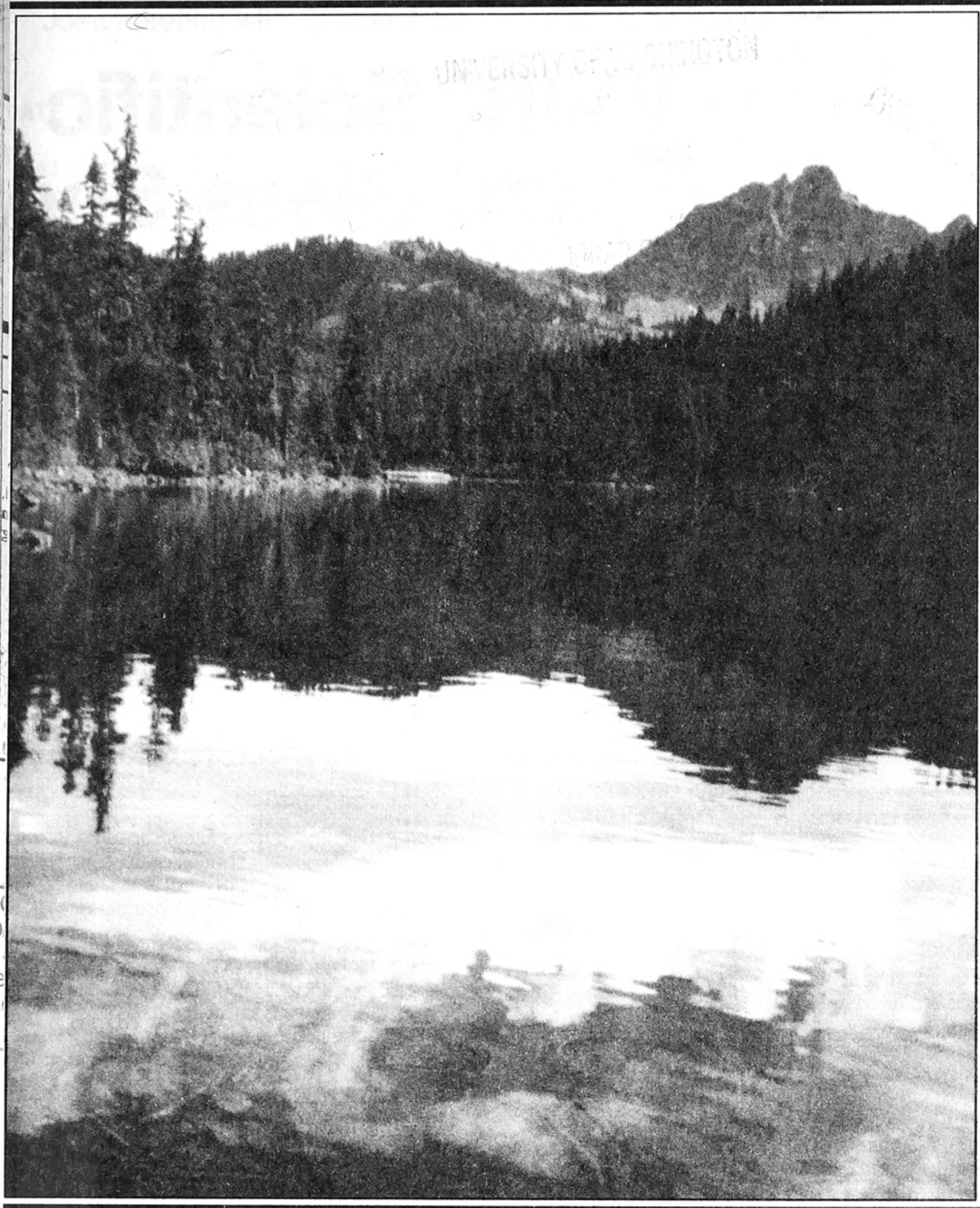


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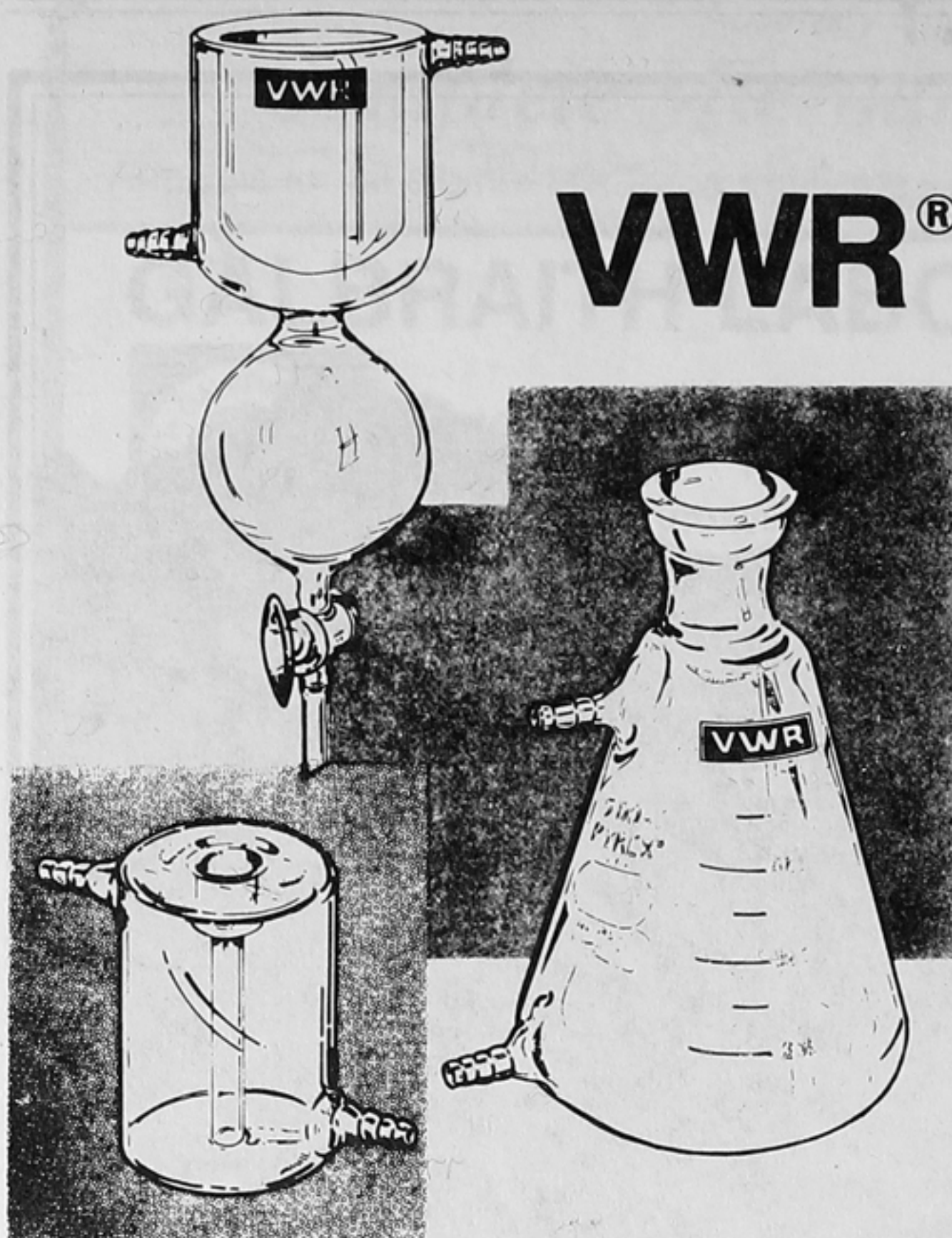
PUGET SOUND CHEMIST

BULLETIN OF THE PUGET SOUND SECTION OF THE AMERICAN CHEMICAL SOCIETY

Volume 56, Number 7



November 1995



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NOVEMBER MEETING

Joint meeting with Seattle Area Association for Women in Science

- DATE:** Thursday, November 9, 1995
- FEATURED SPEAKER:** Dr. Natalie Foster
Lehigh University, Bethlehem, PA 18015.
- PROGRAM:** "Strong Poison: Chemistry in the Mysteries of Dorothy L. Sayers!"
- LOCATION:** University of Washington Faculty Club
(Across from Hub on Stevens Way) University of Washington Campus, Seattle
- SCHEDULE:** 6:00 p.m. Social gathering; 6:30 Dinner;
7:30 p.m. Program.
- DIRECTIONS:** From I-5 (North or South), take the 520 exit going east to Bellevue and then the next immediate (Montlake) exit to right. Turn left to go north on 25th Ave NE (other routes may also lead to 25th Ave NE) to the UW campus 25th Ave NE entrance across from the University Village. Go up the hill to the gate and park (\$2.50) in Padelford Lot for the Faculty Club which is adjoining. Alternatively, park in the Union Bay lot north of the Intramural Center on 25th Ave NE (\$1.50) and walk up the hill to the Faculty Club. Please feel free to join us for the program even if you are unable to join us for the dinner.
- COST:** \$23 per person for dinner
- NOTE:** When you make reservation for dinner, you have an obligation to pay. Once the food is ordered, the section is billed even if you do not show up.
- RESERVATIONS:** All reservations must be made by **NOON, Friday, November 3, 1995**. Please call: Seattle: 543-1610; Bellingham: 650-3070; Tacoma: 535-7530.
- OFFER TO STUDENTS** The section will pay half the cost of dinner for the first ten students (graduate, undergraduate, or high school) who call 543-1610.

NATALIE FOSTER WILL BE THE FEATURED SPEAKER AT THE NOVEMBER MEETING OF THE PUGET SOUND SECTION

Natalie Foster is currently an associate professor of chemistry at Lehigh University in Bethlehem, PA. She holds a bachelors degree from Muhlenberg College and a MA, DA and Ph.D. from Lehigh. She has been a visiting scientist at the University of Utah.

Her major areas of research involve studies of intermolecular interactions of molecules of biomedical interest. Her research group examines the associations between porphyrins and phthalocyanines that are candidate agents for the diagnosis and treatment of malignancy, and polymers like tRNA, cellulose and keratin. Interests that do not require the use of high resolution NMR include travel, food, wine, baseball, the Civil War, Winston Churchill, and detective fiction. She is also a devoted fan of Star Trek, but claims to be a trekkor, not a trekkie.

Natalie is active in the ACS, serving as a councilor for the Lehigh Valley Local Section, as a member of the steering committee of the Middle Atlantic Regional Meeting, and nationally as a member of the Committee on Nominations and Elections.

Also, Natalie claims to travel accompanied by "a smile on my face and a melody in my heart (and my running shoes)".

Any of our Puget Sounders willing to show Natalie how to put her running shoes to good use?

ABSTRACT

"Strong Poison: Chemistry in the Mysteries of Dorothy L. Sayers"

Dorothy L. Sayers (1893-1957) has made an indelible mark in three literary spheres: Theological works, translations of classics, and detective fiction. Although she was not trained as a scientist (she graduated from Somerville in 1915 with Class I honors in French), her mysteries are laced with fact and opinion on the science of the 1920's and 1930's. Decidedly the most chemically oriented of her novels was one written in collaboration with Dr. Robert Eustace in 1930 entitled *The Documents in the Case*. The resolution of this superbly crafted tale of death hinges on a fine point of stereochemistry involving the laboratory synthesis of the poisonous component in the mushroom *Amanita muscaria*.

Other novels and short stories, many featuring Lord Peter Wimsey, deal with topics from the realm of medicinal chemistry: A physician cleverly poisons an elderly patient with his own medicine; a cruel husband deliberately withholds medicine from his wife who suffers from a debilitating but controllable deficiency disease; a devious fellow conveniently develops a tolerance to arsenic. The scientific content of these masterfully executed stories of crime and detection is reviewed and grades will be issued.

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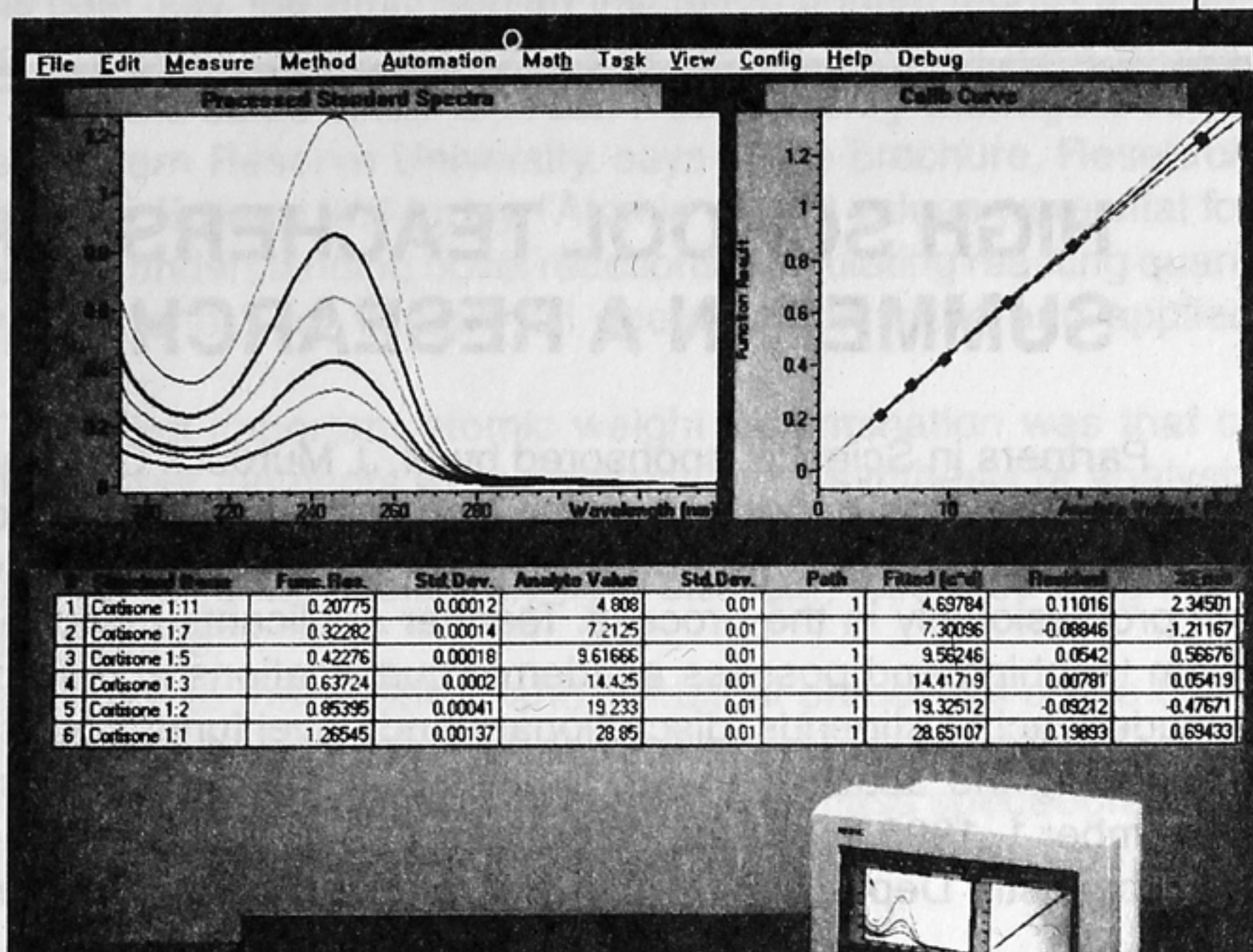
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ASSOCIATION FOR WOMEN IN SCIENCE

The Association for Women in Science (AWIS) was founded in 1971, and the Seattle Area Chapter in 1985, with major objectives "To promote and improve education and employment opportunities for women in all areas of science, math and technology". Puget Sound Section of ACS has had many women active in chemical science and technology and welcomes the opportunity to meet jointly with AWIS and to discuss problems of joint interest and other mutually planned programs.

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HE DEFINED PRECISION, LOOSED THE CHAINS ON SCIENCE, AND THE WORLD CHANGED

The American Chemical Society has named Edward W. Morley's determination of the atomic weight of oxygen 100 years ago as a National Historic Chemical Landmark. When Professor Morley made his measurement at today's Case Western Reserve University in Cleveland, travelers either sailed the Atlantic or worried that the boiler would blow up. You went to grandma's house by slow train or even slower horse, and when you got sick — mostly you died.

Then, 100 years ago this past July, the Smithsonian Institution printed Morley's scientific paper "On the Densities of Oxygen and Hydrogen and on the Ratio of their Atomic Weights." The world has not been the same since. Dr. Alan Rocke, Henry Eldridge Bourne Professor of History at Case Western Reserve University, says in the brochure, *Research in the Atomic Weight of Oxygen by Edward W. Morley*, "Atomic weight values were vital for determining chemical composition, understanding novel reactions, calculating reacting quantities in industrial processes — in short, for virtually all operations in pure and applied chemistry".

Rocke further states, "The most important atomic weight determination was that of oxygen. Atomic weights for most other elements were determined by synthesis or analysis of oxides, and the accuracy of these weights depended directly on that of oxygen. Moreover, a small error in the value for oxygen, a relatively light element, would be magnified proportionally for the heavier elements."

Oxygen's weight was key, then, to the scientific and industrial processes of the time. Morley, Rocke contends, gave science a tool that made all subsequent atomic weight calculations more precise. Such precision, to be sure, was inevitable. The mass spectrograph — ancestor for today's ultimate quantifier of atomic weight — would have put us on track, within the next 20 years.

But even if inevitable, Morley was first. His measure would make the recipes of chemical process more precise: Industry's recipes could better control the making of steel —

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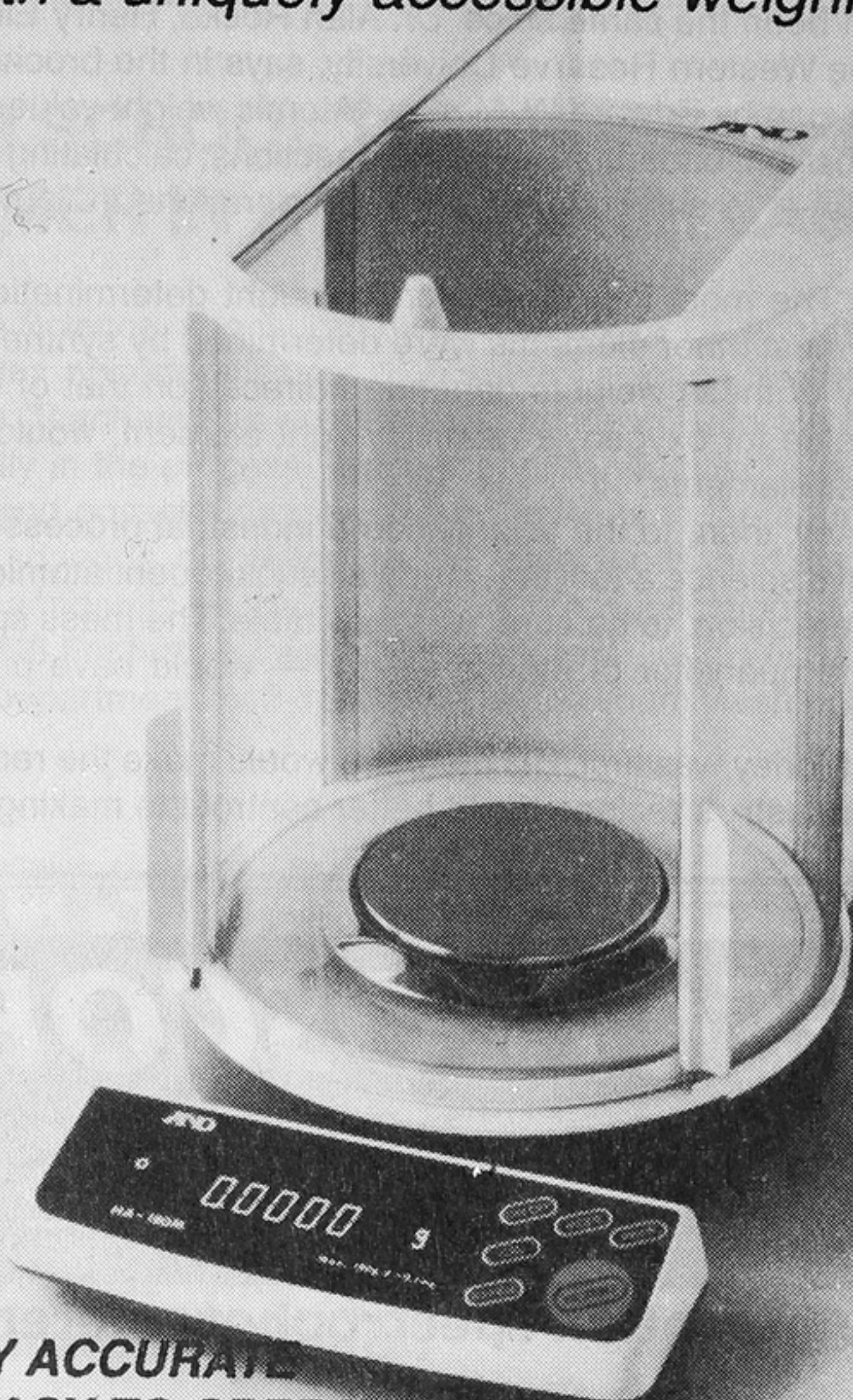
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perhaps with boilers that were less likely to blow up. Rails might be stronger. Trains could then go faster and carry more.

None, perhaps, directly attributable to Morley's measure, but consider what the lack of Morley's measure might have taken from industrial chemical processes during subsequent decades: When would the internal combustion engine have grown to produce more power at lighter weights? How far would the Wright brothers have flown with engine steel and fuel from 1895?

The latter gives a feeling for the significance of Morley's contribution. The precision would have come, from Morley or machine. Remarkably, the precision of today's sophisticated instrument — the mass spectrometer — can surpass Morley's laborious "wet chemistry" methods at only the third decimal place.

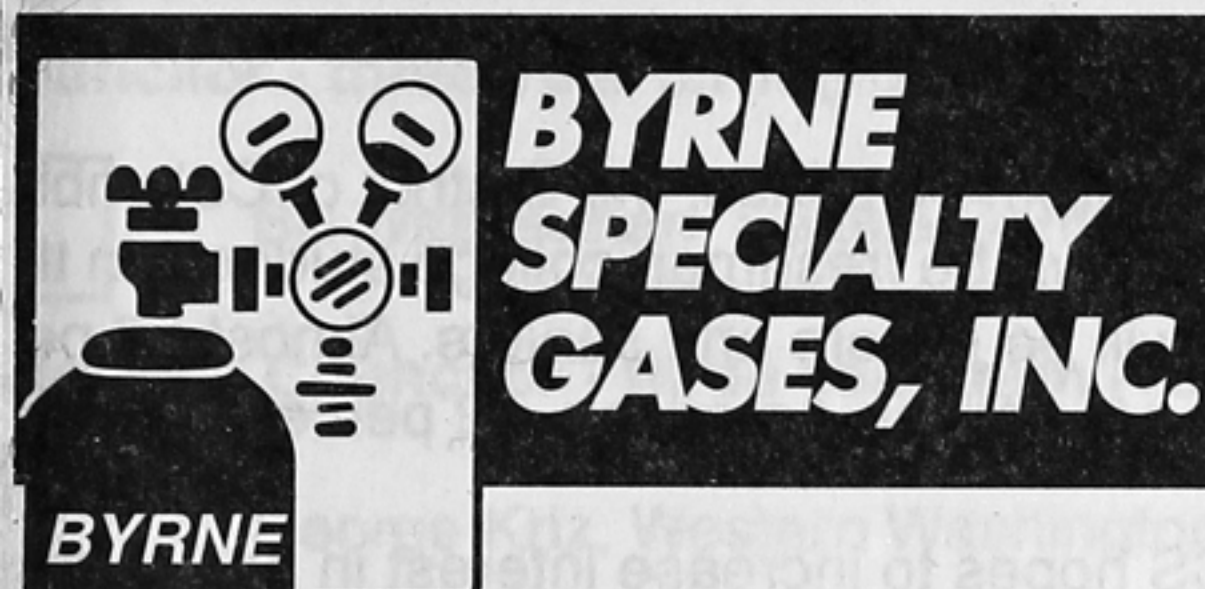
The accepted weight of oxygen today is 15.874 versus Morley's 15.879. But, you won't find either number on today's periodic table of elements. The custom of science in Morley's time expressed atomic weights in terms of hydrogen atoms. Their scale made hydrogen equal one unit, exactly. It doesn't turn out that way in nature, however, and today's measure puts hydrogen at an atomic weight of 1.0079. Oxygen, on today's periodic table, is 15.9994. It all works out in the end, though. Just divide 15.9994 by 1.0079.

Obsession is the word that comes to mind when reading through Morley's paper. His determination to eliminate any chance of inaccuracy comes, Rocke says, from childhood, when he showed ingenious and meticulous skill as a craftsman.

In addition to Morley's achievement of determining the weight of oxygen, he also partnered with Albert A. Michelson to conduct what many consider the single most significant experiment in physics. They measured the speed of light in different directions with a precision never before imagined.

The experiment was designed to detect the earth's motion through "the ether," a substance hypothesized to occupy all space. Their measure showed light's velocity was unaffected by "ether drift." Light waves were mirrored to directions that caused them to cancel or nullify at a given point. There was no "drift." Michelson became the first American to win a Nobel Prize in science as a result of his studies on the velocity of light. The null result of the 1887 Michelson-Morley experiment was used to justify Einstein's special theory of relativity.

In his lifetime (1838-1923), Morley was graduated as a minister, served in the Civil War, and taught 11 different subjects for South Berkshire Institute in Massachusetts. He was known as a "polymath of the highest order," a "gifted linguist and musician," taught mathematics and "all the principal sciences" at the college level, and published 55 scientific papers. He received the most prestigious awards in his profession, was named honorary member to great international societies, was appointed to both the National Academy of Sciences and the American Academy of Arts and Sciences, and served as president of both the American Chemical Society (1899) and the American Association for the Advancement of Science (1895). Retiring as professor emeritus in 1906, Morley and his wife Isabella moved home to Connecticut. He was awarded the prestigious Davy Medal of the Royal Society of London the following year.



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From the National Office:

MINORITY SCIENCE STUDENTS SELECTED TO RECEIVE MORE THAN \$600,000 IN SCHOLARSHIPS FROM THE AMERICAN CHEMICAL SOCIETY

The American Chemical Society (ACS) has just announced the selection of 201 African-American, Hispanic and American Indian students who will receive more than \$600,000 in scholarships for the 1995-96 school year. Over the next five years ACS expects to provide a total of \$5 million to needy minority students with good academic records who plan to major in chemistry, biochemistry or chemical engineering.

The scholarships are renewable and range in value up to \$2,500 each in the freshman and sophomore years and \$5,000 each in the junior and senior years, for a maximum of \$15,000 over a four-year period. The students may use the funds for tuition, books, supplies, lab fees, and lodging. Dorothy Rodmann, administrator for the ACS Minority Scholars Program, says it is intended to "give students financial support and encourage their interest in the study of chemical sciences." She adds that "we want to help students replace their loans with scholarship money and reduce their need to engage in work-study programs."

Graduating high school seniors, as well as chemistry, biochemistry and chemical engineering majors in college, and students transferring from community colleges to four-year institutions were all eligible to apply. Guidelines used in awarding the scholarships include demonstrated financial need, a B average or better in science and math courses, and examples of leadership at school and in the community.

The ACS Minority Scholarship winners come from 36 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands. Nearly half will be freshman college students in the fall, a quarter will be sophomores, and the rest will be juniors and seniors. Almost 57 percent are female. And 54 percent of the Scholars are African-American, 42 percent are Hispanic and 4 percent are American Indian.

Through the new scholarship program, ACS hopes to increase interest in and participation by African-American, Hispanics and American Indians in the chemical sciences. Currently, their participation doesn't reflect the makeup of the U.S. population. While African-Americans, Hispanics and American Indians comprise almost a fifth of the population, a much smaller proportion is going into science careers, notes Rodmann. She adds that "the scholarship program will offer extensive mentoring services to the students, which the Society hopes will not only retain the Scholars in the chemical sciences but also help them experience some of the excitement and challenge associated with science careers."

Students interested in applying for scholarships for the 1996-97 academic year should contact Rodmann at 202/872-6250, or by mail c/o ACS, 1155 - 16th Street N.W., Washington, D.C., 20036. The 1996-97 academic year scholarship announcement will be made in November 1995, and interested students may apply at any time from now until February 1996.

Other ACS programs directed to minorities include community science grants, consulting help to predominantly minority colleges and universities, career presentations at minority-advocacy organizations, an On-line clearinghouse of minority activities and programs, a summer internship program, workshops at ACS national and regional meetings, and programs that provide direct contact with graduate school recruiters.

PUGET SOUND SECTION OFFICIAL BALLOT FOR 1996 OFFICERS

Please complete the ballot, remove this page, fold and seal it, and mail to Ms. Diane Davis, Secretary, ACS Puget Sound Section, P. O. Box 24032, Seattle, WA 98124-0032. **The deadline for completed ballots is November 6, 1995.**

Although it may seem unnecessary to vote when candidates for the offices are unchanged, it is important to show that you support the ballot. Besides, we need certain percentage of ballots returned to validate the election. Please show your support of the section by sending in your completed ballot today.

Chair Elect (vote for one)

☐ Thomas W. Griffith, Ph.D., Associate Dean,
Science and Mathematics Division,
North Seattle Community College

Secretary

We do not have a candidate, however, we are still looking for volunteers

Treasurer (vote for one)

☐ David Munch, Seattle Central Community College

Councilor - three year term (vote for one)

☐ Bill Wasserman, Seattle Central Community College

Alternate Councilor - three year term (vote for one)

☐ George Kriz, Western Washington University

☐ Walter Volland, Bellevue Community College

Thomas W. Griffith, Ph.D., candidate for the position of **Chair-elect**, comes with an extensive background in academia. He has been Associate Dean, Science and Mathematics Division, North Seattle Community College, since 1994. He was Professor and Chemistry Department chairman at Seattle University from 1988 to 1994. He was Assistant Professor and then Professor at Northwestern State University of Louisiana from 1973 to 1988.

Dr. Griffith graduated from Iowa State University in 1965. He obtained his M.S. in Organic Chemistry from Idaho State University in 1968, and his Ph.D. in Biochemistry from Oklahoma State University in 1971.

Dr. Griffith has been a member of the American Chemical Society since 1966. His other affiliations include membership in the AAAS, Society of the Sigma Xi, Louisiana Academy of Sciences, and, since 1989, a member of the Westinghouse State Science Talent Search Committee.

David Munch, candidate for the position of **Treasurer**, has been our treasurer for a number of years. He earned his Ph. D. in theoretical chemistry from the University of Washington and has been teaching at Seattle Central Community College.

Bill Wasserman, candidate for the position of **Councilor**, has been an active member of our section holding various positions and has been a councilor for a number of years. He has been teaching at Seattle Central Community College.

George Kriz, candidate for the position of **Alternate Councilor** is Professor of Chemistry at Western Washington University, Bellingham, where he has been since 1979. Actually, he joined the faculty at Western when it was known as Western State College. He graduated from University of California, Berkeley, CA with a B.S. in 1961 and obtained his Ph.D. in 1966 from Indiana University, Bloomington, IN. He is a member of the ACS, AAAS, The Royal Society of Chemistry, Sigma Xi, and a member of the Board of Directors of the Washington College Chemistry Teachers Association.

George is a coauthor of the following books in laboratory techniques: "Introduction to Organic Laboratory Techniques: A Microscale Approach", by D. L. Pavia, G. M. Lampman, G. S. Kriz, and R. G. Engel, Saunders College Publishing, Philadelphia, 1990; Second Edition, 1995. "Introduction to Spectroscopy: A Guide for Students of Organic Chemistry", by D. L. Pavia, G. M. Lampman, and G. S. Kriz, Second Edition, Saunders College Publishing, Philadelphia, in press.

George has been singing in the Whatcom Chorale (bass section) since 1983. The Whatcom Chorale is a 75 - 100 member classical chorale ensemble, comprising singers from Whatcom, Skagit, Island, and Snohomish counties. In 1986 they joined the Seattle Symphony Chorale for a European concert tour, which included performances in England, Germany, and Yugoslavia.

Dr. Walter Volland, candidate for the position of Alternate Councilor, is Professor of Chemistry at Bellevue Community College where he has been teaching chemistry since 1968. He obtained his B.S. in Chemistry (cum laude) from California State University at Long Beach in 1962 and Ph.D. in Physical Chemistry from University of Washington in 1967. He did postdoctoral work at Cornell University (1967-68) and University of Washington (1977-78).

Dr. Volland was Visiting Lecturer at University of Washington and Seattle University. He spent a year (1978-79) as Associate Professor at the College of Medicine and Medical Sciences, King Faisal University in Saudi Arabia. He has participated in various conferences on chemical education presenting papers on Computer Modeling and Laboratory Simulations in College Chemistry at Washington State College Chemistry Teachers Conference.

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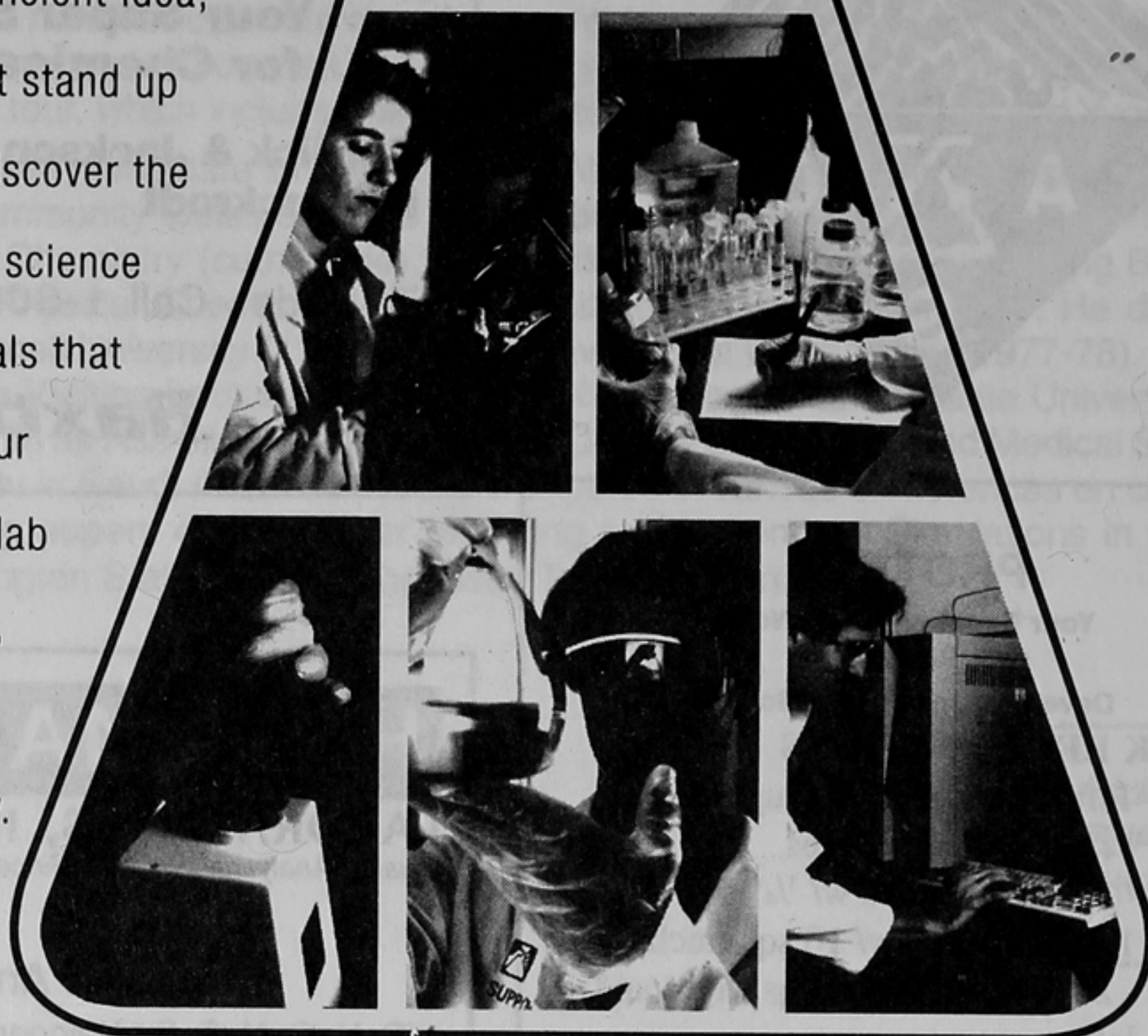
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Puget Sound Section, ACS, Executive Committee Future Meetings in 1995

Meetings are open to all members and are held on the second Wednesday of each month

November 8, December 13

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