

Professor bonds basics to breakthroughs

Helping hands aid in research

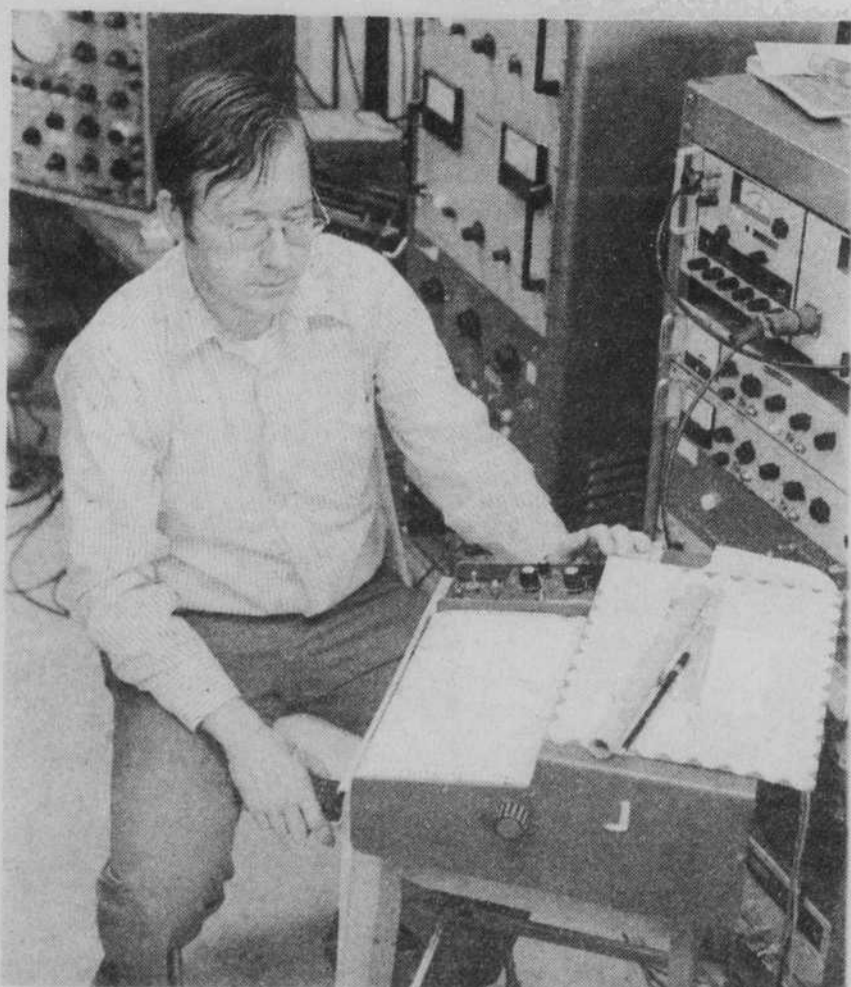


Photo by Doug Williams

One University chemist's research is based on fundamental knowledge. Thomas Dyke has aided weather forecasters with his analyses of water molecules and heat.

By SHERALYN WELLS
Of the Emerald

Scientific breakthroughs can come from knowing something as simple as the structure of two bonded water molecules, says University Chemistry Prof. Thomas Dyke.

With the aid of approximately \$130,300 in grants, Dyke and five assistants are developing the kind of fundamental knowledge that Dyke says may hold great significance.

Among his successful experiments so far is an analysis of the way two water molecules join together. The shape of this structure in the atmosphere determines the amount of heat able to pass through it. Weather forecasters can use this information to better predict global temperatures and weather, Dyke says.

Another phase of Dyke's research deals with structures and reactions between chemicals like oil, and water at the molecular level. His findings facilitate progress on a larger scale, such as in

solutions to oil recovery problems.

The promise shown by his work has brought Dyke three grants to continue his research. The largest is a three-year contract for \$92,300 from the National Science Foundation (NSF) which runs out next September.

He is also in the final year of a \$14,000, two-year Alfred P. Sloan Fellowship awarded to about 95 promising scientists each year. The University Chemistry Department nominated Dyke for the award, making him one of only two professors in the state to receive one last year.

The third grant came from the Petroleum Research Fund of the American Chemical Society for \$24,000 targeted to work in "surface chemistry."

Working with Dyke on the Project are five doctoral students from around the world. Ade Odutola from Nigeria, Ram Viswanathan from India, Dutchman Marcel Terbeeck, Dhiren Patel from the Fiji Islands, and American Dave Margoese carry on the research during the school year while Dyke

teaches, writes reports, and does committee work.

In his four years at the University, Dyke has taught only upper-division chemistry courses. He says that most new professors hired in the sciences haven't taught before, and so begin with the more "resilient" upperclassmen.

In researching new fields, Dyke and his assistants have designed and built their own equipment. Occasional breakdowns on the homemade apparatus have required time-consuming repairs.

The complex equipment can be explained fairly simply. A supersonic molecular beam at one end passes through a low pressure vacuum (only one molecule of air in ten trillion remaining) where it is bombarded with radio frequencies and microwave radiation.

The way the molecules absorb this radiation tells something about their structure, Dyke explains. This information is detected in the third section of the apparatus and recorded by a computer. Dyke said that when a really "hot" experiment gets going, he and his team may work 24 to 40 hours straight.

While his present research may continue from five to ten years, Dyke is already formulating future project ideas. Among them is one using laser spectroscopy, an offshoot of the research he is doing now. He and another University professor, Paul Engelking, have discussed collaboration on the project which would involve studying molecules with laser techniques.

Workshops prepare exam-anxious students

Though the school year just started, graduate school-bound seniors may already be wondering and worrying about the Graduate Record Examination.

The GRE acts as the "nation's gatekeeper" for controlling the flow of graduate student admissions, says David Hubin, newly appointed Learning Resources Center director.

This widely-used graduate admissions test is divided into two components — the Aptitude Test, designed to measure verbal, quantitative, and analytical ability, and the Advanced Tests, which measure knowledge and understanding in 20 subject areas.

Before taking the exam, students should check admission requirements of prospective graduate schools to determine if Advanced Tests are needed in his or her major, says Hubin.

Hubin will offer a newly-instituted five-week workshop at the Learning Center this fall to aid test-anxious students. The sessions will acquaint students with the skills necessary to complete the exam, such as math, English vocabulary, and analytical logic, he says.

During the sessions, Hubin will emphasize what he calls the "rehearsal effect," a technique of practicing the exam. "Students should feel more comfortable if they are familiar with what to expect on the test," he says.

Hubin's workshop, similar to the UCLA extension course that he is now working on, will also inform students on pacing strategy, knowing when to guess, and familiarity with the test instructions.

Hubin has scheduled the fall term GRE workshop for 12:30-1:20 p.m. Monday, Wednesday, and Friday starting Nov. 6 at the Center's office in Friendly Hall. The director will offer two workshops per term thereafter and single-session clinics throughout the year.

Evelyn Rowe, psychometrist (test-administrator) at the University Counseling Center, recommends using the practice tests prepared by the GRE. Sample questions can also be found in books such as *Barron's How to Prepare for the GRE*.

Rowe, who has administered the exam for 15 years, observes that students come to the test with various levels of anxiety and com-

posure. She rarely finds anyone suffering from "totally debilitating anxiety."

"The majority of students come with a 'job to be done' attitude," she adds.

Universities and departments use test scores differently in determining admission, says Warren Brown, acting dean of the graduate school. "Some departments use the scores and some don't."

The law and business schools use their own tests, he adds.

"The graduate school doesn't dictate the detailed standards for admission," he says. "That depends on the faculty in the different departments."

A Minority Locator Service is offered through the GRE to help institutions identify minority students interested in graduate education. Files on students are searched three times a year by over 120 participating schools.

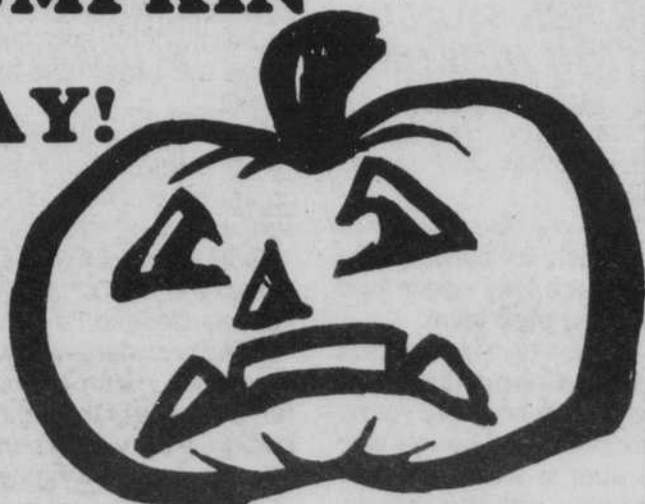
GRE test dates at the University are Dec. 9, Jan. 13, April 28, and June 9; registration deadlines are Nov. 8, Dec. 12, March 28, and May 9 respectively.

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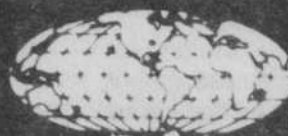
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