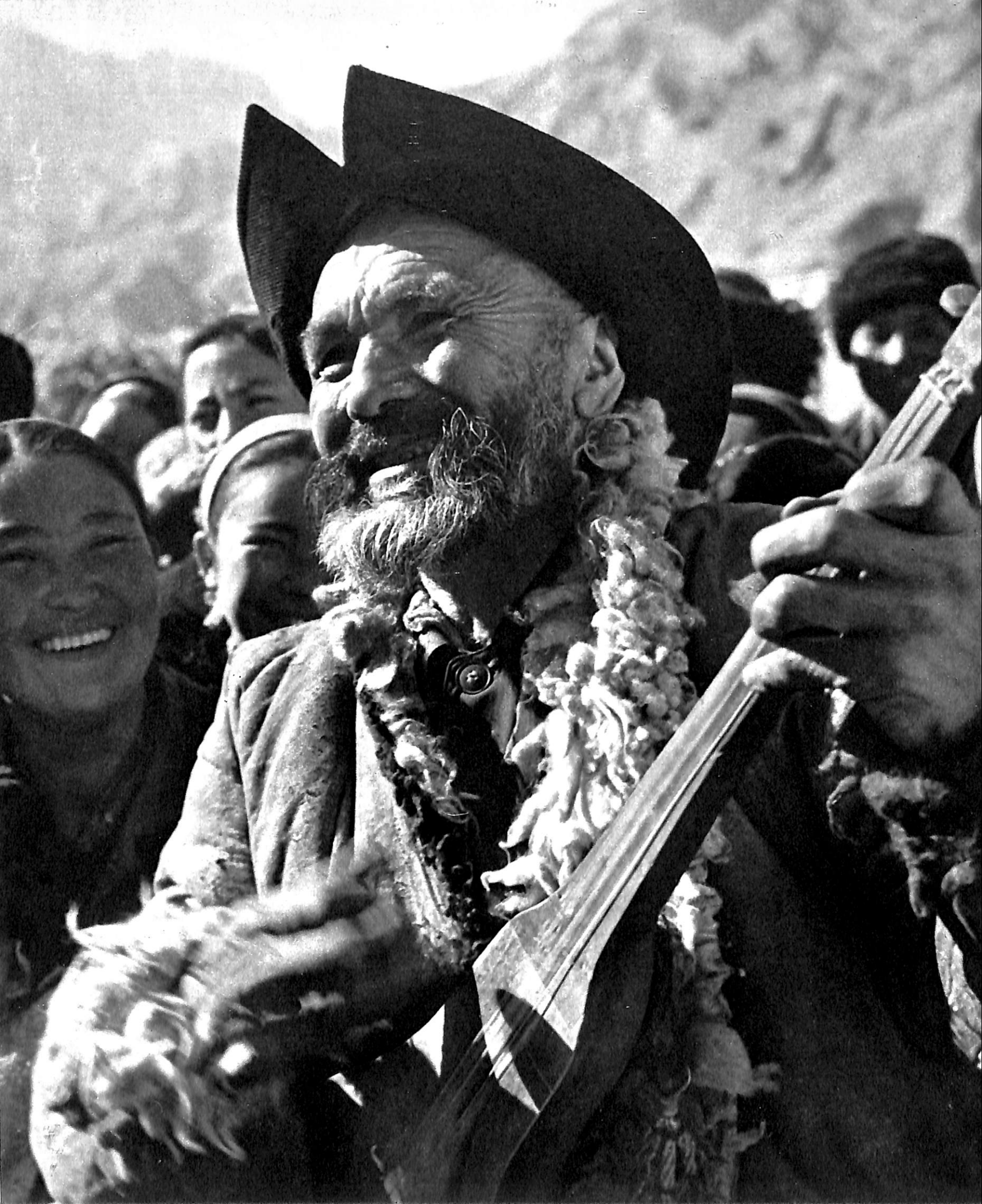


China Reconstructs

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JULY 1973





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CONTENTS

TRADITIONAL CHINESE AND WESTERN MEDICINE — FROM OPPOSITION TO INTEGRATION <i>Li Ching-wei and Tsai Ching-feng</i>	2
A NEW METHOD IN REMOVING CATARACTS	6
CHANGSHA	9
SAMDECH SIHANOUK AND MME. SIHANOUK TOUR CAMBODIAN LIBERATED ZONE	15
THE LIBERATED ZONE OF CAMBODIA	18
QUESTIONS AND ANSWERS: DEVELOPING THE NATIONAL ECONOMY	20
KIANGSU PROVINCE MOVES AHEAD <i>Su Wen</i>	22
A NEW TYPE OF UNIVERSITY	26
600,000 YEARS OF LABOR AND STRUGGLE (II) — EXHIBITION OF ARCHAEOLOGICAL FINDS IN NEW CHINA <i>Hsia Nai</i>	30
SPORTS: SWIMMING	38
MUSIC FOR FRIENDSHIP	41
WHEN 'THE LITTLE RED SOLDIER' COMES TO THEIR HOME	43
LANGUAGE CORNER LESSON 19: 'WE ARE ONE FAMILY'	45
HOT SPRINGS <i>Chen Kang</i>	47

COVER PICTURES:

Front: Winter swimmers on Orange Island, Hunan province. (See story on p. 9)

Inside front: Kazakh folk musician.

Back: Startled Deer (Woodcut by Hao Po-yi)

Inside back: Hot springs (See story on p. 47)

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Traditional Chinese and Western Medicine

— from Opposition to Integration

LI CHING-WEI and TSAI CHING-FENG

TRADITIONAL Chinese medicine, part of the centuries-old civilization of the Chinese people, has gradually developed through their prolonged struggles against disease and natural environment.

From ancient medical literature, we can see that more than 2,000 years ago the Chinese people were able to prevent and treat diseases with roots, stalks, flowers, fruit, the bark of plants, various parts of animals and minerals. For example, the efficacy of treating asthma with *ephedra sinica*, dysentery with *rhizoma coptis*, and malaria with *dichroa febrifuga* has been proven by modern scientific experiments. *Huang Ti Nei Ching*

(*Yellow Emperor's Inner Classic*), a medical treatise written in the 5th century B.C., systematically compiled a great many therapeutical practices and theories, including acupuncture and moxibustion. Around the 2nd century A.D., Chinese doctors knew how to perform surgical operations under anesthesia with a mixture of alcohol and some medicinal substances.

China's first medical school — the Imperial Institute of Physicians — was founded in Sian (then Changan, the capital of the Tang dynasty) between the 6th and 7th centuries. Its 300 students studied internal medicine, surgery, pedi-

atrics, acupuncture, moxibustion, massage, cupping and the treatment of eye, ear, nose and throat and skin diseases. In the 10th century, China was preventing smallpox with a human vaccine. By the 16th and 17th centuries this method had traveled to the Arab world and Europe.

Decline

In the 19th century, imperialist aggression broke through the "closed door" of the Ching dynasty. Western medicine came into China with the Christian missionaries. Instead of combining with traditional Chinese medicine, western medicine stood opposed to it — two schools artificially separated. The compradors and other lackeys during the Ching and Kuomintang regimes, catering to the needs of foreign imperialists, branded traditional Chinese medicine as "unscientific" and an "obstacle" to the development of modern medicine. Excluded from major city hospitals, in 1929 traditional Chinese medicine was even publicly banned for a time.

However, the criterion for scientific truth is practice. In their centuries of experience, the working people of China saw that since traditional medicine could cure diseases, there must be reasons, and so had faith in it. They knew that, even though Chinese doctors could not always explain traditional medicine in terms of modern science and their explanations were often archaic and hard to understand, Chinese medicine

Fracture patient exercises to restore normal muscular function — part of a combined Chinese-western method of treatment.



LI CHING-WEI and TSAI CHING-FENG are members of the Department of Medical History of the Academy of Traditional Chinese Medicine.



Traditional Chinese and western-trained doctors in Shansi work out a method for treating ectopic pregnancy without surgery.

was nevertheless scientific. Because of its efficacy in curing diseases, the broad masses kept Chinese medicine alive in spite of the boycott by foreign imperialists and reactionary domestic rulers. The two schools of medicine existed side by side for more than a century, each playing its part in protecting the health of the Chinese people.

The founding of the People's Republic in 1949 swept away the artificial barriers between the two schools. A national health conference was called the following year by the people's government under the leadership of the Chinese Communist Party. Chairman Mao urged the conference to **"unite all sections of medical and public health workers, veteran or new, Chinese or western style, in a solid united front and strive to undertake the great task of public health work for the people"**.

Guided by the correct policy of the Party, the two schools of medicine gradually eliminated the

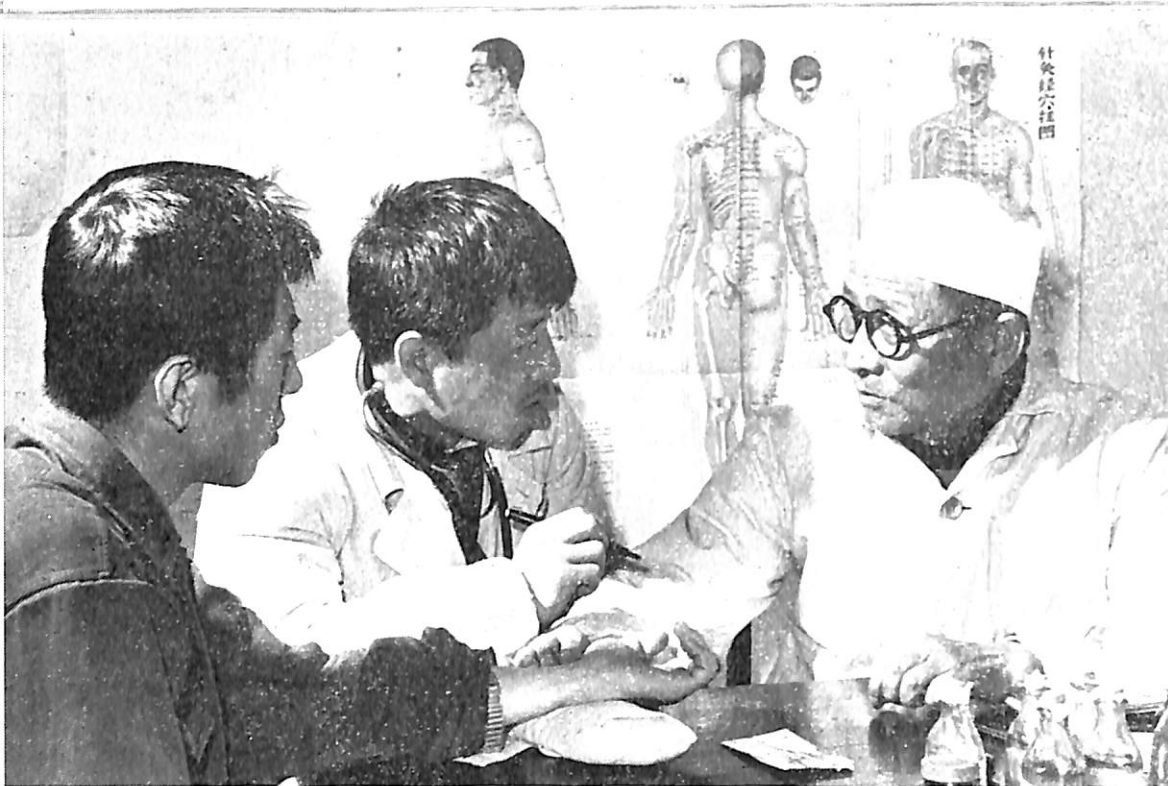
wrong attitude of paying attention only to western medicine and looking down on traditional medicine, and did away with the old relationship of mutual distrust and opposition. They began a new relationship in which they cooperated and learned from each other. Finally in 1955, the Academy of Traditional Chinese Medicine was founded in Peking.

The academy set up a class in traditional Chinese medicine for doctors trained in western medicine. Over 70 from different parts of China began to learn from experienced traditional Chinese doctors. Two and a half years of theoretical study and clinical experience showed them the results achieved in treating many diseases with traditional Chinese medicine. This strengthened their determination to find the scientific principles underlying traditional Chinese medicine.

In 1958, after this first group graduated, Chairman Mao told medical workers, **"Chinese medi-**

cine and pharmacology are a great treasure-house, and efforts should be made to explore them and raise them to a higher level." This spurred medical workers to learn traditional Chinese medicine. Within a year, several thousand western-trained doctors were attending classes in different parts of China.

Today the Academy of Traditional Chinese Medicine has two research institutes (traditional pharmacology and acupuncture), three hospitals and a medical school. The staff has grown nearly tenfold. Research institutes of traditional Chinese medicine have been set up in most provinces and municipalities. There are schools of traditional Chinese medicine or departments for such studies in western style medical colleges, and traditional Chinese medicine departments in hospitals. Thousands of classics on traditional Chinese medicine have been gone through, some have been annotated and reprinted. New books and articles



A western-trained doctor (center) and a traditional Chinese doctor (right) discuss a patient's pulse in diagnosis.

on traditional Chinese medicine have appeared in large numbers, those on acupuncture alone accounting for more than 9,000.

Integration

Each of the two schools has its merits. Traditional Chinese medicine has several thousand years of clinical experience and its own theoretical system. Western medicine is rich in scientific knowledge and advanced technique. In the course of their common efforts, western-trained doctors first learn from Chinese traditional doctors until they really understand traditional Chinese medicine. Many years of practice has enabled revolutionary medical workers to create many different forms of treatment combining traditional and western medicine, such as analyzing traditional medicine with modern scientific methods, guiding clinical treatment with traditional Chinese theories, etc. Its long-range aim is to create a new system of medicine and pharmacology, different from either the traditional Chinese or the western medicine, and combining the strong points of both. This process has only just begun.

However, the joint efforts of the doctors of both schools in the past decade have achieved some valuable results. Their cooperation has grown from the preliminary stage

of consultations, where the western doctor diagnosed the case while the traditional doctor administered the treatment, to the higher stage in which doctors of both schools cooperate closely in diagnosis, treatment, observation, analysis of cases and the improvement of methods. With close cooperation they have achieved initial successes in various fields of medicine such as new therapeutic methods, new theories and new techniques. While different from either the traditional Chinese or the original western methods, they are simpler, more economical, more effective and shorter in treatment — features which make them popular with the people.

A milestone on the way to combining traditional Chinese with western medicine is acupuncture anesthesia, developed from the acupuncture method and medical theory of ancient China. In studying traditional Chinese medicine, western-trained surgeons learned that acupuncture can relieve pain in many diseases, particularly in the incision after an operation, its effect being more marked than morphine. This led them to think that anesthesia might be induced by acupuncture instead of drugs.

At first they adopted acupuncture anesthesia in minor operations such as tonsillectomies.

With modern medical instruments and scientific techniques in electrophysiology, they carefully observed the changes in the body of patients under acupuncture anesthesia and gradually improved the method, making it simpler and more effective. Today it has developed into an entirely new method different from both the traditional Chinese acupuncture to stop pain and the western method of anesthesia with drugs. It is already widely used in brain, thoracic, heart and abdominal operations.

On the basis of much clinical experience in recent years, Chinese medical workers are probing into the principles underlying acupuncture anesthesia. In the future, the systematization of its principles may open a new chapter in the annals of anesthesia and broaden the prospect for a deeper understanding of the human body.

Exploring how to combine traditional Chinese with western medicine is a process in which shortcomings of both schools and all kinds of wrong ideas must constantly be overcome. When a western-trained orthopedist begins to learn from a traditional Chinese bone specialist in treating fractures, he may admire the dexterity of the Chinese doctor in coaxing the broken ends into alignment, but he may doubt the totally different method of immobilization used.

In western medicine, a plaster cast is applied to completely immobilize the fracture with the joints above and below the break until the bone knits. But a traditional Chinese doctor advocates only relative immobilization, e.g., immobilizing the fracture with a short splint, allowing suitable movement to the joints above and below. A western-trained doctor is afraid that this might lead to the displacement of the fracture and other complications. However, clinical experiments and X-ray examinations show that the traditional Chinese method actually shortens the period required for the bone to knit.

Such an unexpected result shook the orthopedists' theory of complete immobilization and made

them more modest in learning from traditional Chinese medicine. Meanwhile, traditional Chinese doctors have a great deal to learn from the modern knowledge and technique in western medicine. For example, the use of X-ray to examine the reduction in order to prevent malunion of the bone is better than the method used by traditional Chinese doctors. The constant learning from each other and overcoming one's weaknesses by acquiring the other's strong points made their opinions on treating fractures come closer and closer. A new theory and new

ern method alone, and the restoration of functions is faster. Such complications as joint stiffness and muscle atrophy often seen with the use of plaster casts have almost entirely disappeared.

Combining traditional Chinese with western medicine has widened the spheres of medical exploration. The combination of methods of both schools is progressing in varying degrees in treating bronchitis, coronary arteriosclerosis, tumors, acute abdominal diseases and ailments of the urinary organs.

operations have brought good results in treating ascariasis of the biliary system and stones in the gallbladder, bile duct or urinary organs.

So far only the first steps have been taken in exploring these spheres. On the basis of clinical successes, medical workers have encountered many new problems. For instance, in the case of acute appendicitis, while western doctors regarded any cathartic or analgesic as taboo, how is it that it can be cured with a mild cathartic in the Chinese way? Again, in the case



Acupuncture anesthesia experimental group at the Kwangtung Provincial People's Hospital analyzing clinical results.



The Tung Jen Tang traditional Chinese pharmacy in Peking.

technique in treating fractures thus evolved.

While taking over the good points from both schools in reduction, the new method has adopted the use of short splints for localized immobilization from traditional Chinese medicine. In treating fractures, orthopedists now encourage the patients to do suitable exercises early so as to promote blood circulation and restore metabolic functions, thus facilitating union of the bone. Many thousands of different fracture cases have been treated with this combination of traditional Chinese and western methods. Results show that the patients suffer less pain, treatment is shortened by one-third to one-half compared with either the old Chinese or west-

In treating acute abdominal cases, such as acute appendicitis, ectopic pregnancy, ascariasis of the biliary system and gallstones, western-trained doctors usually think that once the disease is diagnosed, operations should be performed as soon as possible. But Chinese clinical records show that many such cases have been cured with herbal medicines. Therefore the doctors of both schools join their efforts to treat these diseases with medicines. At the same time, they make preparations for surgery, observe the physiological changes and operate if it becomes necessary. In the cases of acute appendicitis and ectopic pregnancy, the results are usually satisfactory. Moreover, medicines instead of

of ectopic pregnancy, how is it that a Chinese decoction can cause the absorption of the foetal sac and blood mass? How is it, by taking Chinese herbal medicine, stones in the urinary organs can be softened and eliminated through the urinary canal? Many such problems need repeated experiments with modern scientific methods and techniques in order to raise clinical experience to modern systematic theoretical knowledge.

We believe that the exploration of the treasure-house of traditional Chinese medicine will continue, and progress in the integration of traditional Chinese and western medicine will become faster. This will contribute to promoting human welfare.

A NEW METHOD IN REMOVING CATARACTS

During a physical examination of a patient in a Peking hospital, a doctor was astonished to find that the patient had had the lenses of his eyes removed, but there was no trace of the incisions near his normal pupils.

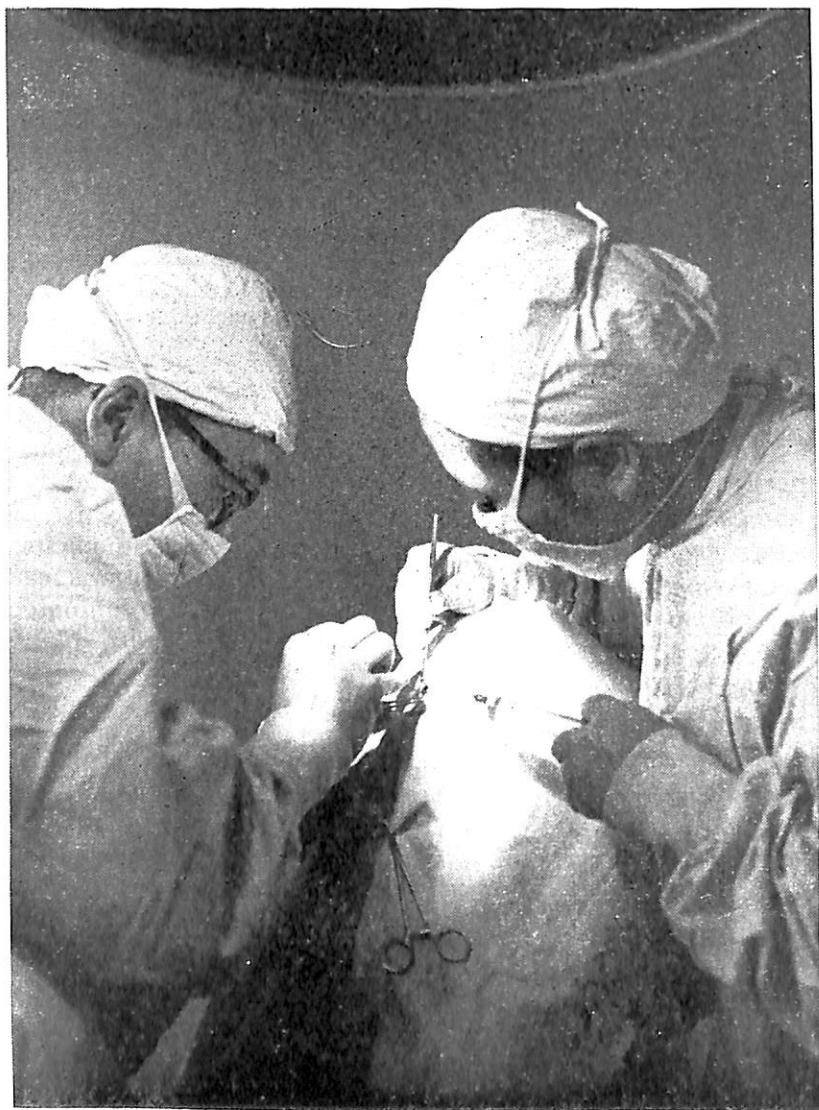
"Have you had cataracts?" asked the doctor.

"Yes. They removed them at the Kuanganmen Hospital," answered the patient.

Cataracts are a common eye disease in China. Their removal is usually done through a semicircular incision about 10 to 11 mm. long above the cornea. Those incisions were missing in the patient. How had the cataracts been removed? Dr. Tang Yu-chih, ophthalmologist at the Kuanganmen Hospital of the Academy of Traditional Chinese Medicine, gave the following answer.

— Editor

Dr. Tang Yu-chih (left) operating with the couching method on Sung Tsai-lien, blind because of senile cataracts.



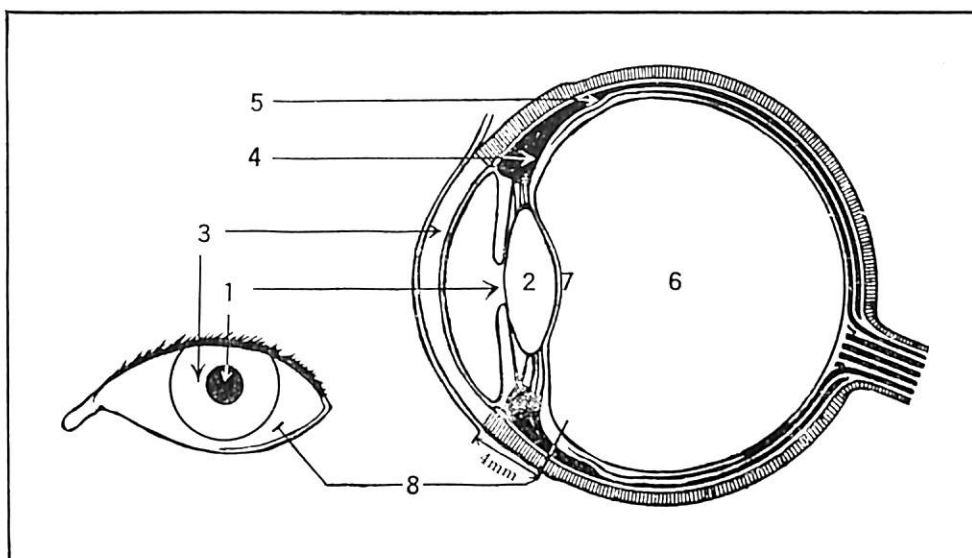
Patient sees the doctor's two fingers right after the operation.



THIS patient was one of the first cases in which we removed a cataract with the loop extraction method. We did not make it public then. The new technique grew out of an ancient Chinese surgical method, called couching, of moving the cataract out of the field of vision with a needle or spatula. This only displaced it. Now, combining this with western surgical technique, we first displace, then crush the cataract and remove it through a very small incision.

To understand the new technique, we must tell how it developed.

When the metabolism of the transparent oval lens is disturbed or affected by outside factors such as toxins, trauma or radiation, it becomes opaque and diminishes vision. This condition, known as cataract, becomes worse as time goes on. To restore vision, the



Left: Front view of the left eye. Right: Side view.
1. pupil; 2. lens; 3. cornea; 4. raised part of the ciliary body; 5. flat part of ciliary body; 6. vitreous body; 7. anterior wall of vitreous body; 8. location of incision.

cataract must be removed when it has stopped, or nearly stopped, developing.

More than 1,000 years ago Chinese doctors treated cataracts with the couching method. This is described in the medical literature of the Tang (A.D. 618-907) and Ching (1644-1911) dynasties. As part of the move to combine traditional Chinese with western medicine, eye surgeons in our hospital studied this ancient method in the light of modern science and technique. In 1959 we made a 3-mm. incision below the cornea and moved the cataract out of the line of vision with a tiny spatula inserted into the incision. This method restores vision in 4 or 5 minutes, but is not entirely satisfactory and its application is limited.

Toward the end of 1968 we developed this method into the actual removal of the cataract. A specially made loop was closed, inserted through the incision, opened again to slip over the cataract, closed and gently pulled out. As the loop appeared at the incision, we opened it again, crushed the cataract with forceps into tiny fragments which we removed one by one. The incision required only one stitch, the operation took only some 20 minutes and the result was fairly satisfactory.

From 1959 to 1972, we and other medical workers from different parts of the country have handled

over 4,000 cataract cases, including those in which we used the new method. Ninety percent of the patients regained vision in varying degrees.

IN the beginning of our study of the traditional couching method we met many objections. Some thought the result would be unsatisfactory and there would be postoperative complications. Some maintained that the incision was located in a danger zone. Others asserted that, since the cataract was left inside the eye, secondary glaucoma was inevitable.

We paid attention to these opinions, but were determined to find the correct answers through our own efforts. We began our research by studying all available material on the couching method and intensifying our clinical practice. First we scientifically analyzed the problems connected with the traditional method, such as the location of the incision, the operating technique, the instruments, and the complications that might arise during and after the operation. A long period of practice and clinical observation enabled us to find the merits of the traditional method and ways of preventing postoperative complications. Gradually we mastered certain laws in removing cataracts.

Regarding the location of the incision, for example, ancient



Chinese medical literature states that it should be 4 mm. from the outer margin of the cornea. This meant cutting the ciliary body which people thought contained many blood vessels and nerves, and that this would induce bleeding or serious inflammation of the eye. This led us to make a careful and detailed study of the ciliary tissues.

We found that the ciliary body consisted of two parts — one raised and the other rather flat. While the former had many blood vessels and nerves, the latter (about 4 to 6 mm. from the edge of the cornea) had far less. Thus it is possible that the ancients found this the ideal spot for the incision through their own experience. We accepted this good feature of traditional Chinese medicine.

Experiments on animals and clinical practice proved that an incision on the flat part of the ciliary body rarely induced bleeding or inflammatory reactions, easily kept the pupil normal and made fairly satisfactory results possible in the postoperative correction of vision.

Secondary glaucoma was considered inevitable in the past. Unless the displaced cataract was taken out, there was no way to prevent it. At the beginning of our study, we did meet some such cases. Careful observations revealed that the increased pressure inside the eye was caused by obstruction of the flow of fluid between the anterior and posterior chambers, which in turn was caused by the push of the vitreous body against the pupil area.

By repeatedly analyzing our experience, we found a simple way to prevent nearly all secondary glaucoma. Right after displacing the cataract in an operation, we made a tiny incision in the anterior wall of the vitreous body in the lower part of the pupil area. This prevented the buildup of pressure, and the incidence of postoperative glaucoma dropped from eleven to below one percent.

In our study of the couching method, we carefully observed anatomical changes during and

after the eye surgery. After treating over 3,000 eyes and following up on 87 for two to twelve years, we found that the method was useful in treating cataract in patients of advanced age. Vision corrected with glasses usually reached 1.0.

Meanwhile, the tiny incision, the simple instrument, the simplicity and short duration of the operation, the ease of postoperative care, the comparative rarity of complications and the rapid recovery made the method suitable for patients who cannot stand ordinary operations due to old age or certain chronic diseases. We found it difficult, for instance, to use the ordinary extraction method with an old woman in Fukien province whose blood pressure was 240. With the couching method we displaced the cataracts in less than 10 minutes and restored her vision.

However, if this operation was not well done, the displaced cataract might move again into the field of vision. We considered how to improve it.

IN 1968, a young electrical worker was brought to our hospital with the lens of one eye dislocated in an accident. At first we thought to push the lens down with the couching method, but we were not sure of the result. The ideal solution would be to take the lens out through the small incision used in the couching operation. But the lens, 8 to 9 mm. in diameter, required a much bigger incision, through which a great amount of vitreous humor might flow and cause secondary complications.

This contradiction, we thought, could only be resolved by a new surgical technique with newly designed instruments. We discussed, designed and improved our technique until we succeeded in extracting the dislocated lens through an incision at the required place with simple instruments.

Later, with the cooperation of workers in the surgical instruments plants in Szechuan province and Soochow city, we made a special-purpose loop that could be

opened and closed. It could be inserted through a 6-mm. incision, slipped over the cataract and pulled to the opening of the incision where the cataract could be broken into fragments and removed. It rarely injures the eye tissues and assures the initial success of the loop extraction method.

This new technique keeps the good features of the couching method but overcomes the problem of having to leave the cataract in the eye. It not only enables us to remove cataracts in elderly patients, but can be used on certain kinds of congenital, secondary and traumatic cataract and dislocation of the lens. Liu Cheng-fang, a peasant woman, had had congenital cataract for 41 years. It could not be operated on with the old method because of the prolonged immaturity of the cataract. Using the new loop extraction method, we enabled her to see what new China looks like for the first time in her life.

Both the couching and the loop extraction methods — results of the integration of traditional Chinese and western medicine — are simple and safe, make postoperative care easy, and the instruments are light. This makes them highly useful in the countryside and mountain areas. Since 1969 our hospital has sent many groups of ophthalmologists to the rural areas of Fukien province and the Kwangsi Chuang Autonomous Region, where cataract cases are common, to treat, teach and make scientific studies. They have treated many cataract patients and helped nearly one hundred ophthalmologists from other regions to master the new techniques in a short time. These ophthalmologists, in turn, will train others, thus gradually spreading these techniques to all China.

While we have made certain achievements in integrating traditional Chinese with western medicine by the loop extraction method, our clinical observations are not yet sufficient and the technique and instruments still have some defects. It is necessary to improve them through practice.

Changsha



HISTORY goes back 3,000 years in the southern city of Changsha, the capital of Hunan province and its political, economic and cultural center. It is the place where Chairman Mao, leader of the Chinese people, engaged in some of his earliest revolutionary activity. Its many sites of revolutionary interest attract thousands of visitors from China and abroad daily.

The city is located in the mid-Yangtze valley. To its north is the Tungting Lake area, one of China's granaries, to its west the Hsiang River, a tributary of the Yangtze. The north-south Peking-Kwangchow rail artery runs through it. Since ancient times it has been one of the important cities of the central-south region and one of China's four big rice markets. Now with a population of nearly 800,000, it covers an area of 177 square kilometers.

In the Hsiang River lies a sandy strip five kilometers long and half a kilometer wide, the famous Orange Island, named for the fruit for which it is renowned. From the top of the island one can see both the city skyline to the east and the scenic Yuehlu Hills on the river's west bank. The busy city and the quiet beauty spot are linked by a recently built 17-arch open-spandrel bridge which spans the island.

It was to this island more than half a century ago that Chairman Mao, then a student at the First Normal School of Hunan, used to come with his classmates to swim to build up his physique. He re-

ferred to it in the poem "Changsha — to the melody Shen Yuan Chun", which he wrote in 1925.

In the park constructed on the island after the liberation, the mandarin orange trees grow green and luxuriant. Chairman Mao has returned several times to swim. After one such occasion, on the afternoon of June 24, 1959, he had a talk with the commune members on the island, looked at their crops and the Orange Island Primary School, where his visit was memorialized in a picture taken with its pupils and teachers. Now every year the people of Changsha mark the date with a mass swim across the Hsiang River.

Where Chairman Mao Studied

The city end of the bridge is the beginning of "May First" Road, flanked by tall buildings, the city's main thoroughfare which leads to "May First" Square. South of it is the Pachiaoting shopping district; a kilometer's walk from there brings one to the First Normal School of Hunan.

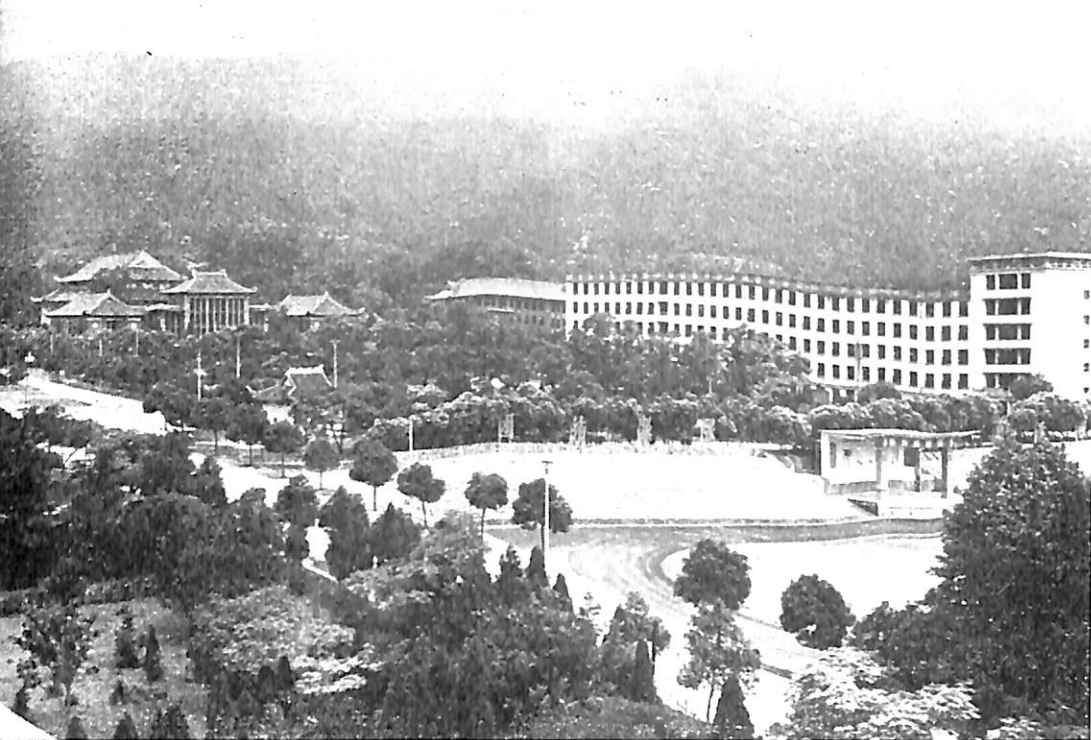
Chairman Mao studied here from 1913 to 1918. In the room where he did most of his studying are photographs of pages of the books he read while there. In one of them he wrote over 12,000 characters of marginal notes in fine, regular brush strokes. From the exhibits

Students from the First Normal School off to work in rural communes.





The Hsiang River bridge links downtown Changsha on the east with the Yuehu Hills cultural district on the west.



A corner of Hunan University at the foot of the Yuehlu Hills.

one can see that he read widely in his spare time, in both ancient and modern, Chinese and foreign works. Even in his student days he realized that reading alone was not enough to enable one to know the world, but that one must engage in social practice. In the summer of 1917 he took his umbrella, and with straw sandals on his feet went on a 500-kilometer walking trip through five counties outside Changsha. On it he learned a great deal about the life of the peasants and their hopes, needs and aspirations.

Many years later, in 1950, he wrote an inscription for his old school: **"To be a teacher of the people, one must first be their pupil."** In big gold characters, it greets all who enter the school's gate. These words have become a way of life at the school. The students and teachers spend part of every semester working in factories or in the countryside. By thus taking society as their classroom and combining education with practical work they have the opportunity to learn to be like the workers and peasants, to make the thinking and good qualities of the working people their own.

In the Yuehlu Hills

Beside a running stream amid tall old trees in the Yuehlu Hills rises the two-tiered green tile roof of the Ai Wan Pavilion. Built in 1792, it came near to collapsing

several times. It was completely renovated after the liberation and now the gold characters of the name are in Chairman Mao's handwriting. The view is particularly captivating in autumn when the hundreds of old maples, turned flaming red after frost, weave with the glowing clouds of sunset.

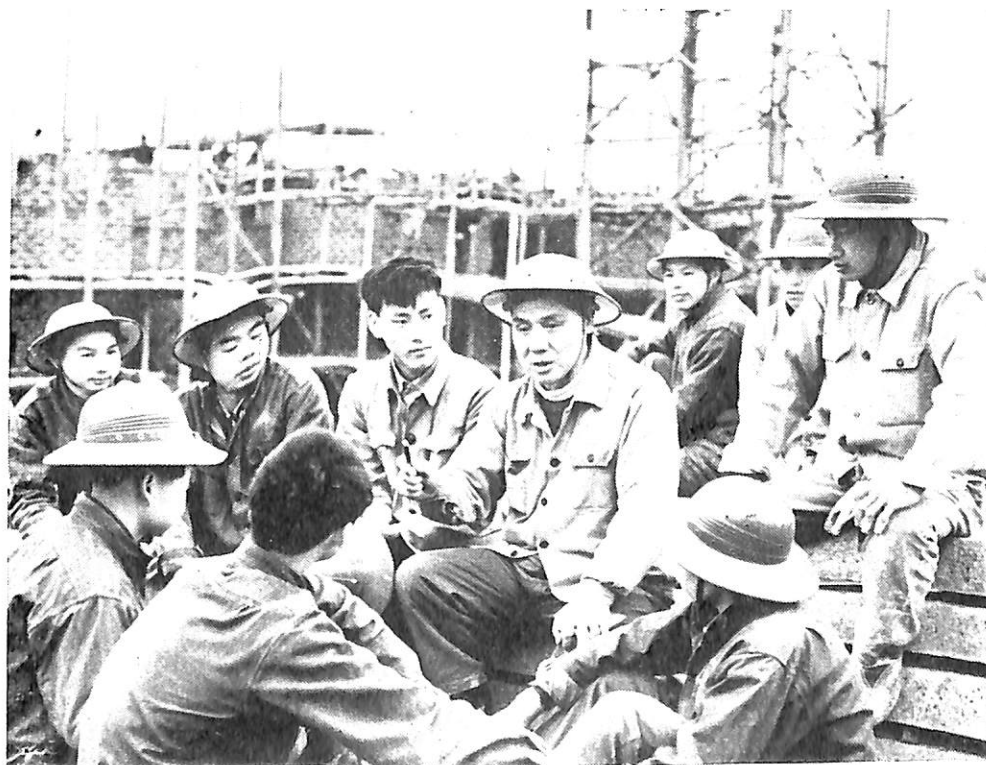
When Chairman Mao was a young student, he and his classmates often sat in this pavilion reading their books and newspapers, talking about the affairs of the world and the problems facing

China's revolution. A group of them camped there during several summer vacations, climbing the hills in the sun, wind and rain to harden their physique and revolutionary will.

The Yuehlu Hills have long been a cultural center. Yuehlu Academy, one of the four big academies in China's history, was established there in the tenth century. In 1925 it was rebuilt into Hunan University. With only 500 students, a hundred-some teachers and very poor equipment at the time of the liberation, it now has ten times as many students, more than 2,900 teachers and staff members, 19 faculties in four departments—chemical, civil, electrical and mechanical engineering—and a department for basic courses.

A six-kilometer highway along the foot of the Yuehlu Hills links the university with Hunan Teachers' College, the Central-South Institute of Metallurgy and many other schools built since liberation, whose hundred or so red brick buildings dot the slopes. The city has seven institutes of higher education and eight specialized middle schools. With over 200 primary and regular middle schools, all children are getting an education.

Young building workers hear the story of the famous 1922 masons' and carpenters' strike.

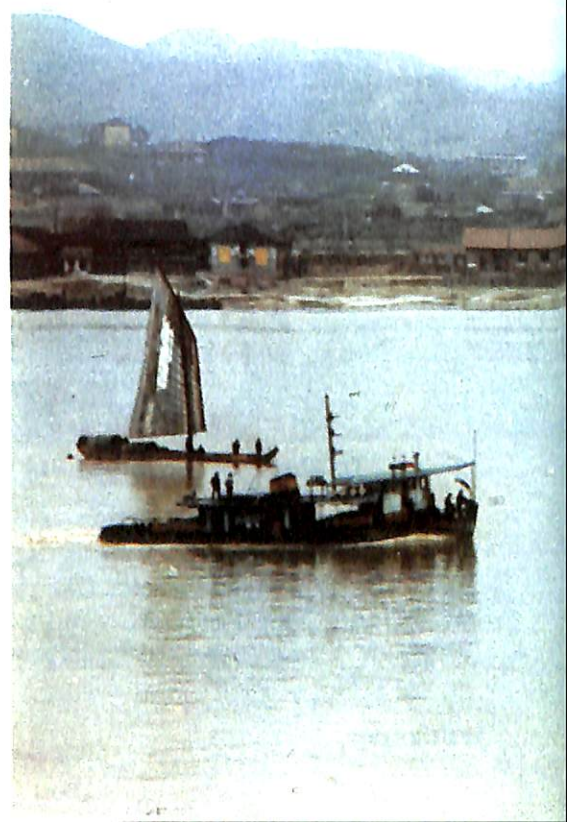




Ai Wan Pavilion



Chuntzu Pavilion in the First Normal School, where as a student Chairman Mao drafted a proclamation to get rid of the reactionary principal.



Orange Island



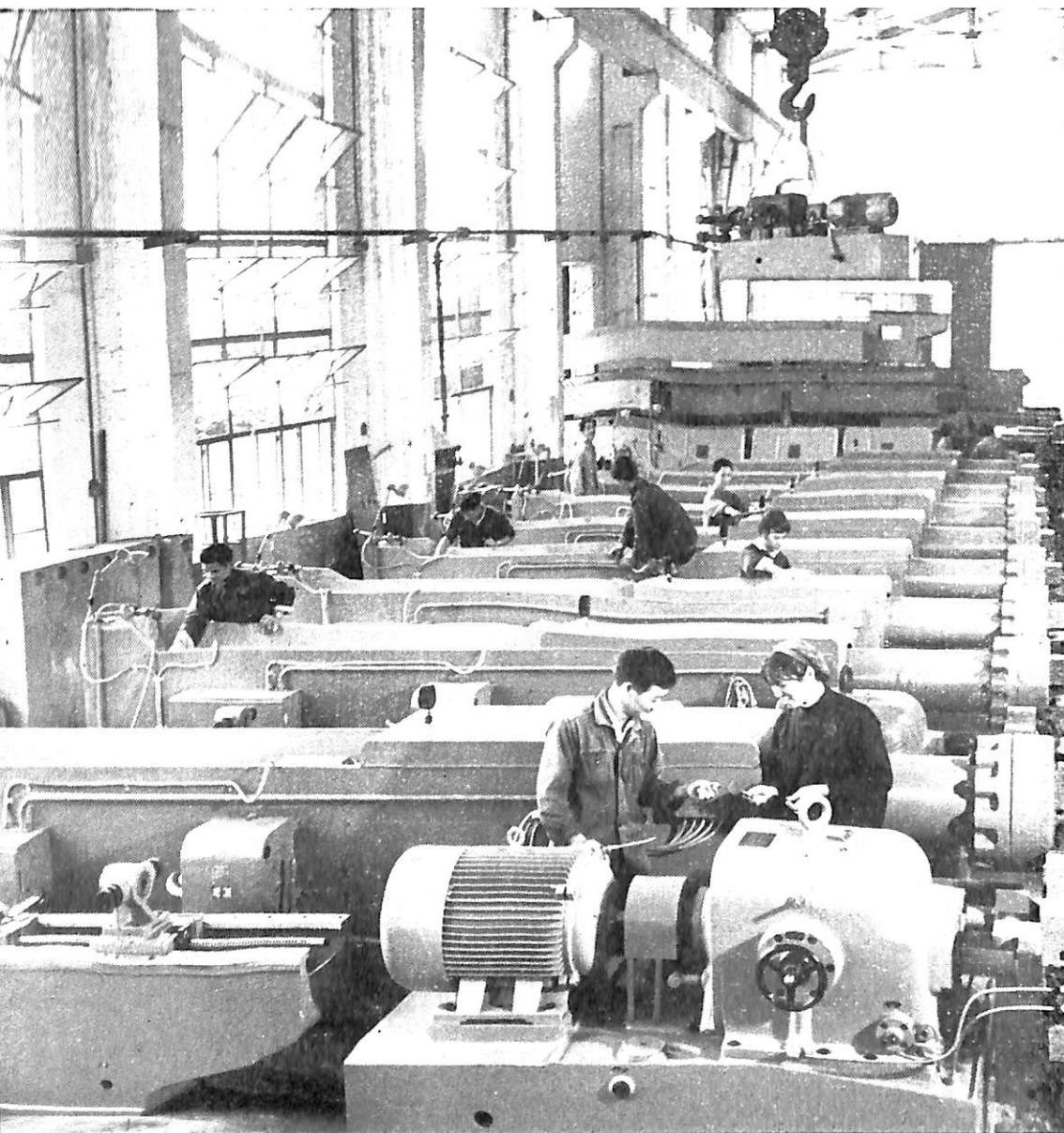
Chingshuitang — Headquarters of the Hunan Province Communist Party Committee in the past.





Work at the Hunan Embroidery Studio on a giant panel, a panorama of Chairman Mao's birthplace, Shaoshan.

Horizontal broaching machines produced by the Changsha Machine Tool Plant.



Chingshuitang

At the bottom of a hill in the northern part of the city stands an ordinary one-story house surrounded by vegetable plots. In front of it are two small pools. From these it gets its name Chingshuitang (Clear Pools). It is an important revolutionary site well known to the people of Hunan. In the autumn of 1921 Chairman Mao returned from Shanghai to Changsha after attending the First Congress of the Communist Party of China and founded the Hunan Area Party Committee, an organization of the provincial level, and became its secretary. As a teacher he rented this house in this remote place so that he could carry on his work for the Party unobserved. The new committee did a lot of work in spreading the ideas of Marxism-Leninism far and wide and in launching the workers' movement. The strike of masons and carpenters which Chairman Mao led in Changsha in 1922 is a brilliant page in the history of the city's revolutionary struggles.

Today the busy city has expanded out to the once-remote Chingshuitang. Thousands upon thousands of visitors come to view the rooms of the Hunan Area Party Committee, now restored as they were fifty years ago, and learn the story of Chairman Mao's early revolutionary years.

Embroidery and Modern Industry

Changsha is a center for the famous Hunan embroidery. From some fine specimens of it discovered last year in a Han dynasty tomb at Mawangtui near Changsha, we know that this type of embroidery was already being done 2,000 years ago. Traditional themes include birds, animals, flowers and landscapes in bright colors in a bold, free style. Outstanding examples of it can be seen in the exhibition room of the Hunan Embroidery Building in the heart of the city. There are also pieces on modern themes which resemble oil paintings: a panorama of Shaoshan, the village not far away where Chairman Mao was born, and embroidered panels depicting other revolutionary sites. These

(Continued on p. 29)

Samdech Sihanouk and Mme. Sihanouk Tour Cambodian Liberated Zone

SAMDECH Norodom Sihanouk, Head of State of Cambodia and Chairman of the National United Front of Cambodia, spent more than a month in the Liberated Zone of Cambodia this February and March. During his sojourn he visited the provinces of Stung Treng, Preah Vihear and Siemreap. He had cordial meetings with NUFC and government leaders in the interior and wide contact with people from all walks of life in the Liberated Zone. Everywhere he was warmly welcomed.

Samdech Sihanouk presided over the first meeting of the Cabinet Council of the Royal Government of National Union to be held inside Cambodia. Samdech Sihanouk, Khieu Samphan, Deputy Prime Minister of the RGNUC and General Commander of the People's Armed Forces of National Liberation, and other leaders sat around a table and talked about the future of their country. The high point of the tour was the grand rally of 10,000 people which Samdech and Mme. Sihanouk joined in the jungle near Angkor in the Koulen Mountains on March 23. It was in celebration of the third anniversary of the founding of the NUFC and the People's Armed Forces of National Liberation.

On the tour Samdech Sihanouk saw abundant evidence of how the patriotic army men and people of Cambodia are fighting with one heart and one mind under the banner of the National United Front of Cambodia. His inspection tour was a big encouragement to people of all social strata in the Liberated Zone.

The heroic Cambodian people are marching forward toward victory with great strides.



Samdech Norodom Sihanouk and his party march toward a camp site near the Cambodian border.

Samdech Norodom Sihanouk is greeted by soldiers of the Cambodian People's National Liberation Armed Forces.





A happy and exciting reunion: Samdech Norodom Sihanouk with Mr. Khieu Samphan, Head of the Interior Resistance in the forest of Stung Treng province. Rear: Madame Sihanouk.



Samdech Norodom Sihanouk (center), Mr. Hou Youn (left) and Mr. Son Sen (right) happily get together.

Leaders of the Khmer Resistance Movement (Samdech Norodom Sihanouk, Mr. Khieu Samphan, Mr. Hou Youn, Mr. Hu Nim, Mr. Ieng Sary, Mr. Son Sen, Mr. Saloth Sar, Mr. Koy Thuon and Mr. Nuon Chea) posing for a group picture in front of a temple on Koutlen Mountain.



People listen with close attention to Cambodian Head of State Samdech Norodom Sihanouk at a meeting near Angkor in Siemreap province.



Samdech Norodom Sihanouk delivers a speech at the rally held on March 23, 1973. The national flag of the Kingdom of Cambodia flies in front of the rostrum.





An event of historic significance: Samdech Norodom Sihanouk, Head of State of Cambodia, presides over the first Cabinet Council of the Royal Government of National Union of Cambodia, which is held in a forest near Angkor.



Samdech Norodom Sihanouk and Madame Sihanouk spend a happy time on the soil of their beloved homeland.



Samdech Norodom Sihanouk and heroes of the Interior Resistance get together at the Temple of Banteay Srei.

The Liberated Zone of Cambodia

THE LIBERATED ZONE of Cambodia now covers over 90 percent of the country. From the northwest mountains to the Mekong plain, from the northeast province of Stung Treng to Koh Kong province on the Gulf of Siam, they are prosperous and thriving. The people's political power is being consolidated, agricultural and sideline production is rising and the people rejoice. This rich land, site of the ancient kingdom of Angkor, is undergoing a rejuvenation.

Changes in Koh Kong

Koh Kong province on the southwest coast has fertile land, abundant resources and well-developed fishing and salt industries. It has the conditions for a good life, but under the brutal rule of the traitor Lon Nol, the people lived in poverty and misery.

Many and exorbitant taxes caused good fields to lie idle and fishing to decline. People were murdered in cold blood. Enraged at the despot rule of the Lon Nol clique, the people, under the banner of the National United Front of Cambodia (NUFC), waged a heroic struggle to save the nation from U.S. aggression. They drove out the Lon Nol clique and set up a liberated zone extending throughout the province.

The NUFC distributed to the peasants land seized from them by the traitors. It helped them set up labor exchange groups, mutual-aid societies and supply and marketing cooperatives and to overcome difficulties arising from lack of seed, buffaloes and farm tools. It launched a province-wide movement for greater production in the area's two rice crops a year. In the intervals in the fighting, officers and men of the Cambodian People's Armed Forces of National Liberation help the peasants reclaim wasteland, build dykes and dams and dig canals and ditches. Each season, the per-hectare yield of rice goes up. The liberated zone

produces a grain surplus. The traditional production of fish sauce, salted fish and shrimp has been restored and is greater than before. The area planted to coconut, pineapple, lichees and vegetables has expanded.

The Koh Kong liberated area has become a consolidated revolutionary base, its people providing more and more material to fight the U.S. invasion.

Stung Treng Today

Stung Treng province in the northeast was known as an outlying area with poor communications where the people got their food grain and even vegetables from other provinces.

But Stung Treng is not a poor place. The Mekong, Khong and San rivers running through the province have created large fertile areas with silt from mountain forests in their upper reaches. After liberation the people of the different nationalities, led by the NUFC, joined together in a big agricultural campaign which doubled the area planted to food grain. Where irrigation was possible they put up waterwheels and built reservoirs, where it was not, they carried water from the rivers. The once grain-short province had a good harvest last year in spite of the drought, and is now self-sufficient.

Uncultivated land around the city of Stung Treng is being used to grow rice, sweet potatoes and vegetables, turning the city and its suburbs green. Paddy fields line the river banks, sweet potato patches surround houses, and sidewalks are edged with rows of vegetables. The whole city has become a garden.

New Look in a Mountain Area

The Koulen Mountain area in the north of Siemreap province has rich natural resources, lush forests and a pleasant climate. Lon Nol's

henchmen had seized large areas of fertile land and rich forests. The local people were forbidden to open up wasteland or hunt in the hills. Offenders were beaten or thrown into jail. With all the fertile land, fruit trees and forests, the people still had to work for the new owners for a mere pittance, not even enough to keep them in food and clothing.

In the struggle against the U.S. invasion, the people threw out the traitors, liberated the area and became masters of field and forest. They set up mutual-aid teams of producers' and livestock-raising and timber-marketing cooperatives. Showing great self-reliance and the spirit of hard struggle, they built irrigation projects to raise grain output. Last year's rainy season harvest was good and this year's dry season crops promise a bumper harvest.

A Glimpse of the Market

Markets throughout the Cambodian liberated areas hum with activity. At 5 a.m. the restaurants open and fill the air with their spicy smells. Supply and marketing co-ops do a booming business in rice, salt, cloth, medicines, petroleum products, farm tools and other items. Fresh fruit, fish, vegetables and handicraft products are on sale. People of Cambodia's many nationalities and foreign residents converge in a friendly atmosphere. The drunkenness, fighting and looting of the Lon Nol era have disappeared.

Prices are fixed reasonably for all commodities by the local NUFC organization. People coming from enemy-controlled areas are astonished at the busy markets, abundance of goods and low stable prices.

Daily necessities like salt and cloth used to be scarce and expensive in mountain areas with poor communications such as Mondolkiri, Preah Vihear and Oddor

Meanchey provinces. Many people suffered from edema as they could not afford to buy salt, and many had no clothes to wear. After the people's power was established, it helped the villages organize supply and marketing co-ops. At the risk of being intercepted by the enemy or killed by bombing, cadres at various levels lead efforts to deliver things the mountain people need for production and daily life. Now salt, cloth, medicines and farm tools are purchasable in mountain co-op stores. These are sold on credit to those who need them.

The result of all this is that the mountain people are putting even greater efforts into increasing production and support for their struggle.

(Based on reports from the News Agency of Kampuchea and the Voice of the National United Front of Cambodia.)



Elections to the people's government in a Cambodian Liberated Zone. Led by the NUFC, the Liberated Zone comprises nine-tenths of the territory and eight-tenths of the population, forming a solid base for the war against US aggression.

Peasants work hard to increase production in the Liberated Zone.



People of a Liberated Zone give a warm welcome to Cambodian People's National Liberation Armed Forces soldiers back from a victory at the front.



Militia of the capital of Cambodia's Stung Treng province in military training.

THE POLICY

How has China gone about developing her national economy? What is the general policy?

China takes agriculture as the foundation and industry as the leading factor in developing her national economy. This general policy was laid down in order to carry out the General Line for Socialist Construction — “go all out, aim high and achieve greater, faster, better and more economical results in building socialism” (see *China Reconstructs*, April 1973).

Why must agriculture be the foundation?

Taking agriculture as the foundation means putting the development of agriculture in first place. It is the main branch of the economy for feeding and clothing China's several hundred million people. Without first solving this problem she can neither develop the economy as a whole nor carry forward with socialist construction. But how? Being a socialist country, China cannot depend on grain imported from abroad, but must produce it herself. Therefore, all her economic development must rest on this foundation — agriculture.

Before liberation, under imperialism, feudalism and bureaucrat-capitalism China's economy was poor and very backward. In addition to the problem of feeding and clothing her people, the new China was faced with the need to change a backward agricultural country into an advanced industrial one as quickly as possible. But where were the raw materials, funds, market and labor power needed to develop industry to come from?

As a socialist state, China must rely on funds accumulated by her socialist economy and on the creativity of the people. With the initiative in her own hands she must take her own road independently.

China is a large agricultural country, with over 80 percent of her population in the rural areas. Farm production is, generally speaking, still not high. The level of mechanization is quite low and agriculture does not have full ability to withstand natural disasters. Grain and raw materials provided by the countryside are as yet insufficient to support the growth of light and heavy industry. Therefore, for greater and faster results in building industry, there must first be vigorous advances in agriculture.

As agriculture develops it will provide more funds for industry; it will enable the countryside, as industry's biggest market, to buy more industrial goods; it will free more labor power for industry. It will also provide more and better raw materials for light industry, which gets about 70 percent of these from agriculture. The growth of light industry, in its turn, will promote the growth of heavy industry.

What does it mean to say that industry must be the leading factor?

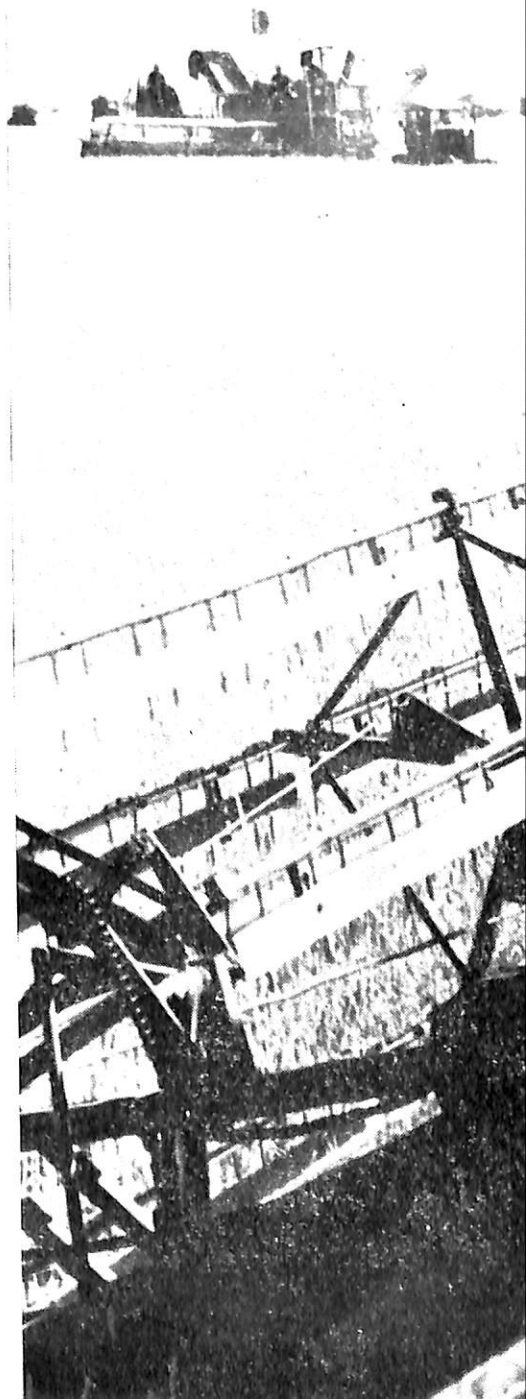
Agriculture's important position in the economy does not mean emphasis only on it and not on industry, nor does this mean completely solving the problem of agriculture before starting on industry. The two must grow together, but industry should play the leading role. Industry exerts this leading role through stimulating scientific progress and providing the technology and machinery, electricity, chemical fertilizer, insecticides and other means of production needed for agriculture to mechanize its present backward manual labor methods.

Industry also plays this role in supplying every other branch of the economy with up-to-date materials, equipment and technology, and it is the means for building a strong modern national defense. In China the development of industry is based on agriculture; the advance of agriculture and rise of its labor productivity cannot be separated from industry's leading role. The two are interdependent and promote each other.

In the national economic plan priority is given to agriculture, light industry and heavy industry in that order.

(For an example of how this policy has been carried out in one province see “Kiangsu Province Moves Ahead” on p. 22 of this issue.)

As industry develops it provides more machinery for agriculture.

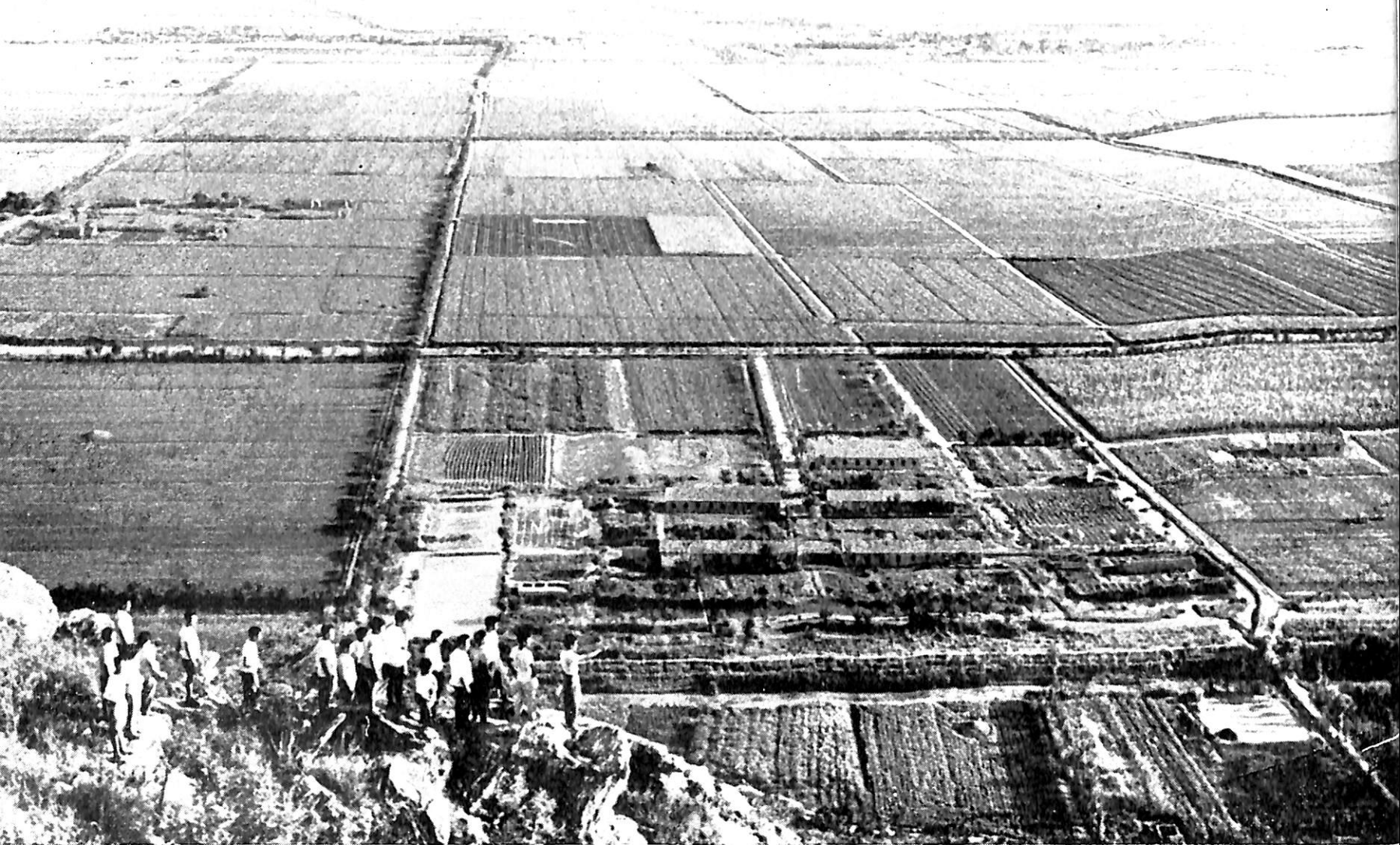


FOR NATIONAL ECONOMIC DEVELOPMENT



Kiangsu Province Moves Ahead

SU WEN



These guaranteed high-yield fields in Kuanyun county of north Kiangsu were once highly alkaline.

IN April 1949, one million men of the Chinese People's Liberation Army under Chairman Mao crossed the Yangtze River and occupied Nanking, capital of the reactionary Chiang Kai-shek government. Five months later the People's Republic of China was established and the coastal province of Kiangsu, together with other parts of the country, began to build a socialist society.

The semi-feudal, semi-colonial character of old China, however, had left Kiangsu with serious economic scars. Exploited and oppressed by the imperialists, bureaucratic capitalists and feudal landlords, the countryside was backward and impoverished. Located on the lower Yangtze and Huai rivers, it was constantly menaced by floods and waterlogging.

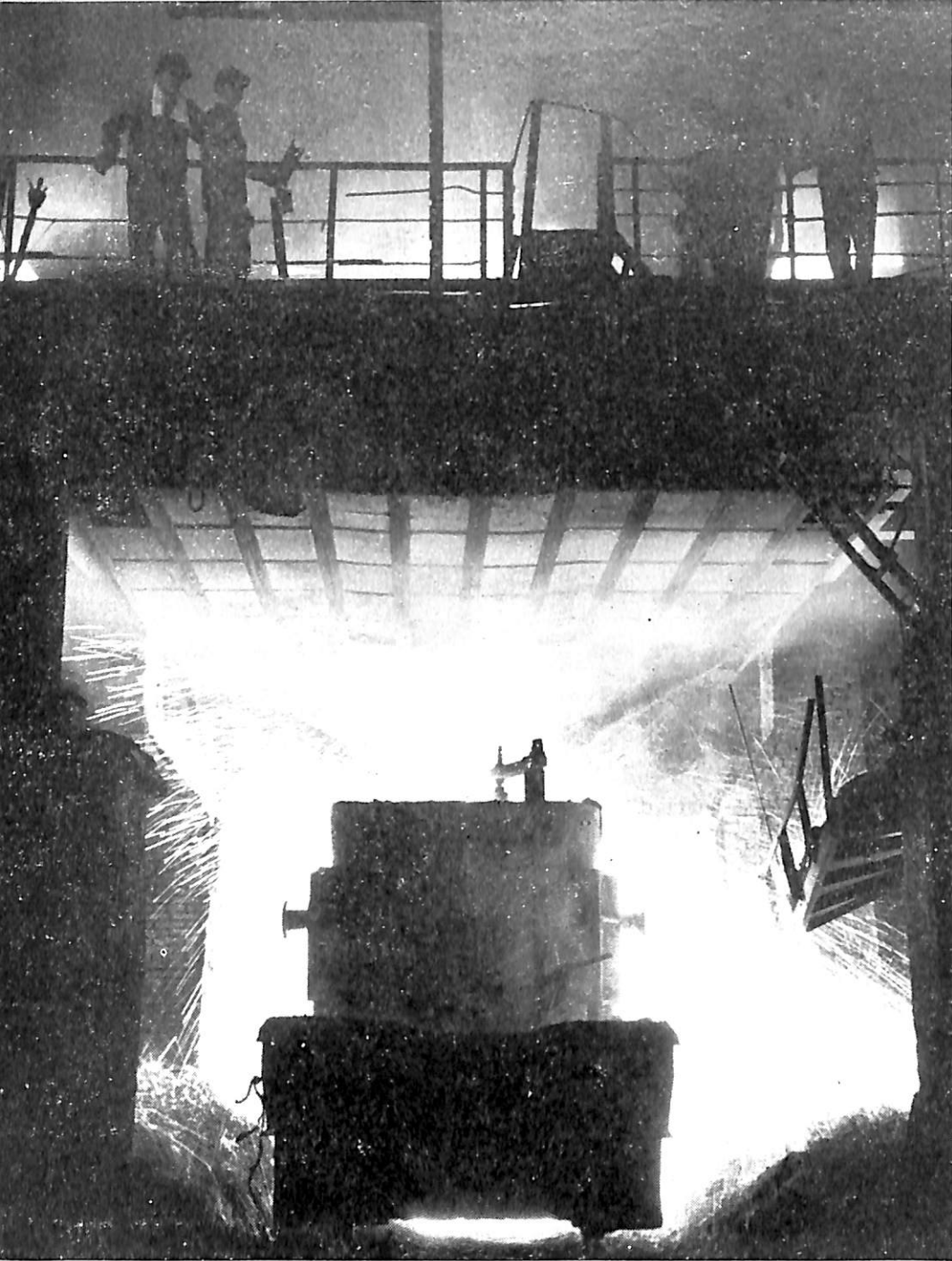
The north, with two-thirds of the cultivated land, suffered from flood and drought every year. The Huai, pouring down from Anhwei province, had insufficient outlet to the sea and consequently submerged over a million hectares each year, forcing refugees to flee into south Kiangsu and other provinces. In the south, "the land of fish and rice", crops were highly unstable because of the disorderly waterway system and the feudal division of fields into tiny fragments.

The distribution of industries, concentrated in a few cities and towns along the Shanghai-Nanking railroad, was also lopsided. Industry was non-existent in the rural areas. Even in the cities, mainly consumer centers, industrial plants were few — chiefly

cotton and flour mills, silk filatures and handicraft shops supplying imperialist countries. A few machine shops did repair work or assembled imported parts.

Heavy industry was extremely weak. There were no iron and steel works. Light industry lacked important branches. There were practically no industries serving agriculture. The only chemical plant in the province produced less than a kilogram of fertilizer per hectare per year.

Land reform after liberation smashed the centuries-old system of exploitation by the feudal landlords. Collectivization of agriculture and the socialist reform of private industry, commerce and handicrafts followed. This created the conditions for developing a prosperous socialist economy.



Molten steel flows from a top-blown oxygen converter at the Nanking Iron and Steel Works.

In the past 23 years, guided by Chairman Mao's revolutionary line, the people of Kiangsu carried out his policy of "taking agriculture as the foundation and industry as the leading factor" (see page 20) and put herculean efforts into building it as soon as possible.

Transforming Agriculture

Right after liberation, the people of Kiangsu set out to harness the Huai River and other menacing waterways. Every winter several million peasants dredged and repaired. Four years later, two new canals were taking floodwaters into the sea and large sluice gates were regulating the level of Hungtse Lake and the flow of the main irrigation canal from the lake to the sea. Dykes and lake em-

bankments were strengthened. With the problem of outlets to the sea and the prevention of floods basically solved, they turned their attention in 1955 to eliminating waterlogging in the Lihsiaho district. By 1957, sluices on lakes and rivers and stronger dykes along rivers and the seashore had eliminated most of the serious waterlogging.

Now the problem was poor soil. Centuries of washing and inundation by floodwaters had left the land seriously alkaline and full of holes and marshes. This was true particularly in the Hsuchow-Huaiyin region (the "flood corridor"), one-third of the province. Though freed from major drought and flooding, dry spells and small floods still occurred. The people

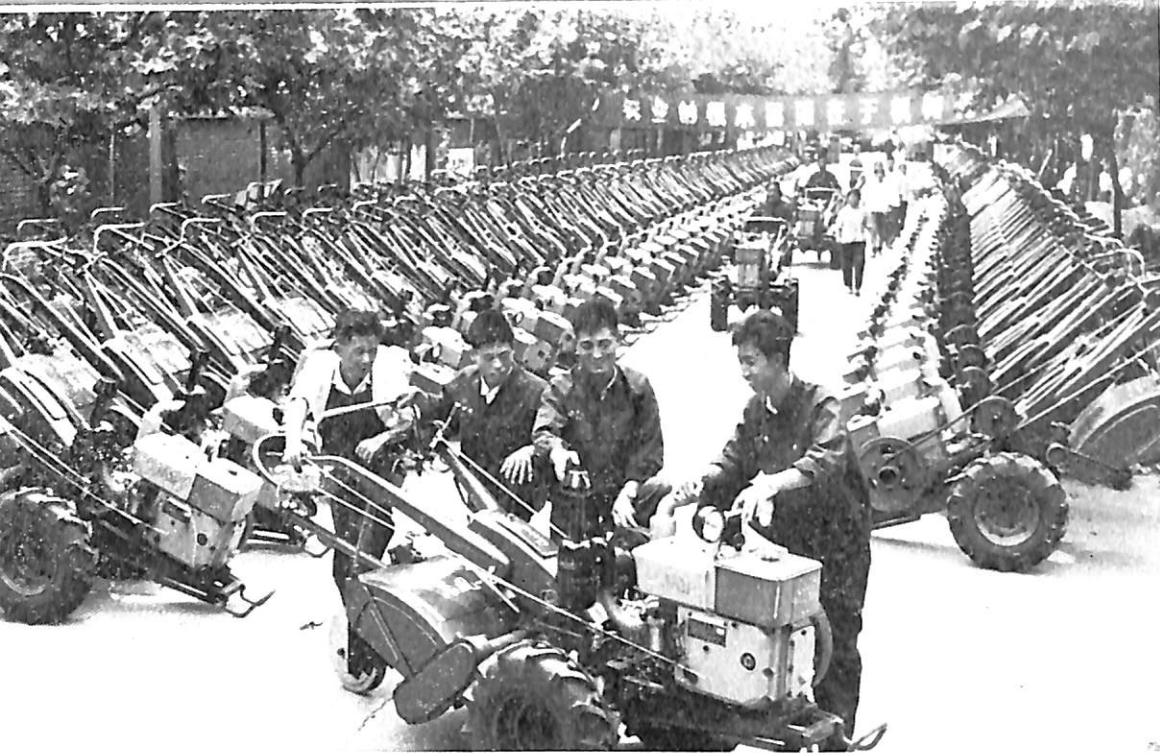
plunged themselves into capital construction on farms, with water conservation and soil improvement as the central task.

The formation of the people's communes in 1958 created the conditions for supplying sufficient manpower and materials for large-scale capital farm construction. While half a million peasants continued to build medium and large water conservation projects along the Huai, between three and four million commune members began on small irrigation works which required less capital and gave quick results. During the cultural revolution a nationwide movement developed to learn from Tachai, a model farm unit in Shansi province which had successfully rebuilt its destitute land. This also accelerated Kiangsu's capital farm construction.

In the Tafei production brigade in north Kiangsu's Huaiyin region, 80 percent of the land was rugged and covered with sandy alkaline soil. In 1968, the brigade's Party branch secretary Shih Chang-sheng advised digging ditches and levelling the fields. In four years brigade members dug 75 drainage channels and filled in 260 pits and ponds. Meanwhile, to get rid of the alkali and change the nature of the soil, they deep-plowed most of the land, turned up the black soil underneath and mixed it with manure. In this way they built 135 hectares of fields that would get good harvests in spite of long dry spells or too much rain. Their grain yield per hectare more than quadrupled that before 1958.

Tafei was only a miniature of what happened in the whole Hsuchow-Huaiyin region. Today, after years of tireless effort, the people have completed water conservation works involving 3,700 million cubic meters of earth and stone, dredged 200 streams and waterways, built 80 reservoirs and dug 37,000 wells. The irrigated area has expanded from 25,300 hectares after liberation to 978,700 hectares, two-thirds of which are guaranteed high-yield fields.

In the whole province, conservation works have expanded the area of guaranteed harvests to over 2



Twelve-horsepower walking tractors made by the Changchow Tractor Plant ready for delivery.



The Soochow area never raised so many silkworm cocoons before.

million hectares and greatly improved irrigation and the fertility of the soil. This created conditions for scientific farming. In recent years, a mass movement to increase yields by intensive cultivation and by changing the planting system has swept the province.

In the Hsuchow-Huaiyin region, 665,000 hectares of dry land has been converted into high-yield paddy fields on which one crop of wheat and one of rice are grown each year. In the Lihsiaho region a quarter-million hectares of low-yield marshland which used to grow only one rice crop now grows two (one of wheat and one of rice). In the Soochow region in the south, where water is plentiful, over a third of a million hectares now grows three crops, one of wheat and two of rice.

The socialist road of collectivization taken by the people of Kiangsu and the tremendous work they put into developing agriculture in the past 23 years have basically ended north Kiangsu's backwardness, vulnerability to natural disasters and low farm yields, and brought south Kiangsu to both stable and high yields. The province has had excellent grain harvests for the past ten years. Grain output last year was 2.4 times the harvest just after liberation. After putting aside collective and individual-family reserves, the province sold millions of tons of grain to the government.

As the province carried out the policy of "taking grain as the key link and ensuring an all-round development", the output of cotton and oil-bearing crops last year surpassed 1971, a bumper-crop year. Pigs, silkworm cocoons, tea, fruit and aquatic products were the highest in history. Cotton was over 12 times the post-liberation years and cocoons 3.7 times.

Agriculture Promotes Industry

The all-round development of farming, forestry, livestock, fisheries and sideline occupations provides more foodstuffs and raw materials for light and heavy industry, and the steady rise in the purchasing power of the rural population provides industry with an expanding market. This has speeded up industrial development in the province.

Cotton and silk textiles, traditionally famous Kiangsu industries, account for a great part of the output of Kiangsu's light industry. Abundant cotton and cocoon harvests for several years in a row raised the 1972 output of cotton yarn 60 percent and raw silk more than 100 percent over 1965. In Soochow, a silk-weaving center since the Ming dynasty (1368-1644), the output of silk fabrics, nearly 200 types, is 25 times more than early liberation.

In the past Kiangsu's silk industry lay only along the Shanghai-

Nanking railroad and 90 percent of its cotton spindles were in south Kiangsu. The introduction of silkworm raising and the expansion of cotton fields in north Kiangsu enabled such regions as Huaiyin and Yencheng to set up silk filatures and cotton mills for the first time. Today 45 percent of all cotton spindles in the province are in north Kiangsu.

With the great increase in pigs, poultry, aquatic products, fruit and vegetables, the province's own canning industry now puts out 20,000 tons a year. Bumper grain harvests provide large quantities of rice and wheat straw for paper-making. The few paper mills of liberation days now number over 50 and produce 20 times more than in 1949.

The development of such new industries as chemical works, electronics, plastics and synthetic fibers has greatly increased the variety of products of light industry. The Light Industry Department of Kiangsu calculates the total output value of light industry to be 6.7 times the early liberation period. The steady growth of light industry has accumulated large amounts of capital for the development of heavy industry. Light industry demands more machinery and equipment from heavy industry. The 2,000 people's communes demand more farm machines, fertilizers and insecticides. These demands propel heavy industry forward.



Grocery store near the Drum Tower in Nanking.

First to develop rapidly were such basic industries as iron and steel, coal and machine building. Kiangsu had no iron and steel industry before. Today it has 60 small and medium iron and steel mills. Over a hundred small coal mines have been opened in both plain and hill areas. With iron and steel and fuel, the province's machine-building industry has expanded steadily. Today the province, while putting out many large machine tools for heavy industry, mass produces general-purpose machine tools for the rural areas and light industrial plants. Complete sets of equipment for automobile works, shipyards, small power and chemical fertilizer plants, and some major installations for mines, metallurgical works, petrochemical and textile plants are also produced.

Industry Supports Agriculture

With its own supply of iron, steel, power and machinery, the province has been able to set up many small plants in its seven regions directly serving agriculture. These small local industries scattered in 64 counties, built under local conditions, meet the local demands of agriculture.

In the rice country of Soochow, for instance, a small, light, easy-to-handle tractor is needed to replace plowing with animal power. In 1970 a plant was set up to produce 12-h.p. walking tractors. Its first year's output of 450 jumped

to 1,500 last year. The tractors are so low-priced that ordinary production brigades can afford them. The Soochow region has also set up a plant turning out small diesel motors for walking tractors, water pumps and machines for processing farm produce. The peasants like this multi-purpose motor.

Agriculture in the Soochow "water country" also needs large numbers of boats. Because lumber is hard to get, some concrete block plants began building boats of reinforced concrete. Sturdy, and not affected by acid, alkaline and rot, they transport ammonia water and manure. Equipped with power pumps, they become mobile pumping stations.

Changing its planting system and increasing multi-cropping, the province needs chemical fertilizers and mechanized irrigation and drainage equipment. In the past few years, 65 plants in the province have worked together and built many complete sets of equipment for local chemical fertilizer plants. While there were only 11 such plants in 1965, today there are 72, and the output of nitrogen fertilizer has grown tenfold. Meanwhile, the output of diesel engines, motors and pumps for irrigation and drainage has gone up sharply.

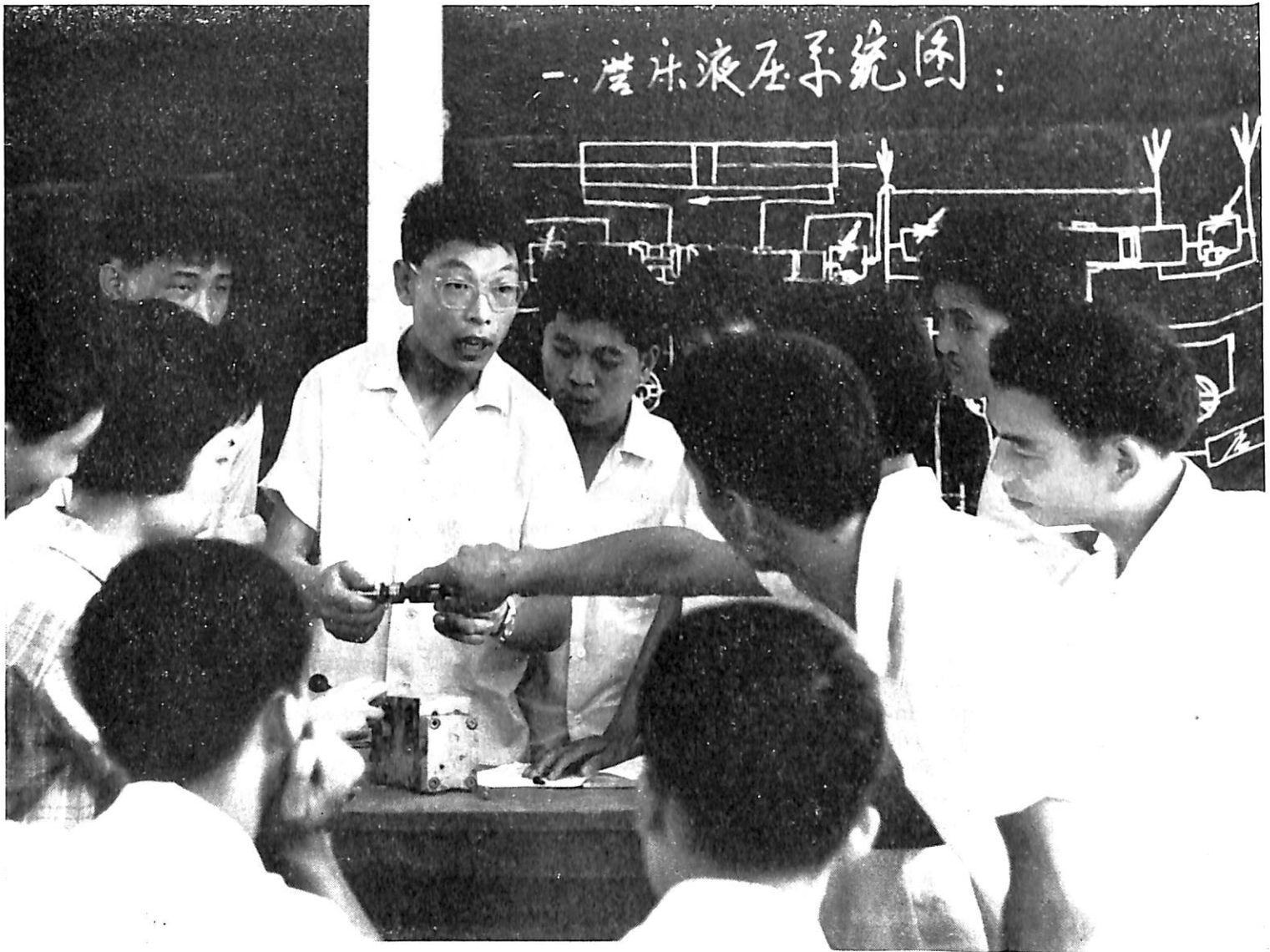
In north Kiangsu, particularly in the Hsuechow-Huaiyin region, industry and agriculture were much weaker than in the southern part of the province. Kiangsu's in-

dustry therefore has put its main emphasis on supporting agriculture in the north. In the past two years alone, the province has sent 300,000 horsepower of irrigation and drainage equipment to the Hsuechow-Huaiyin region to help transform large areas of dry land into paddies. It has supplied over 3,500 walking tractors for paddy-field use and a great number of medium-sized tractors for dry land.

More important from the long view is helping the backward regions of north Kiangsu set up their own local industries. In the past three years the central and provincial governments have provided hundreds of machine tools to help the counties in the Hsuechow-Huaiyin region start farm machinery plants. These are used not only to build more machine tools to expand their own plants but to make machines for the farm tool plants and repair shops of the people's communes.

With the material and technological assistance of the central and provincial governments, the Huaiyin region is building the city of Chingchiang into an industrial base. In its outskirts, covered with weeds only a few years ago, modern industries have sprung up, including iron and steel mills, and plants making medium-sized tractors, machinery for the chemical industry, ball bearings, rubber products, sugar and cotton textiles.

(Continued on p. 40)



Chiu Teh-feng (center) holds a part he designed for a hydraulic system as he teaches a class of new students. A graduate of the university, he was originally a worker in the hydraulic systems shop.

A NEW TYPE OF UNIVERSITY

Staff Reporter

THE Shanghai Machine Tools Plant is famous in China for its high-precision grinders. But it is even more famous for the great contribution it has made to the nationwide revolution in education by organizing a system for training engineers from among its 6,000 workers. Before 1968 the Shanghai Machine Tools Plant set up a spare-time pre-engineering school with an enrollment of 700 workers.

On July 21, 1968 Chairman Mao issued an important directive in the *People's Daily*, "Take the road of the Shanghai Machine Tools Plant in training technicians from among the workers. Students should be selected from among workers and peasants with practical experience, and they should return to production after a few years' study." This gave a new orientation to China's educational work. The

Hsu Hsuch-teh in class.



percentage of workers and peasants entering universities rose sharply. Factories across the country began opening their own schools of different types. Two months after Chairman Mao's directive, the Shanghai Machine Tools Plant started the "July 21" Workers' University.

Not Like Other Universities

As the fifth anniversary of Chairman Mao's directive approached, this reporter visited the school.

Located in a tree-shaded corner of the plant's grounds, the "July 21" University does not have imposing classroom buildings or a big library with thousands of books. There are only ordinary one-story houses for classrooms, laboratories, reading rooms, offices and dormitories. The first class of 52 worker-students graduated in 1971 — in three years. The second class has 98 workers. There are 30 teachers and staff members. The school seems very small, but because dozens of well-equipped shops in the plant serve as its

classrooms and many veteran workers and engineers do the teaching, it is actually very big.

One of the school's characteristics is that all its students are workers with practical experience. The men and women in the present class come from 22 machine-building plants in Shanghai. Their average age at enrollment was 26, and their average work experience was eight years. Some have worked nearly two decades, others are middle school graduates with only three years' work experience.

All these worker-students were selected by their fellow workers. They pay no tuition or fees, continue to get their full pay and enjoy all worker benefits. They all have a point in common — they are highly conscious of what the leaders and their fellow workers expect of them and they study to contribute more to the building of socialism.

Both professors and engineers teach in the "July 21" University. The professors have had years of experience in teaching basic theory

at universities of science and engineering and some practical experience. The engineers have wide practical experience and a certain theoretical knowledge. Technician Wang Teh-fa, 40, who is the leader of the university, was an apprentice when he was 14. In 1966 he was the chief designer of the M-7150A large surface grinder which met advanced levels.

These two kinds of teachers prepare lessons together so that they can learn from each other and collaborate for better teaching. Forty-eight workers, technicians and engineers also teach, each taking up a topic in his own field. The students — who are lathe workers, fitters, milling workers, grinders, forge workers, electricians and cold workers — also teach when their own work experience is involved. For example, when hardening is being taught, students familiar with heat treatment become teachers. When casting technology is the subject, foundry workers do the lecturing.

The "July 21" Workers' University curriculum at present majors in the design of grinders. In addition to classes in Marxism-Leninism-Mao Tsetung Thought, there are classes in mechanical drawing, higher mathematics, mechanics, hydraulics, electricity, machine design and production, and foreign languages. The three-year course produces engineers able to design and make grinding machines of all kinds.

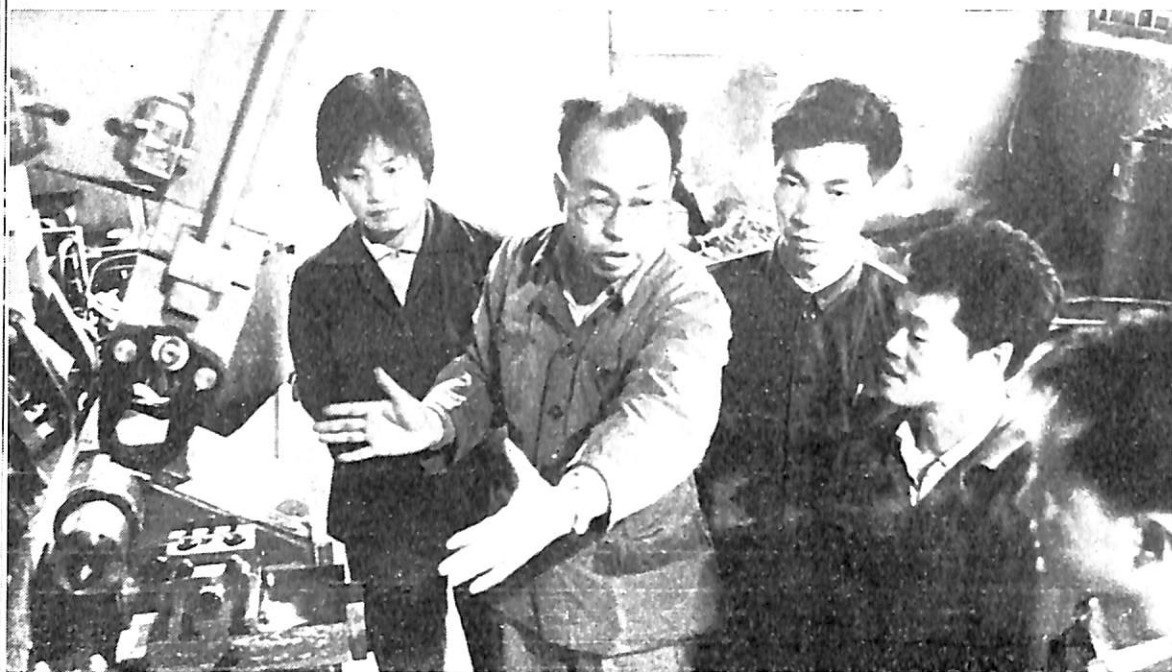
New Teaching Materials

On a teacher's desk we saw a 246-page university-level textbook, *Design and Manufacture of Grinding Machines* written by the "July 21" Workers' University and published by the Shanghai People's Press. "A product of the revolution in education," the teacher said. One of the main contradictions the new school ran into was teaching material. Because the old material contained much unnecessary detail and the general discussion was unrelated to actual practice, it could not be used.

A team of teachers, students, workers and engineers shouldered the task of compiling new texts. They critically analyzed the old

On the campus.





Wang Teh-fa (second left), a teacher and students aligning a new-type copying lathe they have just assembled.

texts, kept what was useful and incorporated advanced science and technique both foreign and domestic. The new texts took account of the students' characteristics and requirements after graduation, and linked theory tightly with practice. *Design and Manufacture of Grinding Machines* was written by six people based on research by 80 others. It takes much less time to go through and has more of the theory needed for designing and producing grinding machines than the old text. The new teaching material will be improved and new techniques added as they appear.

Practice Comes First

Do worker-students only need theory in the classroom? The "July 21" University does not think so. In line with Chairman Mao's description of how knowledge develops — "Practice, knowledge, again practice, and again knowledge" — the course is divided into four stages.

First, necessary basic courses such as mechanical drawing, trigonometry, geometry and fundamental knowledge about grinders are added to the students' practical experience. These lay the foundation for the next stage.

The second stage is more important — carrying on teaching in combination with typical projects. The students learn theory while designing and making typical

machines needed by the plant. This raises their practical experience to the level of theory and enables them to handle similar cases. Thus, from the particular to the general, they begin to learn the basic principles of designing and making machine tools of every description.

We entered a laboratory where students and teachers were intently adjusting and testing a semi-automatic hydraulic copying lathe 3.6 meters long and 2.7 meters high — one of the three typical products actually made in the second stage. One student said

proudly, "This is our 'home work', done under the guidance of four teachers. After an acceptance test it will be used in production."

The third stage, built on problems encountered in the second stage, continues a systematic study of theory in order to raise the students' ability to grasp general laws. The courses include: higher mathematics, mechanics, hydraulics, electricity and the design and manufacture of grinders. They also regularly work in the laboratory.

In the fourth stage, the students are assigned work in plant shops for additional practice. Here, with workers and engineers, they design and make a complete machine tool, applying their new theoretical knowledge to practice and further raising their theoretical level. They also attend several theoretical classes a week.

The Story of a Bench Worker

Although the worker-students have a lot of practical experience, their educational levels are all different. How can they master this difficult curriculum in such a short time?

The story of bench worker Hsu Hsueh-teh, 36, answers this question. Oldest of the students, he only had a primary school education. Most of the others have at least gone through junior middle

Wu Chi-chou (center) and workers discuss assembling a new machine tool.



school. After two years in the "July 21" University, he is in the middle of his class. He has learned English and can now translate foreign machine-tool data into Chinese.

When Hsu recalls his bleak childhood, his eyes grow moist. His father was an odd-jobber and his mother a servant. In the old society, how could they keep four children from starving? So Hsu's older sister was given away and has never been heard from again. His younger sister was put in a foundling home run by imperialists in the name of philanthropy and wound up buried in a mass grave. His parents managed to get him and his younger brother into school, but every day after school they had to slip into nearby St. John's University and scavenge the leavings of rich children's meals to feed their family.

When Shanghai was liberated in 1949 Hsu Hsueh-teh was able to finish primary school and go to work in a machine-tool plant. As things got better and better, he kept thinking of how to do more for his socialist country. He wanted to make technical innovations but was handicapped by lack of theory.

With these feelings, Hsu Hsueh-teh entered the "July 21" Workers' University in 1971, determined to

be a credit to the working class. But he was upset after the first week. Geometry and trigonometry made him dizzy, so he asked his teachers to coach him after class. They gave him warm help. His classmates concentrated on him in their mutual-aid group, determined not to let a single class brother fall behind.

In these warm surroundings, Hsu began studying with amazing persistence. What others studied once, he studied ten times. When others got up in the morning, they found him already studying. He often stayed in the classroom drawing or calculating long after they had gone. He studied hard on Sundays, a teacher or fellow students at his side.

Hsu Hsueh-teh gradually discovered that he had not been born unintelligent and that the more he studied the smarter he got. His practical work experience helped him understand theory, and theory helped him analyze his experience and raise his understanding to the level of principle.

Winged Tigers

How good are the worker-students turned out by this three-year university course?

The 52 graduates of the class of '71 have answered this in practice. They have gone back to production

as Chairman Mao directed. Some have returned to their shops, others have been transferred to the plant's grinder research institute. Now they play a bigger role in production and especially in technical innovation. The workers say they have become tigers with wings.

Wu Chi-chou, a fitter who returned to his shop, is one of these. He had wanted to make a greater contribution to China's machine-building industry for years. Though he wanted to fly, he did not have wings: he didn't know how to make design calculations or draw plans.

Now he does his own calculations, draws his own plans, rolls up his sleeves and processes the parts. When it comes to assembling, he's an old hand. In five months, with the help of engineers from the grinding machine research institute, he and seven other students designed and built China's first cylindrical grinding machine for pieces up to 1.6 meters in diameter.

Graduates of the '71 class have taken part in the design and manufacture of many new products, including a 75-ton hydraulic press, a boring and milling machine, a deep-hole drill press and an automatic double-wheel grinding machine.

(Continued from p. 14)

show innovation in both content and the use of stitches.

The Hunan Embroidery Studio has 120 women on its staff. Its work has been exhibited in some 50 countries. Embroidery is still a traditional home occupation among the women commune members in the rural districts outside Changsha. Over 15,000 of them do embroidery for the studio.

An important change in Changsha is the growth of its modern industry. In the early days after the liberation there were only seven factories which employed more than a hundred workers. The Changsha Machine Tool Plant grew up out of a factory which

manufactured mainly parts for kerosene lamps. Now reconstructed, it produces large precision lathes used both in China and abroad.

The city, which previously had no steel industry, now has a number of plants of medium and small size for this and other metallurgical production, as well as for machinery, electronics equipment and chemicals. Its light industrial products include medicines, textiles and porcelain. New industrial districts have grown up in the formerly wild hills around the city.

In 1938 even before the Japanese invaders approached Changsha, the Kuomintang reactionaries, unwilling to resist them, fled. As

they left they set fires which finally consumed 80 per cent of the city's houses. After that the only housing the working people had were the shacks or straw huts they built in the ruins, about which they used to say, "When you stretch out, your feet stick out of the door."

The streets used to be filled with the cries of water sellers with their buckets of river water hanging from their shoulder poles, as the city had no water mains. Since liberation more than twenty new public housing and workers' residence projects, all with running water and electricity, have been built. The total floor space of new construction is more than twice the area of the entire old Changsha.

600,000 Years of Labor and Struggle (II)

— Exhibition of Archaeological Finds in New China

HSIA NAI

In the June issue of China Reconstructs Professor Hsia Nai, director of the Institute of Archaeology, Chinese Academy of Sciences, discussed the pre-Chin dynasty archaeological finds on display in an exhibition now on tour abroad. In this issue he deals with those of the Chin and Han dynasties and later.

— Editor

IN 221 B.C. Chin Shih Huang succeeded in annexing all the six powerful states and set up a centralized government based on the feudal economy. The inscription on the pottery capacity measure in the exhibition records his imperial decree ordering the standardization of weights and measures. The decree was issued in the unified script of the Han language. The tall pottery figure of a seated woman, unearthed from Chin Shih Huang's tomb at Lintung in Shensi province, is graceful and dignified. Although China's unification under the Chin dynasty lasted only fifteen years, it laid the foundation for a powerful, unified state during the Western and Eastern Han dynasties (206 B.C.-A.D. 220).

Western Han Tombs at Mancheng, Hopei, and Bronze Figurines, Chariots and Horses from an Eastern Han Tomb in Wuwei, Kansu

The Han dynasty was one of the most splendid ages in China's history. Chinese historians used to call the Han and Tang dynasties "the Flourishing Age of Han-

Tang". During these periods China was not only a powerful country but had a thriving economy. In addition, its art works were magnificent, lively and vigorous. In the succeeding ages, such as Ming and Ching, art became over-ornate and comparatively lacking in strength.

Cultural relics of the Han dynasty have been unearthed in large quantities since liberation in 1949. The most outstanding finds, however, are the funeral objects from the two Western Han tombs at Mancheng in Hopei province and articles from an Eastern Han tomb at Leitai in Wuwei, Kansu province.

The tombs of Liu Sheng, Prince Ching of Chungshan, and his wife were excavated in 1968. Liu Sheng, who died in 113 B. C., was the elder stepbrother of the famous Han emperor Wu Ti (reigned 140-87 B. C.). Over 2,800 objects were unearthed from the two tombs. Among them the most exciting were two suits of well-preserved "jade clothes sewn with gold thread" worn by the dead. Jade burial clothes preserved in their entirety had never been discovered before. When they were first exhibited in Peking in 1971 they astonished both Chinese and foreign viewers. The suit displayed in the exhibition abroad is the one of Liu Sheng's wife. It was made of 2,160 pieces of jade tied together with fine gold thread through holes in the corners. Judging from present-day handicrafts, it would have taken an expert Han dynasty jadesmith more than 10 years to complete such a suit. The two jade suits are a good example of the early artisan's high technical skill.

The other funeral objects discovered in the two tombs at Mancheng include jade articles,

bronze vessels and earthenware. Many of them are beautiful in form, delicate and colorful in design, and made with meticulous workmanship.

The few bronze vessels, either gilded or inlaid with gold and silver, are exquisite. An example in the exhibition is the bronze *hu* wine vessel inlaid with gold and silver, its body brightly gilded with a dragon design. Another example is a bronze *hu* wine vessel with a gold and silver inlay of bird script, one of a pair unearthed and a rare piece. Bird script, a kind of decorative writing, first appeared on bronze swords at the end of the Spring and Autumn period (770-475 B. C.). It has been found on many bronze objects but none is so intricate and beautiful as this one.

The ram-shaped bronze lamp and the bronze *poshan* censer supported by a human figure mounted on a beast also deserve attention. The carved human and animal figures are lively and lifelike, good examples of the realistic approach of the time. The exhibit also includes a gold needle and a silver one used for acupuncture.

The Eastern Han tomb at Leitai, Wuwei county, in Kansu, was discovered in 1969. It was large and contained many bronze figurines of warriors and men and women servants, chariots and horses. These finds, like the processional scenes of the stone reliefs and wall paintings of the Western Han tombs, depict the pomp with which the nobles of the time went about. A significant art treasure is a unique, lively horse of bronze, galloping and neighing with its head and tail high. To show that its speed is faster than a bird, the unknown craftsman placed its right hind hoof on a bird in flight,

and its other hoofs in the air. From the time of emperor Wu Ti of the Han dynasty, the famous "heavenly horses" (or "blood-sweating horses") were brought to China from Ferghana in the Western Regions. This explains the appearance of improved breeds on wall paintings and stone reliefs of the Eastern Han dynasty. There were also many horses of excellent breed in pottery but none as lively as this one.

Cultural Relics of the Han Dynasty Found at Shihchaishan, Chinning, Yunnan and Other Places

A great number of Han dynasty cultural relics have been found in various parts of China. Some of them are displayed in the exhibit abroad, such as the painted pottery horsemen of the Western Han dynasty, the pottery acrobats and musicians, the wooden monkey and painted wooden unicorn of the Eastern Han dynasty. All of them are lively in form. It is interesting to note that the wooden monkey unearthed at Wuwei in Kansu resembles modern occidental sculpture. Some of the bronze objects, gilded or inlaid with gold and silver, are similar to those found in the Western Han tombs at Mancheng. The designs are fine and intricate, the colors rich and bright. An exquisite rare piece is the bronze chariot ornament discovered at Tinghsien in Hopei province in 1965. In the shape of a long tube, it is skilfully inlaid with gold, silver and turquoise, and successfully creates four scenes of hills, masses of clouds, and animals and birds including a peacock and an elephant. The lines are delicate and the colors are resplendent. Some of the inlaid gold and silver lines are as thin as a hair. It is no exaggeration to refer to it as of "immortal workmanship". Among the gilded bronze objects are a wine vessel and wine warmer excavated at Yuyu in Shansi. The two jade articles with open-work designs of dragons and other animals also show a high level of craftsmanship. They too were unearthed at Tinghsien.

The finds at Shihchaishan, near Chinning county in Yunnan prov-

ince, deserve special mention. Between 1955 and 1960 some 40 tombs of the Kingdom of Tien of the Western Han period were unearthed there. Among the finds are bronze tools such as plowshares and axes, animal-shaped bronze ornaments and drum-like containers for cowrie shells and agate ornaments. On the cover of the containers are often cast human figurines in various activities such as attending sacrificial ceremonies or spinning and weaving. The one displayed in the exhibition shows a spinning and weaving shop with slaves working under the slave-owner or his agent. These graphic materials provide important information for the study of the slave system in this locality during the Han dynasty. The animals on the ornaments, particularly when fighting, are lifelike. The King of Tien had nomadic tribes under his rule. The bronze articles with animal designs perhaps were related to the bronze designs of nomadic tribes on the Eurasian steppe.

Pottery and Porcelain of the Tsin, Southern and Northern Dynasties and Stone Sculpture of the Northern Dynasties

Techniques for making celadon porcelain continuously improved during the Western and Eastern Tsin dynasties and the Northern and Southern dynasties (A. D. 265-589). The development from proto-porcelain to porcelain was completed during this period.

The eagle-shaped celadon vase on exhibit was unearthed at Nanking from a tomb dated the second year of the reign of Yung Ning (A. D. 302) of the Western Tsin dynasty. The shape is unique, novel and attractive. The celadon pot with the head of a cock and the celadon jar with four loop handles were prevalent forms. The celadon ware found in the tomb of Li Yun (A. D. 496-575) of the Northern Chi dynasty is noted for its snow-white body and sparkling glaze. Compared with the celadon vessels of the Tang dynasty, they reached the same level of perfection.

Celadon and white porcelain objects were also found in the tomb of Fan Tsui (A. D. 549-575) of the

Northern Chi dynasty. In this tomb three yellow-glazed flasks decorated with musicians and dancers were also found. One of them is in the exhibit. At the neck of the flask is a pair of knots to which a string could be fastened. Evidently it was used by horsemen. The scene has four people playing music around a person dancing on a lotus-shaped stand.

Among the stone sculptures of the Northern dynasties, the graceful Buddhist carvings in various caves are well-known throughout the world. The caves at Yunkang, Tatung in Shansi province and at Lungmen, Loyang in Honan province are treasure-houses for the study of the history of Chinese sculpture. The two carved bases of pillars from the Northern Wei dynasty were excavated from the tomb of Ssuma Chin-lung (who died in A.D. 484) at Tatung. Its skilful workmanship equals the sculptures at Yunkang. It is generally believed they were done by the same group of sculptors.

The stone image of Sakyamuni preaching, a work of the Northern Chi dynasty, was unearthed at Linchang in Hopei province. After Buddhism was introduced to China in the Eastern Han dynasty, it greatly influenced not only the religion but also the philosophy, literature and art of the Chinese people. This was already evident in the Western and Eastern Tsin dynasties and Southern and Northern dynasties.

New Han and Tang Dynasty Finds Along the Old Silk Road

Since the founding of new China, silk and woolen fabrics of the Han and Tang dynasties have been found from time to time at Minfeng (Niya), Turfan and Bachu along the old Silk Road. The silks deserve particular attention. They include damask and polychrome silk. The designs of the Han silks are similar to the designs of Han lacquerware or bronzes inlaid with gold and silver. Lozenges, clouds, animals and birds were common. Some are interwoven with Chinese characters such as *yen nian yi shou*, meaning "augmentation of age, extension of longevity". Tang silks used birds

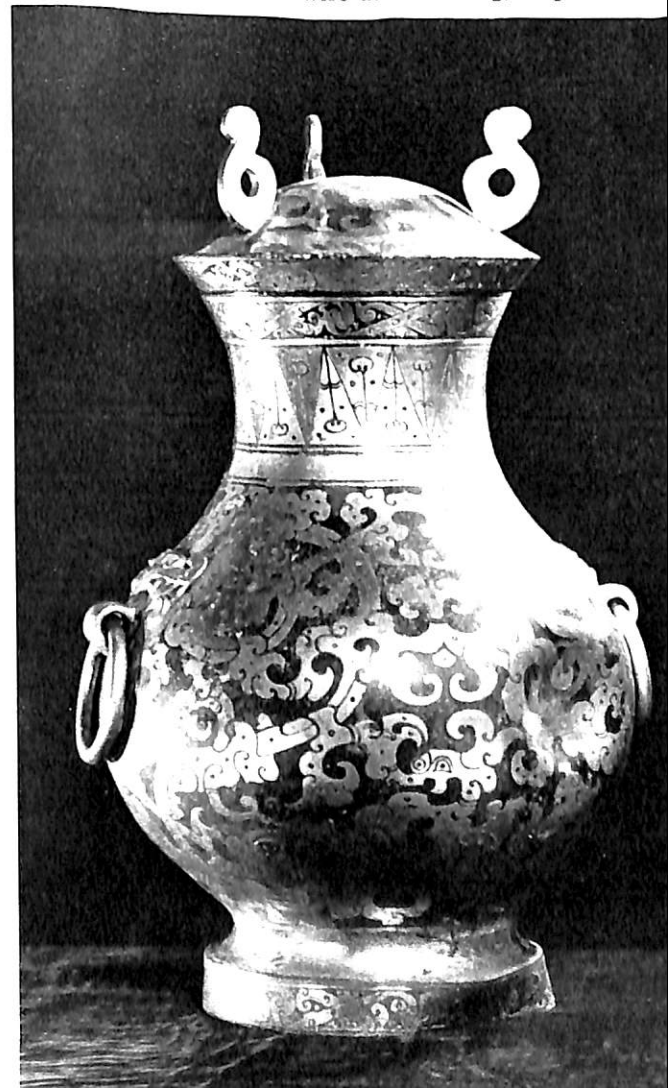


Bronze cowrie-container decorated with a spinning and weaving scene on the cover, Western Han dynasty. H. 27.5 cm. D. of the bottom 30.9 cm. From a tomb at Shihchaishan, Chinning, Yunnan. (Close-up above.)

Gilt bronze *tsun* wine warmer, Han dynasty. H. 24.5 cm. D. of the mouth 23.4 cm. Unearthed at Yuyu, Shansi.

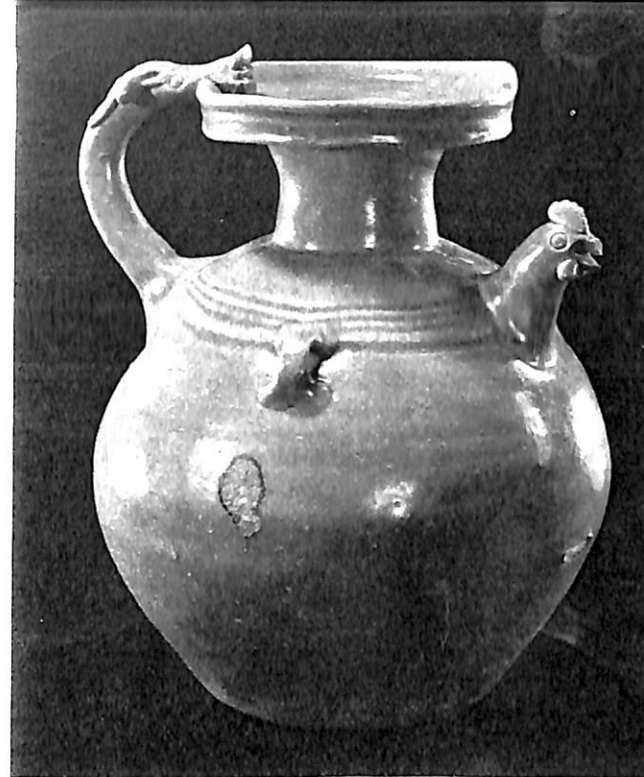


Bronze *hu* wine vessel inlaid with gold and silver, Western Han dynasty. H. 59 cm. From the tombs of Liu Sheng, Prince Ching of Chungshan of Western Han dynasty and his wife at Mancheng, Hopei.





Gold bowl with embossed lotus-flower petals and traced design, Tang dynasty. H. 5.5 cm. D. of the mouth 13.5 cm. Unearthed at Hochiatsun near Sian, Shensi.



Celadon pot ornamented with the head of a cock, Eastern Tsin dynasty. H. 23.5 cm. Unearthed at Yuyao, Chekiang.



White water-pot (*kundi*) with carved flowers, Ting ware, Sung dynasty. H. 60.5 cm. Unearthed at Tinghsien, Hopci.

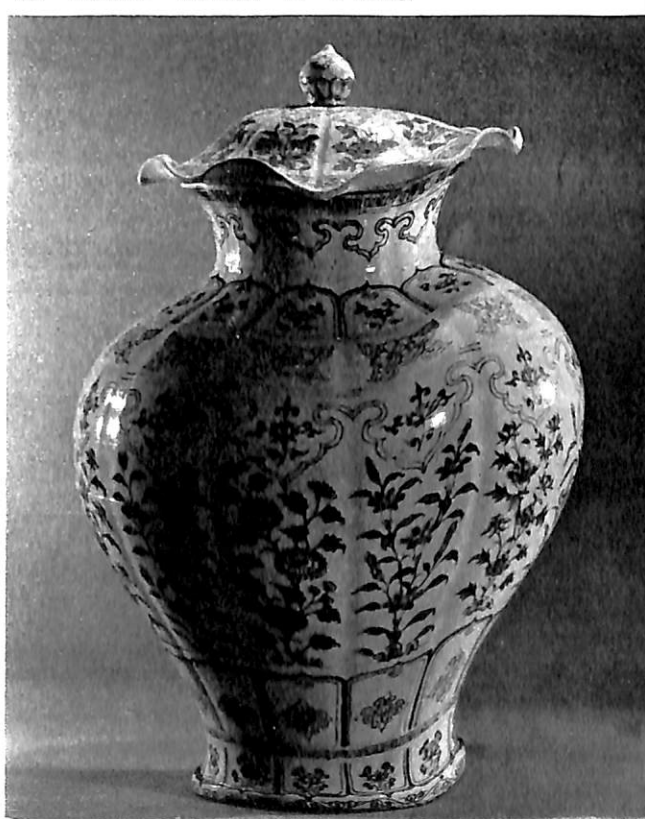


Three pottery figurines, Yuan dynasty. H. 37-39.2 cm. Unearthed at Chiaotso, Honan.

Porcelain vase with cloud design, Yuch ware, the Five Dynasties period. H. 50.7 cm. From a tomb at Lin-an, Chekiang.



Blue and white covered jar, Yuan dynasty. H. 66 cm. Unearthed in the Haitien District of Peking.



and circles composed of flower sprays often seen on gold and silver articles of the time, but also new decorative motifs prevalent in western Asia such as a pearl-bordered medallion, confronting birds and the heads of boars. Some pieces are woven with both western Asian designs and Chinese characters, testifying to the trade and cultural interchange between China and central and western Asia.

Official and private documents in the Han and minority nationality languages were discovered in the tombs at Turfan. Food such as *chiaotzu* dumplings and fried breadrolls — favorite foods during the Tang dynasty and later — were also found. These finds prove that the Hans and national minority people in this area already lived and worked together in ancient times.

Other finds include coins. Silver Sassanian coins from Persia and gold Byzantine coins were found together with Chinese coins. This is an indication of the flourishing trade then existing between China and western Asian countries.

The Surveys of Changan and the Discovery of the Treasures at Hochiatsun Village

In A.D. 589, the Sui dynasty once more unified China and ended the confrontation between the Northern and Southern dynasties. It built a magnificent new capital at Changan (the present-day Sian). The Tang dynasty (A. D. 618-907) inherited the Sui accomplishments. Its feudal economy flourished as never before. Its capital Changan was one of the biggest cities of the world at the time. Its city walls were about 35 kilometers long. Continuous surveys and excavations have been made since 1949 and important finds unearthed.

A hoard of the Tang dynasty was found in 1970 at Hochiatsun village, within the site of Hsing-huafang, a ward in the central part of the city of Changan, now a southern suburb of Sian. It was contained in two pottery jugs and consisted of gold and silver objects, precious stones, jewelry, jade ware, medicinal minerals (cinnabar, stalactite, amber, rock-crystal,

amethyst) and Chinese and foreign coins, totalling 1,023 pieces. Gold and silver vessels alone accounted for 216 items. The discovery of Tang gold and silver articles was of unprecedented significance. Examples of this group in the exhibition are a gold bowl with embossed lotus flower petals, each with flower and bird design traced on a ring-matted ground; an octagonal gold cup, each face of which has a musician or dancer in high relief; and a silver box with a meticulously traced flower and bird design, partly gilded. These are masterpieces of excellent workmanship.

The medicines were contained in varied-sized silver boxes, the cover of each bearing the name and quantity of the medicine inside. There was also a silver vessel in the shape of a pomegranate for preparing medicines. These medicinal minerals were thought by the feudal rulers to prolong their lives.

The hoard was found at the site of the mansion of the Prince of Pin, Li Shou-li, who died in A. D. 741. Li was the cousin of emperor Ming Huang. It is possible that a member of the family of the new Prince of Pin buried the hoard before fleeing to Szechuan with the emperor Ming Huang, his family and high officials of the court when a subordinate of An Lu-shan attacked Changan in the 15th year of Tien Pao (A.D. 756).

The Tomb of the Tang Princess Yung Tai and the Handicrafts of the Tang Dynasty

A number of tombs of Tang dynasty nobles were excavated in the vicinity of Sian. The tomb of Princess Yung Tai (A.D. 685-701) in Chienhsien was representative. Among the finds are three-colored pottery horses and mounted hunters, painted pottery horsemen and mounted hunters, three-colored pottery bowls and dishes. All of these have rich, attractive colors. Murals with portraits of female attendants on the walls of the tombs and incised figures of palace ladies on the stone sarcophagus of the princess are the most distinguished ever found for their graceful lines, quiet, elegant colors and varying postures.

Exquisite three-colored pottery figurines and painted pottery figurines were also found in Tang tombs at Chungpao village near Sian in 1959 and in the tombs of crown princes Chang Huai (A.D. 654-684) and Yi Teh (A.D. 683-701) at Chienhsien in 1972. In the latter two tombs there were priceless murals and incised figures on the stone sarcophagus. Crown Prince Chang Huai was the son of the famous Empress Wu Tse-tien, while Crown Prince Yi Teh and Princess Yung Tai were her grandson and granddaughter.

In the Tang dynasty, celadons and white porcelain reached a high level of perfection. In the Northern Chi and Sui dynasties white porcelain had already come into existence. Two examples of these periods are shown in the exhibition. One is the figure of a warrior and the other the figure of an attendant. Both were found in the tomb of Chang Sheng (A.D. 502-594) of the Sui dynasty. Tang white porcelain is more exquisite and spotlessly white. Representatives of the Tang period are a white porcelain spittoon and a white porcelain stem-cup applied with an impressed flower design.

The bronze mirrors of the Tang dynasty inherited the decorative tradition of the Warring States period and the Han dynasty but with fresh development. For instance, the designs of hunting, birds and flowers, double phoenixes, and "sea horses and grapes" were never seen previously. There were also new shapes. In addition to round mirrors, there were flower-shaped ones with petaled edges, called the "water-chestnut flower mirror" (with pointed petals) and the "mallow flower mirror" (with rounded petals). The back of the bronze mirror on exhibit, of extraordinary workmanship, is inlaid with a silver plaque decorated with animals and birds.

Porcelains from the Five Dynasties to the Sung Dynasty and Cultural Relics of the Liao and Kin Dynasties

Chinese celadon ware entered a new stage during the Five Dynasties (A.D. 907-960). The famous

Yueh porcelain was manufactured at this time. In 1969 several articles of Yueh ware were found in a Five Dynasties tomb at Lin-an in Chekiang province. The porcelain vase with a cloud design in the exhibit (H. 50.7 cm.) is a rare piece.

During the Sung dynasty (A. D. 960-1279) the manufacture of porcelain was further developed with increasing varieties in color and design. White porcelain Ting ware was manufactured by one of the five famous kilns of the time. In 1969 many Ting porcelains were unearthed from the foundation of two pagodas at Tinghsien in Hopei province. Two of the most beautiful are in the exhibition—the white water-pot (*kundi*) with carved flowers and the porcelain conch.

Other noted celadons in the Sung dynasty were Lungchuan ware from Chekiang, Yingching ware from Kiangsi and Yaochou ware from Shensi. Representatives of these three are displayed in the exhibit. Both celadons and white porcelains are of a single color. The decorative designs are either impressed or carved. But since the glaze is thick in the depression lines, it produces varied hues like the "hidden design" in silk damask.

Another famous kiln was at Tzuchow in Hopei province which produced white or green porcelains painted with black decorations. It was a civilian kiln and its products are mostly painted in a realistic and special style. An example of Tzuchow ware is the head-rest with a design of a boy fishing.

Contemporaries of the Sung dynasty, the Liao dynasty of the Khitans (A. D. 916-1125) and the Kin dynasty of the Nuchens (A. D. 1115-1234) existed in northern China. "Khitans" is the origin of the word "Cathay" which the Europeans used to call China in the middle ages. Among the exhibits are some cultural relics from the tomb of the consort of the Princess of Liao at Chihfeng in Liaoning province. Some are in traditional Han style such as the white porcelain plate marked with the Han character *kuan*, meaning official. Other objects, such as the flat

white porcelain flask ornamented with a cockscomb, were in styles of the Khitans themselves. The iron heads of the whistling arrow and the gilded silver saddle ornaments and tassel ornament for horses were probably made by Han artisans, for their designs are patterned on the Han tradition. These burial accessories indicate the martial spirit of the Khitan nobles who still treasured the old tribal nomadic customs.

The archaeological finds of the Kin dynasty in the exhibit include three pottery actors unearthed at Houma in Shansi province. They were originally placed in a small stage-shaped niche in a wall of the tomb. They are significant material for the study of the history of Chinese drama. The other three pottery figures, one playing a flute, one whistling and one dancing, were unearthed at Chiao-tso in Honan province. These probably belong to the Yuan dynasty. Though the style of modelling in the main follows Liao and Kin traditions, the figures are much more lively.

Remains of the Yuan Capital Tatu and Its Handicrafts

Tatu (Great Capital), which was begun by the Yuan dynasty (A. D. 1271-1368) in 1267, is the predecessor of modern Peking. Tatu was one of the famous capitals of the world. The Italian traveller Marco Polo (A. D. 1254-1324) once stayed here and highly praised its planning. He described the streets as orderly as a chessboard. Since the founding of the People's Republic of China in 1949, surveys and excavations have been carried out on a large scale. During the cultural revolution, a barbican at Ho Yi Men (Gate of Harmony and Righteousness), a number of dwelling sites and a large number of building parts and ceramics were discovered. They are important material for the study of Tatu.

Some of the beautiful Yuan porcelains unearthed in Peking are exhibited, such as the Yingching statuette of Kuanyin, Goddess of Mercy, the blue and white porcelain vase with flower design, the Yingching brush-rest, and the

porcelain jar decorated with two phoenixes in black on a white ground.

In addition to the finds in Peking, excellent Yuan porcelains have also been found in other parts of China. In Paoting, Hopei, for instance, a group of blue and white porcelains was discovered. The blue color is derived from cobalt oxide painted under the glaze. Blue and white porcelain probably began in the late Southern Sung dynasty. It is still rarely seen in the Yuan dynasty. Several groups of blue and white porcelains have been found since liberation. The covered jar with a floral design unearthed in Peking (H. 66 cm.) and the covered bottle decorated with a white dragon design found at Paoting, Hopei (H. 51.5 cm.), are rare priceless treasures. The latter is most precious for its bright color.

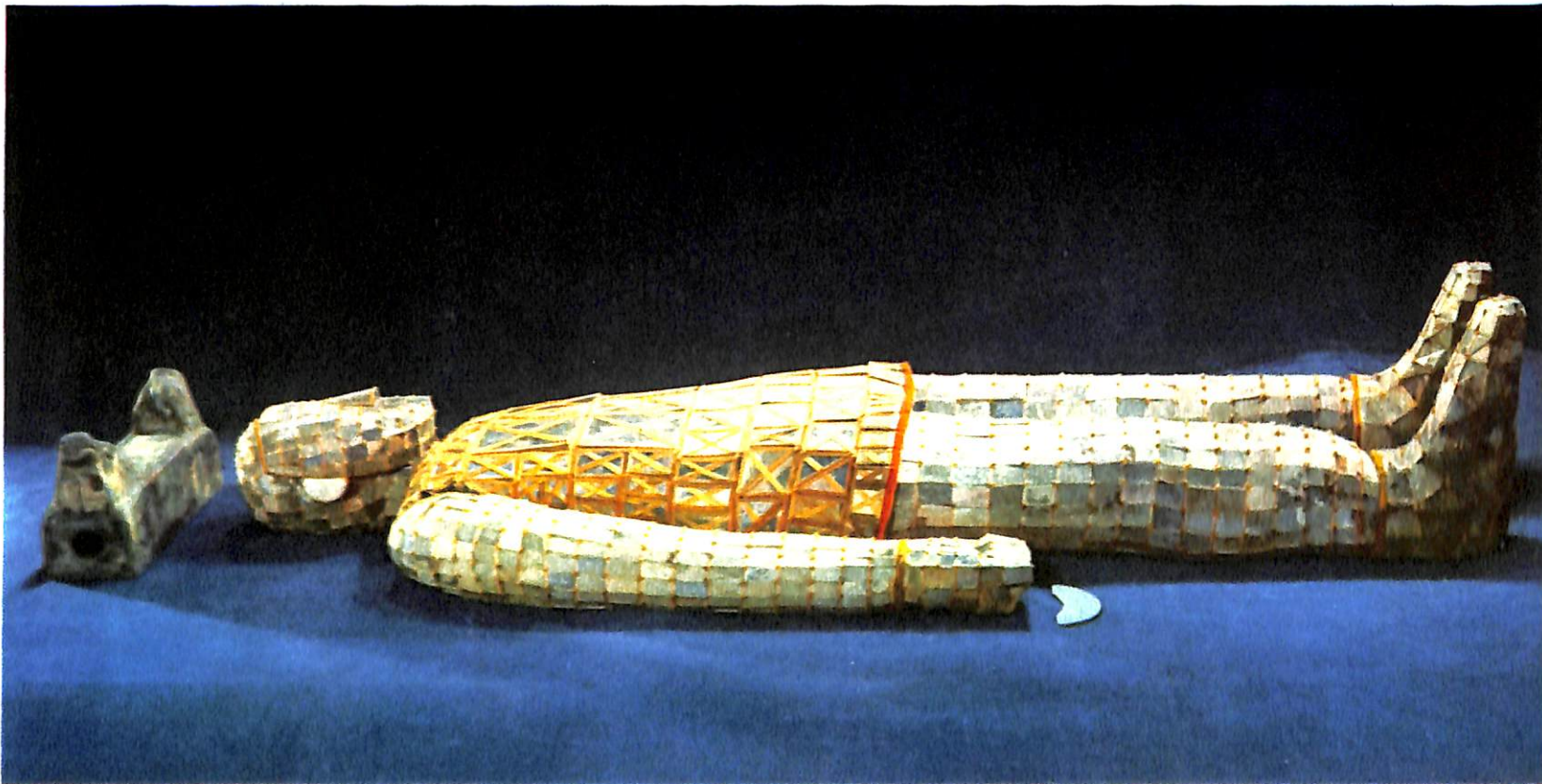
In the Chun ware, copper oxide was used as the coloring agent which produced a glaze in pale blue color dappled and splashed with purple or red, looking like the glow at dawn. It is due to the different air conditions in the furnace. Exhibits of this kind of Chun ware are a plate found in Peking and a basin discovered at Paoting, Hopei.

Among the Yuan cultural relics on exhibit are a silver confectionery box decorated with two phoenixes found at Hofei in Anhwei province, toilet articles and a silver toilet box with stand unearthed at Soochow in Kiangsu, and a round lacquerware box carved with human figures discovered in Shanghai. The round lacquer box is not of first-rate Yuan quality, but since it was found in the tomb of the well-known painter Jen Jen-fa (1254-1327), it has attracted much attention.

China developed one of the earliest cultures in the world. During their long period of assiduous labor and arduous struggle the Chinese people created a splendid civilization. The precious historical relics now being exhibited abroad can promote understanding of China's long history and fine culture. We hope the exhibition will promote friendship among the peoples of the world.



Bronze galloping horse, Eastern Han dynasty. H. 34.5 cm. L. 45 cm. From a tomb at Wuwei, Kansu.



Jade clothes sewn with gold thread—shroud for Tou Wan, wife of Liu Sheng, Prince Ching of Chungshan of the Western Han dynasty. L. 172 cm. From the tomb of Tou Wan at Mancheng, Hopei.

ARCHAEOLOGICAL FINDS IN NEW CHINA



Three-colored pottery figurines, Tang dynasty. H. 45 cm. Unearthed at Sian, Shensi.



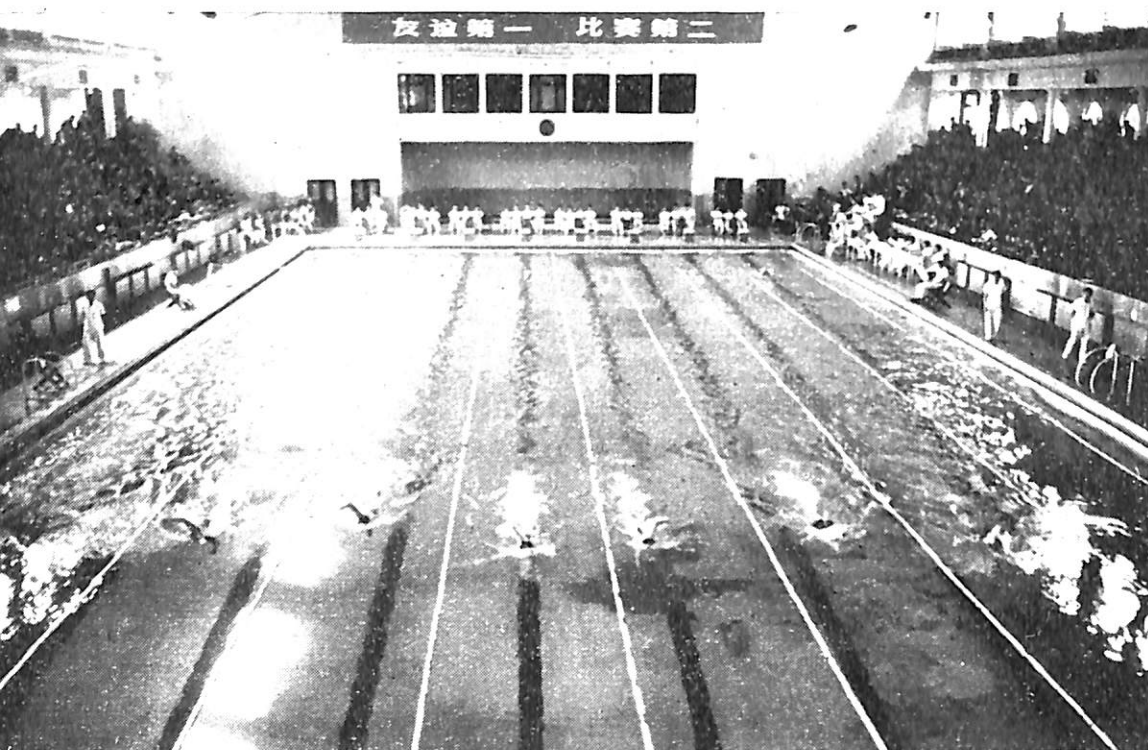
Brocade with the picture of a drinking party, Tang dynasty. L. 12.8 cm. Unearthed at Turfan, Sinkiang.

Procession scene (polo-players), wall-painting of the tomb of Crown Prince Chang Huai, Tang dynasty. (Copy) 148 × 204 cm. Discovered at Chienhsien, Shensi.



SWIMMING

The men's 4 × 100 m. medley relay.



Tseng Kuei-ying (left) shares her experience in freestyle swimming with members from other teams.



THE 1973 National Spring Swimming Tournament held at the indoor swimming pool of the Peking Stadium last April brought teams from twenty-three provinces, municipalities and autonomous regions and the People's Liberation Army. There were nearly 500 swimmers from the Han, Hui, Manchu, Miao, Chuang, Tai and Maonan nationalities.

Going All Out

The women's 200-meter freestyle finals on the last evening produced a new national record. After the starting shot, fourth-lane swimmer 21-year-old Tseng Kuei-ying from Kiangsu province, took the lead and finished first with 2 min. 22.8 sec., cutting 1.8 sec. off her national record last year. During the 8-day contest, Tseng broke the national records for the women's 400- and 800-meter freestyle and the women's 400-meter individual medley. She also took first place in the women's 100-meter freestyle.

Daughter of a worker, Tseng was fond of swimming as a child and joined contests during her primary school days. In 1969 she went to live and work in the countryside in northern Kiangsu to learn from the peasants and temper herself politically and physically. In 1970 she became one of the best swimmers of the province. In order to master swimming and keep improving her level, she always fulfilled her training program in earnest, first doing a few kilometers a day and then extending this to ten. In 1972 she set new national records in the women's 200-, 400- and 800-meter freestyle.

Such rigorous practice was evident in many teams. Outstanding examples were Tu Pi-yun from Kwangsi and Pan Wei-cheng from Chekiang among the women, and Pai Pao-cheng from Peking who broke the men's national records in the April events.

Mass Base

Chairman Mao considers swimming important. He has swum the Yangtze River several times. At the Ming Tombs Reservoir in June 1964, he said, "Swimming is an exercise in struggling with the



Tseng Kuei-ying from Kiangsu province.

Sixteen-year-old Lo Chao-ying from Kwangtung province.

Ying Ching-li from Shanghai.





Mass swimming activity in the Taochiao commune in Kwangtung province.

forces of nature, and you should toughen yourselves in big rivers and seas." Swimming has developed vigorously among the Chinese people, providing a mass base for the sport.

Nearly twice as many swimmers took part in this year's tournament as in the Second National Games in 1965. Most of the times clocked in the finals were better than those at the Second National Games. The winner's time in the 1965 women's 200-meter breaststroke, for example, only rated sixth place this year.

The April tournament also saw many more swimmers from border areas and inland provinces where the sport had developed slowly. The Inner Mongolia Autonomous Region in the northern grasslands sent a team for the first time. The team came out of recent mass swimming activities. Yunnan province on the southwest

plateau, where people swam little in the past, sent a number of good swimmers. Tao Lien-ying from the Tai nationality was one of them.

Tao, a girl born in subtropical Hsishuangpanna, joined a swimming team in 1971, worked hard and made rapid progress. More than 10 times she improved four province records.

Heilungkiang province in the far north has a cold climate and a short swimming season. But because leaders at various levels of the entire province attached much importance to the sport, the level of swimming showed marked improvement. Woman swimmer Li Li-fen still maintains the national 100- and 200-meter butterfly stroke records. A large number of young swimmers have come to the fore. The Heilungkiang team placed sixth in the women's team total.

The Kwangtung province team, which captured first place in nine men's events and in team total as well, was the largest, with 57 swimmers. Kwangtung is known for its strong mass swimming activities. From the Tungkuan county seat, called "Swim Town", the sport has spread out to the hill areas. Seventy percent of the members of the Taochiao commune, for example, can swim. Twenty-four members of the Kwangtung team came from Tungkuan county. One of them, 17-year-old Chen Chin-hui, beat the national men's 200-meter backstroke record with 2 min. 23.5 sec. set by Tai Chien at 2 min. 23.7 sec. seven years ago. He also topped the men's 100- and 200-meter backstroke.

New Swimmers

The wide popularity of swimming has brought out a great number of new hands. Seventy-two percent of the swimmers in this year's tournament were under 17, the youngest being 12. Even children between four and seven swam in exhibition events.

Twenty-four national junior records were rewritten 94 times by 27 swimmers and three relay teams. Four junior swimmers broke four national records. Junior swimmers Lo Yao-ming and Li Hui, 14 years old, broke the national women's 400-meter individual medley junior record in the same event. Lo also beat the adult national record for this event. Li Hui, who could swim 1,000 meters across the Whangpoo River when she was five, placed first in the women's 200-meter butterfly with 2 min. 47 sec.

(Continued from p. 25)

Industry in south Kiangsu has helped the rural areas of the north develop their own local industries. The city of Wusih, for example, dispatched engineers, skilled workers and cadres to the Yen-cheng region to help set up industrial plants. They helped choose factory sites, design buildings, work out production process, install machinery and equipment, and train technical personnel on

the spot. Only after the trial runs proved successful in the new plants did they go home.

These local industrial plants spread over the rural areas of Kiangsu have not only changed the old concentration of industry in a few cities but given the countryside a new look. The people's communes, to a greater or lesser degree, have their own machinery for plowing, irrigation, drainage, threshing, plant protection and

processing farm produce. The amount of land on which plowing is done with tractors, and irrigation and drainage is done with power pumps, is steadily growing.

The ancient cities of Nanking, Wusih and Soochow in south Kiangsu have prospered with the development of industry. Hundreds of mills, factories and mines in and around these cities have converted them into industrial centers.

Music for Friendship

BOTH the London Philharmonic Orchestra and the Vienna Philharmonic Orchestra played in China last spring, bringing the friendship of the British and Austrian peoples to the Chinese people. To Chinese audiences they brought enjoyment of their fine renditions of British and Austrian works, strongly expressive of national musical traditions, as well as other European classics. Their successful performances here were a significant contribution to mutual understanding and musical exchanges among our peoples.

THE British musicians arrived on March 17, giving five concerts to capacity audiences in Peking, Shanghai and Kwangchow (Canton) during a nine-day tour. "The members of the London Philharmonic Orchestra have been awaiting this visit very eagerly," Eric Bravington, managing director, told his hosts.

The orchestra's presentation of the British modern composer Edward Elgar's *Cockaigne Overture* ("In London Town") added to the Chinese audiences' understanding of the everyday life of the British people. They also performed Beethoven's *Symphony No. 7 in A*, Brahms' *Concerto for Violin and Orchestra in D* and Dvorak's *Symphony No. 8 in G*, embodying the musical culture of other European peoples.

Conductor John Pritchard's interpretation was very fine and sensitive. Solo violinist Ida Haendel demonstrated her distinctive technique and style. In a warm gesture of friendship, the British musicians played "Happy Women Fighters" from the Chinese modern revolutionary ballet *Red Detachment of Women*.

On March 20, China's Central Philharmonic Orchestra and the

British musicians met at a rehearsal to exchange experience and learn from each other. The Chinese musicians played some of Chairman Mao's poems set to music, the Yellow River Piano Concerto and a solo on the *pipa* (a Chinese traditional plucked instrument). The British musicians went up to the stage for a warm talk

with their Chinese colleagues. They discussed music and exchanged scores and recordings.

The day after they arrived in Peking, the orchestra members visited the Great Wall. Veteran violinist Marie Wilson climbed to several watchtowers with great interest. "This is the first time I have been in China," she said.

The London Philharmonic Orchestra in Peking.



欢迎奥地利维也纳交响乐团访华演出



The Vienna Philharmonic Orchestra and Chinese musicians perform a Chinese work, *The Yellow River Piano Concerto*.

"There has not been much contact between the British and Chinese peoples in the past, but such contacts will grow more and more frequent. The Great Wall has become a symbol of our friendship."

SOON after seeing off the London Philharmonic Orchestra, Peking audiences received the Vienna Philharmonic Orchestra. From April 11 to 14 the Austrian musicians gave four concerts in Peking. The sincerity and fidelity of their performance won the acclaim of Chinese audiences.

The Vienna Philharmonic Orchestra was founded in 1842. During a long history of 131 years it has faithfully kept and developed the Viennese tradition in music. For the first time the Chinese public was able to hear, in Peking concert halls, works of the Viennese classical school and of other Austrian and German composers performed by distinguished Austrian musicians.

Claudio Abbado, permanent conductor of the orchestra, directed with simplicity, decisiveness, power and feeling. Conducting symphonies by Mozart, Beethoven, Schubert and Brahms, he demon-

strated a precise and fine concept of each work and brought out the characteristic style of each composer. Willi Boskovsky, another conductor of the orchestra, was exceptional in directing music by the Strauss family. He played the violin while conducting, in the way the Strausses did in Vienna in their day. The Chinese audience was enthusiastic in its applause.

In a graphic expression of mutual friendship, the Viennese orchestra and the Chinese pianist Yin Cheng-chung performed the *Yellow River Piano Concerto* together. The visiting musicians quickly

mastered its development of emotion, shades in timbre, degrees of intensity and distinctive rhythmic textures. The especially warm feeling with which they performed this piece of Chinese revolutionary music demonstrated their deep friendship for the Chinese people.

At a farewell banquet, Professor Wilhelm Huebner, president of the Vienna Philharmonic Orchestra, said, "With music as our bridge, we have come to you and made friends. We hope that our departure will be a good beginning for friendly art exchanges in the future."

Translation of LANGUAGE CORNER Exercise III

One August evening, some customers came into the Hungchou Restaurant. Young Liu, an attendant, received them warmly.

As they gaily dined together, Liu noticed that one customer, who wasn't eating much, got up and closed a window. "Why did he close the window when it's so hot," Liu wondered. So he walked

over and asked, "Don't you feel well?"

"No, I've got a bit of a headache."

Young Liu rushed off to confer with the cook, who made the man a bowl of egg-and-noodle soup. When the customer saw this he was very happy. The other people were also quite moved.



Listeners.

When 'The Little Red Soldier' Comes to Their Home

EVERY afternoon and evening when "The Little Red Soldier" begins, children stop their play and run to the radio. The twenty-minute program especially for children broadcast twice a day is another of the ways to further China's aim of rearing children with the proper moral development who grow into workers with both socialist consciousness and culture.

The program was begun five years ago during the cultural revolution as an attempt to give chil-

dren radio listening with more revolutionary content. Its lively and educational offerings include stories about revolutionary heroes, longer stories presented serially, songs by children's groups and poems written and read by the children themselves. There are frequent programs on science and the writing of compositions. A popular feature is reading letters from young listeners and answering their questions. Extremely responsive to the children's opinions, the program staff frequently plans programs they suggested.

Most absorbing are the revolutionary stories, intended to inculcate in the young listeners the heroes' lofty ideals and help them grow up with healthy attitudes. A story about Hsieh Jung-tse, a boy



The radio children's chorus.

Taping a discussion on how to grow castor beans for the science program.



Actor Tung Ti from the Peking Drama Troupe tells a story.



who headed the Children's Corps* during the War of Liberation and died fighting the enemy, brought a letter from Ai Chun-lin, a girl in Peking. "When it comes to study," she wrote, "I don't like anything hard. Once I got stuck on an arithmetic problem and after I thought a while I gave up. Just as I was about to go to play, 'The Little Red Soldier' program came on with the story of Hsieh Jung-tse. I blushed to compare myself with him. I sat down before that difficult problem and worked until I solved it."

The staff frequently receives letters from children saying they want to be able to write good compositions but don't know how. That was how the idea for the program on composition-writing was born. Good compositions are broadcast and writers and teachers are asked to talk about them.

On one program Hsia Yung-hung, a grade school pupil, told how he learned to write themes. He had not done well in Chinese and his inability to put his ideas down in writing caused him great difficulty in other spheres of activity. He finally realized that if he could not write well he was lacking one of the basic skills needed for serving the people. He applied himself to his Chinese and finally was able to write a lively composition without difficulty. His talk had quite an impact on the children. Letters expressing determination to study hard like Hsia Yung-hung poured in to the program.

To cultivate a scientific attitude in the children and habits of precise thinking, "The Little Red Soldier" frequently offers "Questions to Think About", mainly mathematical problems. With their paper and pencils ready, the children are keen to take them down and work them out. Many send their answers in to the program.

A variation of the question program features those sent in by the young listeners themselves — How do you keep teeth from decaying?

* Organized in the Children's Corps, children in the liberated areas helped the People's Liberation Army and militia by doing things like delivering messages, laying mines and acting as sentinels.

Can snow be used for anything? How should we care for the young trees we planted? Why do water vats crack in winter? Why does wheat stay alive through the winter? The program staff tries to give scientific answers in a popular way.

The program also tries to use incidents drawn from children's own lives to educate them. One program entitled "How Liu Hsiao-hui Changed" was about a boy who gained new appreciation for his schoolwork. One mother wrote, "My son is just like Liu Hsiao-hui, playing all the time and neglecting his studies. 'Why, that's about me!' my son said with surprise when he heard the story. 'He is much better than you,' I said, 'because he turned over a new leaf.'"

The story was re-broadcast at the mother's suggestion.

Affiliated with the program is an amateur chorus composed of 80-some children chosen from local

grade schools. It meets with coaches from the radio station two afternoons a week to learn and rehearse new songs and tape them for performance.

The planners get help from teachers, actors, musicians, scientists, commune members, and workers and others from mines, plants, shops and government offices. Some write scripts and songs, others provide information for answers to questions. Many people have appeared on the program telling of their experiences in old China to help the children gain a deeper appreciation of their life in the new society. Listeners make suggestions by letter and phone.

There is no accurate figure for the size of the young audience. It numbers in the millions, for today practically every city family has a radio, and in many remote areas radio rediffusion systems now bring national broadcasts to commune members' homes.

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Lesson 19

‘我们是一家’
‘Wǒmen Shì Yì Jiā’
‘We Are One Family’

今年 春节, 解放军 战士
Jīnnián chūnjié, Jiěfàngjūn zhànshì
This year Spring Festival, Liberation Army fighter

“哟, 我们俩去的...” 女 同志
“Yō, wǒmen liǎ qù de...” Nǚ tóngzhì
“Oh, we two go...” Woman comrade

王红新 回到 北京 探亲。快要
Wáng Hóngxīn huídào Běijīng tànqīn. Kuài yào
Wang Hongxin returned to Beijing (to) visit family. Soon would

没有 说完 就 笑起来 了。
méiyǒu shuōwán jiù xiàoqǐlai le.
had not finished speaking then began to smile.

到 家 的 时候, 他 看见 前面 有
dào jiā de shíhòu, tā kànjiàn qiánmiàn yǒu
arrive home time, he saw ahead was

到了 二十八号, 这位 女 同志 说:
Dàole èrshíbāhào, zhèwèi nǚ tóngzhì shuō:
Arrived No. 28, this woman comrade said,

一位 女 同志 扛着 一 袋 面, 提着
yì wèi nǚ tóngzhì kángzhe yì dài miàn, tízhe
a woman comrade shouldering a sack flour, carrying

“请 进 吧!”
“Qǐng jìn ba!”
“Please enter!”

两条 鱼, 走路 很 不 方便。他 就
liǎng tiáo yú, zǒu lù hěn bù fāngbiàn. Tā jiù
two fish, walk road very not convenient. He then

“不, 我得 先 给 你 送到 家,”
“Bù, wǒ děi xiān gěi nǐ sòngdào jiā,”
“No, I must first for you send to home,”

赶上去 说: “同志, 我 帮 你 拿 点。”
gǎnshàngqu shuō: “Tóngzhì, wǒ bāng nǐ ná diǎnr.”
caught up said, “Comrade, I help you take (a) bit.”

红新 说。
Hóngxīn shuō.
Hongxin said.

一边 说, 一边 把 那 袋 面 扛在
Yìbiān shuō, yìbiān bǎ nàdài miàn kángzài
At same time spoke, at same time took that sack flour shouldered at

“同志, 我们 是 一家。” 女 同志
“Tóngzhì, wǒmen shì yì jiā.” Nǚ tóngzhì
“Comrade, we are one family.” Woman comrade

自己 肩上。
zìjǐ jiānshàng.
own shoulder on.

一边 笑着 说, 一边 喊: “王大妈,
yìbiān xiàozhe shuō, yìbiān hǎn: “Wáng Dàmā,
at same time smilingly spoke, at same time shouted, “Wang Aunt,

这位 女 同志 感激地 看了看 红新,
Zhèwèi nǚ tóngzhì gǎnjīde kànlekan Hóngxīn,
This woman comrade gratefully looked (at) Hongxin,

红新 回来 了!”
Hóngxīn huílai le!”
Hongxin's come back!”

问: “同志, 你 去 哪儿?”
wèn: “Tóngzhì, nǐ qù nǎr?”
asked, “Comrade, you go where?”

王大妈 赶忙 迎了 出来, 笑得
Wáng Dàmā gǎnmáng yíng le chūlai, xiào de
Wang Aunt rushed (to) welcome came out, smiling so

“我 就 住在 这条 胡同 二十八号。”
“Wǒ jiù zhùzài zhètiáo hùtòng èrshíbāhào.”
“I just live at this lane No. 28.”

嘴 都 合 不 上 了。看到 儿子 有
zuǐ dōu hé bú shàng le. Kàndào érzi yǒu
mouth even close not up. Seeing son had

“是 王大妈 家 吗?”
“Shì Wáng Dàmā jiā ma?”
“Is Wang Aunt's home?”

些 迷惑不解, 王大妈 对 他说: “这是
xiē míhuòbùjiě, Wáng Dàmā duì tā shuō: “Zhè shì
some perplexity, Wang Aunt to him said, “This is

“对, 对。”
“Dui, dui.”
“Right, right.”

粮店 售货员 刘同志。她 看 我 年纪
liángdiàn shòuhuòyuán Liú Tóngzhì. Tā kàn wǒ niánjī
grain store salesperson Liu Comrade. She saw my age

大了, 每月 都把粮食给我送来。
 dà le, měiyuè dōu bǎ liángshí gěi wǒ sònglái.
 great, every month all take grain for me send come.

听说你要回来, 你看, 还替我
 Tīngshuō nǐ yào huílai, nǐ kàn, hái tì wǒ
 Heard tell you would come back, you see, also for me

买了鱼。”
 mǎile yú.”
 bought fish.”

红新 非常 感动地 说: “刘同志,
 Hóngxīn fēicháng gǎndòngde shuō: “Liú Tóngzhì,
 Hongxin extraordinarily moved said, “Liu Comrade,

谢谢你。我一定好好学习你们为
 xièxiè nǐ. Wǒ yídìng hǎohǎo xuéxí nǐmen wèi
 thank you. I surely well learn your for

人民服务的好思想。”
 rénmín fúwù de hǎo sīxiǎng.”
 people serve good ideology.”

刘同志说: “我做得还差得
 Liú Tóngzhì shuō: “Wǒ zuò de hái chà de
 Liu Comrade said, “(What) I do still lacks

多, 我还要向解放军学习呢!”
 duō, wǒ hái yào xiàng Jiěfàngjūn xuéxí ne!”
 much, I still must from Liberation Army learn!”

Translation

This year at Spring Festival, People's Liberation Army fighter Wang Hung-hsin returned to Peking to visit his family. When he was almost home he saw a woman ahead of him with a sack of flour on her shoulder and carrying two fish, which made it very hard to walk. He caught up with her and said, "I'll help you carry a bit, Comrade." As he spoke he shouldered the sack of flour.

With a grateful look the woman asked, "Where are you going, Comrade?"

"I live at No. 28 in this lane."

"Is that Aunt Wang's home?"

"Right."

"Oh," the woman said, "we two are going..." Then she broke into a smile.

When they got to No. 28, she said, "Go in, please."

"No," he replied, "I'll take you home first."

"We are all one family, Comrade," she said with a smile. "Aunt Wang," she shouted, "Hung-hsin's back!"

Aunt Wang rushed out to welcome him, smiling so much she couldn't keep her mouth closed.

Seeing her son somewhat perplexed, Aunt Wang said, "This is Comrade Liu, a saleswoman at the grain store. Knowing that I am old, she delivers my grain every month. Look, when she heard you were coming back, she also bought fish for me."

Extraordinarily moved, Hung-hsin said, "Thank you, Comrade Liu. I will certainly try to learn your good ideology of serving the people."

"What I do is still far from enough," she replied. "I must still learn from the PLA."

Notes

1. *Complex complement of degree.* In Lesson 7 we introduced the simple complement of degree. In this lesson we introduce the complex complement of degree. For example, in *Wáng Dàmā xiào de zuǐ dōu hé bù shàng le* 王大妈笑得嘴都合不上了 (Aunt Wang smiled so much her mouth couldn't even close), 嘴都合不上了 is a subject-

predicate construction serving as the complement of degree of the verb 笑. Again, in *Wǒ zuò de hái chà de duō* 我做得还差得多 (What I do still lacks much), 差得多 is a verb-complement construction (多 is the complement of degree of 差) serving as the complement of degree of the verb 做.

2. ... de shíhòu ... 的时候 ("when" or "at the time of"). Generally used after a subject-predicate construction, it converts the whole clause into an adverb, as in *Zuótiān wǎnshàng wǒ huí dào jiālǐ de shíhòu, wǒ dìdì hái zài kàn shū ne* 昨天晚上我回到家的时候, 我弟弟还在看书呢 (When I got home last night, my brother was still reading a book), where 昨天晚上我回到家的时候 is an adverbial clause modifying the verb 做.

When the subject preceding 的时候 is the same as the subject of the sentence, the former is omitted, as in *Kuài yào dào jiā de shíhòu, tā kànjiàn qiánmiàn yǒu yí wèi nǚ tóngzhì kángzhe yí dài miàn* 快要到家的时候, 他看见前面有一位女同志扛着一袋面 (when he was almost home, he saw ahead of him a woman comrade carrying a sack of flour on her shoulder).

3. *The adverb 就.* The adverb 就 is important and often used. We have met it often in previous texts. Here is a summary of its uses.

(1) To indicate that something happens fast, as in *Cānguānwán shuǐkù, wǒmen jiù dào le Xìngfúgōu* 参观完水库, 我们就到了幸福沟 (After visiting a reservoir, we went right to Happiness Valley. — Lesson 11).

(2) To indicate something is to happen soon, as in *Wǒ hòutiān jiù yào qù le* 我后天就要去了 (I will go the day after tomorrow. — Lesson 15).

(3) To indicate relationship between two ideas, as "so" or "therefore" are used. *Kuài yào dào jiā de shíhòu, tā kànjiàn qiánmiàn yǒu yí wèi nǚ tóngzhì kángzhe yí dài miàn, tǐzhè liǎng tiáo yú, zǒu lù hěn bù fāngbiàn. Tā jiù gǎnshàngqu shuō: ...* 快要到家的时候, 他看见前面有一位女同志扛着一袋面, 提着两条鱼, 走路很不方便。他就赶上来说: ... (When he was almost home, he saw a woman comrade ahead of him with a sack of flour on her shoulder and carrying two fish, which made it very hard to walk. So he caught up with her and said, ...).

(4) To emphasize "this in particular" and not something else, or "thus" and not "otherwise", as in *Wǒ jiù zhùzài zhètiáo hùtòng 28shíhào* 我就住在这条胡同二十八号 (I live at No. 28 in this lane).

4. *Liǎ 俩.* 俩 means 两个 and is different from 两. (For an explanation of the use of 两, see Lesson 12.) Since the measure word 个 is already contained in 俩, no measure word can be placed between it and a noun. We say *liǎ rén* 俩人 (two people) and *liǎ péngyou* 俩朋友 (two friends), but not 俩个人 or 俩个朋友. 俩 may be used after plural personal pronouns: *wǒmen liǎ* 我们俩 (we two); *nimen liǎ* 你们俩 (you two); *tāmen liǎ* 他们俩 (those two).

Exercises

I. Answer the following questions on the text:

1. 王红新快要到家的时候, 看见了什么? 他是怎样做的?
2. “哟, 我们俩去的……” 女同志没有说完的话是什么? 你能给补出来吗?
3. 红新为什么有些迷惑不解?
4. 红新为什么非常感动?

II. Make two sentences with each of the following:

1. ... 的时候
2. 一边..., 一边...

III. Read the following passage:

八月的一个晚上, 红州餐厅来了一些顾客, 服务员小刘热情地接待了他们。

正在他们高兴地聚餐 (jùcān dine together) 的时候, 小刘发现一位顾客吃得比较少 (shǎo little), 而且站起来把窗户 (chuānghu window) 关 (guān close) 上了。小刘想: 天气这么热, 他为什么关窗户? 于是, 走过去问: “您不舒服吗?” “是的, 我有点头痛。”小刘赶忙去找厨师 (chúshī cook) 商量 (shāngliang confer), 给他另外作了一碗鸡蛋面条 (miàntiāor noodles) 汤。这位顾客看了很高兴。其他的人也很感动。

(Translation on p. 42.)



Yang Pa Chan hot spring on the Chinghai-Tibet highway.

HOT SPRINGS

CHEN KANG

CHINA has more hot springs than most countries — over 1,900. Many of these are of low and medium temperature, but quite a few are over 60° C. and some are over 100° C. They serve in daily life, as a source of energy and raw materials, and for medical treatment. China has pure, sulfated, carbonated, saline, alkaline and radioactive springs.

Distribution

Though there are hot springs in practically every part of the country, they are most numerous in the provinces of Yunnan, Kwangtung, Fukien and Taiwan. These account for almost half the total. The remainder are mainly concentrated in the Changpai Mountain region and the Liaotung Peninsula in the northeast, at the foot of the Taihang and Luliang mountains in north China, in the Wei River region of Shensi, and in the southern part of the Chinghai-Tibet plateau.

Yunnan province has the most hot springs — over 400. Tengchung in the west is the best-known area. About a million years ago there was strong volcanic activity here. The volcanos are now extinct, but high-temperature steam and water still shoot from craters and cracks in the earth's crust. Tengchung's 50 hot springs have a very high temperature and sulfur content. Nine range between 90-105° C. and the rest are over 50° C. Some spurt steam from time to time. Hot Water Pool at 105° C. shoots a col-

umn dozens of meters into the air and the steam hangs in clouds for a long time. The springs are often in groups. One kilometer-long gulley with numerous steam and water geysers along its length looks like a cauldron with its boiling water and clouds of steam. The sound of bubbling water, geysers and running water never stops and a strong odor of brimstone can be smelled from a long way off. Natural sulfur and sulfates precipitate around the mouths of many springs. Brimstone Pool at 102° C. has a very high sulfur content. The peasants extract 30 tons of it every year, using it for local match production.

Kwangtung, Fukien and Taiwan provinces in the southeast have many hot springs. The temperature of most of these is over 40° C. Many in Kwangtung and Taiwan are over 100° C. Foochow, the capital of Fukien, has many hot springs. In some places, digging into the alluvial land produces hot water. Drilling 40 to 70 meters deep brings up quite hot water. The many bath houses located outside the city's Hot Water Gate use water from hot springs.

Tsunghua near Kwangchow (Canton) is one of the better-known hot springs in Kwangtung. The clear, colorless, odorless, tasteless water ranges from 30° C. to over 60° C. and is suitable for bathing and treatment of illnesses. The scenic streams and waterfalls among the green hills and valleys

attract tourists from all over China.

The hottest spring in China has a temperature of 140° C. and is at Pingtung in southern Taiwan. In the north of the province, the Tatun volcanic area is known for its hot springs, among which Tsao-shan and Peitou are beautiful scenic spots. There are also many other hot springs in central and southern Taiwan.

The Liaotung Peninsula and the Changpai Mountain area of the northeast have hot springs because of a well-developed earth fault and molten rock activity. Many of the springs in the Changpai Mountains are distributed along the right bank of a river flowing down from the mountains, 32 of them ranging from 55° C. to 76° C. in an area of about half a square kilometer. The bubbling springs covered with white mist are a fine sight.

Halun Rashan ("hot spring" in Mongolian) on the west side of the Greater Khingan Mountains in western Kirin province is a well-known area. There are 48 springs clustered here, some only a few meters apart, yet all with different temperatures. Local Mongolian herdsmen have used the waters of these springs to cure illnesses for over a century.

The Chinghai-Tibet plateau, the "roof of the world", has many hot springs in mountains 4,000-5,000 meters above sea level, perhaps the highest such springs in the world.

Some of them are over 80° C., which is just about the boiling point at these altitudes. The average temperature of the Paikon Lake hot springs is over 85° C. The Tanglha Lake hot spring and the Yang Pa Chan hot spring on the Chinghai-Tibet highway are over 100° C. Known as "Boiling Water Spring", the latter has a geyser three meters high.

There are hot springs in Lhasa, the capital of Tibet, and along the northern slopes of the Himalayas. In this cold region, the mountains covered with a white blanket of snow and ice while clear springs steam at their foot are in striking contrast. Stranger still, at many points in the middle reaches of the Yalutsangpo River there are high-temperature springs in the river bed which shoot off every few hours, scalding fish so that some stretches are known as Dead Fish River.

There are also many hot springs in Hunan, Hupeh, Kiangsi, Anhwei, Kiangsu, Chekiang, Kwangsi, Kweichow, Inner Mongolia, Ning-sia, the eastern part of the Tsaidam Basin in Chinghai and at the foot of the Tjenshan Mountains in Sinkiang. Mountain scenery makes the Hsingtzu hot spring on Lushan in Kiangsi and the Huangshan hot

springs in Anhwei famous tourist attractions.

Utilization

The Chinese people have used hot springs for many centuries. Over 2,000 years ago large quantities of salts were extracted from the highly mineralized hot spring waters at Tzekung in Szechuan. Hot springs were used for treating illnesses 1,300 years ago. Long serving daily life and work, since liberation in 1949 these resources have been put to even greater use.

Agriculture. People in a dozen provinces and municipalities use water from hot springs to raise rice seedlings, irrigate fields and grow fodder. In Yingcheng in Hupeh this advances the season for raising early rice seedlings by 20 days. Fengshun in Kwangtung uses hot springs to regulate the temperature of irrigation water. This solves the problem of early rice seedlings rotting in the ground in cold weather. In some parts of Hupeh and Kiangsi, hot springs are used to raise water lettuce for pig food even in the coldest part of the winter. Shantung peasants use the water from hot springs in tanning, to cook animal feed, and to soak hemp and briar.

Industry. In some areas of China hot spring water for spinning, weaving, dyeing, paper-making, tanning, prefabricating concrete and meat packing brings great savings on fuel. Some places extract sulfur, sodium sulfate, iodine, lithium or boron from the springs. China has recently started using them as a source of energy to generate electricity. It saves fuel and does not pollute the atmosphere. China's first experimental geothermal power plant was built in Fengshun, Kwangtung, in 1970. Other regions are planning such plants.

Daily life. Residents in hot spring areas use the water the year round for bathing, laundry, cleaning poultry and washing utensils. Hospital wards and factory dormitories in Shantung, Hupeh and Liaoning are heated with the water from hot springs. The high-temperature springs on the Chinghai-Tibet highway provide hot

water for local people and drivers passing through. Thin strips of meat hung in the boiling water cook quickly. Local road workers sometimes pitch their tents there.

Therapy. People who have always lived near hot springs rarely suffer from rheumatic arthritis or skin diseases. China has over 50 sanatoriums in well-known hot spring areas. Some also use hot spring mud containing certain chemical elements for treatment. Hot spring water, combined with physical therapy, is fairly effective in treating a number of chronic ailments.

Sightseeing. Some of China's hot spring areas have been tourist spots for centuries, but were always in the hands of feudal emperors and princes or reactionary officials whose luxurious palaces and villas turned them into places of dissipation. These hot springs only really became the property of the people after China was liberated. This was the case with Huachingchih — historically the most famous hot spring in China.

Lying at the foot of the green Lishan Mountains near the ancient city of Sian, Huachingchih's beautiful surroundings first attracted the attention of emperors and princes at the time of the Chin and Han dynasties over 2,000 years ago. A thousand years later, the Tang emperors built their splendid Huaching Palace there, a place for excursions and debaucheries with their concubines. Though the dynasties changed, the situation did not. Huachingchih was only opened to the public after the People's Republic was established. Relics left by the past have been restored and preserved, and well-equipped sanatoriums, bath houses, swimming pools, hotels and restaurants built to serve people from all over the country.

A therapy room in the sanatorium at the Hsiaotangshan hot springs near Peking.



Inside back cover:

Upper left: Hot spring in the forests of the Changpai Mountains.

Upper right: Sanatorium at the hot springs in Tsunghua, Kwangtung province.

Lower left: Huachingchih in Shensi.

Lower right: The smoking crater on Peitou Mountain in Taiwan province is the source of the hot springs there.



