universities, the locations of which have not yet been chosen, are meant partly to meet the demand for higher education which is, even at present, unsatisfied in west and central France. (There is at present a net movement of students towards Paris, the southwest and the Lyon region.) The problem will be to persuade able academics to move away from the centre.

Research. The government acknowledges the need to "arrest the slow erosion of university research over the past several years". The ministry of education hopes to accomplish this by several means.

There will be a system of competitive grants for research and scholarship administered by a committee (the Conseil Scientifique de l'Education Nationale) under the Nobel prizewinning chemist Jean-Marie Lehn. Salary supplements for academic-researchers should work towards the same end.

It may also help that the government plans to encourage the emergence of new university centres of excellence. It has nominated a handful of places which, "by the quality of their research, the diversity of their teaching and the the attractiveness of their locations", may rival "Oxford, Heidelberg and Berkeley" in the united Europe of 1993. The ministry has so far nominated Grenoble, Strasbourg, Orsay-Polytechnique (southwest of Paris) and Toulouse; it promises further names — but a few of them — before 1993.

Organization. The ministry of education, at the Napoleonic hub of France, is used to redefining and rebalancing the interests of the centre and periphery. The new calculation is that four-year renegotiable contracts with the ministry of education will give universities an incentive to skimp on spending in fields in which costs are elastic, and to invest the funds they save where there are intellectual opportunities, or students to be recruited. The council of ministers, on the recommendation of the ministry, will continue to appoint the rectors of the universities.

Several innovations are promised. A study is under way (with the ministry of economics and finance) to see whether budgetary procedures can be radically simplified and whether real-time ("*en temps réel*") techniques of data processing can assist the administration of universities. (Ways of counting students would be a big help.)

Cosmetics. The ministry, which hopes that it will be possible to double the number of doctoral students preparing theses in the five years ahead, plans to set up an organization for monitoring all theses under preparation. It is hoped that this information (to be published annually) will form the basis for determining university research policy as well as for comparisons between French and other research. □

GRANDES ECOLES

Lyon's hot-house university

WHY should French teenagers compete so fiercely to go to universities that are unable, by their constitution, to award degrees? Because the universities are not universities at all, but *grandes écoles*.

These citadels of French higher education owe their existence to functional considerations: how best can the state secure the services of able people who have been specially trained in certain fields? By recruiting them young and competitively, by making them civil servants for at least ten years and then, by training them. Thus was the *École Polytechnique* Napoleon's device for assuring a supply of artillery officers.

By definition, the *grandes écoles* are in Paris, or at least they were. But in the 1980s the ministry of education embarked on an experiment to see whether they could be transplanted to provincial soil. Now, after more than a decade of heart-searching and hard work, a version of the *Ecole Normale Supérieure* has been transplanted from Saint Cloud, in Paris, to a complex of post-Modern buildings on the site of an old abattoir in this provincial city, now the next largest after Marseille.

The Ecole Normale Supérieure de Lyon has taken in 100 students in each of the past two years. They are a cut from those successful in the national *concours*. Most give themselves an extra two years preparation after *le bac* before entering the competition, which means that *normaliens* are usually 20 years old when they begin their studies. Although most of those entering the annual competition give one of the Parisian schools as their first choice, they (and their teachers) know they come from the top 0.1 per cent of whatever proxy for the national IQ distribution is measured by the *concours*.

Moving the school from Saint Cloud to Lyon has not been trouble-free. The idea seems first to have been mooted in the mid-1970s, and more or less agreed by the arrival of the Socialist government in 1981. At that stage, those threatened with banishment from Paris, and their unions, pleaded with the new government to put a stop to the plan. But the then minister of education, having brooded for some time, decided not merely that the move should go ahead, but that Lyon's floor-area should be increased by 11,000 m^2 to a total of 36,000 m^2.

Guy Aubert, appointed director of the new school two years ago, is an energetic man; among other things, he reckons to travel 50,000 km a year on the autoroute between his laboratory at Grenoble and the school at Lyon. He has high ambitions, not least that of making Lyon the best of this esoteric bunch, as follows:

■ **To get the best students**. Even at the top, competition remains fierce. Lyon has to stake its claim on the affections of the brightest few hundred making their way to the *grandes écoles* by the reputation it establishes in the next few years. The counter-attractions of Paris will persist. But even as things are, 3,000 people compete for the 100 places at Lyon. Competence in some foreign language is required. French entrants are paid as junior civil servants.

■ **Education through research**. Lyon offers three options — mathematics and *informatique*, science of matter (physics or chemistry) and life and Earth science. From the outset, students at Lyon will be plunged into research (and, during the first two years, taught to write and speak English). The requirements vary from one department to another, but most students spend half of the first three years of the four-year course on laboratory work and research. In the process of doing so, they normally acquire (from the University of Lyon) a first degree and, usually, the *diplôme d'études approfondies* (a necessary but not sufficient qualification for teaching at a university). Students at Lyon follow as a matter of course the laboratory-based *magistère* curriculum. They spend the last of their four years either preparing for a two- or three-year PhD course or in qualifying as fully fledged teachers in higher education (the process known as *Agrégation*. Aubert expects that 9 out of 10 will head towards a PhD.

■ **Internationalization**. Like everybody else in France, Aubert is scheming to do his bit for the integration of Europe. One possibility is to recruit students from elsewhere to Lyon, perhaps as many as 50 each year. (The statutes allow foreign students to attend, and to pay no tuition fees, but they would not be paid or other-

Polytechnic Institutes

THREE relatively new institutions, in many ways intermediate in character between the *grandes écoles* and the national universities, have a particular influence. The best known is the Institut National Polytechnique de Grenoble, with roughly 3,000 students and an associated group of *grandes écoles* specializing in technical fields. There is also an Institut National Polytechnique at Toulouse and another in Lorraine.

All three were founded in the early 1970s as a means of stiffening higher technical education and lending coherence to its academic procedures. All are relatively small in terms of student numbers — between them the institutes have about 8,000 students. □