

Breaking walls, building bridges

As the initial euphoria subsides, scientists from East and West Germany are starting to realise that major barriers still exist to a working relationship

Mick Hamer, Berlin

THE OPENING of Berlin's Brandenburg Gate just before Christmas sets the seal on a new relationship between scientists in East and West Germany. Since the Berlin Wall went up in 1961 scientists in East Germany have largely been isolated from the West. "The system was very close to adiabatic [thermodynamically closed]," according to Bernd Wilhelmi, director of the Academy of Sciences' Institute of Physics in the German Democratic Republic. "It is not a system which fits a modern country."

Wilhelmi sees the relaxing of border controls as an exciting opportunity. But he admits that he is an optimist; although the disintegration of the Iron Curtain between East and West Germany offers the prospect of new cooperation between scientists in the two countries, the changes will also produce problems and stresses for both sides.

Science in East Germany, for example, has suffered as a result of largely missing out on the revolution in microelectronics. One reason for this is that the GDR has a chronic shortage of hard currency for Western scientific equipment. "It is not so difficult to get equipment which is made in our country, but we often need equipment from abroad," says Wilhelmi. "It is very difficult to get hard currency, so the average level of equipment is below that in West Germany or in the US."

The second—and probably the most important—reason for the lack of sophisticated research equipment is the 40-year-old embargo on high-technology exports to Eastern bloc countries imposed by the Coordinating Committee on Multilateral Export Controls (COCOM). "We have had to do all the things other countries did not have to do," says Wilhelmi. "For example, Austria never had to develop integrated circuits. The GDR had to. Austria did not build its own computer. The GDR had to. That's not very efficient."

The dearth of computers has seriously impeded the development of science in East Germany. Admittedly a handful of Western computers have slipped through, but modern research needs thousands of computers. And the problem with computers also applies to technologies as diverse as electron microscopes and high-vacuum systems.

The official line in the West is that the COCOM restrictions are supposed to

impece access to high technology with military applications. But many East German scientists see them as part of a political and economic war against the GDR, a view shared by some European industrialists who want to sell their wares there. Both groups claim that the way in which some products are taken off the list as soon as the East Germans have developed their own substitute is proof that much of the list is not primarily concerned with weapons research.

The isolation of East Germany's scientists has been partly due to the fact that the Communist Party is deeply entrenched in the GDR's scientific establishment. The party secretary in the workplace has been in a powerful position. For example, this official controlled travel abroad, and any scientist who wanted to work or visit abroad

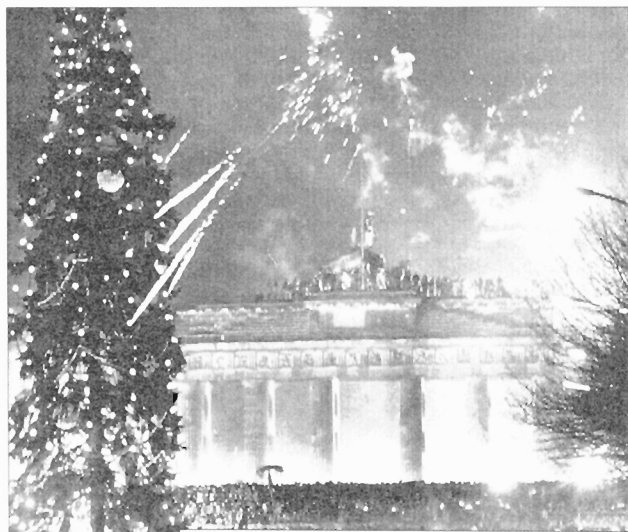
has had to be vetted by the secretary.

Wilhelmi, who until recently was director (vice chancellor) of Jena University, said that he always fought to give his young scientists trips abroad. Sometimes he was not successful: the bureaucracy objected to some scientists leaving the country because of fears that they might defect.

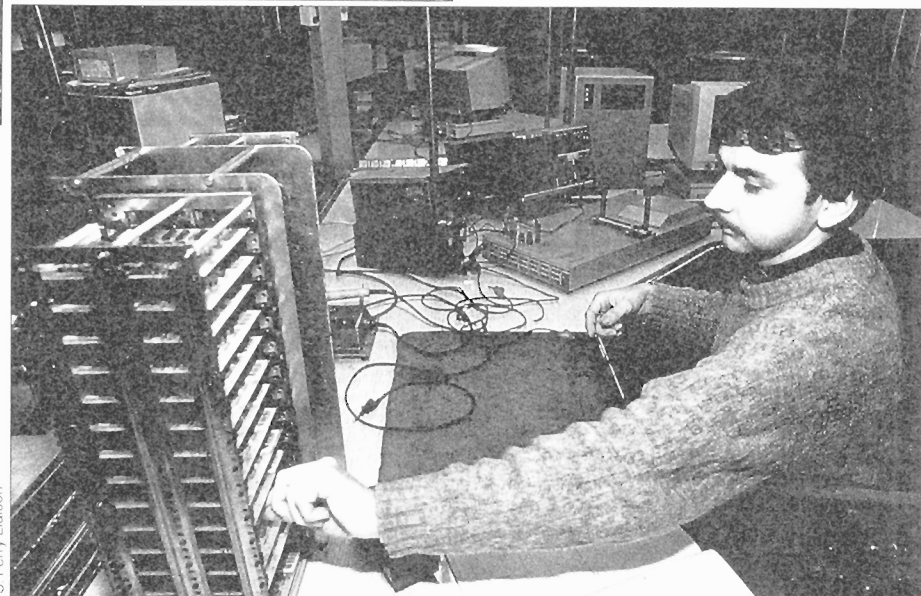
The biggest bonus for East German scientists since the border restrictions were lifted has been easy access to scientific libraries in the West. This is not as trivial as it sounds. Because of the lack of hard currency, few libraries in the GDR could afford Western scientific journals. In addition, access to photocopyers in the GDR has been strictly controlled in an attempt to prevent the circulation of underground leaflets.

For East German scientists, the result was that literature searches were extremely time-consuming. Now they are making full use of the possibility of access to scientific libraries in the West. In November, one library in West Berlin, the easiest place for East Germans to reach, was reporting 100 new members a day. Dieter Bimberg, professor of solid-state physics at West Berlin's Technical University, and a leading figure in efforts to promote close cooperation between East and West German scientists, says: "We welcome them here for their research. It doesn't cost anybody anything."

The comparative lack of research facilities has also influenced the type of research that is carried out. According to Bimberg, for example, theoretical physicists in East Germany have different strengths from those in the West. One school of thought in modern physics favours a massive number-crunching approach, the other a more



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S. Perry Liaison

After the celebrations, East Germany must find ways of catching up with the West. Areas such as microelectronics have been refused access to Western techniques

cerebral approach to the subject.

Bimberg says that the physicists are as good at the "pen and paper" thinking as any scientists in the West and can work wonders with personal computers—when they have access to them—through clever programming. But clearly they cannot compete on number crunching because they do not have Cray supercomputers.

One of the strengths of the East German approach to research is its commitment to linking basic and applied research. Out of the 2000 graduate scientists working at the Institute of Physics in East Berlin, for example, about half are working in pure science, and half in applied science. Wilhelmi quotes the motto of the Academy of Sciences, the words of its 17th-century founder Gottfried von Leibnitz, "*Theoria com praxi*", to support his point that both theory and application are necessary.

Given the country's many difficulties, East Germany is now naturally looking towards its Western neighbour for assistance. The most obvious response is the aid programme. West Germany will help the East to rebuild its roads and renew its ramshackle telephone system.

However, as Alex Bradshaw, the English-born director of the Fritz Haber Institute of the Max Planck Society, points out, such aid is not disinterested. Companies which will provide the technology to modernise the telephones will be West German ones, such as Siemens and AEG. Much of the benefit from the aid will flow back into the West German economy. There is also a question over the extent to which the latest high technology will be employed. Bimberg, for instance, has been lobbying the West Germans to give East Germany access to fibre optics for its

telephone system. He says that the West should give them up-to-date technology, not the technology of the early 1980s.

One unresolved question is the extent to which aid will be geared to political change. Wilhelmi said: "We have to build an alternative to capitalist countries, with a form of prosperous socialism. I hope that young scientists are interested to take part in the experiment." This remark prompted a variety of comments in the West, ranging from "that shows they have not changed at all", to the more measured response that both Britain and West Germany have had socialist governments in the past.

But there remains the thorny question of the future role of the Communist Party. The workplace secretary is no longer so powerful. At one institute, the party secretary called a meeting of members after the opening of the Wall on 9 November, and said he now discovered what he had been telling them for years was untrue. He said he was resigning, not only from his job but from the Communist Party.

However, communists cannot simply be removed from their positions, since many have important managerial experience. And most of the scientists who will run the GDR's scientific institutions for the next decade are likely to have been members of the Communist Party, since almost every scientist of note in East Germany has been a Communist Party member. "We have to live with that," says Bimberg. "Many of them were indeed idealists. I am happy to work with people who were SED [Socialist Unity Party] party members. What is important is whether or not they are good and honest scientists."

Politics has also played a role in collaborative research projects between scientists

in East and West Germany. Most projects are governed by an agreement signed in September 1987. This listed 27 subsidiary topics on which agreements would be drawn up, from materials research to controlling pollution from power stations. Some of these have not been signed, and never will be, because those who designed the agreement had not consulted those who would implement it.

There have been other problems. For example, Bradshaw, director of the Fritz Haber Institute, is mainly concerned about the agreement on materials research. This has still not been signed because, he says, of the East German reluctance to include the Bessy electron storage ring at the Fritz Haber Institute in the agreement. The GDR would like access to the technology, but the inclusion of Bessy would imply a recognition of West Berlin.

This is a delicate issue. Berlin is effectively part of the Federal Republic. West Germans see it as being part of the Federal Republic, whose government responds by pouring substantial amounts of money into Berlin's universities.

The East Germans see Germany as being divided into three: the GDR, the Federal Republic and West Berlin, which is still administered by the victorious powers after the Second World War. The problem spills over into science. Scientists in West Berlin say that although colleagues in the Federal Republic have had invitations to go to the East, scientists from West Berlin were not invited until recently.

Informal agreement may be easier to achieve and produce more immediate results. Professor Arnim Henglein, chairman of the scientific council of the Hahn Meitner Institute in West Berlin, says he dislikes formal agreements because of the bureaucracy involved. He has a two-month summer programme of 12 visiting students at the college. In future he hopes to establish an informal quota of something like 40 per cent of these places to be reserved for scientists from the GDR. The Technical University hopes to appoint an East German from the Academy of Sciences to an honorary professorship.

Despite the differences in levels of technological competence between East and West Germany, in the long run Wilhelmi says that he looks forward to a future in which microelectronics will be applied to traditional German industrial strengths, such as high-quality optical instruments, and other precision engineering, in the East as it now is in the West. Henglein says that the West suffers from a dearth of good chemists and a shortage of skilled technicians, which the East might be able to fill in return.

"This uncle and nephew business does not work," says Bimberg. "There must be a situation in which both sides can offer something for their mutual benefit." As an example he points out that the GDR is currently his chief source for gallium arsenide with titanium, a rare semiconductor material. The next best source is the Massachusetts Institute of Technology. The irony is that Bimberg sees an important use for gallium arsenide with titanium in high-speed computers—a technology which the West will currently not allow the East to have.

One Germany, one brain drain

OF ALL the East European states that have been opening up their borders to the rest in recent months, East Germany has been most threatened by the loss of skills, particularly to West Germany. Like Britain and the US, the two Germanies have a common language, and one country pays much higher wages. But the problem is more acute in East Germany because the two Germanies also have a common border.

Even with the promised liberalisation of domestic policies, the danger of an accelerating brain drain remains serious. Some 400 000 East Germans (more than 2 per cent of the population) are reckoned to have left in 1989. About 1 per cent of scientists at all levels have gone West, slightly below the average, although the loss of skilled workers has been higher.

The temptation to leave is considerable. A scientist in West Germany, with a couple of years' work experience after leaving university, can earn 60 000 DM (about £21 000). In East Germany the equivalent salary might be 10 000 marks, while a professor could earn 25 000 marks. The exchange rate in the West is about 14 East German marks for the Deutschmark, although direct comparisons are difficult; the purchasing power of the East German mark in the GDR is far greater than it

appears, because so many of life's essentials, rent, food and public transport, are extremely cheap.

The easy passage through the frontier could also increase overcrowding on some university courses in West Germany. The education system of the two Germanies has remained the same. East German school-leavers are as well educated as West Germans. About 16 per cent of the people arriving from East Germany are students.

The problem is particularly acute in West Berlin, where proximity of the border means that students can live in the East relatively cheaply and go to university in the West. Students are entitled to a grant of 850 marks a month. Courses in a number of subjects, such as medicine and economics, are already overcrowded.

Even after university the differences are slight. Those from the east are less likely to be computer literate, whereas most West German undergraduates need to be taught programming. Fewer people in East Germany speak fluent English than in West Germany. In the GDR the first foreign language is Russian. However, as Dieter Bimberg, professor of solid-state physics at West Berlin's Technical University, pointed out, these are minor differences: "We are the same people." □