agriculture. Monarca, with support from the World Wildlife Fund, is launching a program to help the local inhabitants improve agricultural and forestry techniques to compensate for the loss of their land. The monarch preserves could, however, greatly help the local economy. Freese notes that last year alone more than 50,000 people visited the sites, and local artisans are already catering to the tourist traffic.

The situation in California is more complex. It is generally accepted that the western monarchs follow a similar migration to those in the east, leaving their winter roosts in early spring to migrate inland and northward, and their descendants will return in the fall. At least one scientist challenged this notion at the Los Angeles meeting, however. Adrian Wenner of the University of California at Santa Barbara argued that there is scant evidence that western monarchs undergo a true long-distance migration in the fall, and proposed instead that the butterflies simply expand and contract their range with the seasons. Wenner did not win many converts, however. "There is no question in any of our minds that migration is taking place," says Christopher Nagano, staff biologist with the Monarch Project, a conservation group based in Portland, Oregon.

In any case, it is clear that the monarch's western winter habitats are disappearing at an alarming rate as prime ocean real estate is turned over to commercial development. The Monarch Project has been attempting to locate roosting areas and, according to Nagano, seven of 45 known sites have been destroyed in the past 2 years alone.

How many more sites could be lost before there is a serious impact on the monarch population is anybody's guess, but entomologists, including Wenner, are expressing growing concern. Wenner also argues that it is essential to preserve patches of milkweed.

The Monarch Project is having at least some impact in zoning decisions and the granting of building permits. A few years ago, Nagano says, government agencies "used to laugh" when told that proposed developments might destroy the butterfly's winter roosts. "Now," he says, "some agencies come to us to ask whether developments will endanger sites." But this is not always enough. According to Nagano, commitments have been made to preserve the monarch roosts in development plans, but the trees have been cut down anyway. The Monarch Project is now hoping that growing public awareness of the monarch's unique and spectacular migration will provide sufficient pressure to preserve the phenomenon for future generations. ■

COLIN NORMAN

ICSU Bids for Bigger Share of the Limelight

But a contested presidential election reflects continuing tensions over the role of an organization to which most scientists belong but many know little about

Paris

CONTESTED elections for top posts are rare in the International Council for Scientific Unions (ICSU), the umbrella body that links together 20 international unions representing individual scientific disciplines, as well as 71 national academies and research councils. Next week, however, delegates attending ICSU's 21st General Assembly in Berne, Switzerland, will, for the first time in many years, be asked to make a choice between two rival candidates for the next president.

Some of the scientific unions belonging to ICSU have decided to back an "outsider" candidate, Swiss chemical engineer Heinrich Zollinger, against Indian physicist M. G. K. Menon, the original nominee of the executive committee. Their unusual move suggests the depth of feeling over one of the most divisive issues currently facing the international scientific community—how to react to South Africa's apartheid policies in the context of ICSU's support for the free movement of scientists.

Some are urging that ICSU should fill the void created by UNESCO's decline.

In particular, Zollinger's main backers—such as the International Union of Pure and Applied Chemistry and the International Union of Crystallography—are also pushing a resolution that would prevent ICSU-affiliated organizations from holding scientific meetings in countries (such as India) which require South African scientists to declare their opposition to apartheid before being granted entry visas (if, indeed, they are offered visas at all).

Both candidates for president have strong scientific credentials. But Menon has long been active in government science policy circles in India, as a top science adviser to both Prime Minister Indira Gandhi and, more recently, her son Rajiv Gandhi. Zollinger, a former president of Switzerland's National Science Foundation, is said to appeal more to those who argue that politics should be kept at arms length from science. Indeed, when he was president of IUPAC several years ago, he came personally into conflict with the Indian government over the admission of Israeli scientists to a scientific conference.

Divergent perspectives are not new within the scientific community on how it should relate to governments and to political issues that impinge on science. Indeed, tensions have never been far below the surface in discussions among those who, for a variety of reasons, have sought to organize science on a global scale.

Participants in these discussions tend to fall into two camps. One argues that since basic science is primarily funded by governments, its international organization should also be a government responsibility, with scientists acting largely as advisers. Those in the second camp accept that government backing is required—for example in providing both the funds and the facilities needed to mount large-scale global research projects—but argue that decisions on how funds are allocated should be left in the hands of the scientific community.

Partisans of the first approach, such as prominent British scientists Julian Huxley and Joseph Needham, were largely responsible in the immediate postwar years for adding science to what was initially to have been merely the United Nations Educational and Cultural Organization, thus turning it into UNESCO.

For the past 40 years, the broad scope of UNESCO's activities and the size of its science budget (currently $35 million a year) have tended to overshadow those of ICSU, an older body which evolved in 1931 out of the International Research Council. The IRC was itself established in 1919 with George Ellery Hale, the founder of the National Academy of Sciences' National Research Council, as one of its chief architects, and ICSU has remained the main channel

through which supporters of the second approach have pursued their aims.

ICSU and UNESCO have a close working relationship. ICSU is recognized as the UN agency's main source of scientific advice, and the principal channel for its financial support to the international scientific community through an annual grant. Furthermore, the two have cooperated on scientific projects such as the International Biosciences Networks, the International Geological Correlation Program, and the Man and Biosphere program.

UNESCO's current difficulties, however, have led some leading activists within ICSU, particularly—but not exclusively—those coming from the U.S. scientific community, to suggest that the time is ripe for their own body to play a more visible role on the international stage.

The reasons are partly ideological, reflecting a desire to be acknowledged more widely as the "conscience" of the scientific community, but also financial. The reduction of UNESCO's operating funds caused by the U.S. withdrawal last year (followed by Britain) has led the UN agency to cut its contribution to ICSU's $2-million annual budget from $541,000 in 1985 to $329,000 in the current year.

Despite initial promises, not all this money has been made up by direct grants to ICSU. The United States has offered an extra $148,500 through the National Academy of Sciences, and Britain's Overseas Development Agency has also provided a grant, but these still have not met the reduction in the UNESCO contribution.

Finding funds for future expansion will therefore require turning to the private sector, in particular to foundations and even, some have suggested, multinational corporations. And to do this, it will be necessary for ICSU to emerge from the relative obscurity in which it has tended to operate in the past. Molecular biologist John Kendrew, master of St. Johns College, Oxford, and current ICSU president, points out that although the organization claims to represent all scientists, most have never even heard of it. "It is rather paradoxical," he admits.

Achieving greater visibility for ICSU and its activities was one of the main recommendations to emerge last year from a 3-day meeting on the organization's future held at Ringberg Castle in southern Germany at the suggestion of its then treasurer (and former foreign secretary of the National Academy of Sciences) Thomas F. Malone.

Several steps have already been taken in this direction. For example, a committee has been set up to examine ways of increasing links with the mass media, perhaps through the appointment of a full-time press officer, and discussions are taking place about creating a new policy journal, provisionally entitled "Science International."

Raising more money, however, as British physiologist and ICSU finance committee chairman Richard Keynes admits, will require specific projects, since these are our "only really saleable products." Over $700,000, for example, was raised from bodies such as the Andrew W. Mellon Foundation, the Carnegie Corporation, and the Rockefeller Brothers Fund, to help cover the costs of the recent highly publicized report on the effects of nuclear war.

One planned project that could raise the organization's visibility and thus, indirectly, its ability to raise funds, is the multi-year International Geosphere/Biosphere Program (IGBP), which is intended to study the global impact of human activities on the relationship between the geosphere and the biosphere. The project is popularly known as Global Change. Like its predecessor, the highly successful International Geophysical Year of 1957–58, this started life as a U.S. idea that has since been given an international dimension, largely through the offices of the National Academy and its strong involvement in ICSU.

Although the Global Change program has met with some skepticism, it is expected to get ICSU's endorsement.

The project has met with some skepticism from parts of the scientific community. Last year, for example, the executive committee of the International Union of Geodesy and Geophysics suggested that "the need for a global view does not necessarily imply a need for a new global super-program." Others have expressed concern that funding and manpower demands for the new program could compete with those currently allocated to other global research projects, such as the Man and Biosphere program.

Some of the initial skeptics have been converted, however. Britain's Royal Society, a leading critic in the early stages, now says it feels that it is the "the right moment" for such a program. Furthermore, the Swedish government, which has invested heavily in space-based observation technologies and is a strong ICSU supporter, has already offered to cover the costs of a small full-time secretariat in Stockholm.

As a result, IGBP is expected to receive the endorsement of next week's General Assembly in the form of a decision to set up a scientific committee to agree on an initial research agenda. This will also give a boost to those arguing that ICSU should bid for a more ambitious role in the organization of all scientific disciplines on a global scale, a move enthusiastically endorsed by some of the main architects of IGBP.

For example, a position paper submitted to the Ringberg meeting by Malone and Francesco di Castri, a former director of the Man and Biosphere program who now works for France's National Center for Scientific Research, argues that a "single scientific agenda" should be identified to harmonize the activities of the various members of the ICSU "family." They suggest that the present $6-million collective annual budget of this family "should be trebled," and Malone has separately described ICSU as the "steering wheel" of international science.

Others speak in more modest tones about the scope of ICSU's future ambitions. They talk of functioning as an "efficient interface between governmental and nongovernmental organizations," and emphasize what ICSU's current vice-chairman, Walter Rosenblith, who is also foreign secretary of the National Academy of Sciences, describes as the organization's "catalytic" role in international activities.

But even here, the vision of ICSU becoming an International Council of Science, embracing both the promotion of science and reflections on its social impacts, is not far below the surface.

Many of those planning to attend next week's meeting in Berne say they back attempts to strengthen the organization's small secretariat—which currently consists of seven people and is widely praised for its efficiency—and support moves to give ICSU a greater public identity.

There is less consensus over whether the organization should attempt to play a more active role in the political scene. Differences of opinion are likely to be most acute on the issue of apartheid and the free movement of scientists. On the broader question of the future of ICSU, supporters of radical changes argue that if the organization does not seize the opportunity to play a more prominent role, it will remain, in the words of one member of the Ringberg working party, "a somewhat elitist, but comfortable club protected from the main buffeting of public-political concerns."

They will have to reckon with others who argue that ICSU may operate most effectively by remaining just that. ■

DAVID DICKSON