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Visions of China

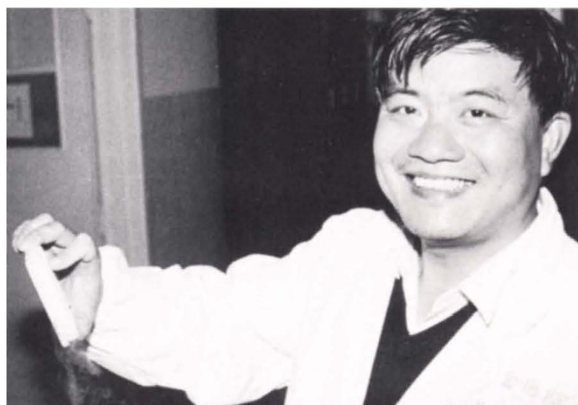
Shanghai. The last time China experienced as rapid a period of economic growth as now, the results were disastrous. Five years ago, national demonstrations demanded democratic reforms only for hardliners to take control, imposing martial law in Beijing. On 3 June 1989, the People's Liberation Army drove their tanks into Tiananmen Square and crushed the demonstration, inflicting hundreds of casualties. Activists went into hiding, while some managed to escape to the West and condemn their homeland from relative safety.

But for Chen Zhu and his wife, Sai-Juan, the crackdown evoked mixed emotions as they watched the grim scenes on television in their Paris apartment. Chen had come a long way: as a teenager in the early 1970s, he was forbidden to read anything but the works of Mao Zedong, but he nevertheless managed to learn English. Years later, he was in Paris gaining his Ph.D with Jean Dausset, the Nobel Laureate who founded the Centre d'Etudes Polymorphisme Humain (CEPH). But Tiananmen Square stirred up a deep

sense of responsibility and a commitment to work "inside, not outside". Chen returned home two months later, with his wife, to head the Institute of Haematology at the Rui Jin Hospital in Shanghai, one of the largest teaching hospitals in China, and affiliated with the Second Medical University.

Two years ago, he began collaborating with Samuel Waxman, of New York's Mt Sinai Hospital, in a study of the molecular basis of cancers such as acute promyelocytic leukaemias (APL). Chen's group established the efficacy of all-*trans* retinoic acid therapy for APL patients, producing a spectacularly high remission rate. One patient who did not respond well was recently shown to have a unique t(11;17) chromosomal translocation involving a novel *Kruppel*-like zinc finger gene (Chen, Z. *et al.*, *EMBO J.* 12, 1161–1167; 1993). Moreover, the resulting fusion protein antagonizes the wild-type retinoic acid receptor in much the same way as the well-known t(15;17) APL product (Chen, Z. *et al.*, *Proc. natn. Acad. Sci. U.S.A.*, in the press). Waxman's Cancer Research Foundation has raised large sums to equip Chen's laboratory and keep it stocked with supplies bought in the West and shipped to Shanghai. An arrangement with the Mayor of Shanghai ensures that there will be no tariffs or bureaucratic hold-ups.

This year, Chen hopes to establish one of the primary centres in China working on the human genome project. From CEPH, he has the only human genomic yeast artificial chromosome library in the country, an invaluable resource as the Chinese genome project embarks upon ambitious ventures in genetic diversity, new technology and gene therapy (the project has had



Chen Zhu and his CEPH library.

success with haemophilia B). The search for disease loci is another priority, notably genes predisposing towards hypertension, the leading cause of death in China in the form of strokes and heart disease, and cancer. For instance, northern regions of China have high rates of oesophageal cancer, from the habit of pickling vegetables, but again there is also an hereditary susceptibility. The recent cloning of the gene for Wilson disease (see *Nature Genet.*, December 1993) is of special importance given the high incidence of that disease. However, finding other disease loci using classical linkage studies will be hampered by the government's one-child policy (see below). Nor is the Chinese genome project's current allocation of just \$800,000 per annum going to suffice.

Much of Chinese medical research is still recovering from the chaos wreaked by the Cultural Revolution two decades ago. So far, there are few signs that the research arena is benefiting from the massive investment pouring into places like Shanghai, which was sprouting at least 5,000 construction works at the end of last year. Modern equipment, much of it from Japan, is not uncommon but consumables are scarce. Journals take up to six months to arrive, and copyright infringements appear to be widespread. The Chens may enjoy excellent facilities, but they (like their colleagues) must struggle to attract talented Chinese working abroad, even though the Waxman Foundation is willing to supplement salaries for those who return.

China syndromes. The gains that Chinese research is making are unfortunately all but obscured by problems in medical genetics of immense national and international significance. One is the recent government proposal to institute a programme "On Eugenics and Health Protection" that would have used abortion, sterilization and other means to try to prevent the transmission of hereditary traits such as mental illness. China faces a formidable problem in that some 460,000 children are born each year with disabilities: up to 100,000 babies are born with neural tube defects, more than a third of the world's total, because of folic acid deficiency. (A new US-Chinese programme to issue folic acid pills has met resistance from many pregnant

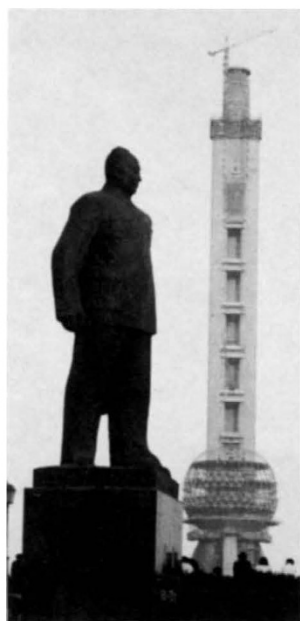
DNA/双螺旋发表40周年
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1953 — The year of the DNA?

women who suspect it to be a form of sterilization.) Phenylketonuria is another prevalent disorder in China, with an incidence of 1 in 16,500 births (similar to Caucasians). However, the standard Western low phenylalanine diet is "either impractical or too exorbitant for most affected Chinese families", leading them to prefer prenatal diagnosis and, if necessary, abortion (Lo, W.H.Y. *et al.*, *Chin. med. Sci. J.* 8, 180–185; 1993). But stung by sharp criticism when the proposal was first made, China has backed down, and said recently that it will not force mothers to have abortions. "The essence of China's better births policy is totally different from the racist 'eugenics' policy pursued by Adolf Hitler", said the Public Health Ministry. It has since renamed the proposal the "Draft Natal and Health Care Law".

This latest controversy adds to long-standing criticism surrounding China's 'one couple, one birth' policy, implemented in 1979. Even though the government says it is opposed to coercion, about 6.5 million Chinese were sterilized in 1992. Other forms of punishment are likely for couples who contravene the policy, although exceptions are allowed for minorities and couples whose first child is a girl. Although the overall birth rate is on the decline, the growing excess of males to females is alarming. A 1992 survey revealed 118.5 newborn boys for every 100 girls — normally there would be 105 or 106 boys. Adoption, infanticide and misreporting are part of the reason, but the chief culprit is the growing abuse of ultrasound diagnosis. More than 100,000 ultrasound scanners are thought to be in use in China. Doctors can be bribed for \$35–50 to reveal the sex of a fetus, and females are then aborted. The preference for boys is more than simply the need for manual labour: Chinese tradition says that only sons pass on the family line. But if this growing imbalance continues, there will be dire consequences 20 years from now.

As the turnabout on the eugenics proposal demonstrates, the Chinese are willing to learn from others and keen to have a greater role in the scientific community. Beijing may have lost the 2000 Olympics, but it will host the XVIIth International Congress of Genetics in 1998 and Shanghai, not wishing to be outdone, may well bid for similar meetings. □



Shanghai surprise: A new 1,500 ft television tower looms over Mao Zedong's statue.