

Taking knowledge to the poorest

Three months ago, the World Bank warned of the dangers of a growing 'knowledge gap' between the rich and poor nations (see *Nature* 395, 529; 1998). In the following pages, *Nature's* correspondents describe the increasing attention being paid to the search for ways in which this gap might be bridged.

The first article outlines the origins of the World Bank's concerns, and some of the debates this has provoked inside the bank about the nature of development aid. This is followed by a description of the growing interest in the United States and Europe in placing such aid on a more scientific footing.

Our Indian correspondent describes some cautionary tales of the pitfalls associated with imposing science-based solutions on problems where the social environment has not been adequately taken into account. Finally, we look at the promise offered by new communications technologies to the Third World, in particular the growing use of the Internet.

The picture that emerges is one of promise and opportunity, but also of significant hurdles, both financial and institutional. Both sets of issues will be discussed at the World Conference on Science, organized by the United Nations Educational, Scientific and Cultural Organization (Unesco) and the International Council of Science, and to be held in Budapest at the end of June.

In a bid both to contribute to and to stimulate discussion of the issues, a section of the *Nature* website will follow and comment on the preparations for the conference. The site opens today (7 January) with a contribution from Federico Mayor, the director-general of Unesco, on why science needs to renew its 'social contract' with society, and includes fuller versions of the five articles published here. It can be accessed on www.nature.com. **David Dickson**

World Bank invests in global science base

[LONDON] After 50 years of paying for roads, power and schools, and helping poor countries to liberalize their economies, the World Bank — the financial arm of the United Nations system — has started shifting some of the focus of its activities to supporting 'knowledge development', including science.

Two separate internal World Bank task groups are investigating a potential role for the bank in supporting science in developing countries. Each group will report back this year with proposals on how the bank can best support basic research, something it has never before considered, how to make its expertise more available to developing countries, and whether it needs a science department to oversee its new initiatives.

The bank, which is owned by 180 governments, provides long-term loans at commercial interest rates, mainly to developing countries. One quarter of its lending is interest-free and goes to the poorest. In the 1980s, with its focus on infrastructure development and trade liberalization, it closed its science department and abolished the science adviser's post.

Direct support for research in developing countries is now seen as more of a priority. This is because the bank believes research will help to find solutions to its priority issues, such as providing the poor with access to food, clean water and a disease-free environment.

But it also comes from a belief that developing countries need to build up knowledge-based industries to remain economically competitive. In an attempt to help the poorest countries, particularly those in Africa, to catch up with those better off, the bank is helping to fund information technology infrastructure under a programme called *infoDev*.

As a sign of this new thinking, the bank devoted the latest edition of its annual World Development Report to bridging the 'knowl-

edge gap' between rich and poor countries. Last month it agreed to partly fund in Chile the first in a chain of centres of excellence in scientific research — known as Millennium Institutes — in developing countries (see *Nature* 395, 529 & 396, 711; 1998).

Both events represent the culmination of a three-year study by the bank into how it can fund science in developing countries in partnership with governments and philanthropic foundations. Ian Johnson, the bank's vice-president for environment, acknowledges that the bank previously considered research to be a luxury for developing countries. But he says that attitudes have changed.

"Development in the next 20 to 30 years is going to be more science-based," says Johnson. For example, he says, biotechnology and climate change will have a major impact on world agriculture. "We need to recognize, understand and be prepared for this."

Despite its previous reluctance to provide significant funds for research, the bank is no stranger to science. For example, it hosts the secretariat of the Consultative Group on International Agricultural Research, a network of 16 agricultural research centres mainly in developing countries. It is also one of three partners in the Global Environment Facility, the US\$2 billion United Nations funding agency for environmental projects.

When the bank closed its dedicated science department it decided to place greater priority on encouraging countries to liberalize their economies. This stemmed from the belief that a favourable economic climate was needed for projects to function and loans to be repaid.

Charles Weiss, programme director of science and international affairs at Georgetown University in Washington DC, was the bank's science adviser in the early 1980s. He believes this latest attempt to get the bank thinking about science has more chance of succeeding than his own efforts. This, he says, is partly because they have the support of senior executives, particularly James Wolfensohn, the bank's president, and partly because the bank is now keen to promote knowledge-based development.

This strategy is based on the bank's need for a new role now that private capital has replaced development aid as the main source of external finance for developing countries. Whereas the bank's lending has remained at around \$20 billion for the past five years, private-sector foreign investment in devel-

Gift of knowledge: information technology has an essential role to play in world development.



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oping countries has increased sevenfold, to more than \$150 billion per year.

Wolfensohn is known to be keen for the World Bank's profile as a 'knowledge bank' to be raised. "When the bank was a major financial influence, its information role was downgraded," says Weiss. "Now it is the reverse."

Unusually for a lending institution, the World Bank possesses world-class expertise on the projects and the regions where it lends money. Of its 8,000 staff, 3,000 have a PhD-level qualification, and many of these are top-ranked researchers headhunted from universities. The quantity and quality of the bank's research is consistently high.

But this more analytical aspect of the

bank's work has always been overshadowed by its lending arm — known as operations — which has generally considered research to be a function of lending, rather than an activity in its own right. In 1987, half of the research funds were sent to work in operations.

This tension between the research and lending wings remains, and is one of several challenges that will need to be overcome if the new strategy is to bear fruit. In particular, the need for a new department for science is being questioned by some who do not want to see science confined to a ghetto and think it should be part of the lending portfolio of all of the bank's departments.

Some operations staff have yet to be con-

vinced of the merits of raising the bank's research profile or funding research in developing countries. They believe that more attention should be paid to conventional infrastructure needs in poorer countries which, because of low credit ratings, will have little access to private capital.

The reaction from developing countries will be an important test of the new strategy. The richer countries of southeast Asia, Latin America, North Africa and the Middle East are likely to be more receptive than poorer countries, particularly in sub-Saharan Africa, where the bank is not popular, and where almost 50 per cent of bank-assisted projects have failed during this decade. **Ehsan Masood**

US spirit is willing, but funds are still weak

[WASHINGTON] International collaboration has never been a higher priority for the United States, if public pronouncements by the leaders of the scientific establishment are anything to go by.

Bruce Alberts, president of the National Academy of Sciences, has made collaboration with the developing world one of his top two priorities (the other being science education in schools). "A generous sharing of knowledge resources by our nation's scientists and engineers can improve the lives of those who are most in need around the globe," he told the academy's annual meeting last April.

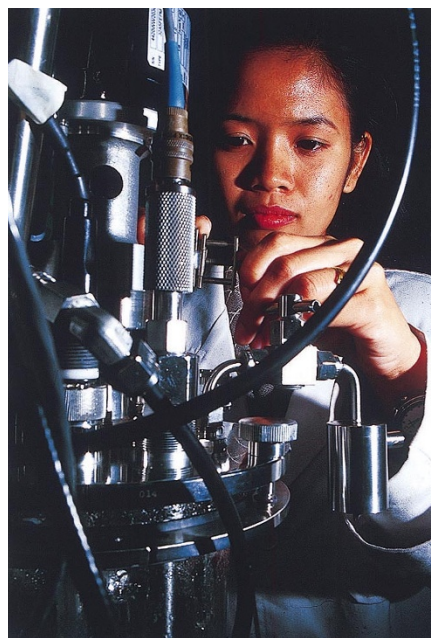
Harold Varmus, director of the National Institutes of Health (NIH), has placed new emphasis in the past year on the need for the NIH to confront global health problems, such as malaria and African strains of AIDS.

And Rita Colwell, the new director of the National Science Foundation (NSF), has spent much of her first few months in office travelling abroad, talking in particular about her collaborative experiences in cholera research (see *Nature* 396, 202; 1998).

But critics say there is more talk about such collaboration than action. And, by raising the issue now, these three scientific leaders are perhaps acknowledging that, in practice, the large and well-funded US scientific community has never been more isolated from the rest of the world.

"We've moved a long way backwards in the past 40 years," says Alberts, adding that a new generation of researchers "has little knowledge about the opportunities and challenges" of working with scientists abroad. "The young people have enormous potential interest" in such research, "but they don't see how to do it," he says.

Of the \$75 billion that the US government will spend on research and development this year — a quarter of it on basic research — only a small fraction will involve collaboration with foreigners. The NIH, the science



Worldwide prescription: the NIH is set to pursue a global public health agenda for the first time.

agency least constrained in spending money abroad, says it will spend \$200 million (1.5 per cent of its budget) on international projects.

The international division of the NSF will spend \$20 million, although other activities at the agency involving foreign partners will cost ten times as much. "They get crumbs from the table," mutters an international official at one leading US scientific society.

Some critics go further in taunting the US track record in supporting international collaboration in science. In the current issue of the journal *Issues in Science and Technology*, Congressman George Brown (Democrat, California) and Daniel Sarewitz of Columbia University's science policy unit write that "although there was little evidence that [international science and technology agreements] have led to significant scientific part-

nerships, there is plenty of evidence that they support a healthy bureaucratic infrastructure in the US government".

Critics also contend that the international division at NSF and the Fogarty International Center, which performs an analogous function at the NIH, have a marginal impact on the powerful directorates and institutes that dominate the two agencies.

One man planning to change that is Gerald Keusch, a biologist with a strong track record in researching infectious diseases in Africa, who was picked by Varmus last September to direct the Fogarty centre. Keusch says Varmus left him in no doubt that the NIH is ready to pursue "a global public health agenda — which is something different from NIH's agenda in the past". In the coming year, the centre's budget will grow by 25 per cent, to \$35 million, although it will remain the smallest budget of any NIH institute.

The Fogarty centre has been shifting its collaborative emphasis from work with scientists in developed countries to work in developing countries and the former Soviet bloc. Between 1987 and 1996, the proportion of its spending on the latter two groups doubled, to more than 40 per cent of the total.

Keusch expects this trend to continue. "My goal is to steadily focus on the developing and transitional countries where needs are greatest," he says. He adds that other mechanisms exist to support collaboration between developed countries.

Keusch is the first director of the centre to also be appointed associate director at the NIH — at the recommendation of an external study into Fogarty's effectiveness. He hopes that this, together with his own scientific relationship with the directors of several powerful NIH institutes, will enable him to increase the centre's influence.

He is also working to improve relations with the World Health Organization, the World Bank and the US Agency for Inter-