

Xi Jinping: "Science Has No Borders, but Scientists Have A Motherland"*

On September 11, Xi Jinping, President of the People's Republic of China hosted a symposium of scientists in Beijing and delivered a speech.



TODAY, WE ARE HOLDING A SYMPOSIUM for scientists to listen to your opinions and suggestions on promoting innovation-driven development and accelerating the pace of scientific and technological innovation during the "14th Five-Year Plan" period and beyond. The scientists and science and technology workers attending today's symposium come from scientific research institutes, universities, and enterprises, and are involved in basic research, and applied research. There are also foreign scientists working in China.

Just now, in combination with your respective research fields, you have put forward many valuable opinions and suggestions on deepening the reform of the scientific and technological system and promoting scientific and technological innovation and development. Relevant

parties are responsible to study and absorb them carefully. Now, in conjunction with your speeches, let me make some comments.

1. Fully understand the major strategic importance of accelerating scientific and technological innovation

Since the 18th Party Congress of the Communist Party of China, we have attached great importance to scientific and technological innovation and insisted on taking innovation as the primary driving force for development. Through the collective effort of the whole society, our country's scientific and technological undertakings have made historic achievements and seen historic changes. Major innovations are emerging, and some cutting-edge fields have begun to enter and lead the stage. Our technological strength is



Chinese President Xi Jinping, chairs symposium attended by scientists in Beijing, capital of China, Sept. 11, 2020 (Yao Dawei / Xinhua).

moving from the accumulation of quantity to a qualitative leap, from the breakthrough of points to the improvement of system capabilities. During the fight against the new crown pneumonia epidemic, a vast number of scientific and technological workers carried out scientific research in many important fields such as treatment, vaccine research and development, prevention, and control. They provided strong support and made major contributions to the overall promotion of epidemic prevention and economic and social development. I take this opportunity to express my heartfelt thanks to the scientific and technological workers!

The world today is undergoing major changes not seen in a century. Our country's development faces a domestic and international environment of profound and complex changes. Our country's development during the 14th Five-Year Plan period, as well as in the long term, is raising ever more urgent requirements for accelerating scientific and technological in-

novation. First of all, accelerating technological innovation is needed to promote high-quality development. Building a modern economic system, promoting quality change, efficiency change, and power change all require strong scientific and technological support.

Second, accelerating scientific and technological innovation is needed to achieve a high-quality of life for the people. At present, the main social contradiction in our country has been transformed into a contradiction between people's growing needs for a better life and unbalanced and inadequate development. To satisfy the people's yearning for a better life, more scientific and technological innovations that involve people's livelihood must be introduced.

Third, accelerating scientific and technological innovation is necessary to build a new development pattern. To promote the domestic cycle, we must adhere to the main line of supply-side structural reform, improve the quality and level of the supply system, and create new demand

with new supply. Technological innovation is key. To unleash domestic and international dual circulation requires scientific and technological strength to ensure the safety and stability of the industrial chain and supply chain.

Fourth, accelerating scientific and technological innovation is necessary to successfully start the new journey of building a modern socialist country in an all-round way. From the initial proposal of the “four modernizations” to the present proposal of comprehensively building a modern socialist country, the modernization of science and technology has always been an important part of our country's modernization.

The key is to improve the scientific and technological innovation ecosystem, stimulate innovation and creativity, and provide scientists and scientific and technological workers.

Now, our country's economic and social development and the improvement of people's livelihood require more scientific and technological solutions than ever in the past, and it is even more necessary to enhance the primary driving force of innovation. At the same time, in the face of fierce international competition and against the backdrop of rising unilateralism and protectionism, we must take a path of innovation that suits our national conditions. In particular, we must put the improvement of original innovation capabilities in a more prominent position and strive to achieve more “from zero to one” breakthroughs. It is hoped that the majority of scientists and scientific and technological workers will shoulder their historical responsibilities and persist in facing the frontiers of world science and technology, look toward the main economic battlefield, look toward the major needs of the country, look toward the people's lives

and health, and continue marching towards the breadth and depth of science and technology.

2. Accelerate the resolution of some key issues restricting the development of scientific and technological innovation

Our country has a large number of scientific and technological workers and large-scale R&D investments. It initially has the conditions to compete on the same stage with the international advanced level in some fields. The key is to improve the scientific and technological innovation ecosystem, stimulate innovation and creativity, and provide scientists and scientific and technological workers. They set up a stage to display their talents and make scientific and technological innovation achievements emerge continuously.

First, uphold demand-orientation and problem-orientation. The selection of scientific research topics is the first problem that must be solved in scientific and technological work. I have often said that the selection of research direction should be demand-oriented, starting from the urgent national needs and long-term needs of the country, truly resolving practical problems. Engels said: “Once a society has a technical need, this need will push science forward better than ten universities.”

At present, our country's economic and social development, improvement of the people's livelihood, and national defense construction are confronting many practical problems that must be resolved. For example, in agriculture, we rely heavily on foreign countries for many seeds, and the cultivation and processing technology of agricultural products is relatively backward. In some areas, agricultural non-point source pollution and heavy metal pollution in cultivated land are serious. In industry, some key core technologies are controlled by others, and some key components, parts, and raw mate-

rials rely on imports. In terms of energy resources, the degree of dependence on foreign oil has reached more than 70%. Oil and gas exploration and development, and the development of new energy technologies are insufficient; the spatial distribution of water resources is unbalanced, all are causing many problems. In terms of society, the aging of our country's population has continued to deepen, the people's requirements for a healthy life have continued to rise, and the lagging technology development in biomedicine, medical equipment, and other fields has become increasingly prominent. We must push forward the technologies that can rapidly push through and solve problems promptly. For technologies that are strategic and require long-term success, we must deploy them in advance.

Second, integrate and optimize the allocation of scientific and technological resources. For scientific and technological innovation, the optimal allocation of scientific and technological resources is crucial. The success of the "Two Bombs and One Satellite"¹ depended on a group of leading talent, and our country's powerful organizational system. We have a large number of scientists, academics, and world-class scientific researchers and engineers. We must pay close attention to the construction of the innovation system, optimize the combination, and overcome the disadvantages of fragmentation, inefficiency, and duplication. We need a batch of talented scientists who effectively leverage scientific research resources. It is necessary to give full play to the main role of enterprises in technological innovation, promote the concentration of innovative elements in enterprises, and promote the in-depth integration of production, education, and research. It is necessary to give full play to the advantages of our country's socialist system that can concentrate its efforts on major tasks, optimize the allocation of ad-

vantageous resources, and promote research on key core technologies in important fields. Several national laboratories should be established, and the existing state key laboratories must be reorganized to form a laboratory system in our country. It is necessary to give play to the important role of universities in scientific research, mobilize the enthusiasm of various scientific research institutes, give play to the advantages of abundant talents and orderly organization, and form a strategic force.



Xi Jinping: "We must put education in an ever more important position, comprehensively raise the quality of education, and focus on fostering students' innovative mentality and innovative abilities." (Xinhua, 2019)

Third, persevere in strengthening basic research. Basic research is the source of technological innovation. Although our country's basic research has made significant progress, the gap with the international advanced level is still obvious. The root cause of many "bottle-neck" technical problems that our country faces is that basic theoretical research cannot keep up, and the source and underlying issues have not been clarified. On the one hand, basic research

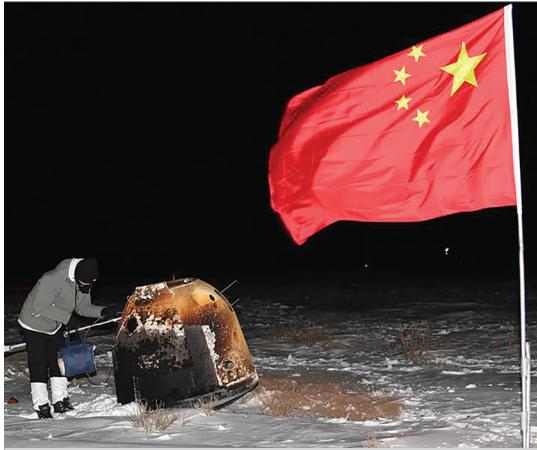
¹ Editor's Note: Two Bombs and One Satellite is a Chinese nuclear and space project conducted during the Mao Tse-Tung period in 1960s. Through this project, China tested its first atomic bomb in 1964 and its first hydrogen bomb in 1967. In 1970, China became the fifth country to launch its own satellite.

must follow the laws of scientific discovery, driven by curiosity to explore the mysteries of the world and encourage free exploration and full exchanges and debates. On the other hand, it must be driven by major scientific and technological issues to abstract theoretical issues from major applied research. We must further explore the laws of science, so that basic research and applied research promote each other. It is necessary to clarify the direction and development goals of our country's basic research field and continue to work for the long term.

Talent is the first resource. The fundamental source of national scientific and technological innovation lies in people.

To increase investment in basic research, first of all, the state financial investment must increase, and at the same time, it is necessary to guide enterprises and financial institutions to increase support in appropriate forms, encourage the society to invest in multiple channels through donations and fund establishments, expand funding sources, and form a continuous, stable investment mechanism. For scientific research units and enterprises that have carried out effective basic research, necessary policy support should be given in terms of finance, banking, and taxation. It is necessary to create a good scientific research ecology that is conducive to basic research, establish a sound scientific evaluation system and incentive mechanism, encourage scientific research personnel to emancipate their minds, make bold innovations, and allow scientists to concentrate on research. It is necessary to run first-class academic journals and various academic platforms, and strengthen domestic and international academic exchanges.

Fourth, strengthen the education and training of innovative talents. Talent is the first resource. The fundamental source of national scientific and technological innovation lies in people. It takes a decade to grow a tree, but a century to cultivate a person. We must put education in an ever more important position, comprehensively raise the quality of education, and focus on fostering students' innovative mentality and innovative abilities. We must strengthen the build-up of basic disciplines such as mathematics, physics, chemistry, and biology; encourage higher education institutions meeting conditions to vigorously set up basic research and interdisciplinary courses and specializations; strengthen undergraduate training in basic disciplines; and explore models for continuous training between undergraduate, graduate, and doctoral levels in basic disciplines. We must strengthen the training of top-notch students in basic disciplines, build foundations in disciplines such as mathematics, physics, chemistry, biology, etc., and guide the most excellent students to dedicate themselves to basic research. It is necessary to strengthen basic research in colleges and universities, plan out the construction of cutting-edge science centers, and develop new research-oriented universities. It is necessary to respect the law of talent growth and the law of scientific research activities to cultivate a group of strategic scientific and technological talents, leading scientific and technological talents, and innovative teams with international standards. We must attach great importance to the growth of young scientific and technological talents so they can become the main force of scientific and technological innovation. It is necessary to gather first-class talents from all over the world, attract high-end overseas talents, and provide internationally competitive and attractive environmental conditions for overseas scientists to work in China.



*Xi Jinping: "We need to be more proactive in integrating into the global innovation network and enhance our technological innovation capabilities."
(Wang Jiangbo/China Daily)*

Fifth, relying on reforms to stimulate the vitality of scientific and technological innovation. Our country's science and technology team has great innovation potential, and the key is to effectively release this potential by deepening the reform of the science and technology system. Transforming government functions is an important task of scientific and technological reform. Many of our industrial supply chains need technological solutions. Only the thousands and thousands of scientific and technological workers and market players who are fighting on the front line can provide such solutions. What our government must do is create a good environment for them, and provide basic conditions, playing a good organizational and coordination role. It is necessary to speed up the transformation of science and technology management functions, and shift more energy from dividing money, dividing materials, and determining projects to determining strategies, guidelines, policies, creating an environment, and improving services. We must accelerate the advance of scientific research institute reform, entrust higher education institutions and scientific research bodies with greater autonomy, give leading in-

novation talent greater decision-making powers over technological pathways and funding use, and firmly eliminate "only papers, only job titles, only CVs, and only awards." It is necessary to integrate the financial research investment system and change the state of divided, small, and scattered departments. We will comprehensively study and consider the issue of strengthening the overall coordination of scientific and technological forces raised by you.

Sixth, strengthen international scientific and technological cooperation. International cooperation in science and technology is a major trend. We need to be more proactive in integrating into the global innovation network and enhance our technological innovation capabilities through open cooperation. We must implement a more open, inclusive, mutually beneficial, and shared international science and technology cooperation strategy.

On the one hand, we must persist in doing our affairs well, continue to improve our capacity for independent innovation in science and technology, build a "long board" in some areas of advantage, and consolidate the foundation for international cooperation. On the other hand, it is necessary to promote international scientific and technological exchanges and cooperation with more open thinking and measures. Under the current situation, it is necessary to pragmatically promote international scientific and technological cooperation in the field of global pandemic prevention and control, and public health, and carry out research cooperation in the fields of drugs, vaccines, and testing. It is necessary to focus on common issues such as climate change and human health to strengthen joint research and development with scientific researchers from various countries. It is necessary to gradually liberalize the establishment of international science and technology organizations in our

country and foreign scientists to hold posts in our country's science and technology academic organizations so that our country will become a broad stage for global scientific and technological open cooperation.

Science has no borders, but scientists have a motherland. The historic achievements of our country's scientific and technological undertakings are the result of generation after generation of scientists who have dedicated themselves to serving the country.

3. Forcefully carrying forward the scientist's spirit

Scientific achievements are inseparable from spiritual support. The spirit of a scientist is a precious spiritual wealth accumulated by scientific and technological workers in long-term scientific practice. Since the founding of New China, a vast number of scientific and technological workers have set up monuments of scientific and technological innovation in the motherland, and they have also created a unique spiritual temperament. In May last year, the Party Central Committee issued the "Opinions Concerning Further Carrying Forward the Scientist's Spirit, and Strengthening Work Style and Learning Style Construction," which required to vigorously promote the patriotic spirit of mind-ing the motherland and serving the people, and the innovative spirit of bravely climbing the peak and being the first to pursue truth, the pragmat-ic spirit of rigorous scholarship, the dedication spirit of being indifferent to fame and fortune, dedicated research, the spirit of gathering wis-dom to tackle key problems, the spirit of unity and cooperation, and the spirit of educating people willingly and rewarding. The majority of scientific and technological workers must shoul-

der the important task of scientific and techno-logical innovation entrusted by history. Here, I will emphasize patriotism and innovation.

Science has no borders, but scientists have a motherland. The historic achievements of our country's scientific and technological undertak-ings are the result of generation after generation of scientists who have dedicated themselves to serving the country. From Li Siguang, Qian Xuesen, Qian Sanqiang, and Deng Jiaxian to a large number of outstanding scientists who grew up after the founding of New China, such as Chen Jingrun, Huang Danian, and Nan Ren-dong, they are all models of patriotic scientists. Hope that the majority of scientific and techno-logical workers will not forget their original in-tentions, keep their mission in mind, uphold the national and people's interests first, inherit and carry forward the excellent qualities of the older generation of scientists in caring for the moth-erland and serving the people, carry forward the "Two Bombs and One Satellite" spirit, actively undertake to bear the heavy burden of historic responsibility, and merge their scientific pursuits into the magnificent undertaking of building a modern Socialist country.

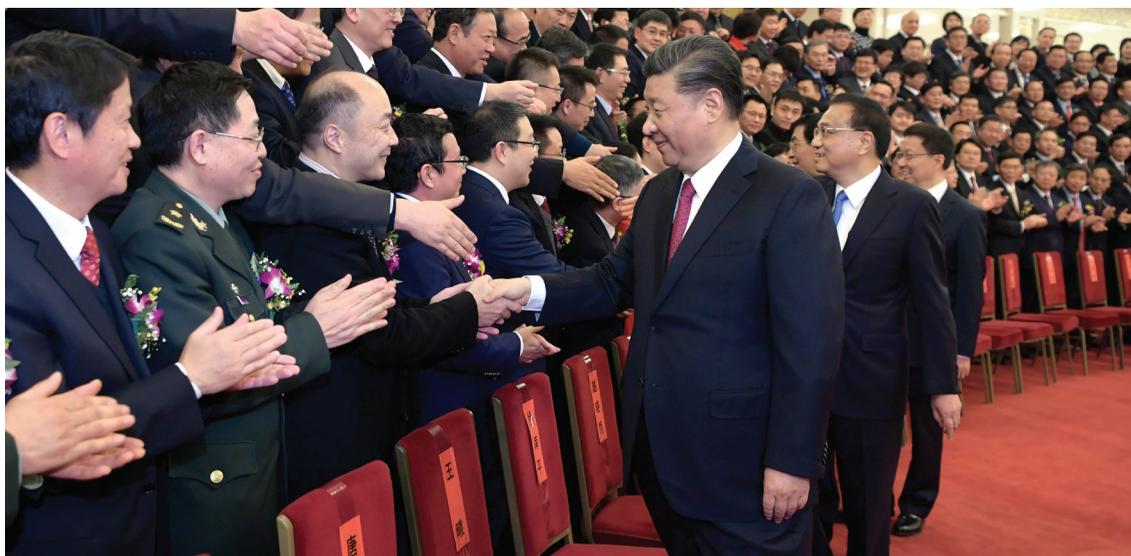
Technological innovation, especially origi-nal innovation, requires the capability of creative thinking, strict evidentiary methods, non-wor-ship of academic authority, not blindly follow-ing existing theories, daring to challenge boldly, build concrete evidence earnestly, and exper-iment constantly. Originality generally comes from hypotheses and conjectures. It is a complex process of continuous observation, thinking, hypothesis, experiment, verification, and induc-tion, rather than simple induction. The creativ-ity of assumptions and conjectures is crucial. Einstein said: "Posing a question is often more important than solving a problem." If it is not chosen correctly, even with great energy it is dif-ficult to produce positive results. The vast num-ber of scientific and technological workers must have the ambition to be creative, dare to propose

new theories, open up new fields, explore new paths, and work hard on originality. It is necessary to produce more high-level original results to contribute to the continuous enrichment and development of the scientific system. Scientific research, and especially basic research, often start from scientists' curiosity to investigate the profound mysteries of nature. In practice, all scientists achieving prominent achievements rely on perseverance, curiosity, a sense of dedication, and a life-long exploration to achieve their cause. Studies have shown that scientists' advantages are not only based on intelligence but more importantly, focus and diligence. After long-term exploration, they form an advantage in a certain field. It is necessary to encourage scientific and technological workers to concentrate on their scientific research, study diligently, do not seek vanity, and do not consider fame or fortune. It is necessary to widely publicize the vivid deeds of scientific and technological workers who dare to explore and devote themselves to science. Curiosity is human nature. The guidance and training in scientific interests must be started from childhood to ensure a better understanding of scientific knowledge and grasp of scientific

methods, creating a large batch of young cohorts equipped with scientific potential.

Party committees and governments at all levels and leading cadres at all levels must earnestly implement the Party Central Committee's decision and deployment on technological innovation, implement the innovation-driven development strategy, respect labor, knowledge, talent, and creativity, follow the laws of scientific development, and promote scientific and technological innovation results that are constantly emerging, and transformed into actual productivity. Leading cadres must strengthen the learning of new scientific knowledge and pay attention to global technological development trends.

Marx said: "There is no smooth road in science. Only those who are not afraid of hard work and climb steep mountain roads can hope to reach the culmination of glory." I believe that our country's scientists and technology workers have the confidence, have the determination, and have the capability to climb the peaks of science, and properly contribute to realizing the great rejuvenation of the Chinese nation and the building of a community with a shared future for mankind! 🌸



Chinese President Xi Jinping meet with representatives of the award winners before an annual ceremony to honor distinguished scientists, engineers and research achievements at the Great Hall of the People in Beijing, capital of China, Jan. 10, 2020. (Li Xueren/Xinhua)