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CHINA EXAMINES SCIENCE POLICY

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The articles in this report have been selected from the DAILY REPORT: CHINA and JPRS: CHINA REPORT: SCIENCE AND TECHNOLOGY and JPRS: CHINA REPORT: ECONOMIC AFFAIRS. The documents are presented chronologically within each subheading and cover the Fall 1980 - January 1982 period, with emphasis on the last six months of 1981.

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I. Science Policy--Technology Imports, Non-agricultural Economy, Politics of Science

BEIJING RADIO STRESSES USE OF SCIENCE IN ECONOMY

OW101908 Beijing Domestic Service in Mandarin 1200 GMT 10 Jan 81

[Station contributing commentator's article: "In Performing Scientific and Technological Work, We Should Make the Promotion of Economic Development Our Primary Task"]

[Text] The major readjustment of our national economy is designed to gradually rationalize our economic structure and find a way to expand the production of society by primarily relying on running existing enterprises well, improving production techniques and raising economic efficiency. Recently, the State Scientific and Technological Commission held a scientific and technological work conference and studied the policy concerning science and technology. It has been decided that in performing scientific and technological work we should make the promotion of economic development our primary task. We should make still more remarkable contributions to agricultural development, the development of consumer goods production, the rational technological transformation of existing enterprises and the realization of our long-range economic plan.

Science and technology should be coordinated with economic and social development. We must attach great importance to the factor of science and technology while working out such details of economic plans as economic objectives, economic structural changes, the rational utilization of resources, the distribution of productive forces, the orientation of the technological transformation of enterprises, the employment structure, population control, medical care and environmental protection. When we select the priority scientific and technological projects and decide the proportion, scope and speed of progress of various research work, we must consider the necessity and feasibility in a certain stage of economic and social development.

We should emphasize technological research and development for production. While continuing the necessary research and development of high-grade, precision and advanced science and technology, we should from now on mobilize and organize scientific and technological personnel in a more comprehensive way in all fields of our country and make great efforts to step up the research and development of productive technology. The research on productive technology should be done to promote the development of inexpensive good commodities to meet market demand. We should coordinate scientific research, design and production and not stop only at exhibits and samples.

We should step up the technological development of industrial and mining enterprises and popularize relevant experiences. The industrial and mining enterprises should make technical innovations in a comprehensive way, actively apply new technology to improve the quality of products and accelerate the production of new generations of products. Only in this way can they constantly improve their technology, enhance the competitive power of their products, make quick responses to market changes and quickly improve economic effects. This is the only way to modernization.

We should encourage and organize the scientific and technological personnel of various scientific research organizations and institutions of higher education to actively support the scientific and technological work of industrial and mining enterprises by popularizing scientific and technological achievements, cooperating in research and offering consultation. We should see to it that basic scientific research progresses step by step and on a firm foundation. We should develop and step up basic scientific research directly affecting the economy in a planned way. We should learn, absorb and digest foreign scientific and technological achievements as an important way to develop our own science and technology. We should not try to do everything from scratch nor attempt to invent everything by ourselves. In learning from foreign countries, we do not have to go after the newest and most advanced in everything, but should consider our economic needs and our technological foundation. In learning from foreign countries, we should not weaken or slacken our scientific and technological research at home. When we import foreign technology, we will be unable to truly absorb and digest it if we do not have our own scientific and technological research to match it.

GUANGMING RIBAO ON SCIENCE, TECHNOLOGY

HK300732 Beijing GUANGMING RIBAO in Chinese 15 Jan 81 pp 1, 3

[Commentator's article: "Science and Technology Must Be Developed in Coordination With the National Economy in the Course of Readjustment"]

[Text] Over the past year, our country's scientific and technological front has made fruitful efforts and achieved remarkable successes. In order to make steady progress, in 1981, our scientific and technological work must be carried out in coordination with the readjustment of the national economy.

Our country's national economy must be greatly readjusted this year. Under the circumstances in which our investments in capital construction projects have been reduced, readjustment of the national economy mainly depends on giving full play to the roles of the existing enterprises which must carry out rational technological transformation and reforms in economic structures, cut down the consumption of raw materials, improve the quality of products, raise efficiency and strive for beneficial results. With the basic change in the policy on our economic construction, we must rely on science and technology in a more effective way, give full play to the role played by science and technology in promoting productive forces and use science and technology to achieve better quality of products, greater economic benefits and higher speed. [paragraph continues]

Our scientific and technological work must make still greater contributions to promoting agricultural production, developing the production of our people's articles for daily use, promoting technological transformation and progress in our existing enterprises and developing the national economy in the days to come. In a word, the tasks for our scientists and technological front have not become lighter but have become heavier and more pressing.

During the period for economic readjustment, there is also a question of readjusting scientific and technological undertakings. To achieve a proper readjustment, we must clear and overcome the influence of the "left," conscientiously proceed from our national conditions and further sum up experiences and lessons. The following are some of our problems: The problem of blindly striving to catch up with and surpass advanced countries and losing contact with Chinese reality; the problem of not paying great attention to the agricultural and light industrial science and technology; the problem of not paying great attention to the scientific and technological work of enterprises; the problem redundant scientific research projects and tasks; the problem of building some redundant scientific research organs and making irrational overall plans; the problem of having an improper ratio between various types of scientific research work and various types of personnel in scientific research organs; the problem of not paying great attention to the rational use and training of scientific and technological personnel; and the problems of having great shortcomings in our scientific and technological management system and of having an urgent need to raise the standard of management. We must face these problems squarely, conscientiously carry out proper readjustments and enable our science and technology to advance more healthily, sturdily and steadily. For this reason, while trying

in every possible way to strengthen that scientific and technological work which meets the needs of the developing economy, we must also readjust all impractical plans, reduce the speed and scale of some projects and cancel other projects. In this sense, the scientific and technological front also holds the question of retreat in the course of readjustment.

To properly readjust our scientific and technological work and to properly strengthen and cancel some of our scientific and technological projects, we must pay special attention to coordinating scientific and technological development with economic and social development, coordinate our scientific and technological readjustment with the readjustment of the whole national economy and regard promoting the development of the national economy as the most important task. According to the spirit of the recently held national conference on scientific and technological work, we should pay attention to the following few questions regarding the guiding principle for the development of science and technology:

First, the development of science and technology must be brought into the orbit of the plan for developing the national economy and there should be a unified plan for developing science, technology and the national economy. We should attach importance to scientific and technological factors when we give consideration to making policy decisions and mapping out plans for economic and social development such as deciding on the targets of economic development, transforming economic structures, making changes in consumptive structures, making rational use of resources, arranging productive forces, choosing policies on technology and economy, deciding on the orientation of enterprise transformation, proving the necessity of important construction projects and projects of an earlier stage, creating more jobs, controlling population growth and promoting environmental protection, public health work, labor safety and educational reform.

Second, we must attach importance to and strengthen research on production techniques and correctly choose from the available techniques and from a rational technological structure. In the coming period, our country cannot carry out many capital-intensive technological projects that consume large amounts of energy resources, but should actively develop those advanced technological projects that require high-level technical knowhow, are suitable for our country and consume smaller amounts of energy resources. In the course of readjustment, we must achieve the three-in-one unity of advanced technology, productive feasibility and rational economy and pay special attention to handling some important problems in our economic construction which demand prompt solution. [paragraph continues]

These problems include the problem of energy conservation, the problem of popularizing achievements in agricultural scientific research, the problem of developing good and cheap articles for people's daily use and building materials, the problem of raising the basic technological level of our manufacturing industry and the problem of improving the quality and competitive ability of our export commodities.

Third, we should attach greater importance to and strengthen the work in popularizing achievements in applied science and technology. There has been very unbalanced economic development in various areas of our country. An important reason for this unbalanced development is that there are great differences in the technological levels of various areas. If we popularize the technology of advanced areas and enterprises among backward areas and enterprises and popularize the application of many new techniques and technology that are available in China according to local conditions, we shall not necessarily spend a lot of money on this kind of popularization and we can achieve rather quickly some relatively great economic results, thus enabling our country's national economic output value and revenue to increase by a big margin.

Fourth, we must make full use of the scientific and technological forces of the existing factories, mines and enterprises, make full use of the capital and material conditions of our enterprises and further strengthen the work in exploiting the technological forces of our enterprises. We must encourage and organize scientific and technological forces in all fields to actively support the technological exploitation and scientific experiments carried out by our factories, mines, enterprises and rural areas. We should energetically advocate "circulating knowhow" and strengthen the mutual infiltration and "hybridization" among different branches of learning and technology. We should adopt measures to encourage our scientific and technological personnel to go to the border areas, factories, mines, enterprises and rural areas to give assistance to the work there, and we may also encourage them to do part-time jobs or consultative work in such places.

Fifth, within the limits of security regulations, we should try in every possible way to introduce achievements in military scientific research, most advanced branches of military technology and even some scientific management methods to civilian units. In the course of readjustment, the national defense scientific and technological system should use its relatively superior manpower and material resources to make more contributions to promoting national economic construction.

Sixth, we must persist in mastering, assimilating and digesting foreign scientific and technological achievements and regard this way of doing things as an important way to develop our country's science and technology. We must study with an open mind and be good at studying. During the readjustment period, our country will proceed in all cases from the needs of the national economy and the conditions of our technological foundations and resources and will only selectively import foreign technology and software. Generally speaking, our country will no longer import complete sets of equipment. In carrying out our scientific and technological work, we must pay special attention to linking the import of foreign technology with the work in studying and digesting imported foreign technology and in manufacturing complete sets of equipment and also pay special attention to linking the import of foreign technology with the work in transforming technology in old enterprises.

Seventh, we must also ensure that basic research can be gradually developed on a stable basis. Wtih regard to some basic research projects which are of strategic significance to the long-term development of the national economy and to the raising of the people's living standard, and with regard to some most advanced branches of science and technology which touch upon the modernization of our national defense, we should rationally readjust and concentrate our forces to quicken the pace of carrying out such research in order to strive for a breakthrough at an early date.

In the course of the readjustment of the national economy, the retrenchment of national financial expenditure will bring about some temporary problems in our scientific and technological work. We think that there is no reason whatsoever for any undertaking to use the word "strengthening" or the world "developing" as an excuse for increasing the number of organs and personnel and the amount of capital. [paragraph continues]

We must conscientiously study the ways to spend money rationally and use it where it is needed most. If we rationally organize our business and raise our management standard, we can frequently "get more done for less money." Of course, this does not mean that the development of science and technology does not need money. We are trying to say that in the face of temporary difficulties, we should try in every possible way to create conditions and to "open all financial avenues." For example, from now on, we should distribute funds according to scientific research projects, use funds in a concentrated way, support good projects and support competition. We should actively popularize the "crosswise" and "lengthwise" scientific research contract system. According to this system, on the premise of fulfilling state plans and tasks, a scientific research unit can increase its income and make up deficiencies caused by insufficient state appropriations through taking on commission research projects that are not listed in state plans, through transferring technology or through offering technological consultative services. The funds for the development of and research on technology in factories, mines and enterprises should be taken from factories, mines and enterprises. Such funds should either come from their production funds or should be deducted from their profits earned due to achievements in the research. Many areas have already implemented these measures which are effeictive in practice. We should also give consideration to emulating the "trial methods of offering scientific and technological loans" decided by Sichuan Province and the Sichuan branch of the People's Bank of China and open up new ways to win scientific and technological funds. After the existing three types of scientific and technological development expenses have been renamed scientific and technological funds, all departments and areas may draw a certain amount of money from their renewal and reform funds and other types of funds and classify this money as "scientific and technological development funds" which should be used for handling the current national economic construction problems demanding prompt solution. Achievements in all research tasks that have been fulfilled by certain areas or units should be popularized through a compensable tranfer of the possession of achievements in scientific research. We should try in every possible way to avoid carrying out unnecessary and repetitive research projects and oppose squandering funds. In a word, through the reform in financial, banking and other administrative systems and the implementation of the method of integrating administrative orders with economic management, we not only can open up new ways to win scientific research funds but can also spend funds thriftily and rationally. It all depends on the human factor and it is well worth doing!

The current further readjustment of the national economy will affect the situation as a whole, produce an impact on every field and bring about a series of new problems in scientific and technological work. Some problems are foreseeable and other problems may be expected. Therefore, the leading comrades of party committees and governments at all levels must unite with and lead the masses of cadres and people and be prepared to use their indomitable will and make industrious efforts to successfully carry out a large amount of difficult and painstaking ideological, political and organizational work. In particular, they must do well in grasping ideological and political education which is the key link. These problems can surely be solved step by step in the course of readjustment as long as party organizations at all levels correctly and effectively give full play to their organizational roles on the basis of strengthening ideological and political work.

RENMIN RIBAO CALLS FOR SELF-RELIANCE IN MODERNIZATION

HK260800 Beijing RENMIN RIBAO in Chinese 23 Feb 81 p 2

[Commentator's article: "We Must Have Confidence in Our Own Strength"]

[Text] The Chinese people are industrious and brave. Since the founding of new China, they have, under the leadership of the Communist Party, opened up numerous mines, built numerous railway lines and erected numerous bridges all over the land by relying on their bare hands and their wisdom. A number of the large-scale construction and scientific projects have had wide repercussions at home and abroad. They include the Panzhihua Iron and Steel Company, the Daqing oilfield, the bridge across the Chang Jiang, atomic and hydrogen bomb tests and the test firing of intercontinental missiles. Today, this paper is running a report on the Gezhouba key water control project on the Chang Jiang. Work on this project, from design to manufacture of equipment and installation, has been done solely by Chinese engineers, technicians, and workers. Facts prove that under the leadership of the Communist Party and under the socialist system, the Chinese people are fully capable of carrying out large-scale construction by relying on their own strength. It is foreseeable that the Chinese people can achieve the four modernizations by relying on their own strength. Depreciating ourselves, not having faith in our own strength, lacking confidence and not having any aspirations are not to be tolerated. We must have confidence in our own strength and have revolutionary aspirations at all times.

Since the Gezhouba key water control project victoriously filled in the gap with its cofferdam, the raging Chang Jiang has been stemmed. A project of such magnitude and involving such complicated technology is unprecedented in China. It is also rarely seen in the world. It furnishes us with the essential experience we need in building key projects on big rivers and in the comprehensive exploitation of our country's rich water resources.

The stemming of the river at Gezhouba saw the great display of the spirit of socialist coordination. Working in close cooperation, cadres and workers from units at central and local levels, in the front and in the rear, all contributed toward stemming the river. The worksite teemed with people and trucks. Their tasks were arduous. The leading cadres studied everything carefully, made rational arrangements and gave elaborate directions. The masses of workers observed discipline and stood fast at their posts. Since everything was in good order, the river was successfully stemmed at one fell swoop. This fully reveals the leadership level and organizational ability of our working class in building large-scale projects.

The Gezhouba project also displayed the energy of our workers, technicians and cadres. Under difficult conditions, they ate and slept at the worksite, worked day in and day out and displayed great tenacity. They finally won their race against time and accomplished the task of stemming the river before the dry season. This heralds a new chapter in the Chinese people's history of conquering the Chang Jiang. Facts show that economic construction calls for an undaunted spirit of getting on with the job. With this spirit, we will not slacken off in the face of difficulties and will not be discouraged when we encounter setbacks. We are in the middle of a large-scale economic readjustment and are faced with many difficulties. For this reason, we must display a sense of responsibility as masters of the country, start with ourselves and strive to be conscientious men of action. Mr Lu Xun said: "Since ancient times, people who quietly immersed themselves in hard work could be found among us." We must inherit and carry forward this spirit of the Chinese nation.

The Gezhouba project gave full play to the role of experts and technicians. Technicians in the fields of surveying, design and construction did a great many calculations and hydrographic examinations and verifications. The engineering bureau and technological department responsible for the project convened a number of professional meetings attended by relevant colleges and universities and research and design departments all over the country. [paragraph continues]

At these meetings, they discussed at length proposals concerning river-stemming techniques, repeatedly compared the proposals and paid special attention to hearing and drawing on the opinions of experts and scholars on water conservancy and hydroelectricity from all parts of the country. Because they pooled the wisdom of the masses and respected the views of experts and technicians, work at the Gezhouba project proceeded more smoothly at the latter stage. In undertaking every item of production and construction, we must invite experts to take part and leading cadres must consult experts. In this way, we can leave fewer loopholes and avoid detours in work.

We have full confidence in our motherland's future and have unshakable faith in our own strength. We are determined to overcome all difficulties on the road of advance and build China into a modern and powerful socialist country and have faith that we can succeed.

RENMIN RIBAO ON FOREIGN ECONOMIC, TRADE TIES

OW2514O1 Beijing XINHUA Domestic Service in Chinese 0732 GMT 25 Feb 81

[Text] Beijing, 25 Feb (XINHUA)--In an editorial today entitled "Economic and Trade Relations With Foreign Countries Must Serve the Readjustment of the National Economy," RENMIN RIBAO says that at present when the policy of readjusting the national economy is being carried out throughout the country, the central task in economic and trade relations with foreign countries is to make them positively serve the needs of readjustment of the national economy.

The editorial points out: As the root cause of the "left" errors made in economic work over the past many years has not been eliminated, imbalances have appeared in various sectors of the national economy. The influence of "left" deviationist thinking in our economic and trade relations with foreign countries can be seen from the following facts: 1) We failed to obtain a comprehensive understanding of the policy of maintaining independence, keeping the initiative in our own hands and relying on our own efforts and, in developing the national economy, neglected the important role of promoting economic and technical exchange and cooperation with foreign countries. 2) We failed to proceed from reality and, being overanxious to get quick results, committed excesses in introducing equipment and technology from abroad without considering our own capabilities, thus aggravating the imbalances in the national economy. All this runs counter to the open-door economic policy laid down by the party's third plenary session and must be overcome. We must follow the correct guiding principles for the work regarding economic and trade relations with foreign countries.

How can economic and trade relations with foreign countries best serve the readjustment of the national economy? The editorial says: First, it is necessary to develop production and continue to expand our export trade. We must incessantly consolidate and expand the established international market. Though the export volume of certain commodities may decline in the future, the fairly marked development of agriculture and light industry during the period of readjustment is expected to provide a better source of commodities for export. In view of the fairly good foundations and great export potential of our machinery processing industry, we should make our imports serve our export goals. In other words, we should import raw materials and export them as finished products. Especially there is plenty of room for the development of labor-intensive processing by using imported raw materials. By improving the quality of export commodities, redesigning the packaging and raising efficiency in fulfilling contracts, we will be able to earn more foreign exchange.

The editorial emphasizes: Efforts should be made to strengthen import and foreign exchange control. Foreign exchange is difficult to obtain, and therefore we must use our foreign exchange where it is needed most. Many countries encourage exports but limit imports. In view of our country's deficit in the balance of revenues and expenditures and its immediate and long-range needs, we must strictly control both import trade and use of foreign exchange, formulate relevant policies and establish rigid methods of control. [paragraph continues]

In transmitting the Beijing Municipal Trade Union Council's "circular," the All-China Federation of Trade Unions added an instruction. The instruction said: In order to rescue a drowning child, Comrades Gao Yuntao and Tian Jiyue honorably sacrificed their precious lives. Their self-sacrificing spirit and lofty moral character reflect the mental outlook of China's working class, cultivated by the Chinese Communist Party over a long period of time. The lofty moral character of Comrades Gao Yuntao and Tian Jiyue is in sharp contrast with the decadent thinking and behavior of benefitting oneself at the expense of others, of pursuing private ends and of "doing everything for money" and is a strong repudiation of the ultraindividualist bourgeois outlook on life. The two comrades' heroic deeds have set a brilliant example for the working class in our country.

The All-China Federation also urged trade union organizations at all levels to publicize the glorious deeds of Comrades Gao Yuntao and Tian Jiyue among staffs and workers, to use every trade union function to vigorously commend good persons, good things and the advanced, to strengthen ideological and political work among staffs and workers, to conscientiously implement the forum's guidelines on grassroot work and to do a good job in mass work so as to further mobilize the enthusiasm of the broad masses of staffs and workers in building socialism, making greater contributions to economic readjustment and promoting stability and unity with one heart and one mind.

XINHUA INTERVIEWS SCIENCE, TECHNOLOGY OFFICIAL

OW231244 Beijing XINHUA in English 1220 GMT 23 Feb 81

[Text] Beijing, 23 Feb (XINHUA)--Speaking to China's scientific and research communities today, the vice-minister of the State Scientific and Technological Commission Tong Dalin said scientific priorities must be realigned consistent with China's current economic readjustment.

In an interview with XINHUA, Tong said, "Science and technology are primarily to serve economic construction. This is the new guideline for the development of China's science and technology in the period of readjustment."

Tong said a five-point guideline had been formulated at a recent national policy-making conference on science and technology. The guideline established: Science and technology will be coordinated with the growth of the economy and social needs, the primary purpose being the acceleration of economic development; production technologies and their appropriate application should be a primary focus; industrial and mining enterprises should expand technological research and popularize the results; basic research should increase steadily and gradually; foreign scientific and technological advances should be studied for assimilation into China's own research.

In keeping with the new guidelines, many programs will gear to present development priorities such as energy, improvement of agriculture, light industry and the streamlining of already extant enterprises. Some research projects, said Tong, such as construction of telescopes, nuclear reactors and linear accelerators will be postponed. Recalling some of China's past research successes in nuclear weaponry, aerospace and genetic engineering, Tong nevertheless emphasized the necessity of focusing on production technologies in the slowed economic climate.

"The readjustment is a big change for the scientific and technological work in China," he said. "It is dictated by the needs of the economy and social development. China is already readjusting its science and technology," Tong finished, "We are making an effort to put that readjustment on solid ground.

The party members and the CYL members are advanced elements among the masses. They should play an exemplary role in the course of building a civilization imbued with the socialist spirit. The cadres and the party's leading cadres in particular should take the lead in following the practice of decorum and courtesy in their private lives. Conducting activities regarding decorum and courtesy is an important step in building a civilization imbued with the socialist spirit. Party committees at all levels and the grassroots-level party organizations should adopt practical measures to support the proposal put forward by the nine mass organizations.

RENMIN RIBAO ON SCIENCE, TECHNOLOGY IN PRODUCTION

HK100512 Beijing RENMIN RIBAO in Chinese 27 Feb 81 p 1

[Commentator's article: "Grasp Science and Technology To Boost Production"]

[Text] In the course of our economic readjustment, promoting this year's industrial and agricultural production is an important matter. To promote our industrial and agricultural production, we must give full play to science and technology. The State Scientific and Technological Commission has issued a circular calling on scientific and technological workers throughout the country to suggest ways and means for promoting China's economic construction. Suggesting ways and means for promoting China's economic construction is a honorable task of the Chinese scientific and technological workers. This call will certainly be warmly supported and welcomed by the vast numbers pf scientific and technological workers and the masses of cadres and people.

Two of the "leftist" manifestations in economic construction are underestimating the role of science and disrespecting economic laws and suggestions made by scientific and technological workers. We must conscientiously correct these deviations. Our economic readjustment does not primarily depend on an increase in capital construction projects to develop social productive forces. In fact, our economic readjustment primarily depends on giving full play to the roles played by our existing enterprises. However, if we do not attach importance to science and technology and do not give full play to science and technology, it will greatly constrict the giving of full play to the roles played by the existing enterprises. As a matter of fact, with the promotion of the national economic readjustment, the objective situation is forcing some comrades to abandon their previous practices such as contending for capital construction investment funds and is also forcing them to seek scientific and technological help and to strive for economic results. In this sense, the readjustment period should serve as a good opportunity for us to greatly promote our scientific and technological work and should also serve as a good opportunity for the masses of scientific and technological personnel to give full play to their abilities.

Since the 3d Plenary Session of the 11th CCP Central Committee, a series of correct rural policies formulated by the party Central Committee have already manifested their tremendous strength in our rural areas. The broad masses of peasants are showing unprecedented concern for attaining achievements in their work and for production technology. In 1980 many areas adopted effective measures to spread suitable advanced technology which was warmly welcomed by the peasants and also produced marked results. At present rural areas throughout the country one after another are comprehensively carrying out farm work. All rural cadres must conscientiously heed the opinions of scientific and technological workers and adopt all feasible measures to ensure high and stable yields and low costs in this year's agricultural production including farming, forestry, animal husbandry, sideline production and fishery.

This principle also applies to our industrial production. At present our light, textile and heavy industries have the following widespread drawbacks: high consumption, high costs, low efficiency and poor quality. How are we to reduce industrial production costs and consumption and increase the output of marketable and fine products at low prices? How can we bring the potentials of our existing industrial enterprises into full play? Without science and technology, we cannot begin to talk about tapping the potentials and carrying out reform and innovation nor can we achieve the best economic results.

In short, production command posts at all levels, all factories, mines and enterprises and all communes and brigades engaged in agricultural production should regard scientific and technological work as an important means for promoting the development of production.

Scientific and technological research requires a certain period of time and it is very difficult to get instant results. However, we should see that due to many years' hard work and great efforts put forth by the masses of scientific and technological personnel, we have accumulated a large number of scientific and technological achievements. Our current industrial and agricultural production work can quickly produce the desired results so long as our scientific and technological departments and our production departments act in close coordination, make joint efforts, adopt necessary measures, actively apply and spread scientific and technological achievements and perfect and manufacture some complete sets of equipment.

To grasp science and technology, we must first respect science, promote technological democracy and give full play to the roles played by experts. The party Central Committee recently noted: In carrying out a project, we must hold group discussions on this project. Group discussions include seeking the opinions of scientists. With regard to scientific and technological issues, we must implement the technological responsibility system. Party organizations at all levels must guarantee that experts who are responsible for and command scientific and technological work can exercise their functions and powers and do their duty.

To grasp science and technology, we must also mobilize the masses of workers and peasants and give full play to their initiative and creative power for assiduously studying science and technology, carrying out technological innovations and popularizing new technology. We should encourage and support our scientific and technological personnel to go right to the frontline of production and to assist and guide workers and peasants in carrying out scientific and technological activities.

RENMIN RIBAO ON DIGESTING IMPORTED TECHNOLOGY

HK130521 Beijing RENMIN RIBAO in Chinese 27 Mar 81 p 2

[Commentator's article: "Do a Good Job in Digesting Imported Technology"]

[Text] Our aim in importing technology from foreign countries is to improve China's technological standards and increase her self-reliance capacity. By doing a good job in digesting imported technology, we can master advanced technology and ensure that it meets our needs for producing all kinds of commodities. We cannot produce good economic results if we just enthusiastically engage in importing technology without paying attention to digesting it. This is a problem that has not yet been solved well; it merits our attention.

In digesting and absorbing technology from abroad, we must first produce products that are up to standard in accordance with foreign technology; we must then go on to achieve mastery through a comprehensive study of the subject and learn how to design product series; and finally we must take foreign technology as the starting point for developing and creating new things, and catch up with and surpass advanced world standards. This is work that involves grafting one twig onto another. To ensure that foreign twigs can take root, bud, blossom and bear fruit in China, we must prepare excellent soil and create the necessary conditions of all kinds. In importing a technology, we must first select the best factories for using it, that is, those factories with relatively good production conditions and relatively high standards of technology and organizational management, that have the capacity to digest and absorb advanced technology. Factories with weak technical forces, low standards of technology and chaotic management, that cannot carry out production in a normal way, cannot be designated as units for accepting imported advanced technology. Improper choice of factories was a major cause of previous "indigestion" in certain technology imports. It is essential to have extensive cooperation in order to digest and absorb imported technology. When using foreign technology to create certain products, we are required to provide many more new materials and new-style accessory products, and to organize departments and factories cooperating in production to develop new products. We must also succeed in dovetailing production and keeping the channels open.

This is complex organizational work, and it is necessary to arrange it by bearing in mind the interests of all sectors. At the same time, in organizing production in accordance with imported technology, the factories must put forward new demands regarding the standards of designers, craftsmen, management personnel, and operatives, and promptly promote training and improvement of these personnel. It is also necessary to have a whole set of encouraging policies, and provide material and spiritual awards for those who have done well in digesting and absorbing imported technology or have made new developments in it. In short, given fertile soil and plenty of sun and rain, twigs from abroad will grow into beautiful flowers and yield rich fruit.

If we fail to make efforts to develop imported advanced technology, "aging" will take place with the passage of time, and it will turn into backward technology. Hence it is necessary to persistently combine learning with creating new things. The reasons why some countries have been successful in importing technology is not just that they have paid relatively economic prices for importing technology within a relatively short period; more important, it is that they have not shrunk from using a lot of money and manpower on digesting and absorbing such technology and on striving to develop it and create new things. Japan spends several times as much on digesting and absorbing imported technology as she does on importing it. This shows that the Japanese place the stress on digesting and absorbing imported technology. It also shows how much manpower and finance is needed in stepping up scientific research before such technology can meet a country's requirements and maintain its relatively advanced nature on the international scene for a long time. In importing certain technology in the past, China had her eyes solely fixed on current production and attached no importance to research; we only aimed at "drawing a gourd according to the model" and made no efforts in development and new creation. Unless this situation is changed, we will get into a vicious circle of depending entirely on imported technology. Apart from consuming and wasting a lot of state capital, it will be very difficult to achieve continuous improvement of domestic technological standards, and we will end up trailing along behind foreign countries and blindly following suit. Catching up with and surpassing advanced world levels will turn out to be empty talk. We must therefore step up scientific research and put development and new creation in imported technology in its proper place. We must seriously organize coordination between units importing technology and the research units, make full use of existing research forces and ensure that they play a still greater role in development and new creation.

Setting up responsibility systems and putting them on a sound basis is the guarantee for doing a good job in digestion. Factories and management departments importing technology must take full responsibility for buying technology, producing products, learning design, and carrying out development and new creation. They must grasp this work all the way through. Units importing technology must accept economic responsibility, and institute rewards and fines on the basis of clearly defining the responsibilities and work criteria. We must change the past situation whereby a lot of money was spent on technology imports and then no products were produced for years, without anyone bothering about it.

Our country has imported a certain amount of technology in the past few years. This has played an important role in improving our production technology standard. We should also realize that we have "suffered indigestion" over quite a lot of imported technology, and the economic results have not been good. There are many reasons for this. Obviously the most important one is the interference and sabotage caused by the Lin Biao and Jiang Qing counterrevolutionary cliques; the errors in our work should not be neglected either. Due to lack of the spirit of doing things according to our capability and seeking truth from facts, and our one-sided pursuit of progress, certain items of imported technology are not suited to our national condition; we have spent a lot of money on them without being able to digest and absorb them.

In some cases supplies of raw materials, fuel and power are not guaranteed, and we thus end up "cooking a meal without rice"; and certain items are not suited to our needs, and there is no market for the products turned out. We must seriously sum up these experiences and lessons and firmly commit them to memory.

We must have the spirit of respecting science, seeking truth from facts and seriously taking responsibility, base our efforts on our actual financial and material strength, and analyze our existing technological standards; we must study domestic and international needs, and investigate the state's energy and raw material supply capacity together with the time needed for recouping investment. On this basis we should decide what and what not to import, what to import first and what later, and whether to import complete or partial technology. In this way, even if certain problems occur it is easy to recoup them, and no great losses will be caused.

Placing the emphasis in importing technology on digesting it should become an important guiding principle in our technology import work. In cases of previous "indigestion" in technology imports, we should seriously absorb the lessons and strive to recoup the losses. We must do a thoroughly good job in digesting future technology imports.

RENMIN RIBAO EXPLAINS SCIENCE, TECHNOLOGY POLICY

HK201400 Beijing RENMIN RIBAO in Chinese 7 Apr 81 pp 1, 4

[Editorial: "Further Clarify the Policy for the Development of Science and Technology"]

[Text] From now on, we should take the road of improving economic results in developing the national economy of our country. This determines that, while readjusting the economic structure and carrying out organization and integration in industry, we should rely more upon the strength of science and technology. Important changes in the policy of economic construction require us to further clarify the policy for developing science and technology.

In more than 30 years since the founding of the PRC, tremendous progress has been made in science and technology in our country. We have trained a scientific and technological contingent of over 5 million people. The explosion of atomic bombs and hydrogen bombs, the launching and recovery of manmade satellites and the successful experiments with long-range carrier rockets underscore our attainment of a considerable level in some high-grade, precision and advanced science and technology. At the same time, large numbers of new achievements in science and technology have been applied to production and construction, which bolsters economic development. Of course, we should also be aware that the role played by science and technology as a productive force in promoting the national economy is still not enough. In all departments of the national economy there are a large number of technical problems in production which have not been taken seriously and have remained unsolved for a long time; some comparatively ripe fruits of science and technology have not been promptly popularized and applied in production. For example, we have trial produced and produced some precision equipment, but many basic elements and basic progresses in the engineering industry are not up to standard; we have developed several hundred highly sophisticated raw materials, but have been unable to produce some common steel products. Why does such a state of affairs exist? There are two reasons. The main one is that, due to guidance by "leftist" ideas, experts were discriminated against and no importance was attached to science and technology. Whenever the development of production was put forward, a large staff would be maintained, capital construction would be increased and backward technology would be repeatedly employed. In addition, no competition was allowed in the system of economic management and no attention was paid to economic results. So the road for the development of technology in production was blocked. Another reason is that the policy for the development of science and technology has never been clear and definite.

Since the third plenary session, we have been criticizing and correcting "leftist" errors in economic work step by step. We now understand better that we suffered too-heavy losses in economic construction in the past 30 years or more because science and technology were not duly valued. Not long ago, a national work conference on science and technology was held, at which, in accordance with the instructions of the party Central Committee and the State Council, the work experiences in science and technology since the founding of our

country, especially since the smashing of the "gang of four," was seriously summed up and problems concerning the policy for developing science and technology were discussed. The meeting held that we should pay attention to correcting the tendency of only attaching importance to high-grade, precision and advanced science and technology, ignoring production technology which is large in quantity and broad in scope, reaching for what is beyond one's grasp and of blindly catching up with and surpassing others. The meeting explicitly put forward the policy for the development of our country's science and technology over the coming period.

The main contents are: to develop science and technology in harmony with the economy and society, and the most important task of science and technology as the promotion of the development of the economy; to lay emphasis on strengthening the study of technology in production, the selection of correct technology and the rational formation of a technological structure; to strengthen the work of technological development and popularization in plants, mines and enterprises; to ensure progressive development in basic studies on a steady basis; and to regard mastering, absorbing and digesting achievements in foreign science and technology as an important means for developing our country's science and technology. The core of this policy is that science and technology should first and foremost promote the development of the national economy. Once we have clarified this point, we will have shaken off "leftist" influence in scientific and technological work.

First, this policy is based on the basic aim of scientific research. What is the aim of scientific research? Some say that it is to probe the unknown. Others say that it is to catch up with and surpass advanced world levels. Still others say that it is to achieve good results and to train competent personnel.... There are grounds for all these sayings. However, what does all this finally boil down to? To increase the productive forces. If we deviate from this fundamental aim, it will be difficult to avoid tendencies such as scientific research for its own sake, catching up with and surpassing others for the sake of doing so and achieving good results just for the sake of achieving them, and in the end, production cannot be benefitted and it will be difficult to develop the economy and get on with scientific research.

Second, this policy is based on our national conditions. The basic characteristics of our country's economy and social development are a large population, a poor foundation to start with and a low level. A pressing matter of the moment is to push the whole national economy forward by means of readjustment so that it will reach the level of a "fairly affluent family." We have a contingent of scientific and technological workers, but the number of people in this contingent is not enough and its level cannot be regarded as high. As our country is still poor, funds for scientific research are still quite limited. Our limited strength in scientific research can only be used on the most urgently needed spots. The way things were put in the past, such as: catch up with and surpass the world's advanced level in a fairly short space of time; we want everything foreign countries have; set up a complete system in scientific research, and so on, can be cited as proud words showing the lofty aspirations and great ideas of the Chinese people, but if they are used for guiding practical work for a substantial period of time, we shall be making more haste and less speed.

Third, this policy is based on practical needs in economic construction. Drawbacks such as high consumption, high cost of living, low efficiency, low quality, and so on, commonly exist in our country's economic construction, and in industrial production in particular. The cause of these is a low technological level in production. The only way out is to extensively and steadily develop and adopt appropriate advanced science and technology. In some countries whose economy, science and technology are well developed, a large portion of the increase of the total annual output value of the national economy is the outcome of introducing new achievements in science and technology. In a developing country like ours, the potential in this aspect should even be greater. it will be quite remarkable if science and technology can accelerate the increase of the total output value of industrial and agricultural production by 1 percent, and this is entirely possible.

It is very important to be clear about the policy that science and technology should first and foremost promote the development of the national economy. Once the policy is clearly understood and everybody has the same understanding, the tasks for scientific research of the whole country, different departments and different localities can be put forth and technological policies suitable for the state of our country can be formulated in accordance with this policy. Once the policy and tasks are clear, reform of the system of scientific research will then have a direction.

The policy that science and technology should first and foremost promote the development of the national economy should be fully reflected in plans for developing the national economy and science and technology. Planning departments and technological departments at all levels should make concerted efforts to organically integrate plans for developing the national economy with plans for developing science and technology.

In determining the aim of economic construction, carrying out reform of the economic structure, rationally allocating the productive forces and utilizing resources, reforming technology in enterprises, formulating technological economic policies and so on, we should without exception attach importance to factors in science and technology. In the past, when planning departments formulated plans for the national economy, they seldom took into consideration scientific and technological factors and were not good at listening to specialists' opinions, so it was difficult to make out good economic plans. Subsequently, no requirements for scientific and technological departments could be put forward. Very often, scientific and technological departments did not know much about economic work and could not grasp scientific and technological problems in economic construction which urgently required solution. With a clear policy for the development of science and technology, and with concerted efforts, planning, economic, scientific and technological departments can change the state of each department being isolated from others, and can really achieve harmonious development of science and technology, the economy and society.

In implementing the policy that science and technology should first and foremost promote economic development at the present stage, we should especially attach importance to the study of scientific and technological problems closely linked with the people's food, clothing, shelter and transportation. All scientific and technological work should contribute to increasing the agricultural productive forces, developing a diversified economy, and reforming technology in existing enterprises. If readjustment of the national economy is to be carried out smoothly, scientific and technological strength is quite indispensable. Science and technology have bright prospects in the readjustment of the national economy. Just imagine, which of the weak links in our economic construction and short supply of products is not caused by backwardness in science and technology, besides causes such as irrational economic structure, insufficient investment and insufficient attention paid in the past? Therefore, in readjusting the national economy, in addition to using strong points to offset the weak ones and changing the economic structure, appropriate rein must be given to science and technology.

Emphasizing that science and technology should first and foremost promote economic development does not at all mean that basic theory and high-grade, precision and advanced science and technology can be discarded. Even during the readjustment period of the national economy and the work of science and technology, basic study should keep on developing on a steady basis, and research and development of some high-grade, precision and advanced science and technology directly related to economic development and the modernization of national defence should be continued. Science and technology are an organic whole. Only when basic, applied and developed study are developing in an appropriate and well coordinated way can they better promote economic construction.

If we do not carry out certain basic research and research on high-grade, precision and advanced science and technology as a reserve, we shall be in a passive position when production technology needs further improvement. Therefore, we should understand the policy for the development of science and technology correctly and comprehensively. In drawing up plans, we should take into consideration the short term and long term needs of the national economy, guard against one-sidedness, and avoid treating all things equally in an oversimplified way. A national comprehensive center for the study of natural science such as the Chinese Academy of Science should persist in implementing the correct policy of "laying particular emphasis on the foundation, laying particular emphasis on advance and serving the national economy and the construction of national defense."

We have been carrying on construction for over 30 years. After some twists and turns, economic construction has again taken the road of sound development through readjustment and reform. At present, we have further clarified the policy for the development of science and technology. We believe that under the leadership of party committees and government at all levels and with the concerted efforts made by scientific and technological departments and economic departments in implementing this policy, the work of science and technology will be even more vigorous and the whole face of economic construction will be greatly changed.

GUANGMING RIBAO ON SCIENTIFIC POLICY RESEARCH

OW180819 Beijing XINHUA in English 0806 GMT 18 Apr 81

[Text] Beijing, 18 Apr (XINHUA)--The GUANGMING DAILY, in a front-page editorial today, calls for the establishment of official councils on scientific policy research to advise central authorities on China's economic and social development. Entitled "The Entire Communist Party Must Pay Attention to Science," the editorial stresses the recent State Council approval of guidelines for science and technology, which call the fields to primarily serve China's current economic restructuring.

The paper says policy decisions must be made on the basis of scientific research and technical evaluation while devising a unified approach to the country's scientific, technological, economic and social development. "Positive and cautious steps should be taken to restructure the current systems of economic and scientific management," the editorial says, "and to help promote the coordination of scientific research institutions, factories and consumers of technology."

The editorial also asks an increase in funds for scientific research proportional to the state budget on the basis of a re-examination of current investment policy. "Researchers must discover the most pressing scientific and technological problems in fields of top priority," says the editorial, "namely agriculture, light and textile industries, energy production, transport, machine building, production of industrial materials and electronics."

EAST CHINA ENVIRONMENTAL PROTECTION CONFERENCE HELD

Beijing GUANGMING RIBAO in Chinese 3 May 81 p 2

[Article by Yang Kaimin [2799 7030 3046]]

[Text] A conference on environmental protection for six provinces and one city of East China took place 7-9 April under the auspices of the Environmental Protection Office of the State Council. The participants exchanged their experience and studied ways to activate in-depth propaganda activities for environmental protection.

The propaganda activities for environmental protection envisaged by the conference are as follows: The various provincial and municipal people's governments must play a more active role; sum up the environmental protection work and commend those units and individuals for their satisfactory work; join together the "five emphases," "four beautifications," and the patriotic health drive in order to make the environmental protection propaganda more extensive and penetrating. The conference decided that the next round of propaganda activities should focus on "The State Council Decision on Strengthening Environmental Protection During the Readjustment of the National Economy" so as to make the propaganda cover both the State Council decision and the environmental protection law. Special emphasis should be placed on the environmental protection policy during the readjustment of the national economy. The essentials are as follows: Prevent the spread of new sources of pollution and stop the construction of all improperly planned industrial projects which waste natural resources and energy and cause uncontrollable environmental pollution; all capital constructions must meet the "three concurrent requirements" just as pollution control must be included in efforts to explore production potentials or the innovation and transformation of an enterprise; all the cities and industrial centers concerned should investigate and analyze the sources of environmental pollution and work out plans to control them according to the degree of urgency. The immediate targets are to control pollution by industries and enterprises located in residential areas, protected areas of water supply and areas of scenic and tourist interest; and publicize effectively the state environmental protection programs and guidelines to get the people's governments at all levels to work for effective pollution control by including the targets, requirements and implementation measures of environmental protection in the plans and programs they formulate for the national economy and social development.

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CSO: 5000/4065

Briefs

SCIENTIFIC ACHIEVEMENTS AWARDS--Beijing, 14 May (XINHUA)--The Invention Assessment and Selection Committee of the State Scientific and Technological Commission recently awarded prizes to scientists, engineers and technicians of 26 inventions including new fine strain cotton seeds "Lu Mian No 1"; a method of coal mining with flexible pseudo-slope shield props; a method for manufacturing curvilinear parts; a method of copper-smelting from silver; an effective pesticide for the elimination of crossocosmia in tussah [silk worms]; a diaphragm-type food extractor; Dongfeng 2-S mobile rice seedling transplanter; a method for the prevention and treatment of a tussah disease and so on. [OW160327 Beijing XINHUA Domestic Service in Chinese 0158 GMT 14 May 81]

CSO: 4008/360

JIEFANG RIBAO ON ELIMINATING 'LEFTISM' IN SCIENCE

HK090211 Shanghai JIEFANG RIBAO in Chinese 2 Jun 81 p 4

[Article by Xia Yulong [1115 4416 7893] and Liu Ji [0491 0679]: "It Is Also Necessary To Eliminate Erroneous 'Leftist' Influence on the Science and Technology Front"]

[Text] (Outline) "Leftist" errors on the science and technology front are mainly expressed as failure to truly regard science and technology as a productive force; the serious consequences of this are that the subjects and projects for scientific research are incompatible with national economic development and thus get out of joint with it. In these circumstances, to simply say that science and technology are productive forces is not sufficient to arouse the interest of those engaged in actual economic work. Science and technology can have ample scope for displaying their abilities and develop in a flourishing way only if scientific circles genuinely regard science and technology as a productive force and further integrate science and technology with economic development both in topics and in systems of research. [end of outline]

I

The Central Committee and State Council have repeatedly emphasized recently that the whole party and the whole country must attach importance to science, that it is necessary to rely on science and technology to develop the national economy, and that at the same time science and technology must serve economic construction. This is a major strategic guiding principle; it is a correct principle. The moment science and technology are closely integrated with the national economy, they will produce tremendous social productive force and speed up the modernization drive.

We should fully affirm that China's science and technology have rapidly revived and developed since the "gang of four" were smashed, and played a beneficial role in national economic development. However, we hold that it is essential to seriously eliminate erroneous "leftist" influence in order to better implement the central authorities' guiding principle. In other words, it is precisely "leftist" error that has laid "two strips of skin" between our national economic planning and science and technology development planning, and today this error is still the main obstacle to implementing the correct policy decision of the Central Committee and State Council. An outstanding expression of "leftist" error on the economic front is a failure to acknowledge that science and technology are a productive force; as a result, on the one hand people act in a shortsighted way and discriminate against and even ruin basic research, holding that "this kind of money thrown into the pond does not even produce bubbles" with the result that basic research undergoes large fluctuations and is unable to gradually attain steady development; and on the other hand, and perhaps even more serious, people misinterpret the slogan "serve production," "devour" the personnel and manpower for

applied research and actually eliminate such research. This state of affairs reached a fantastic peak during the 10-year catastrophe. This "leftist" error is the reflection of the narrowmindedness of small production. It has done a great deal of harm on the science and technology front. There has been a fundamental change in the situation since the "gang of four" were smashed, and especially since the 3d plenary session of the 11th Central Committee. The scientific notion that science and technology are a production force has been accepted by people. However, the problem of the extensive and deep nature of erroneous "leftist" influence has not yet been solved in practice. We must therefore continue to eliminate the influence of the "leftism" that looks down on science, so as to ensure the implementation of the central authorities' principle. There is no doubt at all about that.

The current problem is, are there any "leftist" mistakes and influence on the science and technology front, which is directly harmed by "leftist" error? If there are, in what respects are they expressed? With regard to this issue, we take the liberty of making an initial test probe so as to arouse discussion.

According to our observations, the chief expression of "leftist" error on the science and technology front is a failure to truly regard science and technology as a productive force, with the result that they get out of joint with economic development. There are many expressions of this, the main ones being as follows:

1. Paying no heed to the national condition, blindly catching up and overtaking, and actually engaging in "world science." For more than 20 years guiding principles and schemes for science and technology were determined on the basis of striving to catch up with and overtake others, and the idea was publicized that "we must have things that foreign countries have and also have things that they do not have." Hence we took aim at all advanced levels in world science and technology and attempted to catch up and overtake people at all points of the compass. However there are many categories and branches of modern science, in fact there are as many as 2,400 in the field of science and technology alone. We wanted to do so in all of them and to accomplish at one stroke achievements that had taken advanced industrial nations 10 generations of effort. Of course this was very difficult to achieve. The history of modern science and technology shows that today no nation or state can provide more than 25 percent of world scientific knowledge. In particular it was even more unrealistic and also uneconomic to carry out all-round catching up and overtaking in China, with its current actual scientific and economic capability. In the United States, expenditures on research in oil, coal and hydrolectric power, research in atomic energy, and research in high-energy physics are in the ratios of 100:10:1, and it is not proper for China and its weak foundation and minimal funds to spend a lot of money on "big science" and on scientific research which cannot play much of a role in the national economy for several decades. In short, unless we eliminate the tendency to catch up and overtake others for its own sake, in the end production will not benefit, and it will be difficult for the economy to develop, while scientific research also cannot be promoted.

2. Failing to act according to scientific laws, neglecting the role of experts, and actually pursuing "scientific research of the whole people." Specialization is the fundamental characteristic of modern socialized large-scale production, and to pursue constant improvement and institute division of labor and cooperation in accordance with the various specialities will, as Marx pointed out, produce productive force without costing a cent in capital. Scientific and technological research is presicely a major specialization in modern social division of labor. Scientific and technological activities have their own characteristics in comparison with other human activiites, such as creativity, exploration, inheritance and so on. In engaging in scientific and technological activities, people will obviously want to mobilize a certain amount of manpower, material and finance to carryout these activities in a planned and organized way with division of labor; but to adopt the method of mobilizing the whole people and creating a great uproar cannot produce good results, and will create a situation of

"starting off like a swarm of bees, getting stuck in the middle, and ending with a gust of wind." Many of the methods we adopted for more than 20 years ran counter to the laws of scientific and technological development. For example national crazes appeared for "supersonics," "radiation," "fluidics," "bittern" and "chicken's blood" and so on. The national science congress has played a tremendous role in promoting science and developing technology; however, due to the fact that the "leftist" influence of "the whole people engaging in science" has not yet been eliminated, the phenonemon of "all levels building research centers and flowers of science blooming everywhere" has appeared. According to our information, the number of scientific research organs in 1 province has soared by 153 percent--more than half of them are country-level research centers--while the number of research personnel has grown by 70 percent; very few of them are technicians, and 23 percent of the research centers have fewer than 5 technicians. There are over 2,000 farm machinery research centers in the whole country, yet there are only some 20,000 researchers there. Some research centers are dubbed "three no" centers (no research subjects, no funds and no personnel), some are known as "three dimunitive" centers (one room, one seal, one empty shelf), while others are styled "three machine" centers (one mimeograph, one stapler, and one telephone).

China has been short of researchers, and there are only 310,000, representing 3/10,000 of the population. Since there are very few personnel, and they are scattered everywhere, the superior features of research capability are sure to be lost, and although research work seems lively on the surface, in fact it cannot produce hard results.

3. Only bothering about scientific research, failing to stress economic effect, and neglecting research in production technology. Many scientific research departments simply regard research reports as the final result and academic level as the sole evaluation criterion; this has created the notion of striving for academic standards as the highest aim in research. Stress is laid neither on cost accounting nor on economic effect. This is even the case in applied research. This is extremely prominent in the allocation of manpower, finance and material. In foreign countries, experience over that long run has shown that the ratio of expenditure in the benefit of a basic research project, its translation into applied technological research, and the resulting development of a product is 1:10:100. Without going into great detail, although the ratios of manpower and material allocation are not necessarily the same, they are similar. However this ratio is extremely lopsided in China. Serious neglect of technological development and of popularization of research has caused not only shortages of manpower, finance and materials but has sometimes even resulted in the suspension of research. As a result the development of many products stagnates for long periods in the stage of "samples, exhibits, and gifts," bringing about a situation in which these three things can be found everywhere while no actual products are produced. According to statistics from the international economic cooperation organization, in the United States 80 to 85 percent of the benefits of research can be promptly applied in production, and the utilization rate of research benefits is 50 to 60 percent in Britain, France and West Germany, while in the Soviet Union this rate is 30 to 50 percent., But the average rate in China is only about 10 percent. Even in places where standards of science and technology and management are relatively high, the utilization rate is only 30 to 40 percent. For instance, the five units subordinate to the Shanghai Municipal Electronic Elements Company achieved 144 research benefits from 1970 to 1978, but only 45 -- 31.2 percent -- were put into production. This was far behind the level in advanced countries.

Science and technology develop very rapidly in today's world. The cycle from scientific invention to economic benefit is shortening all the time. According to material from the U.S. Senate, this cycle was 30 years before World War I, 16 years between World Wars I and II, and 9 years on average since World War II. At present, the effective lag time before the use of new material is 10 years, new techniques 7 years, and new instruments 5 years. Hence, in order to ensure that science and technology will effectively stimulate national economic development, it is necessary to stress economic effects, step up production technology research, raise the utilization rate of science and technology in the field of production, and shorten the cycle.

4. Impatience for success, launching projects blindly, and violating scientific research order. The selection of subjects for research is the key order in scientific research. A good start is half the battle, and directly determines the economic benefit of the benefits of research. The selection of subjects itself is research work that requires great caution, and it is also a major aspect of research management. In carrying out this work we have to conduct technological and economic analysis and exposition based on the broadest and most accurate information in order to "be clear about the situation and summon up great resolve." However, many research departments lack sufficient understanding of the importance of scientific and technological information. They not only fail to carry out market surveys and forecasts of social needs, but even regard the collection of scientific information itself to be second-class work, invest little money in it, and assign people to it who are mostly old, weak, ill or crippled. Information gathered in this fashion can only amount to odd bits and pieces, and no systematic analysis can be expected. Although they may not have a clear view of the situation, people summon up resolve very quickly. Quite often they make up their minds just on the basis of one official document or even just one sentence. According to a sample survey of 749 new products developed in 10 years by 35 Shanghai mechanical and electrical machinery plants producting complete items of equipment, 82 percent had not been subjected to technological proof and almost 100 percent were not economically analyzed.

It is naturally difficult to get good results from such a blind launching of new projects, the effort turns into "bearded research subjects," and abandonment halfway is a common occurrence. How could such projects play a stimulating role in the national economy?

III

The above-mentioned "leftist" mistakes and their influence have caused a whole series of grave consequences in scientific research activities.

For instance, there is vast duplication in research subjects, and money spent turns out to be useless. According to some estimates, about 40 percent of the research subjects undertaken in China are duplicates of subjects researched abroad which have already produced results. Duplication within China is even more serious. Nearly 100 units are developing yttrium-aluminum-garnet laser crystals; nearly 300 are developing Wankel engines; over 20 are developing peripheral equipment magnetic discs for computers; and no less than 980 are developing haploid seed breeding.

Again, the scattering of the already limited manpower, finance and material turns them into pepper noodles, since they are scattered among various military organizations and all kinds of research centers and plants. The results can be imagined. Duplication of large amounts of experimental equipment results not only in a very low utilization rate but incomplete sets of equipment in some cases; the equipment thus cannot play its proper role. For instance, the Shanghai scientific research and higher education systems were duplicating each other in 28 out of 63 projects introduced in 1978 and 1979, while 24 of them were duplicates of the 53 projects introduced in these systems from 1973 to 1974. After their introduction, the utilization efficiency of these projects was low. The digestion and further development of these projects after their introduction was even poorer.

However, the gravest consequence is that the science and projects in scientific research are incompatible with national economic development and thus get out of joint with it. "World science," "scientific research of the whole people" and so on obviously are incompatible with the current national condition and demands in China's current economic development, and even key science and projects are out of step with the development of the national economic structure because there is no stress on economic effect, projects are undertaken in a blind fashion and so on. This greatly hampers the stimulating role of scientific research on national economic development. Simply saying that science and technology are a productive force is not sufficient to arouse the interest of those

engaged in actual economic work. Only if those in scientific and tecynological circles truly regard science and technology as a productive force and further ensure that science and technology dovetail better with the national economy in research subjects and systems can they attract the interest of those engaged in actual economic work, who can then regard the economy and science and technology as depending on each other for survival. The postwar experiences of Japan in economic and scientific and technological development are worth absorbing in this respect. Japan has consistently considered things from the angle of integrating the economy, industry and science in the course of accomplishing modernization. From 1945 to 1950 the Japanese Government decided that the chemical fertilizer, coal, iron and steel, and electric power industries should be the main industries; from 1950 to 1960 it decided that the electric power, iron and steel, machinery and petrochemical industries should be the main industries; and from 1960 to 1972 it decided that the automobile, automation, environmental equipment, and computers industries should be the main industries; and the development of science and technology and the selection of key sciences was closely integrated with these industries as appropriate. As a result, industrial production rose, while science and technology also had ample scope for displaying their abilities and rose along with industry.

At present our country's economic front is clearing away erroneous "leftist" influence and carrying out readjustment and reform. A modern economic structure of rational and steady development is gradually taking shape. The science and technology front must catch up, completely clear away erroneous "leftist" influence on itself, and resolutely act to ensure that science and technology are readjusted onto the track of close integration with economic development. That will be a new era of flourishing development of science and technology, and also of soaring national economy. Let us work hard for that.

'RENMIN RIBAO' EDITORIAL STRESSES SCIENCE

OW072325 Beijing XINHUA Domestic Service in Chinese 1208 GMT 7 Jun 81

[Editorial report on p 1 of RENMIN RIBAO, 7 June: "Vie With Each Other as Warriors in Scaling the Heights of Science and Technology"]

[Text] Beijing, 7 Jun (XINUUA)--In addition to its front page report on a special-class invention award given by the State Scientific and Technological Commission and the State Agricultural Commission to a scientific research coordinating group for breeding xian-type hybrid rice, today's RENMIN RIBAO also publishes an editorial entitled "Vie With Each Other as Warriors in Scaling the Heights of Science and Technology."

The editorial says: Since the establishment of a system of awards for inventions, this is the first special class award ever given. The successful cultivation of hybrid rice of the male sterile line, which is of tremendous economic value, has not only opened a new way to a big increase in rice production but has also broken our predecessors' set pattern and enriched the theory and practice of heredity in hybrid rice seeds. Many noted international rice experts acknowledge that our country leads the world in research and extension of hybrid rice.

The editorial says: Since the 3d plenary session of the 11th CCP Central Committee, we have been pursuing an open-door policy in dealing with other countries. In our contacts with other countries, we have learned a lot. In a failure of analysis, however, some people regard everything foreign as good, put blind faith in foreigners and improperly belittle themselves. This successful cultivation of hybrid rice is sound teaching material for those people.

The editorial says: Our country has led the world and made brilliant achievements in astronomy, geography, mathematics, physics, chemistry, architecture, medicine, agronomy...and in many other fields for long historical periods. However, our country has lagged behind in modern times because of imperialist aggression and oppression and exploitation by the reactionary ruling class at home. In old China, a semicolonial and semifeudal society, the Chinese people were smeared by foreigners as "benighted" and were regarded as an inferior nation. The victory of the Chinese people's revolution made a clean sweep of the servility of the reactionary ruling class, national nihilism and our national inferiority complex. The radical change of our social system, the development of our economic construction and our scientific and technological achievements in, for example, nuclear technology, carrier rocket technology, synthetic bovine insulin and the successful launching and recovery of

manmade satellites has made the world look at us with new eyes. Through the efforts of our scientists and technicians in the first 17 years after the founding of the PRC, the gap between China's scientific level and advanced world levels narrowed. During the 10 catastrophic years, the Lin Biao and the Jiang Qing counterrevolutionary cliques disrupted scientific and technological undertakings and persecuted scientists and technicians, thus again broadening this gap. However, with deep love for the motherland, with firm faith in our party and with a sense of responsibility as masters of the country, our scientists and technicians still quietly immersed themselves in hard work and persisted in engaging in scientific research in those difficult days. Comrades like Yuan Longping continued their efforts without interruption, thus successfully cultivating hybrid rice. Many countries have done research on hybrid rice of the male sterile line but have not yet succeeded. But, our country was the first to successfully breed the hybrid and popularize it. This once again shows that our scientists and technicians have great intelligence as well as high aspirations and creative power. We have full strength and confidence that we can stand on our own feet in the ranks of the nations of the world.

The editorial says: Compared with advanced world levels, the scientific and technological level of our country is still rather low. We resolutely oppose "looking at the sky from the bottom of a well" and "parochial arrogance." We should practice "the doctrine of taking things from others" advocated by Li Xun and study other countries' advanced science and technology suited to the conditions of our country in order to make foreign things serve China. However, we must not improperly belittle ourselves and so blindly worship foreign things as to lose our self-confidence and become dispirited.

In the past 30 years, we have trained and tempered millions of scientists and technicians to a fair educational level. This contingent of scientists and technicians who are loyal to the motherland and the people and who have firm faith in the party and socialism is a force that can be completely relied on. After summing up our experiences and lessons over the past 30 years, we have clearly realized the role of science and technology as a productive force. We are fostering an atmosphere of respecting science and scientists throughout the party and society and are starting to gradually improve the conditions for the livelihood, work, study and advanced study of scientists and technicians. Although we shall still meet with various difficulties as we advance, we have the confidence and strength to surmount them and to scale world heights in science and technology in order to bring benefit to the people, to win honor for the country and the nation and to make contributions to mankind.

The editorial points out: The extension of hybrid rice on large tracts of farmland has effectively promoted our country's agricultural development. This once again proves the correctness of the party's policy that it is necessary to rely on policy and science in developing agriculture. When the question of the system of responsibility in agricultural production is basically solved, it will be more necessary to rely on science to develop agricultural production. Party committees and governments at all levels must attach importance to agricultural science, improve and strengthen their leadership over agricultural scientific research units and agricultural colleges and schools and correct the ideas and practices that 16 more agricultural science and education. It is necessary to concientiously implement the policy toward intellectuals, to further arouse the socialist enthusiasm of

large numbers of agricultural scientific researchers, agricultural technicians, experienced old peasants and educated young people in the countryside and to give full play to their role as the mainstay in agricultural economic construction. In fact, we must rely on policy and science not only to develop agriculture but to develop industry as well. We must rely on science and technology to build a modern, powerful socialist country. All party comrades and cadres must attach great importance to the role of science and pay close attention to bringing scientists' power into full play.

CSO: 4008/378

'JINGJI GUANLI' ON LESSONS FROM IMPORTING EQUIPMENT

HK301356 Beijing JINGJI GUANLI [ECONOMIC MANAGEMENT] in Chinese No 6, 15 Jun 81 pp 12-14

[Economic commentary by Lin Senmu [2651 2773 2606]: "Lessons Drawn From the Importation of 22 Complete Sets of Equipment"; passages within slantlines published in boldface]

[Text] After the smashing of the "gang of four," the party Central Committee made a decision to expedite the pace of our socialist modernization program with the utilization of foreign funds and technology. Practice has fully proven this to be entirely correct. But it must be acknowledged that there cropped up some shortcomings and mistakes in the process of implementing this correct policy decision. The importation of the 22 projects of complete sets of equipment signed in 1978 was a prominent instance. This batch of projects was the product of "leftist" mistakes, and was a product of not seeking truth from facts, and of subjectivism.

In the 10 chaotic years, our national economy was brought to the brink of collapse, the disproportionate relations of the national economy were very serious, the scope of capital construction was overstretched and the orientation of investment was irrational. Normally speaking, after the smashing of the "gang of four," we should have carried out readjustment and rectification and let the people rest and build strength, instead, we called for "getting going and going all out" and building 120 large-scale backbone projects, and the total amount of investment within 8 years (from 1979 to 1985) was planned to exceed the total sum of the past 28 years. Under the guidance of this "theory of achieving quick results," an upsurge of importing complete sets of equipment was started. In 1979 in a very short period of time, large numbers of contracts to import foreign equipment based mainly on the 22 projects were signed. This included the contracts comprising about half of the total amount of transactions which were signed within 10 days beginning from 20 December 1978 to the end of that year. Many of them were projects outside the state plan. The Shanghai Baoshan Iron and Steel General Plant, the biggest project ever seen to date, was also a project outside the state plan. On the issue of importing these projects, no procedure of construction was followed, neither were any earnest investigation and study nor technical and economic deliberation and comparison of various plans made, and also no overall balance was made through the planning departments. Everything in this respect was decided by the leading cadres by marking dots and small circles. Even without the simplest

certificates for planned tasks but only based on a scrap of note paper with some dots and ring marks, they could sign more than US$2 billion worth of contracts with foreign businessmen and decide on construction projects with a total investment of 10 billion [presumably yuan]. Therefore, the importation of these 22 projects was made largely at random and in a blind way. The large quantity of foreign exchange used and investment poured into these projects could only help make the imbalances of the national economy worse.

/1) Making the scope of capital construction become viciously inflated./ The long-drawn-out situation in which the scope of our national economy was overstretched, the management was in disorder and the investment effects were poor has remained unsolved for a long time. Although these 22 imported projects were small in number, the investment channelled into them was substantial. This made the already overstretched scope of capital construction continue to expand. It will take 7 or 8 years to fulfill the volume of investment needed by the planned large and medium-scale projects which have not been completed, calculated on the basis of their original level of investment of that year, even without any new projects being set up. The 22 imported projects (excluding the accumulative total of fulfilled volume) occupied 34 percent of the total investment needed. According to their original plans, the investment in these imported projects will reach a climax in 1980 and 1981, each year needing 10 or 20 billion yuan of investment, surpassing the limit of the national financial strength and material resources. In fact, to make this batch of projects form comprehensive productive forces requires the building of additional necessary complete sets of projects such as railway and power stations, and transforming electrical transmission lines, coal cleaning plants and projects for the production of industrial chemicals, and the corresponding urban construction. It was estimated that the actual scope of the 22 imported projects plus their necessary complete sets of projects would be 100 percent greater than the planned scope. This will greatly surpass the actual abilities of our national strength.

/2) The orientation of investment is irrational./ In China's distribution of investment in capital construction there has existed a tendency in which heavy industry is given one-sided stress while light industry does not receive the deserved attention, resulting in a very irrational economic structure. Because of the one-sided priority given to the development of heavy industry and the overly low proportion of investment in agriculture and light industry, agriculture and light industry could not develop in a proper way. In the inner sectors of heavy industry, owing to the practice of "taking steel as the key link," the basic structure such as the energy industry and transport and communications have become the weak links. With the backward state of energy and transport and communications, only 20 to 30 percent of the industrial productive forces could be utilized, and many enterprises stopped production for 3 days and operated for 4 days, and vice versa. Therefore, it is necessary to readjust this irrational orientation of investment and rationalize the economic structure. However, among the 22 imported projects signed in 1978, the main projects were metallurgical and chemical industrial projects comprising 74 percent of the total volume of investment in this batch of projects, energy projects constituting only 11 percent and light industrial and textile industrial projects occupying only 12 percent. As a result, the orientation of investment has become more and more irrational.

The total volume of investment needed by the unfinished projects of the planned large and medium-scale projects which were under construction centered on heavy industry, particularly the metallurgical industry comprising 22 percent of the total volume of investment needed by the unfinished projects and the chemical industrial projects constituting 10.6 percent.

/3) Without the conditions for production being practicable, even though the items are completed, they still cannot go into operation./ Most of the 22 imported projects consume large quantities of energy. After going into operation, they will annually consume 10 million tons of crude oil and 20 million tons of coal. In the present situation in which our energy supply is strained, the state cannot afford to supply. Take a copper-producing basic construction project for instance. If its conditions for coal, electricity and transport and communications are unpracticable, it will annually consume 1 or 2 million tons of coal according to the originally planned scope. This will affect the newly built power plants and the balance between production and demand of coal, and coal should be imported from other areas, which in turn will add weight to the overloaded railway transport, thus demanding additional railways to be built or rebuilt. Some chemical industrial projects still do not know where to get crude oil from. In addition, several other projects will encounter the problem of energy supply of raw materials after completion.

In sum, the problems of the construction of the 22 imported projects were relatively many. Therefore some of them got stranded before going into operation; many projects which have been put into construction had to be cancelled or postponed and still others whose construction plans should be altered and scale should be reduced. In this way, warehouses had to be constructed to store the several billion U.S. dollars' worth of equipment, consuming a large amount of manpower, materials and finances to preserve and take care of them, resulting in several billion [currency unspecified] units of foreign exchange or scores of billion renminbi lying idle over a long period of time. This was unprecedented in terms of politics and economics.

At present, the primary task for clearing away and ridding ourselves of the "left" deviationist ideological shackles in economic work and further implementing the principle of readjustment of the national economy is the further curtailment of capital construction to a proper degree. In the meantime, it is imperative to earnestly sum up and draw lessons from these 22 imported projects.

/1. Borrowing from abroad to buy mechanical equipment depends on the amount of national funds necessary to manufacture complete sets of equipment./ Under the prerequisite of putting self-reliance first, it is entirely necessary to borrow from abroad to import some advanced techniques. This is conducive to counteracting our weaknesses in construction funds to speedily enlarge the productive forces and utilizing advanced technology to transform the national economy. But most of the foreign debts we borrowed 2 years ago were used to buy mechanical equipment. Using foreign debts to buy mechanical equipment does not depend on our subjective will but depends on how much investment the state can afford for the necessary complete sets of equipment. The ability to manufacture the necessary complete sets of equipment should be considered in two ways: one is the

national investment, materials for equipment and ability to construct needed by the projects to manufacture the necessary complete sets of equipment, and the other is the ability to form complete sets of raw materials, fuel, power and transport and communications after the projects have been constructed.

Some people once argued that it was permissible to separate the carrying out of capital construction using equipment bought with foreign debts from the domestic planned arrangements, thus allowing it to go its own way, that is to say, it could be disconnected with the domestic state plans or finance. This "theory of disconnection" does not hold water. Take the first phase of the project of the Shanghai Petrochemical Industrial General Plant, which has been completed and put into operation for example. This project has 18 sets of equipment in all, of which 9 sets were introduced from abroad and 9 others are Chinese-made. The public facilities, municipal administrative facilities and nonproductive construction were all supplied domestically. Viewed from the angle of the ratio of investment, the imported installations comprised 37 percent while the Chinese-made ones constituted 63 percent. If the portion of the 9 Chinese-made installations had been imported from abroad, we should have spent more foreign exchange. Meanwhile, the domestic productive capacity of these projects cannot be utilized. This is economically irrational. If we build by means of borrowing from abroad the public facilities (heat and power stations, water works, railways, roads and docks) and import all power-generating equipment, rail sleepers and locomotives, this seems to be disconnected, but where should we get the needed rolled steel, timber and cement from? Apart from the bricks, tiles, lime, sand and stones which should be taken from the domestic market, it is almost impossible to rely on foreign countries to supply cement, electricity, coal and transport and communications facilities needed by the construction. The nonproductive construction (housing, canteens, shops and hospitals) and the construction of water supply, sewage, gas, telephone and transport facilities which serve factories also cannot be solved by borrowing from abroad. In addition, taking production into consideration, even if we borrow from abroad by processing supplied materials, assembling supplied parts and importing assembly lines, and pay them with products exported, we still require domestic replenishment of complementary materials, packaging materials, necessary complete sets of equipment and the relevant funds. How can the large-scale imported projects be disconnected with the domestic appropriate ones? Needless to say, no matter what means and measures we take in borrowing from abroad to undertake construction, it is necessary for agriculture and light industry to provide us with the means of livelihood. Borrowing from abroad to undertake production should be based on the substantially increased production of agriculture and light industry. The disconnection of arrangements between construction using borrowed foreign funds and production by domestic strength, in fact, is to be divorced from the overall balance of the whole national economy, starting to build all over again. This will inevitably lead to loss of control over the scope of capital construction and damage the proportionate relations of the national economy.

Therefore, in borrowing from abroad to import some projects, it is necessary to make an overall plan and link up the interior and the exterior to attain overall balance. As regards all projects using foreign investment, it is essential first of all to consider the degree of capability and possibility to cooperate and

manufacture the necessary complete sets of equipment domestically. It is not permissible to decide in isolation on the scale, schedule and effects of the imported projects regardless of the conditions for the construction of projects to manufacture necessary complete sets of equipment and the possibility for cooperation of building times and conditions for construction. The imported projects and the projects for the necessary complete sets of equipment should be arranged well concurrently, otherwise even when they are completed, they will not produce any practical results and on the contrary, they will become a heavy burden.

/2. It is necessary to proceed from the national condition and increase the capability for self-reliance./ The aim of importing technology by using foreign investment is to increase our capability for self-reliance. We should rely on our own strength in building the four modernizations and not buy modernization. In using foreign debts, we should not import any projects whatsoever production. Particular stress should be laid on introducing advanced technology and trying in every possible way to increase the domestic level of designed capacity and manufacturing capability. Everyone should take the overall interests into consideration and energetically foster the domestic manufacturing industry. It is not permissible to weaken and attack the domestic engineering (manufacturing) industry. Hence the domestic departments concerned should be allowed to undertake every design that can be undertaken or mastered through learning at home. Equipment that can be manufactured and supplied at home should be supplied as much as possible by the departments concerned at home. As for some equipment that cannot be supplied at home for the time being, it is permissible to introduce from abroad the blueprints (drawings) and technical data, and engage foreign specialists as instructors. We should try our best to manufacture them by ourselves. In case we are obliged to buy equipment from abroad, we should buy the key equipment.

Furthermore, in importing advanced technology, we should take our own actual conditions and the current national ability and resources into consideration. Our country has limited funds, insufficient technological force and a large population. Therefore in carrying out modernization, we have to consider what is to be modernized first and what later, proceed on the priority principle, make rational arrangements, differentiate what is primary from what is secondary and distinguish between what should come first and what should come later. Whenever modernization is mentioned, people think that everything can be accomplished by "pressing a button." It is unnecessary and impossible to do things like that. In our country, advanced and relatively backward techniques will exist concurrently. Therefore, it is necessary to spontaneously develop automation, semi-automation, mechanization, semimechanization and manual labor of various types.

/3. Decisions on every project should be based on scientific confirmation and technological and economic deliberation./ In deciding on every imported project, we should act according to the procedure of capital construction and the scientific laws and correct the unhealthy tendencies of writing instructions or notes arbitrarily and starting projects in an unplanned way. Without the examination of comprehensive departments concerned and approval through collective discussion, no one, from secretaries of the people's communes to members of the Standing Committee of the CCP has the right to ratify any projects.

An earnest technical and economic deliberation (feasibility study) should be made before importing a project, including the main problems of the research projects such as resources, (?geology), raw materials, fuel, power, communications, technological processes, equipment selection, product specifications, varieties, quantity and market. We should conduct technological and economic investigation and study of the project, make a comparison of the various plans and calculate the technical and economic results after it is completed. Only after this project has been proved to be technically advanced and reliable, economically beneficial and profitable, and in addition, we are capable of undertaking it, can we begin to carry out trade negotiations and sign contracts for imports. Without making any scientific confirmation and without any analysis of technological feasibility or economic feasibility with regard to the imported projects, we decided on them after making assumptions by marking only a few dots and small circles on a piece of paper. We "did not have a real understanding of how things stand but had great determination and lots of measures." This practice of blindly deciding on projects to be imported will inevitably cause great waste and inflict many hidden dangers and insurmountable incurable diseases on production.

/4. Learn to do business./ Over the past 20 years, blocked by imperialism in the first stage and disrupted and sabotaged by Lin Biao and the "gang of four" later, it was impossible for us to develop economic activities with other countries on an intensive scale. As a result, we have a poor understanding of international economic activities and little knowledge in many respects. Owing to lack of experience, the importation of the 22 projects was a bit too hasty, hence we suffered some losses. We must learn to do business and master the knack of doing business.

In negotiating loans to import technology, we have come into contact with many foreign capitalists. We should soberly realize that foreign capitalists are after all capitalists, and are "the personification of capital" (quotation from Marx). Their motives and aim for doing business are to achieve the biggest profits. The profits they aim to obtain definitely cannot be less than the average international profit rate. If the profits they gain are less than the average profit rate, they will not take risks to make investments and they are entirely justified in keeping their money in banks to receive interest safely and surely. In talking about the role of gold under the socialist system, Lenin pointed out: "After winning international victory, I think, we will build some lavatories with gold in the streets of the several biggest cities in the world." But at present, we "must still treasure gold. If you sell your gold, sell it at a higher price, and if you buy any commodities with gold, buy them at a lower price. If you live with wolves, you should learn to bark like wolves."

Promptly summing up experience, upholding what is correct and correcting what is wrong are our fine traditions and also the main reasons for the progress we have made in our work. We should uphold our fine traditions and do a proper job in using foreign investments to import technology.

CSO: 4006/421

FANG YI STRESSES SCIENCE EDUCATION FOR YOUTH

OW201924 Beijing XINHUA Domestic Service in Chinese 1802 GMT 19 Jun 81

[Text] Beijing, 19 Jun (XINHUA)--Speaking at the inaugural meeting of the Chinese association of scientific-technological instructors for youngsters, which closed on 19 June, Fang Yi, Song Renqiong and other comrades urged all in society to show concern for and give support to young people's activities in the field of science and technology.

Fang Yi said: An important thing in developing science and technology is to train competent workers in this field. We should not only strengthen our present ranks of scientists and technicians, but also try to discover talented persons and cultivate them as early as possible into a mighty scientific and technological reserve force while continuing to raise the scientific and cultural level of the young generation. Promoting extensive activities in the scientific and technological field among young people is an important task toward this end. These activities, he said, can supplement classroom teaching and play a vital role in cultivating the young people's aspiration for and interest in science and in raising their ability to observe, think and work in a practical way. These activities are also of vital significance to promoting socialist spiritual civilization as they can bring about good habits among the young people of behaving decorously, paying attention to morality, loving science and studying diligently. In his speech Fang Yi praised the scientific-technological instructors for youngsters as "sowers of the seeds of science and good gardeners for cultivating the seedlings of science and technology."

In his speech Song Renqiong stressed that education in science and technology must start with children, teenagers and youth so that the youngsters will have a foundation in science. He expressed the hope that the broad masses of scientific-technological instructors for youngsters across the country, in particular those working in the countryside, will work harder than ever to help with the young people's activities in the field of science and technology. Among those attending the closing ceremony were responsible persons of the Chinese Scientific and Technological Association, the Ministry of Education, the State Physical Culture and Sports Commission, the CYL Committee, the All-China Women's Federation, Beijing Municipality and other departments concerned.

The inaugural meeting of the Chinese association of scientific-technological instructors for youngsters opened on 12 June. The purpose of this association is to unite and organize on a still wider scale all scientific-technological instructors for youngsters and enthusiasts supporting young people's activities in the field of science and technology. The meeting exchanged information on achievements and experiences in carrying out activities related to science and technology among young people. It adopted a "proposal for further developing the science-loving campaign among young people." Wu Zhonghua, an engineer and thermophysicst and executive chairman of the presidium of the Chinese Academy of Sciences, was elected chairman of the association's board of directors. Jiang Nanxing, minister of education, was given the title of honorary chairman of the association's board of directors.

At the 19 June closing ceremony, speeches were also made by Jiang Nanxiang and chairman of the Chinese Scientific and Technological Association Zhou Peiyuan. Before the closing ceremony, Fang Yi and other comrades met with all the outstanding scientific-technological instructors for youngsters attending the meeting.

RENMIN RIBAO COMMENTARY ON SCIENCE, TECHNOLOGY

HK190454 Beijing RENMIN RIBAO in Chinese 5 Jul 81 p 3

[Commentary by Jia Weiwen [6238 5588 2429]: "Combine the Plans for the Development of Science and Technology With the Plans for the Development of the Economy and of Society"]

[Text] The combination of the plans for the development of science and technology with the plans for the development of the economy and of society will enable the economic development of our country to take the road of less investment and accumulation and achieve better results. This is a historical trend in the development of modern society. There are at present several ways of combining the overall planning and all-round arrangements of the above three: The planning departments should set requirements on science and technology, the main task of which is to solve key problems in the development of the economy; major capital construction projects, the orientation and policies of economic development, which will be included in the plan, should all be checked and approved by specialists; major items in economic development should be arranged in a connected sequence; the unification of the three should manifest itself in various economic development plans; and strengthen the connection between scientific research and production. In the meantime, we should work out a relatively independent plan for developing science and technology. Planning personnel, science and technology personnel and social science personnel should be organized together.

At present, the outline of the sixth 5-year plan and the outline of a 10-year plan are being drafted in various departments and localities. In the summer of last year, the leading comrades of the party Central Committee pointed out that our country's plan should include not only plans for developing the economy, but also plans for developing science and technology and for developing society. Recently, a leading comrade of the State Council clearly stated that in working out the plan we are going to carry out, we must strive to express the principle of combining the development of science and technology with the development of the economy and of society, and overcome the shortcoming of separating the three. But in our actual work, the combination of the three has not been carried out in orderly ways. A conscientious study and settlement of this problem are an important condition for doing a good job in working out the plan. This is an urgent subject which will promote the development of our country's economy and society and the progress of science and technology.

The Combination of the Three Aspects in the Objective Need of Economic Development

For a long time, the plans for the development of science and technology in our country have been divorced from the plans for the development of the economy and of society. They have not been able to merge together organically. Economic development has seldom relied on science and technology. Science and technology have not played a sufficient role in solving major problems in the economic and social development. This is very detrimental to economic development.

The problem is, in the actual condition of our country, should economic and social development rely on science and technology? To what extent should it rely? How important will be the roll played by science and technology in promoting the development of the economy and society? In the future development of our country's economy, we should probe into and take the road of less investment and accumulation and of getting better results. To take this road, we are required to change the stress in the economic development indices from just concentrating on output value, quantity and speed to raising the quality of products, increasing their variety, reducing the consumption of energy and raw materials and lowering the cost of production. This requirement should be reflected not only in the contents of the plan indices but also in checking methods of production and construction units.

In order to accomplish targets of economic development and achieve better economic results, and especially to achieve better economic results when investment in capital construction is reduced, the main thing is to carry out readjustment, reform and technical innovations. The economic development of our country in the future cannot mainly rely on the increase of equipment or personnel from the original level. We must not expand production by extending production. We must expand production and raise the level of production mainly in the contents of production. This all the more requires us to combine economic with technical means, that is, to combine readjustment (the structure of economy and products), reorganization (specialization and cooperation), reform (management system) and restructuring (technology), so as to energetically raise the economic and technical indices and achieve better economic results. Taking this road is more difficult and arduous than taking the old road. But this is a broad road, which will become broader and broader.

The combination and unification of the plans for developing science and technology with the plans for developing the economy and society have become a historical trend in which modern society develops. In particular, during the more than 30 years since World War II, there have been many new major breakthroughs in science and technology, which play a more and more important role in the development of the economy and society. According to statistics, at the beginning of this century, technical progress accounted as a 5-20 percent factor in the economic growth and labor productivity increase in economically-developed countries. In the 1970's, technical progress accounted as a 50-70 percent factor in the economic growth of the developed countries. Because of this, many counries have now determined, from the point of the planning and work system, on the combination of the plans for developing science and technology with the plans for developing the economy and society.

Some people think that for a technically backward country like ours, the role of science and technology is rather small. Therefore it cannot be regarded as an important backing for realizing economic growth. These people only see the backward side of our country's technology, but fail to see that our country's economy has after all developed to a certain scale, though our country's economy and science and technology have suffered many setbacks; that our country has a science and technology contingent of a certain scale and level that has achieved, in different degrees, certain results in many fields of scientific research and that has accumulated certain reserves; and that we have also imported advanced techniques from abroad. By joining all this together, we know that our country's science and technology can play a magnificent role in promoting economic development. We have obtained successful experience in this respect. The problem now is to really bring into play the role of science and technology and make it a great force in raising economic results and promoting economic development.

Several Key Methods of Carrying Out the Combination

In what ways can we combine the plans for developing science and technology with the plans for developing the economy and society, and unify them? Judging from the present conditions, we can at least adopt the following methods:

First, put the plans for developing science and technology and the plans for developing the economy and society under overall consideration and all-round arrangement. The plans for developing science and technology and the plans for developing the economy and society should be component parts of the plan for developing the whole national economy. Economic development sould provide the development of science and technology and the development of the society with the necessary conditions.

Second, the planning departments should set requirements on the departments of science and technology according to the needs of economic development. The development of science and technology including scienctific research, the import of techniques and the digestion and absorption of imported techniques, should meet the maximum need of economic development and take the solution of key technical problems in economic development as its major task. In scientific research, we should, through various experiments, obtain complete, reliable technical and economic data that can be realized repeatedly. This data should be provided to the production and construction departments.

Third, major capital construction projects, technical innovations, imported techniques and the major problems of orientation and policies in economic development should all be checked and approved by specialists in economics and in science and technology. Without checking and approval by specialists, the planning departments cannot list the above-mentioned items in the plan. The departments of science and technology should organize this work and make it a system to be established. When working out a plan, we should go by the major technical policies that are jointly made step by step and in a planned way for the main undertakings by the departments of science and technology and those of economics.

Fourth, from scientific research, the import of techniques and technological design to construction and the operation of production, we should have set arrangements in connected sequence for the major subjects and tasks in economic development, so as to change the results of scientific research into productive forces as soon as possible.

Fifth, and most important, the combination of the development plan for the three aspects should be reflected in the process of the working out of the various development plans for the economy (society). This is the basic link and the main tie for joining up and connecting the development plans for science and technology with the development plans for the economy (society). The economic development plan includes not only a production plan and a capital construction plan, but also a technical innovation plan, with the enterprises as its foundation and the development plan for products and undertakings as its main content. We should regard technical innovations as the main path for developing products and undertakings. So long as problems can be solved by restructuring the present enterprises, we must resolutely avoid carrying out new construction in this respect.

The technical restructuring plan of enterprises and undertakings includes the renewal of products and the adoption of new techniques and technology. It is in fact the popularization and application of the results of scientific research or of imported techniques in production and construction. The economic development plan of various trades and undertakings should include plans for developing new products and for adopting new techniques and technology. We should also create conditions for setting the indices for net output value resulting from technical progress. There are two aspects in fully relying on the role of technical progress in the economic development plan: on the one hand, absorb and digest the nourishment of science and technology and adopt appropriate advanced techniques as far as possible in production and construction and in technical innovations; on the other hand, starting from the needs of the development of the economy and society, requirements of various aspects should be set on science and technology. Many items and subjects in the plan for developing science and technology should be put forward in this way.

Giving priority to technical innovations in the existing enterprises does not mean that we do not want capital construction. In the light of the actual condition of our country, capital construction should have a certain proportion in the investment in expanded reproduction. In view of our 30 years' experiences and lessons, we must energetically strengthen the work in the early stages of capital construction. Technical preparation is an important component part of such work. Technical preparation should also include the necessary scientific research. Therefore, in the work in the early stage of capital construction, we should make appropriate arrangements for scientific research.

Sixth, in order to strengthen the connection between research and production, we should build more sample production devices for economic results that need major techniques and for popularizing the possible results of scientific research. Take production lines and workshops as an example. They should carry out small-scale production. It is necessary for the production and construction units to cooperate with the scientific research units to realize this plan. Production enterprises will be responsible for the investment needed and the state will be responsible for the investment and loans for major and important projects.

Only when various trades and undertakings take science and technology as an important means for developing the economy so as to make the development of science and technology an organic component part of the economic development plan and intertwine the economic and technical means of achieving economic growth together, can the method of working out plans in a mechanical way be changed and the problem of the development of science and technology and the development of the economy really be solved.

When working out the social development plan, we should also combine economic measures with the technical measures. Take the problem of the control of air pollution in the urban areas as an example. If no major and important measures are taken in respect of the popularization of the use of gas in the urban areas, it is difficult for us to achieve outstanding results in air pollution control. And the popularization of the use of gas in the urban areas cannot but rely on science and technology.

Work Out a Relatively Independent Plan for Developing Science and Technology

In stressing the combination of the plans for developing science and technology with the plans for developing the economy and society and by stressing that the contents of science and technology should be taken as an organic component part of the various economic development plans, we do not in the least mean that there is no more need to work out plans for developing science and technology. According to the present actual condition of our country, we should concentrate our efforts on solving key technical problems that have emerged in the present and recent production and construction, and giving priority to the arrangement of projects that can bring about major and important economic results. We should also have development in mind. We should devote certain efforts to the study of basic theory and to the study of very advanced techniques. We should also arrange some long-term projects so as to make preparations for the future development of the economy and technology.

The plans for developing science and technology should include major and important projects of scientific research (including basic, applied and exploitation research), major and important projects for the import, digestion and absorption of techniques, projects for capital construction in science and technology (such as experimental bases, test centers, research centers and information centers), development plans for scientific and technological undertakings, including funds for scientific and technological research and material, and training plans for the increase of qualified personnel. It should also include several key undertakings and areas to be opened up and comprehensive projects of science and technology. According to the actual condition of our country's science and technology and in light of needs and possibilities, we should do things in order of importance and urgency, decide what is to be learned at home and what imported from abroad, and carry out comprehensive balance and all-round arrangement. The projects that are to be listed in the plan must have implementation details and guarantees so that the plan can have certain strategic aims and be relatively practicable.

We should also adopt organizational measures to carry out the combination of the plans for developing science and technology with the plans for developing the economy and society, and do our best to organize together the planning, science and technology and social science personnel. So long as we can organize well the forces from various aspects and conscientiously carry out investigation and study, it is possible for us to work out a fairly good plan.

ROLE OF TECHNOLOGICAL SCIENCES IN NATIONAL ECONOMY, DEFENSE CONSTRUCTION

Beijing ZIRAN BIANZHENGFA TONGXUN [JOURNAL OF THE DIALECTICS OF NATURE] in Chinese No 4, 10 Aug 81 pp 4-6

[Article by Lo Peilin [5012 3099 7207] of the Science & Technology Committee of the Fourth Ministry of Machine Building: "The Role of Technological Sciences in the National Economy and Defense Construction in China"]

[Text.] I. Delineation of the Major Stages of Contemporary Science and Technology

Activity in contemporary science and technology can basically be considered to have four key stages: basic science (i.e., basic research), technological science (i.e., applied research), technological development (including what we customarily call prototype manufacture), and concrete engineering technology. The first three stages are clearly characterized by the core goals of discovery, invention, and creativity, and in general by what is called "research and development" (often denoted abroad by the English abbreviation R&D). Here, "scientific research" includes the two stages of basic and applied research.

Concrete engineering technology is wide-ranging. This is using the experience of each domain to raise the level of technical guidance, or what could be called science and technology for everyday use. Examples include the technology of production engineering in industry; planting, plowing, and harvesting technology in agriculture; clinical diagnosis and treatment technology in medicine, etc. Technological development, thus, is a stage inextricably linked to technology for everyday use. It is already a common and important source of contemporary technology for everyday use. It includes aspects from the initial design stage to the development and trial-production of articles. It also includes the overall development and realization of production and operations technology. The clear goal of technological development is to plan on the basis of applied experience.

Basic scientific research is another of the four stages. Its mission is the discovery and description of the natural world's basic phenomena and principles. The new achievements of contemporary basic science have led to many important new technological breakthroughs. For example, the discovery of the Maxwell equations and Hertz' experiments led to the development of radio communications; the discovery of nuclear fission led to the development of nuclear energy and nuclear weapons. The theory of energy transmission in quantum mechanics made crucial contributions to the continuous rise of semiconductor technology. However, in practice if one simply proceeds from these basic achievements, it is often still impossible to go directly to technical development or the development of technology for everyday use. At this point, it is necessary to conduct a great deal of scientific experimentation and theoretical investigation. On the other hand, the accumulation of a great degree of empirical data and materials during everyday practice and the development of technology requires experimental verification and theoretical summarization in order to create rational knowledge possessing even more guiding meaning, even to the point of being able from this to enrich the content of basic science.

All this is the mission of technological science; it is the bond joining basic science and the development of technology. The emergence of a strong technological science is a great event in the contemporary development of science and technology as well as currently being the direct source of much new technology. On the basis of the contemporary experience of advanced countries, the existence of the four stages has already produced a relatively complete scientific and technological system in which each of the four stages is essential. They depend on, permeate, and complement each other.

II. Historical Experience on the Development of Science and Technology

Having an overall understanding of the history of the following developed countries' science and technology development and comparing their differences and merits could provide important lessons for our country's development of science and technology.

Early science has a practical nature. Since the Industrial Revolution many important inventions have come from combining early scientific knowledge with experience gained through production. Later, in Western Europe, under the influence of that region's scholastic tradition, advanced basic science was developed. These basic scientific achievements established important conditions for modern science and technology, but at the time it emerged, it was not at all intimately related to the development of that region's production. The development of a technological science between basic science and technological development came somewhat later.

American science and technology originally lagged behind that of Western Europe and was the historical model of a less advanced country achieving virtually complete success in gaining first place. At an early stage it made use of West European technological development for its own production. The rapid development of industry enabled applied technology to advance rapidly, leading to a great number of inventions and the flourishing of technology. This began in the late 19th and early 20th centuries, which was also the time of Bell, Edison, and the Wright brothers; from this developed the ranks of American technological scientists. At the time of WWII, the development of nuclear energy, radar, and jet technology propelled it to new peaks. With the immense planning for space, the rapid expansion of the information industry, the large-scale advancement of nuclear testing, and the urgent demands on energy and the environment currently being stressed have sufficed to continue its development. The existence of powerful technological science ranks has become the characteristic of American science and technology. It was only after WWII that the US energetically developed basic science. However, since it has such favorable conditions as a highly developed economy and a profound degree of applied scientific achievement and engineering technology, it rapidly entered the advanced ranks. During this period Western Europe also began to fill in the thin spots in its own technological science. It is also worth mentioning that the US relied heavily on European talent for the development of its basic science and technological science.

Japan is a model among contemporary states of a backward state which has reached the front ranks and attained remarkable development. After WWII, Japan began extensive economic, scientific, and technological development. For this reason it could make full use of the achievements of Western European and American science and technology. First, it transferred foreign, especially American, applied engineering and technology, vital to the rapid development of the economy and production. Later, along with copying, it paid full attention to developing its own technology. Because of this they were able thoroughly to master and digest imported technology as well as being able to improve it so that many facets of it attained the front ranks. As far as basic science and technological science are concerned, Japan repeatedly achieved world class results, but did not gain a flourishing level overall. In recent years they have demanded an increase in the rate of technological development and, having already realized their technological reserves are weak, they have begun to pay attention to strengthening these two stages.

The historical development of the Soviet Union occurred under different circumstances. Because of court promotion in Tsarist times, a foundation for basic scientific research was established early. Building on this heritage, the Soviet Union established the Soviet Academy of Sciences, developed powerful basic scientific ranks, and became one branch of the world's advanced scientific ranks. Dedicating themselves to sophisticated military technological development, they also achieved notable results. They concentrated talented scientific and technical specialists and major material and financial resources on this arena, thereby weakening various aspects of applied engineering technology and technological development.

This cannot but be an important reason why their national economy incorporates such key sectors as electronics which are characterized by long-standing inferiority to other developed countries. Since high technology and applied technology are insufficiently developed and do not make urgent demands on technological science, technical science of course cannot flourish either.

III. Problems Worth Noting in Science and Technology Development

1. Longterm scientific research should be properly managed. The US in its early period and Japan are examples of stress on achieving immediate results; the Soviet Union is an example of concentrating energy on the achievement of longterm results. We cannot follow the old Soviet road of longterm development in isolation, nor can we put longterm development into the background like the US and Japan. We should take the overall experience of each into consideration. In passing from a period of isolation to getting results by "feeling one's way," longterm research has been neglected. In recent years, attention has been paid to basic science, but the stress on applied research remains insufficient. Although applied research, i.e., technological science, does not lead directly to products or techniques, it provides creative conditions and paves the way for technological development. Numerous key problems currently blocking production and technological development often can be solved only through emphasis on technological science research. The US established strong technological scientific ranks relatively early. This was of great utility to its attainment of the leading place in production and technology. The great significance of such experience should be fully emphasized.

2. Adjustments in the proportion of technological development to engineering technology in common use are useful to facilitate rapid scientific and technological results in social practice. For example, in industrial experience, flatly stressing the development of production during a given period not only led to underemphasis on scientific research but caused production engineering and the advancement of related technology to be severely neglected, as well as leading to the neglect of general technological development. Therein lies the crux of the problem of retarded application of many scientific and technological achievements, high production costs, and low quality. Since production engineering and development of technological research both require a great deal of work, this deficiency necessitates earnest treatment. The development of production should be adjusted conscientiously, duplication reduced, quality improved, and efficiency raised. The transfer of a substantial amount of energy to production engineering is beneficial to the development of technological science. The lesson to be derived from Soviet experience is that underemphasis on the development of engineering technology should be avoided.

3. One should fully understand and abide by the rules of interdependence between the development of science and technology and the development of production. Practice demonstrates that science and technology development often leads to a rise to a new level of production. A great amount of new technology is currently available abroad which can be of use to our production. Production requires the utmost prior resolution of technological problems, only after which can one move freely ahead. In view of these points, scientific and technological work is the precursor of production and daily practice. But on the other hand, the task of developing science and technology must be addressed primarily from the viewpoint of social practice. Everyday practice has given far more data and source material to the development of science and technology than scientific experiments have been able to provide. Many scientific and technological achievements reach final realization only after a long period of practical verification, substantiation, revision, and development. The scope of science and technology development should be adapted to the needs and capabilities of the level of economic development. Viewed in this light, science and technology development is the continuation of the development of production and construction. In the US and Japan, during the course of science and technology development, we can see everywherethe great degree to which the development of production and construction has promoted and conditioned the development of science and technology.

4. Several other important problems must also be managed well for the development of science and technology.

(1) Theory and Practice: Many concrete science and technology problems can only be exposed and resolved through profound, broad social practice. In the development of science and technology, theory and experimentation are indivisible. It may be that theoretical work is the key element in certain sciences and tasks. But as far as scientific and technological work as a whole is concerned, that by far the greatest part is accounted for by experimental work is a fact which must be faced.

(2) Scientific Research and Inventions: Contemporary, systematic scientific research and technological development have made unprecedented contributions to new technology. But after the expansion of social practice and the general elevation of the people's comprehension of science, the process of inventing, rather than having lost ground, has flourished, with practical experience and creative ideas the essential factors, and even more has been based on the new level of knowledge. In the same year that nations are celebrating the 100th anniversary of Einstein's birth, the US is holding a great celebration of the 100th anniversary of Edison's invention of the electric light bulb. The solid ranks of inventors remain a major support for the economic development and technological advancement of today's developed countries.

(3) Imported Technology and the Development of Domestic Science and Technology: In reality many achievements which we have not yet mastered exist in the world. We should make full use of imported technology, earnestly and honestly studying and profoundly assimilating it. But through imports we can only learn of other people's experiences; we cannot learn the rich knowledge accumulated by others through long practice nor can we achieve the essential development of our own science and technology, modes of thinking, work methods, or work style. Technology importation certainly has its limits. To go the last step toward advanced international standards, one must rely on oneself. The Japanese studied a great deal of foreign technology, thereby saving themselves a great deal of science and technology development work, but they applied themselves positively rather than relaxing their own technological development. Because of this they were able to surpass the level of overseas technology, entering the international front ranks while expending relatively little energy of their own. We should study Japan's experience.

(4) New and "Traditional" Disciplines: The newly developing discipline often symbolizes new progress in the level of science and technology and should of course be emphasized during the phase of initial acquisition. "Traditional" disciplines also have great vitality and are often the essential foundation for new disciplines, but they are also often the weak stages of backward countries. They also reach new levels in the process of going from superficial to profound, from low to high, to the point that some are once again transformed into important, brand new disciplines. Therefore, they too must be fully emphasized.

In sum, during work on the four scientific and technological stages, one should give the proper weight to various relationships. In the past, technological development was stressed, the other three stages being slighted. Our work covers a broad range but is sometimes blocked by crucial technology so that protracted effort accomplishes nothing. To overcome these difficulties, it is necessary to strengthen research in the technological sciences and accumulate technological reserves. In areas where the responsibilities of scientific institutes, institutions of higher education, and industrial departments overlap, applied technological scientific research should be allowed to occupy its proper place and advance by means of overall planning, full cooperation, and the making of contributions.

MORE SCIENTIFIC FORMULATION OF MACROECONOMIC POLICY URGED

HK230204 Beijing JINGJI GUANLI [ECONOMIC MANAGEMENT] in Chinese No 8, 15 Aug 81 pp 17-20

[Article by Sun Xiaoliang [1327 2400 5382]: "How Economic Leadership Departments Can Make Their Macroeconomic Policy Formulation More Scientific"--passages enclosed in slantlines printed in boldface]

[Text] (I) An important lesson from the experience of Economic Construction

Over the past 31 years, our country's total output value has grown very rapidly. Except for a few years, the annual growth rate always stayed above 7 percent. The accumulation rate was also very high, reaching around 30 percent in the majority of these 31 years. However, we did not achieve the desired economic results. Only 69 percent of the total investment was converted into fixed assets. Only 46 percent of it has genuinely played a role in the economy. The standard of living of the masses of people has not been improved to the desired extent. Huge amounts of capital funds have been wasted or have been tied up because of overstocking.

There are many reasons for this situation. An important lesson from our experience is that our macroeconomic policy formulation was unscientific. This was reflected, in practice, in the formulation of unrealistic principles and policies, the lack of a scientific basis in formulating construction plans, the issuing of arbitrary and impracticable directions, and so on.

Examples of unrealistic principles and policies include the continuous promotion of production relations to higher levels, causing them to surpass the level of development of the productive forces; principles that violated the laws governing socialized large-scale production, such as principles requiring each province to become a self-contained economic system, requiring each locality to produce a balanced assortment of materials and to make available complete sets of equipment, and so on; slogans such as putting an end to the situation of having to transport coal from the north to the south, and so on; policies concerning the use of fuel, such as switching from coal to oil and then later inconsistently switching from oil to coal, and so on; and so forth.

Examples of the lack of a scientific basis in formulating construction plans include the following: The 10-year plan stipulating the building of 120 major projects was put forth before the possibility of making the funds available was

calculated. Imports were made on a massive scale before the availability of foreign exchange was ensured, so with regard to some imported items, though contracts had been signed, their implementation had to be postponed or the contracts had to be amended because of a lack of funds. The project of "supplying Sichuan's natural gas to other provinces" was decided upon before the natural gas reserve was cearly ascertained, so that the project had to be discontinued halfway because of the inadequate reserve. Numerous major projects were started before raw materials, motive power or complete sets of equipment were available. Some completed projects incurred losses right from the time they went into operation.

In our economic life, there have also been numerous instances of issuing arbitrary and impracticable directions. Sometimes, major economic policies were formulated on the basis of some "tendencies" or of some leaders' feelings. When the call for developing the iron and steel industry on a massive scale was issued, several hundred thousand people were directed into this effort; everywhere primitive blast furnaces were set up; trees were cut down when coal was not available; in many regions, highly valuable forestry resources were destroyed; and consequently money and manpower were wasted, with the losses being greater than the gains. When the slogan of "do away with the dictatorship of rules and regulations" was put forth, all enterprises were put under lower administrative levels. Some enterprises which provided services on a nationwide scale were also put under county authorities. The consequence was chaos in economic life over a period of time. To develop a dozen or more daqings was merely casual talk, but this turned out to be the basis for formulating plans for opening up oilfields.

These ways of formulating macroeconomic policy, which were unscientific or even contrary to science, resulted in losses, some of which are incalculable. Therefore, we must make our macroeconomic policy formulation more scientific; that is, we must make it compatible with the objective reality and economic laws, and we must have an accurate numerical basis and must perform quantitative analysis. If this problem remains unsolved, the national economic proportional relations will be disrupted again even if they have been readjusted, and the economy will not be markedly improved.

(II) The Importance of This Problem

The problem of making macroeconomic policy formulation more scientific is an extremely important problem, rather than being an ordinary one. It affects the future and destiny of the planned economy. It is connected with whether the superiority of the socialist system can be brought into play, and whether the system of ownership by the whole people will degenerate.

The founders of scientific socialism clearly stated that the basic contradiction in the capitalist system is that between the socialization of production and the private ownership of the means of production. The forms of expression of this basic contradiction are the class antagonism between the proletariat and the bourgeoisie, as well as the anarchic state of social production. This contradiction can be radically resolved through the seizure of public authority

by means of the proletarian revolution, and the exercise of this authority to make possible the social ownership of the means of production, to free the means of production from their subordination to capital, and to acknowledge their social nature. On the basis of public ownership, the anarchic state of social production must give way to regulation by planning mechanism, and social labor time must be consciously allocated according to proportions among various categories of production, so that the development of the productive forces can be promoted. [HK230230] This is an important manifestation of the superiority of the socialist system. However, the goal of proportionate development can be attained only with scientific centralized social planning. Bitter experiences at home and abroad have proved that unscientific centralized social planning will only lead to the artificial disruption of proportional relations. Moreover, the consequences of disrupting the proportional relations "in a planned way" are much more serious than those of the spontaneous disruption of the proportional relations. Precisely because of this, although we have instituted the public ownership of the means of production and have adopted the planned economy, the superiority of the socialist system has not been fully brought into play because the formulation of many macroeconomic policies has been unscientific.

To demonstrate the vitality of the planned economy, we must not rely mainly on "theoretically explaining" its superiority. Instead, we must "prove" its superiority "through practice." If our planning is unrealistic, violates economic laws, is marked by the lack of accurate data as its basis, and is effected through the "invention of ideas" by a minority of people, then the reputation of the planned economy will certainly be tarnished, and its prestige will certainly be damaged. The First Five-Year Plan was rather satisfactory. It really effectively guided our national economic development and enabled people to realize the superiority of the planned economy. However, late on, for one thing, attempts were made to continuously widen the scope of planning and increase the contents of our plans, so that our work load was divorced from our actual capabilities and standards. For another thing, the setting of high targets and the issuing of arbitrary and impracticable directions gradually became dominant, and criticisms were continually launched against right conservatism and the passive maintenance of equilibrium; and consequently, our planning became less and less scientific. If things continue like this, the prestige of the planned economy among the people of the world will be utterly destroyed, and the planned economy will be deprived of its vitality.

Unrealistic policy formulation, unscientific planning for construction and issuing arbitrary and impracticable directions, actually amount to the degeneration of the system of ownership by the whole people. In our country, such ownership is realized through the ownership of the means of production by the state in the name of the people. Real life experience tells us that when our state organs formulate economic policies, there may be two categories of possible results with regard to whether such policies represent the common will and interests of all of the people. When the economic policies formulated by the state are scientific, the implementation of such policies inevitably promotes our national economic development. This amounts to representing the people's common will and interests, and the realization of ownership by all of the people. When the economic policies formulated by the state are unscientific, the implementation of

such policies inevitably lead to hugh losses and waste. This is against the common will and interests of all the people. However, the laborers are incapable of doing anything about it. Therefore, this actually amounts to the disintegration of ownership by all of the people.

Thus, from whichever point of view, we should not consider the problem of making macroeconomic policy formulation more scientific as an ordinary or minor problem.

(III) How To Make Macroeconomic Policy Formulation More Scientific

The major requirement is that we must eliminate the influence of "leftist" ideology in economic work. An increasingly large number of comrades are beginning to realize this point, and are effectively performing work in this respect. The power of economic policy formulation must be linked to the responsibility for the consequences of implementing economic policies. We must put an end to the situation in which the subjectivist issuing of arbitrary and impracticable directions causes losses to the state amounting to hundreds of millions of yuan, and the policymakers shoulder no responsibility for these economic consequences. Aside from these two methods, we must, by reforming our economic management systems, make our methods of organization and our systems capable of ensuring more scientific macroeconomic policy formulation.

We must not believe that the reform of our economic management system merely amounts to expanding the enterprises' decisionmaking power. When the enterprises' decisionmaking power is expanded and microeconomic activity is promoted, there will be an urgent need to strengthen guidance by planning. The formulation of plans must be scientific, and the means of guidance must be powerful, so that the conscious and proportionate development of the entire national economy can be ensured. To achieve this, we should include at least the following three elements in the reform of our economic management system. (1) The enterprises under the ownership of the whole people should "be subjected to ownership by the whole people, practice independent accounting, and assume sole responsibility for their profits and losses," so that the power to run the enterprises independently, and an internal motive force that promotes continuous improvements in management and operations will be available. (2) We must reform the functional, organizational and personnel structures of government departments in charge of economic management, so that macroeconomic policy formulation can be made more scientific. (3) We must reform and perfect the agencies of economic regulation, and flexibly employ various means of regulation, so that a "bridge" can be established between the state's macroeconomic policy formulation and the enterprises' microeconomic policy formulation. [HK230312] If these three categories of reform are carried out, then the enterprises' and the workers' enthusiasm, initiative and creativity can be brought into play, and microeconomic results will be improved; and moreover, proportionate national economic development can be consciously maintained, so that macroeconomic results will be ensured.

A rather popular view holds that if the enterprises assume sole responsibility for their profits and losses, then the government departments at various levels responsible for economic management can be combined or abolished. Actually,

things are quite far from being so simple. When the enterprises have been assigned greater decisionmaking power, not only must the government departments responsible for economic management use a new set of methods to guide economic activities so as to ensure the achievement of overall equilibrium, but macroeconomic policy making must really become scientific. This is a very arduous task. Therefore, for the economic management departments of the state, reform is not merely a matter of simplification, combination and abolition, but amounts to a series of structural reforms.

/First, the functional structure must be reformed./ At present, our government departments responsible for economic management are actually performing two categories of functions. First, they study and formulate principles, policies and plans concerning national economic development. Generally speaking, this function lies within the scope of macroeconomic policy formulation. Second, they organize and direct the enterprises' activities in production, supply and marketing. Generally speaking, this belongs to the scope of microeconomic policy making. At present, a large proportion of their time and efforts are actually used to organize the enterprises' production, supply and marketing activities. The work of studying and formulation principles, policies and development plans is done in a very crude manner. With the assumption of sole responsibility for profits and losses by the enterprises and the assigning of microeconomic decisionmaking power to the enterprises, this functional structure must undergo a major reform. With the implementation of the reform, the economic management departments will inevitably have to do some work in coordinating production, supply and marketing, but their main function and key task will be macroeconomic policy formulation, to which they must devote the greater proportion of their time.

/Second, we must reform the organizational structure./ At present, our government departments responsible for economic management actually consist of two categories of organizations. The first category are organs of power, which are mainly responsible for organizing, directing and controlling production, distributing funds and material resources, deciding upon construction projects, and so on. The second category are advisory bodies, which are mainly responsible for making investigations about and studying principles and policies, compiling and analyzing information, studying development plans, designing schemes for policy formulation, and so on. Judging from present circumstances, specialized advisory bodies are too few. Their work is mostly concurrently performed by organs of power, so that it is very difficult to perform such work meticulously and to a great depth. Our past mistakes of various types of macroeconomic policy formulation were to a great extent due to the underdevelopment of such advisory bodies. The formulation of an economic policy generally involves three "subprocesses." First, we must compile adequate and accurate data, some of which may be collected for a short period of time, but most must be collected on an annual basis. If we do not compile and analyze information in this way, it will be impossible for us to formulate our policies on a scientific basis. The second stage is to design schemes for policy formulation. On the basis of mastering and analyzing an adequate amount of information, we must design a number of schemes for policy formulation, analyze the feasibility of these schemes, and clearly know the advantages of each. This requires a great deal of expert knowledge and a large number of qualified specialists. The last stage is to select the right policy. The person

or group responsible for decisionmaking will choose one from a number of schemes presented for implementation. That is, he or they will "have the final say." The first two stages involve a great deal of work which cannot be performed by a policymaker or a number of policymakers, but must be done by advisory bodies. Without those bodies which are essential for compiling information and designing schemes for policy formulation, the policymakers will not have any accurate data, any quantitative analysis findings, or a number of schemes to compare and select from, as was the case of "supplying Sichuan's natural gas to other provinces." Under these circumstances, even if the policymakers are technical experts, it will be very difficult for them to formulate scientific policies, even after repeated group discussions. The reason is very simple. They lack the requisite basis for scientific policy formulation. Therefore, with the expansion of the enterprises' decisionmaking power, the organs of power should be simplified, combined or abolished, while the advisory bodies should be increased and strengthened. We must also establish, as quickly as possible, certain bodies which have not been established, such as an overall national economic planning department, whose establishment has been repeatedly proposed by Comrade Qian Xuesen.

[HK230340] /Third, we must reform the personnel structure./ The need for reforming the personnel structure arises from the reform of the functional and organizational structures. On one hand, with the vanishing of the function of organizing and directing production, supplying and marketing activities, and with the decrease in the number of organizations, the size of the contingent of personnel will inevitably be correspondingly greatly reduced. On the other hand, with the rising need for scientific macroeconomic policy formulation, and with the strengthening of advisory bodies, there must be a great increase in the number of people needed for the satisfactory formulation of macroeconomic policies, such as experts in social engineering and systems engineering, mathematicians, statisticians, economic management experts, and so on. Such is the reform in the personnel structure of the state's economic management departments.

Abstract reasoning invariably does not leave such a deep impression as concrete facts do. Because at present, people have not adequately paid attention to this issue, it is necessary to introduce here some relevant circumstances in Hungary. Not long ago, some personnel of Hungary's Central Statistical Bureau told the comrades of our country's observation group that subsequent to their economic reform, the work of their statistical bureau changed greatly and they began to pay greater attention to analyzing major problems; for example, analyzing and studying the effects of various regulatory means on the economy, studying how net income can be optimally distributed between the state and the enterprises, studying the enterprises' wages funds and their relationship with the accomplishment of tasks, and so on. Every year, the bureau conducts a family livelihood survey of 2,300 families of various types, such as those of workers, peasants, mental workers, retired persons, and so on. It analyzes facts related to their income and consumption, and also changes in their consumption pattern. A special research office under the statistical bureau is responsible for making forecasts, three times a year. Once every 2 years, the bureau prepares an input-output table providing information about 30 sectors, and once every 3 to 5 years, it prepares another such table concerning 100 sectors. Some 1,000 people of the statistical bureau, or approximately 7,000 people if those belonging to local statistical departments are included, are involved in the carrying out of these tasks.

What we have described is just a small part of the work which must be done to do a good job of macroeconomic policy formulation. However, we can see from this that making macroeconomic policy formulation more scientific cannot depend on our wish alone; it requires us to do a great deal of arduous and meticulous work. The agencies and personnel of our existing economic management departments are incapable of meeting the needs. Not to mention the issuing or arbitrary and impracticable directions, marked by "great determination with little knowledge of the situation," our government bodies and personnel are probably incapable of doing a good job of scientific economic policy formulation. Last year, several mathematicians proposed using the scientific method of input-output tables to achieve a satisfactory comprehensive national economic equilibrium. According to our knowledge, some foreign friends have also put forth similar ideas. This is really necessary in the light of the requirements of making economic policymaking more scientific. However, this is not feasible in the light of the foundation of our work and other objective conditions. The way out is to reform the functional, organizational and personnel structures of our economic management departments, so that conditions will be created for the attainment of this goal.

CSO: 4006/1

COMMENTATOR ON APPLICATION OF SCIENCE, TECHNOLOGY

HK220632 Beijing RENMIN RIBAO in Chinese 13 Aug 81 p 3

[Commentator's article: "Scientific and Technological Work Must Be Oriented to 'Application'"]

[Text] The national conference on scientific and technological work convened at the end of last year defined the principle that science and technology must serve the development of the national economy. How are we carrying out this principle in practical work? The technological exchanges organized by the State Scientific and Technological Commission and the State Economic Commission concerning the popularization and application of new materials such as organic silicon, organic fluorine and so on, have given us an important inspiration: to center our work on "application," and help scientific and technological achievements to be applied as soon as possible to industrial and agricultural production, so as to push ahead with the development of the national economy.

To center on "application" in scientific and technological work means in principle to do a good job of popularizing and applying those new technologies invented at home and abroad which have been proved to fit our country's circumstances, and to push the transfer of science and technology from laboratories to plants, from military to civilian use, and from abroad to home. At present, our country possesses over 4,000 independent scientific research units and a scientific and technological contingent of several million, who are both Red and expert.

In some advanced and difficult branches of technology, we have considerable capability to break down technical barriers. However, due to irrationality in economic and scientific research systems, divorce between scientific and technological work and economic work is quite common. Although we can make tremendous progress in some very advanced branches of technology, our technology for producing commodities that are greatly needed by the masses is really backward. Although we have made many individual achievements in fields such as large integrated circuits, lasers and so on, we lack the comprehensive technological capability to produce items in complete sets. Quite a number of new results and new products come about every year, but only a few of them can really be applied and put into mass production. Some new techniques are still confined to production in military industry and have not been popularized quickly in the production of civilian goods. Some new techniques introduced from abroad have not yet been well digested and popularized. The aim of centering on "application" and carrying out the three transfers is to overcome the weakness brought about by the divorce of science and technology from economic construction, and to give full play to science and technology so as to improve economic effect and push ahead with economic development.

There are many branches of science and technology. In research, there are basic, applied, and development research. In order to center on "application," and to enforce the three transfers, we have to handle well the relations between them. Basic research cannot be neglected, and pioneering work has to be continued. But, since science and technology must serve the national economy, much effort (including manpower, material resources and financial capacity) still have to be devoted to applied and development research. At present, there are many technologies at home and abroad that suit the conditions of our country. If we use these new technologies to transform and replenish the existing 380,000 enterprises, to solve those problems of the national economy that are of great significance in terms of economic effect, and to improve old technologies and to create new ones on the basis of application, then our production capacity will be greatly raised and better economic results will be achieved. The popularization and application of new materials such as organic silicon, organic fluorine and so on have set very good examples.

To orient scientific and technological work to "application" and to carry out the three transfers, we are required to consider the economy, science and technology and social development together, and to strengthen the close coordination between scientifc research units and production units. As scientific research departments are those which know best the characteristics, effects and uses of scientific research results, naturally they should take the responsibility for popularization and application. Scientific research departments should promote social service work, and all application research institutes should establish close contact with enterprises. Scientific research units must make economic contracts with production units so as to push forward technical services and popularization services. These contracts, concerning production, design, construction and advisory services, range from those linking remuneration to work to those compensating for transfer of research results. At present, some regions and departments have already broken down the barriers of the "local ownership system" and "departmental ownership system." They make contracts with whatever unit which can render good services; some of them even organize various forms of integration of scientific research and production. All these practices which enable the services of science and technology for the economy to develop to more sophisticated forms of organization deserve to be promoted.

ECONOMIC RATIONALITY MUST ACCOMPANY TECHNICAL ADVANCEMENT

Tianjin KEXUEXUE in Chinese No 2, 20 Aug 80 pp 11-14

[Article by Lu Taihong [4151 1132 1347]: "Technical Advancement and Economic Rationalization"]

[Text] The three elements of economic growth are: an increase in labor, an increase in capital and adoption of new technology. Adoption of new technology occupies a more and more important position among these three elements with the rapid development of science and technology. Take Japan, for example. The contribution to its economic growth from the end of the war to 1960 was approximately 52 percent due to the labor force, 43 percent due to technological development and only 5 percent due to increase in capital. The period 1965-1970 was a period in which Japan's economy showed a very rapid growth rate--an average annual rate of 11.6 percent, of which 4.4 percent was achieved with an aid of science and technology. According to many forecasts, 65 percent of Japan's economic growth during the 1980's will be due to the power of science and technology. According to a study made by an American economist, E. F. Denison [phonetic], adoption of advanced technology constitutes 44 percent of the weight of various factors contributing toward increased production. In fact, 40 to 60 percent, or even 80 percent, of the economic growth achieved by a few advanced nations is due to the adoption of new technology. Therefore, a large amount of advanced technology must be employed in order to develop the economy. However, can every concrete technological advance bring about economic benefit? The answer appears to be affirmative, but in fact, it is not. Here are a number of examples attesting to this effect:

The solar energy hot water heater, distributed by Beijing service enterprises, which has been praised as "a new blossom of science and technology" and widely propagandized by the newspapers and radio stations, was awarded a national science conference award. A total of 41 units of this solar energy hot water heater were built, as a result of which 700-800 tons of coal could be saved a year and air pollution could be eliminated at the same time. However, since the cost of operating the solar energy hot water heater comes to almost twice the cost of heating water with a conventional boiler, many units which are in possession of such equipment often opt not to use it. A certain unit spent over 10 million foreign exchange units in order to import an advanced computer. But because of its low rate of utilization, a few hours each day at most, the economic profit it earns is not even enough to make up its depreciation cost. Various types of advanced numerically controlled lathes and work centers developed and manufactured in China during the 1970's have not been popular among the users in spite of their high degree of automation and

superior capability. On the other hand, a type of numerically controlled linear cutting lathe which is far simpler in design (so it is not counted as part of the numerically controlled lathes nationwide) has become so popular that the supply could not meet the demand for a time.

Many similar phenomena have been observed during the process of our technological development. Which prompts one ot ask: Why? Where is the grave illness of the problem? This article will not attempt to provide an overall answer to these questions. It merely intends to start out from a number of important facts related to technological development and economic growth and to analyze and discuss one side of the problem--technical advancement and economical rationalization--with the hope of contributing in a very small way toward establishment of a technological policy.

1. Three Foundations for the Establishment of Technological Policies

If the body of science and technology is compared to a tree, then science is the root and trunk, while technology is the branches and fruits. Technology depends on science for survival, while science is materialized through technology. The measure for science is truthfulness while the measure for technology consists of advancement, economy and safety. Since the end of World War II, science and technology have grown into a giant tree with an abundance of branches and leaves reaching into the blue sky. Therefore, it has become more and more difficult to give an overall evaluation of the entire body of science and technology or to make an accurate prediction about it. As a result, technology policies which define the direction and guide the development of technology were necessary. The facts concerning the world's technological development indicated that a correct technology policy could bring about an enormous strategic profit to a nation, while unaccountable losses were also brought about as a result of wrong technology policies. For example, the Soviet Union made a mistake on technology policy related to the raw material used in the electronics industry. While the semiconductor industries of the technologically advanced nations were quickly converting from germanium to silicon as the main raw material for semiconductors, the Soviet Union preferred germanium and continued to pursue germanium technology. Later on, when it too decided to make the conversion, it had already lost a considerable amount of time, manpower and material power, and a state of backwardness in the electronics industry resulted. In the field of chemical industry, the Soviet Union failed to recognize the importance of the petrochemical industry, so not enough effort was made. As a result, the Soviet Union was still dependent on imported technology in the 1970's. China, during the 1950's and 1960's, failed to assess the true strategic significance of the electronics industry, so, in addition to the "congenital disorder," "malnutrition" at a later time created a severely backward state of electronics industry in China today. However, in the field of oil resources, a new view presented by Comrade Li Siguang concerning the existence of an oil-bearing basin in the depression belt of the New Huaxia system in China's northeast area provided a basis for policy-making by the central government and thus steered China away from entering the very expensive road of synthetic fuels. The United States is the country in which research into machine translation was done the earliest. It is in possession of enormous power for carrying out research. However, after a white paper was published in 1966 pointing out the mistaken trend of machine translation, the development of machine translation has declined. In recent years, more and more nations have begun to

attach greater importance to technological policies and their development. In the United States, a law was enacted in 1972 establishing a mechanism so that all important technological policies (such as energy resources) will be decided by the president personally. There are many technology policy problems which are related to the realization of the four modernizations in China today. A leading comrade of the Academy of Sciences says: "Research into technology policy is an important undertaking having strategic significance not only for China's science and technology but also for the economy."

What should be the bases for doing research and drafting in order to produce technology policies which are as correct as possible? The following results have been obtained from an analysis of a large volume of facts throughout the history of development of science and technology: technological evaluation, economic evaluation and damage evaluation are the three indispensable bases for drafting correct technology policies. The technological evaluation weighs the advancement of technology; economic evaluation weighs the economic advnatages and disadvantages of the technology; and the damage evaluation weighs the damages that the technology may bring about. Without evaluating the advancement of technology, technological development may produce a large number of repetitions and waste, or introduce obsolete equipment, or engage in research into technologies which have long been solved. There are numerous examples of unnecessary losses incurred as a result of lack of information and neglect in evaluating the advancement of technology. Yang Zhenning once estimated that "at least 40 percent of China's research topics are subjects which have already been solved abroad." Without evaluating the economic rationality, the various probable courses the technology may follow cannot be compared and the best course chosen among them; nor is it possible to find out whether the advanced technology can enter into a practical application stage, or become popularized and widespread; nor is it possible to expose any latent weaknesses that the technology may possess. Is an advanced technology adoptable? We must find the answer in how economically rational the technology is. This is a commonly known principle understood by everybody in the course of our own daily lives. The reasons why nylon stockings so quickly replaced silk stockings is not only because nylon stockings have appeal and durability (advancement), but also because nylon stockings are economically profitable. Although the airplane is one of the means of transportation with a highly advanced technology, many people still prefer to ride on trains or steamships. One of the reasons is that the air fare is too expensive (economically irrational). A pity! Such a simple yet important principle has never been sufficiently applied to our technology management in the past. Scientific research project proposals are often found without an estimation and comparison of economic cost and a prediction of the technological and economic effects. In screening the project proposals, little attention has been paid to the economic rationality of the project. In evaluating the achievement or popularization of a new technology, we lack the figures of competitive economic indexes as a guide for passing judgment. A few years ago, there was even a mistaken notion or slogan which ignored the economic evaluation completely. For example: "It does not matter how much money is spent as long as it can be developed." Or, some projects which have been completed domestically are used "to fill the gap in this province (or this district, etc)." Using this kind of standard in screening and awarding, many projects which were neither advanced technologically nor rational economically were simply copied. Without evaluating the damage that a technology may bring about, no preventive measures and warnings against the side effects of a technology can be issued, so in

the end, the loss may become greater than the gain. As a result of severe air pollution created by the industrialization in and around London, England, in the early 1950's, a tragedy of 4,000 deaths within 4 days was recorded. The accident which took place at the Three Mile Island nuclear power plant in the United States in 1979 sent ripples all over the world, causing those nations with nuclear power plants to reevaluate their technology policies. A great number of small automobiles solved the transportation problem, but at the same time, created a shortage of energy resources and air pollution. Advanced automation technology can significantly increase labor productivity, but is also capable of creating employment problems in a country like China with a large population. An irrational way of creating rice paddies from lakes, hydraulic engineering projects without a bioenvironmental concept, and excessive fishing and water pollution can all contribute to a significantly reduced yield of fresh water fish.

Moreover, we can also understand how inseparable these three foundations--evaluations of technological advancement, economic rationality and possible damage--are from the study of a few special phenomena observed during the course of technological development. For example, utilization of solar energy is overwhelmingly superior to any other energy resources, and technical feasibility has long been confirmed. But why is not the technology for utilization of solar energy popular all over the world? In contrast, the microprocessor is a technology which appeared only in the early 1970's. Why was it able within the short period of only a few years to enter into commercial production and undergo four generations of changes, with production reaching 400,000-500,000 units in 1975, an annual growth rate as high as 52-55 percent (estimated over the period of 1975-1980) and spread over a very broad area with surprising speed? The United States is a country with highly advanced electronic computer technology which is in possession of the most advanced technology of the fourth-generation computers. Why then during the late 1960's and early 1970's did it develop and manufacture a large number of sequential control devices, which require much less advanced technology than the computers, and popularize them? Among the numerically controlled technologies developed by the United States in the early 1950's, the closed-loop control was an advanced technology. However, after the closed-loop control technology had matured, why did Japan begin research and development of a technologically simpler open-loop control technology? And since 1965, why did the United States itself also develop a kind of numerical control device with a lower degree of control power using the open-loop control as its main feature? In the summer of 1970, a gigantic Aswan Dam was built on the upper Nile River, increasing Egypt's farm area by 20 percent and producing 8 billion kW of electric power a year. The project was acclaimed as a "great technological" victory at the time. But why, only 2 years later, was the project judged by the United Nations environmental conference as "a failure in hindsight"?

During the process of drafting technology policy, the weight assigned to the three--technological evaluation, economic evaluation, and damage evaluation--may vary according to the objectives and emphases. In certain circumstances, one of these three may have to be dominant. For example, military requirement emphasizes advancement of technology. However, the present trend tends to emphasize evaluation of advancement of technology and neglect evaluation of economic rationalization and damage. The science and technology management neglects economic evaluation, while the economic management neglects technological evaluation. As one of the leading comrades of the State Science Commission observed: "Generally speaking,

the comrades who are engaged in economic work lack understanding of science and technology matters and so are unable to think deeply about technological advancement and possibilities." We shall put aside the damage evaluation for a while and concentrate on an analysis of the interrelationship between technological evaluation and economic evaluation.

2. Four types of Technology and Four Stages of Technological Development

In order to take into consideration both technology and economy, the foreign management field has developed the concepts of "performance-cost ratio" and "performance-cost curve." These useful concepts are employed to express the different economic prices required by the different technologies to achieve the same performance. Starting out with this concept, various types of technologies may be grouped into four groups. When we select technology from an ocean of technologies, we can choose from one of these four groups.

First group: Backward technology and high economic price.

Second group: Relatively backward technology with some economic profit. For example, coal as an energy source used in some old equipment and old technology engaged in production.

Third group: Advanced technology with high economic cost and high price. For example, solar energy utilization equipment developed in the 1970's; the magnetically suspended high-speed train; and the direct steel smelting method.

Fourth group: Advanced technology and low economic cost. Typical examples include the microprocessors and the minicomputers which appeared in the early 1970's. A minicomputer priced at $300 is more advanced in technology than the first large-scale computer (ENIAC) built in the world. It is 20 times faster, several thousand times more reliable, 30,000 times smaller in size, and a millionth the price. A history of computer development spanning more than 30 years indicates that approximately every 5-8 years the computer speed is raised 10 times, the size is reduced 10 times, and the cost is also reduced 10 times. The cost of the storage device, among all the computer components, has been reduced most significantly. The performance-cost ratio of the dynamic storage onboard the computer dropped from 1 penny/bit in 1972 to 0.04 penny/bit in 1979.

Therefore, technological advancement and economic rationality do not always go hand in hand. The most advanced technology is not necessarily also economically rational. An advanced technology without economic rationality cannot endure. At a certain time and in a certain domain, it will be replaced by a relatively less advanced technology which is economically more rational. For example, Sweden is a country in which the electronic communications technology is relatively advanced. During the 1970's, it already grasped the advanced technology of an all-electronic automatic exchange. However, it did not mass-produce this device and utilize it immediately because it learned from the performance-cost curve that, compared with the existing old equipment, the new equipment could become economically rational only in the 1980's.

Furthermore, every single new technology has its life cycle, as is evident from a study of the process of technological development itself. Each life cycle has four stages, including the inception stage, the growth stage, the mature stage and the decline stage. Technology in the inception stage has an uncertain future. An advanced technology with important economic profit can emerge if a breakthrough can be made and if it can ride out the technological and economic storms (risks). For example, controlled thermonuclear reaction, magnetohydrodynamic power generation, generic engineering, and intelligence modeling of the 1970's. Technology in the growth stage has life power and is also in possession of a potential economic competitive power. For example, applications of optic fiber communications technology and the microprocessors of the 1970's. According to a Japanese analysis, if the profit growth rate of a technology at this stage is above a horizontal line, then a steady economic profit over a period of time can be obtained. Technology in the mature stage is an established technology, and it may have already been commercialized. Therefore, it is a waste of money to repeat research work on this type of technology. It is more profitable economically to import the technology and try to expand it horizontally according to a certain specific need. For example, civilian applications of military technology; household applications of electronics technology; and importation of a television production line by China. Both the technological advancement and the economic profit can be further increased if a new technology can be created on the foundation of the imported technology (such as the steel making technology of Japan and the computer software technology of Rumania). Technology in the decline stage is an obsolete technology which belongs to the first group described above.

3. Horizontal Expansion and Vertical Penetration of Technology

In carrying out the technological evaluation, the first group and the fourth group described above are relatively easier to deal with, because the technological advancement and the economic rationality are in agreement in these two groups. The second group and the third group are more difficult to evaluate, because the technological advancement contradicts the economic rationality in these two groups. The purpose of applications research and development research is, for the most part, an effort to transform this pair of contradictions. If the factors causing the failure of an advanced technology to be adopted are called the risk factors, then there are two kinds of risk factors. The first kind is technological risk: failure is brought about by insufficiently verified technology, insufficient technological power, and insufficient ability to assimilate the technology. The second kind is economic risk: failure is brought about by irrational economics. The tasks of technology policy in such circumstances are to select a technological objective and chart the course to achieve this objective in spite of the risks. In selecting the technological objective, one concept which has become popular in recent years involves adoption of "intermediate technology" or "appropriate technology." According to this concept, a relatively advanced technology, situated between the most advanced technology and the existing traditional technology, which is most appropriate for the existing circumstances should be selected, because this technology is more mature and will be able to bring about large economic advantage.

Large numbers of facts accumulated over the history of development of technology and economy have proven that horizontal expansion and vertical penetration of technology are the means employed to reconcile the disagreement between technolog-

ical advancement and economic rationality. Horizontal expansion of technology means application of the same technological invention in different areas. Horizontal expansion of large-scale integrated circuit technology has produced electronic watches, intelligent machines, intelligent robots, household electronic brains and minicomputers. Laser technology has seen a similar expansion. A very large economic advantage can be brought about when new products are manufactured from the combination of a number of technologies in the mature stage. The Japanese call this "combination technology," and they consider that this is one of the trends of technological development today. China should especially emphasize this trend in its economic management today and exert efforts to develop new products by extending the useful economic life of the existing mature technology. Vertical penetration of technology means to dig deeper into the technology and to make it more advanced. Economic irrationality can be transformed into rationality through technological breakthroughs. Electronic computers used to be very expensive, but the price came down as a result of the breakthrough of the large-scale integrated circuit. A huge economic advantage has been brought about by the appearance of the large-scale technology since the 1950's, and large-scaling has become a trend as well. For example, the manufacturing cost per unit of power output of a 6 million kW generator unit is 10-20 percent lower than that of a 200,000 kW unit. A synthetic ammonia facility with an annual capacity of 200,000 tons consumes energy amounting to 1,450 kWh per ton, while a synthetic ammonia facility with an annual capacity of 460,000 tons consumes only 50 kWh per ton. A number of breakthroughs made in the petrochemical industry (consisting mainly of direct synthesis technology and new types of catalysts) have likewise made the economic index change toward greater rationality. For example, a method of manufacturing acetaldehyde from ethylene by means of direct oxidation has brought down the cost by 16 percent, increased the profit by 65 percent, and reduced the equipment cost by 25 percent. The production of hexanolactam using the toluene method has brought down the cost by 25 percent, increased the profit by 100 percent and reduced the equipment cost by 33 percent.

Another approach to transforming the contradiction between technology and economy is to import technology. As long as the policy for technology import is correct, we cannot only gain time and advancement but also obtain economic profit and rationality. Take Japan, for example. Japan spent $6 billion on the importation and popularization of foreign technologies over the period 1945-1970. As a result, a project could be concluded in 2-3 years based on the imported technologies. On the other hand, the research expenditure of the original technologies was as high as $180-200 billion with a time period of 12-15 years for a project to be concluded. Therefore, the cost for importation of technology is only 1/30 of the original cost and the time is also 4/5 shorter. To further illustrate this point using specific products as an example: Japan's Toyo Rayon Company spent $7 million to buy a license for the production of nylon, and earned from the export of nylon $90 million within 2 years. The profit amounted to approximately 13 times the cost of licensing the patent. On the other hand, the Du Pont Company spent more than $250 million and 11 years in order to develop this patented technology.

It is evident from the above that technological advancement and economic rationality do not always go hand in hand. Whether a certain technology policy is correct, or whether a certain manager is really able is measured by whether the policy or the manager is capable of grasping the optimum point at which to carry out this transformation of contradiction, to achieve the maximum economic effect by adopting the advanced technology at the optimum time.

4. A Few Suggestions

A. Technological policy should favor the development of technologies belonging to the fourth group (advanced technology with economic rationality). Application screening and evaluation of scientific research projects must include economic indexes, and a prediction of the economic rationality and the probable damage must be made.

B. Technological policy should protect and financially support those technologies which are technologically advanced and economically competitive. These technologies, which are in the growth stage, will hopefully bring about relatively large economic effect. The economic measures and price policies which in practice protect the backward technologies should be abanoned as soon as possible.

C. In selecting scientific research projects, special attention must be paid to those key technologies which can create obstacles to economic rationality. For example, the key technology in the utilization of solar energy is the search for better materials with higher conversion efficiency and not different types of converters.

D. The fund controlled by the Economic Commission for developmental research and the fund controlled by the Science Commission for scientific research must be clearly differentiated according to the subjects for funding. The Economic Commission fund should be spent mainly on the horizontal expansion of technology in accordance with market demand in order to achieve the maximum economic profit in a short period of time. Therefore, its subjects should consist mainly of technologies in the mature stage. The fund of the Science Commission should be spent mainly on the vertical penetration of technology in order to achieve breakthroughs. Therefore, its subjects should consist mainly of technologies belonging to the third group, or technologies in the growth stage.

E. The economic department should strengthen the upgrading and renewal of products. As a result of rapid progress in modern science and technology, the period from the appearance of a new technology to a product being produced industrially is becoming shorter, so is the period for upgrading and renewal of new products, and also the period for an equipment or a technology becoming obsolete. For example, the life of a new product in the United States, West Germany and Japan is in general 6-8 years, and no more than 2-3 years for certain most advanced technologies (such as the on-board storage device). The life of new materials is approximately 10 years. The life of new technologies is approximately 7 years, and the life of new instruments is approximately 5 years. About one-fourth of the 3,500 products of the 3M Company of the United States were unheard of 5 years ago. In contrast, some products in China have been "continuously in production for several decades." Large economic profit cannot be achieved from the use of technologies which are in the decline stage.

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NANFANG RIBAO ON PROMOTING SCIENCE, TECHNOLOGY

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[Commentator's article: "A New Task in Leading Work in the Rural Areas"]

[Text] While the agricultural production responsibility system is becoming steadily more perfect and the initiative of the peasants in learning and making use of science is surging to a new high, how should the party and government, in this new situation, strengthen their leadership in the field of agricultural science and technology in order to promote the overall development of agricultural production with advanced scientific techniques? This is a new task we are facing in our work in the rural areas.

Since the 3d Plenary Session of the 11th CCP Central Committee, the party committees at all levels in this province have devoted their main efforts to ensuring the implementation of the rural economic policies as well as putting into practice various forms of the production responsibility system. In this regard, they have achieved very notable results. In many places earnest efforts have been made in implementing policies while at the same time stressing science. As a result, production has developed just like a tiger that has grown wings. Practice has shown us that policy and science are the two deciding factors in agricultural production. By practicing the production responsibility systems, the development of production and the peasants' economic benefits have been directly linked, and the study and application of science have become matters that are of mutual interest to the masses of the peasants. In the past, agricultural technological publications which were distributed free attracted only a few readers. Now, people rush to purchase these publications. Formerly, when technicians visited the countryside, few people took an interest in them. Now, the peasants knock on their door to seek their advice. In fact, many agricultural research institutions and stations are as crowded as a marketplace. In this new situation, we can clearly see that with the basic implementation of the agricultural responsibility systems, the importance and urgency of science as deciding factor has become all the more prominent. Under these circumstances, we must be as enthusiastic in dealing with science as we were with policies, and do our very best to satisfy the urgent demands of the peasants in learning and making use of science. It must be pointed out that due to the many years of leftist influence, which resulted in the neglect of science and technology as well as the limitations caused by the inadequate science and cultural training of the cadres, many comrades are not conscientious enough in their work in promoting science. In this regard, a situation does exist where the leading cadres lag behind the masses, and we must clearly recognize this. Consequently, to strengthen our scientific and technological work, we must first tackle this problem in connection with our guiding ideology in order to ensure that cadres at all levels will have a deep understanding of the absolute importance of science and technology to the enhancement of economic development and thereby increase their efforts in promoting science.

The party committee and government at all levels must list the strengthening of science and technology in the rural areas as an important item on their agenda, and make it a part of the national economic development plan. This will basically assure the development of science and technology in the rural areas. We should assign to scientific and technological departments research projects and tasks as well as support and assist them in tackling difficult problems. We should also investigate all possibilities of yearly increasing by small amounts those funds designated for scientific research. We must appoint cadres who are devoted to the cause of science and technology, who have leadership qualities and are well versed in their professional work, to the leading posts of the scientific and technological departments. We must ake good care of the scientific and technological personnel, particularly the middle-aged and young personnel. It is necessary to earnestly implement the policy dealing with the intellectuals in order to further promote the initiative of the agricultural scientific and technological personnel, the indigenous experts and the intellectual youths of the rural areas as well as to give play to their roles. The scientific and technological departments must actively implement the policy of serving economic construction in their research programs, which in the past they undertook in isolation and unrelated to local needs. They must also devote their energy to promoting the development of the local economies.

In order to strengthen the leadership of the scientific and technological work in the rural areas, we must also pay attention to the study of new situations and finding solutions to new problems. For example, in the past, the system of organizing scientific and technological research work in the rural areas comprised a four-tier network. With the implementation of the production responsibility systems this organization has, in many areas, undergone changes.

The popularization of scientific knowledge is now directly intended for the thousands and thousands of ordinary households. Many new forms of activities have appeared, such as scientific lectures geared toward the masses, evening classes on science and technology, centers for holding technological consultations, contracts for spreading techniques of combining production and so on. Which of these forms do the people actually welcome most and which produces the best results. Investigations into these forms must be made to arrive at conclusions on how to improve them.

Let us take another example. In the process of implementing economic management methods and spreading the results of science and technological improvement, in which ways can resonable charges be collected? In which ways can quality be guaranteed? These problems are directly relevant to the immediate benefits to the peasants as well as to maintaining the peasants' enthusiasm in learning and making use of science, and are awaiting our investigation and solution. The bulk of scientific and technological work in the rural areas consists of popularizing scientific knowledge and spreading the scientific and technological improvements which are suitable to local conditions. To achieve this, we must persist in carrying out the guideline of serving localities in light of present conditions, suiting things to local condition, and viewing things from actual conditions. In all these aspects, we must be practical and realistic and be careful not to commit such mistakes as formalism, commanding blindly, or "cutting with one knife."

Let us rouse ourselves, strengthen our leadership, do our best to enliven our work in science and technology, do a solid job in initiating an upsurge in studying and making use of science in the rural areas throughout the province, and thus construct civilized and prosperous socialist new villages.

'JINGJI GUANLI' ON TECHNICAL TRANSFORMATION

HK190357 Beijing JINGJI GUANLI [ECONOMIC MANAGEMENT] in Chinese No 10, 15 Oct 81 p 3-6

[Article by Chen Yi [7115 2496]: "Overall Technical Transformation of the National Economy Must Be Carried Out."]

[Text] 1. The Readjustment of the National Economy Should Be Combined With Technical Transformation

During a period of economic readjustment, how to combine this readjustment with technical transformation is a question that should be seriously studied. At present our country's industrial situation is that while light industrial products and textiles are unable to meet demand, heavy industry, particularly the machine-building industry, is operating below capacity. To increase the light and textile industries' productive power by closing, suspending or amalgamating factories or switching them to other production is only a temporary measure and is not the best method. Such amalgamation and switching can neither greatly increase the productive power of the light and textile industries, nor can it help to accelerate the socialization and modernization of production. The current situation is one of "tearing down the eastern wall in order to repair the western wall." In actual fact, neither of these "walls" is newly built, as both have been in a state of disrepair for a good many years. Furthermore, this approach also raises two other questions: First, when most of the heavy industry is operating below capacity, how is the national economy to maintain a steady rate of growth; secondly, how should this temporarily-idle productive power be employed, readjusted, strengthened and improved? In the final analysis, implementation of the four modernizations must ultimately depend on heavy indsutry, and on the machine-building industry in particular.

For these reasons we should view readjustment as a positive measure and not as a case of taking down the eastern wall in order to repair the western wall. By combining readjustment with technical transformation, the whole of the national economy can be revitalized.

It was said recently by a leading comrade that, "in the past the emphasis was placed on new construction and external growth; now the emphasis is placed on technical transformation and internal improvement. This is a strategic change in our policy for construction. The need to make full use of our present material and technical base and to carry out an overall technical transformation of the national economy is an important task which influences the whole economic situation and one which

now clearly faces all parts of the industrial sector, especially the machine-building industry." During the period of readjustment the use of the whole country's machine-building power to carry out a gradual technical transformation will allow us to kill two birds with one stone: as the level of the entire national economy is gradually raised and such a transformation is carried out throughout the economy, the machine-building industry itself will also be transformed. The phenomenon of lopsided development will then disappear.

2. If the Four Modernizations Are To Be Implemented, an Overall Technical Transformation of the National Economy Must Be Carried out in a Planned Manner

After more than 30 years of construction, our country has already established a complete industrial base. However, as far as the needs of the four modernizations are concerned, this is clearly not sufficient. If the year 2000 is assumed to be the target date for the initial implementation of the four modernizations, this means we still have 19 years left to go; or if one calculates from 1985, with the completion of readjustment, there are 15 years left; either way the period of time is not short. Both West Germany and Japan managed in the space of about 15 years to rebuild themselves into powerful industrial nations from the ruins of war. Furthermore, compared with them, our base is stronger, and conditions are slightly better. However, two other factors should also be taken into account: First, compared with China, Germany and Japan are relatively small countries with small populations. They also had some experience on industrial production, their people had a certain degree of education and, more important, both countries enjoyed American support. Our situation is thus very different from theirs. Secondly, the distance separating us from the advanced nations of the world is too great; this is true for all sections of the national economy. Examples of this can be drawn from agriculture as well as heavy and light industry: 5 percent of the American population live on the land and provide enough food for 200 million people, with per-capita grain consumption being around 3,000 jin. In our country, on the other hand, 80 percent of the population live on the land, which means that a force of 300 million strong farm laborers must support a total population of 1 billion, and the per capita grain consumption is only around 600 jin. With over 12 million workers our country's light and textile industries make up the largest part of the industrial sector. However, the people's level of consumption is still very low compared to other countries. Taking 1978 as an example, the average per-capita number of cotton goods produced in the developed nations was 3-4 times greater than it was in our country. As for chemical fibers and plastic products, the developed nation's per-capita rate of production was 21 times higher than it was in China. For synthetic detergents the foreign rate of production was 14 times higher and for sugar and paper it was 13 times higher. The productivity of our country's workforce is also less than it is abroad. For example in America the spinning of a piece of 20-count yarn requires only 1.5 man days, while in our country it takes 6.5 man days. Our country's steel industry has as many workers as the combined workforce of the American, Russian, Japanese and West German steel industries. However, the actual level of production is less than 10 percent of the combined production in these 4 countries. Our country's coal industry employs over 3.8 million workers, which is about the same as the total number employed in the important coal-producing nations; however, our coal industry accounts for only 20 percent of total world production. While over 80 percent of foreign coalmines have been fully mechanized, only 28 percent of our major mines have such equipment. Our country's power generator installed capacity is only 10 percent

that of America's and 50 percent of Japan's. In terms of workers and the number of machine tools, our country's machine-building industry is the second largest in the world; the value of output, though, is 1/9 of America's and 1/4 to 1/3 of West Germany's and Japan's. Labor productivity in the machine-building industry is about 1/12 to 1/10 of that in America, West Germany and Japan. As for the machine-building industry's production of export products, America, West Germany and Japan produce 150 to 200 times more than our country does; France and Britain produce 100 times more; and even several small East Asian nations produce 5 to 7 times more. Our machine-building industry's utilization rate of steel is only 65 percent, while in advanced foreign countries it is up to 80 percent. The floating capital turnover in our machine-building industry takes about 221 days, while in America it is 70 days and in Japan 76.

For these reasons it can be seen that while our country has a certain industrial and technical base, the actual productive power is extremely low. At present the critical question is how to use our present base and promote its improvement and development. There exist two possible solutions: the first is to make a determined effort to liberate productive force by reforming any irrational relations of production which may now exist. Generally speaking, if improvements are made in this area there should be no problem in increasing productive force by 1/3 to 1/2. The alternative solution is to basically use our present technical and economic base as the starting-point for a full-scale technical transformation of our national economy, that is, of our current productive power. This will mean the renewal of critical equipment, the upgrading of backward technology, the reorganization of irrational productive units and the use of modern managerial techniques and methods to strengthen the administration and management of enterprises. It can be said that aside from these two alternatives, there is no other shortcut.

3. The Regular and Sustained Introduction of Technical Improvements Into Industry Is a Common Way of Developing Productive Forces

An overall survey of Western nations' industrial development shows that while the construction of new factories is a continual process, most new factories are built during the initial period of industrial development. In later periods, the introduction of technical change in old factories is a more common way of achieving a higher level of performance. In the last 10 or so years in particular, the rapid development of science and technology, combined with the intensification of competition, has resulted in a constant striving for lower prices which, in turn, has benefited both technological and economic development. There are several common methods of achieving this: The use of the existing economic base combined with a strengthening of scientific and technological research; the renewal and replacement of outdated equipment; the adoption of advanced techniques; and the improvement of administration and management. Such efforts to develop production and maintain forward momentum by carrying out continual and sustained transformation of existing industry is what we mean by placing the emphasis on technical transformation and internal improvement rather than on new construction and external growth. Why is it that many foreign countries have proceeded in this manner? First, such improvement is not only cheaper and faster than new construction; it can also allow for a more effective use of the existing base; second, because improvement is continuous and technology accumulates easily; third, because such improvement is meant to meet relatively short-term needs, one can keep a clear view of the situation;

feasibility studies should be relatively simple and it should also be easier to manage the economy in a rational manner; fourth, even though there may be mistakes in the plans for improvement, errors can be corrected easily and actual losses should be small. In short, this scientific economic approach derives solely from the realities of the situation.

There are many factual examples: for the past few years the number of machine tools in the advanced industrial nations has not increased greatly, and in some cases has even decreased; production, however, has still continually increased. For example, in America before 1960 there existed a steady proportional relationship between the growth in the number of machine tools and the increase in production. After that date production increased at a rate of 20 percent every 5 years. In 1978, however, the number of machine tools had declined by 14 percent compared with 1973. At the same time, however, the number of numerically-controlled machine tools and processing centers doubled; production lines increased by 20 percent and overall production during this period went up 20 percent. In Japan the situation was very similar. Between 1967 and 1973 the number of machine tools increased by a little over 20 percent, while the actual output value quadrupled. This shows that the forces and level of production do not depend on a numerical increase in equipment and enterprises but rather on qualitative improvement. Comrades who return home after studying this problem abroad all say that in the industrially developed nations it is not at all uncommon for old factories to be producing goods which can still compete on the international market. On one occasion a general engineer visited a steel-rolling mill in a Western country; the manager pointed to a steel-rolling machine and said, this machine dates from the 1950's but it is still more efficient than new machines because of continuous technical improvement. He also expressed deep regret over the fact that our factories are only used and never improved. In Japanese industrial circles it is often said that, "the process by which an enterprise continually develops and prospers is a process of continual technical improvement." Although Japan's social system is different from our own, this statement holds true for our country as well, and deserves serious thought.

For the past 10 or more years capital construction has been the centre of efforts to increase productive forces. For a number of reasons, the problem of duplicate construction is a very serious one, and the utilization rate of equipment is very low, which results in a wastage of manpower, materials, financial resources and time. In the heavy industrial sector, our country has more heavy machine plants than any other country in the world; furthermore, many of these plants rank among the world's largest. However, there are also many factories which even after many years in operation have still not reached full capacity. Take the case of our country's hydraulic presses for example: While we have more such presses than Japan, Western nations' orders for forgings of several hundred tons or more are always placed with Japanese factories. What is more, we are often unable to produce forging of over 10 tons for ourselves, and many of our hydraulic presses lie idle. If a general survey were carried out of the whole country's economic results, people would be shocked by the number of examples of such waste.

Once a capital construction project has been put into operation, why is not it possible to quickly bring the productive forces into full play? The most basic reason for this is that while we have a system of capital construction we have no system for the transformation of production techniques. There are numerous financial

channels designed to assist capital construction projects; however, when it comes to the funding of technical improvements, not a single channel exists. Therefore a newly-built factory is expected to be a sort of "money tree" which only has to be shaken to produce and needs neither pruning, weeding, watering, or fertilizing. The result of this is that its effectiveness decreases daily and it gradually withers away. The classic example of this was during the 1960's, when we imported a complete factory to produce hydraulic equipment from Japan. The factory was in every way the same as factories of the same class in Japan at that time. After 10 years, however, the factories in Japan had increased their output 6 times and were already producing the 3d generation of their product. In our country, on the other hand, things were still the same as they were 10 years before, and in some areas production had even deteriorated.

The introduction of technical improvement into our existing economic base not only increases productive forces at a faster rate; it is also cheaper and relatively profitable. Under the present circumstances, it is very common for people to think that because capital construction demands large amounts of money, it should be included in our economic plan; technical improvement, on the other hand, is merely a question of accounting and cannot be included in the general plan. Such an approach is entirely mistaken.

The implementation of overall technical transformation of our national economy is, of course, a very large project. An optimistic estimate would be that it will be difficult to complete the task in less than 10 to 15 years. For this reason it must be carried out in stages. We must first of all gain experience by transforming those enterprises that produce products very important to the development of the national economy. Such transformation must be based on a scientific foundation and should also accord with economic and technical reality. The results of such a transformation should be the development of our country's productive capacity, the raising of the technological level, the increasing of the economy's efficiency and the creation of greater accumulation for the state. Products of which there is a domestic shortage should certainly be considered as targets for technical improvement. We will need to reduce imports and increase exports and also to increase the quality of domestically increased products. For example, the supply of products such as bicycles and sewing machines is unable to meet demand. We should investigate whether or not it is possible to use the whole country's machine-building capacity to carry out technical improvement in these factories (for decades most of our nation's industrial investment has been used to increase our productive capacity for primary products, and very little investment has been used to increase our productive capacity for secondary products. As a result there are many light industrial factories where not only is the equipment antiquated and techniques backward, but even the working environment is substandard. Technical transformation should certainly be carried out in such factories.) In addition to technical improvement we should also implement the system of socialist cooperation and division of labor. The organization of several large groups each producing from 5 to 10 million bicycles would strengthen the development of each smaller unit. As for reducing imports and increasing exports, the reform of several factories will not only increase foreign exchange revenue but will simultaneously reduce foreign exchange expenditure. According to statistics, during the last 3 years we have imported more than 4 million tons of steel plate at a cost of $2.2 billion. Naturally, such imports cannot be continued for a long period of time, and we should make a

determined effort to use a portion of this expenditure to carry out improvements in one of our steel-rolling mills. Such an approach would certainly benefit the state. The conservation of energy is another area where money can be saved. Our country has many inefficient boilers; but if we were to spend money on reconditioning them we would be able to save 1 ton of coal for every 60 yuan invested. If, on the other hand, we wanted to increase the production capacity of coal by 1 ton, it would require an investment of around 200 yuan. A comparison of these two cases clearly demonstrates how worthwhile technical improvement is. There are many other such examples. In sum, it can be said that no matter whether we look at technical improvement from a macroeconomic point of view, from a long-term point of view or from the point of view of the cause-and-effect relationship that exists between the economy and financial revenue, we can feel equally confident. Some leading comrades now insist that we should study the way in which money is made, accumulated and used. In a society there exist numerous sources of funds; financial allocation is not necessarily the only way of finding the funds necessary for technical improvements; economic methods can also be used and may even yield better results.

4. The Role of the Machine-Building Industry in the Technical Transformation of the National Economy

A leading comrade once said that, "the machine-building industry is the national economy's equipment section." It was said in the past that, "the machine-building industry is the heart of industrialization" No matter which phrase we choose to use, both emphasise the crucial role to be played by the machine-building industry in the technical transformation of the national economy.

There are, at present, two incorrect views of the machine-building industry. One of these views underestimates both its capacity and level, and seems to suggest that since nothing is any good we should even start importing products which we have been producing domestically for decades. In actual fact, in our existing technical and economic base over 80 percent of the equipment was domestically produced. Why is it that such things were good enough in the past but now simply won't do?! Certainly, domestically-produced equipment has certain shortcomings compared with equipment produced in the advanced industrial nations: it does not form complete sets, its reliability and durability are sometimes deficient, and the service is often poor. Some of these problems are scientific and technical, others are managerial, while others are problems of materials. All of these problems must be carefully solved. However, there exists another more important problem, which is that the state must have a policy that protects and supports its own industry. If this is not the case it is impossible to talk of self-reliance; and the loss of self-reliance would certainly influence the progress of the four modernizations.

The other view is that the machine-building industry is too big. Therefore, as soon as any mention is made of readjusting this industry, the problem is always seen in terms of drastic cuts, closures, suspensions, amalgamations and conversions. Such a view pays too much attention to quantity and not enough to quality. There are also people who say, quite correctly, that our machine-building industry is too bloated. With about 3.8 million machine tools, our country ranks second in the world in terms of the number of machines. However, if this is analyzed a little more closely it can be seen that of these machine tools over 100,000 date from before the revolution; another 100,000 were imported during the 1950's; another

800,000 are machines that were produced before "the great leap forward;" and during the great leap forward itself about 1 million machine tools were produced. Of the products dating from the "great leap forward" and the "cultural revolution," many were manufactured in a shoddy and slipshod way and their quality is often below standard; as a result many such machines, lying idle in factories, have become a real burden. There are probably only about 900,000 relatively standard machine tools divided among 170,000 different factories. Some 100,000 of these machines are run by people's communes, and the remainder belong to more than 1,500 small and medium enterprises. It is thought that key enterprises account for only about 600 of these enterprises. This means that there are probably no more than about 1,000 enterprises that will be able to play a positive role in the future.

About half of these 900,000 standard machine tools have already exceeded their service life. In one machine-building complex, most of the equipment is already more than 20 years old; in another one 70 percent of the equipment is more than 20 years old; there is even one enterprise in which 80 percent of the machine tools are over 25 years old. Abroad, the depreciation period for equipment is usually about 5 to 10 years; in our country it is 30 years. For these reasons our machine tools need constant repair; some have been overhauled up to 10 times. It should be pointed out that after a machine tool has been overhauled it is only possible to restore 96 percent of its original precision; after a second overhaul another 6 percent is lost; after a third time another 15 percent is lost, and by the time a machine tool has been overhauled for a fourth time, only 60 percent of its original precision rating remains. In actual fact, once a piece of equipment has been overhauled three times, not only does its level of precision decline, but the amount of money spent on repairs begins to exceed its original net value. The fact that our country's equipment has such a long depreciation period means, in reality, that there exists no system for the renewal of equipment, and much of our equipment is already old and inefficient. If, as well as being unable to produce precision products, we continue to use this substandard equipment to produce generation after generation of equipment, the standard will certainly get lower and lower. Low productivity, high cost and low utilization rate of materials also all flow from this same problem. For this reason the machine-building industry itself also has a serious problem with technical improvement.

Should we first transform the machine-building industry, and only when this is accomplished, set about reforming other sectors; or should we adopt a proportional approach and try to improve each industry a little? Neither of these methods seems to be particularly appropriate, for the following reasons: First, the existing productive capacity of the machine-building industry needs to be brought into full play; secondly, there needs to be a demand for machine products; thirdly, most of the capital needed to carry out technical improvement in the machine-building industry should come from that industry itself. Therefore, the introduction of technical improvement into this industry must depend on the technical transformation of other industries; that is to say, the machine-building industry should serve other industries in a practical and realistic manner. Through the process of helping other sectors to carry out changes, the machine-building industry itself will also naturally achieve a degree of technical improvement. This is not a before-and-after relationship, but a relationship of dialectical development. In Japan the machine-building industry was at the centre of their development plan. First of all, 10 or so products were chosen as targets for technical improvement; the object

of this was to increase exports and reduce imports with a view to improving the foreign exchange balance. Our objectives are not entirely the same; and our economic relations are also different. The machine-building industry will act as both the equipment section and the technical reform section for the overall technical transformation of the national economy. For this reason, only when we have taken the transformation of the whole national economy as our starting-point can we then decide the order and process of transformation in the machine-building industry.

5. Several Questions That Should Be Answered Before Technical Transformation Is Carried Out

(1) The technical transformation of the national economy is an extremely complicated and painstaking task; it will require a unified plan, constant reappraisal and scientific verification. The leadership and command system which carried out Japan's machine-building industry restoration was more unitary block than our country's. Each of our country's industrial sectors has its own sphere of control, and the scope of our national economy's technical transformation is far wider than it was in Japan; for these reasons the task is much more difficult than it was in Japan. Without strong and powerful organization and leadership and without a unified plan, nothing can be accomplished. The formulation of a realistic and feasible plan for technical transformation will require the participation of a great number of experts. Problems such as what should be improved and what should be improved first should be subjected to repeated scientific analysis.

(2) The overall technical transformation of the national economy is a major strategic decision. As with the construction of 156 major projects in the first 5-year plan, no effort should be spared. Moreover, compared with the period of the first 5-year plan, we have many more methods today. If the state wants to meet some of the problems involved in technical transformation by introducing various items of legislation, such measures must first be passed by the permanent organs of the NPC, which have absolute authority, and only then will legislation be legally binding. In this way a unified understanding can be reached and affairs can be managed according to law.

(3) The phrase "technical transformation" should be understood in a broad sense. It refers to both the improvement of material conditions and also the readjustment and reform of organization and management. Because of this, when we carry out technical transformation it will be necessary, on the one hand, to reform any irrational parts of the superstructure and, on the other hand, to break away from the limitations of the different forms of ownership. The implementation of this plan and the carrying out of reorganization should be relatively centralized. Otherwise, we will end up expending a lot of effort for small results because none of the different channels link up; and this opportunity for reform could end by merely exacerbating the phenomenon of a divided system with numerous large and small independent units.

(4) The state should have a policy of supporting those enterprises in which technical transformation is being carried out. Depending on the particular circumstances of each enterprise, the government should make special provisions for loans and taxation.

In short, this is a major undertaking that requires full cooperation in all areas, as well as joint study and investigation.
CSO: 4006/113

REPORT ON FIRST ECONOMIC SCIENCE MEETING

HK211242 Beijing RENMIN RIBAO in Chinese 15 Oct 81 p 5

[Academic trend report by Jiang Yingguang [5592 2503 0342]: "China Federation of Economic Science Organizations Holds First Meeting"]

[Text] From 3 to 9 September, the China Federation of Economics Organizations held its first annual meeting in Dalian.

This federation is a mass academic organization made up of economics societies, research institutes and associations at the national, provincial, municipal and autonomous regional levels. It was established in March this year and it has 226 member organizations. The main topic for discussion at the meeting was the development of the science of economics in order to better serve the socialist modernization.

Participants at the meeting held: Much development has been made in the research on the science of economics since the founding of the PRC. Particularly after the 3d Plenary Session of the 11th CCP Central Committee, the broad masses of theoretical economic workers and economic workers inspired by the party's spirit of emancipating the mind, using the brain and seeking truth from facts, have carried out investigations and studies on new situations and new problems in readjusting, restructuring, rectifying and improving the national economy. They have put forth various ideas and suggestions for reforming the economic system and readjusting the economic structure, participated in different ways in the government's work of making economic decisions and have promoted and developed the science of economics. They have played their part in pushing the socialist modernization forward. During this period, branches of the science of economics which had a relatively better foundation have developed to varying degrees. Some new branches of the science of economics have emerged. Various organizations related to the science of economics, including research institutes, associations and societies and various kinds of theoretical economics periodicals have sprung up like mushrooms. Academic intercourse with foreign countries has also continuously developed.

The participants held: At present, the socialist construction has posed many complicated problems for the science of economics. Under these circumstances, comrades in the economics circles should rouse themselves, strive to develop the science of economics and better serve the socialist modernization. The participants also held that the science of economics is a science with a wide scope and many branches and it has many problems which need study. At present, we should, in the light of the situation of our country's socialist modernization, strengthen the study of those various branches of the science of economics which relate to ownership structures and economic management systems at the present stage of socialism, strengthen the study of various branches of the science of economics which relate to our country's economic development strategy and strengthen the study of various branches of the science of economics which relate to management. We should strengthen not only the study of applied economics but also the study of the current economic situation

at home and abroad. The participants stressed that comrades in the economic circles should enthusiastically make their contributions to the economic construction during the readjustment period. To achieve this, we should carry out further studies on problems such as economic readjustment, structural reforms, enterprise rectification, enterprise operation, planning and management, rationalization of the national economic structure, making economic decisions in a scientific way and economic relations with foreign countries.

The participants also stressed that in studying the science of economics we should uphold the correct orientation of Marxism-Leninism-Mao Zedong Thought and seriously implement the Marxist principles and policies which are conducive to the development of science. We should strengthen our study, increase the force engaged in theoretical economics, train more qualified people in this field and develop various undertakings which serve the science of economics. The meeting proposed a "plan for the work of the China Federation of Economics Organizations," and decided to run classes for studying the science of economics, publish a series of books on basic economic knowledge and a book entitled "General Information on China's Socialist Construction," make preparations for publishing ECONOMIC SCIENCE WEEKLY and ECONOMICS DIGEST and do a good job in academic exchange, propaganda, popularization and improvement of the science of economics.

Thus, they quickly became well off. This convincingly shows that both plains and mountainous areas have broad prospects for developing diversified economies. This is because: first, agricultural production involves seasonal work and since the slack season is rather long in the north, it provides the peasants with enough time to engage in diversified production. Second, since the implementation of various responsibility systems, the productivity has been raised and more labor has been left idle, thus providing the development of a diversified economy with an important manpower resource. For example, there are more than 30,000 such people in Xinxiang County. Third, though it is true that on the plains there are too many people and limited land, there is great potential. There are rich natural resources on our vast plains, which spread all over the tropical, subtropical, temperate and frigid zones, waiting for our exploitation.

The development of Xinxiang's diversified economy shows that there is no end to the exploitation of natural resources. By constantly tapping new potentials, Xinxiang, which was already advanced in production, has gained the initiative in exploiting and making use of natural resources.

YU GUANGYUAN ARTICLE ON ECONOMIC SCIENCE

HK261453 Beijing RENMIN RIBAO in Chinese 15 Oct 81 p 5

[Article by Yu Guangyuan [0060 0342 6678]: "Develop Economic Science To Better Serve Socialist Modernization -- Report Delivered on 3 September at the First Annual Meeting of the China Federation of Economic Science Organizations" -- capitalized passages published in boldface]

[Text] We economists must bestir ourselves and strive to develop economic science to better serve socialist modernization.

FIRST, WE MUST UPHOLD MARXISM-LENINISM-MAO ZEDONG THOUGHT.

Past experiences and lessons tell us that we must persistently take Marxism-Leninism-Mao Zedong Thought as our guide if we want to make our research in economic theory yield results in socialist modernization. The basic tenets of Marxism-Leninism-Mao Zedong Thought are our guide to research in economic science. We must not only systematically study writings by Marx, Engels, Lenin, Stalin and Mao Zedong, but must really understand and master them. This is especially true with books like "Das Kapital." Otherwise our study and research will go astray. Insisting on studying their writings does not mean we are not going to further develop our economic science. Comrade Mao Zedong once said something like this: Communists and proletarian thinkers of every nation must create new theories, write new books and produce their own theorists. At no time will it be adequate just to rely on old things altogether. Proceeding from reality in doing everything is the living soul of Marxism-Leninism-Mao Zedong Thought. We must put dialectical and historical materialism into application, end the state of ossification and semi-ossification of thinking, completely and thoroughly emancipate ourselves from the shackles of dogmatism and conscientiously study the objective course of socialist economic movements and developments. In particular, we must hammer out, from the tortuous course we traversed, specific forms in which socialist economic laws operate in our country, and, on the basis of summing up practical experiences in China and in other countries, establish a system of socialist economic science and better serve socialist modernization. Bourgeois economics is essentially in the service of the capitalist system. We cannot accept its vulgar and unscientific notions. Neither can we accept ideas which do not conform with our system. Of course, there is no denying that it also deals with all kinds of socialized mass production and certain regular patterns of the commodity economy, and these deserve proper attention. We must pay close attention to past and present research in economic theories in other countries and critically assimilate what is useful in the light of our national condition.

SECOND, WE MUST CONSCIENTIOUSLY IMPLEMENT THE MARXIST GUIDING PRINCIPLE AND POLICIES ON THE DEVELOPMENT OF SCIENCE.

"Letting a hundred flowers blossom and a hundred schools of thought contend" is the fundamental policy for bringing about a flourishing socialist culture and for promoting the development of economic science.

After taking into account the objective fact that all kinds of contradictions still existed in a socialist society and also our country's pressing demand for rapid economic and cultural developments, Comrade Mao Zedong put forth the "double hundred" policy in 1956. However, this policy was not properly implemented due to interference from the "left" and from the right. Since the downfall of the "gang of four," especially since the 3d Plenary Session of the 11th CCP Central Committee, a nationwide ideological emancipation movement has been going on and a lively situation of "a hundred flowers all blossoming and a hundred schools of thought all contending at the same time" has emerged. This provides a favorable atmosphere for the flourishing and development of economic science. In order to develop economic science, it is also necessary to intensify the movement to emancipate the mind. Without emancipating the mind, we will not be able to properly analyze the new circumstances, study the new questions, voice our opinions, including constructive suggestions and criticisms, and work out good solutions. We should have the necessary theories and courage to actively probe into new problems, particularly matters of overall importance which have a direct bearing on the fundamental interests of the party and the state. Without independent thinking and free discussions, it is impossible to push scientific research forward. The correctness or incorrectness of people's views can only be judged through discussion and practice. The purpose of unfolding criticism and self-criticism in the academic field is to carry out truly free discussions so that everyone can state their own views and make criticism and countercriticism. Unfolding truly free discussions is altogether different from bourgeois liberalism and it is impermissible to speak of them in the same breath. We must guard against bourgeois liberalism and sternly criticize such inclinations. Bourgeois liberalism and leftist trends of thought are obstacles to the unfolding of truly free discussions and must be eliminated. Unfolding criticism and self-criticism, maintaining close ties with the masses and integrating theory with practice are fine work styles of our party. They are at one with each other. Most erroneous ideas originate from our failure to immerse ourselves with the masses, go deep into the realities of life and integrate theory with practice. Therefore, we economic theorists must attach importance to theoretical work and conscientiously apply ourselves to study. At the same time, we must pay attention to practice and strengthen investigation and study. Only in this way can we represent the interests of the masses, proceed from reality in doing everything, uphold the truth and rectify mistakes. Under the erroneous influence of "leftist" ideas, we have always resorted to political movements to resolve ideological problems. This gave some comrades the false impression that it was necessary to launch a movement in order to unfold criticism. Criticism means discussion; it means analyzing different points of view and debating on them. We should see that after years of tutelage and education by our party, we now have a large number of economic theorists. They are valuable assets for socialist modernization and are a force upon which our party relies. In scientific research, differing viewpoints are mostly questions of understanding. The issue is whether or not something conforms with objective reality, and this can only be resolved through social practice. The Resolution on Certain Questions in the History of Our Party Since the Founding of the PRC points out: "We must correctly understand that there are diverse social contradictions in Chinese society which do not fall within the scope of class struggle and that methods other than class struggle must be used for their appropriate resolution." Upholding the four fundamental principles is in keeping with "letting a hundred schools of thought contend." In order to "let a hundred schools of thought contend" and ensure the normal practice of criticism and self-criticism, we must not handle differing and even erroneous viewpoints in academic research in an oversimplified and crude way. In particular, we must oppose the practice of resorting to administrative means to back up one academic viewpoint and repudiate another. This is an important point we have learned in implementing the "double hundred" policy over the past two decades and more. Of course, words and deeds that would undermine socialist construction are something different. Toward them, we must wage necessary struggles.

Integrating theory with practice is a fine tradition of our party; it is also a fundamental principle for the development of economic science. Since the downfall of the "gang of four," especially since the 3d Plenary Session of the 11th CCP Central Committee, this principle has been upheld by our economists. This has played a remarkable role both in raising the theoretical level and in giving impetus to practice. However, we should still pay attention to rectifying theoretical research which is divorced from reality. Tasks of economic research should originate from practice. An economic theorist must pay attention to investigation, take socialist modernization as his classroon, be bold in practice, constantly study new circumstances and solve new problems, truly adhere to the realistic

and practical principle of "believe only in facts, not in what your superiors have told you or in books" put forth by Comrade Chen Yun back in the Yanan days and cultivate the scientific approach of proceeding from reality in doing everything. Of course, while paying attention to overcoming the tendency for theory to become divorced from reality, we must also pay attention to overcoming the tendency to slight theoretical work. The Resolution on Certain Questions in the History of Our Party Since the Founding of the PRC points out: One of the social and historical causes underlying the "Great Cultural Revolution" which dragged on for as long as a decade was that our party "was not fully prepared, either ideologically or in terms of scientific study, for the swift advent of the newly born socialist society and for socialist construction on a national scale." For this reason, the resolution emphasizes that "it is imperative for the whole party to engage in a more diligent study of Marxist theories, of the past and present in China and abroad, and of the different branches of the natural and social sciences." In this regard, it is of particularly great significance to strengthen research in economic theory.

THIRD, WE MUST EXPAND AND RAISE THE STANDARDS OF THE PRESENT CONTINGENT OF ECONOMIC SCIENTISTS AND TRAIN A LARGE NUMBER OF QUALIFIED ECONOMIC SCIENTISTS IF WE WANT TO FURTHER DEVELOP ECONOMIC SCIENCE.

Our contingent of economic scientists has expanded considerably in recent years. However, it still falls short of the arduous tasks of socialist modernization we have before us. This contingent is not only too small in number, but is not up to the mark qualitatively speaking. For example, in terms of the fields of study, most people are engaged in theoretical research in general political economics and very few are engaged in other disciplines. Many bourgeoning and frontier branches of learning are in a state of blankness and there are gaps to be filled. Most economic scientists have a limited scope of knowledge. They know very little about Chinese history, Chinese society, various aspects of production, practical knowledge such as advanced mathematics, modern science and technology and modern economics, even the new progress being made in other countries in research in their respective branches of learning. They also have a relatively low level of foreign language training. Therefore, we must strengthen and raise the standards of the present contingent of economic scientists in order to meet the demands of socialist modernization. This is a very pressing task. Our federation of economic science organizations should play its proper role in this regard. We must make every effort to train and bring up new forces. We must tailor the teaching of economics in such a way as to suit the needs of socialist modernization. To this end, it is necessary to reform the pedagogical structure and curricular setup of economics and help the economics students broaden their scope of knowledge. In this way, we will be able to provide economics research and teaching and also the economic departments with more professional men of a high caliber.

In conducting research in economic science, it is not only necessary to divide the work but also to strengthen the links between various branches of learning. If we all stay in our own small world and do not communicate, we will not be able to reach an understanding on many questions. In addition, we must also have an overall idea of and planning for the development of economics in the whole country, including planning for each locality. Our federation of economic science organizations can also do something useful in this regard.

FOURTH, WE MUST DEVELOP VARIOUS ECONOMIC SCIENCE SERVICES.

The development of the service trades is an outcome of contemporary social development. Services in the field of science (economic science included) constitute an important aspect of the service trades. In addition to our own research tasks, we economic scientists should also strive to provide good scientific services and serve socialist modernization with scientific conclusions, scientific knowledge, scientific information and scientific methods. For example, we can help ascertain the effects of economic policies, provide economic information, data and counseling, train economic management personnel, put forth plans and proposals for rationalization, provide scientific arguments and evidence for various technical measures and construction projects, and so on.

It is one of our important tasks under the new historical conditions to popularize the knowledge of economic science in the course of socialist construction. Only by helping more people master the knowledge of economic science can we do a better job of our economic work.

XINHUA ON INTEGRATION OF SCIENCE, PRODUCTION

OW260255 Beijing XINHUA Domestic Service in Chinese 0706 GMT 24 Nov 81

[Commentary by unidentified XINHUA reporter: "The Integration of Scientific Research and Production Is Imperative"]

[Excerpts] Beijing, 24 Nov (XINHUA) -- From the State Scientific and Technological Commission and the Chinese Academy of Sciences to the various research institutes, the people have recently been enthusiastically discussing a question: How can science and technology be transformed as quickly as possible into productive forces to enable the national economy to develop at a greater speed?

The occurrence and development of science are linked with production right from the start. When production develops to a certain stage, it inevitably places new demands on science and technology. Once science and technology make a new breakthrough and apply their achievement to production, a leap in production takes place. It was in this way that the history of mankind's development of production was proved. However, not everyone is paying attention to carrying out such an obvious and easy-to-understand truth in practice. Therefore, it is necessary to demand that comrades who are leaders in production should attach importance to the application of new achivements in science and technology and ask for output and quality from science and technology. Comrades who are leaders in scientific and technological work should attach importance to the popularization of scientific and technological achievements in production and ask for scientific research projects from the production side.

Recently, the State Scientific and Technological Commission has collected many practical examples eloquently explaining the power of new new scientific and technological achievements in promoting the development of production.

The comrades in economic departments might say that new technology is certainly good but it cannot be applied to their production because the channel between scientific research and production is now impassable. The comrades in scientific and technological departments maintain that in order to bring a scientific and technological achievement from the laboratory to production, there is a series of technical and economic problems to be solved; however, the scientific and technological departments are incapable of solving these problems. A scientific and technological achievement must be taken over by the production department for a continuous intermediary test before it can be transferred from the laboratory to the plant, the rural area or the mine, or even to the various production fronts. However, for a long time, precisely because of the absence of an intermediary bridge, most of the achievements have remained samples, exhibits or presents, and have been buried year after year.

Regarding this problem, the party Central Committee's policy is that except for a small amount of basic research, applied scientific research should systematically be more closely integrated with production and should gradually break through departmental and regional limits. It is necessary to study the reform of the systems from the angle of the integration of scientific research organizations with production.

To build the bridge of integration between scientific research and production, we must depend on the joint efforts of both the scientific research departments and the production departments. If only leading departments at all levels work in accordance with the party Central Committee's policy, do away with the ideology of sticking to old ways, positively make the channels between scientific research and production passable, study the concrete policies and measures of encouraging the production departments to adopt new technology and new achievements and do something in a down-to-earth way, we will be able to gradually transfer advanced scientific and technological achievements from the laboratory to the plant, the rural area and the various departments in the national economy. If we act in this way, the national economy will develop at a greater speed like a winged tiger, enabling an earlier realization of socialist modernization.

EXCERPTS FROM ZHAO ZIYANG GOVERNMENT WORK REPORT

OW140138 Beijing XINHUA in English 0103 GMT 14 Dec 81

[Excerpts] 9. Raise the scientific and cultural level of all working people, and organize strong forces to tackle key scientific research projects. We must train large numbers of specialists of all grades in all lines and large numbers of competent workers for our modernization programme. This is of paramount importance. China is still rather backward in education and science, whose development thus lags behind that of the various sectors of the economy. Unless we solve this problem, we shall fail in our drive for modernization.

Our basic policy for scientific and technological development is equally clear-cut. Science and technology, with their numerous branches, should serve all aspects of human life. There must be no weakening of basic research, but the stress in the development of science and technology as a whole should be on serving economic construction and, in particular, on the solution of key problems in the economy involving major economic benefits. Our present task is to employ science and technology more efficiently so that they will be a powerful productive force, a great stimulus to economic development.

To place science and technology fully at the service of the economy, it is now most necessary to apply and spread the results we have obtained in scientific and technological research. In recent years, we have accomplished much in such research and also imported a good deal of advanced technology. Drawing on these assets and making wider use of them can yield enormous results if we do it in time. We should strive to apply the results of scientific and technological research in laboratories to production, apply those gained in the national defence industry to production for both defence and civilian purposes, and apply those gained in the coastal areas to production in the hinterland, as well as assimilate foreign experience for use in China. In the past year or so, several research and designing institutions have organized various forms of association with production units, and owrked out new methods and systems, such as the contracting system, compensated transfers of technology, technical services, output-related responsibility in agro-technical service, and advisory agro-technical contracts. All this has helped research and designing instiutions to be directly oriented towards production, and to cater to the needs of increasing production; at the same time, it has provided a motive for the popularization of science and technology. It is thus highly beneficial to the development of the economy and of science and technology themselves.

Generally speaking, our science and technology are still rather backward, but they are by no means backward in every respect. For in certain fields we have already attained a fairly high level and a considerable scale in terms of size of research staff, experimental facilities, and results of research. We should in no case underestimate ourselves.

To meet the fairly long-term needs of our developing economy, it is now necessary to set before all leading scientific and technological departments, all research institutions and all scientific and technological personnel the task of tackling key problems in science and technology by pooling their efforts and strengthening their cooperation. After repeated studies and confirmation by the departments and specialists concerned, we will select a number of research projects of major national economic significance and organize the efforts of all concerned to effect a breakthrough.

These projects include techniques for increasing farm yields such as seed and soil improvement, water and soil conservation, plant protection and manufacture of new varieties of farm chemicals; techniques of foodstuff storage and processing, and of keeping it fresh for a long time; finishing techniques for textiles; techniques for the conservation and better utilization of energy; techniques for the multi-purpose use of coal and petroleum; techniques for the comprehensive exploitation and utilization of nonferrous metals; and research on new materials, new technologies, new equipment and new products which are of key importance to China's economic growth. Work on the above projects is important and necessary for the accelerated development of our national economy. We hope that all concerned will give it adequate attention. Our achievements in science and technology are already at the point where we can conquer a number of difficult scientific problems. We are convinced that our scientific and technological personnel have both the will and the ability to make a breakthrough in these major projects.

ECONOMIST ON RENEWAL OF EXISTING INDUSTRIES

HK120250 Beijing CHINA DAILY in English 12 Dec 81 p 1

[By staff reporter Zhang Ciyun]

[Text] China's plans to shift more funds from capital investment to the renewal of existing industrial enterprises in the next 10 years is the only way to make the economic readjustment and modernization program a success, in the view of Sun Yefang, a noted economist and member of the Chinese People's Political Consultative Conference.

In an interview with CHINA DAILY, Sun said, "I greatly appreciate the 10 principles for economic development outlined in Premier Zhao Ziyang's report to the current people's congress, and I'm particularly happy with the one which calls for making full use of existing enterprises through systematic technical transformation."

He said renewing old enterprises requires less money and brings prompter results than building new ones.

"I have been advocating this policy for almost 20 years, but some economists disagreed with me," he said.

Sun, 74, published an article in 1963 urging the government to stop emphasizing the construction of new enterprises in developing agricultural and industrial production. He suggested the government use half of its capital investment to renew existing enterprises.

"Being a poor and undeveloped country, China cannot afford large-scale capital investment. It is ridiculous that mills purchased in the latter half of the 19th century and machinery imported before national liberation in 1949 are still expected to compete in the world market," Sun observed.

He pointed out that the depreciation rate in China's enterprises is only four per cent 15 to 20 percent lower than in industrialized countries.

If China renews its equipment only every 25 or 30 years, hopes of catching up with the advanced countries are "only a fond dream," he said.

He suggests now that the government raise the depreciation rate to at least 10 per cent "although I am well aware that this means a reduction of almost 20 billion yuan from the annual state income and the Financial Ministry won't be happy about it."

"This is the only right and practical way to complete the current economic readjustment and turn China into a modern, prosperous country by the year 2000," he said.

Sun also said that emphasizing renewal of enterprises will give a boost to heavy industry.

"If heavy industry can shift its focus to the renewal of the more than 400,000 existing enterprises in this country, it could find a vast field for further development and its production could be rapidly increased," he asserted.

Referring to figures cited in Premier Zhao's report, Sun noted that while China's agriculture is enjoying more good harvests and light industrial production has increased by more than 10 percent this year, heavy industrial production has dropped.

As a result, the nation's total agricultural and industrial production rose only 4 per cent this year, well below the average yearly increases of 18 percent during the first 5 year plan (1953-58) and 17.9 per cent during the nation's first 3 year economic readjustment just before the "Cultural Revolution" (1966-76).

Sun said that in the last 2 years, many heavy industrial enterprises have been idled; the sector is now suffering a depression as the result of the nationwide economic readjustment.

"This does not mean that China has overdeveloped its heavy industry, but reveals the fact that heavy industry has been slanted too much to meeting the needs of building new projects and enterprises," he said.

II. Science Policy--Agriculture

AGRICULTURAL SCIENCE RESEARCH AND EDUCATION

Beijing ZHONGGUO BAIKE NIANJIAN in Chinese 1980, pp 361-363

[Excerpts] Revival and Development of Agricultural Research

In old China, agricultural science research work was extremely weak. Following Liberation, six large regional agricultural science institutes were set up in the northeast, north China, east China, south China, the northwest, and the southwest. Provinces (municipalities and autonomous regions) and regions (leagues and municipalities) also set up agricultural science institutes or experiment stations.

In 1957, the Chinese Academy of Agricultural Sciences grew out of the North China Institute of Agricultural Sciences. Subsequent to 1958, some provincial agricultural sciences institutes were enlarged to become provincial academies of agricultural sciences. During the Great Cultural Revolution, as a result of the interference and destruction caused by Lin Biao and the "gang of four's" ultra-leftist line, some of the institutes of the Chinese Academy of Agricultural Sciences and numerous provincial (municipal, autonomous region), and prefectural (league and municipal) agricultural science research organizations were abolished or downgraded, and research work in agricultural sciences was seriously crippled.

Following the smashing of the "gang of four," a national science conference was convened in 1978; the State Council approved the revival of the Chinese Academy of Agricultural Sciences, and research in agricultural sciences was revived and developed. In 1979, the "Decision of the CCP Central Committee on Some Questions Concerning the Acceleration of Agricultural Development," which was passed by the Fourth Plenary Session of the 11th Party Central Committee, placed specific requirements on the development of research work in agricultural work. The Ministry of Agriculture placed strong emphasis on building up the Chinese Academy of Agricultural Sciences, requiring that it gradually begin to operate national research centers for agriculture and livestock raising. Also established were such national agricultural research organizations as the Chinese Agricultural Engineering Research and Design Academy, the Chengdu Methane Gas Institute and the Environmental Protection Scientific Monitoring Institute. .Each province (municipality and autonomous region)

revived and established provincial academies of agricultural sciences and prefectural academies of agricultural sciences. Some provinces (municipalities and autonomous regions), as well as a small number of prefectures also established special research units directly subordinate to agricultural and livestock departments. Some institutions of higher learning also set up laboratories for strengthening research work in agricultural sciences.

By adopting the method of combining specialized teams with the broad masses, research work in agricultural sciences launched a wideranging campaign of scientific experiments in agriculture from which numerous scientific and technical accomplishments were derived. At the National Science Congress in 1978, 243 prizes were awarded for major scientific and technical accomplishments in agriculture and livestock raising. Thirty of these approached, attained, or exceeded advanced world levels. For example, in the field of agriculture, in 1956 the world's first dwarf superior variety of rice, "Aijiao Nante" was bred. In 1973, an improved xian type hybrid rice was grown; and an allooctoploid triticale was propagated using polyploid breeding methods. Research in control of saline-alkaline fields brought results that laid a scientific foundation for the control of large areas. Insect pests and diseases that cause serious damage to agricultural production such as migratory locusts and wheat rust have been substantially brought under control. In the field of animal husbandry, research was launched on improvements in domestic livestock and domestic poultry breed, and in artificial insemination techniques using frozen semen for domestic livestock. Research has been successful with numerous safe vaccines. Pernicious epidemic diseases including rinderpest, hog cholera, and chicken pest, which were virulent before Liberation have either been brought under control or eradicated.

(Wang Zhiqi [3769 0037 3823])

Building an Agricultural Science and Technology Popularization Network

Agricultural science and technology popularization network is the common way of referring to the agricultural science and technology popularization organization. It was formed out of the former agricultural technical popularization stations and the four level agricultural science experimental network. It includes all agricultural science and technology popularization organizations from the central authorities to the grassroots levels. At the center, a science and technology popularization department has been established within the Science and Technology Bureau of the Ministry of Agriculture. In provincial and prefectural agricultural bureaus, agricultural science and technology popularization stations have been established or else are administered by appropriate units within agricultural bureaus. In the counties, either agricultural science and technology popularization offices or agricultural science and technology popularization stations have been established. People's communes have agricultural science and technology popularization stations; production teams have set up either agricultural science and technology teams or agricultural technicians. Agricultural science and technology popularization organizations at all echelons at or above the county are subordinate to the national institution. Some of the commune agricultural science and technology popularization stations are subordinate to the national institution, and some are subordinate to collective units. Production brigade and production team agricultural science and technology teams are mass scientific and technical organizations.

The agricultural science and technology popularization network is a link and a bridge for the application to agricultural production of agricultural research accomplishments and advanced techniques; it is the key link in giving play to the productivity role of science and technology. Its principal tasks are: adaptation of general methods to local situations for the popularization of advanced techniques in agricultural production, all around implementation of the "Eight-Point Charter for Agriculture", and implementation of scientific farming. Below the county level, it performs experiments and demonstrates, promotes and gives technical training. It firmly follows the direction which serves present and local agricultural production and holds to a policy at which popularization is the center. It upholds all principles and all model demonstration methods that have undergone testing. It organically combines experimentation, demonstrations, training, and popularization work, gains experience through experimentation, derives models through demonstrations, develops backbone technical cadre through training, and achieves the goal of increased output and increased insome through the popularization of applications to production.

In the course of their work, agricultural scientific and technical popularization organizations give attention to close coordination with research units, and agricultural institutions of higher learning, actively promote their scientific and technical accomplishments, and request their assistance in the solution of technical problems they may encounter in the process of popularization.

(Yao Jiaqiu [1202 0857 4428])

Revival and Development of Agricultural Institutions of Higher Learning

Following the smashing of the "gang of four," China's agricultural institutions of higher learning made an initial recovery and moved forward. In 1979, of 15 institutions including Beijing, Hebei, Yunnan, and Yilin agricultural universities, and Nanjing, Shenyang, Anhui, and Northeast agricultural colleges that had been moved, 12 returned to their previous addresses. Simultaneous with the revival of the old schools, the state also approved the founding of an additional 10 schools of the Beijing and Laiyang Agricultural College, the Tibetan College of Agriculture and Animal Husbandry, the Jinyang, Xichang, and western Henan professional schools of agriculture, the Sichuan and Qinghai animal husbandry and veterinary medicine colleges, the Zhelimu Academy of Animal Husbandry, and the Zhengzhou Professional School of Animal Husbandry and Veterinary Medicine. By the end of 1979, there was a total of 43 agricultural institutions of higher learning (not including state farm and land reclamation, farm machinery, and forestry institutions) of which 35 offered regular college courses, and 8 offered specialized courses. In terms of curriculum, 37 were in agriculture and 5 were in animal husbandry and veterinary medicine; one was in sericulture. There were 360 institutions offering 52 different courses on agriculture, pomology, vegetables, livestock, veterinary medicine, agricultural mechanization, farmland water conservancy, and forestry. There were more than 45,000 students enrolled, 477 researchers, and a staff of more than 28,000 at the schools. The state also revived and authorized as key national institutions of higher learning seven institutions, namely, Beijing Agricultural University, and Nanjing, Southwest, Northwest, Central China, South China, and Shenyang colleges of agriculture, and instituted a dual leadership system comprised of the Ministry of Agriculture and concerned provinces and municipalities with the Ministry of Agriculture leadership being paramount. At the same time, it approved the Shanxi Agricultural University, and Jiangxi Communist Labor University as a major national institution of higher learning under the leadership of the province.

Simultaneous with the revival and development of agricultural institutions of higher learning, efforts were made to improve the teaching quality. By 1979, the Ministry of Agriculture had already examined, approved and promulgated plans (trial drafts) for the Four specialized schools of agronomy, pomology, animal husbandry and veterinary science in agricultural institutes of higher learning, and a draft plan for instrument and equipment standards for eight agricultural microbiology laboratories. It had also organized teachers from agricultural institutions of higher learning throughout the country to write teaching outlines for 71 courses in agronomy, pomology, animal husbandry and veterinary medicine, and teaching materials for 160 courses in 12 fields of agronomy and animal husbandry. The Ministry of Agriculture, the Ministry of Foreign Affairs, and the Ministry of Education authorized establishment of [sister] school relationships between the Beijing Agricultural University and Minnesota University in the United States, Guelph University in Canada, and Hohenheim University in West Germany, between South China Agricultural College and Pennsylvania State University in the United States, and between Shenyang Agricultural College and Iowa University in the United States. They began reciprocal exchanges of specialists, teachers who lecture, exchange of data, exchange of students engaged in advanced studies, and cooperative research. The Ministry of Agriculture selected more than 50 teachers from agricultural institutions of higher learning throughout the country as visiting scholars who went to the United States, the United Kingdom, Japan, Canada, Yugoslavia, and Romania for study, refresher courses and improvement. They also commissioned experts and teachers from pertinent agricultural schools to conduct 27 refresher courses including basic English, basic Japanese, agricultural chemistry, botany, domestic animal environmental sanitation, entomological survey, veterinary clinical diagnosis, domestic animal dissection, and histoembryology, farming, and animal biochemistry so as to train teachers and increase their level of specialized knowledge.

(Jiao Ji [3542 1323])

Training Classes for Agriculture Leadership Cadres

In 1979, the Ministry of Agriculture entrusted seven agricultural institutions of higher learning including Beijing, and Zhejiang agricultural universities, and Shenyang, Northwest, Southwest, Central China, and South China agricultural colleges to conduct training classes for agricultural cadres. They trained separately the directors and deputy directors of agricultural and livestock bureaus in various provinces, municipalities, and autonomous regions who had not previously studied agricultural specialities, the chairman and deputy chairman of agricultural academies, and the chairmen and deputy chairmen of agricultural institutions of higher learning; prefectural secretaries responsible for agriculture, assistant directors, officers in charge of agricultural offices, directors of agricultural and livestock bureaus, county (or banner) CCP Committee secretaries, county heads, deputy secretaries in charge of agriculture, and cadres above the department level in the Ministry of Agriculture. Training would be twice each year, each period lasting from four to four and one-half months. Every 4 or 5 years, these cadres would be rotated once to training. Content of instruction was agricultural economics, agricultural programs and policies, agronomy (including plant physiology, genetic and breeding, crop cultivation, soil fertility, and plant protection),

animal husbandry and veterinary medicine, and agricultural mechanization. Depending on the different needs of students, each class might set up elective courses. Through training and subsequent work experiences, these leading cadres in agricultural management would gradually change from greenhorns to insiders versed in their own profession.

During the last half of 1979, seven training classes were each in session for one period. Participating in the training were department level cadres from offices in the Ministry of Agriculture and affiliated units, and leading cadre responsible for agricultural work from 29 provinces, municipalities, and autonomous regions, 77 prefectures (or zhous), and 387 counties (or banners), numbering 514 students in all. Forty-two of the students were cadres from 16 national minorities. Aside from six of the students who were unable to complete the course, all others were tested and found to meet requirements and were issued certificates of completion for the course work.

(Yu Pei [6735 1014])

Activities of the Chinese Agriculture Society

The Chinese Agriculture Society is an academic mass organization organized by China's agricultural scientists and technicians. It was founded in 1917, and known before Liberation as the "China Agriculture Society."

The present session's council has 145 council members, 43 standing committee council members, 14 deputy directors, and 1 director, all of them elected by a congress of the membership. This session's director is Yang Xiandong [2799 7359 2639].

The Chinese Agriculture Society is a combined organization that includes the Chinese Crop Society, the Chinese Horticulture Society, the Chinese Plant Protection Society, the Chinese Animal Husbandry and Veterinary Medicine Society, the Chinese Tea Society, the Chinese Serology Society, the Chinese Tropical Crops Society, the Chinese Cotton Society, the Chinese Apiary Society, the Chinese Atomic Energy Agricultural Society, the Chinese Agro-Economics Society, the Chinese Grasslands Society, the Chinese Agricultural Engineering Society, and the Chinese Agricultural Modernization Research Society. Most provinces, municipalities, and autonomous regions have also established agricultural societies.

Centering on the central problem of how to accelerate the modernization of agriculture, in 1979 the Chinese Agricultural Society organized the broad masses of agricultural scientists and technicians for academic discussions and exchanges. Examples were the Northeast Region Agricultural Modernization Academic Discussion Meeting, and the Tropical Crops Modernization Academic Discussion Meeting, and the Tropical Crops Modernization Academic Discussion Meeting. The Chinese Agricultural Society has also regularly held academic discussion meetings and report-back meetings of various kinds or on various subjects. It has sent delegations abroad on inspection trips, to participate in international academic conferences, to exchange academic accomplishments, to increase their academic level, and to examine and approve as well as recommend effective technical measures.

This year the Chinese Agricultural Society turned to the 800 million peasants by actively launching agricultural science popularization work. It began with the publication of a collection of books titled "A Course of Lectures on Modernized Agricultural Science." In conjunction with the Central People's Broadcasting Station, it presented "Special Lectures on Agricultural Modernization Science Knowledge." It used newspapers and magazines to publish articles pertaining to agricultural technology. It showed science education films; it set up various slide shows in special fields. It operated training classes in various specialties.

In 1979, the Chinese Agricultural Society edited and published 17 academic publications. They may be generally divided into two major categories, learned journals and magazines. Learned journals include ZUOWU XUEBAO [Acta Agronomica Sinica], YUANYI XUEBAO [Acta Horiculturae Sinica], ZHIWU BAOHU XUEBAO [Acta Phytophylactica Sinica], ZHIWU BINGLI XUEBAO [Plant Pathology Journal], XUMU SHOUYI XUEBAO [Acta Veterinaria et Zootechnica Sinica]. Magazines include ZHONGGUO SHOUYI ZAZHI [Chinese Journal of Veterinary Medicine], ZHONGGUO XUMU ZAZHI [Chinese Journal of Animal Husbandry], ZHIWU BAOHU [Plant Protection], ZHONGGUO YANGFENG [Chinese Apiculture], CHAYE KEXUE [Tea Science], CANYE KEXUE [Silkworm Industry Science], REZUO KEJI TONGXUN [Tropical Crops Science and Technology Bulletin], NONGYE JINGJI WENTI [Problems of Agricultural Economics], YUANZINENG NONGYE YINGYONG [Agricultural Applications of Atomic Energy], YUANZINENG NONGYE YICONG [Translations on Agricultural Applications of Atomic Energy], ZHONGGUO CAOYUAN [Chinese Grasslands], and NONGYE GONGCHENG [Agricultural Engineering].

(Li Junkai [2621 0689 0418])

Widening of Foreign Agricultural Technology Exchange

In 1979, China's technological cooperation and exchange with foreign countries saw further development. According to incomplete statistics from the Ministry of Agriculture, a total of more than 420 people in 65 delegations and inspection groups were sent abroad during the year, and more than 580 people in 120 visiting delegations or groups arrived in China.

This year, China and the United States, Yugoslavia, France, Thailand, Argentina, and Japan arranged through government or civilian organizations for the exchange of special inspection delegations and groups in livestock, pomology, variety resources, and biological control. These exchanges were based on equality, mutual benefit and cooperation. Swiss, Japanese, French, and West German industrial plants and traders have sent seed and agricultural chemical experts for technical exchanges, and they have welcomed specialists whom China has sent abroad to study advanced techniques. Yugoslavian, French, and American special research organizations or agricultural institutions as well as international rice, wheat, corn, and potato research institutes have exchanged scholars with China, and welcomed specialists whom China has sent abroad for advanced study or for cooperative research. The United Nations Food and Agriculture Organization ran a technical training class in China on the use of remote sensing in soil surveys, and also sent some livestock specialists to China for short periods of teaching to help in the training of specialists. They also received isotope and paddy rice experts sent abroad from China for advanced studies. The Beijing Municipal Sino-Japanese Friendship People's Commune sent 25 young farmers and technicians to Fukushima and Hokkaido in Japan at the invitation of the Japanese to study paddy rice, vegetables, fruit trees, and milk cow feeding techniques.

Thirteen American agricultural specialists of Chinese descent, and one Canadian agricultural specialist of Chinese descent visited China at China's invitation to give numerous lectures and engage in academic exchange. They hold nationwide red soil improvement and domestic fowl epidemic disease training classes, and conducted 157 report-back meetings and academic discussion meetings.

(Zhu Pirong [2612 0012 2837])

Development of International Cooperative Relationships in Agricultural Technology and Economic Cooperation

In 1979, China developed long term cooperative relationships in agricultural technology and economics with numerous countries. In addition to signing agreements for technical cooperation with more than 10 countries, it made technical and economic cooperative arrangements with American, Yugoslavian, West German, French, Australian, and New Zealand business firms, and it entered into cooperative experiments and technical exchanges on agricultural chemicals, farm machinery, and seeds with Japanese, British, French and Swiss industrial plants and firms.

This year China introduced eight sets of agricultural machinery from Japan for pilot projects at Gongzhuling in Jilin, Wuxi in Jiangsu, Chongming in Shanghai, Jinhua and Wuxing in Zhejiang, Jinxian in Jiangxi, and Dandu in Anhui. Plastic greenhouses introduced from Japan are being used experimentally at the Sijiqing People's Commune in the suburbs of Beijing. A modernized greenhouse introduced from Holland is being tested in the suburbs of Harbin. Modern livestock farm equipment and techniques were introduced from Australia and New Zealand. Through the auspices of the United Nations Food and Agriculture Organization, a complete range of seed processing equipment was introduced as well as grain drying equipment and remote sensing technical instruments and equipment for soil surveys. Additionally, a demonstration farm with modern facilities is planned for construction at the Wengniute Banner in the Nei Monggol Autonomous Region. More than 4700 varieties of agricultural crop seeds and nursery stock have been introduced from 38 countries and international organizations. From New Zealand and Australia have been introduced Romney sheep, and from Korea has been introduced eight different quail strains. From the United States has been imported Nigula [phonetic] white-feathered turkeys, and from Japan earthworms to further increase China's breed resources.

Additionally, China has presented 858 seed and nursery stock items for various farm crops to 18 countries. Rice hybrids are being tested in the United States, and some of them have yields of from 30 to 40 percent higher than local varieties.

(Zhu Pirong [2612 0012 2837])

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RELY ON POLICY, SCIENCE TO INCREASE GRAIN PRODUCTION

Beijing RENMIN RIBAO in Chinese 6 Mar 81 p 2

[Article by Hou Xueyu [0186 1331 3558], Botany Institute, Chinese Academy of Sciences: "How Should the Problem of Increased Food Output Be Looked At?"]

> [Text] Solution to the problem of increased grain output requires, first of all, establishment of an outlook of "grain in a larger sense." The road to increased output lies not in emphasis on increase in the rice, corn, and wheat area and the multiple cropping index, but rather in increases in per unit yields, and close attention to intensive farming. The basic issue is reliance on policies and on science.

Ours is a country with a population of one billion in which solution to the problem of getting enough food for everyone to eat requires self-reliant increases in grain output. How can grain output be increased? This is a problem that very much merits discussion.

Many proposals have been made for increasing grain production. Some people have suggested a need to stabilize the area planted to rice, wheat, and corn, permitting no further reductions. Others have advocated stabilization of the dual crop system in South China. Are these proposals valid?

I believe that it is necessary, first of all, to learn the reasons why speed of growth of grain output in China is slow. On the basis of my investigations during the past several years in north and south China, I would say that one major reason has been that peasants everywhere have been eating "out of a large common pot." Beginning from 1956, and more particularly since 1958, the speed of changes in production relationships in rural villages has outstripped productivity. When we were out examining the countryside, we frequently observed several oxen plowing the fields and 10 or 20 people working together on a plot of land, and a very great amount of enforced idleness. In October 1980 during an inspection trip in Anhui Province, I saw heartening changes. The Yingtou sugar production team in Liyuan Commune, Fengyang County had for more than 20 years depended on grain resold to them by the state, and every year, following the harvest, both adults and children would flee famine to beg for food. In 1977 following the overthrow of the "gang of four," though the weather had been normal, grain yields had still

only been 66 jin per mu, and 8000 jin of grain returned by the state was consumed. In 1979, with large scale contracting with teams for production, grain yields were 200 jin per mu. In 1980, after institution of a system of contracting for production with households, grain yields were more than 400 jin per mu. During that year, in addition to grain for consumption and for use as seeds, more than 110,000 jin of grain was sold to the state, and more than 10,000 jin of peanuts was sold as well. This situation shows that with the same cultivated land, the same workforce, and the same production conditions, eating "out of a large common pot" and not eating "out of a large common pot" makes a vast difference. Once the peasants had true autonomy, only then did initiative arise, and only then was the most made of the advantages provided by the soil and the workforce. Inappropriate production relationships destroy peasant initiative, and must inevitably block growth in grain output.

Secondly, scant harvests from widely planted areas is also a major reason. In 1980, I made an investigation of the Tsaidam Basin in Qinghai Province, which had had a record high output of spring wheat. At many farms there, yields of winter wheat from small cultivated areas (15 mu) amounted to 2,000 jin per mu. One production team with 1,500 mu of cultivated land also had average yields of 1,000 jin per mu. But on most farms, average yields were only 200 to 300 jin per mu. This was because at that time higher authority required only that each farm guarantee a certain area for wheat, making no clear requirements for output. As a result, every farm planted a wide area, but harvested little, and they did not pool water, fertilizer, and manpower to do intensive farming. Another actual experience took place at the Muzhuang Production Brigade in Nanpi County, Hebei Province, where there are large tracts of salinized soil. In 1974, 2,650 mu of grain was planted, but yields were only 46.8 jin per mu. In 1978, the grainfield area was curtailed to 1,769 mu and water and fertilizer were concentrated for intensive farming; yields rose to 211.8 mu per jin. In 1979, the grainfield area was further reduced to 1,229 mu, and yields rose to 336.6 jin per mu. During these 2 years, this production brigade afforested sandy areas, grew reeds in low-lying areas, and grew hay or rotated hay and grain in saline areas in an all-around development of agriculture, forestry, and livestock raising. This shows that the size of grain output depends not only on the size of the area sown to grain. In many places in China, low grain yields are inseparable from the guiding mentality of planting large areas and reaping scant harvests.

Destruction of forests, the clearing of mountain lands for agriculture, and reclamation of lakes to make fields is another major reason for droughts, and adverse effects on grain production. Destruction of mountain forests and the clearing of land there not only hurts forestry, livestock raising and diversification, but also has bad consequences for grain production itself. In Shenxi Province, the masses say, "When the mountains are cleared to the peaks, people become poor and die out," and "when clearing is done on the mountains above, disaster ensues for the people below." In western Hunan Province, the forests on Xuefengshan were felled, and all the cleared mountain slopes, including those with a slope of more than 30 degrees, were cleared for the planting of corn, which was intercropped with young China fir seedlings. During a particularly heavy downpour of rain in 1979, more than 10,000 mu of ricefields at the foot of the mountain in Dongkou County were washed away, and more than 20,000 mu were stricken with drought. In 1958, trees were cut from the Dabieshan in Anhui

Province to make charcoal for the smelting of iron. As a result of erosion, flood and drought disasters subsequently increased in frequency. The reclamation of lakes to make farmland seemingly increases the amount of cultivated land, but because of the decrease in water reserves, floods occur during rainy seasons, and water is lacking for irrigation during dry spells. One example was the Chengxi Lake in Huoqiu County, Anhui Province, which stored 700 million cubic meters of water before reclamation. Following reclamation, it held only 0.75 cubic meters. When the rainy season came, more than 600 million cubic meters of water innundated every place. Not only were the lake fields that had been reclaimed innundated, but all the surrounding fields were drowned as well. The local people said, "Reclaiming the lake was like reclaiming the bottom of a kettle, and the water flooded over the sides of the kettle." Because of waterlogging, more than 100 million jin of grain was lost in 1980. Furthermore, as a result of the reclamation of the lake and the building of locks, fish were unable to migrate into the lake to spawn, and a great decrease occurred in the production of fish, crabs, and shrimps. This source of animal protein was lost, and there was no place for lotus, Gorgon fruit, wild rice, and such food plants to grow. Baitang Lake in Congyang County in Anhui formerly had 180,000 mu of water surface, but more than two-thirds of this water surface has now been reclaimed. Before reclamation, the lake produced more than 2 million jin of fish annually. In 1979, this dropped to somewhat more than 200,000 jin. Formerly catches of wild ducks amounted to more than 1 million, but now they are extinct. In 1980, one-third of the dikes surrounding the lowlying fields were breached. Someone rightly said, "When man wanted to go against the will of heaven and enclose the lake to make fields, heaven got rid of the reclamation and made it back into a lake."

The reckless changes made in the system of farming nationwide from south to north is another major reason. Ever since 1958, in particular, when the double cropping of rice was promoted in the south as a "panacea," total grain output in some places has declined contrary to expectations. In the fertile soil areas in the mid-reaches of the Yangtze River, for instance, total output from both crops of rice is about 1000 jin per mu. But should lots of rain fall and temperatures drop in the fall reducing output from the late rice crop, only the 700 jin from the early rice crop can be assured. However, a two crop system of rice and wheat (or rape) can bring consistent yields of 1,100 jin per mu. In 1980, Jiangsu Province organized high yield experiments on 100 mu continuous tracts at 26 different sites, which proved that a two crop system of rice and wheat can outstrip the yields of a triple crop system. In the case of Tianzhuang Production Brigade in Wantou Commune, Hanjiang County, double cropping of wheat and rice produced yields of 2,014 jin per mu, while three crops of rice produced only 1,515 jin per mu. In the area that runs from Taoyuan in Hunan to Taihe in Jiangxi, two crops of rice generally yield no more than 600 to 700 jin per mu. In the aforestated places, sunlight and atmospheric temperatures during July and August are good, (with sunlight amounting to 30 percent of the year's total). During this time of year, the early season rice is already in its final stage of growth when photosynthesis has greatly declined. Meanwhile, the late season rice is only in its seedling stage when leaf surfaces are extremely small and unable to make fullest use of the sunlight and warmth conditions prevailing during July and August. Winters are fairly cold in this area and the spring season warm, exactly the right temperature conditions for the vernalization stage of wheat and rape and able to play a "height of the season" role. However, since two crops of

rice mean long term innundation of the soil with water, if green manure is intercropped with late season rice, opportunity is lacking for plowing it under and sunning the soil in winter, making the soil prone to some secondary gleying. Since soil porosity is poor, the plant roots have difficulty breathing, so even if greatly fertilized, the rice roots still are unable to fully absorb nutrients. The period of irrigation of the fields is long, and some natural enemies of insect pests such as ricefield spiders are drowned, or are unable to survive and reproduce, which aggravates the damage done to the late rice crop by diseases and insect pests. When two crops of the same kind are grown in a single year, the quantity of fertilizer required and the amount of seeds needed are particularly great. It may be seen that the area of double cropping of rice in South China should be curtailed rather than stabilized at its present unreasonable acreage.

On the northeastern plain, after the "great leap forward," the gaoliang, millet, and soybean acreage was reduced and the corn acreage expanded. More than 90 percent of the former soybean fields are intercropped with corn, and millet fields are also intercropped with corn. Corn is a warmth loving crop, and this is particularly true of medium-late ripening varieties, which if exposed to frost during the late growth stage, will have seriously reduced output. In addition, corn is a crop with large stems, which when intercropped with soybeans, shade the soybeans from the sunlight and reduce temperature to some extent. In the northeast, where the growing season is short, this results in reduced soybean output.

On the North China Plain, historically during years in which the autumn crop was the major one, the land lay fallow in a system of three crops every two years whereby gaoliang or corn was grown one year as an autumn crop, soybeans or millet was grown one year as a late autumn crop, and wheat was grown one year. Nowadays the farming system on the North China Plain has become a single one with winter wheat or corn accounting for about 80 percent of the acreage. Since 1958, curtailment has taken place in the area planted to millet and gaoliang, which resist drought and tolerate alkaline-saline conditions; and peanuts, which are suited to growing in sandy soil; soybeans, which tolerate wetness; and cotton, which tolerates slight salinity, have been squeezed out by wheat and corn. This has resulted not only in reduced output of cotton and oil bearing crops, but also the continuous planting of wheat and corn year after year has both plundered the soil of its fertility and made it lack organic matter. There is no nitrogen fixing bacterial activity from root nodules of pulses; nor is there any bean cake or peanut cake for use as fertilier, so soil fertility declines and grain output can never be increased.

Following analysis of the aforestated reasons, solution to the problem of increased grain output requires a certain direction of effort.

In addition to acting in accordance with economic laws and correcting production relationships not in consonance with productivity, it is necessary to establish, first of all, an outlook of "grain in a larger sense", and to smash the narrow view that grain is limited to paddy rice, wheat, corn, and such grass family foods, which are predominantly starch. It is necessary to start with human health requirements, and in addition to developing starch to calories, it is necessary also to develop meats, eggs, milk, and fish, which contain animal

protein, and to develop goods that contain vegetable protein, and vegetable fat, as well as vegetables, fruits, and sugars. Therefore, when soybeans and sugerbeets are grown in the northeast, when soybeans and peanuts are grown in North China, when rape and peanuts are grown in southern regions, and when sugercane is grown in South China, they may not be dismissed as not being grain, nor may the raising of fish, crabs, shrimp, and wild ducks in lakes, or the growing of lotus, water chestnuts, Gorgon fruit, and wild rice on the edges of lakes be deemed something other than grain. Furthermore, further serious attention should be devoted to woody oil foods such as tea oil, Chinese chestnuts, walnuts, and persimmons. If one has this outlook of "grain in a larger sense," there will be no further stupidities such as the reclamation of lakes to create fields, the destruction of forests to clear land for agriculture, or destruction of the ecological balance, nor will there by any violation of the laws of planting crops in the soils where they grow best.

Increase in the per unit yields of all kinds of low output fields in the country is a major way to solve the problem of increased grain output. In South China, red and yellow soils and dryland slopes account for 180 million mu form which yields of grain are less than 200 or 300 jin per mu, and even as low as several score jin per mu. Low yield fields such as this have a strongly acidic reaction, so in addition to applications of nitrogenous, potash, and phosphate fertilizers as well as green manure, they need powdered limestone to neutralize their acidity. This is a key measure for increasing per unit yields from dryland crops such as corn, peanuts, pulses, and sweet potatoes. Were some small water conservancy projects to be built so that drylands could be converted to the growing of wheat and rice, and additional fertilizer applied, yields of 800 jin per mu would be easily attainable, Furthermore, in the cold waterlogged fields, the poorly drained fields, and the clayey fields in hilly and mountain gulch regions, most of which are highly acidic and where the daily period of sunlight is short, yields of rice are less than 300 or 400 jin per mu. In addition to using lime, especially needed is the construction around the mountains of flood prevention ditches and drainage ditches in a good system of drainage and irrigation so as to be able to dry out and sun the fields in order to avoid marshy conditions and secondary gleying, and a change to the growing of winter wheat, rape, and broad beans, and the growing in summer of mid-season rice with yields of 800 jin per mu not being difficult. In the numerous low yield fields with accumulations of water in the south where yields are now only 200 to 300 jin per mu, the principle contradiction is also with internal waterlogging and drainage problems, but yields of 800 jin per mu are also possible there.

Most of the low yield fields in North China contain salinized soil. For those that receive large amounts of summer rain in the Huang, Huai, and Hai plains, the key lies in solution to the spring seedling problem including the washing away of salt, avoidance of salt, tolerance of salt, and resistance to salinity whereby yields can be easily increased from 200 jin per mu to 500 jin per mu. For inland dryland areas with salinized low yield fields, field plots should not be excessively large; the ground should be leveled, and the irrigation and drainage systems should be separate from each other. Through the use of the advantages there in sunlight, water, and warmth, it is possible to increase yields of spring wheat from 200 to 300 jin per mu to 1000 jin per mu. There are about 500 million mu of low yield fields throughout the country. If intensively farmed, and given

just the right amount of material and energy investment to increase yields by an average 200 to 300 jin per mu, the annual grain increase would be more than 100 billion jin.

Still another major means to increase yields is to encourage farming methods for use and nurture of the soil, meaning the reverse cropping or rotational cropping of pulse crops and grass grain crops, and dryland crops with paddy rice. The south should curtail its present double rice crop acreage in order to reduce the rotting of early rice crop seedlings in the Yangtze River basin and the crop losses or only half-filled glumes occassioned by autumn rains and low temperatures. Even in southern Guangxi and southern Guangdong where atmospheric temperatures are sufficiently high, some of the double crops of rice should be changed to a rotational cropping system of dryland-wetland-dryland so as to keep the paddy fields from being immersed in water for too long a period of time, thereby preventing secondary sleying. North China should adapt general methods to the local situation in an advocacy of a rotational cropping system of wheat, corn and soybeans, and peanuts. The northeast should exploit its advantages for growing soybeans and rape. In the northwest, spring wheat should be rotated with peas, broad beans, and rape. All these are major ways to increase yields.

In addition, where ecological and environmental conditions permit in the eastern part of the country, woody oil.crops such as walnuts, Chinese chestnuts, persimmons, and large dates (as well as semi-tropical tea oil) should be grown, and in the south fruits such as citrus, lichees, longans, pineapple, and bananas should be developed. In the north, pears, peaches, apples, and grapes should be developed, and all should be regarded as increases in output of foodstuffs.

In the field of increased output of animal foods, major ways in which the country can increase output is to grow beef cattle in the south, yaks on the high plateaus, cattle and sheep in the grasslands of the northwest and along the seacoast in North China, while rural villages raise poultry and hogs, and rivers, lakes, and ponds grow fish. If the 300 to 400 million mu of water surfaces were used to raise fish, with suitable amounts of feed being provided them, figuring catches of only 30 jin per mu, 10 billion jin of protein could be provided.

In summary, solution to the problem of feeding China's 1 billion population requires, first of all, an outlook of "grain in a larger sense," and the way to increased output lies not in emphasis on expansion of the rice, corn, and wheat acreage or on the multiple cropping index but rather in raising per unit yields and giving serious attention to intensive farming. A fundamental problem is implementation of correct policies for the development of agriculture, reliance on policies, reliance on science, and steady heightening of the initiative of the masses to preserve and develop the productivity of agriculture.

9432
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GUANGMING RIBAO ON SCIENCE'S ROLE IN PRODUCTION

OW241226 Beijing XINHUA in English 1215 GMT 24 Apr 81

[Text] Beijing, 2 Apr (XINHUA)--Cotton growers in Shandong Province last year earned an additional 320 million yuan by using a new variety of cotton seed developed through radiation-induced mutation to increase the output of the crop by 50,000 tons, reports the GUANGMING DAILY today. In contrast, the provincial authorities spent only 3.6 million yuan on the Research Institute of Cotton under the Shandong Academy of Agricultural Sciences which developed the new variety, from the founding of the institute in 1959 to 1980. The new variety, named "Lumian No 1" is hailed by the GUANGMING DAILY as a convincing example to show the role science can play in promoting production.

In a front-page editorial accompanying the news report about the variety, the newspaper calls upon the "entire party to pay still greater attention to scientific work." More than 566,000 hectares last year in Shandong Province and approximately 100,000 hectares in Hebei, Henan and other provinces were sown to Lumian No 1. Resistant to adverse farming conditions, it yielded on the average 25 percent more than traditional varieties in Shandong Province.

Shandong is a major cotton grower in China. Work began in 1961 to develop a new variety to replace the degenerating Daizi 15, which was sown in 80 percent of the area for cotton. Thanks to the cooperation of the Institute of the Application of Atomic Energy to Agriculture, another branch of the provincial academy of agricultural sciences, researchers of the Cotton Institute succeeded in developing Lumian No 1 in 1976.

Today's GUANGMING DAILY editorial is the second in a series demanding more attention to scientific research. It calls for more investment for this purpose.

ZHONGGUO QINGNIAN BAO CITED ON AGRICULTURAL SCIENCE

OW241041 Beijing XINHUA Domestic Service in Chinese 1245 GMT 23 May 81

[Report on ZHONGGUO QINGNIAN BAO 23 May editorial: "Be Pioneers in Studying and Popularizing Agricultural Science and Technology"]

[Text] Beijing, 23 May (XINHUA)--Under the headline "Peasants Thirst for Science, Young People Take the Lead in Studying Hard," today's ZHONGGUO QINGNIAN BAO front-pages a number of reports on the study and application of science by young people in the countryside. The reports vividly reflect the encouraging changes in the countryside brought about by implementing the policies of the 3d Plenary Session of the 11th CCP Central Committee. The paper also publishes an editorial entitled "Be Pioneers in Studying and Popularizing Agricultural Science and Technology."

The editorial says: We must rely on policy and science in developing agricultural production. Now that the question of the system of responsibility in production has been basically solved, development and popularization of agricultural science and technology are the key to further agricultural development. This is also the immediate demand of the broad masses of peasants. Therefore, to be pioneers in studying and popularizing agricultural science and technology is a glorious task facing the hundreds of millions of young people in the countryside.

The editorial says: Science and technology are of great importance to promoting the development of agricultural production. The average per-mu output of the superior variety of hybrid rice first successfully bred in our country is generally 100 jin more than that of other varieties of rice. Since the large-scale popularization of this variety, grain output has increased more than 20 billion jin in the past 5 years. The fine variety of "Shandong No 1 cotton" has been praised by the masses as "a ready source of money." Since popularizing this variety of cotton in Shandong, the province's ginned cotton output increased 2.5 million dan, valued at 320 million yuan, in 1 year alone. These are all major developments. As far as minor developments are concerned, it is possible to achieve remarkable results by improving soil, breeding a fine variety of a crop and properly applying chemical fertilizer and pesticides. Particularly in areas where output quotas are fixed on a work group basis and individual laborers undertake to fulfill certain quotas in farm work, whether or not scientific measures are taken and how much production increases have a direct bearing on the interests of individual commune members. The commune members' personal experiences show that "the more scientific farming is carried out, the better."

The editorial calls on the large numbers of educated young people in the countryside to swing into action, conscientiously study agricultural science and technology, vigorously conduct agricultural scientific experiments, vigorously popularize agricultural scientific and technological achievements and to bring about a mass upsurge in marching toward agricultural science and technology.

The editorial points out: Our common objective is to build a prosperous countryside. It is impossible to build communism in a country full of illiterates. Likewise, it is impossible to achieve agricultural modernization in villages that are scientifically and technologically backward. The countryside will become prosperous if all young people there conscientously grasp and apply science and technology. As far as most people are concerned, "It is better to master skills than to have money in the pocket." If we grasp science and technology, we will have the skills to contribute to the four modernizations and to make more contributions to the party and the people. Then, our personal livelihood will improve step by step.

The editorial continues: Some young people think that it takes time and causes delays in their work to study science and technology, thus affecting their income. At the same time, the crying of children and shouting of adults in their households make it impossible for them to study.

The editorial adds: To study it is necessary to put in time and energy. Young people in the countryside have favorable conditions for studying agricultural science and technology because they have an intimate knowledge of agricultural production. So long as they study hard, they can grasp agricultural science and technology even in difficult circumstances. Now all comrades from the central level down to the local levels are concerned about the question of study by young people in the countryside. Broadcast agricultural schools, correspondence schools, evening technical schools, short-term training classes, mobile technical reporting groups and spare-time agrotechnical schools for young people have opened broad avenues for the study and popularization of agricultural science and technology. We must study hard and seriously and persist in doing so for several years in order to master agricultural science and technology.

EXPANDING CONTRACT SYSTEM FOR SCIENTIFIC FARMING EMPHASIZED

Beijing BANYUETAN in Chinese No 14, 25 Jul 81 pp 26-27

[Article by Zhou Changnian [0719 7022 1628]: "'Contract System for Scientific Farming' That Is Worth Popularizing"]

[Text] The Chunwan Commune of Yangchun County in Guangdong Province has an advanced model in scientific farming--the Sanjie production team. For 18 years, the paddy rice planted by this team has always produced high and stable yields and the cost has been low. For example, in 1979 the yield of paddy rice per mu (early and late seasons) reached over 1,920 jin, over 1,000 jin more than that of other production teams. The economic income of commune members was also onefold higher than that of other teams. The local leadership organization summarized their experience of planting paddy rice and called it the "sanjie experience" and tried to popularize it in all other localities, but they were not able to popularize it. In 1980, however, the scientific association and the county scientific committee of Yangchun County signed a "contract for scientific planting" with three production teams to popularize the "Sanjie experience" through the commune's science popularization association; reduced yields were to be fully compensated for and increased yields were to be distributed proportionally. The three production teams happily accepted. After implementation, the paddy rice produced large-scale increases in yield and the costs dropped. At one of the production teams, called "yu ding san," the average per mu yield of early rice increased dramatically from the previous year's 627 jin to 928 jin, and the late rice increased in yield by 51 percent. The costs for chemical fertilizers and farm chemicals dropped, the cost of each dan of rice grains dropped 1 yuan. The per capita average income distributed to commune members increased from 92 yuan the previous year to 154 yuan. Commune members smiled happily.

In recent years, many localities in our nation have implemented the "contract system for scientific farming." Some achievements and experience in agricultural science and technology that could not be popularized for a long time in the past have rapidly been popularized. Science and technology have been directly converted into productivity, and the farmers have applauded the increased yields and increased harvests.

Why is it that the achievements and experience of agricultural techniques that "nobody wanted" are now welcomed? The problem is that in the past it was a habit to popularize them by administrative methods, regardless of whether people could use them or not and without giving concrete technical guidance, and a more important reason was that nobody was responsible for reduced yields. The farmers rely on farming for a living; of course they were not willing to use new techniques about which they were uncertain.

The "contract system for scientific farming" joins the popularization of new techniques with economic benefits and economic responsibility as stipulated by the contracts, so the situation is different. The general methods are: the scientific and technical departments of the county sign contracts with production teams according to the agricultural production needs of the production teams and in accordance with subjective and objective conditions, and issue the contracts through the commune science popularization association (this mass scientific and technical organization is organized by the agricultural technical personnel of the commune, experienced old farmers and various skilled professionals). Agricultural technicians are dispatched and stationed with the production teams, technical measures to increase yields and increase harvests are established in accordance with the actual situation of the production teams, and the technicians teach the production teams to grasp and utilize these measures. If the production team causes a reduction in agricultural yield by the implementation of these measures, the scientific and technical departments pay the compensation. Reduced yields due to natural disasters which could not be resisted are not laid to the account of either side. If there are increased yields, the scientific and technical department and the production team share the surplus proportionally according to the stipulations of the contract. The methods of dividing the increased yields proportionally vary. Some methods provide 30 percent to the scientific and technical departments and agricultural technicians stationed with the production team, and the production team receives 70 percent. Some methods provide that an increased yield of 5 percent belongs entirely to the production team, and that any surplus beyond the 5 percent is equally divided between the two parties. In this way, the farmers will be able to boldly accept new techniques.

Viewing the situation of recent years, most of the scientific farming contracts have been successfully executed. The farmers have increased yields and increased income, the collective economy has been consolidated. When the scientific and technical departments popularized new techniques, some even realized a surplus from the portion that could be retrieved or from total investment, and their enthusiasm in work was even higher. In the farm villages, there is always a group of active persons who enthusiastically study agricultural science and technology. After the contract system of scientific farming was implemented, they joined the commune's science popularization association and they have been able to utilize their talent and develop their skills so their efforts have grown more quickly.

It is hoped that the contract system of scientific farming will be popularized at even more localities!

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RENMIN RIBAO EMPHASIZES AGRICULTURAL SCIENCE

HK280222 Beijing RENMIN RIBAO in Chinese 21 Jul 81 p 1

[Editorial: "Strive To Meet the Peasants' New Demands in Studying and Applying Science"]

[Text] Following the popularization of various systems of responsibility, which pay according to output, the masses of peasants have been very enthusiastic about mastering and studying science and technology. This indicates that a great campaign of the popularization of science and technology is rising in the rural areas and foretells great changes of historical significance in the Chinese countryside.

Marxism-Leninism-Mao Zedong Thought maintains: Only when people directly feel that a new ideology, new theory and new science are inseparable from their livelihood and destiny, will they become interested in them, pursue them and regard them as parts of their life. Millions upon millions of Chinese peasants are celebrated for their diligence and wisdom. They use their own hands to create enormous material wealth and accumulate precious experience in farming. However, in old China they were fettered by the backward production relations and vicious exploitation system. They toiled without enough to eat and wear. It was absolutely impossible for them to be educated and to study and apply science. After the founding of new China, the broad masses of peasants became the masters of their land, which provided them with rights and conditions for receiving education and studying and applying science. In the 1950's and early 1960's, an upsurge of popularizing advanced agrotechnology rose in the Chinese countryside and we achieved great success in this respect. However, due to lack of experience, defects of formalism, and the issuing of confused orders, "doing things in a rigid way regardless of specific conditions" occurred. Under the influence of leftist deviationist errors, agriculture could only develop according to a typical model in China, a very big country, during the "Great Cultural Revolution." This seriously undermined agricultural research and education and the popularization of agrotechniques. Some agrotechnicians did achieve limited results in very difficult conditions. However, little in the popularization of agrotechniques was achieved in many areas, despite the concerted efforts of the agrotechnicians. This was because the peasants had no power to make their own decisions and egalitarianism in the communes, which were larger in size and had a higher degree of public ownership, dampened the peasants' enthusiasm for applying science. It is different now. Linking remuneration with production output is like linking the peasants' hearts, and anyone who works under the system of linking remuneration with production output has to be concerned. This is because the system of responsibility in agricultural production links up the peasants' decisionmaking rights, responsibilities and interests. Now the peasants take the initiative in finding ways to increase production. In the course of practice, they have experienced the truth that production can be increased by the application of science. Therefore, they are eager to study and apply science. Some areas have practiced a contract system for popularizing agrotechniques. They do this by directly linking the results of popularizing agrotechniques with the bilateral interests of the agrotechnicians and peasant households. This has promoted the popularization of agrotechniques. The task now facing party committees and people's governments at all levels is that, while they

must stabilize the series of rural economic policies that have been welcomed by the peasants since the 3d plenary session of the 11th party Central Committee, they should sum up and perfect them. They must also strive to meet the peasants' new demands in studying and applying science. Only by doing this and by giving full play to the role of policies and science can we further consolidate and develop the fine situation in the countryside.

Comrades in Ningxia were right when they said that when cadres go to rural areas now, they must bring along both policies and science. This shows that the peasants have set higher demands on our cadres. Rural cadres at all levels must clearly recognize this new situation and conscientiously acquire agrotechnical knowledge. Earlier, comrades in some areas were worried that the peasants would not obey directives after the introduction of the system of responsibility in production. It is now very obvious that the peasants welcome the method of leading production according to scientific laws and that they will certainly refuse to obey directives that ignore science. If the directives are issued to them arbitrarily, they will on no account welcome some pervasive methods of leadership. Cadres who are welcomed by peasants must have some knowledge of science. By the end of 1980, some agricultural colleges and schools had trained over 16,000 leading cadres above county level. Apart from responsible comrades of various departments and provinces, secretaries of prefectural party committees also attend study classes organized by the State Agricultural Commission and the Organization Department of the CCP Central Committee. Various departments and bureaus in charge of agricultural affairs and a number of provinces are also organizing training classes. It is an unprecedented good thing that such a great number of leading cadres are studying theories, policies and knowledge regarding science and technology. We sincerely wish them greater success in making themselves more educated and also hope that more and more cadres at their posts will manage to find time to study some scientific knowledge. By gradually taking off the label of "illiterates in science," leading cadres will not only win the right to speak in leading production, but will be in a better position to rely on and organize agrotechnicians to popularize agrotechniques among the peasants.

It is the duty of agrotechnicians to popularize agrotechnical knowledge among peasants and promote practical agrotechniques in light of local conditions. According to initial statistics, county agricultural research institutes, agrotechnical popularization centers, seed companies (centers), plant protection centers and farmyard manure centers throughout the country have employed 173,000 cadres who are responsible for the popularization of agrotechniques. In addition we have about 200,000 part-time agrotechnicians. Although their number is not large enough, they are the backbone force for popularizing and spreading agrotechniques at present and in the near future. They are welcomed in the rural areas because they have acquired certain scientific and technological knowledge. In the meantime, the peasants have realized through their practice over the past few years that these agrotechnicians are serving the peasants truly and wholeheartedly and that they are dependable persons who will make contributions to agricultural modernization. The fact that these comrades are warmly welcomed by the peasants has made them further realize the correctness of the party's line, guiding principles and policies, and that they are shouldering a heavier task. They have to do lots of work, such as popularization of scientific knowledge and results, the training of personnel, model operation and on-the-spot guidance, and so forth. Following the development of production and the further implementation of policies, the peasants will set new technical demands in the field of scientific farming and diversified undertakings. By continuing to carry forward the style of arduous struggle and by diligently doing their work well, constantly studying new techniques and raising their professional standards, the masses of agrotechnique promoters will certainly make greater contributions. The party Central Committee recently called on scientists to do their work by linking it with reality and by acting as their own masters. Agricultural scientists and agricultural education workers should plunge into the reality of production in the countryside to seek topics, and make technical and other key problems in agricultural production the important points in their research. It is absolutely necessary to carry out research on the basic theories of agriculture. It was foolish to drive all agricultural scientists to the countryside. This practice should no longer be carried out.

However, agricultural scientists should also realize that all research topics, in the final analysis, come from practice in production and serve production. Agricultural research and education should not be separated from the practical conditions of our country and the actual demands of the peasants. Why did we succeed in breeding hybrid rice and the cotton "Lumian No 1"? Why are they welcomed by the peasants? It is becuase we have stuck to a correct orientation of scientific research. This will be proved by more and more facts.

In order to meet the peasants' demands in science and technology, the system of agricultural research must be readjusted and reformed and the forces of agricultural research must be strengthened. There are quite a number of agricultural research organizations throughout the country, but the number of people engaged in this research is insufficient. The quality of research is poor. Besides they are somewhat scattered, and engaged in duplicate research. The network for popularizing agrotechniques is incomplete. This situation must be changed step by step. We should proceed from the demands of agricultural production in our country to organize people who are engaged in research work and arrange research tasks for the departments of agriculture, forestry, animal husbandry and aquatic products industry. Both division of labor and coordination are needed. We should gradually change the ownership system of the departments and localities. The state and provinces should strengthen the forces of research institutes (departments) so that they will become research units specialized in certain fields. The main task of the county agricultural research centers is to conduct experiments, demonstrate and popularize new techniques and carry out training for technical cadres and the popularization of science. Apart from doing a good job in the investigation of natural resources and differentiating agricultural regions, agricultural departments in various localities should effectively carry out the popularization of the results of key projects in particular.

The peasants' desire for science and technology has also set new demands on propaganda and publishing departments. This newspaper has recently received a large number of letters from readers, complaining that the supplies of books on agrotechnology are insufficient and that these books are not applicable even if available. Therefore, publishing departments should investigate and organize forces to expediently compile and publish various books which meet the peasants' actual needs. Newspapers, magazines, broadcasting and television services in various areas should take advantage of favorable conditions and introduce more agrotechnical knowledge.

Party organizations at all levels must regard meeting the peasants' new demands in studying and applying science as an important part of strengthening the party's leadership over work in the countryside. It is necessary to run rural elementary, middle and agrotechnical schools well, show concern for the livelihood of agrotechnical cadres, support their work and truly rely on them in leading agricultural production. The present agricultural situation in our country is excellent. If we rely on science, the situation in the countryside will further improve. If the situation in the countryside improves, our country's economic readjustment will certainly succeed.

BIOLOGICAL RESEARCH TO MODERNIZE AGRICULTURE EMPHASIZED

Beijing ZIRAN BIANZHENGFA TONGXUN in Chinese No 4, 10 Aug 81 pp 32-35

[Article by Guo Xingxian [6665 5281 0341] of the Department of Biology of the Chinese Academy of Sciences: "Biological Research Must Better Serve Agricultural Modernization"]

[Text] During the course of implementing the academy's guidelines of "emphasizing the foundations, emphasizing improvement to serve the national economy and national defense buildup" by the biological research units of the Chinese Academy of Sciences, there are many problems that require discussion and study. One of the problems is how to better serve agricultural modernization. Our academy's biological sciences department has 26 subordinate research institutes, and in the 1980 research plan one-third of the topics was directly or indirectly related to agriculture. But in recent years the topic of serving agriculture has been mentioned less and less. At the same time, applications research into topics serving agriculture has tended to weaken. Therefore, in implementing the guideline of "two emphases, two services," serving agricultural modernization better is a question worth noticing.

A Simple Analysis of the Various Research Achievements

Through coordination and cooperation with brotherly units outside the academy, a series of achievements related to agricultural modernization have been realized in recent years and they can be analyzed according to the various categories.

Basic Research. Basic research in biology directly and indirectly serving agriculture can be divided into two groups. One is survey and research into biological types, distribution, evolution, kinship and natural conditions, i.e., the accumulation and compilation of basic data. Of course, this also includes theoretical research. The other is basic theoretical research. The work of basic data is important. It should be gathered during ordinary times so that it can be brought out when it is needed for use, and this work should lead production and construction. The task of basic data research in biology is extensive: it includes the compilation of China's fauna, flora, spore flora, economic entomological record, special books on mapping of vegetation on soils, etc. The basic data can serve agriculture in many ways, such as the protection of nature and resources, land utilization, and agricultural zoning; primary material for biological breeding, prevention and control of diseases of humans and of domesticated animals; prevention and control of plant plant diseases and insect pests--they all need related basic data to serve as their scientific basis. For this basic data work, our academy has organized national

cooperation to carry out surveys, arranged and compiled data, and published items of important systematic data one after the other. For example, compilation of the national flora has progressed rather quickly in recent years: 37 volumes have now been published or completed and we are striving to complete 80 volumes by 1985. This will provide preliminary clarification of the origin of about 30,000 types of higher plants. In recent years, our academy has strengthened the study different types of forests and grassland ecology in Jilin, Nei Monggol, Guangdong, Yunnan, Qunghai, and Cinjiang; to carry out long-term observations and research; and to strengthen the link between theory and the actual situation, combine the far and the near, and accumulate a systematic scientific record. In recent years, some major national economic construction projects have been the subject of debate in scientific and technological circles, such as the question of whether to build a fish passageway through the Gezhou Dam spanning the Changjiang in order to protect the aquatic resources. The Marine Biology Institute studied mainly the regional systems of fish and individual ecology on the basis of 20 to 30 years of survey and research data. The institute suggested that it is not necessary to spend a lot of money to invest in the building of a fish passageway, and it proposed measures that can be taken to protect fish resources. This suggestion prompted the government to conduct further surveys and research so as to avoid a premature decision on the construction of a fish passageway.

Basic theoretical research can make major and profoundly significant contributions to agriculture. For example, the study of photosynthesis, the chemical simulation of biological fixing of nitrogen, the utilization of cell engineering and genetic engineering to create agricultural crops with especially large economic value (including tree varieties and grass varieties), new types and new varieties of domesticated animals and microorganisms are all long-term and highly exploratory subjects of basic theoretical research. If a breakthrough is made in such research, we can turn to applications research, and this will bring about revolutionary changes in agricultural production. Take chemical simulation of biological fixing of nitrogen as an example: starting out from the study of the material basis of the function of nitrogen-fixing bacteria--the structure and the function of nitrogen-fixing enzymes--we can use the method of chemical simulation to create new types of catalysts, i.e., jumping from the commonly used synthetic ammonia catalyst that requires high temperature and high pressure at present to a catalyst effective under temperate conditions and to one effective directly under near normal temperatures and normal pressure. If research in this is successful in the future, its tremendous influence can be imagined. During the past 10 years, our academy has organized cooperative efforts together with some universities and research units of the chemical industry system and has realized some internationally advanced-level achievements in nitrogen-fixing enzymes and simulated chemical compounds. Again, for example, in the study of the nitrogen-fixing genes of nitrogen-fixing bacteria, the Shanghai Plant Physiology Institute discovered two new nitrogen-fixing genes and contributed to the molecular genetics of nitrogen-fixing. For this type of basic theoretical research which has possibilities for future production, we must be farsighted, we must have courage, and we must have the stamina to persist and to continue the effort.

Applied Research. Applications research can also be divided into two groups. Some basic research efforts, when they have progressed to a definite stage, can be linked to actual production, and new applied research can be opened up. This means that basic applied research can open up new ways for new materials, new methods and new techniques. When talking about new techniques of breeding, we have utilized

the new methods and new techniques of theories and methods of genetics and cytology to develop pollen culture, isolated female propagation, cultivation and detoxification using the tips of the potato stems to produce nontoxic stock seeds, transplanting the fertilized ovum of domesticated animals using the techniques used in transplanting the cell nucleus to cultivate hybrid fish of different genera or subfamilies of fish. Some of these already have established methods and some have already produced new varieties. In hormone research, we have mainly utilized new advances in biochemistry and physiology to develop oxytocin, sex hormones for many kinds of domesticated animals, insect moulting hormone and juvenile hormone, and information hormones for many kinds of insects or sex hormones, all of which have been used in production. For example, luteinizing hormone-releasing hormone and similar substances are widely used in stimulating sexual activity and ovulation of domesticated fish; they have more effectively solved the problem of artificial cultivation of fish fry of domesticated fish in our nation, and such efforts have attracted great international interest. The sexual exogenic hormones of the dendrolimus punctatus and the meadow caterpillar have been separated, isolated, purified and artificially synthesized. Similar work has not been reported by foreign nations yet. In virological research, we have established serum diagnostic techniques such as coagulation by the principle of conversion and tagging of enzymic union, and we have helped many provinces and cities to determine and discover many new pathogens. We have also developed methods of prevention and control in diagnosis, prevention and control of the weak plant line of the mosaic viral disease of tobacco, preparation of the heliothis nucleopolyhedrosis virus, viral insecticide of the mulberry caterpillar, and the polyhedrosis virus of the domesticated silkworm. In addition, a multiple antimycin antibotic has been successfully developed. It possesses a broad spectrum and is effective against many types of diseases. On the basis of physiological and ecological studies and the regional systems classification of algae and in combination with the needs of production, seven types of nitrogen-fixing blue green algae that propagate quickly, that fix a large amount of nitrogen, and that have a strong adaptability have been selected and successfully popularized over large areas in Hubei for many years, and they have opened up new sources of fertilizers for the rice fields. The achievements in these fields of research have mostly been developed and realized first by our academy within our nation, and like basic research, they have manifested the unique character of the Chinese Academy of Sciences. But we should also realize that although a fairly large part of these achievements has joined the ranks of internationally advance achievements, these fields of research have mostly been created abroad, showing that the level of our nation's biology is still not high, basic theoretical study still has to be strengthened. At the same time, it may also be possible that some basic theoretical researchers do not take the initiative to connect their own research with actual production, thus burying the research fields or topics which could be connected to actual production. Attention should be given to this.

There is another type of research that specifically aims at problems now existing in agricultural production and that it studies and solves concrete production tasks. For example, soil fertilizers, agricultural zoning, surveying of wasteland, improvement of high-yielding paddy rice soil, manufacturing pelletizers for ammonium bicarbonate, studying trace elements, improving saline and alkaline soil, forestation, planting grass, and stabilizing sand have all served a function in production.

In breeding there are multiple spike corn and soybean disease-resistant varieties. In plant protection, an organic phosphorous insecticide phoxin that is highly efficient, has low toxicity, and has a broad spectrum been developed, and it has produced outstanding results in the prevention and control of lepidoptera and coleoptera insect pests. Through the study of the ecology of harmful rodents in grassland, a new and effective method of exterminating the rodents has been proposed. The study of high and stable yields of cultured fish in Donghu in Wuchang has resulted in the proposal of key measures to increase the yield. The study of fermentation of methane in farm villages has led to the proposal of a series of measures to utilize the raw materials and to increase the percentage of production of methane gas. The study of plant resources has led to the successful introduction from abroad over the past 10 years of more than 40 varieties of plants, including the cyamopsis tetragonoloba which has important economic value, and the survey and discovery of many types of domestically produced wild plants that have important economic significance. The simulation experiment of many kinds of tropical plant colonies of the rubber-tea multiple strata has been successful and has been popularized. Such applied research has tended to become weaker in recent years and we must give it attention. For example, comprehensive control of drought, waterlogging, salinity and alkalinity in the Huanghe, the Huai River and the Hai River; water and soil retention in the middle reaches of the Huanghe; the ecology of harmful insect pests and comprehensive prevention and control; the physiology of agricultural crops and measures to increase yields--all these major achievements were realized before the "cultural revolution," but now this type of research is not grasped as tightly as before.

Developmental Work. Some of the research achievements mentioned have been handed over to the agricultural and forestry departments, some can be directly popularized and utilized, and some must be coordinated with the local agricultural science research units and the people's communes so that they can participate in the development. In recent years a lot of developmental work has been done. For example, the propagation of virus-free pedigree potato seeds has won the support of the agricultural departments, and a pedigree seed farm has been established with the cooperation of such units as the Agricultural Science Institute of the Ulanqab League of Nei Monggol and in particular with the localities. Again for example, ammonium bicarbonate easily evaporates and easily cakes, the loss of fertility is great, and the application is inconvenient. The Nanjing Pedology Institute handed its research achievement and ideas to the Jintan Farm Tools Plant early and developed a pelletizer, making it convenient for deep application and for increasing the effectiveness of fertilization. With the support of the State Planning Commission, the institute and the plant joined with the Ministry of Chemical Industry to hold a nationwide field conference and ogranized batch production and popularization. The development of nitrogen-fixing blue green algae, development of the diagnostic method of soil nutrition and the diagnosis box, and the fermentation of methane gas were carried out early and well, on the one hand because of the attention paid to them by concerned scientific and technical personnel who actively went to the frontline of production to work, and on the other hand because of the massive support by the concerned departments which undertook the organization and leadership. Achievements in scientific research are not easily obtained, it would be a pity if they could be applied in production but still were not popularized. Now, many achievements still have not been popularized or are still not fully popularized and applied; this is a widespread problem.

Related Problems That Require Attention and Solution

In order that biological research can better serve agricultural modernization, the following problems must be handled well.

Increase the Understanding of Serving Agriculture. We must fully understand that our nation has 1 billion people, including 800 million farmers, and the national foundation is weak. Biology is a basic science among the agricultural sciences. In "the two services," biological research should in particular conscientiously implement the guideline of taking agriculture as the foundation in developing our national economy. The situation in the farm villages at present is good, the problem of the agricultural production responsibility system has basically been solved, the productive enthusiasm of the farmers is very high, and the farmers urgently need science. At the same time, our nation's strength in agricultural science is weak and agricultural science is relatively backward. Therefore, biological workers must face this fact and the need, increase the enthusiasm to serve agriculture and to contribute appropriately toward the modernization of agriculture. This is a glorious task that must not be shunned.

Correctly Recognize the Proportion and the Relationship Among the Three Types of Research. The guideline of "two emphases, two services" must be treated dialectically. Basic research and applied research are mutually connected, mutually promoting, and mutually convertible. For example, the synthesis of oxytocin of domesticated fish, the luteinizing hormone-releasing hormone and similar substances were the results of possessing the basic level theoretical research achievements of artificial synthesis techniques, and the development toward the new field of applied research of polypeptide synthesis and obtaining a series of polypeptide hormones for agricultural and medical use. They have been welcomed by the production departments, and some have even attracted great interest internationally. During the course of broad application of the luteinizing hormone-releasing hormone, some new theoretical problems which require solution have also been discovered; for example, the question of the structure of LRH in fish and the point of action of LRH in the central nervous system. The Academy of Sciences, as the highest academic natural sciences organization in the nation, undoubtedly should carry out additional basic research. Biological workers engaged in basic research can dedicate their whole lives to research; at the same time, when some basic research efforts develop to the stage where they can be converted to applied research, then this conversion should be advocated and encouraged, especially those basic research projects which can open up new fields of application. Applied research carried out by biological research units constitutes about half of all research efforts, and most of it is related to agriculture. Applied research should mainly be based on the needs of agricultural modernization to study and solve major scientific and technical problems of a key nature. In recent years, applied research serving agriculture has tended to lessen. At the same time, among the subjects serving agriculture, there are more requiring long periods of exploration and less which can be applied in the short term. In addition, there are few major comprehensive scientific and technical problems being studied. This is an important problem of the task of readjusting the direction of research. Whether in basic research or in applied research, the Chinese Academy of Sciences must insist on "the two emphases" before "two services" can be realized better. "Two emphases" must take the international level as the standard, but we must also start out from the actual situation in our nation; we cannot deviate from the actual situation and condition in our nation.

Emphasize Developmental Work. In lot of scientific research achievements, when they are moved from the laboratory and experimental fields to the large fields or the factories, because of different situations and conditions there is frequently a progression of research, a process from imperfection to gradual perfection. This type of developmental work frequently requires direct participation by the scientific and technical personnel before the research results can be converted to productivity. Developmental work is frequently complex and difficult because it involves our nation's level of production, economic conditions, coordination between departments and regions, the working level of popularization system, the farmer's cultural level and various similar factors. The difficulty of agricultural popularization even affects some scientific and technical personnel who are not willing to engage in applied research related to agriculture, and of course this also affects their enthusiasm in participating in developmental work. To better serve agriculture, we cannot unilaterally emphasize that developmental work pertains only to the agricultural departments, we must not retreat in the face of difficulties, we must enthusiastically apply research results in production according to need. We must conscientiously help research personnel engaged in developmental work to solve their actual difficulties. There are more difficulties in field and farm village work: scientific and technical personnel must increase their conscientiousness and enthusiasm in going into the billages and the fields to work. At the same time, scientific management personnel must help solve the actual difficulties, such as working conditions, living conditions, family care, operations and foreign-language learning periods.

Research Results Serving Agriculture Must Be Properly Evaluated. The research achievements that have possibilities for application cannot be simply evaluated by the standard of the papers submitted: their results in production or their future for application and economic significance must be sufficiently observed. We must also see the hardships of applied research work in agriculture; to truly obtain achievements that have important applicable value is not easy. In evaluating the research grades for promotion of scientific and technical personnel who work in the fields or in farm villages for long periods, we must not give too much consideration to their foreign-language level.

In summary, from the standpoint that biology is the basic science of agricultural sciences, from the standpoint of implementing the guideline of realizing national economic development on the basis of agriculture, from the standpoint that the 800 million farmers now urgently need science, from the standpoint that our nation's agricultural sciences are relatively backward, and from the tendency of recent years toward a weakening of biology to serve agriculture at our academy, our academy's biological research should strengthen its service to agriculture; this is very necessary. Each scientific discipline must fully develop its special ability, develop potential and make more and greater contributions. Biological workers must divide the work between themselves and agricultural science workers, coordinate with them closely, and walk ahead of research in agricultural science. This is predetermined by the nature of the scientific discipline, this is the need for division of scientific discipline and coordination; in this way, the advantages can be developed and the shortcomings can be avoided, the superiority can be developed, the unique characteristics can be domonstrated, and this can better serve agricultural modernization.

Several general opinions in accordance with the actual situation of the various research efforts are presented below for reference.

1. For workers participating in research into basic data in the course of investigating and studying the processes of nature, observation and understanding of nature are the fundamental work and purpose, there is no doubt about this; here, the workers must also pay attention to connecting theory with the actual situation, increase the level of basic data, and they must also take the initiative to care about and study the present problems in agricultural production and the future of the development of agricultural production so that they can present opinions or suggestions.

2. Over the past several decades, basic theoretical research in biology has progressed rapidly internationally at a rate of development that has not been seen before. At the same time, a number of rich and varied new ways, new methods and new techniques with important applicable values in medical sciences and agriculture have been opened up by progress in basic theoretical research. The Biology Institute of our academy must continue to strengthen basic theoretical research, and at the same time, we must convert the domestic and foreign achievements in basic theoretical research, including achievements in the various phases of research, to applied research in time in order to open up new fields, fully develop the characteristic of biology as the scientific foundation of agriculture and to walk one step ahead to contribute what biology should.

3. As biology serves agriculture and while implementing the "two emphases," the combination of the long term and the short term must also be handled well. Specifically, in the actual situation of the various aspects of the nation at present, the situation requires that we correctly handle this problem. Biological workers must care about the problems that exist in agricultural production at present, especially the major problems of science and technology of a key nature. We must develop the superiority of our academy of being multidisciplinary, of having many technical arms and being comprehensive. We must strengthen the topics of applied research that can produce short-term results in order to better serve agriculture in time.

4. We must strengthen the necessary developmental work and utilize the research results in production as early as possible. We must organize the existing and related research results, conduct surveys and research, and propose measures to hasten popularization. Some results must be further researched, some achievements still have not been popularized, and some results have been popularized but progress is not rapid; this involves many actual problems, and scientific management personnel must take the responsibility for opening up the situation together in order to help solve the problems and difficulties in popularization work.

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'SHIJIE JINGJI DAOBAO' DISCUSSES AGRICULTURAL DEVELOPMENT

HK150958 Shanghai SHIJIE JINGJI DAOBAO in Chinese No 57, 2 Nov 81 p 2

[Report from Beijing: "The Most Important Measures in China's Strategy for Agricultural Development"]

[Text] "In the past, the erroneous leftist policies of promoting a unitary economic element and an unitary management form were important causes of our failure to achieve rapid development of agriculture in China." In his comprehensive analysis of China's strategy for agricultural development made at a recently held large symposium, Zhan Wu, director of the agricultural economics institute under the Academy of Social Sciences of China, noted that such policies had done great harm. He also called for establishing a structure in which collective ownership holds the dominant position and coexists with various economic elements, management forms and production responsibility systems. This is the most important measures in China's strategy for agricultural development.

At present, our country's academic circles are having lively discussions on issues concerning agricultural development strategy. Zhan Wu has put forward his tentative plan to ensure the realization of the goals in China's strategy for agricultural development.

Respect Proprietary Rights and Self-Management Rights in the Collective Economy. Allow Peasants to Voluntarily Choose a Management Form.

To define the adoption of the collective economy as the principal part of our long-term and stable strategy while actively developing state-operated agriculture and household sideline production and allowing the existence and development of individual farming in given conditions, is of great importance to the strategy for agricultural development. It is also imperative to respect proprietary rights and self-management rights in the collective economy, allow peasants to voluntarily choose a management form, allow the crosswise integration of different types of economies and allow the coexistence of diverse forms.

The coexistence of the public economy and household sideline production for a long period is inevitable. Their coexistence means that they can work in coordination on a reciprocal basis. Household sideline production can play an important role that cannot be replaced by the public economy. We should increase the proportion of household sideline production in agriculture.

Referring to foreign economies, Zhan Wu noted: there are three economic forms among the Soviet Union and Eastern European countries; the economic form with the state-owned economy as its main part (the Soviet Union); the economic form with the collective economy as its main part (Hungary); and the economic pattern with the individual economy as its main part (Poland). Practice has proved that the Hungarian economic form with the collective economy as its main part has achieved better results.

Abandon the Predatory Form of Management and Establish a Good Agricultural Ecosystem

We must conscientiously adopt the viewpoint of an ecological balance in directing all agriculture (including farming, forestry, animal husbandry and fishery) and gradually transform vicious circles into beneficial ones. From a long-term point of view, this approach will be one that is characterized by small investments and greater returns.

We should comprehensively implement the policy on simultaneously developing farming, forestry, animal husbandry, sideline production and fishery. Farmers must completely abandon the predatory form of management, implement the principle of paying equal attention to both using the soil and nourishing the soil, and properly apply crop rotation and reverse cropping. Farmers must also attach importance to integrating modern science and technology with traditional farming and to the integration of organic farming and inorganic farming. By doing so, our country's agricultural development will be characterized by low consumption, low costs and great beneficial results.

Our country's current percentage of forest cover is 50 percent lower than the average world level. It will take great effort to raise China's current 12.7 percent of forest cover to 20 or 30 percent by the year 2000. At present, the crux of the matter is that we must put the stress on planting forests to be utilized as fuel and fast-growing timber forests so as to meet the peasant households' demands for firewood and timber. This is where we can open a speech to terminate vicious ecological cycles. An effective way to quicken the pace at which trees are planted everywhere is to arrange specialized afforestation contracts including contracts made with specialized households for afforestation and forest protection. Those barren hills which the state-run or collective units are unable to open up should be given to commune members as hills for their personal use so as to mobilize every household to engage in afforestation.

Nearly half of our country's pastures have deteriorated due to exceeding the stock capacity and our neglecting the building of pastures. From now on, we must strictly set stock capacity limits, establish a pasture responsibility system or assign pastures for the personal use of commune members.

In our reservoirs, we should develop fish farming and plant water caltrops so that aquatic products can feed on one another.

Our offshore and freshwater fishing resources have suffered astonishing sabotage. The way out for our fishery at present and for quite a long time to come lies in artificial breeding. We must implement the principle of integrating breeding with fishing, with the emphasis on breeding. We must stipulate restricted fishing times and restricted fishing zones so as to protect our offshore fishery.

Readjust the Unitary Ecological Structure of Agriculture. Restore Our Rural Economy's Organic Relationships

On the basis of maintaining a stable increase in the total grain output, we must gradually increase the proportions of industrial crops, forestry, animal husbandry, sideline production, fishery, industry, commerce and transportation in the value of output, the area of land utilized and the disposition of labor. Thus, we will be able to establish a rural agricultural economic structure in which there is a close integration of grain and industrial crops, farming is closely integrated with forestry, animal husbandry, sideline production and fishery, and there is combined development of farming, industry, commerce and transportation.

During the 1979-1980 period, although over 60 million mu of farmland had been switched from growing grain to growing industrial crops or planting trees, the total grain output during this period reached the highest level in the history of the PRC. This has proved that the above-mentioned guiding principles are completely feasible.

We should make use of farming's reciprocal relationships with forestry, animal husbandry, sideline production and fishery in order to quicken the pace of developing agriculture and particularly the pace of developing forestry, animal husbandry, sideline production, fishery and other diversified undertakings. The unified management of the production, the processing, the sale and the transportation of agricultural products is essentially aimed at changing disjointed rules and regulations of the irrational management systems and restoring the dialectical relationships inherent in these sectors of the rural economy. This is a strategic measure to rationalize our rural economic structure and our rural management system.

Restore Our Socialist Agricultural Commodity Economy and Establish Agricultural Products Bases

At present, our country's net agricultural commodity rate is only 30 percent while the average net agricultural commodity rate in developed countries is over 90 percent. Compared with developed countries, we still have a long way to go.

In order to develop commodity production, first of all, in making overall production arrangements, we must gradually realize regional, specialized and intensive management and establish agricultural products bases; secondly, we must devote major efforts to developing a diversified economy and agricultural product processing industries and support the development of specialized households and their integrated units.

The so-called "chopper-whip policy" for purchasing agricultural products—when there are not enough agricultural products, "the whip is used for gathering together enough agricultural products"; if there are too many agricultural products, "the chopper is used for chopping off surplus agricultural products"--has been a great obstacle to the development of a commodity economy. This shows that reforming the circulation system and structure is a task which brooks no delay.

Attach Importance to Investment in Education and Change the Rural Situation in Which Educational and Scientific Levels Are Low and Technological Management Is Bad

To realize the modernization of agriculture, we cannot just pay attention to intensifying labor. What is more important is to pay attention to intensifying technology and scientific knowledge.

Our past neglect of investment in education has had serious consequences. The current educational and scientific levels and the current management standard of the broad masses of commune members and cadres at the basic level are very low. Moreover, 30 percent of our rural youngsters and people who are in the prime of life [aged between 30 and 50], are illiterate. These are great difficulties in developing our rural technological forces.

At present, we must do well in eliminating illiteracy, reform our agricultural educational structure and system and strengthen secondary technical education and the spare-time technical education for peasants.

CSO: 4007/130

COMMENTATOR ON SCIENCE, AGRICULTURAL PRODUCTION

HK100839 Beijing RENMIN RIBAO in Chinese 8 Dec 81 p 3

[Commentator's article: "With Agriculture Relying on Science, the Emphasis Is on Popularization"]

[Text] The development of agriculture relies on policies and science. This is an important policy decision made by the CCP Central Committee and the State Council. While gradually perfecting the various forms of responsibility systems, we must at the same time conscientiously settle the question of the reliance of agriculture on science.

The reliance of agriculture on science involves many fields and there is a lot of work to be done. Departments concerned with agricultural science and farming techniques and leadership at various levels in the countryside must at present put the emphasis on popularizing the existing achievements of agricultural science and farming techniques.

As a result of the efforts made by the broad masses of researchers in agricultural science over the years, our country has already accumulated some achievements in agricultural science and technology. Many of them have already been popularized and applied, but looking at the country as a whole, the work of popularization and application is still not very ideal. According to the statistics of departments concerned, even in those areas in which popularization has been properly carried out, only about half of the existing achievements have been popularized and applied. In other areas, generally, 70 to 80 percent of the achievements have still not been applied in production. At the same time, the masses of peasants have an urgent need for science and technology, and they long for the agricultural scientists and technicians to help them in scientific farming and in scientific development of a diversified economy.

The success of the work of popularization will not only satisfy, as quickly as possible, the need for the peasants to study science and technology and enable the existing scientific and technological achievements to quickly produce economic results, but it will also give an impetus to agricultural research.

Whether or not an achievement can be popularized depends on whether or not it can produce good economic results and whether or not it is welcomed by the peasants. This requires the personnel engaged in agricultural research to go deep into production practice, select a proper research subject and produce a really mature and first-rate achievement. The reasons why the improved strains of "long-grained hybrid rice" and "Shandong cotton No 1" can be popularized over an extensive area within a short time are their outstanding economic results and their keen reception by the peasants. An important reason why many of the scientific and technological achievements cannot be popularized at present is that they are divorced from the actual needs of the peasants or because they are not first class and cannot be fitted into the system. Therefore, placing the emphasis on popularization will not only be a test for agricultural research, but will also provide an impetus to agricultural research.

China has 270,000 agricultural scientists and technicians at present, and about half of them are mainly engaged in the work of popularizing agricultural techniques. There are also several hundred thousand personnel partly released from productive labor engaged in popularizing agricultural techniques and nearly a million peasant technicians. In the past, because we had for a long time practiced the policy of "everyone eating from the same big pot," the peasants had no enthusiasm for studying and applying science and thus the role of these agricultural scientists, technicians and popularizers also could not be brought into play. Now, with the implementation of the production responsibility system, these people have become much sought after. However, they still experience a great many difficulties in actual work and they still lack scientific organization. To make a success of the work of popularizing the achievements of agricultural science and technology, we must urge leadership at various levels in the countryside to conscientiously study and solve these problems so that the enthusiasm of the personnel engaged in popularizing agricultural techniques can be brought into play and so that a scientific system of popularizing agricultural techniques can be gradually set up.

The work of popularizing is a key link between research and application. If this work is not properly carried out, regardless of how many or how good the achievements may be, they cannot be translated into actual production. We must get rid of the viewpoint of despising the work of popularizing and strengthen the ties between the research units and the departments in charge of popularizing. Generally speaking, agricultural research units have greater technological capabilities and are more conversant with various key measures for increasing production and knotty problems in production. Personnel who have been engaged in the work of popularizing agricultural techniques for a long time have accumulated a great deal of experience and they understand the local conditions of agricultural production and the needs of the people. They must learn from and help each other and work together. Departments in charge of popularizing should consult research departments on their own initiative regarding the new achievements and techniques already affirmed and popularized. Research departments should also actively participate in the popularization and dissemination of technology, provide technical training and make a success of the work of popularizing techniques together. In short, we must resolutely overcome the phenomenon of research and popularization splitting up, not communicating with each other and working separately.

Agriculture relies on science, and the emphasis is on popularization. Once this objective has been defined, departments concerned with agricultural science and farming techniques, agricultural colleges and schools and the broad masses of agricultural scientists and technicians at various levels will be able to work with one heart and fully bring their abilities into play, and a new situation will appear in China's agricultural production.

WAN LI STRESSES AGROTECHNOLOGY POPULARIZATION

OW050229 Beijing XINHUA Domestic Service in Chinese 1257 GMT 4 Jan 82

[Text] Beijing, 4 Jan (XINHUA) -- Comrade Wan Li said today: A very lovely and gratifying situation is now emerging in our rural areas. Many peasants have realized, from production experience, that science and technology is a productive force, and they want to study and use science. Party committees at all levels and scientific and technical circles should fully recognize this situation, stay ahead of it, lead the peasants in acquiring scientific and technical knowledge and promote an excellent situation.

Comrade Wan Li made these remarks when he met participants in an experience-exchanging meeting on agricultural (including diversified undertakings) and technical contracts now being held. Responsible persons of concerned ministries and commissions of the State Council and some agricultural specialists were present.

Comrade Wan Li said: I am all for summing up experience in the responsibility system of agricultural-technical contracts and I hope that this activity can be continually improved and popularized on the basis of experience. He said among the 10 principles for our country's economic construction, the first is to develop agriculture. Unless agriculture is given first priority and made the foundation, the four modernizations are out of the question. The development of agriculture will rely on correct policies and on science. Policies are also science, that is, social science. In a word, we must rely on science to develop agriculture, solve the problems of feeding and clothing 1 billion people and of China's economic development.

Comrade Wan Li said the Chinese peasants have accumulated a wealth of production experiences. Scientists should integrate with peasants, combine our country's traditional agricultural technique and experience with modern science and technology and blaze a new trail for agricultural modernization suited to China's conditions.

He said: Do not look down on technical experts and skilled craftsmen among the peasants. They, and specialized scientific and technical personnel graduated from institutions of higher learning, plus a considerable number of middle school students, constitute an important agrotechnical force. We should get them organized, in various ways, to jointly tackle key scientific and technical problems and put their knowledge to use where most needed for agricultural development. The government should give material support.

Comrade Wan Li especially stressed the importance of popularizing agricultural science and technology. He said now that the peasants' enthusiasm for production has been aroused, they also need a scientific approach. We should adopt different methods to energetically popularize agricultural science and technology so that those who exercise leadership over agriculture and those actually engaged in agricultural production will both have a certain amount of scientific and technical knowledge in agriculture.

At the meeting, Comrade Wan Li was briefed by the participants on the development of agricultural-technical contract activities.

III. Scientific Organizations

GUANGDONG GIVES FIRST MATERIAL REWARDS FOR SCIENTIFIC ACHIEVEMENT

Guangzhou NANFANG RIBAO in Chinese 21 Sep 80 p 1

[Article: "Guangdong Province Institutes Material Rewards Throughout the Province for the First Time for Scientific and Technical Achievements. Provincial Science Commission Yesterday Convened an Awards Issuance Meeting of the General Membership to Issue Awards for "Guichao" Superior Rice Variety and for 147 Outstanding Scientific and Technical Achievements, and to Commend Three Units Including the Provincial Testing and Analysis Institute as Advanced Research Units"]

[Text] The Provincial Science and Technology Commission yesterday convened a province-wide meeting of the general membership in the Guangdong Hall of Science for the issuance of awards for scientific and technical achievements. Awards were made for 147 outstanding scientific and technical achievements during 1978 and 1979, and to three advanced research units. The 325 units that participated in this research received certificates of honor, and 867 scientists and technicians received certificates of accomplishment and reward money. This marks the first time that province-wide material rewards have been made for scientific and technical accomplishments.

Since the All-China Science Congress, the broad masses of scientists and technicians in Guangdong Province have liberated their thoughts and applied their wisdom and creativeness to contribute to four modernizations construction so that large numbers of accomplishments in science and technology have emerged, and the quality of scientific research has improved markedly. The categories for which rewards were made on this occasion were all of advanced levels for the province for which results in application were quite good. Following recommendations from various departments in each prefecture, municipality and the province, plus appraisal by others in the same lines of work, the Provincial Science Commission approved issuance of the rewards. Of the total number, 25 were in the field of agriculture, 102 in industry, and 20 in medicine and health. Ninety-five percent resulted from applied research, and some have shown remarkable economic benefits. China was first to pioneer some of these achievements, or hold a leading position in them. First prize went to Huang Yaoxiang [7806 5069 4382] and colleagues at the Provincial Agricultural Academy's Paddy Rice Institute for the breeding of a new rice variety, "Guichao." This is a new variety that produces abundant yields and is best for use as either an early or late crop variety, which has been bred in

Guangdong Province since the 1960's. Currently the area to which its cultivation has spread amounts to one-third the total cultivated rice area in the entire province. Eleven second class awards went to the following: the Silk Industry Institute of the Provincial Agricultural Academy for its erhuaxing [0059 0553 1840] variety of silkworm, "Guangnong No 5"; the Provincial Insect Institute's taxonomical research on lijingui [7787 6855 7898]; the Provincial Marine Transportation Institute, the Shanghai Boat Institute of the Communication's Department, the Wenchong Boatyard, and the Huanan Engineering Academy's shipbuilding department for their hinged blade [7070 0430] ship propeller; the Guangzhou Alloy Steel Plant for its tungsten 12 aluminum high-speed aluminum casting cutting tool; the Guangzhou No 3 Rolling Mill and the Guangzhou Municipal Alloy Institute for their inductor fixed type industrial frequency heat-hardened machine tools; the Guangzhou Ferrous Metals Research Institute of the Metallurgy Department, the Shaoguan Smelting Plant, the Provincial Metallurgy Design Institute, and the Maba Smelting Plant for their flue gas dianluo hefa chugong [4290 4820 0678 3127 7110 3074]; the Huanan Engineering Academy for its ferrite inductive loading (method); the Shaoguan Prefectural Industrial Institute, the Shaoguan Instrument Plant, and the Shaoguan Gear Plant for their large aperture raster numerical display device, and their raster numerical controlled precision forging machine; the Provincial Cardiovascular Diseases Institute, and the Cardiovascular Care Department of the Provincial People's Hospital, the Guangzhou Ferrous Metals Research Institute, the Zhongshan University's Biology Department, the Guangzhou Municipal No 1 Knitting Mill, the No 22 Plastics Plant, the Meat Processing Plant, the I-type Biological Heart Valve from the No 7 Knitting Plant, the Liwan District People's Hospital in Guangzhou, the Shantou Sensitometer Plant, the Guangzhou Photographic Chemicals Plant's Rapid X-Ray Kinescopes in Fully Lighted Room; and the new method of torsiocalculations of the Guangzhou Marine Navigation Bureau's Science Institute. Forty-five items were awarded third class awards, and 90 received fourth class awards. Cash awards of 2000 yuan, 1500 yuan, 1000 yuan, and 500 yuan respectively were given for accomplishments in each of the four classes of awards. The Guangdong Provincial Testing and Analysis Institute, the Guangzhou Municipal Pharmaceutical Industry Institute, and the Shaoguan Prefecture Industrial Institute, who had many accomplishments, were designated advanced units, and each received 5000 yuan worth of research materials as awards.

Attending yesterday's awards meeting were famous scientists Pu Zhelong [5543 5832 7893], Pang Xiongfei [1663 7160 7378], and Lin Ping [2651 1627], as well as more than 800 people from everywhere, including the Municipal Science Commission and officers in charge in provincial departments concerned. Deputy Province Chief and Provincial Science Commission Director Ye Xuanping [5509 6693 1627] spoke at the meeting, giving high praise to the arduous work of scientists and technicians throughout the province, and stressing the need for good management of the scientific and technical accomplishments so that these accomplishments will be spread widely and rapidly and be put to use. The Provincial Science Commission also announced at the meeting that henceforth scientific and technical accomplishments for the entire province will be evaluated once annually and awards made. Accomplishments for 1980 should be reported to the Provincial Science Committee before the end of February next year.

9432
CSO: 4008

SCIENTIFIC RESEARCH SYSTEM REFORMED IN SICHUAN

Beijing GUANGMING RIBAO in Chinese 23 Sep 80 p 1

[Article: "Sichuan Province Decides To Reform Further the Present System of Scientific Research"]

[Text] Reporter Li Jiajie [2621 1367 2638] reports that scientific research units of industrial departments and scientific research units concerned mainly with applied research are gradually putting into effect a changeover to an enterprise-oriented system of management. Specialized research institutes where techniques are applied and enterprises are forming combined companies, enabling the institute to become the company's technical development department. This represents a decision made most recently by the Sichuan Provincial CCP Committee to change the presently operating system of scientific research--a system that is not advantageous for bringing into full play the enthusiasm of scientific research units.

The reform carried out by the Sichuan Provincial CCP Committee on the system of management of scientific research was proposed on the basis of experience gained from giving the province's scientific research units as a whole more autonomy. Based on the Central Committee principle that scientific research is a necessary precursor to building the economy, and in accordance with the specific suggestions of the provincial science committee, the Sichuan Provincial CCP Committee decided to select scientific research units that have comparatively good conditions and, at the same time as carrying out pilot projects in changing over to an enterprise-oriented management, adopted the following measures, advanced and promoted the scientific research units' attempt to broaden its autonomy, and attained the objective of realizing a reform of the system of scientific research as quickly as possible:

First, research institutes (including research units of the national defense industry and institutes of higher learning) themselves have the right to select specialized factories suited to the work intended and, following consultations, to put into effect combined management under the conditions that have been laid down. The factory is responsible for the tasks of carrying out the intermediary testing and formally going into production, based on the research results obtained by research institutes; the institutes are responsible for providing the factory with results of the research and with suggestions for new products, and for directing the factory in proceeding with the remaking of its technology.

Second, specialized scientific research institutes can, according to the reforms of our economic system, enter into a combined company organized by an enterprise in their own field, becoming the company's technical service department.

Third, in matters of scientific research, technical servicing, scientific and technological intelligence, and the production of new, or scarce items [the reform] will break down the barriers between the people as a whole and the collectives, the Central Committee versus the various areas, between military and civilian units, between institutes of higher learning and scientific research units, among scientific research units, and between scientific research units and production units or schools. This will allow the natural advantages of each unit to be brought into full play, making use of the best that each has to offer and developing coordination among them.

Fourth, the banks will grant loans to the scientific research units. The specific method is for the banks to give support by providing funds to scientific research projects of a developmental nature that are definitely able to go into production within a short period of time, that will derive an economic income from the production unit, and that can guarantee repayment of the loan on time.

Fifth, after experience is gained from the pilot projects, scientific and technical personnel can be allowed to operate within a specified sphere. This represents a thorough change from the management of scientific and technical personnel in the past, in which their duties were very specific, and particularly is a change as regards scientific and technical personnel being the common property of all. Thus, if an individual unit does not have need of someone's expertise, the unit will be prevented from not making his services available to others. During the pilot phase, scientific and technical personnel from the scientific research units, engineering and technical personnel from the production units, and teaching personnel from the schools will be allowed to work at each other's facilities or be employed by each other as advisers. One might also, without changing one's address registration, receive an appointment to take on scientific research, technical work, or teaching work in an outlying area.

9634
CSO: 4005

SHANGHAI RESEARCH INSTITUTES REFORM MANAGEMENT SYSTEMS

Beijing GUANGMING RIBAO in Chinese 26 Sep 80 p 1

[Article by Correspondent Xie Junbao [6200 6511 1032]: "Reform Management Systems for Promotion of the Development of Research. Ten Shanghai Research Institutes Achieve Outstanding Results Through Broadened Autonomy"]

[Text] Since last year, a total of 10 institutes in Shanghai, including five regional institutes and five institutes under academies of central government departments have had broader autonomy over methods of economic management such as planning, finances, employee awards, and solicitation of employment applications, as well as the institution of a joint system of research. Within a single year's time, outstanding results have been received.

Fulfillment of scientific research tasks has been promoted. According to statistics from the five regional institutes given increased autonomy, last year's accomplishments on 103 research items exceeded original plans by 15.7 percent, for an increase of 90.7 percent over 1979. During the first half of this year, there was a further increase of 54.8 percent over last year.

Management of scientific research and economic accounting have been enhanced. Following the broadening of autonomy, these test units all strengthened their management over scientific research, established and perfected research discipline, and instituted systems of budgeting for research problems, final accountings, and research problem cost accounting. In the case of the Shanghai Materials Institute, an accounting card was used for each issuance of research funds for problems. Scientists and technicians used these cards to keep their books, and no matter whether expenditures were for materials, for processing, or in connection with experiments, all were written down as part of cost accounting. This effectively changed the situation in which currency had been spent casually and materials requested at will without regard for economic effectiveness.

Income has vastly increased from research and production. According to statistics from the five test site institutes, increased income from research and production last year amounted to 6.52 million yuan, a 72.8 percent increase over 1978. During the first half of this year, there was another increase of 31 percent over last year. The Shanghai Machine Manufacturing Technology Institute and the Shanghai Organic Florine Materials Institute had an income last year that was greater than expenditures. Not only did they require no public funds, but they paid profits to higher authorities.

Further arousal of the enthusiasm of researchers. As a result of the expansion in autonomy and the institution of apportionment of increases in income, the institutes have funds for the development of their own research, for their collective welfare, and for awards to employees. All of these units have instituted a system of awards for employees. Some institutes have allocated some of their collective welfare funds for the construction of dwellings for their employees, and these have enhanced the morale of the scientists and technicians.

On 25 September, the Shanghai Municipal Science Commission convened a citywide conference of leading scientific and technical cadres to summarize the experiences of these units and to call upon other research units to undertake reforms in a planned and measured way, continuing the widening of autonomy and the system of reforms in the management of research.

9432
CSO: 4008

SCIENCE SYMPOSIUM PUTS PROPOSALS TO GOVERNMENT

OW091314 Beijing XINHUA in English 1240 GMT 9 Dec 80

[Text] Hefei, December 9 (XINHUA)--More than 500 delegates to a recent national science symposium here have proposed more active participation by scientists in the country's planning.

Among the proposals they put to the government are:

--That the state and provincial authorities establish advisory centers to help with policy and decision making.

--That a committee of specialists be set up to plan and submit to the government projects for China's scientific, technological and social development.

--That scientists and technicians have greater mobility and free choice of jobs.

--That the government give more money for science and education and encourage the development of talented people.

--That the State Scientific and Technological Commission should seek advice from specialists on improvements in the administration of the country's scientific programs.

--That academies and other higher learning establishments should train people for top administrative posts.

The eight-day symposium dealt with three scientific disciplines which have attracted much attention in China in recent years.

The subjects are the science of sciences (the study of the laws governing science and technology and their relationship to social phenomena--also known in the United States as the "sociology of science"), futureology and rencaiology (the study of making the best use of people with special training).

The scientists debated how these disciplines are related to social studies, economics, management, military affairs, education, medicine and planning of China's current drive for modernization. More than 300 papers were presented at the symposium.

The scientists also discussed the scientific methodology of policy-making, future problems likely to confront the Chinese Communist Party, and the education of gifted children, and the future composition of the country's leadership.

CSO: 4020

PRESENT, FUTURE APPLICATION OF SCIENTIFIC DECISIONMAKING

Beijing GUANGMING RIBAO in Chinese 16 Dec 80 p 3

[Article by Wang Shouyun [3769 1108 0061]: "Using Science and Technology To Realize the 'Scientification' of Policymaking"]

[Text] "Scientification of decisionmaking" is a phrase devised to explain the argument of the "artistic" method versus the experience method of decisionmaking. Of course, condemnation for issuing willful and confused orders is also implied.

In 1806, the Prussian military reformist Gerhard Johann David von Scharnhorst created the general staff system, with which he expected to raise military decisionmaking from a kind of "art" to a field of science. The French scientist André Marie Ampère proposed the need of a science to study the state management in a book he published in 1845. In the past two centuries, many have tried to improve the method of making decisions, in an attempt to cause decisionmaking to be less and less a matter of "art" and more and more a matter of science.

Scientific decisionmaking was adopted the earliest in the realm of military command. Scientification of military command decisions means a scientific system of information decisionmaking and a system of advisory staff policy determination, as well as the quantification of the method of decisionmaking itself. The process of scientification of military command decisionmaking has had a profound effect on the process of scientification of decisionmaking in the realms of society, economy, and political affairs.

Shortcomings exist in China's current system of making political and economic decisions, but if the knowledge means, and organizational methods of national defense science and technology, which China has developed and mastered, are fully utilized, it will be possible to overcome these shortcomings and an important step toward scientification of decisionmaking will have been realized.

Military information technology should be adopted to serve the scientification of civilian decisionmaking as quickly as possible.

For the purpose of making decisions, it is necessary to use a certain method to gather, process, transmit, and utilize information--i.e., to establish a certain information system. The military information system is the earliest to be established and the most efficient. The oldest system of transmitting intelligence data and orders is the fenghuotai [beacon fire] and the message dispatcher. The command

headquarters, using telegraph lines, is a system established in the middle of the 19th century. Early in the 20th century, the general headquarters system using radio telecommunications technology was established. Toward the end of the 1950's, the modern command control system using electronic computers and a data transmission network was developed. The above is a simple picture of the development of the military information system.

In May 1980, China organized the information system of commanding the launching of a carrier rocket in the Pacific Ocean. This is a type of nationwide information system managed through the use of electronic computers. It uses electronic computers and multiple data transmission channels, and it proceeds in a timely manner with the gathering, coding, transmission, editing, storage, searching, dispatch, and display of related information distributed in information sources all over the country to supply the needs of decisionmaking or to store in a central data bank to be randomly accessible to the decisionmaking organization. The efficiency of the process between information and decisionmaking is thus greatly improved.

In developed capitalist countries, this type of information system, managed by computers, was first developed by the military command department and extended to the departments of industry, finance, commerce, trade, and administration at the beginning of the 1960's. Similar "command control centers" were established to form the information management system for the purpose of supplying information to management. At present, China remains backward with respect to gathering, transmitting, processing, and utilizing management information. Statistical data are incomplete, inaccurate, not very reliable, and slow in transmission and feedback; these shortcomings often cause erros in management decisionmaking. The technology of the command information system of defense technology experiments which has been mastered in China can be extended for civilian use to help establish an information management system for large enterprises, or even an information system of the entire national economic construction, so that a firm material foundation may be laid for scientification of decisionmaking.

Organize and establish a general staff decisionmaking mechanism with the participation of scientists and engineers.

At the beginning of the 19th century, a relatively perfect general staff system was created for Prussian troops, indicating that there was a need at that time for the military commanders' decisionmaking process to be supported by the collective wisdom of the staff. This is the first important development of the staff decisionmaking mechanism. During World War II, there was a massive struggle on both sides to develop, deploy, and apply advanced military technology. Scientists and engineers were in urgent demand to participate in the decisionmaking process. At that time, there were no fewer than 700 scientists and engineers engaged in the work of strategy and policy research in the United States, England, and Canada. Their work had a profound effect on the participation of scientists and engineer in the decisionmaking service after the war in every country. Scientists and engineers as a body became part of the decisionmaking process. This was the second important development in the staff decisionmaking mechanism. In 1948, the U.S. Air Force created the Rand Corporation. In the 1950's, China's department of defense technology established a system engineering general design organization. These represent two types of effective forms of development. These two forms, as well as the ordinary form of general staff, are indispensable for a complete staff decisionmaking mechanism.

The Rand Corporation is a research organization set up to provide technical service for strategic decisionmaking. It studies new concepts, new ideas, new theories, and new methods for the realization of optimal decisionmaking. It uses the results of its own research to enrich the wisdom of decisionmaking agencies. The results of its research have had profound effects on the formation and development of U.S. strategic theories and national defense policies. The Rand Corporation has become an indispensable "think tank" in the decisionmaking chain of U.S. military, political, foreign, and social affairs.

In the 1950's, when China moved forward her plan of developing sophisticated defense technology, a new type of staff mechanism--a general design organization of system engineering--was established. It has made important contribution to China's success in artificial satellite and guidance missile plans. This general design organization is to provide technical service for strategic decisionmaking. It takes a series of moves required for the realization of a specific planned goal, considers them to be systems with strict organizational structures, and proceeds with the programming, design, execution, and coordination so as to guarantee that in the decisionmaking system, every tactic is technically and economically feasible and all tactics are mutually coordinated to the extent that certain standards may be used to determine the optimal form to realize the goal being planned. It designs the technical route to realize the specific plan, the technical program, and the structure of the target system. Based upon this type of movement strategy, the decisionmaking agency makes choices and implements the final decision. When Zhou Enlai was alive, he had hopes of applying the experience of the general design organization to important engineering constructions of the national economy. Most recently, Chinese scientists and technicians proposed the establishment of a general design organization for the national economy, so as to extend the object of application of the general design organization from individual military engineering projects or economic construction engineering planning to the overall planning of the national economy. Natural scientists, social scientists, specialists of engineering technologies, and management specialists are to be organically organized into this national economy general design organization to jointly design national economic construction programs, which are to include industries, agriculture, transportation, communication, energy sources, education, science and technology, population, national defense, and people's livelihood, for the reference of the leadership agencies of the state in their policy decisionmaking process. This type of program has been tested as to feasibility and has been measured and compared. It is quantitative. The experience of China's general design organization for the development of its defense science and technology can be applied to establish a general design organization for large-scale economic construction engineering and the national economy.

Application of modern science and technology to the quantification of decisionmaking.

Historically, many scientists, such as Archimedes, Da Vinci, Galileo, [Tadeusz] Reichstein, Edison, etc., all attempted to use the method of natural sciences to analyze war operations. The early stage work of war analysis begot the seeds of new ideas. Model methods and simulation experiment methods of natural science and engineering technologies are applied for the quantification of decisionmaking. During World War II, large groups of scientists and engineers worked conscientiously and in an organized manner to cause these seeds to bloom and bear fruits. Decisionmaking, a field traditionally dependent upon artistic skill to handle problems, has

given birth to a science--operational research--to supply quantitative data to be used as bases to adopt strategies by leadership agencies regarding affairs and activities under their control. As early as 1956, a group of far-sighted Chinese scientists established an operational research organization. Today, it is being used for quantification of decisionmaking in operational research, topology, decisionmaking theory, mathematical programming, network analysis, optimal control theory, graphic analysis, production analysis, and forecast theory. All of these have had considerable development. In 1979, Qian Xuesen [6929 1331 2773] and Wu Jiapei [3527 1367 1014] proposed to apply systems engineering, which has operational research as its foundation, to the macroeconomic movement of the entire country, to establish social engineering in order to realize quantification of decisionmaking in national economic construction. Concretely speaking, statistical data are timely supplied to the national economy information system, mathematical models of macroeconomy are correctly built, simulation experiments of economic construction programs are carried out on electronic computers, choices among plans and programs are made on the basis of the result of quantified experiments, and plans and programs are adjusted in a timely way according to the changing condition of execution of the national economic plan and new developments in politics, economics, and science and technology. This is the general process of realization of the quantification of decisions regarding the national economy.

6248
CSO: 4008

ANHUI SCIENTIFIC, TECHNOLOGICAL ASSOCIATION CONGRESS ENDS

Congress Activities

Hefei Anhui Provincial Service in Mandarin 1100 GMT 26 Dec 80 OW

[Excerpt] The Third Congress of the Anhui Scientific and Technological Association closed on 26 December after a 5-day meeting. The meeting adopted a decision of the Third Congress of the Anhui Provincial Scientific and Technological Association as well as regulations on setting up scientific and technological associations in factories and mines and on organizing associations in the rural areas for the popularization of science there. The meeting put forward valuable proposals on environmental protection, energy, human resources and other issues. During the meeting, Vice Governor of Anhui Yang Jike made a speech on how to readjust the work of the association. Attending the closing ceremony were Su Yu and Lan Ganting, secretary and deputy secretary of the provincial party committee; Ma Changyan, vice chairman of the provincial people's congress; Meng Jiaqin, vice governor of Anhui; Nie Chunrong, secretary of the secretariat of the National Scientific and Technological Association, and leading members of the provincial military district and departments concerned.

Resolution Adopted

Hefei Anhui Provincial Service in Mandarin 1100 GMT 26 Dec 80 OW

[Excerpt] The Third Congress of the Anhui Scientific and Technological Association adopted a resolution on 26 December 1980. It says that the association will from now on promote academic exchanges at home and abroad; energetically popularize scientific and technological knowledge; discover, train and recommend technical personnel; and be an adviser to the party in the scientific and technological field. The resolution adds that the Scientific and Technological Association must truly represent the interests of all scientists and technicians, be concerned with their livelihood, work and study, and promptly reflect their demands. It appeals to all scientists and technicians throughout Anhui Province to rally more closely around the CCP and do their utmost for Anhui's modernization.

CSO: 4008

AWARDS GIVEN FOR MAJOR SCIENTIFIC INVENTIONS

OW140752 Beijing XINHUA in English 0732 GMT 14 Feb 81

[Text] Beijing, 14 Feb (XINHUA)--Technology for blast furnace smelting of vanadium-titanium magnetite with high titanium content devised by the experimental group of the Panzhihua Iron and Steel Company in Sichuan Province received the only first class award given by the State Scientific and Technological Commission in the period from April 1979 to 30 Ja-uary 1981.

The commission announced that 165 major scientific inventions were recognized and given awards by the recommendation and examination committee.

The breakthrough in smelting and polymetallic ore has been sought by scientists abroad for over a hundred years. Panzhihua has vast reserves of the vanadium, titanium and iron ore and the invention will accelerate its development and use.

Inventions recognized and given awards by the commission's recommendation and examination committee must be major, original achievements, up to advanced world levels. The committee classifies such inventions according to their applicability. Twenty-three inventions received second class awards, 111, third class awards and 30, fourth class awards.

The majority of the inventions are new industrial technologies. Second in number are scientific achievements in agriculture and medical science.

The large-size synthetic fluoro-phlogopite (a kind of mica) manufactured by scientists at the Shanghai Institute of Silicate Research under the Chinese Academy of Sciences received a second class award. This is an essential material in the electronics industry.

Medical scientists in the Chinese Academy of Medical Sciences in coordination with scientists from other units were given a third class award for making a new medicine to treat the disease, leptospirosis.

A mulching agent, which increases the temperature of the soil, received a fourth class award. It was produced by scientists at the Institute of Geography under the Chinese Academy of Sciences and the Dalian general oils and fats plant.

The recommendation and examination committee for inventions was set up in April 1979 by the State Scientific and Technological Commission in accordance with a regulation of the State Council. Its aim is to encourage initiative and creativeness on the part of scientists and technologists for the country's socialist modernization drive. The committee is composed of 32 leading scientists and technologists including physicist Qian Xuesen, medical scientist Huang Jiasi, agronomist Jin Shanbao and optics specialist Wang Daheng.

CSO: 4020

SCIENTIFIC, TECHNOLOGICAL ASSOCIATION'S TASKS FOR 1981

OW100634 Beijing XINHUA Domestic Service in Chinese 1545 GMT 7 Mar 81

[Text] Beijing, 7 Mar (XINHUA)--The third session of the Standing Committee of the Chinese Scientific and Technological Association was held on 6 and 7 March in Beijing. The meeting reviewed the association's work in 1980 and discussed and defined the tasks for 1981 in the new situation of furthering national economic readjustment.

Zhou Peiyuan, chairman of the Chinese Scientific and Technological Association, spoke at the meeting, which was presided over by Pei Lisheng, vice chairman of the Chinese Scientific and Technological Association. Zhou Peiyuan said: The important principle put forth by the central work conference on furthering economic readjustment and political stability is a very correct one. The Chinese Scientific and Technological Association and workers in the scientific and technological field support the central work conference principle and are willing to do their part. He said: Further readjustment of the national economy has placed new demands on the scientific and technological circles; all our scientific and technological workers should take positive action and carry out the readjustment of the scientific and technological association itself by coordinating with the economic readjustment. The association's work must link with production, adapt to actual needs and attach importance to research and exchanges of technical experience in agriculture, light industry and energy. We must stress the main points of work and actual results and use our limited manpower and resources in the most needed areas; we must advance the spirit of building enterprises through arduous efforts.

Standing Committee members attending the meeting spoke their minds and discussed the association's work in the light of actual conditions. They held that 1980 was a year of transition in the history of development of the association and also a year of action. In 1981 we must carry forward our good points and overcome our shortcomings to make our work even better.

The association's main tasks for 1981 are as follows:

1. Continue academic and technological exchanges and activities to put forth scientific and technological proposals and to provide scientific and technological advice on the readjustment of the national economy and the four modernizations;

2. Energetically improve education in science and technology, give on-the-job training, and help large numbers of scientific and technological workers, party and government cadres in enterprises, and workers and peasants to raise their scientific and technological level and efficiency in management and operations;

3. Extensively launch activities to disseminate scientific knowledge among the people and promote innovations and education in this field so as to contribute toward building the socialist spiritual civilization;

4. Build the association itself well, paying attention to building up scientific and technological associations in counties as well as in factories and mining enterprises and organs to popularize science in the rural people's communes;

5. Strengthen ideological-political work among cadres of scientific and technological associations at all levels and among scientific and technological workers.

ACADEMY OF SCIENCES RESPONSIBLE PERSON INTERVIEWED

OW301015 Beijing XINHUA Domestic Service in Mandarin 0125 GMT 29 Mar 81

[Excerpts] Beijing, 29 Mar (XINHUA)--A responsible person of the Chinese Academy of Sciences recently granted an interview to XINHUA reporters in connection with the appointment of new members to the Scientific Council of the academy.

The responsible person said: The Scientific Council was founded in June 1955. At that time the council consisted of four departments: the Department of Mathematics, Physics and Chemistry; the Department of Biology, Geology and Geography; the Department of Technical Sciences; and the Department of Philosophy and Social Sciences (predecessor of the Chinese Academy of Social Sciences). In 1957 the Department of Biology, Geology and Geography was divided into the Department of Biology and the Department of Geology and Geography. In 1961 the Department of Philosophy and Social Sciences became subordinated to the Propaganda Department of the CCP Central Committee.

At present, the Chinese Academy of Sciences consists of five departments--mathematics and physics, chemistry, biology, geology and geography, and technical sciences--plus a management science group.

He said that the establishment of the Scientific Council was an important measure adopted by the Chinese Academy of Sciences to place reliance on scientists to take the lead in scientific undertakings. After its establishment, the Scientific Council has implemented the principle of "letting a hundred schools of thought contend" in academic circles and played an effective role in bringing into full play the strength of the scientists' collective leadership in promoting scientific undertakings.

The responsible person said: The Scientific Council was forced to suspend its activities during the "Great Cultural Revolution." In the spring of 1979, the academy decided to resume its work. To do this it was necessary, first of all, to strengthen all the organizations under the council. With this goal in mind, the academy started moves to appoint new members of the Scientific Council.

The responsible person said: The Scientific Council members may be reelected consecutively. The council's tasks are: first, to exercise academic leadership over all research institutes under the academy; second, to unite Chinese scientists, enhance cooperation among scientific circles and jointly promote scientific and technical undertakings in China; and third, to submit reports and suggestions concerning pertinent principles and policies and major scientific and technical problems to be solved in the building of socialist modernization in China. Through discussion at general meetings, Scientific Council members will decide the direction of the development of the Chinese Academy of Sciences, examine and approve scientific research plans, solve major questions and elect the presidium of the academy. The presidium members will elect the president and vice presidents of the Chinese Academy of Sciences.

The responsible person said: The Scientific Council members represent a broad spectrum. They came from various institutes inside and outside the academy. He said: The Scientific Council is still inexperienced in its work and needs to continually sum up experience and improve and raise the quality of the work in the future.

INTENSIFICATION OF PARTY SUPPORT FOR SCIENCE URGED

Beijing GUANGMING RIBAO in Chinese 18 Apr 81 p 1

[Article: "The Entire Party Should Accord the Proper Importance to Science and Tehnology"]

[Text] The development of modern science and technology is currently an urgent and important task of the entire party. The central link in accomplishing this task is improvement of the entire party's awareness of science and technology and bringing science and technology's critical role in our country's socialistis modernization construction and social development fully into play.

Are science and technology really important? What role do they play in national economic development? Consider several facts: In agricultural production, in 1980 hybrid rice already was planted on more than 80 million mu nationwide and was giving an average increase in yield of 100 jin per mu, or a total increase in output of 7 billion jin nationwide. Comprehensive research into techniques for increasing output and their extensive application have enabled Henan Province to increase it wheat output by an average of more than 3.5 billion jin a year for the past several years. Primarily owing to effective popularization of the superior variety Lumian No 1, in addition to implementation of policy and relatively favorable climatic conditions, last year Shandong Province's total cotton output was more than two times larger than in 1979. In industrial production, because the Panzhihua Iron and Steel Company adopted the blast furnace technology, which was developed exclusively by this country, for refining vanadium-titanium magnetite ore, and utilized its comprehensively, it soon turned losses into profits; while in 1977 this enterprise lost more than 11 million yuan, by 1980 it was already paying more than 107 million yuan in profits to the higher levels. Light industry and the textile industry are making use of more than 460 scientific research results and have energetically promoted the production of daily-use consumer goods. Overall, in the last 3 years, and particularly since the 3d Plenum of the 11th Central Committee, here have been great changes in our country's science and technology scene, and the achievements of scientific research are becoming more numerous year after year. For example, the Chinese Academy of Sciences, the center of the country's scientific research, had a total of more than 1,300 research results in 1978, more than 1,400 in 1979, and 1,576 in 1980 (evaluations have indicated that 14 percent of them are close to or at the world state of the art). While the national defense scientific and technological system has been carrying out its sophisticated scientific and technical tasks with flying colors, it has also intensified its scientific research work for the populace. In 1980 the 7th Ministry of Machine Building

alone made available 130 major new technologies, of which 43 are firsts for this country and 25 are at or close to the international state of the art. Innumerable vivid circumstances have given people an increasingly clear understanding of the immense role of science and technology in developing the national economy and promoting social progress, and have further stimulated our vast population's enthusiasm for studying and utilizing science and technology. Historical experience proves that whenever our party has laid increased emphasis on science and technology and scientific and technical personnel, our socialist cause has progressed more smoothly; and when it has not done so, the result has been setbacks of various degrees of seriousness. When the party Central Committee recently stressed again that the "entire party must lay emphasis on science" and pointed out that during the readjustment of the national economy we must also readjust the relationship between science and technology and economic development, gradually increasing the share of scientific research funds in the budget, and assuring that science makes steady progress, it summed up positive and negative historical experience and inferred that there is still a greater and lesser degree of failure within the party to accord due importance to science and technology. At present there are still many comrades within the party, including some who are in charge of economic and party and government leadership, who are insufficiently aware of the importance of science and technology and who do not sufficiently support scientific and technical work. Many party committees and administrative leadership organs have still failed to put scientific and technical work on their agendas, or pay lip service to its importance but actually relegate it to a secondary place, so that it loses out when the pressure of work increases. Some comrades even consider that science and technology stand in the same relationship to production and the economy as the cock-crow at the dawn, i.e that "dawn comes whether the cock crows or not," and that it makes no difference whether science and technology are pursued or not.

There are many reasons for this failure to accord due importance to science and technology. The small producer's narrow ideology and ingrained habit are an important social cause. Some comrades look at science and technology and at education with the small producer's eyes, and will not admit that they are extremely important for the cause of socialist construction and that socialist construction is impossible without them. To root out these influences, it is necessary to take a worldwide view. In the capitalist countries, science and technology are not only a new means by which the capitalists squeeze out excess value, but also a basic factor in the development of modern large-scale production in capitalist society. At present in some developed capitalist countries rates of growth of the national economies exceeding 60 percent are based on scientific and technical progress, and many new production sectors have been entirely brought into being by science and technology. Science and technology are now advancing at a startling pace. In 10-odd years in the 1960's and 1970's, the number of new discoveries and new inventions in science and technology exceeded the total for the previous 2,000 years; every year basic engineering and technical knowledge and specialized knowledge increase by 5 and 20 percent respectively; in the past 10 years 30 percent of industrial knowledge has become outdated, and 50 percent of electronics technology has become outdated. Only if socialism creates a higher labor productivity than capitalism can it ultimately defeat capitalism. In this light, science and technology are a life-and-death matter for the two differing social systems of socialism and capitalism.

An important ideological source of the failure to accord due importance to science and technology is the many years' influence of "left" ideology. In theoretical terms, this influence is expressed as some comrades continued failure to recognize that science and technology are a productive force and that scientific research must precede

production, and their failure to recognize that modern tools of production are embodied science and technology and that the person who constitutes the greatest productive force is the one armed with scientific and technical knowledge. In their thinking regarding the guidance of economic construction, some comrades cannot correctly handle the relationship between economic development and science and technology, and will not admit that science and technology have a critical role in economic construtions. They do not accord importance to science and technology and do not rely upon them in economic construction; when they grasp production they fail to grasp science and technology; and when they embark on capital construction they do not make an effort at technological reform of existing enterprises; the result is that many of our country's scientific and technical achievements cannot be put into use and disseminated in timely fashion, many old enterprises' technologies, processes and equipment cannot be renovated and modernized, and they remain for a long time in a backward condition of high waste, low quality, and production of the same products year after year. Many years of this state of affairs in economic work have not only hindered the development of science and technology in our country but have harmed the country's socialist construction. In their policy on intellectuals, some comrades still discriminate against or even repress scientific and technical personnel and refuse to admit that the vast majority of the intellectuals, including 5 million scientific and technical personnel, belong to the working class, and are a force upon which the party relies. They have long suffered from a phobia about rightism and a belief that "better 'left' than right," and in the process of cadre reorganization they have rejected scientific and technical personnel with their specialized capabilities and organizational ability and have prevented them from participating in leadership groups at all levels, or have given them posts but failed to make use of them, so that they are little more than furniture.

To summarize, the habits of the small producer and the effect of "left" ideology have, to a greater or lesser degree, and in both visible and invisible ways, hindered the development of science and technology. As a result, if the entire party, starting with leadership comrades in party committees at all levels, is to truly make an effort to give due importance to science and technology, then it must take care to guard against and overcome the effects of the small-producer habit of mind and must conscientiously root out the "left" ideology. The aim of rooting out this ideology is to sum up experience and to raise consciousness in the implementation of the party's scientific and technical policy and its policy on intellectuals. The methods for rooting it out must be suitable, must be based on the actual situation in each department, locality and unit, must seek the truth from the actual situation, and must conscientiously solve the problems that exist.

In developing science and technology we must not stop with general slogans. We must also adopt correct policies, and organize all parties concerned for a joint effort to carry out a successful reorganization relative to science and technology. Recently the party Central Committee and the Council of Ministers approved the policy guidelines proposed by the party organization of the State Committee on Science and Technology regarding nationwide scientific and technological development in the immediate future. The main content of these guidelines is as follows: 1. Science and technology and the economy and society should develop in coordination with each other, and promotion of economic development should be made the primary task. 2. Stress should be laid on strengthening the study of production technologies, and technologies should be correctly selected and formed into a rational technological structure. 3. Technical

development and dissemination of technology in factory and mining enterprises must be intensified. 4. Basic research must be maintained on a stable basis and gradually expanded. 5. Learning from and assimilating foreign science and technology should be treated as an important means of developing this country's science and technology. This is a relatively comprehensive set of guidelines which seek the truth in the actual situation, which were drawn up following preliminary rooting out of pernicious "left" influences, and which are beneficial to the entire readjustment of the national economy.

On the basis of these guidelines, the readjustment of scientific and technical work, and particularly the readjustment of its relationship to economic development, should take account of both the overall situation and of scientific research work itself.

In terms of the overall situation, the readjustment should have the effect of making economic work able to rely better on science and technology and to bring their role thoroughly into play. To this end, first, it is necessary to base major policy decisions in economic and social development on scientific research and thorough technical substantiation. Policy research and consultative organizations should be set up at the national level as quickly as possible. Second, an energetic effort should be made to implement uniform planning for scientific-technical, economic and social development. Third, a comprehensive review of our country's investment policy should be undertaken, and the share of funds for scientific research in the state budget gradually increased on this basis. Fourth, in order to improve economic effectiveness, rationalization and reorganization of the broad economic structure should be coordinated with technical renovation of older enterprises. If a reorganization of the economic structure is not undertaken, scientific and technical reform will result in a good deal of blind action; and if the reorganization of the economic structure is not combined with technical renovation, its results will have many limitations and will not be lasting. Fifth, we should actively and prudently reform the economic and scientific and technical management system, reasonably readjust the structure of science and technology and of the ranks of scientific and technical personnel, promote and organize from the top down the unification and coordination of the five front armies on the scientific and technical front, promote and organize unification and cooperation among scientific research, production and applications organizations and their attack on key technical problems, and conscientiously solve the problem of large amounts of unnecessary duplication in construction and research.

Scientific and technical work itself should make a greater and more effective contribution to promoting economic development. First, in a number of urgent near-term areas such as agriculture, light industry and textiles, energy, communications, machine building, materials, and electronics technology, it should select a few topics and solve certain scientific and technical problems which are of major importance for national economic and social development. The key is to select the right problems, in accordance with local conditions and the nature of the organizations, and to grasp correctly the principles of selecting research topics. At the same time, we should establish and fill out our country's own scientific and technical reserve for the long-term needs of economic and social development. Those who do not plan for the long term have difficulties in the short term. We cannot focus solely on immediate benefits. We must make allowances for long-term needs and energetically "take account of both the near term and the long term" and "coordinate near-term and long-term measures." The key in this endeavor is effective basic development of

research. For an individual production department or a research system with a certain degree of integration, the basic development of research should include: a clear and stable direction of research and a properly regulated sequence of work; a politically firm party leadership group, an ideologically unprejudiced research collective, and effective administrative and management bodies; a reationally organized, high-quality, intellectually upright scientific and technical contingent; a precise and flexible information system (including information gathering, library materials and file work); and a good working and living environment which gradually creates the conditions for socialization of research support and technical services. It should also include: development of a practicable subject development policy and relevant technical-economic policy; and systematic, energetic education and training in rotation of scientific and technical management personnel, intensified development of legal institutions, regulations and systems for management of science and technology, and promotion of the specialization of research management and its development into a science.

Strengthening the party's leadership is the fundamental guarantee that our country's science and technology will advance unceasingly. The party Central Committee has great concern for and accords full importance to scientific and technical work. The Central Committee Secretariat regularly requests scientists to make reports, and recently it has heard many reports by the party organizations of the State Committee on Science and Technology and the Chinese Academy of Sciences as well as reports on scientific and technical cadre work from the CCP Central Organization Department, and the State Council's Office of Scientific and Technical Cadres and Office of Personnel Matters, and has issued many important directives and set a model for party and government leadership comrades at all levels. Strengthening the leadership of science and technology is the glorious task which the age has assigned to our party. If the entire party accords due importance to science and technology and painstakingly acquires scientific and technical knowledge and masters the management of science, the party's leadership of science will be strengthened.

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CSO: 8111/1032

ACHIEVEMENTS OF CHINESE ACADEMY OF SCIENCES NOTED

OW080633 Beijing XINHUA Domestic Service in Chinese 0029 GMT 8 May 81

[Excerpts] Beijing, 8 May (XINHUA)--The Chinese Academy of Sciences, which has more than 30,000 scientists and technicians, has made achievements in more than 3,000 scientific research projects in recent years. It has made important contributions to the development of China's national economy and national defense building.

The Chinese Academy of Sciences is our country's research center for natural sciences. It was founded on 1 November 1949. At present, the academy has 117 research organizations with more than 76,000 staff members and workers, including more than 30,000 scientists and technicians. It has branches in 12 provinces, municipalities and autonomous regions.

The present number of scientific and technological personnel is about 100 times the number when the academy was founded. The number of senior and advanced scientists and technological personnel has increased more than 20 times. The academy has furnished national defense and industrial departments with a large number of scientific and technological personnel and, in addition, has trained a number of specialists for various fronts who have mastered new technology in the fields of atomic energy, computers, semiconductors, automation and modern mechanics.

The various research institutes of the Chinese Academy of Sciences have done a large amount of pioneering work for China's successful development and launching of atomic bombs, guided missiles and man-made earth satellites. They have made important achievements in the study and manufacturing of transistors, accelerators, electronic computers, lasers, sonar, sound emitting devices [sheng fa she zhuang zhi 5116 4099 1410 5944 4999], second-generation jet engine high temperature air-cooled turbine blades which require precision casting [jing mi zhu zao gao wen gi leng wo lun ye pian 4737 1378 6999 6644 7559 3306 3049 0397 3260 65444 0673 3651] and photoconductor fibers [guang dao xian wei 0342 1418 4960 4850].

At present, the broad masses of scientific and technological personnel of the academy are stressing building a good foundation and raising the quality of their work. Under the guidance of the policy of running the academy well in order to serve the national economy and national defense building, they are trying harder so as to make greater contributions to the country.

LEADERS ATTEND ACADEMY OF SCIENCES SESSION

OW111630 Beijing XINHUA Domestic Service in Chinese 1240 GMT 11 May 81

[Excerpts] Beijing, 11 May (XINHUA)--The fourth session of the Scientific Council of the Chinese Academy of Sciences opened ceremoniously in Beijing today. Attending the opening ceremony were party and state leaders Deng Xiaoping, Peng Zhen, Deng Yingchao, Zhao Ziyang, Wang Zhen, Wei Guoqing, Ulanhu, Fang Yi, Wang Renzhong and Bo Yibq, and vice chairman of the CPPCC National Committee Lu Dingyi. Present at the meeting were responsible persons of departments concerned, including Zhou Yang, Jiang Nanxiang, Li Qiang, Pei Lisheng, Tong Dalin, Jiao Shanmin and Huang Wei [5524]. Also present at the meeting were Duang Junyi, first secretary of the Beijing Municipal CCP Committee, and others.

Meeting With Academy Personnel

OW121216 Beijing XINHUA Domestic Service in Chinese 1206 GMT 11 May 81

[Text] Beijing, 11 May (XINHUA)--Party and state leaders Deng Xiaoping, Peng Zhen, Deng Yingchao, Zhao Ziyang, Wang Zhen, Wei Guoqing, Ulanhu, Fang Yi, Wang Renzhong and Bo Yibo and vice chairman of the CPPCC National Committee Lu Dingyi met with all representatives attending the fourth session of the Scientific Council of the Chinese Academy of Sciences on 11 May.

Before the meeting, Deng Xiaoping and other leading comrades of the central authorities had cordial talks with the members of the Presidium of the academy and wished the session a complete success. The names of the members of the Presidium who took part in the meeting are as follows:

(In the order of the number of strokes in their names) Ding Guoyu, Ma Dayou (3731), Wang Daheng, Wang Ganchang, Bei Shizwang (3864), Yin Zanxun, Lu Jiaxi (6932), Xu Jie, Chi (3069) Jishang, Hua Luogeng, Wu Xianwen, Li Chang, Li Xun (5651), Shen Hong (7703), Wu Xuezhou, Yang Dongsheng, Yan Jici, Wang You (3731), Wang Dezhao, Zhang Wenyou, Zhang Wenyu (5940), Zhang Guangdou, Zhang Cunhao, Zhang Yu (6877) Zhe, Zhang Jia (4471) Fu, Tang Peisong, Yang Dong, Yang Tingbao, Wu Heng (5899), Chen Shixiang (7534), Chen Zongji, Xhou Peiyuan, Mao Yisheng, Jin Shanbao, Zheng Wanjun, Yu (6735) Wen, Liu Dagang, Cha (2686) Quanxing, Hu Keshi, Hou Xianglin (7792), Qin Lisheng, Qian Sanqiang, Qian Zhidao, Qian Xuesen, Tu Guangchi, Tang Aoqing, Liang Dongcai, Yin Hongzhang, Gao Qingshi (3740), Huan Xiang, Huang Ziqing (0615), Huang Xinbai, Huang Jiqing, Huang Bingwei, Huang Jiasi, Cao Tianqin and Xie Xide.

Yan Jici's Opening Speech

OW111218 Beijing XINHUA in English 1209 GMT 11 May 81

[Excerpts] Beijing, 11 May (XINHUA)--The fourth session of the Scientific Council of the Chinese Academy of Sciences opened here this morning. The Scientific Council, composed of 400 scientists, is the leading academic body of the academy. The current session is the first ever in 21 years since the third session held in Shanghai in April of 1960.

In his opening speech, Yan Jici, vice-president of the Chinese Academy of Sciences and one of the academy's founders, described the session as having "great importance" in the annals of the development of China's sciences.

81-year-old Yan Jici said, in his youthhood, many scientists had the ambition to devote to science for the sake of China's independence and prosperity. However, this proved a dream in the semi-feudal and semi-colonial China. The birth of new China and the regeneration of the country, especially the third session of the 11th Central Committee of the Chinese Communist Party and China's grand modernization program, have opened up even broader vistas for development of China's science and technology and Chinese scientists.

He called on scientists to work more closely with the administrators, technologists and the staff members of the academy in the interests of the motherland.

The program of the session includes: to hear and examine a report on the work of the academy, discuss the draft constitution of the academy, hear and discuss reports by the various departments of the council, elect a presidium of the academy which in turn elects president and vice-presidents of the academy. Each department will elect a Standing Committee which elects director and deputy directors of the department. During the session, each department will hold meetings to discuss its own work and carry out academic exchange.

Academy sources told XINHUA that 283 new members were added to the council last month to bring the number to 400. The council members come from 24 provinces, municipalities and autonomous regions. They work in 27 ministries and departments, 43 universities and colleges and 114 research institutes. The current council is larger than any time in the past and is more broadly represented. There are 79 physicists and mathematicians, 67 chemists, 89 biologists, 75 geoscientists and 90 technical scientists on the council.

Fang Yi Report

OW111559 Beijing XINHUA in English 1541 GMT 11 May 81

[Text] Beijing, 11 May (XINHUA)--Fang Yi, president of the Chinese Academy of Sciences, today proposed that a scientist be elected to the presidency of the academy. He proposed that future presidents be elected by the academy instead of being appointed as he had been in 1979 at the second session of the Fifth National People's Congress.

In his work report to the fourth session of the academy's Scientific Council here this afternoon, Fang Yi said he had offered to resign on a number of occasions with the council taking up the role of policy-making organ of the academy. The present session will elect a presidium to choose the new president and vice-presidents.

Fang Yi, who is also minister in charge of the State Scientific and Technological Commission, said he took charge of the academy under particular circumstances after the downfall of the "gang of four." He was of the opinion that a scientist should take over the job, and the present system of giving leaders life-long tenure should be changed.

After submitting his resignation, Fang Yi said he would continue to support the work of the academy. He will remain to be China's highest leader on scientific affairs, both within the Communist Party and the government. The vice-premier told the scientists: "In my cooperation with scientists in these years I have come into intimate acquaintance with many and learned a great deal from you. We will carry on our friendship, I think I'll continue to be an enthusiast for science."

Further on Fang Yi Report

OW111617 Beijing XINHUA in English 1603 GMT 11 May 81

[Text] Beijing, 11 May (XINHUA)--The fourth session of the Scientific Council of the Chinese Academy of Sciences which opened today marked an important progress in China's effort to reform the system by which scientific development is managed. Fang Yi, president of the Chinese Academy of Sciences, stressed this point in his report on the opening day of the session.

The Scientific Council, composed of 400 noted scientists, will become the highest policy-making body of the academy from a body of advisory nature. The current session will elect a Presidium of the academy, which in turn will elect the academy's president and vice-presidents. A total of 283 members have been recently added to the council through serious examination and voting by the original members. This has brought the total number to 400. The Scientific Council has thus become more representative and authoritative, said Pang Yi.

The appraisal of a scientific result should be left to the scientists, he said. He advised the administrators not to give improper conclusions about academic matters. Nor should a comment from any leader be substituted for an academic appraisal which, he added, should be made only by the scientists themselves.

Fang Yi said that the Chinese Academy of Sciences is the country's highest academic organization in the field of natural sciences and a comprehensive research center. He hoped that the Scientific Council will play an active part in promoting the integration of science and technology with the socioeconomic development. He stated that the Central Committee of the Communist Party and the State Council expect the academy to serve as an advisory body to the party and state in scientific and technological matters.

In the more than four years following the downfall of the gang of four, Fang Yi said, the Chinese Academy of Sciences devoted its attention to restoring its work to the former days. The academy has made new advances and improved its standards. Summing up shortcomings in work, Fang Yi said that owing to the influence of the leftist ideology, the academy had for a time placed too high targets for development, hence the need for readjustment in the plan.

At present, the Chinese academy embraces 117 research institutions with a total staff of 75,000. 36,000 of them are engaged in research projects. 2,000 are senior members. Fang Yi said that the academy has kept up a steady progress in its research work and achieved certain results of high academic standard and practical value. Fang Yi expected the country's scientists to develop the fine tradition of patriotism, hard study and hard work, and persist in an honest academic spirit.

Fang Yi paid high respect to the old generation of Chinese scientists and wished the younger generation to take upon themselves the responsibility of bringing into reality China's modernisation, be diligent in research and courageous in creation.

FURTHER ON CAS SCIENTIFIC COUNCIL SESSION

Leader-Member Conversations

OW141025 Beijing XINHUA Domestic Service in Chinese 1641 GMT 13 May 81

[Newsletter by XINHUA reporters Zhang Jimin, Gu Mainan and Zhou Changnian: "Place Great Hope in Young and Middle-Aged Scientists"--sidelights on the fourth session of the Scientific Council of the Chinese Academy of Sciences]

[Excerpts] Beijing, 13 May (XINHUA)—Young and middle-aged scientists account for one-tenth of the 400 newly elected members of the Scientific Council of the Chinese Academy of Sciences [CAS], and the average age of the council members has thus been reduced by 11 years. They are the new blood of the council. Though small in number they symbolize the bright future of the council. What a delightful event it is for the revolutionaries and scientists of the older generation!

Party and state leaders gladly met all council members attending the fourth session of the CAS Scientific Council on the morning of 11 May and they had cordial talks with the members of the presidium of the session. At approximately 0930, party and state leaders one after another joined the council members. Vice President Li Chang introduced Yang Le, a middle-aged mathematician, to Comrade Peng Zhen. Smiling and tightly holding Comrade Yang Le's hands, Comrade Peng Zhen asked Yang Le to sit beside him. Then, he had a cordial talk with him on how to bring into full play the role of middle-aged council members. He also asked with great concern about the living conditions of middle-aged scientific and technological personnel.

Comrade Deng Xiaoping arrived a little later. On his arrival, he asked: "How many of the council members are under 50?" Vice President Hu Keshi answered: "There are 40 council members who are under 55." Comrade Deng Xiaoping then asked: "Is there not anyone under 40?" Comrade Hu Keshi said: "Yang Le is the youngest. He is 41."

As the meeting began, a middle-aged council member was seen pondering over something with fixed attention. He was none other than Guan Weiyan, a 53-year-old expert in cryophysics and currently deputy director of the CAS Physics Institute. After the downfall of the "gang of four," the leadership of the academy and the masses of the institute chose him to take up a leading post and let him share the heavy responsibility of leading the scientific research work at the institute. During the past few years, he has made achievements in leading the academic work at the institute and in carrying out scientific research work.

Among the female council members attending the current session was 54-year-old Ye Shuhua, deputy director of the Shanghai astronomical observatory under the CAS.

Fang Yi said in his report to the fourth session of the Scientific Council of the Chinese Academy of Sciences: "The young and middle-aged scientific and technological personnel play an important role of inheriting the past and ushering in the future in the development of China's science and technology. We place great hope in young and middle-aged scientists." Yang Le, Guan Weiyan and Ye Shuhua as well as the broad masses of young and middle-aged scientific and technological workers in the ranks of our country's scientific and technological contingent are right now playing such a role. They are the hope of our country's scientific and technological development.

Fang Yi on Achievements

OW141253 Beijing XINHUA in English 1207 GMT 14 May 81

[Text] Beijing, 14 May (XINHUA)--Installation of equipment to produce multi-channel laser beams of ten to the eleventh power watts to study the physics of plasma is one of 500 major scientific achievements made by the Chinese Academy of Sciences from 1977 to 1980. This was announced by Fang Yi, president of the Chinese Academy of Sciences, at the current session of the Scientific Council, the highest policy-making body of the academy.

Fang Yi, in his work report to the session on Monday, said that the Chinese Academy of Sciences has deployed scientists to work in the most advanced branches of science and some major scientific and technological tasks concerning national construction. In an effort to serve the national economy and construction, Fang Yi said, the Chinese Academy of Sciences has allocated great amount of manpower and material resources to carry on research in the fields of agriculture, energy, materials science, environmental protection, and alleviation of natural disasters. Some progress has been made.

He cited as examples the wilderness survey in Heilongjiang Province, research on the transformation of marshes by well irrigation and drainage on the Sanjiang Plain in northeast China, a comprehensive survey of national agricultural resources and research on the geology and rock mechanics of some gigantic engineering projects.

Fang Yi in his report also mentioned the scientific work and achievements of the academy in the area of national defence.

On technology, he said that progress has been made on computers, semi-conductors, lasers, remote sensing and superconductivity. Fang Yi said academy researchers had put into trial operation a computer capable of ten million calculations per second. Several types of large-scale integrated circuits, including an MOS having 4096 bits of storage capacity, and a 16 K large-scale integrated circuit have been successfully manufactured. These are the highest quality level so far produced in China.

The basic sciences have begun to develop after years of sabotage, President Fang said. He mentioned in particular the synthesis of the 3'-half molecule of the yeast alanine TRNA, the structural models of the active center of nitrogenase, the fault block tectonics, the theory of bio-environmental control and the provinciality of floras and faunas in geological time.

Report on Technical Development

OW142027 Beijing XINHUA Domestic Service in Chinese 1214 GMT 14 May 81

[Text] Beijing, 14 May (XINHUA)--In a work report delivered at the fourth session of the Scientific Council of the Chinese Academy of Sciences, [CAS], Li Xun, permanent member of the technical science department, emphasized that energetically developing technical science is an urgent task in order to accomplish China's socialist modernization program at the earliest possible date.

With regard to natural science, Li Xun said, basic science is aimed at probing the secret of natural phenomena and discovering the laws of nature, while the purpose of technical science is to study the processes for man to transform nature and the rules that govern these processes. He said: From the 17th to the 19th century, most developments made in natural science were in the field of basic science, whereas little was accomplished in studying the fundamental rules of engineering and technology. During that period the work of engineering and technology still depended on experience to a great extent. In the late 19th and the early 20th century, people began to realize more and more that they could not resolve the question of strength encountered in the use of materials by merely depending on Newtonian mechanics, nor was it possible to work out the most efficient electric power system by relying solely on the theory of electromagnetism. Similarly, they came to know that Lavoisier's oxidation-reduction theory alone could not give guidance for improving the steel-making process. They felt that between basic scientific theory and practical production technology there should be an intermediary link, and that is technical science. Under such circumstances, material mechanics, metallurgical physical chemistry, mechanical engineering, electrical engineering and other technical science disciplines came into being one after another.

During the past decades, with the progress in basic science and because of the needs of economic development, further advancement has been noted in technical science. A host of new technical science disciplines have been established and are being daily improved. Examples are atomic energy, semiconductors, automation, computers, laser beams, space technology and remote sensing.

Li Xun continued: Technical science is very closely concerned with the national economy and defense construction, and its importance is increasingly prominent. It is generally understood that energy, materials and information, all closely related to technical science, are three pillars of modern civilization. He also mentioned the major achievements China has made in technical science during the last two decades or so. Only by developing our own technical science, he said, can we really absorb and assimilate foreign scientific and technological achievements and develop our economy, as well as our science and technology, in a genuinely independent and self-reliant way.

Li Xun's report stated several points that merit particular attention in energetically developing technical science:

1. Continued efforts should be made to strengthen those disciplines closely concerned with traditional industries, such as mining, metallurgy, mechanical engineering, electrical engineering, engineering thermophysics, civil engineering, hydraulic engineering, architecture, applied mechanics, applied optics and radio electronics.

2. To accelerate the development of such new technology as semiconductors, computers, laser beams, superconductivity, space technology and remote sensing, it is necessary to formulate and implement development plans with emphasis on specific points. Certain pertinent research units should be strengthened on the principle of supporting the outstanding ones. Units in related fields should be organized to work cooperatively and to solve key problems through their joint efforts. They should not be satisfied merely with their success in the trial-production of some products, but rather they should establish a sound technological foundation, study and understand the laws and make scientific discoveries. Take semiconductors, for example. Not only is it necessary to make large-scale integrated circuits of reliable quality and to achieve a high rate of qualified products in the manufacture of such circuits, but, what is more, work should be done to develop the science of semiconductors.

3. Efforts should be made to study and solve the key questions of science and technology in connection with the national economy and defense construction. At present the emphasis should be on agriculture, light industry, energy supply, communications and transport, machine building, materials industry and national defense.

Li Xun called for attention to problems of a comprehensive nature involving more than one department and one trade, as well as to problems of universal importance. Examples are control of environmental pollution, standard weights and measures, survey and testing techniques, instruments and meters, metal corrosion and its control, systems engineering and technological economics.

Referring to future work, Li Xun suggested that the state set aside special funds to establish a science foundation to support those research projects that are relatively advanced and that are really needed. He expressed the hope that all members of the Scientific Council would unite as one and work strenuously to make still greater contributions to the development of China's technical science.

FURTHER ON CAS SCIENTIFIC COUNCIL SESSION

Scientific Gains Noted

OW170554 Beijing XINHUA Domestic Service in Chinese 1317 GMT 15 May 81

[Excerpts] Beijing, 15 May (XINHUA)--The policy of neglecting basic research work is a shortsighted one. Basic research is the treasure house for developing one's thinking and creating new technology in the field of science.

This is Hua Luogeng's point of view emphasized in his report on the work of the department of physics and the department of mathematics to the fourth Scientific Council under the Chinese Academy of Sciences [CAS].

Hua Luogeng, vice chairman of the council, points out in this report which lasts more than 1 hour, that as far as scientific research work in the whole country is concerned, major efforts should be made in the study of applied science. However, he believes that basic research remains indispensable according to the law for the development of science and technology, because theoretical breakthroughs often pioneer the technical revolution. He hopes that in the course of readjustment, the state will maintain stability and continuity of scientific research. He says: The development of some major scientific research projects and facilities can be slowed down and carried out on a smaller scale. However, we should not rashly discard them. He believes: Mathematics, physics (including acoustics), dynamics and astronomy form the important foundation for the incessant development of science and technology. Many aspects of the work are applicable. For example, solid state physics is able to serve material science. Dynamics and applied mathematics are able to serve the national economy and national defense. There are also numerous applications of nuclear physics and nuclear technology. In the field of astronomy, polar shifts in time measurement and the forecast of solar activities, the tracking of satellites and geodesy are indispensable in the development of the national economy and national defense.

Hua Luogeng says: In view of the fact that the state is in a stage of readjustment, it is unrealistic to carry out basic research work in all fields on a large-scale. Therefore, we can only support the major fields. He believes: Major support should be given to the study of the state of aggregation physics and the application of nuclear technology, the work of practical measurement in astronomy, the study of pneumatics and explosion in dynamics and the study of properties in the field of the strength of materials so as to attain even better results.

He says: During the past 4 years, we have already scored 150 significant achievements in scientific research. Thirty-five of them are of high standard and great value in actual application. In the realm of the national economy, the application and promotion of overall quality control, the mathematical models and methods of computation in modern communications, the study of microwave absorption material, technology in seeking the best plan in oil conservation, the method of making overall plans in facilitating transport of the railway system and the basic research on and control of jet noises have made remarkable contributions to the economic results of factories and transport departments and to environmental protection. Remarkable achievements have been made in the field of national defense such

as longwave and shortwave time transmission and its application in launching the long-range carrier rocket, the highly spontaneous digital sounder, the experiments in installing four high-voltage pulse X-ray machines in synchronous photography and the study of heat-prevention problems for ICBM warheads.

Hua Luogeng believes: Some of the scores of achievements made by this Scientific Council in the past years have already reached or approached the international level.

Approval of Constitution

OW181239 Beijing XINHUA in English 1215 GMT 18 May 81

[Text] Beijing, 18 May (XINHUA)--The fourth session of the Scientific Council of the Chinese Academy of Sciences approved of a constitution (for experimental implementation) of the Chinese Academy of Sciences here today. The academy is the country's highest academic institution and comprehensive research center of natural sciences, the constitution stipulates.

According to the new trial constitution, instead of being an advisory body as in the past, the Scientific Council is now the highest decision-making organ of the academy. It stipulates that the council elects the presidium of the academy which is a decision-making organ while the council is not in session. The presidium elects the president and vice-presidents of the academy.

Two-thirds of the members of the presidium are from the Scientific Council and the other one-third is composed of leading members of departments concerned under the State Council and leading members of the Chinese Communist Party organization in the academy.

It stipulates that the director of an institute is in overall charge of the work of the institute. "It thus clarifies that the party work and leadership over scientific research are separated," Zhou Beiyuan, physicist and vice-president of the Chinese Academy of Sciences, said in an interview. Zhou Beiyuan said that there was a draft of the organizational rules of the academy as early as in 1950 and another one in 1955. However, he added, neither were officially adopted.

"We are now in a situation favorable for the formulation of such a constitution," he said. "We have now practical experiences for 30 years and cleared the ultra-leftist influence. We have got better acquainted with the way foreign scientific institutions are organized."

Zhou Beiyuan said, the new constitution will stimulate the development of the academy and science at large in China.

Further on Constitution

OW191101 Beijing XINHUA Domestic Service in Chinese 1412 GMT 18 May 81

[Text] Beijing, 18 May (XINHUA)--The fourth session of the Scientific Council of the Chinese Academy of Sciences approved the "Constitution of the Chinese Academy of Sciences for Experimental Implementation" this morning. The "Constitution of the Chinese Academy of Sciences for Experimental Implementation" is divided into six chapters: general principles, leading organs, scientific council and its members, research institutes and related organizations, funds and appendices. Stipulating the nature, tasks and principles of the CAS, the chapter on general principles points out: The CAS is the country's highest institution and comprehensive research center dealing with the natural sciences. Its tasks are: To run its affiliated research institutes well and, through its research activities in the fields of basic science, technological science and new and developing branches of learning, make scientific and technological achievements of academic value and realistic significance and train qualified scientific and technological personnel who love the socialist motherland and have creative ability and a firm and indomitable spirit; to study the direction of development of the various branches of learning, promote

contacts, exchange and cooperation among its affiliated research institutes and institutes of higher learning, various departments and scientific research institutions in other localities and play a positive role in popularizing science; to put forth suggestions and proposals with regard to relevant principles and policies for socialist modernization and in dealing with important scientific and technological problems requiring solution, and play an advisory and consultative role in decisionmaking by the party and the government; to participate in important international academic activities as the country's academic organization and carry out academic exchange and cooperation with scientific circles in other countries.

In its operations the CAS lays particular emphasis on basic principles and improvement in the service of the national economy and national defense. The CAS undertakes primarily the tasks of basic and practical research, including the application of basic principles and new technology and so forth, of developing research in an appropirate manner; promoting the principle of letting a hundred schools of thought contend; carrying forward academic democracy; and fostering the style of tudy of emancipating the mind, seeking truth from facts, courageous exploration and of working diligently and in united coordination.

In the chapter, "Leading Organs," the constitution for experimental implementation stipulates that the general membership meeting of the Scientific Council is the supreme decisionmaking organ of the CAS. The CAS presidium is the decisionmaking organ when the general membership meeting of the Scientific Council is not in session. The general membership meeting of the Scientific Council shall generally be held once every 2 years. Members of the presidium shall be elected by the general membership meeting of the Scientific Council for a 4-year term, which may be extended once if reelected. Two-thirds of the members of the presidium are from the Scientific Council and the other one-third is composed of leading members of departments concerned under the State Council and of leading members of the CCP Organization in the CAS who are nominated for election after consultation. The CAS president and vice presidents are to be nominated for election from among members of the presidium.

In the chapter, "The Scientific Council and Its Members," the constitution for experimental implementation stipulates that the Scientific Council is an academic leading organ. Members of the Scientific Council are to be selected from among the fine scientists throughout the country for election by membership conferences of the various academic committees under the Scientific Council of the CAS.

The "Constitution of the Chinese Academy of Sciences for Experimental Implementation" also contains provisions for research institutes and other related organizations of the CAS.

Election of Officers

OW191219 Beijing XINHUA in English 1205 GMT 19 May 81

[Text] Beijing, 19 May (XINHUA)--The presidium of the Chinese Academy of Sciences elected Lu Jiaxi, an outstanding physical chemist, president of the academy at its first session here today. Qian Sanqiang, Hu Keshi, Feng Depei, Li Xun, Yan Dongsheng and Ye Duzheng were elected vice-presidents of the academy. The tenure of office for the president and vice-presidents is two years, which may be extended for another term of two years if they are re-elected.

The fourth session of the Scientific Council of the academy elected a 29-member presidium of the academy here earlier this morning. The term for its members is four years, which may be extended for another term if they are elected again. The presidium also elected Yan Jici, Li Chang and Wu Zhonghua executive chairmen of the presidium.

Two-thirds of the members of the presidium are from the Scientific Council of the academy and the remaining one-third is composed of leading members of the State Planning Commission, the State Scientific and Technological Commission, the Science and Technology Commission for National Defence of the Chinese People's Liberation Army, the Ministry of Education and the Chinese Academy of Social Sciences as well as leading members of the party organization of the academy. The presidium is the decisionmaking body of the academy when the Scientific Council is not in session. The presidium ratifies research and development programs of the academy, confers honorary academic titles and major academic awards, decides upon matters of major importance related to international scientific and technological cooperation and exchange, appoints and removes senior personnel, decides upon the establishment and readjustment of research institutions and important regulations of the academy.

The executive chairmen do not hold simultaneously the posts of president or vice-president. The presidium meets three or four times a year with one of the executive chairmen in the chair.

Commenting on the new elections, Hou Xueyi, researcher of the Institute of Botany of the Chinese Academy of Sciences, told XINHUA, "In the past, leading posts of the academy mostly went to physicists and mathematicians. This time, geologists, chemists and technical scientists are better represented. This will help implement the guide lines for the future development the academy."

[Beijing XINHUA Domestic Service in Chinese at 1400 GMT on 19 May carries a similar report on the PRC academy of sciences elections. The Chinese item adds the following sentence not found in the English: "The presidium also appointed Yu Wen [6735 2429] secretary general of the Chinese Academy of Sciences."]

'BEIJING RADIO' ON SCIENTIFIC LEADERSHIP

OW201107 Beijing Domestic Service in Mandarin 1200 GMT 19 May 81

[Station commentary: "Rely on Scientists To Improve the Party's Leadership Over Scientific Undertakings"]

[Text] The fourth meeting of the Scientific Council of the Chinese Academy of Sciences (CAS) is in session in Beijing. Outstanding representatives of scientists from the whole country are discussing CAS work. The meeting passed the provisional CAS charter on 18 May and elected members of its presidium on 19 May. The presidium has elected the CAS president and vice presidents. This signals the grand unity of Chinese scientists and the prospering of scientific undertakings in our country.

All scientists are united in promoting our scientific development and revitalizing China--this is the call of the times, the aspiration of the people and the tremendous historical mission of scientific circles. We wish full success to the fourth meeting of the CAS Scientific Council.

Economic and social development is closely linked with scientific and technological development. To build a strong socialist country, it is necessary to rely on science and technology, on scientists who possess a variety of special knowledge and on all scientific workers. Our scientists and large number of scientific workers have the tradition of patriotism, diligence in pursuing study and hard work. For many years, they have achieved much through painstaking study and selfless work under difficult conditions and made contributions to our modernization campaign.

However, as many people failed to fully understand the role of science and technology and as left ideas and practices interfered with practical scientific work, the role of scientists and scientific workers did not receive the attention it deserved. We have suffered enough in the past in ignoring science and technology. Without changing this situation, it will be impossible for us to succeed in socialist modernization.

To bring into full play the role of scientists and fully rely on them to successfully run scientific undertakings, the fourth CAS Scientific Council meeting introduced a reform to the CAS' leadership system, changing the system of appointing members of the Scientific Council to the system of election. The 283 additional members of the Scientific Council attending this meeting were all democratically elected by the CAS. The status of the Scientific Council meeting also has been changed from a consultative body to the supreme decision-making body of the CAS.

The Scientific Council meeting is to determine CAS development orientation, ratify research programs, decide on major issues and elect the presidium, which in turn elects the CAS president and vice presidents.

Now a scientist has become the CAS president. This is a major reform of the CAS leadership system. It is a concrete manifestation of, and an organizational guarantee for, reliance on scientists to improve the party's leadership over China's scientific undertakings. Replacing the past system of largely administrative leadership, the new system is conducive to doing things according to scientific laws. It is our belief that with China's outstanding scientific representatives taking part in CAS leadership and policy making, the CAS will be run still better, effectively promoting China's scientific development and making still greater contributions to the state.

The significant CAS reform aimed at relying on scientists to lead China's academic development is a first in our country. We should foster a social atmosphere of respecting science and scientists and attaching importance to, and making use of, scientists' ability. All departments and industries should give full scope to the consultative and advisory role of scientific and technical workers. Moral and talented people with scientific and technological knowledge should be placed in the leading body or councils of specialists and advisors should be established to capitalize on science and technology promoting social and economic development.

CSO: 4008/353

'RADIO BEIJING' INTERVIEWS ACADEMY PRESIDENT LU JIAXI

OW201808 Beijing Domestic Service in Mandarin 1200 GMT 19 May 81

[Text] On the morning of 19 May, all the members attending the fourth session of the Scientific Council of the Chinese Academy of Sciences, in accordance with the stipulations on leading organs in the constitution of the Chinese Academy of Sciences (for trial implementation) adopted on 18 May, elected by secret ballot the presidium of the Chinese Academy of Sciences. The presidium elected its executive chairmen and president and vice presidents of the academy. Our well-known chemist, Lu Jiaxi, was elected president of the Chinese Academy of Sciences.

The presidium of the academy is the policymaking organ, if the Scientific Council is not in session. The session elected 29 members to form the presidium. They are (in the order of the number of strokes in their surnames): Yu Guangyuan, Wang Daheng, Wang Ganchang, Ye Duzheng, Feng Depei, Lu Jiaxi, Hua Luogeng, Song Ping, Yan Dongshen, Yan Jici, Li Chang, Li Xun, Wu Zhonghua, Wu Nengyi, Wu Heng, Yu Wen, Zhou Peiyuan, Zhang Wenyou, Zhang Guangdou, Hu Keshi, Hou Xianglin, Qin Lisheng, Qian Sanqiang, Qian Xuesen, Tu Guangchi, Gao Yi, Tang Auqing, Huang Jiasi and Xie Xide (female).

On the morning of 19 May, the presidium of the academy held its first meeting and elected Yan Jici, Li Chang and Wu Zhonghua as executive chairmen of the presidium, Lu Jiaxi as president of the Chinese Academy of Sciences, and Qian Sanqiang, Hu Keshi, Feng Depei, Li Xun, Yan Dongsheng and Ye Duzheng as vice presidents of the academy.

Lu Jiaxi is a well-known chemist in our country and director of the Institute of Substantial Structures of the Chinese Academy of Sciences. He is 66 years old. His ancestral home was in Taiwan Province. In 1939, he went to study at the California Institute of Technology in California, the United states. He returned to China in 1945. He served successively as director of the Chemistry Department, assistant academic dean, director of the graduate school and assistant to the president, of Xiamen University. In 1960, he was appointed vice president of Fujian University.

He was interviewed by this station's reporter and invited to say something on his election as president of the academy.

He said: [begin recording] The party Central Committee decided to have a scientist to serve as president of the academy. The party and the people have placed me in this important leading position. I fear that I am not competent enough to undertake this important leading job. Of course, every Chinese scientist cannot but feel that he has a share of responsibility to develop science and revitalize China. From now on, I am determined to rely on the party's leadership and the support of the scientific circles in Taiwan Province and Chinese scientists living abroad, strive to implement the academy's principle of putting the emphasis on basic science and on raising standards and serving the national economy and national defense construction, act according to the laws of science, do solid work persistently, academically encourage a hundred schools of thought to contend, [words indistinct] promote academic democracy, further strengthen academic interchanges with scientific circles in foreign countries, strive to develop science and revitalize China and dedicate my humble efforts to accelerating our country's four modernizations and enabling our country to rank among the world's advanced nations at an early date. [end recording]

CSO: 4008/353

'WEN WEI PO': HU YAOBANG MEETS SCIENTISTS

HK210905 Hong Kong WEN WEI PO in Chinese 21 May 81 p 2

[ZHONGGUO XINWAN SHE reporter's feature: "Hu Yaobang Meets Scientists"]

[Text] With a red invitation card issued by the General Office of the CCP Central Committee in hand, scientists attending the fourth session of the Scientific Council of the Chinese Academy of Sciences came this morning to a symposium at the Huairen Hall in Zhongnanhai, which was personally presided over by Hu Yaobang, general secretary of the CCP Central Committee.

In front of the curtain in Huairen Hall were displayed fresh flowers and evergreen pinetrees. This solemn rectangular hall is a place where the CCP Central Committee and the State Council hold important meetings. Today, mount taishans and big dippers of the Chinese scientific circles came here as guests of the CCP Central Committee's secretariat to meet cordially with leading members of the secretariat.

At 1000 hours leading members of the secretariat and chief responsible members of the Chinese Academy of Sciences began to take their seats while chatting with each other. On the rostrum were seated from left to right Yao Yilin, Song Renqiong, Wu Zhonghua, Fang Yi, Yan Jici, Hu Yaobang, Lu Jiaxi, Wan Li, Li Chang, Gu Mu and Peng Chong. Of the 12 members of the Central Committee's Secretariat, only 5 were not present at the symposium because they had something else to attend to.

Hu Yaobang, general secretary of the CCP Central Committee, delivered a warm, sincere and rather important speech at the symposium. He warmly congratulated the participants on the complete success of the session and hoped that the scientists would go deep into the realities of life, solve important problems in the national economy and assume the attitude of masters in their work. He called on them to break through brambles and thorns and scale the summit of science with full confidence. His speech won repeated applause which lasted for some time.

Wan Li, Song Renqiong and Yao Yilin also addressed the symposium. They encouraged the scientists to contribute their intelligence and wisdom to the four modernizations.

Yan Jici, acting chairman of the presidium of the Chinese Academy of Sciences, spoke at the symposium. He said that the speeches of leaders of the CCP Central Committee's Secretariat were unforgettable and a great encouragement to scientific workers. He asked everybody to grasp seriously the essence of the speeches and implement them in practical work.

Wu Zhonghua, acting chairman of the presidium of the Chinese Academy of Sciences, gave a lecture on "Solution to the Energy Problem Viewed from Modern Science and Technology" to leaders of the Central Committee's Secretariat and the State Council in Zhonghanhai last year. He was deeply moved by how leaders of the Central Committee showed concern for scientists and how they attached importance to the cause of science. Wu Zhonghua said to reporters of ZHONGGUO XINWEN SHE: The speech made by General Secretary Hu Yaobang has struck chords in our hearts. On the march to realize the four modernizations, we scientific workers should strive to become heroes shouldering the historic mission.

Chen Zongji, an expert in rock and soil dynamics and a returned Overseas Chinese, worked assiduously in solving crucial technical problems of the large-scale projects of the Ge Zhou Dam and the Snman Gorge. At the end of last year, when leaders of the Central Committee discussed problems of the Ge Zhou Dam project, they listened to his opinions and those of Professor Zhang Guangdou. Today, after listening to the inspiring speech made by General Secretary Hu Yaobang, he excitedly told the reporters: "I would like to repeat that I have said: there is ample room for our abilities in our motherland!"

Today, in the forbidden city, the sun is shining bright and the breeze is blowing softly, and in Zhongnanhai, the lake reflects the beautiful blue sky. Before the symposium, the scientists paid a visit to the former residence of the late chairman Mao Zedong and went to see scenic spots such as Yingtai, Yingxun Pavilion, and so on, with great interest and enthusiasm.

CSO: 4008/353

FANG YI SPEAKS AT CAS SCIENTIFIC COUNCIL MEETING

OW300658 Beijing Domestic Service in Mandarin 0900 GMT 29 May 81

[Excerpts of the work report delivered by Fang Yi at the fourth session of the Scientific Council of the Chinese Academy of Sciences on 11 May 1981]

[Text] The report says: In the past 4 years and more since the smashing of the gang of four, the Chinese Academy of Sciences [CAS], working under the leadership of the party Central Committee and the State Council, has strived to implement the correct political, ideological and organizational lines of the party Central Committee. It has radically changed the situation of disorder and solved many questions left over from an earlier period. It has restored order in scientific work and made progress in all fields.

1. It has brought order out of chaos, implemented the party's policies and shifted the focus of the academy's work onto the path of scientific research. After the national science conference, especially since the 3d session of the 11th CCP Central Committee, great efforts have been made to shift the focus of the academy's work to scientific research and to put progress in scientific research ahead of production and construction. Meanwhile, acting on Comrade Deng Xiaoping's pithy analysis of Chinese intellectuals as part of the working class, we have firmly relied on our own scientists and technicians. We have restored the functions and powers to various institute and office directors, restored the academic committees of various institutes and restored technical job titles. We have promoted a large number of outstanding middle-aged and young scientific and technical cadres. We have reiterated the necessity to devote at least 5/6 of our working hours to research. We have restored enrollment of graduate students, reformed political work organizations and increased the proportion of scientists and technicians in the composition of the party committees of scientific research organizations. In the last 2 years, we have emphatically studied the guiding policy of the academy and questions concerning the strengthening of leadership over academic work.

2. We have restored and consolidated scientific research organizations and made initial reforms. In 1965, before the great cultural revolution, the Chinese Academy of Sciences for the first time became a comprehensive research center of natural sciences with all necessary branches of learning. It suffered severe damage during the 10 years of disorder. In the past 4 years, the academy recovered, restored and built a number of research institutes and branch institutes.

The academy now boasts 117 research institutions with a total work force of more than 75,000, of which more than 36,000 are research technicians and 2,000 are higher research technicians. We have initially substantiated the technological system, which is indispensable to scientific research. We have drawn in more personnel who are specialized in designing, production, maintenance and repair of scientific instruments and equipment. We have built and improved some public laboratories and technical service organizations. We have equipped laboratories with a number of new instruments we have made. We have completed a number of laboratory buildings and put a number of large equipment to laboratory use.

3. We have made steady progress in scientific research and achieved a number of results which meet certain academic standards and are of practical value. We have also stepped up the training of cadres. We formulated an 8-year plan in 1977. The academy scored about 500 important achievements 1977-80. In order to expand academic exchanges, we have actively organized and participated in various academic activities at home and stepped up the publication of books and journals. We presently publish 400 kinds of scientific and technological books and some 70 scientific and technological periodicals annually. For the purpose of training cadres, we are determined to run well the Chinese University of Sciences and Technology and its graduate schools. In recent years, the academy has taken in more than 1,800 graduate students. Having received on-the-job training and participated in various study classes, present scientists and technicians, as well as college graduates in recent years, have improved their understanding of basic theories, experimental techniques and foreign language skills. We have made it possible for more than 1,000 people to attend schools, pursue advanced studies or participate in research work in foreign countries. We have set up colleges for cadres to pursue advanced studies and organized the cadres to gain scientific and management knowledge in order to improve the management ability of present party and government cadres.

4. We have strengthened international academic exchanges and developed scientific cooperation with foreign countries. The CAS has signed agreements and memoranda on scientific and technological cooperation and exchanges and established cooperative relationships with the scientific organizations of many countries. There has been a fairly big increase in the number of personnel sent abroad and invited to China. Several international academic symposiums have been held in China in addition to the participation of many Chinese scientists and technicians in international academic conferences abroad.

The report says: As an academic institution, the CAS should take into account the unique features of academic institutions when it adopts the system and methods of leadership. The CAS departments set up in 1955 were specifically meant to strengthen academic leadership by relying on scientists. Since their establishment, the CAS departments have done much work and played their roles well. After 1957, academic leadership was weakened somewhat under the influence of "leftist" mistakes. During the decade of turmoil, CAS department activities were banned. All this hampered the CAS from functioning normally. In the spring of 1979, with the consent of the party Central Committee and the State Council, we began to restore and rebuild the CAS departments and appoint new members to them. Thanks to the support of all departments and localities and the earnest examination and democratic elections by the original CAS department members, 283 new CAS department members have been appointed. Together with the original members, the total CAS department

membership now stands at 400. Formerly CAS departments were primarily consultative bodies. Now the scientific council is the highest policymaking organ of the CAS. This is an important change.

Recently, the central authorities clearly reaffirmed that the CAS is the nation's highest academic institution in natural science and a comprehensive research center. The CAS should do a good job in building the research institutes under its jurisdiction and, through the higher-level research work of these institutes, serve the nation's four modernizations program. At the same time, the CAS has an important responsibility to develop science and technology in the whole country.

The report offers some opinions regarding the future work of the CAS departments.

The report says: Science and technology are productive forces. Scientific research should advance ahead of production and construction. Economically backward countries like China are especially in need of scientific and technical forces to improve the nation's outlook.

The CAS departments and their members should play positive roles in integrating science and technology with social and economic development in the following aspects:

First, it is necessary to make our scientific research yield more fruitful results and make greater contributions to the nation's economic and national defense construction. Second, the party Central Committee and the State Council want the CAS to play the role of staff to the party and the state in scientific and technological matters and to offer valuable opinions or suggestions on important matters related to the four modernizations program. Third, it is hoped that in integrating science and technology with society and the economy, CAS department members will publicize the important role of science and technology among the large numbers of cadres and masses, publicize the significance of propagating scientific research findings and disseminate scientific and technical knowledge so that everyone will study, make use of and support science and technology. Science and technology should serve the nation's economic construction.

The central authorities have clearly laid out the principle for operating the CAS--"placing particular emphasis on the basics and on raising the standards and serving the national economy and national defense construction"--and have pointed out that the CAS should strive to achieve higher academic standards and better meet the needs of the nation's economic and national defense construction. It is necessary to make scientific research match China's present situation and modern scientific developments. At the same time, it is necessary to fully consider the needs of future development. According to this principle, the CAS is mainly responsible for doing research in pure science and some branches of technical science. It is necessary to quickly train outstanding researchers in pure science and gradually increase the ratio of basic research by gradually readjusting research projects, actively training postgraduates and sending personnel abroad for further studies. It is necessary to raise the standards of research in practical application and devote greater efforts to applying the findings from basic research and exploring new domains. It is necessary to take our own capabilities into account when engaging in the work of expansion, which constitutes a large proportion of our present work.

In reporting on his 6-month tour of the United States, Comrade Hua Luogeng said that application cannot be successful without a broad and strong theoretical foundation. Summing up the practical scientific experience of the biochemistry institute in 30 years, Comrade Cao Tianqin also vividly explained the relationship between fundamentals and application. He maintained that research in pure science can facilitate production and that research in practical application can also generate new theories. Some research in pure science may yield practical results if we pay attention to relating it to reality. Research in practical application is linked to production and to raising scientific standards. It may also turn up subjects for basic research.

The CAS should also pay great attention to contributing its share to the nation's economic construction. We have also done a great deal of work in this aspect. However, we have dampened the enthusiasm of some scientists and technicians because of drawbacks in our system and work and because the paths were not cleared for publicizing scientific achievements. In the wake of national economic readjustment and economic structual reform, economic departments are feeling an increasing need for science and technology. This opens broader prospects for science and technology to play their part in production. Scientific research, including the work of pure science research units and many basic research projects, can also promote economic construction. We should pay attention to the ideological aspects of this matter, select the major fields of application and coordinate our efforts.

Since they hail from various departments and localities, CAS department members are more qualified to promote contacts and cooperation among the various departments. In future, CAS departments will examine the direction, tasks and plans of research institutes under the CAS which fall within the scopes of their respective disciplines. They will examine important projects and review the work of research institutes. They should try to prevent needless duplication of research projects among the various departments and institutes of higher learning. This will facilitate mutual understanding.

The report says: Our society as a whole works to achieve a civilization with socialist spirit. Scientists and technicians are builders of material as well as spiritual civilization. As an academic institution, the CAS is charged with the basic task of fostering a fine study style. It is necessary to foster among scientists and technicians a fine study style--of emancipating the mind, seeking truth from facts, daring to make explorations and setting rigorous and tough demands. Our party and government cadres should avoid making conclusive statements on right and wrong in specific academic issues. They should also not regard any leaders' instructions as a yardstick for making academic appraisals. Academic issues can be appraised only by academic circles.

Scientific research is a highly creative and extremely arduous mental labor. A major scientific breakthrough or an embryonic scientific assumption can be made only after scientists have devoted successive years or decades or even their entire lives to research. Sometimes the efforts of several generations are needed to accomplish it. Leading comrades of research institutes of the CAS should fully understand and pay attention to the unique features of scientific research, act according to objective laws and prevent scientific research from being interfered with or disrupted. We hope that the old and middle-aged scientists will help young scientists and technicians foster an indomitable spirit so that they will not rest content with having a smattering knowledge of a subject, retreat at the first sign of hardship or look up against long years of experiments, surveys, observations and investigations.

An extremely important matter now is to fully bring out the potential and functions of middle-aged and young scientists and technicians. Scientists who are relatively advanced in age have many strong points, but they lack the stamina and have limited time to continue their work, a fact dictated by the laws of nature. We should enable them to devote this limited time to discovering, selecting, promoting and training talented people and to use their experience to make up for their inadequacies. We should let them shoulder more important tasks and give them more chance to demonstrate their talents in academic leadership, academic activities, international exchanges and organizational and administrative work. The leadership should show warm concern for their difficulties and problems and solve them step by step. We hope that the older scientists will display tireless zeal in teaching people and continue to guide the middle-aged and young scientists and technicians in academic thinking and methods of academic pursuit.

An important characteristic of science and technology is the constant and endless breakthroughs in the attained levels. Changes occur daily in modern scientific and technological development. Therefore, old, middle-aged and young scientists should constantly study and improve themselves. They should familiarize themselves with the latest developments in science and technology throughout the world, study new problems, accept new ideas, explore new domains, furnish new results and make fresh contributions.

The historical lesson obtained from the revolution and construction in China shows that a correct CCP leadership is indispensable. Scientific and technological development since the founding of new China also shows that a correct CCP leadership is indispensable. Our party has put forth the principles in doing cadres' work--to have revolutionary, more educated, professional and younger cadres. Cadres doing political, administrative or logistic work in scientific research institutions should set higher demands in order to be more revolutionary. They should constantly raise their ideological and theoretical levels and improve their understanding of the policies by studying political theories and party policies and constantly summing up their work experience. They should uphold the four basic principles and foster the lofty ideas of serving scientific research and scientists and technicians, They should pay attention to studying new situations and problems, improving their methods of work, gaining new experience and constantly raising the level of ideological and political work and other administrative work. They should unite all scientists and technicians and help them make constant progress in poltiical awareness and allay livelihood worries that distract them from their work. Party member-cadres should all the more observe the guiding principles for inner-party life and play an exemplary and vanguard role in all work.

CSO: 4008/352

FANG YI, OTHER LEADERS ATTEND SCIENCE CONFERENCE

OW061330 Beijing XINHUA in English 1301 GMT 6 Jun 81

[Text] Beijing, 6 Jun (XINHUA)--A hybrid rice strain which produces extremely high yields and holds great promise for agriculture worldwide was given a special class award by the State Council here today.

In the view of the awarding and examining committee under the State Scientific and Technological commission, the development of this strain--called Xian type hybrid rice of the male sterile line--has great value academically, technically and economically.

The successful cultivation of this hybrid has enriched the theory and practice of heredity in hybrid rice seeds, and opened a new way for the big increase of rice production in China and in the rest of the world.

The special class award, the first of its kind, consists of certificate of merit, a medal and (RMB) 100,000 yuan. The certificate and medal were handed over to agronomist Yuan Longping, representing the inventors, by Fang Yi, vice-premier and minister in charge of the State Scientific and Technological Commission, at an awards ceremony today.

From 1976 to 1980, China sowed Xian-type hybrid rice on a total of 16.7 million hectares of paddy fields, and yields totalled 13 million tons more than with conventional strains. Average per hectare yield was 750 kilogrammes higher than that of other fine rice strains. The new hybrid rice has proved to have extensive fibrous roots, a high tillering rate, thick stems and big ears containing more than the usual numbers of grains. It is also adaptable to different farming conditions and resistant to adverse conditions, and yields grain of good quality.

Yuan Longping, an agronomist at the Agricultural Insititute of Hunan Province, and research workers in other parts of the country, began in 1964 to experiment with hybrid rice of the male sterile line. They succeeded in cultivating the world's first hybrid rice seed of this line in 1973. Subsequently, they developed seed-breeding and cultivation methods, thus created conditions for popularization of the strain.

Leaders of the state and the Communist Party Wang Zhen and Wan Li attended the ceremony and congratulated the inventors on their scientific achievement. A message of greetings from the State Council was read at the ceremony by Wu Heng, vice-minister of the State Scientific and Technological Commission.

Yuan Longping in his address attributed the success of the cultivation of the hybrid rice to the coordination of the country's agronomists in this research work.

Also awarded today were the inventors of a new high-yield cotton seed, called Lumian No One. They received a first class award from the State Scientific and Technological Commission.

'Text' of Fang Yi's Speech

OW070922 Beijing XINHUA Domestic Service in Chinese 1620 GMT 6 Jun 81

["Text" of speech by Fang Yi, vice premier of the State Council and minister of the State Scientific and Technological Commission, at the 6 June meeting to present a special class award to those who invented Xian-type hybrid rice]

[Text] Beijing, 6 Jun (XINHUA)--Comrades: First of all, I am happy to warmly congratulate those who have won the special class award for inventing the Xian-type hybrid paddy rice and those who have won the first class award for inventing the new cotton seed called Lumian No 1.

With your hard work and creative achievements, you have made remarkable contributions to increasing grain and cotton yields in China. Today the state and the people bestow upon you high honor and due awards. This is a memorable day. I hope that you comrades will maintain your honor, work ceaselessly and unremittingly, and create even more and better achievements for the development of agriculture and the country.

Success in breeding the Xian-type hybrid rice has enriched the theory and practice of heredity in hybrid rice seeds, marks a good lead in this field internationally, and has won great honor for the nation. Scientists in the United States, Japan, India, Italy, the Soviet Union and other countries have, for more than a decade, been studying hybrid rice. However, they are still in an experimental stage. We are way ahead.

How is it possible for China to take the lead in this field? I believe that such a lead is by no means accidental. There are good reasons. The Xian-type hybrid rice is an achievement scored by combining modern science and technology with China's traditional experience in agricultural production. China is an ancient farming country. The Chinese nation is one of the earliest in the world to engage in agriculture. It has made indelible contributions to the progress of mankind and to the development of productive forces. In the practice of production over a long period, the broad masses of peasants in China have accumulated extremely rich experience. They have their own originality in breeding and invigorating seeds of fine strains, carrying out meticulous farming, maintaining soil fertility and combating and preventing insect pests and plant diseases. Once such valuable traditional experience in production is integrated with modern science and technology, it will bear rich fruit.

Our party has always advocated that agricultural scientists and technicians must maintain close touch with reality in production and identify with the peasant masses. They have already accumulated a wealth of good experience and scored outstanding achievements in research. The success in rapidly breeding and propagating hybrid rice is a striking example.

The integration of rice strains of three different lines, the development of the seed strain and the techniques in seed cultivation have been achieved by assimilating and summing up the experience of the masses. For example, hybrid rice is evolved from cross-breeding rice of the sterile line with fine strain rice with short stems. Its resultant strain not only has the fine features of a hybrid strain, but also maintains the fine features of being short-stemmed and lodging-resistant. In growing rice seedlings the experience in cultivating and invigorating conventional rice seedlings has been assimilated, and hybrid rice seedlings have been propagated by the use of tillering, thus greatly reducing the amount of seeds needed. In seed-breeding the experience of the masses in "controlling growth with dryness and promoting it by the use of water" has been summed up and applied in solving the problem of infertility in the stage of anthesis. Practice proves that to link agricultural scientists and technicians with the peasant masses and combine modern science and technology with China's traditional experience in agricultural production is the correct path in scoring more achievements and attaining quicker results.

The present situation in China's agricultural production is fine. The party's correct policy in agriculture has already demonstrated its tremendous power and is continuously playing its gigantic role. The enthusiasm of the broad masses of peasants for production has been brought into full play. They have never felt the pressing need of science and technology and such a strong demand in relying upon science and technology to develop production as they do today. All this has put forward before agriculture scientists and technicians a glorious task and even higher requirements. It is hoped that all agricultural scientists and technicians will bring into full play their wisdom and talents and unflinchingly and triumphantly march along this road.

Success in developing Xian-type hybrid rice is a victory for mass socialist coordination. Comrade Yuan Longping began his study on hybrid rice in 1964. After he and other comrades worked hard and discovered the wild-growing paddy rice of the male sterile line in the winter of 1970, they started to coordinate with more than a dozen units in fraternal provinces and municipalities.

Giving no thought to personal gain or fame, they offered their hard-earned achievements to the cause of science of the motherland. They propagated technology and provided the above-mentioned units with reference material. Within a short period of 3 years and thanks to the joint efforts of the units concerned, some strains of the maintenance line [bao chi xi 0202 2170 4762] and the restoration line [hui fu xi 1863 1788 4762] were successfully evolved in various localities in 1973, and the task of developing a fine strain by combining rice strains of the three different lines was fulfilled, creating conditions for the use of hybrid rice in production. Experimental sowing began in 1974, and the acreage of land sown to this improved strain was expanded each year after. The area of land sown to this improved strain totaled more than 80 million mu in 1980. Organized by the China Academy of Agricultural Sciences and the Hunan Provincial Academy of Agricultural Sciences, more than 100 units in more than a dozen provinces, municipalities and autonomous regions, along with thousands of scientists and technicians, coordinated with one another in carrying out the research project.

It is exactly because of this mass socialist coordination that we are able to attain rapid development in scientific research work, in propagating the achievements and in making agricultural science and technology serve agricultural production. This major invention and its success manifest the superiority of the socialist system; reflect the fine style of study of the agricultural scientists and technicians, as well as their lofty moral character; and demonstrate their tremendous strength in unity and coordination. This is the kind of socialist morals and ethics and spiritual civilization that we like to promote. We must vigorously give full play to the fine style of work to coordinate with one another for developing science, raising production and enhancing national strength.

China is a major agricultural country with 800 million peasants. To develop agricultural production is of great significance in creating the political situation of stability and unity and in improving the people's living standards. In developing agricultural production, we must first rely on policy and second depend upon science. The two major inventions to win awards at today's meeting--the hybrid rice seed and Lumian No 1 cotton seed--have yielded tremendous economic results since being popularized and put into use. During the 5-year period 1976-1980, Xian-type hybrid rice was sown on a total of 250 million mu of paddy fields, and yields totaled 26 billion jin more than with conventional strains. Average per mu yield was over 100 jin higher than that of other fine rice strains.

In 1980 China sowed Lumian No 1 cotton seeds on more than 10 million mu of cotton fields, and yields of ginned cotton were increased by nearly a million dan. This has fully shown the significant role of science and technology in the development of production. Success in quickly developing the hybrid rice and the Lumian No 1 cotton seed and putting them to use on a large scale is inseparable from the full attention and support given by the leading comrades concerned. These comrades promptly discovered that the work was promising, firmly carried out their work in leading and organizing the units and people concerned, and gave those units and people moral encouragement and the necessary material

support. Here I would like to express my appreciation to those comrades. I also hope that the party organizations and governments at all levels will strengthen their leadership over science and technology work and regard it as a major topic on their daily agenda. It is necessary to further develop research work in agricultural science and effectively popularize and apply the achievements in agro-science and technolgoy. At the same time, efforts must be made to strengthen education on agriculture, vigorously train scientists and technicians in agronomy and disseminate general knowledge in agricultural science so as to develop China's agriculture persistently and rapidly.

Comrades: Today's meeting is the first of its kind since the founding of the nation to present a special class award for an invention. The first special award in China has been given to an invention in agriculture. This shows that China has a solid foundation in agricultural science and technology, and that it has made outstanding contributions in this field. This also shows that there is plenty of room for development in promoting agricultural science and technology.

The Chinese people are diligent and wise. In the past the Chinese people contributed significantly to the development of science and technology. Now we are lagging behind. As compared with the advanced world level, we are still far behind. Nevertheless, we are full of confidence. After the 3d Plenary Session of the 11th CCP Central Committee, science and technology will definitely flourish with marked progress in the course of national resurgence. I hope that after this award meeting, the broad masses of scientists and technicians will further give full play to their enthusiasm, creativeness and spirit for coordination; identify themselves with the masses and cadres; and make even greater contributions to the four socialist modernizations of the motherland. I hope that you comrades will continue your efforts and score even greater victories.

RENMIN RIBAO EDITORIAL ON SCIENTIFIC COUNCIL

HK120144 Beijing RENMIN RIBAO in Chinese 19 May 81 pp 1, 4

[Editorial: "A Major Reform in the Leadership System in Science"]

[Text] The fourth session of the Scientific Council of the Chinese Academy of Sciences is another landmark meeting of our scientific circle following the downfall of the "gang of four." Due to the concern of the party Central Committee and the State Council, representatives of outstanding scientists across the country came together to discuss and decide upon major issues of the academy and elected its leading group. The victorious opening of this session represents an important development in the reform of the scientific leadership system.

The Scientific Council had held three sessions since its establishment in 1955 which positively influenced the development of our scientific efforts. The fourth session was even more successful than the previous three sessions. Its achievements included:

First, an additional 283 scientists joined the Scientific Council, bringing its total membership to 400. These scientists are working in 27 departments, 44 institutions of higher learning and 114 research institutes in the 24 provinces, municipalities and autonomous regions across the country and in most of the branches of natural sciences. What is more important is that these new members were elected by the current members after conscientious investigations and in a democratic way. In this way, the Scientific Council now has a wider and authoritative representation.

Second, the Scientific Council has become the supreme decisionmaking body of the academy instead of a consultative body. The session elected the presidium of the academy as well as the president and vice presidents from among the members of the presidium. The members of the presidium and the president and vice presidents have a set term of office.

These changes represent an important reform of the leadership body of the academy. Whether viewed from past experiences and lessons or from the needs of the developing situation, such changes are necessary. The Chinese Academy of Sciences has, since its establishment 31 years ago, made many achievements and trained many talented people. The academy has thus made important contributions to devleoping our science and technology and promoting the development of the national economy and national defense construction and accumulated valuable experiences in leading and managing our scientific endeavors. One of the successful experiences is the setting up of the Scientific Council to step up academic leadership by relying on scientists. Yet it was regretful that during a certain period in the past that the Scientific Council was not in a position to fully display its role and during the 10 turbulent years it was compelled to suspend activities. In the recent past, the academy was regarded as an administrative body and it had an administrative management system. The leading position of scientists was far from complete and this situation hindered the development of science. This time, the reform of the leadership system confirms the nature of the academy as the supreme national academic body and research center of natural sciences and changes its management system, thus allowing it to play its leadership role.

Now, scientists will be able to strengthen their leadership over academic matters and fully display their leadership role in scientific affairs; this new situation is in the interest of working according to scientific laws and promoting the development of science. It is also in the interest of pooling together the wisdom and opinions of scientists in various branches so that they will be able to display their role as advisers to the party and the government in deciding important matters and to shoulder various heavy tasks assigned them by the party and the government.

The reforming of the academy heralds the carrying out of similar measures throughout the country. It merits the general attention of various sectors to guarantee making use of the strength of scientists systematically and organizationally. Today, science and technology have been developing on an unprecedented scale and pace and they have penetrated into various sectors of the economy and social life to become an important and indispensable factor for economic and social development. In carrying out the current national economic readjustment and restructuring, we face many difficulties in our economic and social work and all these problems have to be examined scientifically. In fact many problems can be tackled by resorting to science and technology. In principle, various party, government, economic, cultural and educational departments must let specialists take part in leadership and policymaking. But all the departments concerned must proceed from their own specific conditions and may adopt organizational methods that differ from those taken by the academy. For example, they may invite experts to join leading groups with some of them being responsible for practical work and others for advisory work; they may also establish advisory groups composed of experts or authorize some academic bodies to act as their advisers. It is true that it is impossible for the various departments, localities and units to have as many outstanding scientists as the academy, but once they are able to solve various problems ideologically, they will be in a position to take various measures systematically and organizationally and organize the experts from various branches in their departments, regions and units so that these experts will be able to fully display their role in leadership and policymaking. There is a very big potential in this respect.

To let experts take part in leadership and policymaking is an important measure in strengthening and improving the party's leadership over scientific and economic work. Our economy is not strong and our science and technology are comparatively backward. Our scientific and technical personnel account for only 0.5 percent of our population while the number of senior specialists is even fewer. Our scientific and technical personnel constitute invaluable intellectual wealth for our country and nation. They are the Red and expert rank of the proletariat. With considerably higher scientific and technical level, they have the ability to solve independently scientific and technical problems that have cropped up during the modernization construction. In addition, they have a glorious revolutionary and patriotic tradition. The majority of them have been tested in protracted struggles and even in the most difficult times during the 10 turbulent years they all continued to rally round the party. Their confidence in the party, the people and scientific cause never wavered. Quite a number of outstanding elements among them have joined the party. Of the 400 members of the Scientific Council of the academy, 219 are party members. They comprise more than a half of the total. Letting experts take part in leadership and policymaking at various levels no doubt will strengthen the party's leadership over modernization construction. The leadership by laymen over experts was stressed in the past because of the influence of "leftist" mistakes. Measures were taken to criticize the so-called "the line of relying solely on experts" and "letting experts run institutions" and relying on experts was regarded as contradictory to the party's leadership. As a result, our scientific cause and economic work were damaged and the party's leadership was weakened. Now more and more party and government leading comrades have come to realize that the party's leadership will be strengthened only through integration with experts. The party and government leading comrades at various levels must respect science and scientists. They must learn from experts, study and apply scientific and technical know-how and rely on experts to do a good job in leadership and policymaking.

The experts who take part in leadership and policymaking must not be just given titles simply out of courtesy; on the contrary, they must be regarded as the members of the same family. That is to say, we must trust them, unite with and work together with them and create opportunities and conditions for them so that they will be able to fully display their talents and realize their aspirations.

Following the reform of its leadership system, the Chinese Academy of Sciences has set a new and higher demand on all the members of the Scientific Council. The party and people are grateful for the arduous work and outstanding contributions scientists have made over the years and urgently hope that they will make new scientific and research achievements in their endeavors to serve the four modernizations and the motherland. We hope that with high sense of responsibility and the enthusiasm of being the masters of the state, they will carry out their work boldly, display the spirit of scientists who seek truth from facts and express their views without reserve. It is also necessary to persist in a good work style, launch the drive of letting a hundred schools of thought contend, unite the scientific and technical personnel across the country and widely absorb the wisdom of the masses. Veteran scientists have an unshirkable duty in educating young people and bringing up new and outstanding scientists. Of the scientists that have been recently admitted into the Scientific Council, the average age of 40 of them is below 55. This is inspiring news but this number is still too small. We hope that more and more middle-aged scientists will join the Scientific Council and more experienced and outstanding experts will take part in leadership and policymaking at various levels. We hope that all patriotic scientists and the masses of scientific and technical personnel will unite in their efforts to develop science so that they will become the vanguard in inspiring the nation.

RENMIN RIBAO COMMENTATOR ON SCIENTISTS, CONSTRUCTION

HK250727 Beijing RENMIN RIBAO in Chinese 20 Jun 81 p 5

[Commentator's article: "Organize Scientists and Technicians To Serve Economic Construction"]

[Text] In recent years, thanks to the efforts of many scientific research organs and personnel, there has been a great increase in the recycling rate of rare metals of the Jinchuan mineral intergrowth such as nickel and cobalt; and success has been achieved in the separation of elements in rare earths of the Baotou mineral intergrowth, while the grade of concentrates has soared. This has created a lot of wealth for the state. These facts have again demonstrated the power of science and technology in stimulating economic and social development, and also show that so long as we organize the enthusiasm of scientists and technicians to serve the economy, the effectiveness of economic construction will be greatly enhanced.

There are very many difficult problems that need solving in our country's industrial and agricultural production. Many products cannot be replaced by new ones, their production costs and input consumption are high, output and quality are low, they lack competitive ability and are also unable to meet the needs of the people's life, while many rich resources cannot be fully used. This is saddening and depressing. He cannot do without relying on the forces of science and technology to change this situation. There are many aspects of science and technology, and many difficult problems in economic construction have to be solved by coordinating various branches of science. This gives rise to a question of strengthening and improving organizational leadership. The State Scientific and Technological Commission organized the forces of many branches of science in order to score success in research on the Jinchuan and Baotou mineral intergrowths, thus accumulating experience for solving difficult technical problems in economic construction and promoting the development of industrial and agricultural production, and also providing ample scope for scientists and technicians to display their talents.

We already have a completely trustworthy and reliable force of scientists and technicians. They earnestly desire to make more contributions to the party and people and have long been unhappy over the systems of "ownership by departments" and "ownership by units" which have bound them hand and foot. Many scientists and technicians say that now on the one hand the workers need scientific and technical knowledge, while the peasants want science to advance into the countryside, and on the other there are many people working quietly and unknown in certain units which are stuffed with talent. On the one hand the science and technology workers, especially the middle-aged and young ones, urgently demand to do something while they are full of energy, and on the other hand there are all sorts of barriers, they are always being impeded, and are unable to make full use of their talents. In the face of this situation, the party and state are gradually carrying out readjustment and reform so as to bring the enthusiasm of the scientists and technicians into fuller play. However the leading comrades of certain scientific and technological departments are just waiting for the reform of our country's economic and scientific research systems and think very little if at all about what work they could be doing right now.

Centering on the coordinated effort to succeed in the Jinchuan mineral intergrowth and the separation of elements in the Baotou mineral intergrowth, we should make these comrades think about this: We cannot wait until after the reforms are carried out before bringing into play the enthusiasm of the scientists and technicians; we must actively think of ways to promote reform, in order to mobilize their enthusiasm. One way is to advocate that scientists and technicians display the spirit of being masters of the house and plunge into the reality of production to find things to do and take the initiative in grabbing work; and another practical way is to have the leaders of science and technology departments grasp the difficult technical problems in the national economy and organize the scientists and technicians concerned to attack them one by one in a coordinated way. The State Scientific and Technological Commission and the Chinese Science and Technology Association have done a lot in this respect in the past 2 years and scored good results. All areas and departments can also proceed from their own acutal conditions and do a good job in this organizational work. As far as the leaders are concerned, by carrying out this organizational work they can probe and gradually accumulate experience in reforming the systems; and as far as the scientists and technicians are concerned, they can broaden their vision and increase their talent and ability. This would really be a good way of accomplishing many things at one stroke.

In order to organize work well in this respect, the leading departments at all levels need to do some investigation and study, to get to know the talent resources in their areas and departments and the specialities of the scientists and technicians there, and also to find out the material resources in their areas and departments and to ascertain what technical problems need solving. It is not difficult to do this. The key lies in whether one has a good mental outlook and can fully trust and rely on the scientists and technicians.

XINHUA INTERVIEWS LEADING PHYSICIST ZHANG WENYU

OW251241 Beijing XINHUA in English 1231 GMT 25 Jun 81

[Text] Beijing, 25 Jun (XINHUA)--"One-third of my life was spent abroad, one-third in old China and one-third in the new society. I think I have a right to say that the Chinese Communist Party has made China strong," said high energy physicist Zhang Wenyu, 71, in an interview with XINHUA on the eve of the party's 60th anniversary. He is one of the nine senior scientists who joined the party after the overthrow of the gang of four in 1976.

Humiliated and attacked in the Cultural Revolution, he is today director of the Institute of High Energy Physics and among those in charge of organizing the nation's research in this field of science. "The communists' devotion to building the country struck me when I returned from the U.S. in 1956. I applied for party membership in 1965, and applied again after the fall of the gang when I felt I was reunited with the party I have faith in," he said.

In the late 1940's, Zhang Wenyu studied the correlation between the subatomic particles, the muon and the nucleon and discovered the existence of the mu-mesonic atom. Between 1943 and 1956, he worked in the U.S.

Commenting on new China's advances in physics, he paid tribute to Chinese physicists' 1965 proposal of a "straton model" on the structure of basic particles and the 1972 discovery of a heavy particle, whose mass is over ten times that of a proton, at the Yunnan cosmic ray observation station. "Old China, like loose sand, disunited, could never do it," he said.

The veteran physicist was very glad that Beijing University this year will have 128 graduates majoring in physics. In 1931, the year he graduated, there were only five. His High Energy Institute now has a research staff of 438. "The future is promising," he remarked.

ANHUI HOLDS MEETING ON SCIENTIFIC FARMING

OW080810 Beijing XINHUA Domestic Service in Chinese 0130 GMT 8 Jul 81

[Summary] Hefei, 8 Jul (XINHUA)--The Anhui Provincial CCP Committee recently held a Standing Committee meeting and especially invited some agricultural experts to jointly disucss how to strengthen research work and popularize agricultural science and technology to meet the rural areas' requirements under the new situation and the peasants' new demands.

Since the 3d Plenary Session of the 11th CCP Central Committee, Anhui Province has widely implemented various forms of production responsibility systems in the rural areas. During the implementation of the production responsibility system, peasants have widely felt that although it is possible to increase production in 1-3 years by relying on hard work alone, sustained increases in production must still depend on science.

The agricultural experts attending the meeting said excitedly: The production responsibility system has aroused the peasants' "enthusiasm for science" and has ushered in a golden age for the agricultural experts. They made many constructive proposals on how to promote and popularize scientific and technological agricultural research, how to readjust teaching programs in scientific agricultural research and how to raise the scientific and technological level of leading cadres at all levels.

After hearing the experts' views, Gu Zhouxin, second secretary of the Anhui Provincial CCP Committee, said: The current "enthusiasm for science" in the rural areas is a great change. Leaders at all levels must take the initiative in supporting this enthusiasm.

Gu Zhouxin proposed: The major task of scientific and technological agricultural departments at and below the county level should be the popularization and teaching of agricultural science and technology. Furthermore, a few counties may engage in some research projects, management of the county agricultural science institute and the county agricultural technology station should be unified; and the provincial agricultural institute and the provincial agricultural college must also take part in the research of applied technology.

ZHOU PEIYUAN ON SCIENCE, TECHNOLOGY PROGRESS

OW231300 Beijing XINHUA in English 1222 GMT 23 Dec 81

[Text] Beijing, December 23 (XINHUA) -- Zhou Peiyuan, chairman of the China Association for Science and Technology, spoke on the state and progress of the nation's scientific establishment this week.

"China's science and technology, in the past 32 years, has made considerable progress," he said. "We have a complement of experts and technicians and better material conditions than ever before."

Although the level of the nation's science and technology is still lower than that of industrialized countries, he said, we have trained many experts in science, engineering, agriculture, medicine and social sciences conducive to China's important achievements in industrial and agricultural production, medicine and national defence, he said.

The chairman accredited the progress to the leadership of the Communist Party and the unified and clear plans for scientific research.

To develop science and technology in accordance with the guidelines delineated by Premier Zhao Ziyang, the chairman raised the following points:

Tap the potential of scientific and technical personnel, organize this force, strengthen co-operation among scientists and form key task teams in scientific research and development.

Create or provide more favorable material conditions for technical personnel in their research work. The Chinese Academy of Sciences has decided to start a scientific research fund in 1982. The fund will be allocated to applicants with a research plan after approval by the fund committee.

Reform the management system in scientific research and try to solve the problems of overlapping institutions and low efficiency now existing in some scientific research departments.

Promote education by using available talent and training more professional personnel. More vocational, spare-time and secondary technical schools, day universities and other kinds of educational institutions should be established to increase the number of college students and technical personnel.

Strengthen and raise the level of local scientific research to upgrade, as a whole, the scientific level of laborers.

In conclusion Zhou Peiyuan said that the association should do more in organizing socialist emulations which will help China catch up to the world level of scientific research and development.

PRC SCIENTISTS' ROLE BROUGHT INTO FULLER PLAY

Beijing XINHUA in English 0738 GMT 29 Dec 81

[Text] Beijing, 29 Dec (XINHUA)--The Chinese Academy of Sciences has brought into full play the role of the scientists who are giving greater academic leadership since the general assembly of the division members of the Chinese Academy of Sciences last May.

A growing number of professionals have assumed leadership at academy and institute levels. Lu Jiaxi, professor of chemical physics, has taken up the office of Presidency of the Academy. Scientists of nuclear energy, materials, metallurgy, bioneurology and atmospheric physics are elected vice-presidents. The academy's institutes are almost all headed by scientists who have achieved outstanding results. Among them are Peng Huanwu, Wu Xuezhou, Wang Yinglai, Yin Zanxun and Wang Daheng, working respectively in theoretical physics, chemistry, biology, geology and technical sciences.

Scientists are giving their guidance by going to various institutes to appraise research programs.

A group of 28 technical scientists led by Li Xun, a specialist in metals and vice-president of the academy, went to the Institute of Metals in Shenyang in August this year. They studied the feasibility of the institute's research projects and commented on its research results in high-temperature metallurgy, the metallurgy of alloys, vacuum metallurgy and studies in metal crystallic structures. After a series of panel discussions, the visiting scientists suggested that the institute affirmed the outstanding contributions the institute made in basic research in metal physics, and suggested that it step up its work in this field.

Work of the Institutes of Botany, Applied Chemistry, Optics and Precision Machinery, Physics and Geology also have been appraised in the same way.

At a standing committee meeting of the Division of Biology in September, a 5-year plan was made to conduct research in molecular biology, cytobiology, neurobiology, molecular genetics and biological nitrogen fixation.

The Division of Earth Sciences held a meeting of scientists in Qingdao in June and decided to make marine geology the center of its research. The scientists also decided to strengthen basic studies in the development of oil formations and sedimentary basins of oil and natural gas reserves. The focus of their work will be China's Continental Shelf.

SCIENCE, TECHNOLOGY FILING REGULATIONS IMPLEMENTED

OW241450 Beijing Xinhua Domestic Service in Chinese 1139 GMT 24 Jan 81

[Text] Beijing, 24 Jan (XINHUA)--The "Regulations Governing Scientific and Technological Filing Work," approved by the State Council, were recently issued by the State Economic Commission, the State Capital Construction Commission, the State Scientific and Technological Commission and the State Archives Bureau to various State Council departments and concerned departments of various provinces, municipalities and autonomous regions for implementation.

The regulations are formulated to meet the requirements of the socialist modernization program. The regulations contain stipulations with regard to the formation and filing of scientific and technological documents and materials, scientific and technological file management, the administrative system for scientific and technological filing work, the building up of the ranks of scientific and technological file cadres and so forth.

The regulations say: Scientific and technological files refer to drawings, charts, written materials, calculating materials, photos, films, videotape recordings, sound recordings and other scientific and technological documents and materials formed in natural science studies, productive technological activities, capital construction activities and so forth that should be placed on file for safekeeping.

The regulations call on economic and construction departments and scientific research, educational, public health units and so forth to include scientific and technological filing work in the administration of production, technology and scientific research, to strengthen leadership, and to establish and perfect scientific and technological filing in accordance with the basic principle of centralized and unified management so that scientific and technological files will be complete, accurate, systematized, safe and effectively utilized.

The regulations stipulate: The various specialized responsible organizations under the State Council and those under the people's governments of provinces, autonomous regions and municipalities directly under the central government should all build a contingent of scientific and technological filing cadres who adhere to the socialist road, are equipped with professional knowledge in scientific and technological filing, understand the related science and technology and have specific working abilities. All the units should assign a sufficient number of competent cadres as well as a certain number of scientific and technological cadres to the scientific and technological filing departments to insure meeting work requirements.

CSO: 4008

Briefs

ZHEJIANG SCIENCE SOCIETY--The preparatory committee for the Zhejiang Provincial Society for studying science and scientific management was formed in Hanzhou on 8 October. Liu Yifu, vice governor of Zhejiang and chairman of the Zhejiang Provincial Scientific and Technological Committee, addressed the inaugural meeting. The preparatory committee is headed by (Liu Caisheng), vice chairman of the Provincial Scientific and Technological Committee. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 8 Oct 80]

CSO: 4008

SHANGHAI SCIENCE ASSOCIATION--To better lead work in various fields, the Shanghai Municipal Scientific and Technological Association has set up several committees--an academic committee, a science popularization committee, an international academic exchange committee and an organizational work committee. These committees have a total of 117 members, including scientists, professors and engineers as well as cadres in charge of administrative work in the scientific and technological field. Recently the committees held their first meetings to plan their work. [OW131431 Shanghai City Service in Mandarin 1130 GMT 9 Oct 80]

CSO: 4008

HEBEI SCIENTIFIC RESEARCH FORUM--Hebei Province recently held a forum on scientific research work in the universities, colleges and research units. The forum pointed out: At present, all universities, colleges and research units throughout the province should work together to promote scientific research. Li Feng, Hebei provincial vice governor, attended the forum and spoke. The forum also discussed orientations and key subjects of scientific research work in the province. [Shijiazhuang Hebei Provincial Service in Mandarin 0430 GMT 3 Dec 80 HK]

SHANGHAI SCIENTIFIC RESEARCH--The scientific and technological associations in various wards and suburban counties in Shanghai and 23 academic societies and research institutes under the Shanghai Municipal Scientific and Technological Association have worked on many technical problems in connection with the four modernizations in Shanghai. They have organized more than 300 academic activities in 1980 and discussed such subjects as development of high-temperature water supply and use of residue heat in electric power generation. They made suggestions on acceleration of the development of urban gas supply, construction of an electric power station using tidal energy north of the estuary of the Yangtze River and construction of nuclear power plants in Shanghai and east China region. [OW301317 Shanghai City Service in Mandarin 2300 GMT 27 Dec 80 OW]

COUNTY SCIENTIFIC BODIES--Beijing, 28 Dec (XINHUA)--Nearly two-thirds of China's counties have established their county-level scientific associations, according to the conference on the work of county-level scientific associations held by the Chinese Scientific and Technical Association in Beijing from 17 to 24 December 1980. These county-level scientific associations are playing a role in local economic development. [Beijing XINHUA Domestic Service in Chinese 0333 GMT 28 Dec 80 OW]

JIANGXI SCIENTIFIC RESEARCH FORUM--The Jiangxi Provincial CCP Committee held a forum on scientific research on the afternoon of 29 November. Attending the forum were Ma Jikong, Di Sheng, Xu Qin and other comrades in charge of scientific research work. The Jiangxi vice provincial governor presided over the forum. Everybody freely aired their views and exchanged ideas on planned parenthood work, nurses training, education and agricultural production. [Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 30 Nov 80 HK]

NATIONAL ACADEMIC SYMPOSIUM--The national symposium on optics, laser and frontier branches of learning was held in Wuxi from 22 to 24 November. It was attended by over 50 scientists and technicians engaged in the study of laser, physics, chemistry, biology, medicines, agriculture and environmental protection in 13 provinces, municipalities and autonomous regions throughout the country. A total of 32 academic papers were read at the seminar, including 2 papers on anticarcinoma substances derived from combined reactions of ultrasonic laser and anticarcinoma medicinal herbs and the therapeutic effects of a brand new anticarcinoma drug. [Shanghai City Service in Mandarin 1130 GMT 25 Nov 80 OW]

COMPUTING MECHANICS SYMPOSIUM--Hangzhou, 24 Nov (XINHUA)--The 1980 national symposium on computing mechanics sponsored by the China Mechanics Society was held in Hangzhou, Zhejiang, in mid-November. Some 299 representatives from all ministries and commissions under the State Council, the Chinese Academy of Sciences, colleges, universities and scientific research institutes delivered 385 theses at the symposium. Qian Lingxi, vice president of the China Mechanics Society, spoke, noting that study on the theory and application of computing mechanics in China has been broadened in recent years and

that China is catching up with the international level in this field. Chinese mechanics expert Qian Weichang, deputy director He Guangqian of the building research institute and pneumatic mechanics expert Zhuang Fenggan, as well as American professor Ka-de-si-dun-sai, gave lectures at the symposium. [Beijing XINHUA Domestic Service in Chinese 0133 GMT 24 Nov 80]

SYSTEMS ENGINEERING SOCIETY--The Chinese Society of System Engineering was recently founded in Beijing at a meeting. Systems engineering is a new branch of learning. In recent years China has achieved gratifying success in applying systems engineering in coordinating and balancing engineering projects, instituting comprehensive quality control processes in industrial enterprises, mapping out plans for population control and in military equipment programming. The establishment of such a modern scientific and technological department as systems engineering will have great effects in understanding and transforming the objective world. The meeting elected Qian Xuesen and Xue Muqiao as the society's honorary presidents, and elected Guan Zhaozhi as its president. [Text] [OW271205 Beijing Domestic Service in Mandarin 1000 GMT 25 Nov 80 OW]

CSO: 4008

GUANGDONG AGRICULTURAL SCIENCE RESEARCH--Recently, the provincial people's government allocated a special fund of 800,000 yuan for agricultural science research departments, increasing the funds expended for research work, after Ren Zhongyi of the provincial party committee attended a forum of agricultural consultants and experts at the beginning of this month. At the forum, Comrade Ren Zhongyi repeatedly stressed the importance of carrying forward the spirit of self-reliance in agricultural science research and asked scientific research departments to adhere to the principle of achieving more with less expenses, give play to Guangdong's exceedingly favorable natural conditions and to the favorable conditions and superiority of having relatively more scientific research institutes and research workers in Guangdong, unite as one and make joint efforts in scoring greater achievements in agricultural science research. [Guangzhou Guangdong Provincial Service in Mandarin 1100 GMT 20 Jun 81 HK]

SCIENTIFIC-TECHNOLOGICAL MEETING--Beijing, 25 Dec (XINHUA)--The China Association for Science and Technology held a meeting in Beijing 18-24 December to exchange experience in providing scientific and technological advice. Over 120 representatives from various localities across the nation carried out discussions on the purpose and organization of and the tasks and funds in scientific and technological information. [Beijing XINHUA Domestic Service in Chinese 1422 GMT 25 Dec 81 OW]

COMPUTER APPLICATION, POPULARIZATION MAKING RAPID PROGRESS

Wider Application

Beijing GUANGMING RIBAO in Chinese 3 Jan 81 p 1

[Article: "China Now Has Three Thousand Computers in Use"]

[Text] As reported by reporter Wang Xingzhong [3769 5281 0022], in recent years, China has achieved fairly rapid progress in the application and popularization of electronic computers. According to related statistics, there are now three thousand large, medium and small general-use digital computers throughout the entire country, as well as large numbers of analog computers, special computers, microcomputers, and desk computers. The entire country now has some 500 computer centers (stations); major scientific research academies, institutes, schools of higher education and large-scale enterprise organizations in various provinces, urban districts and autonomous regions as well as large and medium cities are basically equipped with electronic computers.

In the application and popularization of computers, many districts and organizations throughout the country are by-passing administrative bounds and pooling their efforts in various ways, such as dividing software research and development projects among themselves, thus turning computers into a productive force for advancing the four modernizations. For example, in architectural designing, some research academies and institutes have jointly developed specialized computer languages and application software systems which are powerful, flexible, readable, easy to learn and understand, and quite well received. The Shanghai Research Institute of Shipbuilding Technology and Hudong Shipyard use Chinese-made 709 and 320 type computers in extensive efforts to develop application software; as a result, computers have replaced some of the old traditional technological methods in the Shanghai Hudong Shipyard, Jiangnan Shipyard and other major enterprise organizations, and become their productive force and indispensable component link. Based on local conditions, quite a few provincial and municipal computer centers (stations) are applying computer technology in agriculture and have achieved excellent results in helping to develop agricultural production.

Due to the wide application and popularization of electronic computers in various sectors of the national economy, many districts, [government] departments and organizations across the country attach great importance to training computer specialists. The Ministry of Education also emphasizes the training of computer specialists. Based on the statistics of 37 higher educational schools directly under the Ministry of Education, 16 of them have already set up computer disciplines. Computer departments have also been established in quite a few other affiliated organizations and local colleges and schools. In recent years, secondary-level computer vocational training schools and technical schools have sprung up all over the country, turning out multitudes of computer specialists and technical workers each year.

Penn State, Jiaotong Universities Work Together

Beijing GUANGMING RIBAO in Chinese 3 Jan 81 p 1

[Article by Wu Hongue [0702 7703 2814] and Xing Pingan [9388 1627 1344]

[Text] The Shanghai Jiaotong University and Pennsylvania State University are collaborating on a joint project to train Chinese computer management enterprise specialists, and the first graduate student class (preparatory course) in Jiaotong University was formally opened on December 8, 1980.

The graduate student class was established through the positive contributions of Mr Zhu Chuanju [2612 0278 2829], an American scholar of Chinese descent who had travelled far and wide, and many times across the ocean to establish the ties, and Mr Rong Hongyuan [2837 7703 0337], a well-known personage who had donated one million yuan.

Mr Rong Hongyuan was formerly one of the board directors of the Shanghai Shenxin Textile Mill, and a large shareholder as well. When the mill was converted into a joint state-private enterprise, his assets were kept in a domestic bank with fixed interest. As an aluminus of the Shanghai Jiaotong University, Mr Rong wanted to contribute part of his dividends to his alma mater.

Last November, when his son-in-law Mr Zhu Chuanju and daughter Rong Zhizhen [2837 2535 3791] were invited to Jiaotong University, they learned about the lack of material resources and qualified teachers in Jiaotong University's Industrial Management Department which also lagged behind the most advanced level in other countries. With the permission of their father-in-law Mr Rong Hongyuan, they decided to donate some money to the department. But Mr and Mrs Zhu Chuanju also felt that the donation alone was not sufficient to solve the problem thoroughly. So, on their return to the United States, they got in touch with the deans of the Computer Sciences School of the Pennsylvania State University, and consulted with them about establishing sister school ties between Penn State University and Jiaotong University. Both sides were to set up funds for the convenience of personnel and academic exchanges between both parties.

In March 1980, Mr Zhu Chuanju, who was over 60 years old, crossed the ocean again to discuss specific matters with Shanghai Jiaotong University. It was decided that Shanghai Jiaotong University's funds would be raised from the one million yuan which Mr Rong Hongyuan offered to donate out of his personal bank interest, while Pennsylvania State University's funds would be raised through other sources.

In the respective months of June and October 1980, Penn State University sent Mr (Previs), Chairman of the Computer Committee, and Vice President (Rubin) to hold consultations with Jiaotong University, and work out specific arrangements for the graduate students class.

9119
CSO: 4008

PRC PROFESSOR DISCUSSES BIOLOGICAL RESEARCH

OW181231 Beijing XINHUA in English 1220 GMT 18 May 81

[Text] Beijing, May 18 (XINHUA)--Scientists in China have successfully separated and purified the active center of nitrogenase, the nitrogen fixation enzyme. This is a big step forward in biological research, according to Professor Bei Shizhang, acting director of the department of biology of the Scientific Council of the Chinese Academy of Sciences.

Interviewed at the fourth session of the council, now in session, 78-year-old Professor Bei said China has made achievements of international importance in molecular genetics and genetic engineering, though work in these fields began quite late here.

Scientists of the People's Republic have done much in the study of the structure, functions and synthesis of biological macro molecules, Professor Bei said. For instance, the crystalline structure of porcine insulin was determined here between 1971 and 1973.

Professor Bei also mentioned that biologists have developed 20 varieties of haploid plants from pollen grain cultures, and a male anti-fertility drug from cotton-seed oil.

China has made many practical applications in biological science as well, Professor Bei said. Forty varieties of important economic plants have been introduced in the last decade, and a number of wild plants which are of great economic value have been identified. Botanists have successfully imitated multi-layer tropical plant communities in Guangdong, Guangxi and Yunnan. Now this work is on a large scale basis, which will contribute to the development of the study of ecology.

Another achievement of scientists in China is synthesis of a hormone to facilitate breeding of fish and domestic animals, Professor Bei Shizhang said.

CSO: 4020/200

RECENT DEVELOPMENTS IN PRC COMPUTER INDUSTRY OUTLINED

Beijing Computer Exhibition

Beijing GUANGMING RIBAO in Chinese 2 Sep 81 p 1

[Article by Zou Anshou [6760 1344 1108]: "Our Nation's Computer Industry Realizes New Progress"]

[Text] This reporter learned from the domestically manufactured computer products exhibition which opened yesterday in Beijing that our nation's new computer industry has made new progress. In recent years, the quality of products, the systematization and software and technical services have all visibly improved, the ratio between performance and price has improved, and computer applications have also produced preliminary results.

Our nation developed her first computer in 1958. Over the past 23 years, the efforts have developed into a fledgeling industry which includes scientific research and design, production and manufacturing and applications services. The whole nation has over 100 development and manufacturing units. In recent years, various models of series of machines have continued to develop. Greater improvements have been made in the stability of the products, systematization and producing sets of equipment, the ratio of performance to price and technical services. For example, the average operating time without downtime of the DJS130 small mainframe computer, which is the one widely used nationwide, has been increased from 50 hours in the past to over 1,000 hours. The systems capacity has increased from the past "three old components" (photoelectric input, punch card output, teletypewriter) as peripheral equipment to over 20 types at present. The systems software is gradually being perfected, the costs and prices have also dropped by a large scale. To strengthen technical service, last year, the nation established the China Computer Technical Service Company and the Series Computers Software Center. This year, branch companies have been established in related provinces and cities. Each production factory has also widely established applications service agencies, provided training for users, provided technical counseling, and equipment maintenance.

According to incomplete statistics, up to the end of 1980, the number of large, medium and small computers installed by every profession and trade throughout the nation had reached 3,000. These computers have served importantly in the development of our nation's science and technology, national defense construction and national economy. Since the beginning of this year, the computer industry has implemented

the guideline of readjustment of the national economy, the emphasis of work turned from production and manufacturing to popularization and application. Some typical applications test point projects which are significant for popularization have been launched in the fields of energy, light textiles industry and transportation industry. Application of the computer in our nation has expanded from mainly for scientific and engineering computations and applications in the past towards data processing, business management and real time control in each of the departments of the national economy.

This computer exhibition and sales meeting sponsored by the National Computer Industry Bureau opened at the Beijing Exhibition Hall. Comrade Wang Zhen [3769 7201] officiated at the ribbon cutting ceremony. Over 200 products by more than 90 research and development units and production units throughout the nation participated in this exhibition. The exhibits were mainly applications oriented. At the same time, some new products were exhibited. According to user demands, technical lectures and technical exchange activities will also be held. The exhibit and sales activities will last for a month and a half and the exhibit will close on October 15.

Applications Stressed

Beijing GUANGMING RIBAO in Chinese 2 Sep 81 p 1

[Article by Staff Commentator: "Take Application As the Key to Exert Efforts in Developing Our Nation's Computer Industry"]

[Text] Popularization of the application of computer technology is a question that concerns the entire situation of developing our nation's computer industry. To solve this problem well will exert an important influence upon the development of the entire national economy, national defense construction and science and culture. At present, under readjustment of the national economy, the important question of developing our nation's computer industry should be to turn from the past practice of centering aroumd the research, design and manufacture of computer hardware rapidly towards popularization and application as the key, and to use this to lead research and development, production and manufacturing, systematization of peripheral equipment, development of applications, technical service and sales of products.

Computer technology is a leading technology. The computer industry is a new industry that serves a leading function. It is an indispensable means of modernization for the technical improvement of the national economy and national defense construction and for the realization of scientific management. At present, the level of computer technology, the scale of production and the degree of application have become important signs of the development of modern productivity. It is a profession that has developed the fastest. It has also rapidly and widely penetrated each field and has brought about great changes in production, technology, management and even social life. Data shows that in modern industrially developed nations, there are over 4,000 professions that commonly utilize computer technology. Our nation is advancing towards the building of the four modernizations. If we do not realize computerization, modernization cannot be imagined. In national defense, whether for combat weapons, strategic equipment, or technical combat command and control, the computer is indispensable. In economic buildup, replacement of a massive amount of products must realize digitization, integration, intellectualization, and these all require the

computer. The design, production, quality control, management reform of products all require the computer. The entire economic activity such as planning, statistics, comprehensive balancing, financial management, capital turnover are all inseparable from the computer. Therefore, in the period of readjustment of the national economy, each profession must emphasize the use of computer technology, select and use domestically produced computer systems and equipment as much as possible so that our nation's computer industry can develop quickly.

Research and development, manufacturing of products, applications services, training of personnel are the four important parts of the computer industry which cannot be separated from each other. Of these, popularization of application and technical service are a link that we have not paid much attention to in the past. We must fully recognize this point, and in readjusting the guiding ideology and industrial structure, there must be a strategic change.

According to our nation's actual situation, we should first pay attention to the popularization of small computer and microcomputer systems. Small computer and microcomputer systems are low priced, changes in the system are more versatile, they can better adapt to the changes in user demands by the users and maintenance personnel and technological developments. Therefore, they are an inexpensive technological means in the important path to realize automation in management and control. Therefore, while developing large and medium sized new series of computers, it seems very important to develop small computer and microcomputer systems that have a great demand and that have broad applications.

Emphasizing application as the key does not mean that systematization and systems functions can be neglected nor does it mean that product quality and reliability of the operating system can be neglected, nor does it mean that the ratio of performance to price can be neglected. It is exactly the opposite. To popularize application, we must tightly grasp the two weak links of software and peripheral equipment. We must develop applications software, develop a processing system for Chinese characters, continuously perfect and expand the function of the computer system, continuously improve the reliability and stability of the system. This is to establish the material foundation for application well. To improve the competitiveness of domestically produced computers and suit the level of the domestic users, it is very important to establish a policy to lower the price.

The goal of developing the computer industry is entirely for application. Only application can open up the way, and especially by strengthening technical services for the users can the sales of products be opened up. Sales is an important economic and technical activity of enterprises, it is the key upon which the life of the enterprise depends. Sales of computers and technical service are closely related. Foreign computer factories and businesses take "user service" as the most important guiding ideology of the entire business activity of the company. The best technical personnel are assigned to sales and technical services positions. Technical service personnel and product sales personnel constitute about one third of the entire personnel of the profession. Now, application of our nation's computers has gradually turned towards the various departments of the national economy. It has expanded from scientific computation to data processing and real time control. While the strength of computer technology of the various sectors of the national economy is still weak at present, the technical problems encountered in data processing and real time control are more complicated, strengthening technical service for the users is a forceful

measure to open up new fields of application. We must allow about thrity percent of the technical force to carry out applications service. Research institutes, mainframe plants, peripheral equipment plants must all place applications service in an important position. We must also readjust some units that presently duplicate production to change them to units specializing in applications service according to plan. We should mobilize special technical personnel from more enterprises and research institutes towards applications service, establish regional and even national sales service networks. Each region should strive towards a three-in-one combination of research and development, production, technical service and market sales while establishing computer industry companies. We must open up a road for broad applications through technical service to lead research and development and production. Only in this way can there by vitality. The present stage of technical service cannot be too ambitious. We should start out from the easy and advance towards the difficult and from the typical to the universal. At present, we must grasp tightly the computer applications systems which are technically more mature, which require less investment, which can produce quick results, which are worth popularization in the fields of energy, light and textile industries, transportation and management so that visible economic gain can be obtained within a short period.

Popularization of the application of computers is a strong driving force in the development of computer technology and industrial development. As long as the leadership pays attention, grasps the situation tightly, the computer industry will surely enter a new stage of development under readjustment and will serve its function in the development of the national economy.

9296
CSO: 4008/462

COMPUTER INDUSTRY STRIVING TO CATCH UP WITH WEST

Beijing DIANZI SHIJIE [ELECTRONICS WORLD] in Chinese No 4 1981 p 5

[Article: "A Brief History of Chinese Computers"]

[Text] According to the American J. Bernstein, "By at least 450 BC, the abacus was already being used as the first digital calculator." COMPUTER MONTHLY reports, "The earliest predecessor of the computer can be traced back to the abacus, which appeared in 600 BC in China and 400 BC in Egypt." China's abacus appeared 200 years earlier than that of Egypt, and so obviously, the predecessor of the computer must be traced back to China. This means that our forefathers made a historical contribution to the origin of computers.

In 1946, the first-generation computer was born. In 1958, the second-generation computer appeared abroad. Our nation's scientist Wu Jikang [0702 0415 1660] designed our nation's first electron tube computer, based on the URAL-2 computer. In the same year, our nation successfully developed the 103 model (DJS-1 model) computer. In 1959, we produced the 104 model (DJS-2 model) computer. Our nation's computers are designated by the heading DJS followed by an Arabic numeral. DJS represents the initial letters of the Chinese spelling of Dian (electronic), Ji (calculation), and Shu (numbers)--i.e., the electronic digital computer.

Through the untiring efforts of the broad scientific and technical workers on the computer battlefront, by overcoming various difficulties they finally developed and produced a second-generation computer (transistorized computer) in 1964 and 1965. Representative products were the 108-B model (DJS-6), and 121 model (DJS-21), the X-2 model, and the 441-B model.

The transision from a first-generation product to a second-generation product took 12 years for foreigners, but China borrowing the knowhow from foreign products, needed only 7 years. The relative rate of development was fast, and as it continues at this rate, China's development in computers has a bright future. However, a movement "unprecedented in history" hindered the development of computers.

In the 1970's, computers were being used on a widespread basis in foreign nations when a fourth-generation computer emerged. However, our nation's third-generation computer had only begun to come out in 1971. Representative products were the

709 (TQ-16) model, with a computing speed of 200,000 times per second. In 1972, the large 160 computer (DJS-11), with integrated circuits capable of 1 million computations per second, was successfully developed. In 1976, the Computational Institute of the Chinese Academy of Sciences successfully developed the 013 computer, capable of 2 million computations per second. In 1978, the Huadong Computational Institute successfully developed a large computer capable of 5 million computations per second. In small computers, the Fourth Ministry of Machine Building organized and led the joint design work for the DJS-100 series. In August 1974, the DJS-130 model computer was successfully developed. That computer imitated the NOVA 1200 computer in design. There are also DJS-180 series computers and DJS-154 series computers.

The Changzhou Radio Plant developed the DJS-110 model in 1977; DJS-200 series computers came out in 1978; then, various types of products emerged, such as the DJS-210 model of Changzhou and Nanjing, the DJS-240 model and DJS-160 model of Beijing, the DJS-220 model of Beijing and Shanghai, and the DJS-140 model computer successfully developed in May 1979.

At present, our nation's DJS-100 series computers are widely used. In this regard, more manpower and materials have been invested and greater results achieved. Qinghua University and other units already have ALGOL 60, BASIC, and FORTRAN IV program languages on DJS-130 computers. Qinghua University and Wuhan University have successfully developed multiple-user expanded BASIC software without magnetic disks. Thus, 16 users can use the same machine at the same time. In addition, the Shanghai Computer Plant uses BASIC and FORTRAN languages on its DJS-131 computer. At the same time, the TQDL 2 model multiplex communications control device has been developed as an accessory. The Shanghai Computer Plant and the Nanjing Engineering Academy have developed the MRTOS real-time operating system for use on the DJS-131 computer. Thus the scope of application of the DJS-100 series has been expanded and its functions are fuller.

Our nation now can design and manufacture fourth-generation computers ourselves. In 1977, the first microcomputer, the DJS-50, was successfully developed in Beijing and Hefei. In November 1978, the Shangwu No 14 Plant announced the DJS-051 computer. In May 1979, the Shanghai Computational Institute, the Shanghai Metallurgy Institute, the Shanghai Semiconductor Institute, the Wuxi Jiangnan Radio Equipment Plant, and the Changzhou Semiconductor Plant jointly developed the N-groove silicon grid MOS large-scale integrated-circuit single-chip microprocessor for the DJS-052 model.

In 1980, the 1932 Institute of the Fourth Ministry of Machine Building developed the 905 computer system; this computer is the fastest and has the largest capacity in our nation at present.

In addition, our nation's Taiwan Province also has developed a computer industry. According to reports on the subject, 307 computers were installed and put into use in 1980, including 120 microcomputers, 55 small computers, 75 medium computers, and 57 large computers.

Our nation has also imported large computers, small computers, and microcomputers from IBM, DEC, and INTEL.

The scope of application of computers in our nation has already included scientific computation, real-time control, information retrieval, communications, postal and telegraph services, medical science, electric power, chemical engineering, and textiles. The DJS-131 computer has been used by the Nanxiang Marshaling yards of the Shanghai Railroad Administration, the Wangting Powerplant, the Nanjing General Military Hospital, and the Xinanjiang Powerplant.

In our nation, intelligent machines have been applied in pattern recognition, machine proof, and robots. Some are in a leading position in the world.

For example, the Acoustics Institute of the Chinese Academy of Sciences has a computer that can understand human speech. A small, general-purpose computer, it can use verbal commands that directly control it to perform addition, subtraction, multiplication, division, and power computations. This is an application in sound recognition and pattern recognition. It is a leader in the world. It is said that, except for a desktop computer that can listen to verbal commands to solve mathematical problems, shown at an exhibition in Tokyo, Japan, there has never been a machine like ours.

An intelligent computer system for Chinese medical science developed by Li Taihang [2621 1132 5300] of the Shanghai Computing Technology Institute can diagnose diseases and write prescriptions. Evaluations by experts indicate that the diagnoses and prescriptions are consistent with those of experienced Chinese medical doctors.

Renowned mathematician Professor Wu Wenjun [0702 2429 0193] has used a computer to solve the problem of mechanical proofs of certain theorems in plane geometry and differential geometry, and he has also discovered new theorems.

In general, China's computers, whether in the varieties produced, the quantities, or their practical applications, have reached a definite level. Foreigners predict: "Software systems are the decisive factor in determining whether China can catch up with the world's advanced levels by the year 2000."

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