

“We have a greater degree of social responsibility than UK scientists”

Joe Schwartz talks to three Chinese scientists visiting the UK about their experiences of research and politics in Britain and China.

MS KAO TSE, aged 46, a chemist from Shanghai, Mr Hsu Tan-lin, aged 38, an electrical engineer from Peking and Mr Tsang Shao-hsien, aged 40, a geophysicist also from Peking are three of a group of 12 scholars in the age group 35-50 that are now visiting the UK. Sipping green tea poured out of a large thermos flask, we discussed differences between Chinese and UK science in the plain quarters of the Chinese cultural mission in West London, far from the smart foreign embassies of South Kensington.

The training of all three has been on the European model. Ms Kao, the daughter of a university professor, attended Fudan University, Shanghai's largest with 4500 students. She specialised in chemistry, the curriculum consisting of inorganic chemistry, physical chemistry and organic chemistry with mathematics up to calculus, two years of physics and a “small amount” of quantum mechanics — a standard Western course of study in 1953 the year she graduated. After teaching in Fudan University for a year she attended Peking University for two years post graduate training in inorganic chemistry. She rejoined the staff at Fudan University with an MSc in 1956 as an assistant instructor and was promoted to lecturer in 1959, a position she has held since.

Kao has worked on a variety of research projects but since 1973 her main work has been on the use of rare earth zeolites as catalysts and as molecular sieves. Zeolites are naturally occurring alumina silicates found particularly on the ocean floor that are used as catalysts in cracking crude oil an area of international concern. Zeolites are also useful as molecular sieves in petroleum by-product refining. Kao is spending two years at Imperial College in London in the laboratory of Dr Lovat Rees, a UK specialist in zeolite research. “I came from a large research group of 25 people in Fudan University. We have similar facilities but on a smaller and less well developed scale. At present China must import its larger instruments so we are behind particularly in the use of Mossbauer spectroscopy and in the use of computers.

“I didn't feel at all strange working at Imperial College and I was able to start work right from the first day. We still have a lot to learn from scientists in the UK — more advanced experimental methods and a broader knowledge of related fields. But there isn't that big a gap.”

Hsu, the son of a Shanghai metal worker is working on aircraft navigation technology at Imperial College. His home institution, the Peking Aeronautical Institute sent him to the UK “to get current

with the most advanced technology in the field.” His brief is digital signal processing using large integrated circuits and computer processing. Digital signals are considered to be far more reliable and easier to work with than analogue signals. Hsu thinks that China can catch up in this field within five years.

He is conversant with the debates about indigenous versus imported technological development. “The government's policy is still one of self-reliance because you can't have political independence without economic independence. We want to introduce microprocessors without becoming dependent on foreign imports. There are already many people in China working on microchip technology and we now can produce some of the chips. We are using the technology that we buy as learning equipment with the ultimate aim of producing it ourselves.”

Tsang Shao-hsien's is an earthquake specialist. His work as lecturer in geophysics at Peking University has concentrated on earthquake prediction. It is an area with extensive and unique mass participation. According to Tsang there are now 10,000 professionals and “many more” amateurs engaged in this research with every province having its seismology bureau and brigade. In this field Tsang feels that the positive aspects of the Cultural Revolution were felt more strongly than in more laboratory based work. “Earthquake prediction is in a primitive state all over the globe. In China, the professionals understood that they needed help from the people. The Cultural Revolution posed the question of theoretical work versus practical work and before 1975 ‘mass work’ instead of professional work was emphasised. In 1973 our efforts were to build more instruments and organise more people. China has good social organisation



Workers at the Shanghai Machine Tools Plant: a model for training technicians

and earthquake research lends itself to this since the science and the socio-political work can be organised together.”

Tsang thinks, however, that theoretical work has been neglected. He has been in the UK for two years familiarising himself with UK theoretical work in the field.

On the wider questions of science policy, education and economic development Kao, Hsu, and Tsang were forthright but at the same time circumspect in the expression of their views. All three believe in quality education. Kao was particularly impressed by recent UK Conservative policy in this area. “I think the Thatcher policy of emphasising aid to the independent schools is important. Some schools should be better than others. In China we have a policy of selecting ‘key schools’ to make an example for the others.”

None of the three saw any danger in the possible domination of education by a small group of intellectuals and party officials. Present policy is that graduates from middle school at age 16 can apply for three years further schooling through competitive examinations set by each city. This is to be compared to policies adopted during the Cultural Revolution when university places went to students elected from their place of work. The example of the Shanghai Machine Tools Factory was important enough for Mao to refer to it in a policy statement on science education in 1968: “It is still necessary to have universities; I refer here mainly to colleges of sciences and engineering. However it is essential to shorten the length of schooling and to make it more political as the Shanghai Machine Tools Plant has done in training technicians from among the workers. Students should be selected from workers and peasants with practical experience and they should return to production after a few years study”.

Kao, Hsu and Tsang were familiar with this policy but dismissed it as being “unrealistic.” “We would like to enroll all middle school graduates but we must select” says Tsang. Hsu feels that the arguments put forward during the Cultural Revolution were “worthless” and that scientists must “concentrate their efforts on doing scientific work” instead of “being occupied with politics.”

When asked whether they saw any differences in the way the UK organised its scientific work compared to China, Kao answered for the group. “In China we tend to work more collectively. It is unheard of for an individual to work alone whereas this is quite common in the UK scientists. Here in the UK, scientists do their work because it interests them. But in China we have adopted the saying “serve the people” as our guiding policy. We believe that the work should be useful first and interesting second. Otherwise it is not good for the human being.” □