Union as a federal state. (The exact anniversary falls on 30 December.) Formally, Soviet culture is defined as "national in form and socialist in content", although what this means for science is not always easy to say, particularly since the implementation of the "Kruschchev theses" of 1958 which emphasized Russian as the preeminent language of Soviet scientific communication and thus blurred the individuality of such distinctive developments as the "Ukrainian school" of cybernetics of the early 1960s. Some local institutes have, however, achieved international renown, notably the Paton Institute of Electric Welding (Ukraine), the Institute of Astrophysics and Atmosphere Physics (Estonia), the Byurakan Astrophysics Observatory (Armenia), and the Tien Shan Cosmic Ray Station (Kazakhstan). Their reputations, however, derive from their status as representatives of Soviet science rather than of the republic academies to which they belong.

In creating these academies, from the Ukrainian Academy founded in 1919 to the Moldavian in 1961, the Soviet state was following the federal structure of the Soviet Union which formally says that all 15 union republics are fully autonomous. (Significantly, though, the largest republic of all, the Russian Socialist Federative Soviet Republic (RSFSR), has no academy of its own, being presumably well served by the All-Union academy.)

The propaganda value of separate republic academies is clear. In his jubilee speech, Academician Kotel'nikov reiterated the usual half-truth that the Estonian Academy of Sciences was established in 1945, in the process ignoring the 1938 decree of the then independent Estonian Republic setting up that academy.

Recently, there has been an increasing emphasis on the duty of scientific institutes to service local industry. In the remoter areas of the far-flung RSFSR, former research stations have been upgraded into fully-fledged filials of the Soviet Academy of Sciences.

This theme of regional devolution has been evident since before the death of Leonid Brezhnev and the accession of Yuri Andropov as General Secretary of the Party. The media run-up to the jubilee had begun to stress the links between the republic academies and local production. In particular, the influential weekly *Literaturnaya Gazeta* ran a survey in which the presidents of the 14 republic academies were asked to describe some of the most interesting research carried out by their academies, the main difficulties they encountered and the participation of the academies in the present high-priority food programme. The answers concentrated overwhelmingly on local needs — from the use of lasers for environmental monitoring in Lithuania to soil surveys for new vineyards in Azerbaijan. **Vera Rich**

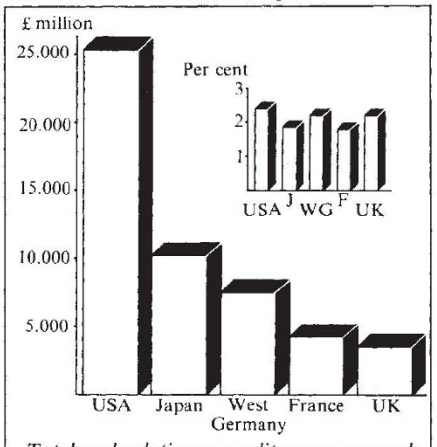
British research policy

Could do much better

Lack of confidence among would-be innovators was cited last week as a major problem underlying Britain's industrial malaise, by Sir Henry Chilver, chairman of the Advisory Council for Applied Research and Development (ACARD). Sir Henry, who was addressing the Parliamentary and Scientific Committee (an unofficial group of MPs, peers and representatives from industry), stressed the importance of science research and development for Britain, and emphasized the need for effective coordination of policies in the many government departments involved with science and technology.

ACARD's terms of reference were broadened in July and the council is now well placed to play a significant role in coordinating research and development efforts in government and industry. ACARD reports directly to the Prime Minister and will also be advising in the recently announced annual reviews of research expenditure by government departments. Its new role was the result of the government's response to the report on "Science and Government" of the House of Lords Select Committee on Science and Technology, which recommended the appointment of a minister at Cabinet level to speak for science and technology.

Sir Henry pointed out that Britain's expenditure on research and development, while comparable with that of its competitors in terms of percentage of gross domestic product, represented only 7 per cent of the total spent in the five major industrial nations (see figure). He therefore argued for more spending on research in private industry and a greater concentration of resources in areas with a potential for later exploitation. He also suggested that more ideas from defence research should be taken up.



Total and relative expenditure on research and development in the five major industrial nations. Relative expenditure is given as a percentage of gross domestic product.

The primary problem, he said, was one of attitudes, and links between universities and industry should be fostered to encourage academics with good ideas to seek support for commercial development.

Few are likely to disagree, but it is far from certain that university researchers and financial institutions will take notice. **Tim Beardsley**

India's second taste of Antarctica

Lucknow

The search for a suitable site for a permanent manned research station is the most important task for India's second scientific expedition to Antarctica. Almost exactly a year after the country's first expedition, the 28-member team set sail on 2 December aboard the hired Norwegian vessel *Polar Circle*.

As with the first mission, the landing site is to be near an old campsite at 70° 3'S/40° 7'E, named Dakshin Gangotri (Dakshin — south: Gangotri — the source of the River Ganges in the Himalayas). An automatic weather recording station has been operating there for the past year and the team's first task will be to collect a cassette of weather data.

The present expedition — under the leadership of Dr V. K. Raina, a glaciology expert from the Geological Survey of India — is due to stay on the ice for 60 days, compared with the 10 days of the first mission. Intelsat telex and telephone links have been set up to maintain contact with India's National Institute of Oceanography in Goa and the Department of Ocean Development (DOD) in New Delhi. DOD's link with Antarctica is particularly strong, since the head of the first Antarctic expedition, Dr S. Z. Qasim, is now Secretary of DOD.

With plans to have the permanent base operating by 1985, and ambitions either to build or to buy a research vessel of its own, India's interest in Antarctica is obviously growing. India has not yet signed the Antarctica Treaty. Prime Minister Indira Gandhi said in Parliament recently that her government is examining the case for signing the treaty, and she stressed that the implications for all developing countries are being considered.

India is taking part in discussions with other developing countries about joint efforts to explore and exploit Antarctica. However, offers of help from the Soviet Union, which offered the use of Soviet airstrips and buildings on the ice cap, have been turned down. **Zaka Imam**

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