ALBANIA

Physicist-President Battles Ethnic Wars and Illiteracy

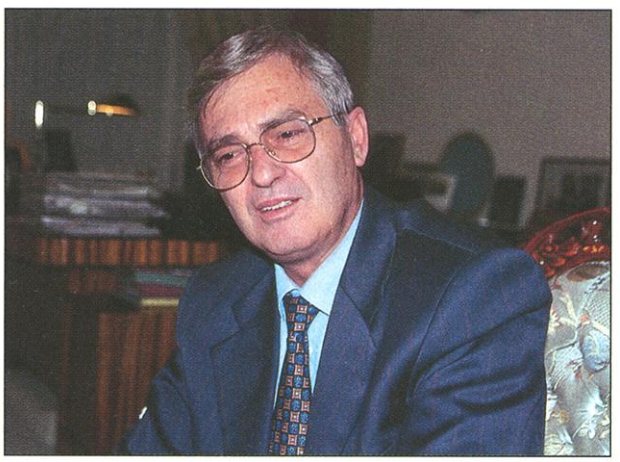
Rexhep Meidani made an unexpected entrance into Albanian politics. Now, as president, he's fighting to rebuild his country's shattered education system

TIRANA—Rexhep Meidani ended his career as a world-class physicist unwittingly, by signing a piece of paper he hadn't read. With Albania's economy sputtering and its commitment to democracy wavering in June 1996, a colleague pleaded with Meidani to join the opposition. "I said, 'No, no, I will not be a member of a political party,' " he recalls. But the friend persisted, finally getting him to sign a paper that Meidani thought was from the University of Tirana, where he headed the theoretical physics section. In reality, the paper represented his acceptance of the position of general secretary of the country's Socialist Party. Within a year, Parliament had elected him as the president of Albania.

Amid growing concern over clashes between ethnic Albanians and Serbs in neighboring Macedonia and Yugoslavia—outbreaks that could engulf the region in another war—the 56-year-old Meidani recently met with *Science* in his office, located in a guarded mansion in the heart of this dusty capital city. He talked for nearly 2 hours, in fluent English, on the problems facing his impoverished country and his transformation from physicist to politician. The country's highest ranking civil servant—Prime Minister Ilir Meta actually runs the government—Meidani has worked to restore Albania's shattered education system. "He's helped us to envision a society rooted in university education and culture," says geophysicist Tamara Eftimi, rector of the Polytechnic University of Tirana.

Some 16 years after Albania's xenophobic dictatorship collapsed and its 3.5 million citizens emerged to face a new day, the nation's economy is on the upswing, having posted annual gains in excess of 7% for 3 years running. But the country's scientific community is on life support. Albania spent barely $2 million last year on research and development, roughly what the U.S. government spends on science every 10 minutes. "Our government wants science, but it has no money for it," says Kristaq Berxholi, director of the Institute of Veterinary Research in Tirana. Breathing life into the country's research, Meidani says, will require forging stronger ties with the other Balkan nations. "Regional initiatives," he adds, "are necessary for the survival of Albanian science."

Reaching out to its neighbors is still a novelty for a country that spent much of the Cold War in self-imposed isolation. Albania allied itself with the Soviet Union after World War II, but broke off relations in 1961 when the superpower denounced Stalin. Albania then sidled up to China, which helped the mountainous, Maryland-sized country build its infrastructure by providing expertise in everything from concrete to silkworms. But this relationship fell apart after former U.S. President Richard Nixon's historic visit to Beijing in 1972.



Playing catch-up. Rexhep Meidani says regional collaborations are essential to strengthen science in Albania.

The country's strongman, Enver Hoxha, shunned any faith-based alliances by banning religious activities in this predominantly Muslim nation. Instead, he erected some 800,000 mushroom-shaped bunkers, each big enough for a family, to be occupied in the event of an invasion. Today the half-buried concrete bunkers, many torn apart for their iron reinforcement rods, litter the countryside.

During this half-century of darkness, TV broadcasts from abroad were jammed, and few scientists had access to Western literature. "We were afraid of foreigners; they were like UFOs," says biochemist Zhaneta Miloti of the Maize and Rice Institute in Shkodër. In the 1970s, a handful of scientists was sent to be trained in France, one of the few countries that had sustained diplomatic relations with Albania. Meidani, who had earned a B.S. in physics with first-class honors from the University of Tirana in 1966, was dispatched to the University of Caen in France. There, he received a master's degree in solid state physics in 1974.

He stayed in France to get his doctorate in the magnetic resonance lab at the government's nuclear energy research center CEA Saclay, working under Pierre-Gilles de Gennes, winner of the 1991 Nobel Prize in physics. Offered a research position after receiving his degree, Meidani recalls a fleeting "beautiful dream" about a career there. But his familial ties were stronger. Although he made up a story about having to care for his aging parents, his real fear was that Hoxha would brand him a traitor and imprison his wife and children if he failed to return.

So, in 1976 he came home, joining the physics faculty at the University of Tirana. Theoretical physics was one of the few fields that the mostly agrarian country could afford to support. "We were fortunate that he came back," says former University of Tirana physicist Kastriot Islami, now a member of Parliament. "He was one of the best researchers our country has produced." Although every research paper had to clear censors before being submitted to a foreign journal, Meidani recalls the "idealism" he shared with many colleagues in those days. It was a "passion that helped develop the country's research institutes and education system," he says.

Hoxha's death in 1985 allowed the country to slowly ease travel restrictions. That freedom allowed Meidani to hit his stride as a researcher. He forged collaborations with colleagues in England, Germany, Greece, Italy, Romania, and the United States and co-authored some three dozen papers in Western journals on condensed-matter physics and phase-transition theory. "We admire him because he continued to conduct research of good standard under very difficult conditions," says Yu Lu, a condensed-matter physicist at the Abdus Salam International Center for Theoretical Physics in Trieste, Italy, who calls Meidani "very honest and modest."

Meidani's reputation at home grew apace. A prolific writer of newspaper editorials and popular science books, he became increasingly outspoken on politics. In 1994, he was nearly fired after accusing several administrators at his own university

CREDIT: R. STONE

of misrepresenting their scientific credentials for financial gain. His principled stand won him acclaim and led to his appointment that year as chair of the Albanian Center for Human Rights.

Named president in July 1997, Meidani had a hard time adjusting to his new life. "I suffered in giving up a research career," he says. "It was the most fruitful time when I left." He now spends his days representing Albania abroad. Although Meidani's domestic authority is limited mostly to acting in a crisis—declaring a state of emergency, dissolving Parliament, and calling new elections—he exerts substantial influence as one of the few intellectuals who stayed to rebuild the country. While thousands of expatriates help prop up their homeland by sending hard currency to relatives in Albania, Meidani felt that the only way to fight for the university system was to remain in Tirana.

However, Meidani realizes that such beliefs make him an exception, and that the chances of luring back many senior scientists on a salary that tops out at about $250 per month are slim. (Meidani, the highest paid civil servant, receives $600 per month.) What's worse, opportunities for young scientists are practically nonexistent. At least during the Hoxha days, he says, there was a surfeit of idealism; "now it's money, money, money." On the other hand, notes geneticist Kostandin Hajkola, whose cash-starved Maize and Rice Institute is on the brink of collapse, "the last decade has convinced us that idealism alone can't hold institutes together."

Threatening to hasten the decline of Albania's crumbling scientific community is the perilous state of the country's primary and secondary schools. "I'm afraid there's little competence in secondary schools, which could lead to big problems," Meidani says. One proposed solution is to split the secondary schools into two branches, one oriented toward natural sciences and the other focused on social sciences, increasing the odds that the best science students get solid training early on. Putting Albania's science on a footing with the rest of Europe "will take many years," he notes, "and the desire to do so has to come from within." The question is whether scientist-statesmen like Rexhep Meidani can lead the way to such a transformation.

–RICHARD STONE

MEETING SOCIETY OF TOXICOLOGY

Toxicologists Hit the West Coast

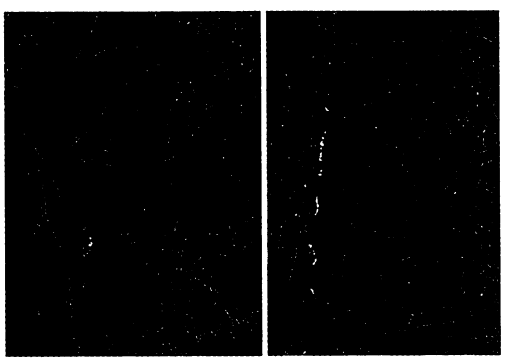
SAN FRANCISCO—A record-breaking 6000 toxicologists gathered downtown here 25 to 29 March for the 40th annual meeting of the Society of Toxicology. Among many topics discussed were how ozone pollution might spur childhood asthma and genetic diversity in enzymes that protect against DNA-damaging agents.

Smog a Culprit in Childhood Asthma?

For children and others with asthma, smog alerts are bad news. When ozone levels jump in cities, visits to hospital emergency rooms due to asthma attacks rise, too. But although ozone clearly worsens asthma, whether early ozone exposure makes children more likely to develop the disease has been controversial. New data suggest that it does. At the toxicology meeting, researchers reported that ozone exposure can restructure the lungs of young rhesus monkeys, apparently making them more vulnerable to asthma, which has risen sharply in the past decade in the United States and other industrialized nations.

Pulmonary toxicologist Charles Plopper of the University of California (UC), Davis, and his colleagues are working with monkeys to resolve questions that can't be answered with smaller lab animals. Rats can be made to develop asthma, but the newborn rodents' lungs develop in just 2 to 3 weeks—far more quickly than a child's (or a monkey's). The researchers showed that they could create asthmatic rhesus monkeys by giving both adults and infants injections and nasal sprays of house dust mites, a well-known allergenic trigger. When later exposed to dust mites, the monkeys showed signs of asthma: They breathed with difficulty, had more air flow–resistant airways, made antibodies to dust mites, and showed immune system changes such as having more cells called eosinophils.

The UC Davis team also exposed groups of six infant monkeys to either ozone alone, ozone and dust mites, or just mites. Over 5 months, the researchers turned the ozone on for 5 days on and off for 9 days to simulate ozone-pollution episodes. They used levels of 0.5 parts per million—three to four times higher than in Los Angeles during smog alerts but about the same as a high-pollution week in Mexico City, Plopper says.



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Straining to inhale. The respirator bronchiole of a young monkey exposed to ozone and dust mites had more smooth muscle bundles than a normal bronchiole (left), making it less effective at allowing air to pass through.

The ozone had dramatic effects, "remodeling" the infants' lungs in a way dust mites alone did not, Plopper reported. After 5 months, the monkeys exposed to ozone alone had developed just two-thirds as many airway branches as control monkeys had, and the dust mite–and-ozone-exposed infants had just half as many as controls. The ozone-treated monkeys also had more sensitive airway nerves, changes in bronchiolar smooth muscle, and depleted stores of glutathione, a chemical that protects cells against oxidative damage. When the researchers triggered asthma attacks in the monkeys, those that had grown up exposed to ozone and dust mites in combination had double the antigen response and airway resistance of controls. "We think the way airways are organized is critical for the way the asthma develops in children," Plopper says.

Because the air in industrialized cities is getting cleaner, experts have sought other explanations for soaring rates of asthma, such as lack of exercise or fewer infections to shape a child's immune system. But, says allergist David Peden of the University of North Carolina, Chapel Hill, the UC Davis monkey experiments "force us to reexamine the potential role that ozone exposure may have" in the induction of asthma.

Diversity in Mending DNA Damage

What are your odds of developing cancer from sunbathing, getting x-rays, smoking, or eating charred meat? One factor may be how well your DNA repair genes are working. These genes code for an army of enzymes that mend