Hungary for High-Tech

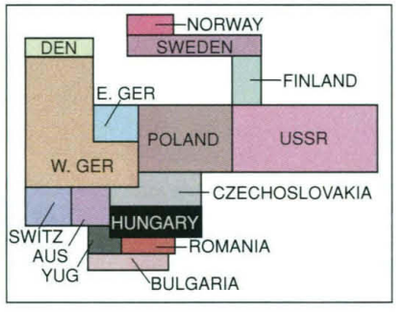
If your main associations with Hungary are goulash and rhapsodies, it's time for an update. Little Hungary (population 10 million) is at the vanguard among former Soviet satellites in courting multinationals and cultivating high-tech industry, analysts say.

Before the Iron Curtain fell in 1989, Hungary, which already had incorporated free-market mechanisms into its state-run economy, used to be known as "the happiest barrack in the gulag," says science attaché Andras Roboz. It also may have been the brainiest, what with its tradition of turning out prominent scientists—John Von Neumann, Leo Szilard, and Albert Szent-Györgyi, to name a few.

Now Hungary is parlaying its scientific talent into high-tech gold. It's becoming a "technological minipower," economist Adam Török, chair of Hungary's National Committee for Technological Development, told participants at a "Hungarian R&D Day" held at the Industrial Research Institute in Washington, D.C., earlier this month. Multinationals, including General Electric and Audi, are now responsible for the bulk of the country's exports, said physicist Norbert Kroo, Ministry of Education undersecretary for international affairs.

Török pointed to an emerging "Hungarian Silicon Valley"—a nest of 40 high-tech firms, nourished by tax breaks, growing 60 kilometers west of Budapest on the site of a company that used to supply telecommunications to the Russian military. One striking success story is Kürt Computer Systems, whose director, Sándor Kürti, related at the meeting how he turned $7000 into a $7 million a year business based on helping companies recover lost computer data.

Hungary has reason to boast, says World Bank development official Kate McCollom. "They undertook their structural reforms [of banking and industry] early ... and they stayed the course." Now, she says, Hungarians "are probably right at the forefront" in luring investments by foreign high-tech concerns.



Hungary has been building on a substantial base, as indicated by this diagram showing disproportionately high per capita scientific citation rates in the '80s.

Multicultural Astronomy

"My people once hunted for buffalo—now we hunt for knowledge."

—Chief Joseph Chasing Horse of the Lakota Nation, as quoted in a NASA press release announcing a meeting this month in South Dakota to explore "connections between recent space findings and traditional Lakota star knowledge."

Music as Brain Builder

Many parents and day-care facilities nowadays expose tots to classical music in hopes of triggering the so-called "Mozart effect"—the sharpening of the brain that some classical music is said to bring about. Now the researchers who started the trend, Gordon Shaw and colleagues at the University of California, Irvine, have come up with evidence that piano lessons hike up children's performance on a test of proportional math.

Six years ago, Shaw's group found that listening to a Mozart two-piano sonata briefly raised college students' spatial skills. They subsequently reported that in preschoolers, piano lessons gave a sustained boost to spatial skills.

In the latest study, Shaw compared three groups of second-graders: 26 got piano instruction plus a math video game that trains players to mentally rotate shapes and to use them to learn ratios and fractions. Another 29 got computer-based English training plus the video game. A control group of 28 got no special training. After 4 months, the results were "dramatic," the authors report in the current issue of *Neurological Research*.

The piano group scored 15% higher than the English group in a test of what they had learned in the computer game—and 27% higher on the questions devoted to proportional math. These gains were on top of the finding that the computer game alone boosted scores by 36% over the control group.

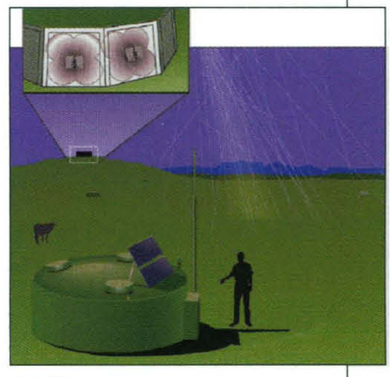
Shaw says the improvements suggest that spatial awareness and the need to think several steps ahead—both required in piano playing—reinforce latent neuronal patterns. "Music is just tapping into this internal neural structure that we're born with," he says. Piano lessons may well condition the brain just as muscle-building conditions an athlete, says Michael Merzenich, a neuroanatomist at the University of California, San Francisco. Music may be a "skill ... more fundamental than language" for refining the ability of the brain to make spatial and temporal distinctions, he says.

Cosmic Groundbreaking

Near the dusty oil town of Malargue in Argentina's Mendoza Province, astrophysicists from around the world gathered last week to break ground on a $53 million facility they hope will solve one of the great puzzles of the sky: Where do cosmic rays come from and what makes them so energetic? Called the Pierre Auger project, it will be the world's first large-scale cosmic ray detector, eventually comprising 1600 11,000-liter tanks of water spread over 3000 square kilometers.

Showers of particles created when extremely high-energy cosmic rays slam into Earth's atmosphere will pass through the tanks, creating trails of so-called Cherenkov light that will be picked up by detectors. These rays are still "a mystery of the first order," says Nobelist James Cronin of the University of Chicago and the University of Utah, a spokesperson for the 19-country team. The detector won't be complete until 2004 but will start taking data by next year.

The $100 million Pierre Auger project (*Science*, 1 September 1995, p. 1221) is designed to include a second detector, for the Northern Hemisphere, which, if the funds are raised, may be built in Utah.



Catching some rays.

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