

science and technology, Mr Barry Jones, have repeatedly said as much.

Perhaps significantly, the present Liberal-Country Party coalition government has responded by increasing support for the Industrial Research and Development Incentives scheme from A\$14 million to A\$50 million. More broadly, the government has taken to justifying a more interventionist approach to Australian industry by references to "market imperfections".

More animal care

Washington

Public pressure for a change in rules governing the care of laboratory animals has prompted the National Institutes of Health (NIH) to tighten up their requirements, whether or not Congress acts on the matter this year.

NIH will require that at least one non-scientist be appointed to each research institution's animal care committee — the groups charged with overseeing the treatment of experimental animals. This echoes one of the requirements in the bill now before Congress. (The bill, renumbered HR 6928, has cleared the House Science and Technology Committee and is now before the health and environment subcommittee of the Energy and Commerce Committee.)

NIH is also planning to mount a series of site visits to check on the extent to which researchers are complying with NIH guidelines. Under current rules, recipients of NIH grants must agree to adhere to the practices outlined in NIH's *Guide for the Care and Use of Laboratory Animals*. Failure to do so can result in loss of NIH funding. A major criticism of the system, however, is that too much reliance is placed on the good-faith assurances of the researchers and too little on inspection.

But NIH is not yet ready to order on its own another change in the proposed legislation: the mandatory accreditation of all research institutions by an independent group such as the American Association for Accreditation of Laboratory Animals Care (AAALAC), which sets standards and conducts routine inspections every three years. According to Dr William Raub, NIH's associate director for extramural research, "We think the concept of accreditation makes a lot of sense. But we're not yet, at least, willing to mandate it until we know more about the costs". Universities have claimed that bringing all NIH-supported institutions up to the AAALAC standards would cost \$500 million. The legislation before Congress would eventually require all institutions to meet the AAALAC standards, but would soften the blow by allowing ten years in which to meet this goal.

Stephen Budiansky

Labor is less inhibited about intervention. The July conference undertook that research and development expenditure should increase from the present 0.9 per cent of gross national product to a level "equivalent to that in other technologically advanced countries". Prudently, Labor did not specify a target figure.

What Labor offers is more pragmatic — a promise of a new division in the Department of Science and Technology to be concerned with industrial research, development and innovation. A Labor government would be a dutiful customer for new Australian products, and would back technical innovations with hard cash. It would also provide venture capital for new kinds of industrial developments, in biotechnology for example.

On issues such as these, the parties differ only moderately. Neither will increase

spending on basic research. The best hope is that Labor would not let research funds be eroded by inflation.

Long-standing disagreements persist, however, about the role of foreign corporations in high-technology industries. Labor would require foreign corporations to carry out some research and development in Australia, but Mr Barrie Jones seems well aware that he must find a form of words not so restrictive that foreign corporations will be driven away.

The new Labor policy also promises innovations to give high relief to Australian science. The conference approved a plan for an "Australia Prize" of A\$100,000 for humanitarian scientific achievement, to be administered by the Australian Academy of Science, and an international conference on Antarctic research to reinforce Australia's claim to the largest slice of the Antarctic.

Vimala Sarma

Mexican science in money trouble

Mexico City

In the face of Mexico's present economic crisis, the country's expensive and ambitious programme for science and technology now faces shocking sudden austerity. "A crisis can be good," says Pablo Rudomin, the distinguished neurophysiologist who is president of the Mexican Academy of Sciences. "It leads you to deep thoughts about where you're going. I think it [the crisis] will give us a sense of community. We'll have to work on priorities, and quality and on preserving what we have."

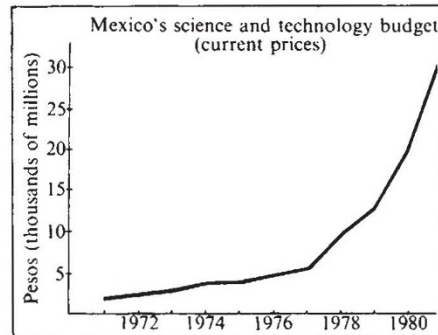
What has happened is that after a decade when the economy was flooded not just with domestic oil revenues but with loans from foreign banks (chiefly in the United States), Mexico has found that it cannot pay the instalments due on its debts, estimated at \$80,000 million. The payments were rescheduled in August, since when the Mexican banks have been nationalized. All sectors of the economy will have to be cut back, but just how will not be known until the new government of President Miguel de la Madrid Hurtado takes office on 1 December.

"Things will change, but probably for the good," echoes economist Manuel Gollás, who holds a key political post as head of the advisers to the director general of the Consuejo Nacional de Ciencia y Tecnología (CONACYT), the Mexican science agency. One irony of the boom, he reflects, is that sometimes "we had more money than we did worthwhile projects".

Supported with government oil revenues and announced with a great fanfare at the beginning of President José Lopez Portillo's 6-year term, Mexico's science and technology programme was designed to strengthen the infrastructure of science and to encourage Mexican self-sufficiency in technical matters. The programme was nothing if not ambitious. Basic research did well, but there were also

special priority programmes in fields such as agriculture and nutrition. The energy programme included work on nuclear and solar energy production. There were schemes for supporting industrial research, and the government had emphasized the importance of training graduate students.

Interviewed in their respective offices in Mexico City, both Rudomin and Gollás acknowledged that the programme had been criticized as being only a shopping list of unrelated projects, reflecting the interests of individuals and government agencies. Indeed, its execution reflected this pattern. CONACYT, which designed



the original programme and serves as the president's science adviser, actually controlled only 11–12 per cent of the total science and technology budget. The government gave the rest directly to universities (the major one being the Universidad Nacional Autónoma de México, whose main campus is in Mexico City). Money for the Institut Politécnico Nacional, for example, comes from the Ministry of Education. Private industry and foundations play almost no part in sponsoring Mexican science.

More than half of CONACYT's budget for 1981, estimated at 3,899 million pesos, went for scholarships, another 20–30 per cent for administration, public relations, and publications. Grants for basic science directly to investigators in fact accounted

for only 5 per cent of the budget, Rudomin estimates, or 109 million pesos. With other funds, basic research claimed about 20 per cent of the total CONACYT budget.

The science programme built on a major educational effort launched by the government of President Luis Echeverría in 1970 to stress education, including science and mathematics in the Mexican schools (*Nature* 280, p.101; 1979). According to Mexican officials, in 1968–69 Mexico had around 600 PhDs. By 1982, after more than 26,000 scholarships had been awarded, it claims 15,000 technically trained graduates, of which an estimated 6,000 hold a PhD.

Language a barrier

Mexico's ambition of achieving excellence in basic science is complicated by a double-edged language barrier: few scientists in the English-speaking world read Spanish scientific journals, while not many Mexican scientists know English well enough to publish in English-language journals. Even among Latin American countries, Mexico ranks low in the prorated number of its scientific publications in English-language journals, according to one recent survey. Many Mexicans feel it is "traitorous", as one of them put it, to publish in English. The Mexican science agency was sharply criticized when it decided that its fourth publication should be in English. (This is *RD Mexico*, a colour magazine that is suspending publication because of the current crisis.)

Science Citation Index reports that of the 3,068 journals in the index, only 13 are published in Latin America. Of these, 12 are published in Spanish and one is trilingual. Three of the 13 are published in Mexico. Latin America as a whole, therefore, contributes less to the index than does East Germany, which has 40 journals, or Austria, which has 24.

Mexican scientists complain that they are damned either way. If they publish in an English-language journal, their colleagues cannot read it and if they publish in a Spanish journal, their peers abroad will not. Yet English-language journals solve this dilemma for them, they allege, by discriminating against Latin American submissions. One scientist said that he has had an easier time getting his papers accepted by English-language journals when his co-authors have had Anglo-sounding names.

In any event, Mexico has a particular disadvantage on the language question because it did not experience the waves of immigration from European countries (except from Spain) that have admixed the populations of Brazil, Argentina and Chile. Deborah Shapley

One result is that most Mexican scientists are younger than Rudomin, who is in his mid-forties, and his predecessor as president of the Academy, engineer Daniel Reséndiz, who is 42. "Mexican science is not more than 40 years old," says Rudomin. "The first thing we have accomplished is to have trust in ourselves." Rudomin himself returned to work in Mexico after a stint at the Rockefeller University in New York. He has striven, he says, to make other Mexican scientists abroad come home to do good science.

However, the science programme did not succeed in achieving its goal that 1 per cent of the Mexican gross national product (GNP) should be devoted to science and technology. Science and technology have been between 0.38 and 0.47 per cent of the Mexican GNP for the past decade, whereas in developed countries the proportion is more than 2 per cent.

On the other hand, Mexico's GNP has grown so fast that the monetary gains for science and technology have been huge. The annual increases in government spending on science and technology averaged 34 per cent in the decade 1971–81.

The present crisis has changed all this. Sitting in his modest cinderblock office, Rudomin says wistfully of the CONACYT

basic science budget, "This year it was going to be 400 million pesos. Unfortunately, we are going to have a change in the slope. Our concern now is to keep what we have achieved."

Whether that will be possible is an open question. The ambitious science programme — and the financial policies that have got Mexico into trouble were the work of the Portillo government. By custom, the new government of president-elect Hurtado will be able to reshape science policy entirely: political appointees such as Gollás are getting ready to leave their jobs. "Our programme in science and technology was oriented as far as possible to the goals of the national development programmes, the whole national economy and society. That connection should be maintained, Gollás says.

Rudomin met Hurtado in August and is on a committee of scientists appointed to advise the new president before he takes office on 1 December. "When there's an economic crisis, they will try to solve the immediate problems," Rudomin says. "I think it depends a lot on us, whether we will be able to convince them that it is important to have this [science]. I think that it's going to be a difficult task."

Tabitha Powledge

Woods Hole laboratory

Summer camp seeks more funds

Woods Hole, Massachusetts

The passage of Labor Day last Monday will allow the biologists' favourite summer camp, the Marine Biological Laboratory, to settle down to its year-round pre-occupation: fund-raising. By the centenary of the laboratory in 1988, the plan is to have raised \$27 million, much of which will be spent on the rehabilitation of laboratories. There are also fond hopes of augmenting the endowment fund, now more or less a pittance at just over \$3 million.



From candle-making to administration

According to Dr Paul R. Gross, director of the laboratory since 1978, money began to dry up in the early 1970s. One of the painful discoveries since then is that the laboratory has no funds with which to cover the cost of maintaining buildings, but there are also ambitions to get rid of wet laboratories immediately above parts of the library (which needs also to be extended by 10,000 square feet) and to rehabilitate the housing in which the

summer campers camp.

These anxieties seem not to have depressed this summer's visitors, more than 1,000 altogether. Clam chowder has been bounteously consumed. People have acquired a tan that should last until Thanksgiving, and the beaches have been as full as ever in the afternoons, at least until the weather turned cold towards the end of August.

The popularity of Woods Hole may be, in the long run, its most enduring asset. Gross says that the competition for places on the seven summer student courses has been as brisk this year as in the past. Three-quarters of the successful applicants turn out to be graduate students; the remainder are an interesting mixture of advanced undergraduates and postdoctoral people.

The competition from more senior people to spend the summer at the bottom right-hand corner of Cape Cod is probably, however, more influential. Some senior people turn up to help teach courses; others move their research projects lock-stock-and-barrel, bringing their assistants with them. Prudent applications to grant-making agencies specify the importance of access to fresh squid or some such animal, for the laboratory will charge bench-fees, while the cost of accommodation will be extra.

Woods Hole, a frankly elitist establishment, is thus a continuation of academic life by other means — means by which a person's knowledge of how to organize a