

Molecular biology, China and the West

15 years of teaching at the Max Planck Guest Laboratory in Shanghai • by Wolfgang Hennig

More than 15 years ago, in November 1985, I travelled to China for the first time. I joined a symposium on developmental biology in the Shanghai Institute of Cell Biology (CBI), organised by the Chinese Academy of Sciences and the Max-Planck-Gesellschaft in Germany. The symposium was meant to provide perspectives for the future of the Max Planck Guest Laboratory, just founded in the CBI. When I attended, I did not anticipate that my visit to Shanghai would initiate a long-term com-



Courses in the Guest Laboratory with Chinese students

mitment to China. I did not even expect to return to China in the near future. But early in 1987, my colleague Uli Schwarz from the Max Planck Institute of Developmental Biology in Tübingen, who was and still is in charge of the Guest Laboratory, asked if I could hold a lab course at short notice. I was attracted by the challenge of teaching under these unusual conditions, and in April 1987, I returned to Shanghai accompanied by my PhD students Hannie Kremer and Peter Huijser for physical and mental support.

remember the lectures, as they had to be given without any optical support since the bulb of the only overhead projector broke at the moment it was switched on, the slide projector did not work at all, all pens for the board were dried out and even a simple chalkboard was unavailable. Nevertheless, the 4 weeks were successful and enjoyable for the students as well as for ourselves. We were impressed by the students' activity and motivation. They did not want to stop working in the evenings. Beyond their interest in the

living habits or educational systems. One thing that has not changed is the students' motivation and interest in science. Over the past few years, we have often been asked by participants of our courses to extend them for an extra week. At the institute, graduate and postgraduate students work in the laboratory in the evenings and during the weekends—something rarely seen in European laboratories these days. Another thing that also has not changed is the strong desire to continue their science education in western countries, preferably in the USA. There is hardly a student who is not planning to go abroad as soon as possible. In general, they expect to have a better chance of obtaining a good career position on their return to China. This expectation is well founded, as research institutes in China offer unusually good conditions for young Chinese scientists willing to return from abroad. There remains, nevertheless, the question of how long such opportunities will exist, since the positions available will most likely soon be taken.

The principle aim of the Max Planck Guest Laboratory was to allow European scientists to work for a period of time in an appropriately equipped laboratory in China, and to stimulate contacts between Chinese and European scientists. The

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For 4 weeks we taught 10–12 Chinese students the basic techniques of nucleic acid investigation and gene manipulation. The lab course included experiments and a lecture series. Clearly, it was an adventure in almost every respect. We had to carry everything—from the chemicals to the laboratory equipment—to Shanghai, a total of >450 kg excess baggage at horrendous cost. At that time, it would have been impossible to obtain any missing item at short notice in China. I also

experiments, they continually questioned us about everything in western countries. At that time information available in China regarding 'the West' was still scarce.

My initial activities in China included yearly teaching of a 4-week practical lab course, and a lecture series on developmental genetics or cell biology. Since 1990, I have been visiting the Guest Laboratory twice a year, for a shorter period in spring and autumn, when the

former head of the CBI, Professor Chuang Hsiao Hui, established the laboratory during a visit to Germany in the early 1980s, when he was invited as a former fellow of the Alexander von Humboldt Foundation. Prior to World War II, Professor Chuang received his PhD and his 'Habilitation' in Germany, after studying and teaching in Freiburg and Munich. He was a most appropriate partner in the initial contacts between China and Europe after the opening of China in the early 1980s.

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Since then, significant changes have taken place all over China, although not to the same extent as in Shanghai and Beijing. We often tend to forget that many people in the countryside still live on a minimal income. I was reminded of this 2 years ago when—without prior intention—I had to drive through one of these poor regions in Southwest China due to heavy flooding after a thunderstorm. In the cities, poverty has increased over the past years. The discrepancy between the increasing wealth of some parts of the population and the increasing poverty of others, often due to unemployment, is increasing—a situation not too unfamiliar to ourselves. The prospect of better living conditions therefore still contributes to the flow of Chinese to western countries. For some students it may be curiosity to experience a different environment that stimulates their interest to leave China, but I do not think this is their prime motive. In fact, most Chinese students in Europe or the USA tend to stick together and often develop very few contacts with people of other nationalities. Of course, exceptions exist, and I was lucky enough to have Chinese students in

my own laboratory, at the Catholic University of Nijmegen in The Netherlands, who integrated into the scientific community and developed personal contacts with other members of the laboratory.

Another strong motivation for Chinese students to leave their country is to obtain a better education. Teaching at Chinese universities emphasises the learning of theories and facts rather than promoting originality, independence and systematic approaches to scientific problem solving. This reflects an earlier school education, which starts with an amazing training in knowledge acquisition. Students usually display excellent knowledge of their field of specialisa-

tion, but in general, their background is not very broad. Their ability to learn, however, gives them an unusual capacity for quickly familiarising themselves with an unknown field. For westerners, the major educational task is to teach them systematic approaches to problem solving.

Many other difficulties had to be resolved in the early years. Our financial resources were limited, especially in the days when all equipment had to come from Germany. Often, only donations or major discounts on materials, in particu-

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lar from Boehringer Mannheim, enabled us to offer laboratory courses at an appropriate scientific level. Also, the climatic and environmental conditions in Shanghai are a permanent threat to instruments. Nevertheless, working with Chinese students is motivating and work can be done very effectively if one is patient. The slower pace of life in China is often a welcome contrast to the hectic one of many western countries. It is an important experience that allows one to realise that it is not the wealth of western countries that makes life worthwhile, but rather motivation and enthusiasm even under the most modest of circumstances.

In 1991, I had the opportunity to extend my contacts in China to other institutes, in particular to the Department of Medical Genetics of the West China University of Medical Sciences. This gave me a greater insight into research conditions in places other than Beijing and Shanghai. In the early 1990s, research facilities outside these two cities were poor. This has changed dramatically over the past few years. In parallel with major changes in the structure of the Chinese Academy of Sciences, the government has recently reorganised the education and research system. A number of universities have been designated as key universities of the new century and key research laboratories have been identified. These measures were accompanied by appropriate investment and additional funding for strong research groups. This helps to attract young Chinese scientists, in particular from the USA, to return to China. After a slow initial phase, such approaches are now increasingly effective. We have also seen this at the Guest Laboratory. A recently initiated, second attempt at instituting



Celebrating a PhD: Dr Wang and Professors Hennig, Yao and Xu (from left).

'young scientist groups'—supported by both the Chinese Academy of Sciences and the German Ministry of Science and Technology—has been more successful in attracting candidates than the first round, 5 years ago.

This is due in part to the fact that the negative effects of the events on Tian An Men square in 1989 have now been overcome. I happened to stay in Beijing and Shanghai in May and early June, 1989, and so I experienced this disaster and its consequences in the subsequent years. All of the excitement and activity that I observed between 1985 and 1988, after China's opening to the west, disappeared. Young Chinese scientists abroad refused to even think about returning. It seemed as if the clock had been turned back. It took 3 to 4 years to return to earlier conditions and enter a new phase of innovation.

I have participated in the Max Planck Guest Laboratory for almost 15 years now. In addition, I have recently joined the Management Group of the European Biotechnology Node for Interactions with China, initiated on behalf of the EU Commission. I have also become a member of the reviewer group of the German Academic Exchange Service for the biotechnology program for China, Brazil and Indonesia. No doubt these activities and the practical courses will demand much energy and time.

The reader may ask why I have become so involved with China; especially as my activities, except for travel expenses and accommodation, are not financially supported. The most immediate reason was the challenge of working in a different environment and under—at least initially—demanding conditions. Later, the Guest Laboratory became a refuge when the financial resources at the universities

in The Netherlands faded drastically. I started to carry out key experiments there, for example, making clone libraries, studying antisera or performing *in situ* hybridisation that could then be used in my home laboratory. My regular presence in the Shanghai Guest Laboratory, espe-

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cially after the events of Tian An Men, was also critical in providing additional trust in our engagement. In The Netherlands, I was actually told that this continuing work had officially been declared undesirable. However, I still believe in what I said at a plenary lecture at the International Genetics Congress in Moscow, 1978, when our American colleagues refused to participate due to the situation of Soviet dissidents. It makes no sense to interrupt international communication between scientists, as they are the ones—not the governments being criticised—who suffer most, scientifically and personally, from the lost possibilities of communication. Today, I consider the unique opportunity of experiencing a cultural environment so totally different from that of Europe as more than sufficient compensation for all of these efforts. But these experiences would not have been possible without the extensive support and friendship of our Chinese colleagues. Their hospitality over the years has been the basis for our engagement in China.

The support of applied research constitutes a major effort by the Chinese gov-

ernment. Hence its strong support for biotechnology and medical biology, as well as animal and plant breeding. However, fundamental research is also considered to be very important, particularly within the Chinese Academy of Sciences and other academies. Basic research is becoming more and more concentrated in younger research groups. Also, interactions with Europe are creating a great deal of interest among scientists, although the number of contacts is still lower than with Japan or North America. There are, however, ample national and European activities that are helping to improve interaction with China although they could be used more effectively. In the future I think that Europe will need to develop additional and more independent activities if it is going to improve its contacts with China, a country that will, in many respects, influence the 21st century.



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