Science, Technology and Education News from China

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Introduction
This month’s newsletter features a report produced by the Center for China and Globalization on the increasing number of Chinese students who chose to study abroad. In science and technology, the Chinese government unveils new guidelines on science and technology management and talent incentive programs. In education, the Ministry of Education is urging local governments to draft new plans for college entrance examination reforms. In health, the genetically modified “golden rice” trail provoked public concern in China. The Ministry of Health is struggling to push forward the healthcare reform as well as to reduce the cost of drugs.

Contents

Story of the Month .................................................................................................................................................................................. 2
News............................................................................................................................................................................................................. 3
1. China Investigates Whether Children Were Used in GMO “Golden Rice” Trail ................................................................. 3
2. China Struggles to Cure the Violent IIs of Its Health System .......................................................................................... 4
3. Fresh Talent Programs to Boost Science and Technology ......................................................................................... 5
4. Shining Light on the Sun ...................................................................................................................................................... 6
5. New Gaokao Plan Still Excludes Many Students ............................................................................................................. 7
6. How Will China Become World Technological Power .................................................................................................. 8
Events (October 15th - November 15th 2012) ...................................................................................................................... 9

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1 Please click on the blue texts to activate the hyperlinks to either email addresses or related websites.


**Story of the Month**

**Studying Abroad: Where, When and Why**

According to *the Annual Report on the Development of China’s Study Abroad (2012)*, which was published by the Center for China and Globalization in September 2012, a total of 2.24 million Chinese students have studied abroad from 1978 to 2011. The annual number of Chinese students that left China for overseas education has been increasing by more than 20% since 2008, hitting a record high of 339,700 in 2011. With such a high speed of growth and the largest pool of students at home, China has become the biggest source of students for many major study destinations, including the United States, the United Kingdom, Canada and Australia.

2000-2011 statistics showed that the majority of the students who went abroad for studies were self-financed, and the percentage grew from 82.0% in 2000 to 92.67% in 2011. According to 2009 statistics, the top 10 destinations for Chinese students, namely the US, Australia, UK, South Korea, Japan, Canada, Singapore, New Zealand, France and Russia, hosted 86.3% of all the outgoing students in that year. Chinese students have now accounted for over 22%, 20% and 30.3% of the international students in U.S., UK and Australia respectively. Other popular destinations include Germany, Hong Kong, Netherland, Italy and Switzerland. Choice of study destination is evaluated on the basis of several criteria, including quality of education, foreign-student friendly environment, cost, financial-aid opportunities as well as immigration prospective.

The majority of the students who wish to study abroad are bachelor students aiming for a master degree from a foreign university. But the number of teenagers who studied abroad has been growing at a remarkable speed. In 2010, 18.6% of the Chinese students who went abroad were high school students or even younger. In 2011, high school students alone accounted for 22.6% of the study abroad student group. Such trend was confirmed by the *Open Door Report* published by the U.S. International Education Association, which mentioned that in 2010-2011 academic year, 36.5% of the Chinese students studying in the United States were enrolled in bachelor programs, a 42.7% increase compared to the 2009-2010 academic year.

Traditionally Chinese students went abroad to study in the areas of science and engineering, but the fields of study have diversified in recent years. A survey conducted among Chinese university graduates in 2010 and 2011 found out that the main study fields for graduate studies are business administration, engineering sciences, social sciences, engineering technologies, information and computer sciences, communication and journalism, education, mathematics, English language and literature as well as other foreign languages. Business administration, which is the choice of 34.7% of the students surveyed in 2010 and 45.1% of the students surveyed in 2011, is the most popular major.

In terms of employment prospect after graduation, around 30% to 40% of the Chinese students who are pursuing graduate studies abroad would like to stay abroad for work on short terms before coming back to China. Another 30% - 35% would immediately come back. Based on the Ministry of Education statistics, out of the 2.24 million students that went abroad between 1978 and 2011, the number of returnees reached 818,400 in 2011, marking the overall return rate at around 36.5%. Returnees are typically found in the mega cities of Beijing, Shanghai and Guangzhou, employed in public organizations such as universities and research institutes (43.2%), private industry (16.1%), multinational companies (16.1%), state-owned companies (13.6%) and government organizations (3.7%). About 7.4% of the returnees would start their own business.

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2 All the figures included in this editorial, unless otherwise mentioned, are quoted from the report.
China Investigates Whether Children Were Used in GMO “Golden Rice” Trail

(Reuters, 11-08-2012)

China's health authorities will investigate allegations that genetically modified (GMO) rice was tested on Chinese children as part of a Sino-U.S. research project, state media said. One Chinese researcher has been suspended by authorities while investigations are carried out.

China is already the world's largest grower of GMO cotton and the top importer of GMO soybeans but, while Beijing has already approved home-grown strains of GMO rice, it remains cautious about introducing the technology on a commercial basis amid widespread public concern about food safety.

The Chinese Centre for Disease Control and Prevention (CDC) investigation came after a report in August, by the environmental group Greenpeace, claimed that a U.S. Department of Agriculture (USDA)-backed study used 24 Chinese children aged between six and eight to test genetically modified "golden rice". According to CDC no domestic institutions had been approved to participate in the research, hence, in order to investigate the issue the Tufts University in the United States was asked for help. Andrea Grossman, assistant director of public relations at Tufts University, told state news agency Xinhua in a recent interview, the university was deeply concerned about the allegations and is reviewing protocols used in the 2008 research "to ensure the strictest standards were adhered to", and further, "We have always placed the highest importance on human health, and we take all necessary steps to ensure the safety of human research subjects [...] and (that we) remain committed to the highest ethical standards in research."

The research by Tufts University and other Chinese scientists was published in the American Journal of Clinical Nutrition in August. It aimed to demonstrate that the product, which is a new type of rice that contains beta carotene with the intention to alleviate vitamin A deficiency, could provide a good source of vitamin A for children in countries where deficiency in the vitamin is common. 3

Nevertheless, the Greenpeace report sparked a wave of criticism on Weibo, China's version of Twitter, with the researchers accused of a breach of ethics for testing poor, rural children whose families may not have been informed properly. As a consequence, one of the Chinese authors, Yin Shi-an, has been suspended from work pending further investigation after his responses proved to be inconsistent, the CDC said. Yin was cited by the official People's Daily newspaper as saying he helped collect data for the study but was unaware that it involved GMO rice. The second of the two Chinese researchers, Hu Yuming, denied his involvement in the research.

China, the world's top rice producer and consumer, approved the safety of one locally developed strain of genetically modified rice, known as the Bt rice, in 2009, but commercial production has been delayed.


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3 The International Rice Research Institute (IRRI) is working with leading nutrition and agricultural research organizations to develop and evaluate golden rice as a potential method to reduce vitamin A deficiency in the Philippines and Bangladesh.
2. **China Struggles to Cure the Violent Ills of Its Health System**

(Reuters, 16-09-2012)

Beijing is struggling to deal with an increasingly violent flashpoint of social unrest in its healthcare system, as its latest bid to cut costs is failing to ease tensions among millions of people who cannot afford basic treatment.

Violent attacks directed at hospital doctors and other healthcare workers in the form of beatings, threats, kidnappings, verbal abuse and even killings soared in recent years to 17,243 cases in 2010, alarming central policymakers who regard China's overhaul of its lumbering public healthcare system a top national priority.

Critics say China's efforts to cut treatment costs in public hospitals and defuse tensions do not go far enough and show little sign of reversing the violence of angry sufferers.

"The government is very worried about violence against doctors, especially when a few doctors and healthcare workers were attacked earlier this year. Some hospitals now have guards guarding them," said a health official in southern Guangdong province, speaking on condition of anonymity because of the sensitivity of the issue. "It's a top priority to stop these things from happening," said the source, who works in hospital administration.

In July, the Chinese government sought to make treatment more affordable by looking to ban an age-old practice among public hospitals of marking up drugs prices by 15 percent, a practice the government allowed to flourish after it wound back subsidies for public hospitals from the 1950s. The ban applies to 300 county hospitals under a pilot project. But a patients' group and senior Chinese health officials say the measure, even if implemented nationwide, does not make medicines substantially more affordable.

Instead, they say Beijing must tackle the far fatter markups enjoyed by drug distributors, a web of middlemen who inflate prices by 40 percent and sometimes by several-fold to levels that are beyond the reach of many ordinary Chinese.

China's healthcare spending is set to grow to $1 trillion by 2020 from $357 billion in 2011, consultancy McKinsey & Company said in a report in July. Embedded in China's healthcare system are strong vested interests: tens of thousands of drug-makers and distributors supporting workers and their families and local governments that depend on tax revenues from these companies.

In China's fragmented healthcare sector, a batch of drugs can go through two, even three layers of distributors before ending up at a hospital. It is not uncommon to have a distributor servicing only one hospital. Each distributor takes a cut and pays doctors and advertisers to promote its sales.

Beijing has a blueprint for reforming distribution but healthcare experts say it is bound to face fierce resistance among provincial authorities already worried about tax revenues as economic growth slows down. In addition, some of the companies involved in the distribution chain are state-owned enterprises, which will resist change, said Li Renbing, a lawyer representing the China Patients' Rights League Project Group.

Still, some major distributors are not resistant to changing the current system. Beijing is starting to set floor and ceiling prices for state-subsidized medicines, which they say could help deliver more affordable healthcare. Still, critics say even that idea won't work because hospitals can find other ways to increase costs for patients, such as by encouraging tests that may not be necessary, and sophisticated and costly treatment.

([http://www.reuters.com/article/2012/09/16/us-china-reforms-idUSBRE88F0GS20120916](http://www.reuters.com/article/2012/09/16/us-china-reforms-idUSBRE88F0GS20120916))
3. Fresh Talent Programs to Boost Science and Technology

(Xinhua, 20-09-2012)

The Chinese government has launched a ten-year campaign to cultivate more than 10,000 talented individuals in scientific and technological fields in its latest effort to consolidate a foundation for the country's development.

The project, titled "National Plan for the Special Support of High-level Talent," aims to support scientists who have made breakthroughs in leading fields and have the potential to become "world-class scientists," according to a statement released on September 19th after a meeting of the Central Coordination Group for Talent Work.

Furthermore, the program aims to include 8,000 people who have made innovative achievements in science and technology – as well as leading figures in the philosophical and social sciences, education and engineering – and another 2,000 people under the age of 35 who are deemed to have outstanding potential in research and technology innovation will also be covered by the program.

In addition to financial support for research projects and team construction efforts, the program will also require employers and related governmental departments to create more favorable policies regarding research, work evaluation and stimulus benefits.

The program is being jointly carried out by the Communist Party of China (CPC) and several government departments, including the Organization Department of the CPC Central Committee and the Ministry of Human Resources and Social Security.

Describing the program as an important part of the country's strategy to boost national strength, Li Yuanchao, head of the Organization Department of the CPC Central Committee, called for strict selection criteria and procedures that will be convincing for insiders, as well as the public.

According to the statement, five departments, including the ministries of education and science and technology, will be responsible for reviewing applications and selecting program beneficiaries.

(http://usa.chinadaily.com.cn/china/2012-09/20/content_15769551.htm)
4. Shining Light on the Sun

Within the next decade, China will observe the sun with the world's largest solar telescope and set up its first overseas observatory in Antarctica.

Since 2010, the team for the Chinese Giant Solar Telescope (CGST), one of the next-generation ground-based solar telescopes, has been doing a scheduled four-year site survey for solar observations in western China. The CGST project is expected to be approved and start in 2016, according to Deng Yuanyong, director of Huairou Solar Observing Station of the National Astronomical Observatories, under the Chinese Academy of Sciences. The project is expected to be a leader in the field of solar observation for 20 years. Deng says the CGST will surpass the capabilities of the large optical telescopes currently being planned by other countries, such as the US Advanced Technology Solar Telescope, which is going to be installed in Hawaii, and the European Solar Telescope. Both have a design diameter of 4 meters. "As the CGST is still in its very early stage, we are looking forward to more international collaboration," Deng says in an interview with Xinhua News Agency. Some large-scale astronomy projects in China, including the Large Sky Multi-Object Fiber Spectroscopic Telescope, completed in 2008, in Xinglong, Hebei province; and the 500-meter Aperture Spherical Radio Telescope, to be completed in 2016 in Pingtang county in Guizhou province, will provide experience for the building of CGST.

According to Wang Lifan, a researcher with the Purple Mountain Observatories of Chinese Academy of Sciences, China is planning to set up an observatory in Antarctica, China's first overseas observatory. If approved and included in the 12th Five-Year Plan, the observatory should go into operation by 2020, Wang tells China Daily at the 28th International Astronomical Assembly, held in Beijing in August. "Antarctica has the best conditions on Earth for astronomical observation, as it has very flat ground, a transparent atmosphere and little turbulence. The ground-based telescopes here will bring us precious information from the universe," says Wang, also the director of the Chinese Center for Antarctic Astronomy.

"Some countries like the US, France and Italy have set up telescopes in Antarctic, which has obtained important data and discoveries," says Chen Xuelei, a researcher with National Astronomical Observatories of the Chinese Academy of Sciences. Chinese astronomers installed the first of three Antarctic Survey Telescopes (AST3-1) at Dome Argus, or "Dome A", located at the highest elevation on the Antarctic continent, at the beginning of 2012. The AST3-1 is China's first domestically produced automatic unmanned telescope, capable of conducting surveys of supernova and other extra-solar bodies. It's 4.5 meters tall, making it the largest optical telescope in Antarctica. The second AST3 will be installed in Antarctica between late 2013 and early 2014, while the third one will be installed between late 2014 and early 2015.

Wang says more than 50 Chinese scientists will help construct the observatory. It will be a robotic remote-control observatory without people stationed there. Its mission is expected to include research on supernovas and dark energy, observing cosmic microwave backgrounds and searching for extra-solar planets suitable for life. "We will search through a wide range of main sequence stars, mainly sun-like stars, and then look for planets within a suitable distance around them. Stars that are smaller and darker than the sun, such as dwarfs, are also in our survey scope," he says.

Scientists have been trying to find signs of life in the universe by looking for habitable planets first. "We know too little about life. Maybe there are new forms of life that do not need exactly the same environment as we have on Earth. Life can survive in very harsh environments," Wang says. "These telescopes are expected to help us find at least 100 sun-like stars. We will work with Australian scientists to further study the movement of the stars to calculate their size."

(China Daily, 10-08-2012)

(China Daily, 10-08-2012)
5. **New Gaokao Plan Still Excludes Many Students**

(Xinhua News, 01-09-2012)

Household registration restrictions on "migrant students" to take the national college entrance exam (NCEE) should be eased beginning from the end of this year, according to an official guideline issued on August 31st.

Provincial governments should publish measures which allow children of migrant workers to take the exam at places where they currently reside, instead of having to go back to their birthplaces, as what is stipulated at present, according to the document. The guideline was mainly drafted by the Ministry of Education and was approved by the State Council, or China's Cabinet.

The ministry currently forbids high school graduates from taking the NCEE in places where they do not have local household registration, or "hukou," regardless of how long they or their family have lived there. There have been growing calls for easing the restrictions in the face of reality that tens of millions of Chinese have left their hometown.

According to the guideline, the ministry will increase the quota of college recruitment in places with a large number of migrant students so as to ensure a fair enrolling percentage for local students after the formation of the plan. Meanwhile, local governments must strengthen examination of the qualification of the exam takers and prevent some families' intentional migration to places given more enrollment quota.

However, the opening-up of access to NCEE to non-local students has caused widespread controversy. Relaxing the stringent rules of this exam has been applauded by many, despite the remaining conditions still being too tough for some migrant students. According to the regulation, migrant students can sit the gaokao outside their hometowns only if both they and their parents meet all criteria required by the city of their residence, including local social insurance contribution and many others. In addition, for non-local students, the gaokao will only be open based on their parents' job in their city of residence. Many netizens in China consider this to be professional bias.

Taking regional disparities in China into consideration, local governments are mandated to set their own criteria for allowing non-local students to take NCEE. According to the regulation, local governments have until the end of the year to publish their implementation proposals, but the regulation did not set any deadline for the plan to be put into practice.

([http://news.xinhuanet.com/english/china/2012-09/01/c_131820890.htm](http://news.xinhuanet.com/english/china/2012-09/01/c_131820890.htm))
6. How Will China Become World Technological Power

(Xinhua, 24-09-2012)

China aims to become a world technological power by 2049 and strives to be a leader in innovation and science, according to a newly-released government guideline on its technological development.

The framework guideline sets the goal for the country to be "in the ranks of innovative nations" by 2020, urging efforts to deepen the reform of the scientific and technological system. It also aims to step up the building of a national innovative system so to lay a foundation for the country to become a technological power when celebrating the centennial anniversary of New China in 2049. With China becoming the world's second largest economy, its leadership, who knows well that science and technology are prime productive forces, has strived to drive growth through technology.

The guideline puts forward new measures to spur technological development: enterprises should become pillar for innovation; supervision of research funds should be enhanced; outstanding researchers aged below 35 should be encouraged to lead scientific projects. With the international economic meltdown continuing to unfold, China is at a key stage of transforming its development model. The country's overall technological strength and competitiveness have played a leading role in economic and social development and safeguarding of state security. China's technological development faces both opportunities and challenges, as international competition and cooperation have become intense.

However, China's current technological system is not compatible with the demands of innovation and global competition. Its technological development has not been well integrated with the economy, facing problems such as fewer original scientific achievements, self-insufficient in key technologies and inefficient commercialization of research results. Moreover, the innovative ability and enthusiasm of researchers have not been given full play, and some of them even lack scientific integrity. The aforementioned factors have contained China's technological growth and innovative efforts.

In order to grow into a global technological power, the releasing of the framework guideline document ushers in a new round of reform for China's scientific and technological system. This new round of reform is based on the initial success of the reform launched at the end of the 1970s when China started to open its door to the outside world. The principle of "economic development depending on technology" as well as the abandonment of a "big-pot" distribution system prompted the country's technological sector to enter the market economy and established many technological companies that played a major role in innovation.

Currently, the average R&D input for China's enterprises is only 0.74 percent of their revenues and the figure is 0.93 percent in large- and medium-sized enterprises, far below the level of 2.5 percent to 4 percent in developed countries. The document has set the target for the average R&D input of large- and medium-sized enterprises to increase to 1.5 percent of their revenues during the 2011-2015 period. By offering incentive policies, the nation plans to nurture several leading assemblages of innovative companies.

The new round of reform of China's scientific and technological system is also based on the opportunity of global technological revolution and industry transformation. To spur the creativity of scientists, China has changed the method of evaluating researchers which only focused on the quantity of thesis, projects and research funds. Instead, a comprehensive incentive mechanism has been implemented to enable scientists to concentrate on research.

Time is on the side of the Chinese people. The best and brightest should be given the autonomy to do their research. China needs patience and persistence in developing technology.

(http://usa.chinadaily.com.cn/china/2012-09/24/content_15779392.htm)
Events (October 15th - November 15th 2012)

S&T, Education and Health-related Events in China

World Resources Forum 2012
Date: October 14th to 17th
Place: Beijing
Contact: Chinese Academy of Sciences

Bioenergy China 2012
Date: October 15th to 17th
Place: Shanghai
Contact: http://www.biochina.org.cn/

China Education Expo
Date: October
Place: Beijing, Xi’an, Chengdu, Shanghai, Changsha, Guangzhou
Contact: http://www.chinaeducationexpo.com/

IOT Expo China
Date: October 25th to 27th
Place: Wuxi

China Mining 2012
Date: November 3rd to 6th
Place: Tianjin
Contact: http://www.china-mining.org/

9th China International Aviation & Aerospace Exhibition
Date: November 13th to 18th
Place: Zhuhai
Contact: http://www.airshow.com.cn

China Wind Power 2012
Date: November 15th to 17th
Place: Beijing
Contact: http://www.chinawind.org.cn

Swiss S&T, Education and Health Events in China

Colloquium on the 100th Anniversary of Swiss Code of Obligations University of Fribourg - CASS
Date: October 26th to 28th
Place: Beijing
Contact: Embassy of Switzerland in China

Swiss Booth at 2012 China Education Expo (Beijing)
Date: October 20th to 21st
Place: Beijing
Contact: Embassy of Switzerland in China

Swiss Booth at 2012 China Education Expo (Xi’an)
Date: October 23rd
Place: Xi’an
Contact: Embassy of Switzerland in China

Swiss Booth at 2012 China Education Expo (Chengdu)
Date: October 25th
Place: Chengdu
Contact: Embassy of Switzerland in China

BBQ Lectures: Innovation
Date: October 25th
Place: Shanghai
Contact: Swissnex China

Swiss Booth at 2012 China Education Expo (Shanghai)
Date: October 27th to 28th
Place: Shanghai
Contact: Swissnex China

Swiss Friendship Day in Nanning
Date: November 1st
Place: Nanning
Contact: Consulate General of Switzerland in Guangzhou

Art and Science Exhibition in Beijing
Date: November 1st to 30th
Place: Beijing
Contact: Swissnex China

Swiss Water Technology Management
Date: November 23rd
Place: Shanghai
Contact: Swissnex China