FOREIGN INFLUENCES

Germany's Turks Struggle Into Science

Minority groups around the world face similar obstacles as they seek to break into science. We look at one example—Turks, the largest minority in Germany—whose story offers both parallels and contrasts to that of U.S. minorities.

Eager to move into scientific professions, Turks face educational and cultural barriers at each step.

BERLIN, GERMANY—Bora Ipek left his native Turkey in 1972, studied engineering in Switzerland and then moved to Germany in 1978, when foreigners were still something of a novelty. He made contacts easily and rose through the ranks as a plant design engineer at the giant chemical corporation BASF. Successful in his work, he eventually abandoned his original plans to return to Turkey.

But today, Ipek worries about his welcome in his adopted nation. "In hard economic times, groups on the edge...get pushed aside. Life for foreigners is getting more and more difficult, not only in Germany but in most of Europe." When he arrived, he was welcomed; now his children are taunted at school. "My 6-year-old came home last week asking, 'What's a foreigner? And why do some people hate us?'"

As Germany's 1.8 million Turks shift their status from "guest" to permanent resident, they are demanding equal access to the professions—especially in science and technology fields. But they face an uphill battle, one that in many ways mirrors the struggles of United States minorities. For example, many Turkish children are filtered out of intellectual pursuits such as science while still in grade school. They must overcome language barriers, as do Hispanic and Asian immigrants in the United States. And like ethnic minorities in many nations, they wrestle with prejudice and cultural differences.

But the struggles of the Turks take place in a very different setting from those in the United States. In Germany, minority issues are just beginning to get widespread attention. As the post-reunification economy suffers, open racism and even violence are on the rise, leaving many Turks fearing for their jobs and sometimes even their safety.

And whereas in the United States, new immigrants are expected to become part of society, in Germany, they aren't. Strict naturalization laws keep most Turks, including those born in Germany, from becoming citizens, and German society is reluctant to welcome these noncitizens outside manual labor occupations of the original Turkish immigrants, says Faruk Şen, who runs the Center for Turkish studies at the University of Essen. Indeed, the very notion of nurturing diversity is alien to most Germans, according to Emi Koen, an M.D.-Ph.D. oncologist in Heidelberg. There is little interest in "getting a mixture of people, in multicultural things," she says. Asked why there was no extra support for the large number of Turks in his university, one official replied, "Why should they need anything special? They can come here like anyone else."

Yet interest in technology-related fields is high among Turks—one-third of Turkish university students major in engineering and 10% choose natural science. Still, Turks are underrepresented at all stages of the science pipeline in Germany. They are four times less likely than their German classmates to attend *gymnasium*—the highest class of high school—and eight times less likely to attend university, although the rates are increasing, according to Şen. Turks are 3% of the population in former western Germany but comprise only a fraction of the professionals in technical companies—less than 0.1% at BASF. There are only a few hundred Turkish scientists in Germany with doctorates, and only a handful of Turkish natural science professors.

School daze. Turks interested in science face an uphill battle in the German education system. On the one hand, schools are free and have high standards—Germans outscore U.S. schoolchildren on standarized math and science exams—and basic literacy is far higher. But some say the system is better at sorting students than nurturing talent. After fourth grade, children are separated into three types of schools: the *hauptschule* for future laborers, *gymnasium* for the university bound, and *realschule* in between. In principle, selection is based on academic promise. But this can be hard to predict so early, especially for slow starters or those from disadvantaged backgrounds.

GERMAN INFORMATION CENTER

Young Turks. Non-German students in Berlin face a rough road to technical careers.

Not surprisingly, one of the biggest filters is language, as is often true for non-English speakers in the United States. When they first enter school, Turkish children lag behind in German, a handicap that helps condemn some to the *hauptschule*. Those who make it into the *gymnasium* may still have problems, says Havva Engin, a teacher-in-training who tutors struggling Turkish pupils. Her typical student: "speech excellent, written expression zero." Even for those without major problems, the subtleties of language—such as interpreting German poetry—can spell failure in *gymnasium*, where grades in German are all-important and students must take at least two foreign languages, excluding Turkish, which doesn't count.

And students in trouble will find little remedial help, especially in high school. "School is voluntary in the upper classes [after 10th grade]," says Gerhard Nitschke, superintendent of schools in a Berlin district with nearly 50% non-German students. "Whoever goes further must know what they're doing." Those who can turn to parents, siblings, or private tutors; others sink or swim on their own.

Unfortunately, teachers aren't trained to deal with non-German students, says Ulrich Steinmüller, education professor and vice president of Berlin's Technical University (TU). Although non-Germans represent one in nine school children nationwide—with some classes approaching 80%—"Teachers are still taught as they were 40 years ago," Steinmüller says. Perhaps as a result, some of them discourage Turkish pupils from aiming high—a familiar saga to U.S. minorities. When

Science recently visited a Berlin *gymnasium* class of mostly non-Germans, one Turkish girl spoke timidly of her interest in studying pharmaceutical science. But the teacher advised against it. "Wait until you get to chemistry. You don't know what you're in for!" When the students left, another teacher praised the "realistic aspirations" of students aiming for technical college or vocational training rather than university study. "Many have illiterate parents," she said. "You can't expect more in one generation."

In addition to difficulties at school, many first-generation Turks also face tremendous problems at home, says Duran Korkmaz, who counsels Turkish students through Berlin's Turkish Science and Technology Center. For kids from poor families, who often care for younger siblings or work part-time, "just getting through school is a struggle," says one Turkish 12th-grader. Nitschke agrees: "Dropping out in the upper grades is less an intellectual problem than a social one."

Indeed the cultural leaps can be hard to make. One Berlin physics teacher says that a few female students at his *gymnasium* arrive in traditional long dress and head cover, then race to the bathroom and change into western clothes. Before going home, they reverse the procedure.

For minority students who persevere, the next obstacle is finding their way through overcrowded universities. Many schools have three times the number of students they were designed to accommodate. And professors aren't always sympathetic to those with difficulties. Says the TU's Steinmüller: "I've had professors tell me they're pleased if 70% of the students drop their course because it raises the level of the class."

Self starter. Navva Engin tutors other Turks.

Once they graduate, with a degree roughly equivalent to a U.S. master's degree, few Turks continue for a doctorate. Like many U.S. students from low-income backgrounds, financial worries often steer them away from the uncertainties of academia. In Germany, such uncertainties are compounded by Turks' weak position as noncitizens, as well as a dismal economy. "Economic security is extremely important for people with backgrounds like most of the Turks in Germany have," says Metin Colpan, a Ph.D. chemist who heads a Düsseldorf-based DNA technology company called Diagen. "There's an unconscious push toward industry. Research is a luxury."

Workplace worry. Once in the workplace, it becomes harder to track Turkish scientists' progress—or lack of it. Government employment statistics rarely include data on nationality, so it's impossible to answer the critical questions: whether Turks have a higher unemployment rate than native Germans, work at lower levels, or hit a glass ceiling—perceptions expressed by many who spoke with *Science* for this article.

Still, it's clear that fostering equal opportunity for minorities isn't on everyone's agenda in Germany. For example, a columnist for a 1990 issue of the Association of German Engineers magazine, agreeing with a letter to the editor, acknowledged that most employers go by the principle, "when in doubt, decide against hiring or promoting the [minority] candidate." The magazine's commentary: "Physiognomy, behavior, and way of thinking are often so 'different' that strong reservations...against giving [foreigners] special leadership functions are at least understandable."

On the academic track, Turkish scientists face an extra hurdle: Professorships are restricted to German citizens, as are many government-sponsored research grants. And stereotypes linger in the halls of academia as well as industry. For example, the cliché of Turks as "manual-laborer-and-garbage-man" was a big problem for Abdulkadir Kilig during his doctoral studies in chemistry. Even in the university, "After meeting someone new I sometimes had to spend the first 5 minutes changing their notion of who I was—a Ph.D. student, not the help," he says, echoing the experiences of some black and Hispanic students.

Problems with overt racism at work seem to be rare—but they do exist. At Adnan Özkan's first job in a small engineering firm, they began with office parties. "When the alcohol started flowing, I could set my watch by how long it would take for the 'Turkish jokes' to begin," he says. Then came threatening phone calls at night, prompting him to quit the job. More typically, BASF's Ipek says he's had only good experiences at work—including apologies from colleagues after neo-Nazis murdered five Turks in Solingen last May. But the violence has shaken up his sense of security. "I love my job and I feel very settled in Germany," he says. "But if anything happens to my kids, we're leaving."

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—engineer Adnan Özkan

Signs of change. Despite all the obstacles, there are positive developments too. As schools and businesses begin to accept the reality that Turks are here to stay, programs to ease their transition are emerging. Leading the charge is Berlin's TU, which has the country's highest proportion of non-German students (17%) and is the first university to institutionalize support for them. Its programs range from small tutorial groups in major subjects to faculty who provide one-on-one contact.

The person behind much of this is Steinmüller, who has also initiated the first federally funded research project in university teaching of foreign students. Some tactics they're urging, says team member Romuald Skiba: more work in small groups and more effort to mix German and foreign students—the same strategies shown to work for minorities in U.S. universities.

Another first is a program that helps prepare struggling non-German *gymnasium* students for the make-or-break exams in their final year. Organized by Berlin's Turkish Science and Technology Center, the program is beginning to show success, says leader Engin, citing two math students who were at the bottom of their class and then made top exam grades. But with a tiny budget of $12,000 the program can't begin to meet demand.

Indeed, although official support is absent, a self-help movement is beginning to sprout among Turks. In addition to helping students and young professionals, their agenda includes politics—in particular, citizenship. "A German passport won't cure racism," says Engin. "But it would give us the same rights as Germans." Without such rights, the battle for equal opportunity is proving to be that much harder.

–Patricia Kahn