

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

clam-bake or to sail a boat may partly offset his ignorance of, say, the mechanisms by which nuclear RNA is processed. Some regular summer visitors have opted out, saying that they prefer their vacations straight. The regulars remark on the importance of each evening's social encounters.

Financially, the seasonality of Woods Hole must be a serious handicap, which is why some importance is attached to two recent innovations — student courses in January (this year there were four) and the continuing research programme (which at present keeps 95 professionals active all year round). Even so, the laboratory (whose operating budget is just over \$6 million, excluding the cost of peripatetic research projects) reckons that it recovers only 42 per cent of the cost of its facilities from those who use them, and that it is at present running on a deficit of about \$750,000 a year.

Part of the problem is constitutional. Since it was established in 1888 to help young women from Boston learn some science, the laboratory has been managed by its members, of whom there are more than 650, who in turn elect the 36-member board of trustees which for practical purposes determines policy.

The climate of opinion seems slow to change (and remains unwilling to commit too much of the site to year-round activities). Indeed, Paul Gross calls himself a "one-man glue-pot" whose job is to hold the place together. Two tangible proofs of



Paul R. Gross — one-man gluepot

his success are apparent — reluctant agreement that there should be a fund-raising effort of any kind and the conversion of the candle-house left over from the New England whaling industry into a handsome administration building.

The plight of the laboratory is thus desperate but not serious. (People tend quickly to say that the Oceanographic Institute, split off from the laboratory in 1930, has greater difficulties.) Visitors nevertheless cannot help but wonder whether the first word in the laboratory's title is still apt, given that "marine" featured in the title of only one of this summer's seven courses.

Biotechnology index

Biotechnology beats bull market

Reflecting the US stock market's sudden surge in August, *Nature's* monthly index of biotechnology company stocks jumped 18.1 per cent from the base of 100 at which it began last June (*Nature* 12 August, p.599).

The *Nature* Biotechnology Index at the close of August (see box) shows that biotechnology companies outperformed two leading indicators of overall US industrial performance during the same period. The 18 per cent rise between 25 June and 27 August was greater than either the rise in the Dow Jones Industrial Average, which rose 10 per cent, or the rise in the Standard & Poor 400 Index which rose 7 per cent, as the table shows.

Biotechnology and other US stocks

Date	<i>Nature</i> Biotechnology Index	Dow Jones Industrial Average	Standard & Poor's 400 Index
25 June	100.0	803.8	122.09
30 July	102.7	808.6	119.95
27 August	118.1	883.47	130.75

Both of these general industrial indicators declined in July, whereas the Biotechnology Index rose to 102.7 in July.

The biotechnology companies as a group also did better than Standard & Poor's index of 12 leading US drug companies, which rose by only 3 per cent during the same two-month period. However, the drug index rose 11 per cent between the end of July and the end of August.

The *Nature* Biotechnology Index is weighted according to the total market value of each company's outstanding shares. It includes 15 representative biotechnology companies publicly traded in the United States. Three of the companies

are based outside the United States.

Wall Street analysts who follow the emerging biotechnology industry were not surprised that the companies as a group performed well during the sudden rally at the end of August that saw trading at record volumes. "People had been looking for refuges in this market" said one analyst at Oppenheimer and Company. "They were looking for safe stocks, buying defensively, selecting only stocks that looked like they would have high growth". More traditional US companies, in the steel, automobile and chemical industries, are unlikely to be favoured until traders think that the decline in interest rates will enable those ailing industries to recover, she said.

Among the biotechnology stocks listed in the *Nature* index, the best performance was by well-established firms, such as A/B Fortia of Sweden, Novo Industri of Denmark, and Genentech of south San Francisco, California. But the stocks of many of the smaller companies did not move at all and some declined. Analysts explained this by saying that active traders tend to avoid very small companies because a purchase can control the overall price. The fortunes of the smaller companies are affected by internal changes.

For example, Bio Logicals, of Ottawa, Canada, saw the value of its 5.9 million shares of outstanding stock decline from \$3 to \$2 per share between July and August, partly perhaps because it has been without a chief executive officer since Robert Bender left in May. Such changes make a big difference to a small company's owners, but little to the market as a whole. "It's a volatile market", as one Wall Street analyst said.

Deborah Shapley

Nature index of biotechnology stocks

1982 high	1982 low	Company (Headquarters)	Close previous month	Close 27 Aug	Change
32 3/4	16 1/8	A.B. Fortia (Sweden)	25 3/4	32 3/4	+7
8	2	Bio Logicals (Canada)	3	2	-1
7	3 3/8	Bio-Response (US)	4 7/8	4	-7/8
14 1/8	8	Cetus (US)	9	8 7/8	-1/8
11	6 1/8	Collaborative Research (US)	8 1/8	8 1/8	0
21 7/8	14 3/4	Collagen (US)	17 3/4	17 1/8	-1/8
8 7/8	5 3/4	Damon (US)	6 1/4	7 7/8	+1 3/8
17 1/4	11 1/4	Enzo-Biochem (US)	11 1/4	12	+3/4
28	6 7/8	Flow General (US)	7 1/8	10 1/8	+3
37 3/4	26	Genentech (US)	30 3/4	33 3/4	+3
3 3/8	2 1/4	Genetic Systems (US)	2 3/4	3 1/8	+1/8
17 7/8	9 7/8	Hybritech (US)	13 3/4	14 3/8	+1/8
10 3/4	6 1/4	Molecular Genetics (US)	6 1/8	10 3/4*	+4 1/8
46 3/4	34 7/8	Novo Industri A/S (Den.)	39 7/8	46 3/4*	+6 7/8
12 3/8	8	Monoclonal Antibodies (US)	9 1/4	9 3/4	+1/2

The *Nature* Biotechnology Index for August 1982 stands at 118.1. Base of 100 as of 25 June 1982. See *Nature*, 12 August, p.599. Close of month prices at the close of business on the last Friday of the month. Where stocks are traded over the counter, the price quoted is the bid price. For stocks traded on the American and the New York Stock Exchanges, the price quoted is the transaction price. Data courtesy of E.F. Hutton, Inc.

*High or low for this calendar year.