A number of other professional schools were subsequently created with the same orientation toward military engineering, and these so-called *Grandes Ecoles* were to grow into incubators of a technically trained administrative elite for government and industry.

French higher education has been divided between these highly selective professional schools, which educate a top-level administrative cadre, and the university *facultés*, which, besides being training grounds for lawyers, physicians, and pharmacists, were open institutions devoted to preserving and transmitting culture.

A high proportion of talented students aspiring to technical or administrative careers have been traditionally attracted to the *Grandes Ecoles*. Perhaps as a result, the university arts and sciences faculties have specialized in producing university scholars and lycée teachers. The outsider is likely to find the plan of French higher education labyrinthine and the hierarchy of degrees hard to interpret unless he remembers that what is involved is qualification for teaching at the various levels.

French university education is organized into three "cycles." The first cycle, which normally takes 2 years, is viewed as a transitional phase between the baccalaureate and work for the university degree, and here, traditionally, a heavy weeding-out process occurs.

The second cycle takes most students 3 years and, for the successful, ends with the granting of the *licence* or basic university degree. The rate of failure is very high, and, despite the unsuccessful examinee's option of sitting for exams in several successive years, it is estimated in some faculties that as few as one in three or four of the students who start the course ever end up winning a degree.

The third or postgraduate cycle includes work for such essentially nonresearch degrees as a Secondary School Teaching Certificate and the Agrégation. Agrégés start off teaching in lycées but very often, especially in the case of science graduates, move to higher education. Faculties of science award four types of doctoral degrees. The so-called "3rd-cycle doctorate," a 2-year research degree, is the route by which most scientists enter fundamental research. The state doctorate is required for appointment to a university chair. Two theses are required for the state doctorate, which is really a 4th-cycle degree similar to the German *Habilitation*.

The higher-education system has been geared to the training of elites. The government has accepted the view that the system must be changed to provide a more diversified education to students drawn from a broader social base. A number of measures aimed at democratization of the schools were put into effect in the 1950's, and in 1964 the council of ministers approved a plan presented by Fouchet which contained the broad lines of reform for higher education.

Secondary education was to be reorganized so that the baccalaureate would become more like a high school diploma, instead of the first hurdle in higher education. Under the new system professional training is to be stressed and the functions of the three cycles are to be more clearly defined, with emphasis given successively to fundamental knowledge, specialization, and research.

Forms are important, particularly since the formal structure of higher education in France has proved particularly inflexible. Great effort has been made in the past, for example, to keep the organization of the faculty of letters and that of the faculty of science in exact parallel, even if this might be inappropriate. As one civil servant wryly observed, "the passion for symmetry is a French perversity."

An overriding purpose of the reforms is diversification. In a sense, an attempt is being made to accomplish what American state higher education systems have achieved with their range of institutions—university, state college, junior college, and technical institute.

Soviet Party Ousts Four Scientists

The Soviet Communist Party has reportedly expelled at least four of Russia's leading scientists for participating in a protest against the detention of mathematician Aleksandr Yesenin-Volpin. According to the New York *Times* and official U.S. government sources, the expelled scientists were among 99 Soviet scientists and mathematicians who recently signed a statement criticizing their government's action against Yesenin-Volpin (*Science*, 22 March). In February, Yesenin-Volpin was committed to a mental hospital for protesting the trial of four dissident Soviet writers.

It is not yet known how many scientists were expelled. However, four were identified by the *Times*. These are Izaak Gelfnd, biologist and winner of the Lenin prize; Sergei Romin, head of Moscow University's cybernetics department; Yuri Manin and I. R. Shfarevich, both mathematicians and winners of the Lenin prize. Shfarevich and Gelfnd are both reported to have been involved in earlier protest activities. Although U.S. government sources maintain that expulsion from the Soviet Communist Party usually entails the loss of one's job and attendant prerogatives, it is not yet certain whether the full penalty will apply to the expelled scientists, at least some of whom are engaged in military-related research.

The expulsion of the dissident scientists was reportedly approved at a recent meeting of Communist Party officials within the Soviet Academy of Sciences. According to *Pravda*, a stern warning against further protest activities also was issued during the meeting. News reports quoted *Pravda* as saying participants at the meeting said that all scientists should "show high political consciousness and uprightness in the ideological struggle between capitalism and socialism and rebuff any attempt by our enemies to . . . subvert socialist society from the inside."

Soon after the letter was issued criticizing the confinement of Yesenen-Volpin, it became evident that the Communist Party was not inclined to accept further dissent even among members of the scientific community. According to U.S. officials, eight of the signers of the letter were summoned in March by Party officials and asked to issue a statement "modifying their protest." On 23 March a letter appeared in *Izvestia*, signed by four of the eight, deploring the use of their protest as anti-Soviet propaganda by the Western press. Later, in a speech at a Party conference in Moscow, Mstislav Keldysh, president of the Soviet Academy of Sciences, expressed regret at the immaturity of the signers of the Yesenin-Volpin statement. Keldysh's sister, a mathematician, is reported to have been one of the signers.—F.C.