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## China looks West

All our news pages this week are devoted to Joseph Needham's impressions of developments in science policy in present-day China. Dr Needham, of course, needs no introduction as a renowned historian of Chinese science and technology. His recent month-long visit to China was made with encouragement and support from *Nature*; we wished to learn of the impact of recent political events on science, and assess the results of the National Conference on Science Policy held earlier this year.

It is clear that Chinese scientists are living through times of immense change—of a sort that Westerners would find almost impossible to comprehend. Within the past few years kept firmly in their place—even actively discouraged—by a tide of anti-intellectualism, they now find themselves given every support, and treated as a precious resource. Any doubts about the seriousness of this new resolve must be dispelled by the massive educational exchange programmes that the Chinese are negotiating with scientifically advanced countries.

So what do Chinese scientists need most at present? They certainly need a period of many years of tranquility, away from the limelight of political attention. For a generation science and higher education in China have lived on a switchback of alternating support, indifference, and even open hostility. Science cannot survive intact given such a bumpy ride. However, given its tranquility, it would be a pity if Chinese science and technology were to adopt the western model entirely without criticism. For while China has much to learn from the West in terms of building up its capacity to perform basic research, it also has extensive experience in applying science in ways that, while profoundly different from the West—may be becoming increasingly relevant on a global scale.

Certainly the Chinese are putting much thought into the most appropriate form of scientific and technological infrastructure; but they are looking to the West for advice. For example, a group of middle-level scientific managers is shortly to make a month's study visit to the US organised by the National Academy of Sciences, and will be making similar visits to other western countries to compare different ways of organising scientific effort. Further, despite the continued lack of full diplomatic relations with the US, economic interest appears to have taken over command from ideological differences in determining the scientific and technological relations between the two countries.

Indeed, the apparent non-political nature of science and technology has made contact and co-operation in these areas a convenient way of opening up broader social and economic contact while avoiding the embarrassment caused by the fact that the US still keeps an ambassador in Taiwan, but has only a liaison mission in Peking.

The most significant manifestation so far of the new situation was the visit of a 14-person delegation of top US science policy-makers, headed by the President's Science Adviser Dr Frank Press and including the heads of the National Science Foundation, the National Aeronautics and Space Administration, and the Department of Energy's

Office of Energy Research, to Peking last month for three days of talks.

Although no specific agreements were reached during these discussions, they helped create a broad framework within which more detailed discussion on specific areas are now taking place. For example, some hundreds of educational exchanges are likely to be set up and in October energy secretary Dr James Schlesinger will be visiting China to discuss, among other things, US involvement in developing China's oil reserves. Here the Chinese are interested in using US know-how to help exploit oil deposits off the coast as a way of financing their ambitious industrialisation programmes. US oil companies see a potential investment of between \$25 and \$50 billion in shared development programmes, which themselves could open up China to broader economic relations with the western world.

Several observers have drawn attention to parallels between China's relatively privileged position—as a relative late-comer to western-style industrialisation, able to be highly selective in the science and technology that it imports—and Japan fifty years ago.

However, with the yen now driving the dollar into the ground on international currency markets, the potential economic challenge has not gone unnoticed in US industry. And at the same time as it opens up the catalogues of the machine tool manufacturers, the US Department of Commerce is also providing instructions in US export controls.

Another problem facing the world will be the environmental and ecological stresses that could result from China reaching the level of industrialisation of western nations. China contains a quarter of the world's people, and it is estimated, for example, that at current western levels of oil consumption, China has the capacity for consumption twice the total annual production of the OPEC countries. And again one has only to look at the Japanese experience to find illustrations of the dangers that can accompany the application of technology with insufficient consideration of its side-effects.

In recent years, many in the West have turned to China as providing, under Chairman Mao's guidance, a different approach to ways of applying science, in which meeting basic human needs has often seemed to take precedence over the pursuit of economic profit. Recent travellers to China have reported that although many members of the new leadership are keen on pursuing the western development model, and are developing their scientific activities within this framework, some of their younger colleagues are giving this model close scrutiny.

From the West, one can only wait and see which way the political winds will turn. Certainly there is much to applaud in the concerted effort that the Chinese are now applying to building up the necessary scientific and technological infrastructure for science to play an active role in the nation's development. But one hopes that, in the process, the Chinese will be sufficiently discriminating and selective to preserve what is best of both eastern and western traditions. □