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NEWSLETTER

The Ministry of Science and Technology
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IN THIS ISSUE

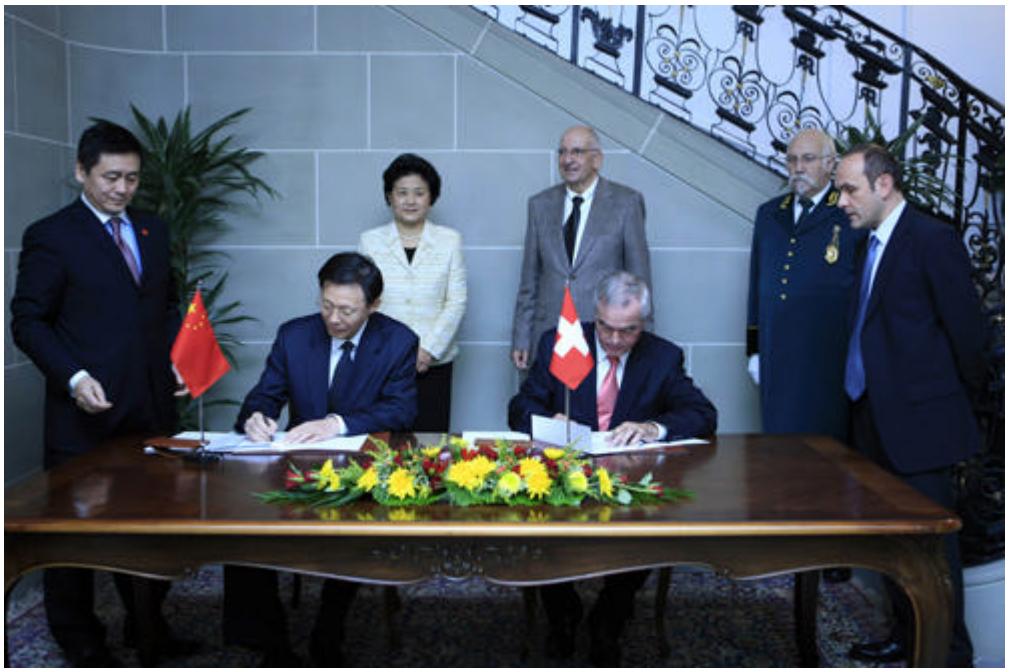
SPECIAL ISSUE

S&T Minister Thought Highly of Accomplishments in Last 30 Years

WAN Gang, Vice-Chairman of Chinese People's Political Consultative Conference and Minister of Science and Technology made a report on November 25, 2008 to review the S&T accomplishments secured in the last three decades featured with reform and opening up. He said that in the last thirty years, China has made brilliant accomplishments in the area of science and technology, with increasingly enhanced S&T innovation capacity. Basic research and high tech industrialization have witnessed fruitful results, with a greatly enhanced support capacity for key projects. Innovation activities in the area of agriculture have played a major role in addressing the "three major problems" in the rural areas, and in ensuring food security. S&T activities have made the sustainable development of Chinese society possible. International S&T cooperation has created a whole range of areas for high level collaborations in diverse forms. Science and technology has also provided a powerful support for the success of the Beijing Olympic Game, and for the effective quake relief. Numerous proprietary accomplishments, including manned space flight, moon probe, super hybrid rice, high performance computer, super larger scale integrated circuit, nuclear power technology, energy efficiency and new energy autos, have made the leaping development possible.

INTERNATIONAL COOPERATION

Chin-Swiss Joint Statement for S&T Cooperation



LI Xueyong, Chinese Vice-Minister of Science and Technology, and Paul-Erich Zinsli, Federal Department of Home Affairs Under State Secretary for Education and Research, inked on November 24, 2008 a joint statement on S&T cooperation in Bern. LIU Yandong, Chinese State Councilor, and Pascal Couchepin, Swiss Confederation President and Federal Department of Home Affairs State Secretary were present at the signing ceremony. Both parties decided to support 19 joint research projects in the area of life sciences, material science, environmental protection, medicine, and energy, at a joint committee meeting held on November 21. The Swiss federal government has established a special fund worth 9 million Swiss francs for the purpose. The signing of the joint statement heralds the official start of the collaborations.

China-Canada Stem Cell Workshop

Under the framework of MOST-NRC bilateral S&T cooperation, a China-Canada stem cell workshop, co-sponsored by China Biotechnology Center and NRC, and organized by Northwestern University, was held November 11-12, 2008 in Xi'an. 21 specialists from China and Canada had a roundtable discussion of a range of related issues, including stem cell technology, stem cell biology and associated division regulations, technical standards for stem cell research and applications, ethic issues, and establishing standards and applications for stem cell lines. Both sides briefed the other side of the latest development of stem cell research in their respective country. CAS Guangzhou Institute of Life Science and its Canadian counterpart have reached an intention of cooperation for future research activities.

Quality and Patient Safety First

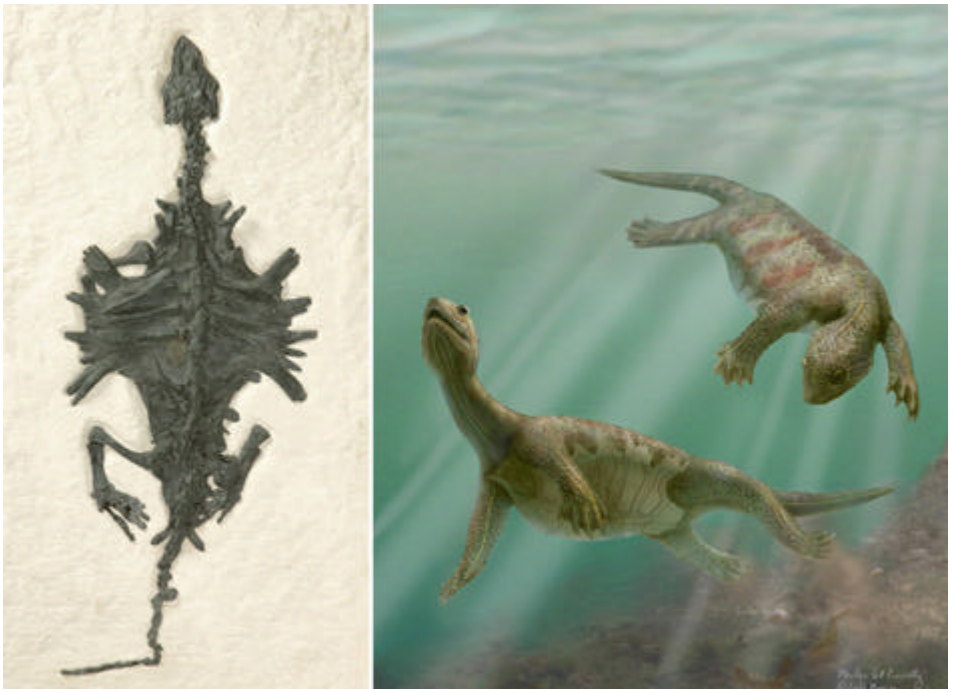
A Quality & Patient Safety Institute, jointly established by Peking University Health Science Center and Joint Commission on Accreditation of Healthcare Organizations (JCAHO), was inaugurated on November 21, 2008 in Beijing. The Institute is established to understand the international trends of evaluating and ensuring the quality of medical service, and to raise the quality of medical services and patient safety at Chinese hospitals. It is mandated to work on a range of topics, including factors associated with the quality and patient safety, status quo of international and Chinese patient safety, and establishing an advanced quality guarantee system. Peking University Health Science Center have organized experts to translate and publish five medical monographs on infection control and operation theater safety, and work on 30 research topics on medical quality control, including the regulated management of pre-operation assessment.

Climate Change and Hydrologic Cycle

Some 70 Chinese and European scientists and scholars gathered together to discuss the global water resource system changed by global climate change, and its impacts on the sustainable development of human society, at a three-day workshop opened on November 24, 2008 in Beijing. Scientists and scholars from the UK Met. Office, UK Center for Ecology and Hydrology, University of Reading, Chinese Academy of Sciences, China Institute of Water Resources and Hydropower Research, and Tsinghua University, discussed an array of interesting issues, including water resources and land cover, regional climate and hydrologic cycle, floods and droughts, water resources management, and agricultural development. Scientists defined the major environment factors affecting the Asia monsoon region and its feedbacks to the global system, and listed key topics for future study. The workshop is designed to strengthen the cooperation between Chinese and European scientists, and exchange the latest research findings in the area of climate change and water resources.

RESEARCH AND DEVELOPMENT

Earliest Turtle Fossil Found



LI Chun and coworkers, from the Institute of Vertebrate Paleontology and Paleoanthropology at the Chinese Academy of Sciences, had not long ago unearthed the ancient turtle fossils in their budding phase. The findings, published in the November 27, 2008 issues of journal *Nature*, have forced palaeontologists to rethink turtle's origins.

The fossil of Odontochelys semitestacea was found in sediments deposited in the Nanpanjiang Trough Basin, and dates back 220 million years. Researchers saw the densely grown teeth and primitive shell structures in the turtle fossil, and named it "half shell turtle". According to a briefing, turtle fossils in the Triassic age are rarely seen in the world, with limited findings unearthed in Germany, Thailand, and Argentina. These turtle fossils, however, look very much like today's turtle, unveiled no clues to their origins. Scientists have to deduct turtle origins relying on the embryonic development of today's turtle, or on the very few ancient reptile species with shells. Unlike the turtle origin theory prevailing among the scientific community, the "half shell turtle" indicates that the Chinese specimen has a fully developed plastron — the flat ventral part of the shell — but the carapace, the dorsal part, is absent, suggesting that the two parts of the shell evolved separately, with the plastron developing first — an idea that contradicts the prevailing hypothesis that the shell was formed by osteoderms (bony deposits) fusing together. The said process agrees with the embryonic development of today's turtles. Additionally, the shell stems from the spine, noticeably associated with the specialization of ribs, which overrides the previous assumption that the shell is an independent growth. The new turtle fossil also indicates that turtles have a more sophisticated and ancient origin than expected.

Metal-Organic Frameworks with Tunable Porosity

Not long ago, a study, headed by Prof. QIU Lingguang of Anhui University, proposed and verified a novel approach to design micro- and mesoporous metal-organic frameworks with tunable porosity, an international puzzle. The finding, published in the journal of *Angew.Chem.Int.Ed*., has greatly expanded the applications of nano metal-organic framework materials.

Researchers worked out hierarchically micro- and mesoporous metal-organic frameworks with tunable porosity, using the super molecule design approach. The material is featured with the tiny pores connecting to each other, with an adjustable caliber up to 31 nanometers, or the largest caliber currently available for the metal-organic frameworks in the world (less than 5 nanometers in the past), greatly expanded the applications of organic-inorganic hybrid composites, such as in gas storage, slowly released drugs and biological activity, and chemical/biological sensors. It also expects an attractive application perspective for high volume hydrogen storage materials (smaller fuel batteries and hydrogen energy vehicles).

Intelligent Brain

Prof. LU Baoliang and Prof. ZHANG Liqing, from Shanghai Jiaotong University Dept. of Computer, made the debut of their latest product on November 22: a brain signal (EEG) based intelligent gadget, using computer based interaction technology. A researcher wearing a bizarre hat sat before the computer, and controlled the turning, accelerating, and slowing down the simulated cars on the computer screen using his thinking power. The new technology expects wide applications, including car control, safe driving system, wheel chair control, high risk/alertness evaluation, and emotion analysis. The technology can also be used to monitor fatigue driving. A driver would have a changed brain pattern when his fatigue reaches a threshold, which will be picked up by the computer for further evaluation or issuing warnings, preventing fatigue related traffic accidents.

Novel Self Heating Materials

A research team, led by CAO Xueqiang and ZHOU Guangyuan at CAS Changchun Institute of Applied Chemistry, has found the solutions to address a range of technologies, including heat release control, heat transmission analysis, and optimized design, through the systematic study of the heat release mechanisms of self heating materials and associated commercial applications. Researchers have developed the needed key and integration technologies for high-energy ball shaping, membrane embedding, and manipulated release of hydrogen ions, and rolled out series high performance self heating materials.

Enjoying numerous merits, including high specific energy, light weight, fast boot, smooth heat release, and safe operation, the novel material is a desirable application for flameless food heaters. For example, an FRH flameless heater can be used in a non-closed

environment, with major indicators, including heat efficiency, heating performance, compactness, and convenience, being better than its overseas counterparts. An FRH—NH model does not produce hydrogen or odors, desirable for applications in a closed environment. The combined use of two models allows an all-weather food heating process, a substantive leaping development for food supply.

Tetraplont Salvia Miltiorrhiza

A tetraplont breeding technique, developed by Prof. CHEN Li and coworkers at Nankai University College of Life Sciences, is able to raise the single plant yield of Salvia miltiorrhiza, a traditional Chinese medicinal herb, up to 2,000 grams or more. The Salvia miltiorrhiza plants currently grown in the country using the diploid technique have an averaged yield at 200-300 grams.

The new species is built on the tetraplont derived from the diploid, and further hybrided with the cultivated or wild Salvia miltiorrhiza plants collected from different parts of the country to become a tetraplont. It is believed that the new species will maintain its strength for at least 10 years, with a strong adaptability and greatly raised quality and yield for the medicinal roots.

The study team weighed the yields of 2,000 tetraplont Salvia miltiorrhiza plants over an experimental plot located in Baodi, Tianjin, and recorded a highest single plant yield exceeding 2,000 grams, and an averaged yield at 800 grams. It is estimated that the total yield of the tetraplont plants will surpass the diploid by 30%-50%. Tests show that the sample plant has contained an effective drug content exceeding the standard defined by the National Pharmacopeia. Researchers have so far sorted out 12 tetraplont species from seven regions, including Shandong, Henan, Shaan xi, Hebei, Jiangsu, Zhejiang, and Tianjin, for further diffusion.

NEWS BRIEFS

Joint Nanotechnology Center

A joint international nanotechnology R&D center was inaugurated on November 24, 2008 at Zhejiang University. As one of the 33 international joint R&D centers at the national level approved by the Ministry of Science and Technology and the State Administration of Foreign Experts Affairs, the new center is also the first international joint R&D center at the national level in the province. According to a briefing, the center will strengthen international cooperation, and develop three platforms for research, S&T finding spin-off, and industrialization, by taking advantage of the strength of Zhejiang University and

nanotechnology expertise in the province. The new center expects to produce proprietary innovative findings, and build up its own blood making mechanism for the future development. It will also provide technical support for the industries in the province, playing a demonstration role as a joint international R&D center.

Utility Levitated Trains

China's first utility levitated train designed to run at low and medium speeds recently came off the assembly line. Manufactured by China CNR Tangshan Railway Vehicles, the new levitated train has entered static intensity tests. The train is made up of three compartments, or two end vehicles of similar structures, and one middle car. Built with a wide aluminum alloy body, the train is designed with a raised voltage from 750V to 1500V, and increased bogies from 4 sets to 5 sets for each vehicle, which allows a reduced turning radius under an enhanced dragging power, desirable for running on sophisticated urban roads.

Tangshan Railway Vehicles introduced 3-D and module approaches in designing the new levitated train, in an attempt to work out generic and compatible modules, and reduce the manufacture costs. All the data of the new levitated train have been recorded in the SAP system, sharing a management and manufacturing platform with the high speed trains running at 350 km per hour.

First Deep Sea Pool in Trial Operation

Shanghai Jiaotong University announced on November 18, 2008 at an international deep sea technology workshop that China has put its first deep sea test pool into a trial operation. With a length of 50m, width 40m, and depth 10m, the deep sea test pool is literally a miniaturized ocean. The floor of the pool is made of steel, allowing flexible ascending or descending for needed depth. The pool is surrounded by a wall made of stainless steel, desirable for calming down the waves. 32 metal wind making units sit across the "sea surface", simulating ocean storms. 222 sophisticated wave making boards stand on the two sides. In operation, the wave making boards will move like a snake, creating and pushing waves to the other side. The test pool, equipped with advanced functions and equipment, is able to simulate a sophisticated marine environment at a depth of 4000m.

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