

OLD WORLD

Which Way Forward for Spanish Science?

by our Special Correspondent

SPANISH science is entering a phase of self criticism and reappraisal. In an unprecedented move to help the scientists and the science policy makers in the country, the association of scientists who work for the Spanish Higher Council for Scientific Research (CSIC) called a meeting in Madrid last week to which scientific luminaries from all over Europe, the United States and Japan were invited.

Apart from organizational difficulties, the Spanish problem is one of where best to concentrate its limited resources for research. Traditionally in Spain, research has been carried out within research institutes, which are in most cases divorced from the universities, and it is only in the past decade that pure research within the universities has been accepted.

A close look was taken at the conference of the way in which Japan has developed since the Second World War. Professor Kankuro Kaneshige of the University of Tokyo, and a member of his country's Council of Science and Technology which advises the Prime Minister, freely admitted that Japanese progress had come about through the development of discoveries made in other countries. But he emphasized that it was Japanese scientists who had put considerable effort into turning the knowledge to commercial benefits.

The way in which France organizes its scientific activity was presented by Mr Philippe Richer, assistant to Mr Pierre Aigrain who now holds the position of scientific adviser to the French Prime Minister.

The comparatively inflexible way in which France organizes its research effort contrasted sharply with the methods by which Britain, with no minister and no overall policy for research and development, organizes its research. Sir Brian Flowers stoutly defended the British way—including the customer-contractor principle—and asked the meeting to decide whether the British system is “an untidy mess or a good example of British pragmatism”.

But which way should Spain go? Should it follow the lead of Japan, which was universally agreed to be good for a country in the short term, or should it aim at a longer term solution by building up basic research within universities or research institutes? Or, indeed, should the resources available be somehow divided between these two approaches?

The eagerly awaited contribution to the debate by Mr José Lladó, the deputy president of the CSIC, lost some of its impact when the talk had to be read because of his sudden illness. But the audience was highly pleased with the contribution of Mr Federico Mayor, recently appointed acting president of the CSIC who, as well as revealing the philosophy behind his direction of the council, stressed that in future the research institutes and the universities will have to move closer together.

Professor Isidor Rabi, of the University of Columbia, reminded the audience of the meteoric rise of science in the United States in the late 1920s and 1930s—not, he said, because of any

conscious policy decision but because a lack of restriction encouraged scientists to work hard. Professor Philip Abelson, President of the Carnegie Institute and editor of *Science*, outlined a depressing view of the United States scientific scene. But he gave a bouquet to Bell Laboratories and held it out as a model of “scientific openness”. But Professor Abelson was highly critical of the massive increase in cancer research funding that President Nixon announced last year. “Most of the money spent in the United States on cancer research will be wasted,” he said.

But in spite of national differences in approach to science and different scales of scientific activity, all the representa-

EARTH RESOURCES

Skylark's Eye View

THIS near infrared photograph of some 300,000 km² of Argentina was taken by a Skylark rocket on its first operational use as an Earth resources survey. The photograph, one of 650 taken during two Skylark flights in late March, shows an area to the east of the Andes in the south of the Cordoba province from a height of 200 km. Cloud to the right of the picture hides the Andean foothills from which a number of rivers flow, and the different tones of the fields indicate the various types of crop that are being cultivated. A town can be seen clearly in the centre of the photograph with roads leading to it. The Skylark's rocket body, which separated from the payload 57 seconds after launch, can be

seen falling away in the top left of the picture.

The survey will reveal land use and provide crop inventories of Argentina's chief agricultural region, and the photographs are currently being analysed by members of the University of Reading's Geography Department and Argentina's Instituto Nacional de Tecnologia Agropecuaria.

The next use of Skylark as an Earth resources rocket will be in northern Sweden this summer when a vegetation survey will be attempted. The chief advantages of using Skylark for Earth resources are said to be cost (launch only costs between £100,000 and £150,000) and the fact that launch can be delayed until cloud conditions are perfect—as happened in the Argentinian survey.

