

My China Story

A Malaysian Expert's Vision: Innovation, Cooperation

By Staff Reporters

Show Kuan Yeow, a renowned Malaysian scientist, has devoted himself to industrial and municipal wastewater treatment for more than three decades. Before joining the Chinese wastewater-treatment company Puritek as a researcher in 2014, Show was a professor at the Nanyang Technological University in Singapore. He currently serves as the director of the Research Institute at Zhejiang Juneng company, a subsidiary of Puritek, and his primary responsibility is to promote new technological advances and applications. Show recently spoke to *Science and Technology Daily* about his interpretation of China story.

S&T Daily: What is the significance of wastewater treatment and how do you help people understand what you do?

Show Kuan Yeow: As we know, Earth is the only planet in the solar system that is covered by water. Every living thing from people, plants, animals, and even those too tiny to see, like microbes, needs water to survive. Without water, life on Earth would never have begun. As a scientist researching wastewater treatment, the aim of my work is to protect the water environment as a life-sustaining resource so that clean water is accessible to all.

I have been giving seminars and talks to the general public on the significance of water environment protection. In sharing our research work in wastewater treatment, I normally show real samples of wastewater before and after treatment collected from our treatment plants. It can be mind-boggling to see how odious, dark coloured and chalky wastewater turned into clean and sparkling water resulting from wastewater treatment.

Does anything in particular stand out from the research you've carried out in China?

One of the successful applications is the treatment of paint wastewater

from a large-scale paint manufacturer in Zhejiang. The wastewater was characterized by complex chemical compositions with recalcitrant compounds which are not degradable. Using the biogranulation technology we developed, the innovation improved significantly the treatment efficiency, satisfying the most stringent trade effluent discharge standards. The innovation contributed to significant cost savings resulting from lower operating expenditures, thus solving the long-standing issue of expensive and energy-intensive treatment by incineration, distillation, or electro-catalytic oxidation commonly practiced in the industry.

The innovation has gained recognition from the end users and government and has been promoted by the paint industry as a demonstration project. We have applied the innovation in over 70 industrial projects, including centralized wastewater treatment plants in chemical industry parks.

Investment in R&D is important to sci-tech progress. How do you assess the role of enterprises' investment in R&D?

In terms of the challenges, business competition is getting stiffer not only in China but worldwide. Companies must be encouraged and willing to invest in R&D in order to leapfrog to a higher level of technological advancement.

Taking chemical wastewater treatment as an illustration, treatment of wastewater especially that generated from the petrochemicals and coal chemicals industries, is getting more complicated. Increasingly complex wastewater is being generated from production of new chemicals and products. Some of the wastewater contains recalcitrant or toxic pollutants that are not readily degradable and have not been successfully treated anywhere in the world. This is where R&D can play an important role in developing innovative ways of treating the recalcitrant and even toxic contaminants.

In the current context, what are your expectations of international cooperation in the sci-tech sphere?

The transformation in China over the last three decades marks a milestone in the history of reform and opening up. Significant achievements and advances had been made through dedicated reform and opening up. These had created solid foundations and favorable conditions for China's continued development. From the 20th National Congress of the Communist Party of China, a clear message has been conveyed that China will advocate a broader agenda of opening up across more areas and in greater depth.

I believe China will pursue a more proactive strategy of opening up to draw greater international cooperation and talents in science and technology. By conglomerating the expertise and international perspectives of global talent, China is committed to tackling the challenges faced by the country and the world, such as global climate change, and to build a global community with a shared future and a better world. I would love to see a flourishing globally

oriented network of innovation, and the world would benefit from China's prosperity.

As a successful scientist, do you have any words of encouragement to the younger generation who may wish to pursue a sci-tech career?

To the younger generation, I would like to say that, as the technological world continues to evolve and advance, the future of sci-tech has never been more important. As a matter of fact, one should focus on effort, not talent or grades. Be persistent and not afraid of failure. As Thomas Edison once said, "Failure is the mother of success." Setbacks and defeats eventually lead to success.

Most importantly, one must have a passion for sci-tech work. Sci-tech can be interesting, and it can always link to problem-solving in the real world. A scientific finding could be significant, no matter how trivial it seems to be, because each little step may form an essential link that eventually leads to a discovery.

This article is also contributed by Jixing Science and Technology Bureau.



The beautiful scenery of Yaozhuang town, Jiashan county, Zhejiang province, after the implementation of projects on riverside landscape construction and wastewater treatment. (PHOTO: XINHUA)

Yin Ruins Tell Ancient Stories

Service Info

By Staff Reporters

Yin Ruins are the remnants of the capital of the late Shang Dynasty (1600 BC-1046 BC). It dates back 3,300 years, and its existence has been confirmed by historical documents, oracle bone inscriptions and archaeological excavations as the first capital site in Chinese history.

Inscribed on the UNESCO World Heritage List in 2006, the Yin Ruins site showcases the ancient Yin-Shang culture, and was named the most important of China's 100 archaeological discoveries in the 20th century. It is regarded as the birthplace of Chinese archaeology and the cradle of oracle bone inscriptions.

The only living ancient characters

Most people who have heard of Yin Ruins across the world, however, associate the site with the discovery of oracle bones and tortoise shells with mysterious ancient inscriptions on them. The oracle bone inscriptions discovered at the Yin Ruins are considered to be the oldest Chinese inscriptions.

Oracle bone inscriptions from ancient China, hieroglyphs from ancient Egypt, cuneiforms from ancient Babylon, and Mayan glyphs from Mesoamerica are among the world's most famous ancient writing systems.

Of these systems the oracle bones are the only one that has survived, evolving over time into the current Chinese writing characters. According to UNESCO, inscriptions on oracle bones found in Yin Ruins bear invaluable testimony to the development of one of the world's oldest writing systems, ancient beliefs and social systems.

According to a report from Xinhua, roughly 160,000 fragments of oracle bone have been found to date. Only 1,600 of the 4,300 characters on them have been deciphered. Historically, the

Shang people employed oracle bone inscriptions as a way to document their rituals of divination and sacrifice. All aspects of Shang dynasty life, including religious rituals, administrative matters, agricultural and military activities, were subject to divination. Today, oracle bone inscriptions have become increasingly valuable resources for understanding the earliest stage of Chinese grammar and the initial layout of Chinese characters.

Largest unearthed bronze vessel in the world

Apart from the time-honored oracle bone inscriptions, delicate bronze ware, jade and ivory articles, production tools, and articles for daily use, have enhanced Yin Ruins' reputation internationally.

The most famous of the artifacts is the iconic Houmuwu Ding, formerly known as Simuwu Ding. Ding is a type of Chinese ritual bronze ancient cauldron.

The four-legged bronze cauldron measures 133cm in height and 875kg in weight, which makes it the world's biggest bronze relic ever uncovered. The vessel shows the high level of craftsmanship as well as economic and cultural development of the late Shang Dynasty.

Remembering a female warrior

The famous tomb of Fu Hao has also been one of the most important archaeological findings at the Yin Ruins since 1928. It is the only tomb of a member of the royal family during the Shang Dynasty to have remained intact.

Fu Hao was an ancient queen and warrior whose remarkable life story can be pieced together from objects found in her lavish tomb. Her story was one of the many recorded on the oracle bones unearthed.

She was the wife of King Wu Ding, who led the Shang Dynasty to its zenith. From these oracle bone inscriptions, we learn that Fu Hao was not only a queen and mother, but she also held a high status as a military head, being second in command to the king.

Expat Activities

Children Experience Different Cultures in Rural Areas

By Staff Reporters

The 2022 Xiaoxiang Foreign Experts Service Activity was held in Ningxiang city, Hunan province recently.

Volunteers from Canada, Pakistan, the U.S. and other countries brought a vivid and engaging science class to more than 100 teachers and students from Jinzhou Junior High School. It is the first time for the children in this rural area to have an opportunity to directly contact

different cultures.

Adam McRoy, one of the volunteer representatives and academic principal of Cogdel Cranleigh School Changsha, said that this activity is important for foreign experts to integrate into Hunan more quickly, and the school will send more foreign professionals to join the volunteer service team.

Source: Science and Technology Department of Hunan province.

NJU Expats Appreciate Beauty of Silk Weaving

By Staff Reporters

In order to foster cultural exchanges, Nanjing University (NJU) organized a themed exhibition on the Kesi technique, which is a form of Chinese silk weaving and was included in the UNESCO Representative List of the Intangible Cultural Heritage of Humanity in 2009.

More than twenty foreign experts gathered on November 15 to appreciate the traditional art's beauty and joined a round table discussion to address the dissemination of traditional Chinese culture and the NJU talent cultivation system. Through in-depth discussion and opinion sharing, the foreign experts gained renewed awareness of traditional Chinese culture and confidence in integrating into Nanjing.

For the sake of promoting international cooperation, Nanjing University has established the Overseas Scholars Service Center, which offers comprehensive and

centralized services to foreign experts. Despite the obstacles caused by COVID-19, the center has helped approximately fifty foreign experts come to the institution for work or academic exchange since its formal launch in 2020. Meanwhile, the center increased its efforts to develop a platform to enhance mutual understanding between Chinese and international scholars.

Source: Global NJU



A foreign expert appreciates the beauty of Kesi at the exhibition. (PHOTO: NJU)

Traditional Eastern Wisdom

Historical Water Conservancy Project in the Pearl River Delta

By BI Weizi

The Sangyuanwei Polder Embankment System, built during the Song Dynasty (960-1127) in the Pearl River Delta in Foshan, Guangdong province, is one of the largest polder embankment projects of ancient China, extending for 64.84 km and covering an area of 265.4 km².

Located in a subtropical marine monsoon climate zone, with an average annual precipitation of 1,620 mm and surrounded by the mainstream of the Pearl River and the Beijiang River, Sangyuanwei is highly susceptible to floods and typhoons, which motivated local people to build a project that allowed them to live in harmony with nature.

Sangyuanwei is mainly composed

of three parts: embankment, irrigation and drainage system, and water control work. The system's dike is crisscrossed with rivers, forming a complete network of irrigation and drainage channels. Water control work of Sangyuanwei is called "dou", which is actually a sluice gate that can control water diversion, drainage and transmission depending on the actual water level. The water system within the embankment is connected with the outside water through the gates on the embankments. At present, there are 63 ancient gates with historical value.

With a history of almost 1,000 years, Sangyuanwei is not only an important historical witness to local water conservancy and cultural development, but also to the historical process of migration of population and expansion of eco-

nomics zones to southern China since then. In December 2020, it was successfully included in the seventh batch of

the World Heritage Irrigation Structures List by the International Commission on Irrigation and Drainage.



An aerial view of mulberry-based fish ponds of Sangyuanwei Polder Embankment System in Foshan, Guangdong province. (PHOTO: VCG)

China Actively Advances Global Sci-tech Cooperation

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China has also taken part in International Big Science Programs and Large-scale Scientific Facilities, including the Square Kilometre Array. Being involved in the global innovation governance of public health and clean energy, the country has put forward innovation motions and cooperation initiatives in multilateral mechanisms, such as G20 Sci-

ence, Technology & Innovation Ministers Meeting, Meeting of Ministers of Science and Technology of the Member States of the Shanghai Cooperation Organization (SCO), and BRICS Science & Technology Ministers Meeting.

Under the Belt and Road Initiative, 53 joint laboratories were constructed. Support has been given to young scientists for 3,500 person-times to come to China for

research work for over half a year. Training has been offered to more than 15,000 overseas sci-tech personnel. The Alliance of International Science Organizations initiated by China now has 67 members.

Eight transnational technology transfer platforms have been built to cooperate with ASEAN, South Asia, the Arab countries, Central Asia, central and east European countries, Africa, SCO

and Latin America.

"We encourage research institutes, universities, enterprises and local governments to actively conduct international cooperation," said Liang, adding that the number of sci-tech papers co-authored by Chinese researchers and partners from 169 countries reached 183,000 in 2021, increasing by 1.5 times than that of 2015.