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Focus

The new "Chinese dream" regards science communication

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Science and technology: these are the mainstays China wants to concentrate on in order to stabilise its future as an emerging world power. Beijing plans to have the whole, enormous Chinese population literate in the scientific field within a few years. Scientific popularization is the key to what now, due to political influences and deep social disparities, seems remote.

Pundits are looking forward to the International Symposium on Science Communication, to be held in Beijing on 23rd and 24th June.[1] The choice was made by the International Network of experts in Public Communication of Science and Technology (PCST); China's capital city is going to host the best communication of science currently available. Fifty successful cases from the four corners of the world will be narrated, their common denominator being the search for "Strategic Issues in Science Communication", as reads the title of the symposium.

It is the first time that the PCST network, together with the China Association of Science and Technology (CAST)[2] and the Science and Development Network (Scidev.net),[3] has decided to hold a meeting in the Far East, though just a preliminary one. South Korea is going to have its share of attention as well, since it will host the first PCST conference in Asia, in 2006.[4] The Beijing meeting will be employed to define themes, discussions and details of the Korean conference, but it is also an evident sign that from now on China wants to play a primary role on the international scene of science communication.

According to Jenni Metcalfe, one of the PCST organisers, "science communication is gathering momentum in this country and they want to share the good things they are doing as well as learn from others' experiences". Full cooperation and willingness to open up to the rest of the world, therefore, as confirmed by the China Research Institute for Science Popularization (CRISP).[5] Its secretarial staff declared that "science popularization is gaining favour in China nowadays. More and more government departments, NGOs and institutions are getting involved. People in doing science popularization have been making dynamic efforts in probing and developing better initiatives with a view to profiting highly from practices and some experience has been accumulated. Under current circumstances, the imposing issue perceived lies in the strategies for science popularization. That is the key for achieving higher effects. PCST2005 to be held in Beijing will be a good chance for Chinese colleagues to understand and experience PCST activities".

According to Deng Xiaoping, scientific and technological development was the most important of the "four modernisations". In its absence, the other three (agriculture, industry and defence) could not have taken place. Nearly thirty years after the beginning of Deng's policy, and after making "market socialism" a priority about ten years ago, China has recently been witnessing a great economic growth. The Purchasing Power Parity (PPP), the indicator of the World Bank comparing the purchasing power of the world currencies, shows that China is second only to the U.S., and the forecasts expect it to be first by 2023.[6] Science and technology do not seem to be keeping pace with the Chinese economy,[7] but Deng's indications are still valid: if China wishes to reinforce its role as an emerging power on the international scene, then science and technology are the key to development and science popularization is the most important factor for their public consolidation.

Everybody's task

2002 marked a turning point for scientific communication in China. On 29th June 2002, the People's Republic of China approved an *ad hoc* law in this field. A few months later, the third national conference on the popularization of science took place, seeing the confirmation of the provisions of the law, under the aegis of the Sixteenth National Congress of the Communist Party. Official reports talked about a new age for science popularisation in China.[8]

Scientific and technological associations have been given a major responsibility as regards the transition. Among them, the China Association for Science and Technology (CAST) plays a crucial role. CAST was created in the late Seventies, with the double purpose of improving domestic communication between different subjects and developing public communication in order to prompt more broadmindedness and reduce superstition and popular belief (rather widespread, particularly among farmers).[9] The 2002 law also states in no uncertain terms that a number of different subjects and social partners must consider science popularization a priority, even a "mission for the whole nation".[10] This is confirmed by tax relief incentives,[11] programmatic declarations[12] and even the most recent reports.[13]

Science in public moderately increasing, among social and geographical differences

This fervour has a very specific purpose, namely raising the level of the Chinese' scientific literacy. In order to assess it, China started large-scale inquiries in 1991, making use of what has been learnt from the nearly thirty years of experience gained in the U.S., thanks to Jon D. Miller's work (questions and questionnaires have been adapted to the Chinese context). It turned out that in 2003 only 1.98 % of the Chinese could be considered scientifically literate. Which does mean an increase by 40 % as compared, for instance, with 2001; nevertheless, the level is still below expectations.[14] The 2003 inquiry also shows that the major source of scientific information is the television: 93 % of the interviewees declare that what they know about science and technology has been learnt from TV, whereas only 6 % of them use the Internet.[15]

The method used in the inquiries has been sharply criticised, but this does not appear to have affected the attempts towards achieving the global scientific literacy of the Chinese – at least so far. Initiatives like *Taking Science to the Countryside*, or *Taking Health to the Countryside*, together with several "science popularization trains", reached tens of millions of people, especially farmers. The National Science Week of 2002 attracted 50 million visitors – more than three times the 2001 turnout. The technical-scientifical staff amounted to about 50,000 people and the global number of activities was 9800 (in 2001, it had been less than a half). Not to mention the countless Special Days, for subjects of particular social relevance, such as the *World Meteorology Day*, the *World Earth Day* or the *World AIDS Day*. In the same year, journals and popularization daily newspapers amounted to some 250, with a global circulation of 53 million copies. The funds allocated for scientific popularization, though still considered insufficient, registered a general upward trend and money has begun to come from various different sources, even if the State is still the most important of them.[16] The academic environment is doing its best, as proved by the interest in science popularization shown by some important associations, such as the Chinese Academy of Science (CAS),[17] though some people regard it as below its potential,[18] the Beijing Association for Science & Technology (BAST),[19] organising scientifical and technological centres in various districts of Beijing, and the Beijing Youth Science Creation Competition,[20] which is part of CAST.

As regards the involvement of the public, the percentages of visitors to Chinese libraries, museums and zoos are still relatively low (in 2001, only 14 % of the population had visited a centre of Natural History or a scientific museum, as compared to 30 % in the U.S.).[21] And even though the construction of infrastructures has been accelerated, there has been no change in the situation of the museums, especially as regards their ability to innovate. As far as traditional mass media are concerned, it is worth mentioning that on 9th June 2001 CCTV-10 was born, i.e. a channel of the China Central Television (CCTV) entirely dedicated to science and technology, with more than twenty hours of transmission a day. Many local TVs have been following this lead. Finally, let's move on to science popularizing literature, which is a special case. That science popularizing books are mainly functional to favouring

other forms of communication is clear to everybody.[22] Yet there is no Chinese writer who writes science books as a profession, in spite of the fact that 2002 has seen the publication of about twelve million copies of science books.[23]

Scholar Yan Wu, winner of several prizes for his science communication works, is also among China's greatest science fiction writers. He reminds us that "science popularisation is a very big area in China. A lot of people are doing this work. There is an organization called Science Writers Association, which has a lot of members, who range from popular science writers to editors, film directors and activity organizers". Wu, an active member of the association himself, also reminds us of some parts of the controversial relationship between science popularization and science fiction in China:[24] "Science fiction belonged to the sector of popular science during the creation of the PRC, from 1949 to 1979. After that, famous science fiction writer Tong Enzheng wrote an article in which he said that science fiction cannot do what science popularization does. It created a big turbulence in the field. There was a lot of criticism. Then, popular science gradually stopped recognizing science fiction as part of it". In 1983 there was even a "campaign against spiritual pollution": science fiction writers were accused of spreading pseudo-scientific nonsense and even condemned.[25]

This hostility can be better understood by taking into consideration the high educational value which is attributed to science popularization. "Functioning as one of the most important approaches in improving public science literacy, science popularization is valued favourably in China", confirms the CRISP. "Far-reaching measures and endeavours could be seen everywhere. Nevertheless, China is a large developing country with a huge population. In comparison with developed countries, Chinese citizens possess a lower rate of scientific literacy, which also shows an evidently unbalanced distribution across the land. In terms of this unbalance, the deficit still needs to be made up in different regions and for different social groups. Roughly speaking, the demand for science popularization from urban residents is higher than that of rural residents, and that of the young higher than that of the adults".

Public communication of science: the Chinese model

The CRISP goes on: "In China, farmers are the most thirsty public sector, as regards science popularization. As an agricultural power, China embraces 72 % farmers out of its total population. The agricultural labour force amounts to 50 % of the entire working population. According to the Survey for Public Science Literacy in China 2003, only 0.7 % farmers claimed to be scientifically literate. That is merely equivalent to 1/6th of urban residents. Science literacy, intelligence structure as well as up-to-date techniques and management standards are badly needed for farmers in China nowadays. The inadequacy severely holds up agricultural productivity from higher efficiency, which demonstrates an extraordinary inappropriateness to the development of modern agricultural economics. Consequently, this makes it hard for farmers to shake off poverty, gain wealth and health and step on a way to well-being. It also stands as an impediment to the nation's economic growth and harmonious sustainable progress of the society".

Differences between urban areas and the countryside and among different social groups make science communication in China quite a hard task.[26] But they could also give birth to a new model. The Chinese colleagues of CRISP do not doubt that for an instant: "The Government's concern and encouragement, immense involvement of social sectors, close linking with reality, use of local facilities and human resources, manifold approaches and diverse patterns, public mobilization, broad social influence, constant and frequent engagement, stress on the popular ways for public involvement and understanding, as well as public science literacy improvement oriented goals: these are the peculiarities of China's science popularization enterprise. It could all be summed up as the 'Chinese model of science popularization'. This model differs from passive-didactic or two-way interactive models. It is a complex structure of multi-patterns. The aim of China's science popularization is to obtain rewarding results and outcomes".

It is not by chance that in China some scientific disciplines benefit more than others from public communication of science. According to the CRISP, "there are distinct gaps of social development between urban and rural areas, and the science sectors benefiting from science popularization vary accordingly. In rural areas, farmers attach much importance to becoming rich through applying practical

technologies. Their voice for agricultural scientific know-how is stronger, especially the knowledge related to farming, forestry, herding, domestic animals and fishery. Their demand stimulated the development of science in these fields. In towns and cities, residents tend to learn more information about their daily lives, such as knowledge related to nutrition, medicine, food, environment, climate and so on. Their special interests provide dynamics for the corresponding sciences".

Concrete activities are booming; consequently, the demand for theories and experts willing to dedicate themselves to science popularization as a new kind of knowledge is growing.[27] But there is still a lot of work to do, if we are to believe Yan Wu: "though China has a large group of people and things to do with science communication, it still does not have any good theory on it. Before 1997, a lot of articles about this topic were a kind of summary of their experiences on writing and behaving. After 1997, a new generation began doing some research. But theories are still lacking".

More transparency

In August 2004, a leading article was published on *Scidev.net*[28] underlining that, in spite of the new procedures to access scientific information (introduced after cases such as SARS), the delays that there had been in the communication of data on the transmission of chicken fever to pigs suggested that China had to make more efforts towards transparency. To be honest, Chinese politicians and institutions had taken great pains to make different disciplines share their respective data as much as possible[29] and to favour science communication to the so-called decision-makers.[30]

According to the CRISP, "China attaches great importance to science popularization. State President Hu Jintao once emphasized: 'Innovation and science popularization are two important aspects of our science and technology engagement. Science popularization is regarded as part of the accountabilities of science and technology departments, research institutions and associations and societies within the scientific community. Science popularization is carried out most of the time under the assistance of the scientific community, where specialists have organized to engage the public. It could be said that all the scientific associations and societies within the scientific community are the powerful intelligence and human resources for the Chinese science popularization'". The independence of scientific information is therefore another crucial element to consider in order to understand the phenomenon of communication in China, also because, as the CRISP concludes, "science popularization in China has a relatively close relationship with the political and scientific hierarchy. Absolute independence is not the case".

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Notes and references

[1] For further information, go to <http://pcst2005.cast.org.cn>
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[3] <www.scidev.net/>
[4] <www.pcst2006.org/main.asp>
[5] China Research Institute for Science Popularization (CRISP) was authorized to take form by the State Council in 1980. The proposal for such an institute was initiated by Mr. Gao Shiqi, the famous Chinese scientist and science writer. Subordinate to the China Association for Science and Technology, CRISP now stands as a unique national institution dealing specially with studies on science and technology communication. Its web-site writes as: <http://210.72.10.8/webpage/zgkpyj/menu_97/menu_98/index.html>
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