French Science at the Crossroads

from our Paris Correspondent

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CONSTERNATION has reigned in most laboratories in France for the past two months. Even before the announcement of restrictive measures which will affect all the nation's budgets for 1970 (with the exception of the Ministry of Education), the counter blow of the French crisis had already, in fact, hit research activities very hard. A high proportion (at least 75 per cent) of grants allocated for 1969 and not yet spent have suddenly been blocked with effect from July 1 this year, condemning certain research teams to a life of semi-hibernation until the end of the year.

These emergency measures, however, were only the first shock wave in the French financial crisis. The Prime Minister, Mr Chaban-Delmas, had told Parliament a few weeks ago that they could expect to see, over and above these immediate restrictions, a "research pause" during the next budget. But these new directions in French policy have been shrouded in secrecy until the past few days. So feeling ran high among research workers, who organized a "national day of action" on October 10 with work stoppages, street marches and protest meetings supported unanimously by nineteen unions.

Were the fears expressed by the research workers wholly justified? Mr Ortoli, the Minister for Industrial and Scientific Development, shed some light on the matter during a recent press conference. As expected, administrative grants will rise very gently in 1970, which means effectively that, bearing in mind the general rise in prices and salaries over the past year, they will stagnate. For example, the National Centre for Scientific Research (CNRS) asked for 550 research posts to be created but will get only 40. As for investment grants, these will fall by 5.5 per cent compared with the 1969 budget, which already showed signs of slowing down the effort made in France over the previous ten years or so.

Mr Ortoli replied in fairly vague terms to questions which were raised on certain particularly spectacular cases. Like all research organizations, the National Centre for Space Research suffered from the partial freeze on its resources for 1969 and in 1970 will only receive some 475 million francs instead of the 532 million francs of the previous year. What will be the effect of this cut? The resignation of a certain number of key people in the French space programme confirms the most pessimistic opinions. The second scientific satellite D_2 seems likely to be abandoned. The Guiana Space Centre, into which a considerable amount of money has been poured and which France is trying, apparently unsuccessfully, to hire out to the United States, will have to curb its activities. The contribution to ELDO (that is, the building of the Europa rocket) and to the Franco-German communication satellite Symphony will continue but no doubt less

actively than was planned. Participation in the future activities of ESRO, while not officially under discussion at the moment, is debatable.

In the field of nuclear energy, Mr Ortoli has also been very discreet. However we do know already that the abandonment of the French nuclear process of graphite-plus-gas which has been certain for a year now (*Nature*, 220, 645; 1968) will soon become official. The Atomic Energy Commission (CEA) and Electricité de France (EDF), which produces the country's electricity, have been waging war for a long time over this issue. Since last April, they have agreed on the necessity of adopting an American enriched uranium process. An attempt to divert this had been made by supporters of the natural uranium process. Supported by M. Robert Calley, the former government's Research Minister, they recommended the adoption of the Canadian heavy water process. Although not altogether abandoned, this latter project will probably only play a secondary part in the French programme. The CEA says it favours a pressurized water reactor. The EDF is torn between the advantages of pressurized water and those of boiling water. Will there be room for several industrial groups or for only one in the new French nuclear policy? Framatom champions the cause of pressurized water reactors (PWR) while the G3A group favours boiling water reactors (BWR). But would G3A refuse to change sides if circumstances required? The outcome of the battle is not yet certain, but the chances of the American firm Westinghouse signing big contracts in the near future seem to be pretty strong. For the present, at any rate, the CEA is seeing its budget severely cut (to 1,825 million francs instead of the 1,945 millions in 1969), and the minister seems to envisage it being partially re-converted along the same lines as Harwell.

France is not only more receptive towards American overtures (witness the welcome given to Dr DuBridge in September) and to the Russians (the Franco-Soviet "Grand Commission" has just met in Moscow) but is also showing unprecedented enthusiasm for scientific and technological collaboration with her Common Market partners. *Nature* (221, 898; 1969) pointed out the encouraging atmosphere in which work was being carried out by the PREST group which—under the direction of a Frenchman, Professor Aigrain—had been commissioned to make concrete proposals to the EEC for a cooperation programme. The PREST group's deliberations are just coming to an end in Brussels and the experts' conclusions will be the subject of a preliminary exchange of views between the members of the council of Ministers for Science of the Six on October 28. The ministers will be meeting first on October 27 to discuss Euratom. On this issue the French position has not changed and it is therefore probable that agreement will once more only be reached on a "mini-

programme" and on the need for redeploying the Ispra Research Centre more and more for non-nuclear work. Yet, Euratom apart, great progress has been made to the extent that the idea of combined scientific policies among the Six, inconceivable a few months ago, seems to be gaining ground. This ambitious objective will not be reached immediately. For the moment, Professor Aigrain and his colleagues have at least managed the difficult job of classifying in order of priority a list of some 47 projects. This initial list had been drawn up at the beginning of 1969 as a result of reports received from seven specialist subgroups. These subgroups, whose members and methods were the subject of a good deal of discussion (especially by the Belgians who would have preferred the study to be global rather than sector by sector), are probably going to be dissolved. The only one to remain will be the group specializing in the problems of data processing, which is generally recognized to have done excellent work. Its favourite project, the plan for a large European computer, is moreover going well. Since the beginning of the year, secret discussions had been held between emissaries from Brussels and ICL, which had already built into its programme the construction of a machine of comparable size, the 1908A. The Six's experts considered it vital to cooperate with the British firm, whose superiority over its continental rivals is unquestionable, if the European computer project was indeed to come to fruition. And again the size of the market made it absurd to make two attempts to meet the American challenge at the same time. The announcement by ICL a few weeks ago that the 1908A should be abandoned really only represents another stage in a long series of diplomatic manoeuvres. It was certainly not by chance that EEC representatives had been in London for two days when ICL's statement was issued. At all events, one thing is certain: in Brussels it is believed that the chances of a large machine being developed collectively by the Six and Britain have increased during the last few weeks.

ICL, moreover, announced in a second statement that the 1908A had not, strictly speaking, been abandoned but replaced by the enigmatic Project 52. According to information received by the EEC this is, in fact, a counter-project to the proposals of the Aigrain group which has in effect been known about in Brussels for some time. There is no feeling of suspense among the initiated. Yet it should be made clear that the

decision to be taken by the Six will only concern, for the time being, the official appraisal of the project (its technical feasibility, the extent and nature of the market and so on). Building the machine properly is quite another matter. . . .

The European ventures are not, *a priori*, destined inevitably to succeed. But the will to give them a serious try is nonetheless a fairly new sign of realism in Paris. It is worthy of note that while France envisages cooperation with present—or future—members of the EEC, it is having to restrict the national effort in the field of computers. The *Plan Calcul*, the anti-IBM war machine of former ministers, had ambitions too lofty for its restricted means to be very convincing. Now the capital given over to the plan is also decreasing, from 174 to 168 million francs. On the other hand, so far as software is concerned, the government, which was firmly opposed to American participation (by Leasco) in the leading French company SEMA, does not seem to disapprove of the discussions currently being held between it and Philips.

The intensified European "overture", the touch on the brake for programmes which are at the heart of orthodox Gaullism such as the *Plan Calcul*, the graphite-plus-gas process, space exploration—all this is not simply the result of a period of economic difficulty. More importantly, the aims of a scientific policy which has been operating for 10 years are being called into question. This shows itself in the change of title of the Minister for Science (now Minister for Industrial Development and Scientific Research, and conferred on a former Finance Minister), and in the formation of an Institute for Industrial Development (IDI) which will be run like a private firm and which will have a function similar to that of the IRC in Britain.

The grand ideas behind this new strategy aimed at profitability or, more generally, efficiency are not new. They have been tried elsewhere and even aired in France many a time. Will they be applied with energy and foresight by the government in Paris? Will the sacrifices that this policy inevitably implies, particularly for fundamental research, pay off? On the protest day on October 10, the director of one laboratory said: "With this policy, there is a danger of throwing the baby away with the bath water". His assistant corrected him: "The real danger is of throwing the baby away *without* the bath water".

Recipe for Change at Universities

SWEEPING changes in the British system of higher education have been proposed by the House of Commons Select Committee on Education and Science in its report on student relations which was published last week (HMSO, 17s 6d). Its main proposals are for the setting up of a Higher Education Commission to be responsible for all institutions of higher education, the abolition of the distinction between universities and other institutions and the representation of students on the governing bodies of universities and

colleges. The report has for the most part been warmly received, although there has been some surprise that its recommendations go much further than its title suggests.

The committee, which consisted of thirteen backbench Labour and Conservative Members of Parliament, began collecting evidence last December. It visited sixteen universities (including four in Scotland), five colleges of art, three colleges of education and four other colleges. Among those who gave evidence to