Plumbing the Science Pipeline

Twenty years ago, researchers at Johns Hopkins University began tracking 2000 mathematically gifted adolescents in order to study the development of intellectual talent throughout life. Now, the study is supplying fodder for the debate over why fewer women than men go into science.

David Lubinski and Camilla Benbow of Vanderbilt University in Nashville, Tennessee, have been tracking 1110 subjects from the Hopkins study—two-thirds of them boys—who said they planned to major in science or math in college. Ten years later at age 23, 84% of the men and 74% of the women had earned science and engineering degrees. And 20 years later, 72% of the men but just 62% of the women had ended up in science or engineering careers.

Why the discrepancy? Some scholars might say a scientific culture that has made it difficult for women to get ahead. But in the December issue of the *Journal of Educational Psychology*, Lubinski, Benbow, and graduate student Rose Mary Webb suggest that the reason more women drop from the science "pipeline" is because scientifically precocious females develop different interests from precocious males—they are more verbally talented and are more likely to be drawn to jobs dealing with people. Lubinski says the goal of 50% female representation across the board is therefore misguided. "Large amounts of money are channeled to correct the disparity problem without considering these important individual differences," he says.

But Jane Daniels of the Henry Luce Foundation, who has long been involved in efforts to draw more females into science, says the results from this elite group don't necessarily apply to everyone. Nor does she place great stock in youthful patterns of interest, asking, "How critical are ability and interest of 13-year-olds to the choice of major and career when we know measures of both characteristics can be increased through intervention?"

Astronaut Takes Logic to New Heights

Astronaut Peggy Whitson, the international space station's first science officer, paid homage to a famous role model on Halloween. She sent a greeting to Mission Control after donning the ears and eyebrows of Spock, the hyperrational Vulcan who served as science officer in the 1960s aboard the U.S.S. *Enterprise* on the TV show *Star Trek*. Whitson, on board the station since June, says her e-mail inbox has been clogged with friends urging her to live long and prosper, the signature Vulcan greeting. She was due to return to Earth this week.

Mountain Watch

People might not be able to move mountains, but they can hurt them. That's the message of "Mountain Watch," a report billed as the first global assessment of mountain ecosystems. It concludes that mountains—which cover 24% of the world's land surface—are fragile and are being threatened by farming, grazing, fires, mining, roads, wars, and climate change. The report was released last month at the Mountain Summit held in Bishkek, Kyrgyzstan, as part of the United Nations' International Year of the Mountain.

Snows of Kilimanjaro are melting (yellow line is 1962 boundary).

Mountains are hardest hit in Africa, where almost half of the hilly regions are being used for cropland or grazing (compared with 14% in North America). And two-thirds of the continent's mountainous areas have been afflicted by war or "high-intensity conflict." Climate change is also doing its bit. In the Himalayas, lakes brimming with glacial meltwater threaten to flood mountain villages.

Homegrown Scope

Build your own scanning tunneling microscope (STM) for just $800! It might sound like a cheap home shopping ad, but it's real—created by physicists at the University of Münster in Germany.

The idea for the budget microscope—commercial ones start at about $8000—was hatched at "Quarks & Co.," a German TV science show, which asked several universities whether they could develop an STM that could be built by high school students. The Münster scientists took up the challenge. Since the "School-STM" was first unveiled on the show last year, "the response has been amazing," says André Schirmeisen, one of the developers. Plans have been put online, and dozens are being built, judging by the response to an Internet discussion forum where about 140 student groups, teachers, and private hobbyists have been consulting with each other on how to construct the instruments.

Susanne Quabis and her physics students at the University of Erlangen were among the first to work with the online plans. "The students built it within six sessions and were really excited about it," she reports. "They even tried to alter the plans in an attempt to get a good resolution on an atomic scale," but they haven't succeeded so far.

Microscope rests on inner tube.

A crucial feature of the STM is complete isolation from external vibrations so the scope can get a sharp picture of single molecules. The home-built version reduces vibrations by a factor of 10 with a partially filled tube from a motorcycle tire, which is inserted under the microscope's wooden platform. It clearly cannot compete with its commercial counterparts; nonetheless, says Schirmeisen, the resolution "is still 20 times smaller than what can be seen with the best optical microscopes today."

Construction plans, including directions for where to buy components, are at sxm4.uni-muenster.de. Coming soon from the Münster group: an atomic force microscope.

CREDITS: (TOP TO BOTTOM) CHRISTIAN LAMBRECHTS/UNEP-DEWA; NASA; U. MUENSTER