

# SCIPHERS

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## **Shakhashiri: Science's Showman for Education**

Preschool children ask "why" continually: Why do soap bubbles pop? Why do cars run? Why do stars shine? To them, the world abounds with new and intriguing things. Learning isn't a chore; it's fun.

But something changes as most children grow up. They lose the spark of intense curiosity. Learning about scientific phenomena often becomes relegated to a rigid time slot at school, a routine subject to be dealt with, then ignored, said Dr. Bassam Shakhashiri during a recent interview at the University of Missouri-Columbia. Shakhashiri, long-time science educator and National Science Foundation's former assistant director for Science and Engineering Education, spoke to faculty, students and the public at a visit in February sponsored by M.U.'s chemistry department and Phi Lamda Upsilon.

**The world's increasingly complex and far-reaching problems such as health care, nutrition, destruction of the ozone layer, global warming, burning of rainforests and population growth must be addressed ... and the public's understanding of science is essential to make wise public policy decisions.**  
**Bassam Shakhashiri**

from a local presentation in Madison, Wis., to a nationally televised show. PBS broadcast the holiday special in December. (The one-hour show is now available on videotape. For a copy, contact U.W. Christmas Lecture, Department of Chemistry, University of Wisconsin-Madison, 1101 University Ave., Madison, Wis. 53706. Cost is \$30.)

With twinkling eyes, Shakhashiri sports a big, round lapel button that reads, "Science is Fun." He radiates enthusiasm and energy. Science may be difficult, he emphasizes, but it is also delightful.

"That's how we enjoy things - when we deal with something complex

The loss of interest in science deeply disturbs Shakhashiri. His remedy? Take science to the people and pique their childlike sense of wonder.

At Shakhashiri's science shows and hands-on exhibits at shopping malls, convention centers, high schools, retirement homes, corporate laboratories and universities, balloons explode, soap bubbles float, chemicals glow in the dark and other "magic" science phenomena entertain thousands each year.

His annual Christmas show, "Once Upon a Christmas Cheery, In the Lab of Shakhashiri," has grown

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## **ASM's Science Journalism Honors Program**

In April, nine science journalism students spent three days in Washington, D.C., touring national labs, meeting researchers and speaking with science communicators. The students were part of the Science Journalism Honors Program, sponsored by the American Society for Microbiology (ASM).

Barbara Hyde, the public relations director for ASM, said the program was based on the workshop run by the Industrial Biotechnology Association in the late 1980s. The goal of the program is to allow beginning science journalists to observe science and science communication on a national level.

Highlights of the program included:

— visits to the National Institutes of Health, the Food and Drug Administration and the Capitol Building;

— meetings with top scientists including: Dr. W. French Anderson, a NIH researcher involved in gene

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# Shakhashiri: Science's Showman

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and we conquer it," he said. "Sometimes it takes months, years, decades to understand a certain natural phenomenon or the complexity of something. That's the fun."

Shakhashiri's tone is as light as the bubbles he pops during his shows, but his purpose is serious. He believes that science education is critical to the economic health and security of a democratic society. The world's increasingly complex and far-reaching problems such as health care, nutrition, destruction of the ozone layer, global warming, burning of rainforests and population growth must be addressed, Shakhashiri noted, and the public's understanding of science is essential to make wise public policy decisions.

Shakhashiri explained that educational strategies must change to maintain interest in science after high school. In 1977, nearly 20 percent of four million U.S. high school sophomores were interested in natural science and engineering. By 1986 less than one percent of the interested group completed master's degrees in relevant fields. By 1992, about one-quarter of one percent of the remaining pool of students completed doctoral programs, he said.

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**Bassam Shakhashiri**

The erosion of student interest in science will eventually cost the U.S. its global leadership position in science and technology, Shakhashiri maintains, and the result will adversely affect the nation's economy.

To implement change within complex educational systems is a slow and cumbersome process, Shakhashiri

says, that is impeded by a sociological barrier, a "general malaise" that cuts across many spectra of our society. He explained that fast money and easy answers are sought by increasing numbers of people, which undermines the type of life-long commitment needed to become a successful scientists or engineers.

To Shakhashiri, the introduction of state lotteries symbolize the extent that governments depend on public ignorance of science and dreams of fast money. Illiteracy in science and math enables lotteries to exist; people who play often lack understanding of the odds against winning, he explained. Moreover, lotteries promote the illusion that persons need to do little other than stand in line to become wealthy.

Since most people learn about science outside a classroom, the news media play a vital role in helping educate the public about science, Shakhashiri said. To communicate science and mathematics effectively, journalists should be knowledgeable about science and need to be open-minded, precise and receptive to new information.

One of journalism's most important roles, he emphasized, is to communicate what science is as well as the risks and benefits inherent in scientific advances.

Shakhashiri also complained that science stories are frequently compartmentalized, or isolated from other news. Since journalists are products of the nation's education system, the separation of science news reinforces and reflects the belief that science should be segregated from other learning curricula.

"Continuing education of people in media is a very important element of a national strategy that is put together, so that science and advances in science are not viewed only as being something on page 13 next to the obituaries or want ads, but as something integral to our lives and how we do things," Shakhashiri said.

Science centers and museums also play vital roles in public education, Shakhashiri said. Museums spark curiosity, foster learning and can provide richly textured opportunities to experience science in action. He praised current efforts by The Association of Science and Technology Centers to provide a coherence to science educational programs.

In addition to better science centers and presentation of press coverage, Shakhashiri finds the nation's science educational goals need to be defined.

"When are we (as a nation) going to develop a vision of what the outcome of education should be? When are we going to come up with a meaningful exposure to science, mathematics and technology for *all* kids, not only for those who are college bound or will go on for a Ph.D. degree, but for everybody?

"What legacy do we leave our children and grandchildren? I'd like to leave them with the notion that understanding the complex world that we live in is a very challenging and stimulating thing to do. Not only intellec-

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## Shakhashiri:

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tually stimulating, but emotionally rewarding.

"If we believe in the democratic principals on which this country was founded and continues to function, then we have to see to it that all students are enabled to fulfill their human potential. Which to me is the purpose of education. I have some doubts that our educational offerings at present are doing that."

Sharon Goluban

**Editor's Note:** Dr. Bassam Z. Shakhashiri is a former assistant director of the National Science Foundation for Science and Engineering. In 1986 he was elected an American Association for the Advancement of Science fellow in recognition of his contributions to science and education. Some of his many awards include the 1977 Kiekhofers Distinguished Teaching award from the University of Wisconsin-Madison, the James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry and the Award in Chemical Education, both from the American Chemical Society.

An interactive chemistry exhibit of his design is on permanent display at the Chicago Museum of Science and Industry. He has coauthored numerous books, including *Chemical Demonstrations: A Handbook for Teachers of Chemistry* and *Manual for Laboratory Investigations in General Chemistry*. He holds numerous honorary degrees.

Dr. Shakhashiri currently teaches chemistry at the University of Wisconsin-Madison.

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## Health and Nutrition Gatekeeper's Workshop September 11-12, 1992

Highlights of this year's Gatekeepers Workshop will include reporting on food safety and nutrition issues, critiques of journalists' work by four leading science editors and a review of risk assessment by six national experts.

The workshop, hosted by the Science Journalism Center, will be held at the University of Missouri-Columbia. Scheduled topics include how food safety relates to irradiation, biotechnology and vitamin supplements, the nutrition gap and lower-income Americans and future issues in food production.

Speakers scheduled include Dr. H. Russell Cross, USDA Food Safety Inspection Service administrator and Dr. Stephen Barrett of the Institute of Food Technologists (IFT). Dr. Barrett is a nationally acclaimed expert in nutrition fraud and health quackery and is the author of Health Schemes: Scams and Frauds (Consumer Reports Books, 1990) and Your Guide to Good Nutrition (Prometheus Books, 1991).

Other speakers include Dr. Ronald Hart, director of the National Center for Toxicological Research, Jefferson, Ark., Dr. Christine Bruhn of the University of California, Dr. Gary Smith of Colorado State University, Dr. Patricia Wagner of the University of Florida and Dr. Roy Fuchs, research biologist at Monsanto Co. Dr. Fuchs, luncheon keynote speaker as well as panelist, has presented talks to many groups, including the American Chemical Society and the 1990 International Conference on Issues in Food Safety and Toxicology.

Experts scheduled to provide writing and editing critiques include Joel Greenberg, L.A. Times, Gary Soucie, National Geographic, Lewis Cope, Minneapolis Star-Tribune and Barbara T. Richman, Environment, Heldref Publications. Journalists wishing to have their work critiqued are encouraged to forward articles, published from April 20 to May 4, to the Science Journalism Center by August 1.

Registration fee is \$75, \$37.50 for publications with circulation less than 75,000. For fee waiver consideration, please contact the Center.

Flyers with further details about the workshop will be coming soon.

## CONTRIBUTE!

Sciphers encourages readers to contribute material for publication. Send announcements, articles, story ideas or book reviews to Rob Logan, Science Journalism Center, P.O. Box 838, Columbia, MO 65205. Call 314-882-4714 for more information.