Federal Institute of Technology

Cosmopolitan route to excellence

THE first professors at Switzerland's high-powered Federal Institute of Technology (Eidgenössische Technische Hochschule or ETH) were refugees who fled prison sentences or political repression in Germany after the failed 1848 rebellion. They found a haven in Switzerland, where the government was building a polytechnic-cum-university to train engineers, architects, science teachers and other professionals.

Many current ETH professors are refugees of a different sort. Lured away from top institutions in West Germany, the United States and Britain, they seek shelter from the struggle for grant money that prevails elsewhere. The teaching load is light, the students generally well-behaved, and, as one US researcher put it incredulously, "every chair is endowed".

ETH aspires to being "one of the twenty best universities in the world" in teaching, research and international reputation, in the words of its President Hans Bühlmann. Nearly half its faculty are foreigners. There have been three Nobel prizes granted to ETH professors and ten more Nobels for researchers who had studied or worked at ETH but did their prize-winning work elsewhere.

The willingness to hire on merit rather than nationality has helped ETH succeed at its original mission. The accent on excellence has arguably helped small, resource-poor Switzerland to become one of the wealthiest countries in the world in terms of per capita income.

One meets foreigners in every stage of their careers at ETH, from graduate students to professors emeritus, by which time many have become naturalized Swiss. Biophysicist Tim Richmond, a US citizen, exemplifies the type of researcher ETH seeks. ETH lured him away from the MRC Laboratory of Molecular Biology at Cambridge (UK) primarily because it could offer him the chance to expand his group.

Richmond and his colleagues had determined the crystalline structure of the nucleosome core particle at the MRC (T. J. Richmond, J. T. Finch, B. Rushton, D. Rhodes and A. Klug *Nature* **311**, 532–537; 1984), a substantial advance. He wanted to try his hand at several new projects, some of which (like attempting to crystallize the DNA-binding region of glucocorticoid receptor bound to the nucleosome) required long-term support. ETH promised him the resources he needed with "the fewest administrative problems of any university I looked at", the others being top universities in the United States.

According to organic chemistry professor Jack Dunitz, a Scot, the average grant proposal in Switzerland is four pages long, and the average chemistry professor spends five or six days a year writing grant applications. At the US National Institutes of Health, by contrast, people spend "50 or 60 days" on the task. The chairs are endowed in the sense that two-thirds of a professor's operating budget is provided by the university. The rest must come from outside sources, in most cases the Swiss National Science Foundation.

The main difficulty in moving to ETH? The language. High German is required, but "nobody speaks it — they all speak Swiss-German", says Richmond. The two are almost as different as, say, English and French, as anyone who speaks fine high German can attest after a (frustrating) trip to Switzerland. Holding lectures in English for a year or two is all right, but eventually German is a must.

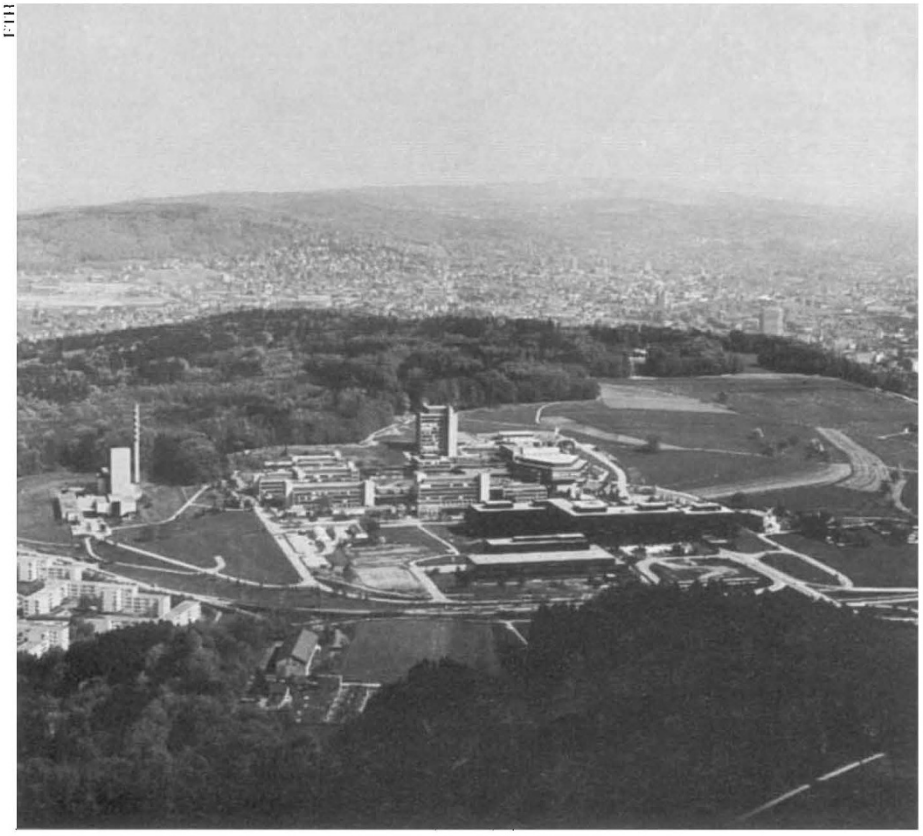
Persistent probing reveals that there are some real difficulties at ETH. Some problems are directly related to success — shortage of space, for instance. ETH's central Zurich campus is almost completely saturated, and expanding into the evergreen forest just uphill from the outlying Hönggerberg campus is not as easy as it looks.

The abundant funds at ETH's disposal sometimes lead to money being invested without enough forethought; the supercomputer installed this year is one example. Professor Niklaus Wirth, the inventor of the Pascal programming language, fears that ETH administrators may be disappointed in the results of a five-year investment programme for new equipment. Wirth also resents the image of information sciences as some sort of service department, expected to churn out lots of graduates to fill a gap in the economy without contributing significantly to research. But he has never been prevented from doing good research in Zurich, and on sabbaticals.

Another, more deeply rooted problem is complacency. Though most professors denied that this is a big problem, President Bühlmann echoed John Kennedy in addressing students and faculty members last year: "Ask not what your future at ETH will give to you; ask what you can do for the future of ETH".

Ralf Hütter is the first 'vice-president for research', a position created last month. His main task, he says, will be "to create a supportive environment for research". Having someone responsible just for research will give professors greater access to the administration and, he hopes, will help them to identify more with the institution. "At some schools, you are a Harvard professor", says Hütter. "Here, we have traditionally been professors [who happen to be at ETH]." The largest task for ETH in the coming years will be to turn out more engineers. There is already a severe shortage in Switzerland which shows no signs of abating. **S.D.**

ETH



The ETH campus at Hönggerberg — seen from the air in 1980.