitude of

Continued on page 145.

## DOUGLAS: ChE Educator

Continued from page 113.

university research administrators. He prepared a proposal for submission to NSF without the usual overhead funds in the budget. The document managed to clear all but the Treasurer's Office. When news of the attempt filtered back like a water hammer, there were an awful lot of red faces, but not Jim's.

## DOUGLAS AS ENTREPRENEUR

ONE ROLE AN ENGINEER often plays is that of an entrepreneur. An outgrowth of Douglas's interest in sailing brought him into partnership with two other engineers from U. Mass., seeking to develop new metal forming procedures useful in forming hulls. His avocation energized an interest in Engineering Entrepreneurship and developed course material for both undergraduate and graduate courses.

We began this article with a clear exposition that James M. Douglas is an uncommon man. This we have shown as true in all his pursuits of scholarship and of leisure. His intensity fires the interest of students and of some colleagues, and the passions of others. "L'éminence grise" (for the gray hair) continues to be a major contributor to the growth of this department and the chemical engineering profession. □

## ALKIRE: The ChE Profession

Continued from page 129.

course described here achieves its purpose in an efficient manner. □

## REFERENCES

1. *Scientific American*, September, 1970.
2. *Synthetic Rubber*, Inter. Inst. Synth. Rubber Producers, New York.
3. *The Foxfire Book*, ed. E. Wigginton, Anchor Press/Doubleday, Garden City, N.Y., 1972, p. 308.
4. *Pencillin Production*, A. L. Elder, ed., CEP Symp. Ser. 100:66 (1970).
5. *The Foxfire Book*, ed. E. Wigginton, Anchor Press/Doubleday, Garden City, N.Y., 1972, p. 150.
6. C. W. Cowley, W. J. Timson and J. A. Sawdye, *I&EC Proc. Des. and Dev.*, 1:12, 81 (1962).
7. C.-C. Shih and J. W. Westwater, *Int. J. Heat Mass Transfer*, 15, 1965 (1972).
8. R. B. Bird, W. E. Stewart, E. N. Lightfoot, *Transport Phenomena*, Wiley, New York, 1960, p. 357.
9. N. DeNevers, *Chem. Eng. Educ.*, 98, Spring (1974).
10. Samuel W. Bodman, *The Industrial Practice of Chemical Process Engineering*, MIT Press, Cambridge, Mass., 1968.

11. P. W. Morgan and S. L. Kwolek, *J. Chem. Educ.*, 36, 182 (1959); P. W. Morgan, *J. Chem. Educ.*, 42, 12 (1965); anon., *J. Chem. Educ.*, 46, A755 (1969).
12. A. A. Collyer, *Phys. Educ.*, 8:2, 111 (1973).
13. C. B. Weinberger, *Chem. Engr. Educ.*, 80, Spring (1975).
14. M. Page and F. H. Hooper, *The School Science Review*, 45, 155 (1964).
15. D. F. Rudd and C. C. Watson, *Strategy of Process Engineering*, John Wiley, New York, 1968, Chpt. 13.
16. *CEP*, 67, June issue (1971).
17. D. F. Rudd, G. J. Powers, J. J. Siirola, *Process Synthesis*, Prentice-Hall, Englewood Cliffs, N.J., 1973.

## WILLIAMS & COSART: Freshman Analysis

Continued from page 135.

has been enthusiastic. We feel that they have a much better understanding of chemical engineering and are certainly much better equipped to handle a rigorous stoichiometry course in the next semester as a result. □

## REFERENCES

1. Shair, F. H., "Chemical Engineering Concepts and Laboratory for Freshmen," presented at the Workshop on Undergraduate Chemical Engineering Laboratories, ASEE Summer School for Chemical Engineering Faculty, Boulder, Colorado, August, 1972.
2. Gerrard, A.M. "Some Simple Experiments for First Year Students," *Chemical Engineering Education*, 9 (1), Winter 1975.
3. Hile, L. R. and Williams, R. D., "Flow-Through Device for Colorimetric Analysis," *Chemical Engineering*, 82 (14), July 7, 1975.
4. Hile, L. R. and Andres, R. P., "Alkaline Fading of Organic Dyes: An Ideal Reaction for Homogeneous Reactor Experiments," *Chemical Engineering Education*, 9 (1) Winter 1976.

## ChE news

WORCESTER, Mass.—Dr. Imre Zwiebel has been appointed head of the Worcester Polytechnic Institute chemical engineering department, effective Sept. 1.

He has been a member of the WPI faculty since January, 1964, when he came to Worcester after three and a half years as a research and development engineer with Esso Research and Engineering Co., Linden, N.J.

A native of Budapest, Hungary, he came to this country in 1948 and was educated in New York City. Following graduation from University of Michigan with a bachelor of science degree in chemical engineering, he was employed for three years by E.I. DuPont Demours & Co. in Wilmington, Delaware.

He held four fellowships at Yale University where he received both Master of Science and Doctor of Philosophy degrees.