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EDITORIAL

Science in Latin America

The magnificent stone palaces of the Incas and the pyramids of the Mayas are giving way to the laboratories of modern cities. The thousands of dialects created by isolated communities in impenetrable forests are accepting the invasion of computer language. This issue of *Science* reports the rising tide of science and scientific research in the vast and historic lands of Latin America.

Much has changed in the Latin America of the 1990s. Democratically elected governments have replaced the military rulers of the 1970s, and burgeoning economies have dispelled the economic crises of the 1980s. There are shadows, to be sure, such as the rebellion in southern Mexico and the instability in that country's economy. But as Latin America as a whole takes steps toward economic and political well-being, *Science* decided it was time to look at how science is faring. For the people of the region, the question is crucial. Future economic growth will depend, as it does in the developed world, on a foundation of scientific and technical know-how. For scientists in the rest of the world, Latin America—a region of nearly 20 countries and 450 million people—is a potentially vast source of scientific brainpower and resources.

This extended coverage of science in Latin America was achieved by four dedicated and perceptive reporters: Tim Appenzeller, Eliot Marshall, Jon Cohen, and Jocelyn Kaiser. Two Policy Forums by Francisco Ayala and Luiz da Costa add a general overview of what is needed to further improve Latin American science.

Like their colleagues elsewhere, Latin American scientists have to struggle with lower budgets than they would like and competition from researchers in other lands. In their situation, the funding problem is more severe because it is not constant or predictable. They also face other problems less familiar to scientists in other countries. Among these problems are special difficulties in equipping their laboratories and communicating with their colleagues and a persistent brain drain that siphons off some of their best students, who are drawn to opportunities in Europe and the United States.

Nevertheless, these scientists continue to produce good science and contribute discoveries in a wide range of disciplines from physics to biology. They show resourcefulness in use of scarce funds and symbiotic collaboration with scientists in areas where better funding or better equipment is available. The slope of the curve depicting increased activity and new contributions is positive and upward. This issue describes facilities and attitudes that reflect the finding and opinions of those carrying out research in Latin America.

Major contributions to Latin American science have come from private philanthropy (Nobel Prize winner Leloir financed his research out of his own personal fortune). But as the data in this special issue show, governments in the region are gradually increasing the amount of support for research and its constancy. The latter is important. Young people considering careers cannot depend on a system in which support waxes and wanes. Unstable funding also makes it difficult to build up a critical mass of scientists or undertake long-term research projects.

The research has focused, in part, on local problems, such as Chagas disease and amebiasis, and on local assets, including the tambaquí fish and the clear skies and high altitudes of the Andes. An interesting project is one to improve tortillas. Mexico consumes 10 million tons of tortillas each year. To produce that amount requires 10^{10} liters of water to soak and wash the corn. This uses up a scarce resource and delivers a highly alkaline waste water. Research on ways to make more nutritious tortillas with higher efficiency and less contaminated water is paying off—a result of great practical value. Latin American researchers are also aiming their talents at issues of global importance, such as high-temperature superconductivity and the behavior of ion channels in cell membranes.

The sophistication and extent of this research is steadily increasing, and it seems obvious that the studies of these scientists will not only improve the lot of Latin Americans but also the whole world.

Daniel E. Koshland Jr.