

This feature article was contributed by Professor T. J. Fitzgerald, Oregon State University.

Oregon State's

OCTAVE LEVENSPIEL

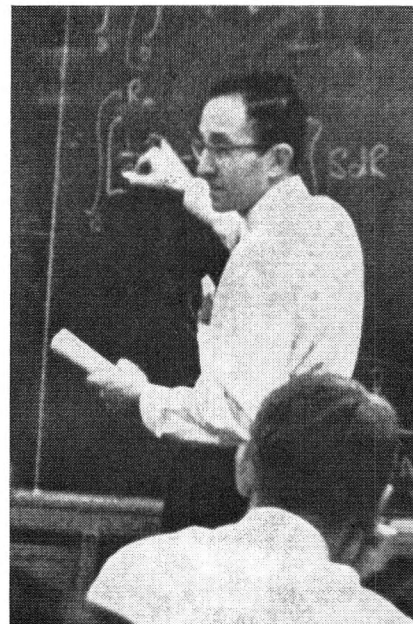
Once there lived in the far-off land of China a wealthy merchant who had thirteen children. The eleventh child who was the eighth son was named Octave (of course). He was schooled in the magic arts of the Orient, boy scout craft, French, German and such other unlikely things as a young Shanghai boy was expected to learn. At least this is the way the story sometimes goes when you ask him.

This investigation gives a much smaller number for the children in the family—probably only one—although the community included his uncles and his cousins and his aunts. Documentation is difficult since the stories grow more elaborate with the passing of time, and because pertinent documents have long ago been absorbed into the omnivorous filing cabinets which Professor Levenspiel maintains. Withdrawal from these files is similar to what computer people call random access: all items are equally difficult to retrieve, and the probability of finding any given document or paper decreases with each new item accumulated. As a result this article is based mainly on the collected stories of relatives, colleagues, and former students.

The real Mr. Levenspiel was not a merchant but was (and still is) a civil and mechanical engineer. There was in those days a rather large European community in Shanghai with its own system of schools, restaurants, and Chinese servants. It was in this community that Octave was brought up, attending a German grammar school, an English high school and a French university.

It is worth retelling two incidents which occurred while Octave attended Araura University in Shanghai—the first because it had a significant effect on Octave's career; the second because it was an early public display of life long passion to excell, sometimes even in bizarre pursuits.

"Science and the application of science are worthwhile activities on which to spend a lifetime."



Octave failed his freshman year of studies—you passed or failed the entire year of course work—and thus required either to repeat the entire year or take up chemical engineering. After what was undoubtedly a painful period of soul searching, Octave took up chemical engineering.

Later on in his college career he set a new record in a physics class which probably has not been matched to this day. The preparation for this feat was difficult, almost dizzying at times, requiring almost an hour of concentrated effort and labored breathing, but the results were spectacular: he managed to hold his breath one time for a full five minutes and twenty-five seconds!

In 1946 Octave came to the United States and spent a year completing his undergraduate education at the University of California at Berkeley and then moved to the chemical engineering department at Oregon State University where he worked for Jess Walton to obtain a master's degree in 1949 and Ph.D. in 1952. During this period he helped organize the first soccer team at Oregon State. This led to his promotion of the boycott of a restaurant that would not accommodate all the members of the multiracial team. There is a rumor that Octave majored in square dancing while at Oregon State. Investigation has shown that indeed he did spend a lot of time at

it, and became proficient even as a square dance caller—but his academic interests stayed closer to chemical engineering. There was an occasional venture into the world of pure mathematics. His proof of the famous four color problem of topology—which asserts that it is possible to color a map using only four colors so that no adjacent areas have the same color—dates from this period. He has never been able to get a mathematician either to agree that the proof is correct, or to state what's wrong with it.

Following his completion of graduate studies at Oregon, Octave returned to Berkeley where he worked in metallurgy as a junior research engineer at the Engineering Research Institute. No doubt a significant factor in Octave's decision to return to Berkeley was the abundance of Chinese restaurants in the San Francisco area.

Octave claims to look upon food primarily as a fuel, and chooses restaurants according to how much food per dollar they serve. If you like rice dishes, Chinese restaurants always come out near the top. And so they are the center of much of Octave's social life. It was at such a restaurant with an intimate gathering of friends in 1952 that Octave formally announced his marriage to Mary Jo. Smiley. "Wife," he said, as a button popped off his shirt, "sew that back on."

Octave and Mary Jo then set off on a grand camping trip honeymoon. As they came upon universities in their travels, Octave would drop in on the chemical engineering department, say a few words, and wait for them to offer him employment. But no one did. In those days Octave travelled faster than his reputation. Finally Jess Walton invited him to return to the Oregon State chemical engineering department for a while as an assistant professor.

Octave and Mary Jo returned to Corvallis and bought a small house on a hill that overlooks the town, and Octave spent the next two years teaching chemical engineering and a potpourri of game theory, statistics, and thermodynamics.

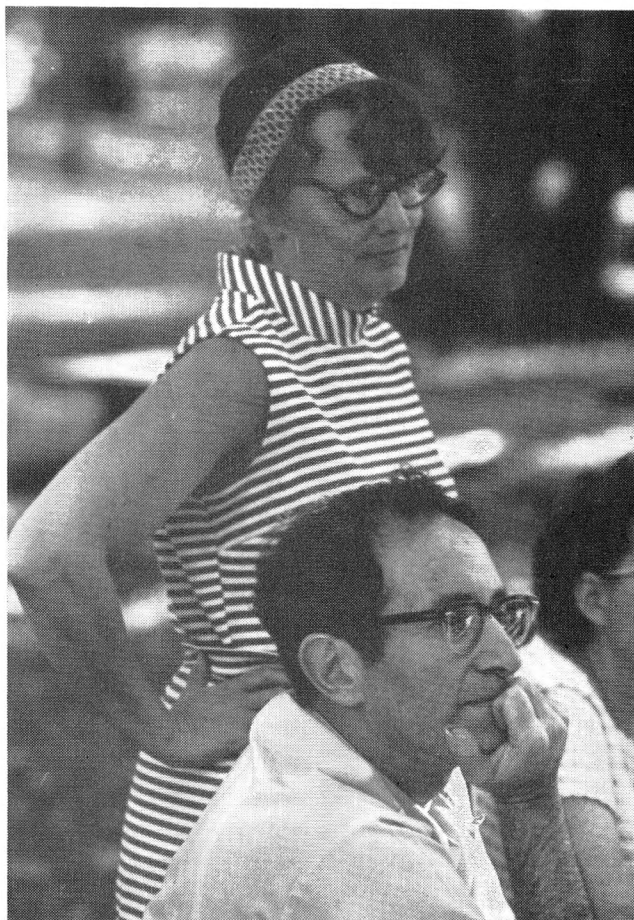
It is not clear just when his interest in Chinese chess, Japanese chess, and Korean chess and, who knows, Manchurian chess was developed, but it is safe to assume that he always considered these games as an integral part of the teaching profession.

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. . . Octave spent a year at Cambridge steeping himself in the traditions of unhurried research, afternoon tea, and English food.

The "Committee and Boomerang Period" (1954 to 1958) began when Octave moved to Bucknell University where he continued his career of teaching and innovating and became involved in thirteen different committees. It was time to set a new record. Not happy with the limited number of committees available, he took up boomerang throwing. In no time at all he could toss and catch a boomerang fifty-seven times in succession. This is no mean trick and probably is the basis for his reputation as the Eastern United States Boomerang Throwing Champion. It is significant that the title has never been disputed.

During his spare time he published some articles in the field of reactor design that produced a veritable avalanche of papers. In one he introduced the topic of moment analysis. He also published some papers on subjects not so directly



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related to chemical engineering, including one which studied movement in zero gravity fields, and a few on statistics.

The next move occurred in 1958. Octave showed up at IIT in Chicago in late August to find out about his new appointment. The Dean of Engineering claimed to know nothing about it, and the department head, Dr. Ralph Peck, had not yet returned from seclusion in the north woods of Minnesota.

But things did get settled and Octave began the ambitious project of writing a book on chemical reactor design. In the following years much of Octave's time was spent researching the battle of Trafalgar and the effect of Sex and Sin on reaction, topics that were ultimately consolidated into the book *Chemical Reaction Engineering*. With this fresh approach Octave slew the monster of chemical kinetics and produced a book which was appealing to undergraduates. The book has been adopted as a text by more than one hundred schools in North America and is available in Czech, Rumanian, and is also available in a less expensive soft cover version outside the United States

In 1963 Octave was appointed a senior N.S.F. post-doctoral fellow and travelled to Cambridge where he spent a year steeping himself in the traditions of unhurried research, afternoon tea, and English food. During the same year the substantial article "Patterns of Flow in Vessels" was published in volume 4 of *Advances in Chemical Engineering*, co-authored with Ken Bischoff, who had done his graduate research with Octave at IIT.

From 1964 until 1968 Octave returned to IIT, wrote another book, this one co-authored with Daizo Kunii, called *Fluidization Engineering*, and sharpened up his game of Chinese chess.

He should have worked on squash.

In 1968 Octave went back to Cambridge as a Fullbright fellow and was beaten 46 times in a row at squash by J.C.R. Turner. In a final flurry of gamesmanship Octave won the 47th game, and retired from the sport.

In 1969 Octave returned with his family to Oregon State University. He now lives in a large

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The Levenspiel Quintette

house on a hill that overlooks most of Corvallis, scarcely a block from the small house he lived in when he first taught at Oregon State. In the intervening years he has become something of a legend in chemical engineering. He has been honored as an outstanding lecturer by the American Society For Engineering Education and Sigma Xi, and has presented talks and lectures to professional and industrial groups too numerous to mention. His book *Chemical Reaction Engineering* has effectively added a new and most important area to chemical engineering education.

Once asked why he wrote a book on reaction engineer he replied, "I flipped a coin versus thermo; chemical reaction engineering lost." In fact it didn't.

Octave is now working on a second edition of this book which hopefully will be even more clear than the first.

Perhaps his best book hasn't been written yet. From the beginning of his career Octave has been strongly interested in the philosophy of science, and has flirted with the idea of writing an introductory text on this subject for all physical science and engineering students.

The goal of the book would be to convince students, as he long ago convinced himself, that "science and the application of science are worthwhile activities on which to spend a lifetime."