

The China Business Review

November-December 1979



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Front Cover: Bell Helicopter's Model 212 in flight over PRC. See story page 20.

China Calendar

WASHINGTON, DC, November 15–December 28

An exhibition of approximately 80 paintings by children of the People's Republic of China will be displayed at the American Institute of Architects. Contact (202) 785-7300.

WASHINGTON, DC, January 8

The Freer Gallery's Oriental Art Lecture Series will feature a discussion of "Shang Bronzes from the Chang Jiang River Valley" by Robert W. Bagley of Harvard University. Contact (202) 628-4422.

SAN FRANCISCO, CALIFORNIA, January 10–11

The Institute for Asian/Pacific Studies at the University of San Francisco will sponsor a conference on "US-China Trade: Prospects for the 1980s." Norman Getsinger, director of Exporter Services at the National Council, will participate in a panel discussion concerning "Prospects for Industrial Development and Trade." Contact Chan Young Bang, Ph.D., (415) 666-6336.

HUNT VALLEY, MARYLAND, January 11

National Council Vice President Stanley Young will discuss the prospects for trade with China at the mid-year meeting of the International Commercial Law Section of the Maryland State Bar Association. Contact Bruce E. Aitken of Busby Rehm and Leonard, P.C., (202) 857-0700.

NEW YORK, NEW YORK, February 14

National Council President Christopher H. Phillips will participate in a one-day conference sponsored by the Conference Board on "China—A New Open Door? The Realities for US Business." Contact James R. Rosche, Jr., (212) 759-0900.

CHICAGO, ILLINOIS, February 25–26

A conference sponsored by the American Management Association/International on "Barter-Countertrade: A New Form of Financing." Contact Leo G.B. Welt, (212) 586-8100.

HYATT CONVENTION CENTER, SINGAPORE, February 29

Offshore South East Asia will sponsor a one-day seminar on "The People's Republic of China—Petroleum Prospects for the 80s." Write Offshore South East Asia, 410 Cathay Building, Mount Sophia, Singapore 0922.

NEW YORK, NEW YORK, April 10–11

National Council President Christopher H. Phillips will speak at a conference sponsored by the Graduate School of Business and the School of International Affairs, Columbia University, on "Business with China: An International Reassessment." Contact Hoke S. Simpson, (212) 280-3405. 完

This piece of mini-legislation would allow the Overseas Private Investment Corporation to include China in its program.

96TH CONGRESS
1ST SESSION

H. R. 5252

To authorize operations by the Overseas Private Investment Corporation (OPIC) in the People's Republic of China.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 12, 1979

Mr. BINGHAM introduced the following bill; which was referred to the Committee on Foreign Affairs

A BILL

To authorize operations by the Overseas Private Investment Corporation (OPIC) in the People's Republic of China.

- 1 *Be it enacted by the Senate and House of Representa-*
- 2 *tives of the United States of America in Congress assembled,*
- 3 That section 239 of the Foreign Assistance Act of 1961, as
- 4 amended, is further amended by striking out "or" before
- 5 "Romania" and inserting in lieu thereof a comma, and by
- 6 inserting "or the People's Republic of China" following
- 7 "Romania".

○

CHINA WIRE

PLANS, LEGISLATION, REGULATIONS, REORGANIZATION—ALL BEING READIED FOR 1980 THROUGH 1982.

December 1979 is prologue to the 1980s in Beijing. China's top leaders in the Central Committee of the Communist party, and State Council, have been deliberating on next year's budget, foreign exchange allocations, technology import priorities. New laws are on the agenda, as well as major policy shakeups, including the extension of China's current 3-year plan.

Municipalities and provinces, as well as foreign trade corporations are setting up to reorganize early in the New Year. What will happen; what will the 1980s bring?

Some New Year's Eve predictions:

—Readjustment will last longer, 1980 through 1982, say reports from Beijing.

—Greater international participation. If the 1970s saw China joining the United Nations and other international organizations, the 1980s will see the PRC actively participating in world agencies—including the IMF and the World Bank, for its own and other nations' benefit.

—Decentralization. More power to the PRC's provinces and municipalities in terms of budget control, foreign exchange, and revenue sharing with Beijing. Many new provincial level organizations: local foreign trade bureaus in Beijing and Shanghai were reorganized in late 1979 as "Import-Export Corporations," with greater city control and decision-making autonomy over foreign trade.

—Increased coordination. Expect more coordination between ministries and between local authorities, with more staff and authority to the State Planning Commission (SPC), which makes national plans, and the State Economic Commission (SEC), which implements plans.

—Infrastructure first. Nothing will happen to industrial development unless infrastructure is established to underpin that growth: telecommunications, rail, container networks, road, and electricity grids, all overloaded and underdeveloped, must be dramatically improved if China is to carry out a sustained modernization program successfully.

—Expanded foreign trade, but . . . Don't look for miracles. Financing will not be the easy way out to expand exports, nor will MFN. China must take more of the responsibility for promoting and marketing its products, put less burden on foreign importers. Key to successful foreign sales in the 1980s will be consolidation and coordination of export production, plus development of a large and competent group of export management personnel.

—Technology import priorities: Energy, chemical industry, mining and metallurgy, construction materials, light and textile industries, and transportation will be China's priorities through 1982. (See page 48.)

—Planning and technology developments. Increasing the personnel in China's planning commissions (the SPC has a staff of only 500, the SEC 300), drastically expanding middle-management

expertise, boosting technical manpower, and putting computers to work are priorities.

MEANWHILE, ANY MOMENT NOW . . .

Businessmen waiting for action can expect Joint venture implementation regulations incorporating such features as a 30-40 percent tax rate, and duration of 10 years for tourism, up to 15 years for light industry, and about 25 years for heavy industry. Under the terms China is asking, wage scales, plus housing and other subsidies, would be two-thirds of Hong Kong's labor costs.

Cooperation trade. No law or regulations are in sight for the near term for this kind of trade, but a draft law is to be prepared soon. Meanwhile, the 10 members of China's Foreign Investment Control Commission double for those in the Export-Import Commission.

Licensing. TECHIMPORT may soon agree to royalties based on output.

Patent and Copyright Law. The PRC's patent law and concomitant system are being finalized, after which China will consider acceding to the Paris Convention and the International Copyright Convention. A copyright law is soon to be drafted in Beijing. Over 2000 US trademarks have been registered in China, or applications made, during the past year. China has recently decided to participate in the World Intellectual Property Organization (WIPO).

And lawyers. Hundreds of lawyers and "legal experts," are being trained both to meet the demands of China big six reorganization laws, effective January 1, and to upgrade business legal expertise. The CCPIT has an expanded legal department, with a new section for legal counseling that will 1) act as attorneys for Chinese and foreign parties in trade legal matters in actions either in China or abroad; 2) act as attorneys for Chinese or foreign parties in assisting them to settle international economic, trade, and maritime disputes; and 3) give legal advice on economic, trade, and maritime matters in China and other countries.

IN CHINA, WAGES AND PRICES GO UP

In a changing economic era, Beijing has lifted price controls on 10,000 items, increased wages of 40 percent of the working force, established hundreds of factory management experiments, and exiled Democracy Wall to a remote Beijing park. (See page 54.) Other developments of note:

—Municipalities can now handle foreign technology imports up to ¥3 million without permission from central authorities.

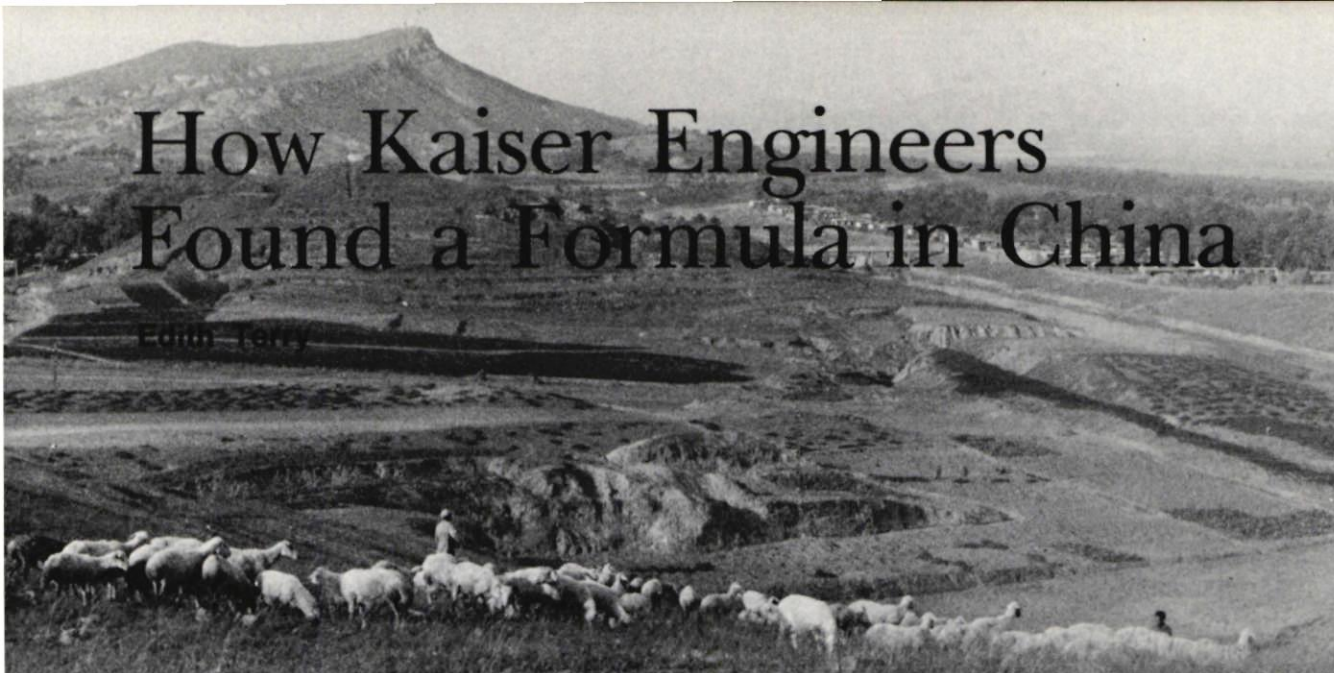
—Universities have their own foreign exchange allocations: Zhongshan U. in Guangzhou, for example, has a ¥1 million domestic purchase budget, and US \$100,000 for foreign goods.

—The State Council is requiring enterprises to calculate inventories, with an eye to establishing norms.

—Higher prices for compulsory sales to the state of farm products: 20 percent for grain, 15 for cotton, 26 for pigs, etc. (October 24).

HAPPY NEW YEAR!

—NL 完



How Kaiser Engineers Found a Formula in China

Scope of Project

I. Nanfen: 35 km. SE of Benxi, Liaoning Province

The site: 30-year-old open-pit iron ore mine; rated capacity of 7.5 million tons/year (1978); 1977 output: 5.7 million tons.

The job: Phase I (conceptual design and preliminary engineering) services to upgrade facilities, increasing capacity to 25 million tons/year. Life of mine projected at 25 years. Study to include mine, maintenance shop, utilities, and other mine auxiliaries. Specific tasks: evaluation of ore reserves; preparation of mining plan; selection of equipment.

Problem: How to phase in new schemes and larger equipment (e.g., 11.5 and 13.6 cu.m. shovels, 154-metric ton trucks, and 1,500 mm. × 2,600 mm. gyratory crushers) without hindering current operation.

II. Sijiaying: 300 km. E of Beijing, Hebei Province

The site: "Riceroots" site; planned to be China's first new open-pit iron mine to take advantage of large-scale economies and the most recent ore extraction and processing techniques.

The job: Phase I engineering for mine, concentrator, pellet plant, and auxiliaries, including utilities, tailings disposal, maintenance and warehouse facilities. Planned initial output of 10 million metric tons/year of self-fluxing pellets.

Problems: Adjacent martite and magnetite strata produce uneven feedstock supply; unusually large overburden (the stripping ratio is three to one); local disposal of tailings out because of surrounding farmland.

III. The Unstated Problem (Sites I & II): How to provide the skills to maintain, operate, and creatively adapt the mines to new needs, if necessary; how to divide the work effectively with China's engineering corps.

In September-October 1978, CBR described how California's Kaiser Engineers obtained the first US mine engineering service contract with the PRC. In this article, Edith Terry follows up on the fulfillment of Kaiser's contract—and on the company's special formula for partnership with the Chinese client, the Ministry of Metallurgical Industry.

Kaiser Engineers (KE) shares with Pullman Kellogg the distinction of being the first among US companies to broach an important new market for engineering services in China. The services provided are poles apart—Kellogg started out with a known end-product, similar to Kellogg factories elsewhere, while a major part of KE's job was to define the end-product. Yet, in carrying out the job, Kaiser Engineers, like Kellogg, found that China's shortage of engineering technology shaped the effort in special ways.

Presented with two iron ore mines to develop, Nanfen and Sijiaying, KE had to come up with the formula to turn them into world-scale facilities. Early on, KE found that to do this it would have to practice what Kellogg called its course of "growing together" with the client. The contract for conceptual and preliminary engineering services carried with it the obligation to admit a number of Chinese engineers to review progress on the project at KE's Oakland, California, headquarters.

This requirement is not unusual in China's import contracts. Pullman Kellogg entertained at least 100 Chinese observers and trainees in the US between 1973 and 1975. Several factors make KE's experience new, and different, from Kellogg's, however.

First, the kind of company KE is. Unlike Kellogg, KE provides engineering and consulting services tailored to clients' needs in many industries, from mining and processing raw materials and the design of fossil-

and uranium-fueled power plants to designing solar-heated nursing homes and NASA's Mission Control Center in Houston. As a general engineering firm, the demand on KE for know-how transfer was exacerbated. In Chinese eyes, the company offered the key not just to Nanfen and Sijiaying but a host of other, unrelated projects. KE's one-year-old history in the China market is in many ways an account of how China tried to turn that key.

Secondly, China's need to conserve foreign exchange and oft-stated policy to assume manpower-based tasks as quickly as the skills become available. The Chinese engineer observers at KE's headquarters had a double function—to learn, and to scope out their supplier. For China, the initial task in undertaking the Nanfen and Sijiaying projects was to determine the exact degree of the knowledge gap, and then close it. These engineers—spanning the skill range from mine operator to senior officials of the PRC Ministry of Metallurgical Industries (the Chinese equivalent of corporate brass)—would report back on how much of the work in subsequent phases could be shouldered by the Chinese alone and how much would have to be contracted out. Meanwhile, they added knowledge to their repertory as they watched and listened.

The relationship, though falling short of participatory decision-making, was designed to lead naturally into a division of the engineering labor between China and the US as it moved into subsequent phases.

Having the Chinese close at hand could work for KE, too. Knowing that the project would be bifurcated later on, KE studied its "observers" to see how best to maximize the relative contributions of vendor and a client whose capabilities were little known. Working side by side, KE began to learn from the Chinese much as they were learning from KE, absorbing invaluable information on Chinese engineering practices and standards as well as resource and materials input data specific to the projects.

Lastly, the importance of the two projects within China's national plan, the newness of the technologies involved, and lack of experience in dealing with foreigners as consultants and service suppliers (as opposed to equipment vendors), meant that every meeting with the Chinese entailed an educational effort on the part of the American firm. "Review meetings that take two or three days in the US may take at least three weeks in China. They are attended by hundreds of knowledgeable engineers who want a full explanation," KE's project director, Les Trew, told the *London Financial Times* (September 17, 1979). In China, audiences ranged upwards of 150, mostly from the Changsha Mining Design Institute and the Anshan Institute of Mining Research, the two principal Chinese design institutes assigned to the projects. These intensive reviews of Kaiser's state-of-the-art began with the initial negotiations.

The Contract: Negotiations, Terms, and Follow-up

The August 25, 1978, order for conceptual and basic engineering services for two mines in northeast China surprised Kaiser almost as much as its competitors. Although media-inspired rumors that China was discussing modernization of its Anshan and Shoudu Steelworks with Nippon Steel had hit the industry earlier in the year, stimulating Bethlehem International Engineering, McKee Corp., Morrison-Knudsen, US Steel, and others to test the market, few geared their approach to engineering consultancy alone. KE itself had experienced considerable confusion in dealing with signs of interest in what was to become its client, TECHIMPORT, acting as contracting agent for China's Ministry of Metallurgical Industry. In the six months preceding the signing of the contract, the company was on the receiving end of a series of cryptic requests from TECHIMPORT. The first was a letter asking the company to send a team to discuss "iron ore."

"I replied to that letter," wrote the late R. W. Fisher, who played a key part in the negotiations, "sent them some brochures, mentioned direct reduction, and described the kinds of services we had available. That was in February 1978. Our next contact was about two months later, when we got a wire asking when we were going to send a delegation. We asked what were we going to talk about? Another month passed, and we got a wire saying that we were going to talk about iron ore, beneficiation, and mining."¹

Through its membership in the National Council, and through its long experience in designing and constructing mining and processing facilities around the world, KE was conditioned to expect an RFP on turnkey plant supply. The team it sent in July 1978 included a mining expert; a specialist in direct reduction ironmaking; Les Trew, an iron ore beneficiation specialist who later became project director; and Fisher, then KE's vice president for Australasia and the Orient. They were ready to present reviews of the company and their areas of expertise. But they hardly expected the client to be ready for their ideas.

The negotiations began slowly, with a week of routine technical seminars in Beijing. The Chinese let the US team wind up its prepared talks and then began the real business of the visit. Fisher recounted, "We were told to expect to be there for two weeks. At the end of a week, they suggested it would be nice if we went to look at some mines. We made a trip to two mines and spent several days at each, again giving seminars to operating people. We discussed their operating problems with no reference to an ongoing operation or relationship. We advised them on what we thought of their operations, on where we thought they could improve."²

This whirlwind consulting tour was followed by a request from the Chinese to put their ideas in writ-

ing. Submitting the proposals drawn up over the course of a weekend, the KE team was sent off to look at four more sites, again requested to put their findings into memoranda, then, while the Chinese were reviewing these, given site data on 12 more mines to "review." During this exhausting four weeks while the Chinese tested out their conceptual capabilities, it began to dawn on the Kaiser group what the Chinese were after. Two weeks after the last of the design exercises, they had their contract.

Settled upon was a three-phase program, with only the first phase committed to KE. Subsequent phases of detailed engineering, procurement, and construction supervision were promised to KE verbally. The form of the contract, in which the letting of each phase hinged on results of the earlier phase or phases, is common in the US industry but had not been tried previously in China. KE understood the verbal assurances they had from the Chinese to mean that the next phase would be negotiated at the 80 percent stage in the first part of the program, for conceptual and preliminary engineering.

Although cost-plus, another new notion for the Chinese, was debated during the negotiations, KE decided to abandon the idea for the time being in favor of a conventional progress payment formula. Payment was to be made on a lump-sum basis in two installments, the first after KE completed the conceptual engineering "milestone" and the second after preliminary engineering was completed to the satisfaction of the Chinese. Progress rather than performance or a calendar date was used as the basis for calling "milestone" meetings and settling payment.

Trew characterizes the preliminary engineering contract as "straightforward, the same type of thing we'd do for a client." The only unusual thing about it from the company's viewpoint was the size of the observation contingent the Chinese planned to send. Though KE tried to limit the number to five, in the end numbers were left out of the wording of the contract. The three groups that did come averaged 10 each—one of the 29 stayed for nine months, the rest for an average of two-and-a-half months. According to the contract, the observers had no authority to make decisions, nor to acquire technology, but it was understood that there would be a formal division of responsibilities in subsequent phases of the project.

Lacunae in the contract were those to be expected in a Chinese import contract: an arbitration clause stressing conciliation but admitting a third-country ruling, in Sweden; a force majeure clause excluding "acts of God" (too vague an idea for the Communist party); and the excision of the pages and pages of penalty clauses that make up the bulk of any US contract.

The first phase culminated in a report, which KE submitted in September 1979. To reach that point, over 50 KE engineers labored for a year, mostly in headquarters and mining operations in the US. In

China, KE conducted studies on pit slope stability, with the assistance of Seegmiller & Associates, and assigned one metallurgist to supervise operations for a Chinese-built and operated pilot plant for four months. Some metallurgical testing was done by the Colorado School of Mines; the rest was provided by the Chinese labs and pilot plant. Starting in the first week of October 1978, various KE personnel were in and out of China "70 percent of the time," according to Trew.

Though the experience of the first twelve months was relatively untroubled, the KE team that flew into China in early November 1979 to review the report with the client and initiate second-phase discussions expected a slower ride than the first time.

Between 1978 and 1979, China's steel plan had been cut back, meaning less of a budget for all projects in the iron and steel sector. This meant at the least that Kaiser could not expect the project to move ahead quickly. Beyond this, it was apparent even in the 1978 talks that the form of the second-phase contract would be highly unusual.

The division of labor between China and the US, though feasible for at least 30 percent of the design engineering, by KE's estimate, was not normal practice for the company. This was the first area that seemed to present difficulties. Then, though it was accepted that KE would supply project management and perform the majority of work requiring use of computer time, KE's third area of potential contribution—coordination with vendors—was somewhat up in the air.

By October 1979, Kaiser Engineers had already contacted some 300-400 equipment suppliers in the course of working out mining, beneficiation, electrical, and instrumentation needs. Chinese observers had visited many of these potential vendors in the mid-west. They were beginning to be initiated into the technologies available. But there was a strong feeling that the Chinese were paying as much attention to events on Capitol Hill as to spec sheets and performance drills. Legislation to extend US Exim Bank export credits to China, though assured of strong support, was still pending. Without it, China might well turn to cheaper, non-US sources for equipment supply.

The team faced roadblocks, too, in working out specifications for equipment from whatever source. "In China, when a project gets underway, its Ministry supplies it with standard pieces of equipment. They have never had the need to work with manufacturers closely," explains Trew. This is not just a problem of coordinating with vendors. It is also a problem for the engineer in writing up specifications and for the Chinese in costing out a project. The mechanism proposed to date for use in the estimating phase, as described by Trew, is for KE to provide specifications in quantities and units, and the Chinese to fill in cost based on non-shared data.

Observers and Partners

One of the noteworthy intangible achievements of KE's first China contract has been the rapport it has established with officials of the Ministry of Metallurgical Industry, the China Society of Metals, TECH-IMPORT and, most important, engineers of the Changsha Mining Design Institute and the Anshan Institute of Mining Research.

The institutes play a similar role to design engineering companies in the US. Changsha, which takes primary responsibility for the Sijiaying project though based some 1,500 km. away in Hunan Province (south central China), specializes in ferrous projects. It has a total staff of about 1,200, with 700 engineers. The institute accepts assignments both from the Ministry of Metallurgical Industry and from local production units, which can skip the ministry application route for smaller projects. According to Changsha Institute staff members interviewed in KE's in-house journal, *Kaiser Builder*, projects undertaken by the institute usually engage 20 to 30 people per project on field assignment, in stints lasting from three to four months. Teams are blended from the institute's departments (for instance, the structural department, with 30 engineers) according to the needs of the project.

KE found out about the caliber of Changsha engineers firsthand. Three groups including Changsha Institute representatives visited the US—the first, a group of operators whose main purpose was to learn general engineering techniques; a higher-level group to review progress as conceptual engineering drew to a close; and a third group including many of the original Chinese negotiators during the progress of basic engineering. In addition, the frequent meetings in China drew in hundreds from the institute and its backup, the Anshan Institute of Mining Research (though located less than 50 km. from the Nanfen site, playing a supportive role).

"Most people are quite knowledgeable and technically competent," says Trew, though more engineers are required to perform the same tasks in China, he adds. A problem from KE's side of the picture is that their counterparts change roles frequently. The chief engineer they worked with in the beginning, by October 1979 was long gone.

The Mines

The mines themselves, though the subject of KE's contract study, are untouched so far except for the operations of pilot plants.

Here, near the waters of the Bohai Gulf in Eastern Hebei, and in central Liaoning, the iron that seams the hills is not much different from ores in the Mesabi hills of northeastern Minnesota. One reason that KE was picked to do the Nanfen-Sijiaying projects is because of its experience at the \$200 million Tilden open-pit mine in Michigan's Upper Peninsula, which bears Mesabi-type ores. Like the mines of Michigan

and Minnesota, Hebei and Liaoning mines produce a 28 percent, low-grade ore that presents unique problems of beneficiation and extraction. At Sijiaying, iron ore of the Anshan type (dubbed after the large but low-grade deposit in Anshan, Liaoning Province), is sandwiched between mica schist, with three low-content beds running parallel to rich ore beds. Nanfen, one of the first open-pit mines in China to be fully mechanized, is mostly lean ore, with 33–36 percent iron.

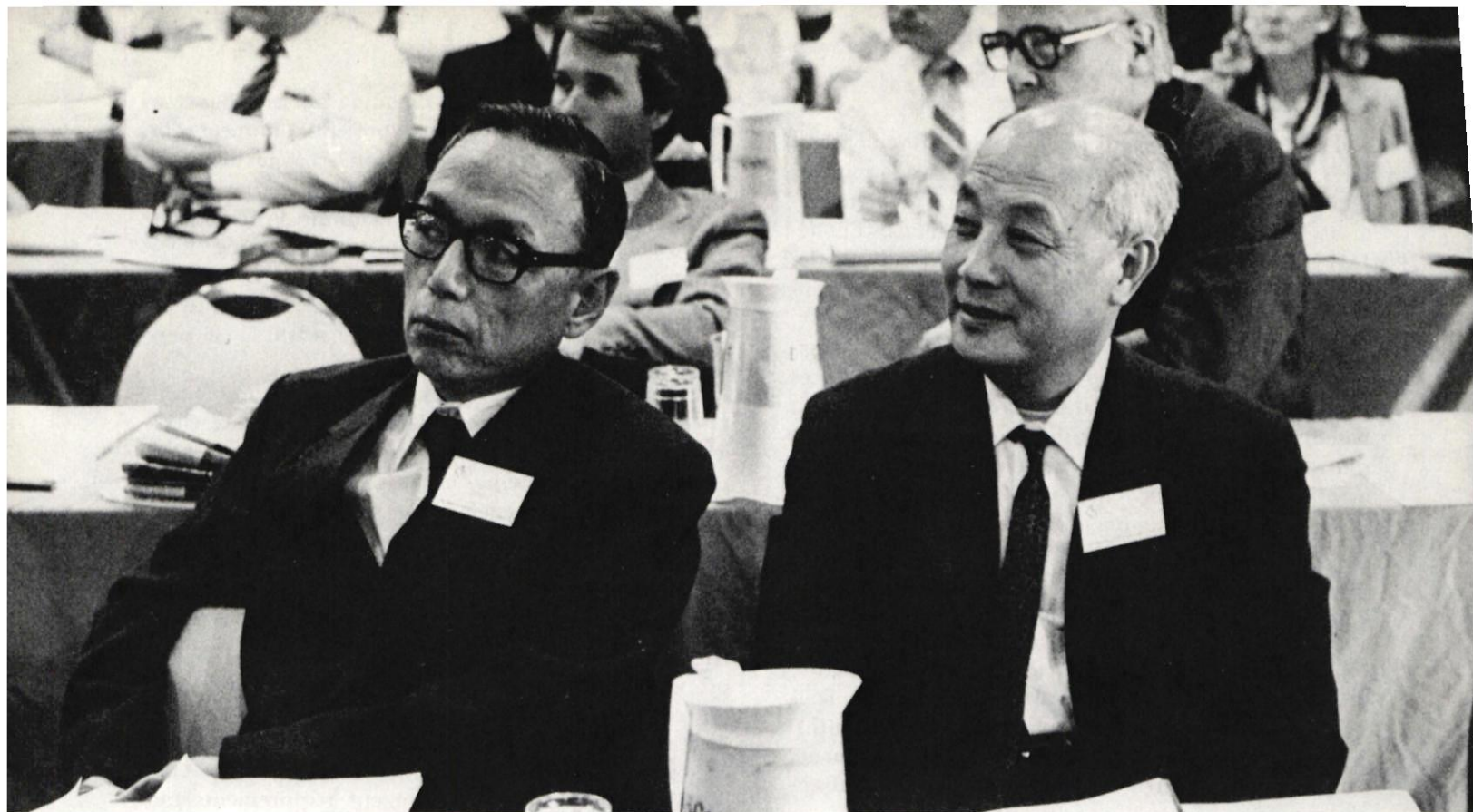
In developing plans to expand Nanfen and build up Sijiaying, KE confronted and met complex challenges in the areas of beneficiation and environmental protection. At Sijiaying, because of the ore structure in the ground, the beneficiation process has to be staggered through three stages of concentration, upgrading the ore from the original 28 percent to 66 percent. The problem of overburden at Sijiaying has no single solution, but KE has laid out the options for its client: rail haulage, truck haulage, crushing in the pit with conveyors, combinations of the above, and the economics of each. It was required that tailings be disposed of in ponds in unarable sand dunes on the coast some 45 to 50 km. away from Sijiaying. Also for Sijiaying, the basic equipment requirements for the plant have been drawn up: 7,500–9,000 kw auto-genous mills; 3,800 to 4,500 kw ball mills; 28.3 cu.m. flotation cells; 1,200 mm. by 3,000 mm. magnetic separators; 130-meter-diameter tailings thickeners; and a pellet plant with two 5 million ton/year lines. Both Sijiaying and Nanfen mines will employ the latest generation of giant mine extraction and transport equipment—11.5 and 13.6 cu.m. shovels, 154-metric ton trucks, and 1,500 by 2,600 mm. gyratory crushers.

The two mines will be among the world's largest when completed. Meanwhile, China must decide how much of the project it can handle by itself. "They still have problems with buying sophisticated pieces of equipment, and in dealing with maintenance and inspection. But I don't think they'll have these problems three or four years from now," says Trew, who has had more contact with the Chinese engineers than anyone else in his year as project director.

What are KE's chances for succession to phase two at Nanfen and Sijiaying? "We believe China will proceed cautiously—as they should—in the development of their natural resources," says Kaiser Engineer's President James F. McCloud. "They are not likely to enter into a massive industrialization program unless they can afford it. They will not stretch their plans beyond their capacity. Obviously, they are assigning priorities to each of these major projects. We will have to wait for their decision." Though KE may have to wait a while, their partnership with China—US to Chinese engineers—seems to have just begun. 究

¹ "A Case Study—Mining Engineering," *How to Reach the China Market*, McGraw-Hill, 1979.

² Fisher, op. cit.



Ren Jianxin (left), Director, Legal Affairs Department, and Tang Houzhi, Chief, Arbitration Section of the CCPIT, at the National Council's sellout conference on selling technology to China, December 5. Mr. Ren delivered a much appreciated presentation on joint ventures, including comments on taxes and patent law.

ON THE AGENDA—JOINT VENTURES

Rong Yiren, President of the China International Trust and Investment Corporation toasting Ed Lavery of Caltex, Vice President of the National Council's banking committee, October 15, 1979.



The Trade Agreement

The Winding Road Toward MFN

Apprehensive importers, probing legislators, angry textile makers, attentive Chinese, and suspicious Soviets all are paying close attention as Congress considers the US-China Trade Agreement. The Council's best guess is that it will be approved in late January or early February.

Many an importer of Chinese goods has been concerned about the congressional passage of the US-China Trade Agreement, which grants most-favored-nation (MFN) status to China, since it was introduced to Congress on October 23. Their concern is not so much whether Congress will approve the agreement, since most observers predict it will pass, but rather when Congress will approve it.

Given Congress's limit of 60 working days within which both houses must vote on the trade agreement, importers have been flipping calendar pages and counting days, trying to second-guess when Congress will take its long weekends and year-end vacation. Many importers have thousands of dollars worth of Chinese merchandise in bonded warehouses, and they are anxious to know when they can stop paying storage fees for it and bring it through customs at the lower duty rates. If the Presidential proclamation implementing MFN for China is worded the same as those for Hungary and Romania, goods entered into customs from bonded warehouses will be taxed at the lower rates.

The time limit for congressional consideration will probably expire in mid-February. Although Congress can vote on the agreement any time before then, it is likely that at least the senators will wait until the last minute, in hopes of an approval for SALT, so that the Soviets will not be unduly antagonized by our granting trade benefits to the Chinese.



President Phillips greets Chinese Minister of Foreign Trade Li Qiang, October 1979.

Meanwhile, in congressional hearing rooms, the debate over the trade agreement has begun. Although most senators and congressmen on the two key subcommittees—the trade subcommittee of the House Ways and Means Committee and the international trade subcommittee of the Senate Finance Committee—supported the agreement, they were not hesitant about querying witnesses closely on several points. Among them:

Emigration Assurances. The Administration rested its case on three points: emigration statistics, public statements by senior Chinese officials, and confidential diplomatic talks in Beijing in July, which the Administration refused to describe or provide written records of.

According to the Administration's testimony, some 71,000 Chinese emigrated to Hong Kong in 1978, more than three times the number in 1977. The trend continued through April 1979 but has slowed since then because of protests of the Hong Kong government.

Senator Henry Jackson, an outspoken supporter of the US-China Trade Agreement, noted two occasions on which senior Chinese officials made public comments on emigration—one by Vice Premier Deng Xiaoping in January 1979 and one by Ambassador Chai Zemin in March 1979.

Vice Premier Deng Xiaoping said to the National Association of Chinese-Americans and Overseas Chinese in the US, January 30, 1979: "Many of you may have relatives living on the mainland of China and wish that they may come over for a family reunion, and others may wish to go back to China to visit their relatives. This is quite natural and understandable. The Chinese government will treat these legitimate wishes favorably and with sympathy and will adopt

effective measures to satisfy these wishes. You may rest assured on this score."

Deputy Secretary of State Warren Christopher also quoted Liao Chengzhi, director of the Office of Overseas Chinese Affairs, who as early as January 1978 said China would simplify the procedures for entering and leaving China.

Top officials from the American embassy and the Chinese Ministry of Foreign Affairs in July held "confidential conversations" in which, according to Christopher's testimony, "the Trade Act's emigration requirements and Chinese emigration policy came to be mutually understood" and from which the Administration concluded that China is liberalizing its emigration rules and will continue to do so. However, the Administration refused to provide any written record of these diplomatic exchanges, asserting that their release would have a "chilling effect" on US-Chinese relations.

Assurances that the Chinese are relaxing their emigration practices are a necessary prerequisite to the passage of the whole trade agreement because of the provisions of the Jackson-Vanik amendment.

Balanced Treatment of China and the Soviet Union. One of the main reasons the question of emigration assurances is so controversial is that Congress's action on the trade accord with China will set a precedent for the US-Soviet Trade Agreement when it is submitted to Congress, which Christopher said he hoped would be soon. The Soviets have refused to provide explicit assurances on their emigration policy. If the China trade agreement manages to get through Congress without explicit assurances on emigration, the chances for later passage of the trade agreement with the Soviet Union are higher.

The Administration advocates enacting trade agreements with both countries, but not linking the timing of the moves too rigidly.

The preference for balanced treatment of China and the Soviet Union was expressed most forcefully by Senator Adlai Stevenson III in his testimony before the Senate Finance Committee. He urged the committee to move slowly on the China trade agreement, and if possible to defer action until the passage of the Strategic Arms Limitation Treaty (SALT). He said that Senate defeat of SALT and passage of a trade agreement with the Soviet Union's adversary, China, would severely antagonize the Soviets and possibly cause them to cut off emigration of Jews and further restrict other "human rights," as well as "move(ing) us toward the full fury of a cold war."

Textiles. Several congressmen, among them some from southern states, raised the issue of disruption in the domestic textile industry by Chinese imports. They said they feared that if a bilateral agreement restricting Chinese textile imports into the US were not signed before the trade agreement was passed, the US Administration might decide later to lift the

quotas it unilaterally imposed on several apparel items in May and October or to settle for lower restraint levels in the bilateral agreement than it otherwise might. Once the trade agreement is passed, the textile industry believes it will not have as much leverage to make sure the government protects it. However, textile opposition seemed to melt early as the 243-member House Textile Caucus decided on the second day of hearings not to oppose the China agreement on textile grounds. The change of heart took place after copious assurances of Administration support for their position and after the imposition of unilateral quotas on two more apparel items on October 31.

Market Disruption by Products Imported from Nonmarket Economies. Another issue raised was the possibility of the US market being "flooded" by low-priced goods made in nonmarket countries, such as China, where costs are administered and enterprises do not need to sell at a profit. A representative from General Time brought to the hearings a Chinese-made clock that he said he had purchased in Australia for a price far below what the materials alone would have cost on the international market.

He supported a bill introduced by Congressmen William R. Cotter and Richard T. Schulze on November 1, which would permit antidumping measures against nonmarket countries that charge prices lower than the lowest price charged by any significant free-market producer. The present method used by the Administration to determine "unfair pricing" by nonmarket countries is a complicated formula based on production costs in a free-market country at a similar level of economic development, whether or not that country produces the item in question.

Although this issue is not likely to hold up passage of the China trade agreement, it may well be the next major hurdle in US-China trade, as more congressmen are becoming concerned about "unfair pricing" by nonmarket economies.

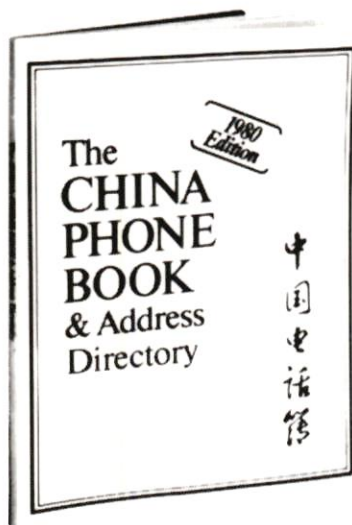
Low Exim Bank Interest Rates. "Do you think that we should extend Exim Bank credit at 7.5 to 8 percent to China when the average factory worker, when he goes out to buy a car, has to pay 18, 19, or 20 percent to get the same dollars?" was a question asked. Congressmen also wanted to know why it was important that the US offer Exim credits to China when China already has access to some \$23 billion worth of credits which it has scarcely drawn on.

Other questions asked in the House hearings:

- Why didn't the Administration try to get some assurances on access to Chinese oil in exchange for MFN?
- Although trade with China is now in the US's favor, how likely is it to switch to a deficit in the future?
- How much tariff income will the US Treasury lose by granting lower duties to China?

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The Way Ahead

1980: Talks, Visits, and Exhibitions



Ren Jianxin and Tang Houzhi from the legal affairs department of the CCPIT express optimism over the prospects for US-China joint ventures to President Phillips, December 4, 1979.

With the US-China Trade Agreement well on its way through Congress, other legislative and governmental plans are underway. A bill making China eligible for OPIC programs should further advance US-China trade, and another bill which would toughen the definition of US market disruption by imports from nonmarket countries could seriously hamper it, if passed. Consulates are opening in both countries, and high-level delegations both to and from China are in the planning stages. The focus of fall 1980 is likely to be on large government-sponsored exhibitions.

October 23: President Carter submitted the trade agreement, providing for most-favored-nation (MFN) tariff treatment and facilitating the availability of Export-Import Bank credits to China, to both houses of Congress for simultaneous consideration.

October 25: The House Foreign Affairs Committee received the Administration's endorsement of a bill

submitted September 12 authorizing operations of the Overseas Private Investment Corp, in the PRC. An identical bill was submitted in the Senate on October 22. Hearings will probably be held in January in the House Committee on Foreign Affairs and the Senate Committee on Foreign Relations, but no final vote is expected until the US-China Trade Agreement is passed.

November 1: Representatives William R. Cotter and Richard T. Schulze introduced a bill to "provide more equitable standards for determining the foreign market value of, and market disruption attributable to, goods manufactured in nonmarket economy countries." This bill would redefine the foreign market value of such goods by comparing it to the price of the lowest-price producer in the free market, rather than using the present complex system.

November 1, 2, 29: The House Ways and Means Committee subcommittee on trade, under Chairman Charles Vanik, held hearings on the US-China Trade Agreement.

November 15: The Senate Finance Committee subcommittee on international trade, under Chairman Abraham Ribicoff, held hearings on the trade agreement.

November 13, 15: The House Science and Technology Committee held hearings on transfer of technology to China (unrelated to any pending legislation).

November 20: Chinese government opened a consulate in Houston. Its address:

Room 1512, Guest Quarters Hotel
2929 South Post Oak Road
Houston, Texas 77056

The consul general in Houston is Wu Xiaoda, formerly counselor to the United Nations. The Chinese are looking for a location for their consulate in San Francisco, where the consul general will be Hu Dingyi, formerly of the Chinese embassy in London. In the meantime, the San Francisco consulate is temporarily quartered in the Saint Francis Hotel.

December 11: The trade subcommittee of the House Ways and Means Committee was scheduled to

hold a mark-up session on the US-China Trade Agreement bill (H. Con. Res. 204). The Senate Finance Committee also planned to hold a mark-up session on its version (S. Con. Res. 47) before recess.

January 6-13, 1980: Secretary of Defense Harold Brown will visit China to discuss "mutual concerns around the world," including China's position on, and role in, international arms control efforts.

Mid-January: Deadline by which congressional committees must refer the US-China Trade Agreement to the floors of the House and the Senate. The committees must do so within 45 working days of the date the agreement was submitted to Congress, October 23. No amendments are allowed.

January 31, 1980: Date to which the US and Chinese governments have postponed the unblocking of Chinese assets in the US. The original date was October 1, 1979, but the Chinese requested a delay because they need more information about the funds. The State Council has empowered the Bank of China to recover the assets, and the Chinese government has asked all owners of blocked assets to register by December 31, 1979. The Bank of China plans to open an office in New York, possibly in 1980.

Mid-February: Expiration of the 60-day time limit within which both houses of Congress must vote on the trade agreement. The accord, and the lower tariffs that go with MFN status, should come into effect within a week after both houses of Congress vote to approve it, but the timing of this is not certain.

Early 1980: Vice Premier Yu Qiuli, head of the State Planning Commission, will visit the US. During his visit he will attend the first meeting of the Joint Economic Committee with China, under the chairmanship of Secretary of the Treasury G. William Miller.

1980: Chinese Premier Hua Guofeng will visit the US sometime during the year, possibly late February or March. President Carter said he would "try to work out a time" during 1980 to visit China.

Fall 1980: The China National Trade Exhibition is scheduled to be held in three US cities in 1980 as follows: September 13-28, San Francisco; October 25-November 9, Chicago; December 6-21, New York City.

November 17-28, 1980: The Department of Commerce will sponsor the first US National Trade Exhibition in Beijing. Some 200 US companies will have 22,000 square meters of space to display agricultural machinery and farm equipment, power generating and distribution equipment, textile machinery and equipment for production of consumer goods, petroleum exploration and extraction equipment, and transportation equipment.

1980: Talks on Four Important Matters

Civil Aviation Agreement: On November 13, 1979, the US government gave notice of its intention to terminate the Nanjing Treaty on civil aviation

signed with the government of the Republic of China in 1946. On November 16, the American Institute on Taiwan completed negotiations on a similar agreement with the authorities on Taiwan for continuation of air service between the US and Taiwan on terms substantially better for both sides than previously. With this barrier out of the way, the State Department hopes to begin negotiations with the Chinese government for a civil aviation agreement soon.

Maritime Agreement: No progress has been made on a US-China government-to-government maritime agreement, largely because of differences on cargo-sharing.

Textiles: There has been much talk of reopening negotiations on a bilateral textile agreement, but no time has been set yet. In late October, the US government unilaterally imposed quotas on two more apparel items, bringing the total to nine categories (seven items).

Consular Treaty: The US government hopes to negotiate and sign its first treaty with the PRC government—a consular treaty—within the next six months. The two governments signed an agreement on consular relations in January, but discussions are underway to put this agreement in treaty form.

—DJ 完

MORE GSP FOR CHINA

Both Japan and Canada decided recently to give China generalized preferential tariff treatment effective January 1, 1980. This type of tariff treatment (known in the US as Generalized System of Preferences) will allow Chinese goods to enter at extra-low or zero tariffs because China is a developing country. The Canadian system excludes certain items, such as textiles, because of their "sensitive" nature.

The Japanese government also reportedly suggested to the Development Aid Committee of the Organization for Economic Cooperation and Development that it consider China a developing country and therefore eligible for preferential treatment.

China's interest in getting preferential treatment grew recently because of a September seminar in Beijing on "Full Utilization of the General Preferential Treatment System," jointly sponsored by the Chinese Foreign Trade Ministry, the UN Conference on Trade and Development, and the UN Development Program. Some Chinese foreign trade personnel attended the seminar. Japan's decision to grant China GSP came three days after the close of the seminar.

Australia and New Zealand already admit Chinese goods under their GSP schemes, and the European Common Market is negotiating with the PRC about granting GSP. The US cannot grant China GSP until the US-China Trade Agreement is approved by Congress and until China joins the International Monetary Fund (IMF) and the General Agreement on Tariffs and Trade (GATT).

—DJ 完

Sichuan Journal

Stephanie Green

*Working hard for petroleum is justified;
Working hard for petroleum is meritorious;
Working hard for petroleum is glorious;
Successful petroleum workers are rewarded.*

—Sign at Weiyuan field, Sichuan
July 1979

The National Council's third petroleum equipment mission to China, which visited Beijing and Sichuan Province in June and July, was the first foreign group ever to tour the Weiyuan Gas Field in central Sichuan. The center of China's natural gas production, Sichuan is one of the last oil and gas areas of China to be opened to Western visitors. Prior to this opportunity to tour Sichuan's gas operations, the 23 delegation members spent a week in Beijing giving technical seminars to oil and gas engineers from around China.

Companies in the delegation included Baker Packers; Baker World Trade, Inc.; Caterpillar Tractor Company; Crest Engineering, Inc.; Dresser Industries, Inc.; H. J. Gruy and Associates, Inc.; Gulf Publishing Company; BJ-Hughes, Inc.; Otis Engineering Corporation; and Reed Tool Company International, Ltd.

This article is the third in a series which includes "Shengli Journal (CBR 5:1) and "Taching/Pohai Journal" (CBR 5:6). A note of thanks is extended to J. Ray Pace of Baker World Trade, Inc., for his attention to the technical detail contained in this piece.



Natural Gas in Sichuan

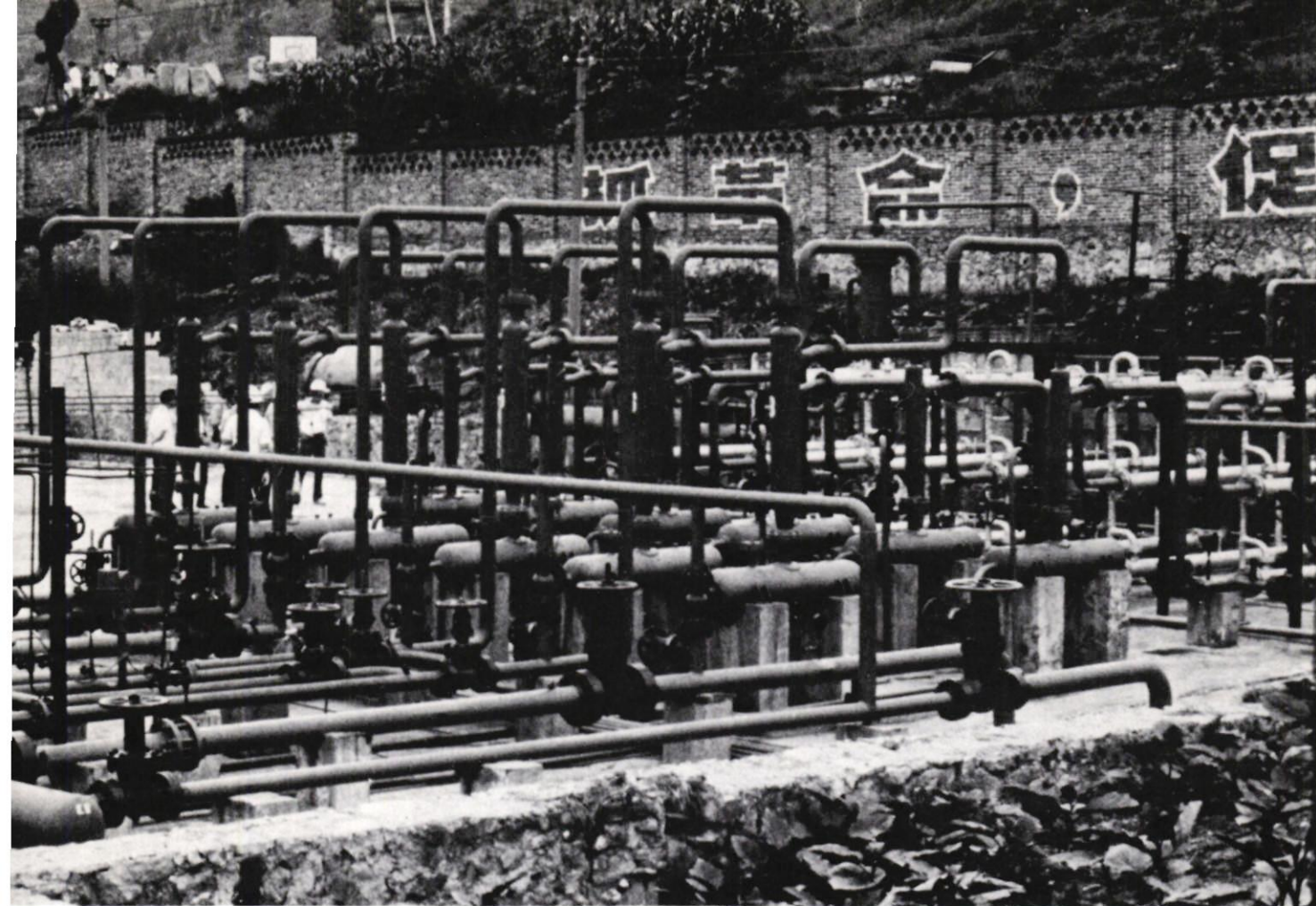
Sichuan Province, famous for its fertile countryside and spicy food, is also the premier producer of natural gas in China, boasting an annual production rate of six billion cubic meters (a figure revealed for the first time to our visiting delegation). Its total reserves may be almost 225 billion cubic meters, based on the data given for one field.

As one writer has commented, the Sichuan Basin is to gas what the Sungliao Basin, location of Daqing Oilfield, is to oil. Along with the Tsaidam Basin in the northwest, it forms the backbone of China's increasingly important gas industry.

About 300 oil- and gas-bearing structures have been discovered in Sichuan, with gas predominant in the south and oil in the center and east.

Not only is Sichuan renowned as a modern source of gas, it is also the site of the oldest drilling operations in the entire country. Over 2,000 years ago, the famous emperor Chin Shi Huang Di, builder of the Great Wall, also supervised another project—smaller, but today with more significance for China—the drilling of a well in Chonglai City near Chengdu. Containing natural gas, it was dubbed a "fire well" by the residents of the area. Soon after that, drilling operations spread to Zigong, in the Ziliujing field, the world's oldest commercial hydrocarbon field, discovered with bamboo strings.

Saltwater drilling became an important industry, and



Weiyuan Gas Field, the largest in Sichuan Province, produces 949 million cubic meters of gas a year.

the area boasts some 2,000-year-old wells still in production. Visible all over the region are old-fashioned wooden derricks, many of which are being used to produce salt water.

By 1132 AD, over 1,100 bamboo wells had been drilled. Gas was used for heating salt brines, fuel, and light, and small amounts of oil and condensate were used for heat and fire bombs. Production suffered during the political upheavals of the early 1900s but since 1949 has swung upward once more.

Under the aegis of the Southwest Branch of the China National Oil and Gas Exploration and Development Corporation (CNOGEDC), the National Council's delegation visited the Weiyuan Gas Field, located 260 km. southeast of Chengdu near the industrial center of Zigong. The largest gas field of Sichuan in area, according to our hosts, Weiyuan produces approximately 949 million cubic meters per year or one-sixth of the total production of the province. It covers a 200 sq. km. area 450 meters above sea level. Its reserves are about 38 billion cubic meters, or enough to last 40 years at the present rate of production.

Some other major fields of Sichuan identified by our hosts are Wulunghou, Shiyougou, Luzhou, Shendengshan, and Zigong. Other large fields, including Huanchiachen, Tengchingkuan, Huangkuanshan, and Yenkaohsi, have been recorded by Western observers. The latter fields each have an estimated ultimate recovery of 30 billion cubic meters.

Organization

Weiyuan field, with a working force of some 2,000 people, reports directly to Zhang Wenbin, the president of the Petroleum Corporation of the PRC. The administration of the field, the group was told, is different from the major onshore oilfields, a fact which was clearly visible to the group as we drove through the countryside.

Daqing and Shengli, for example, are a series of giant communes in which not only the oil industry, but all other energy and support industries, including road construction, health care, agriculture, and coal, are administered by the same official hierarchy. These huge oilfields are actually mini-provinces.

But the gas riches of Weiyuan field are located deep in extremely fertile red earth which is as important an agricultural resource for China as an energy resource. On the rolling hills of Sichuan the delegation saw the tightest and most varied terracing imaginable, with crops including rice, corn, peaches, pears, tomatoes, hot peppers, and eggplants. These crops, as well as Weiyuan's other energy resources such as coal, are not administered by the gas field. Hospitals and schools, however, do fall within its area of responsibility.

Locally, Weiyuan is within the region administered by the Southwest Branch of the Petroleum Corporation of the PRC. This branch oversees Guizhou and Yunnan Provinces in addition to Sichuan. The head office in

Chengdu is staffed by 200 people, mostly engineers, who are responsible to Managing Director Deng Jinbi and seven deputy managing directors—Huo Guozhen, Ma Xingsi, Meng Qingyen, Shi Zhesheng, Ying Guang, Zhai Chungfa, and Ding Yuming.

The delegation's hosts were Gao Zhizhong and Li Guoshun, both identified as directors of the Southwest Branch. They were probably directors of various geographical divisions of the branch.

The Southwest Branch made great efforts to accommodate the wishes of the delegation. No drilling or workover operations are performed in Weiyuan and Zigong at the present time, but efforts were made to show the group a typical well site at Weiyuan as well as a wildcat drilling site about 10 km. from Zigong where drilling had been temporarily halted only a few weeks before. In addition, the delegation was taken to see a sulfur recovery plant and distribution station in Weiyuan, and the Zizhong Internal Combustion Repair Factory en route to Weiyuan—an engine repair plant which also manufactures some parts for the drilling industry.

Drilling and Production

Although the group saw no drilling, it was told that the Southwest Branch of the CNOGEDC operates about 100 drilling rigs. This does not represent the total number of rigs in the Sichuan-Guizhou-Yunnan area; other rigs are operated by the Bureau of Geology and by other government organizations. No information was available as to how these different entities work together to coordinate the results of exploration.

In a briefing at Weiyuan Gas Field headquarters, engineers were very candid about production figures. The total production rate per day is 2.6 million cubic meters, while the production rate per year amounts to 2.5 percent of the reserve.

Delegation members were pleased to be told these concrete overall figures; earlier trips to Shengli and Daqing Oilfields had found the Chinese unwilling to reveal such detail. However, our visit was only one week after the PRC government released its first concrete statistics in 23 years; thus, we were probably some of the first to benefit from the new, open policy on statistics.

Production at Weiyuan is from thick sections of fractured limestone at a 3,000-meter depth, dating from what the Chinese call the "Sinian" period. This term, derived from "Sino," was first used in 1924 by an American geologist living in China to describe a time period roughly equivalent to the late Proterozoic era. The structures in China dating from that time are, however, very different from those on the North American continent. Overall, oil and gas in Sichuan Province is located in a carbonate sequence deposited on a stable platform extending from the late Proterozoic to the Mesozoic eras.

The 200 sq. km. gas-producing zone contains bottom water in a dome-type structure with water running underneath the entire gas cap. The salt dome is several hundred meters thick, and shallow gas is located at a 1,000-meter depth. The Chinese mentioned that problems have arisen with water coning. Gas-water contact is at 2,434 meters, subsea.

In a brief historical account, gas field officials informed

us that exploration was first started in 1938, but with little result, owing to the ravages of the wartime period. In 1956, exploration was started once again with the drilling of Well #1 in the eastern part. In 1964, this well pierced the Sinian formation, culminating in the discovery a year later of the whole field at that depth.

Of 70 wells drilled since 1965, a total of 39 are currently producing. Only four of these have been drilled to the bottom of the production section in the Sinian formation. In conversations during the day in the field, delegation members were told that 15 wells in Weiyuan produce over 15 million cubic meters per day; a few produce over 35 million cubic meters per day, while one prolific well surpasses 200 million cubic meters per day. The gas produced contains 6 percent H_2S/CO_2 : 1.2 percent H_2S , and 4.8 percent CO_2 .

Production equipment in the field is almost entirely of Chinese manufacture, although it was admitted that one of the wellheads observed was a modified Russian design. The only American equipment used has been Hughes and Reed drill bits, although our hosts mentioned that Cameron and FMC wellheads have been imported for the Chongqing region in eastern Sichuan.

All rigs in Sichuan use blowout preventers (BOPs). We were told that only two blowouts have occurred in the Weiyuan field. Most BOPs are imported from Romania, where they are cheaper than the American version. The Chinese currently manufacture BOPs, but not in large enough quantities.

The general practice is to utilize two ram-type BOPs with a spherical preventer on top. The upper ram is a pipe ram, while the lower is a blind type. At the gas field headquarters, the delegation saw a diagram of a three-ram system in which pipe rams were on the top and bottom, with a blind ram in the middle. Remote controls have been installed on all rigs.

Wellhead flowing pressures vary from 100 to 150 atmospheres depending on the quantity of water production, while the gas gathering system pressure is 30 atmospheres.

Most wells have casing set on top of the pay zone, followed by completion in an open hole with some intervals as long as 120 meters. Wells are drilled into the pay zone to varying depths but only rarely all the way to the gas-water contact. A few have liners set through the pay zone.

Typical tubing is 2½", which hangs free. Packers are not used in this field. Casing is set at 7" and a corrosion

SOME MAJOR GAS FIELDS IN SICHUAN

Wulunghe	卧龙河
Weiyuan	威远
Shiyougou	石油沟
Luzhou	泸州
Shengdengshan	圣灯山
Zigong	自贡

inhibitor is injected into the casing and circulated out with the produced gas.

Weiyuan field uses a multi-well gathering system with seven gathering stations. There are two transmission systems, one for gas and one for water. All gas undergoes desulfurization in the field before transport to the pipeline. Weiyuan has installed a circular pipeline network, and delivers all produced water to the town of Caojiaba in eastern Sichuan. It was not stated what was done with the water at that location.

Visit to Well #2

Well #2, located approximately in the center of the field, is Weiyuan's first producing well. The Chinese told us that the wellhead, which has 210 atmospheres of pressure, is a Chinese modification of a Russian drawing. The wellhead has double casing valves, double master valves, single wing valves, and a single crown valve. Casing pressure is at 138 atmospheres, and tubing pressure at 135 atmospheres.

In completing the hole, a 16 $\frac{1}{4}$ " hole was drilled to 440 meters, with 12 $\frac{3}{4}$ " casing to 426 meters. An 11 $\frac{3}{4}$ " hole was drilled to 1,014 meters, a 9 $\frac{3}{4}$ " hole to 2,838 meters, and a 5 $\frac{3}{4}$ " hole to 3,005 meters. Casing of 6 $\frac{5}{8}$ " was set at 2,837 meters, with a perforated liner set from the bottom of that casing to the bottom of the hole. Tubing of 2 $\frac{1}{2}$ " with a perforated nipple was run to the top of the producing zone. It was commented that other completions are similar, but most do not include the liner. One well was sidetracked and completed in a deviated hole.

Well #2 is the most distant of seven wells producing into one of the gathering stations at Weiyuan. The well is a full 2 km. away from the station, and is the only one with an experimental remote data acquisition system installed at the wellhead and production separators.

Among the equipment and instrumentation observed around the site were a control station located about 100 meters from the well, which contained seven copies of Barton orifice meters; an automatic pressure regulator maintaining constant downstream pressure on the flowline between the well and the free water knockout; and casing and tubing pressure transducers sending tubing and casing pressures to the data acquisition station.

From the 2 $\frac{1}{2}$ " well flowline the gas passed into the second stage choke and free water knockout, which had a 24-atmosphere pressure. Gas then passed through an orifice meter from which the gas temperature, differential pressure, and static pressures were telemetered to the data acquisition station. The gas was sent into a 273-mm.-diameter pipeline for transport to one of the two treating (desulfurization) plants in the field which we visited. This one was built in 1966, and another identical one in 1971. The 1966 plant treats 1.8 million cubic meters/day and recovers 25 tons/day sulfur.

Our final visit in Weiyuan was to the gas distribution station, which receives all gas from Weiyuan field (2.6 million cubic meters/day) as well as all gas from Luzhou field (1.5 million cubic meters/day). From the station almost all the gas is directed into a 360 mm., 21.9-atmosphere pipeline to Chengdu. A small amount is retained for local domestic use.

It is interesting to note that all the gas produced in Sichuan is utilized within the province's boundaries, which suggests that the pipeline network to other areas is inadequate.

Wildcat Well in Zigong

Responding to our request to see a deep drilling rig, Southwest Branch officials arranged a visit to Rig #6018, a wildcat location about 10 km. from the nearest production and near the city of Zigong. The rig was a very large Romanian import, Model #F-320-308, delivered in late 1977. In the opinion of several delegation members, it was the best-maintained rig they had seen in China.

Drilling at the site began October 25, 1977. At the time of our visit (July 6) there had been a total of 420 days, or approximately 14 months, of drilling, including seven months of shutdown time, during which time crews were waiting for analysis, cement, tools, and other equipment. Completion of drilling is scheduled for October of this year—a full two years after it was first begun.

During our visit, no drilling had been conducted for two weeks while oil string casing was being set and cemented. In the meantime, the rig was being completely overhauled and painted.

We were informed that the crew had already drilled 5,270 meters of a planned 5,300-meter total depth. As with Weiyuan, the main producing zone at this location is the Sinian.

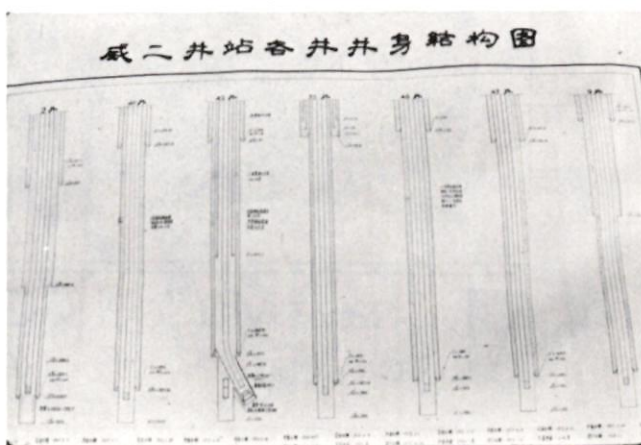
Four kinds of bits have been used to drill to this point, manufactured in China, Romania and by the American companies Reed and Hughes. Only rock bits have been employed.

During the drilling, 13 $\frac{3}{4}$ " casing was set at 481 meters, after which a 12 $\frac{1}{4}$ " bit was used to drill to 4,075 meters. Nine-inch casing was set at 4,070 meters and cemented back to the surface, after which an 8 $\frac{3}{4}$ " bit was used to drill to 5,272 meters. Finally, a 7" liner was set to the bottom with a total length of 1,334 meters.

Delegation members counted 114 stands of drill pipe in the derrick plus 18 drill collars on the rack. The drill pipe was 5" in diameter with an 11 mm. wall thickness.

The entire water-based mud system was contained in steel tanks which had been emptied during the maintenance period; reserve mud had been pumped to tanks on a nearby hill. Each of the rig tanks was equipped with an electric impeller-type mixer. There were two main mud pumps, one powered from the rig power compound and the second independently powered from two V-12 diesel engines. A third mud pump for mixing mud was powered by one V-12 diesel. These pumps were all large, double-acting duplexes.

A diagram of the gas wells at Well #2 in the center of Weiyuan Gas Field.



The mud program was as follows: from the surface to 481 meters, the mud used was 1.2 specific gravity (sg); from 481 to 4,070 meters, 1.4 sg; from 4,070 to total depth, 1.3 sg.

Other equipment in use included a Romanian derrick model #L-38, Japanese casing C-110, and Chinese-made BOPs. The BOPs consisted of two ram preventers, with no spherical preventers in evidence. At the bottom was a blind ram, and above were pipe rams. Delegation members asked the Chinese what pressures they expected from the producing formation. The answer was 600 atmospheres. When one American pointed out that the Chinese BOPs could only stand 350 atmospheres of pressure, the crew said they will change to a 700-atmosphere American BOP, but had not yet decided which company's product.

To the side of the rig was a remote BOP control station with a Upetrom accumulator and a BOP control panel #CH-60-76. Both of these were imported from Romania and seemed to be crude copies of Koomey BOP control units.

There was no choke and no gauge in the choke manifold, but the Chinese said these would be installed prior to starting to drill again.

Delegation members noted with interest that crew dormitories and laboratories were all constructed as permanent brick buildings. When they asked what use the buildings would have once the rig was moved, the Chinese said they would house the production crews who would operate the well. When they were asked what would happen if the hole were dry, the Chinese said the buildings would be trans-

formed into a base for other production. One member of the group noted that this was inconsistent with the earlier statement that there was no other production within 10 km. of this site.

The drilling team of Rig #6018 consisted of 102 people, including a drilling engineer, a geologist, and a team leader. Five shifts of workers are on rotation. A system has been developed in which one shift works only during the day, one relieves on holidays and vacations, and others fill in the balance of the time.

Zizhong Internal Combustion Engine Repair Factory

En route between Chengdu and Zigong, where the delegation spent the night before and after the Weiyuan visit, a lunch stop was made in the city of Zizhong, about 180 km. from Chengdu. The Zizhong Internal Combustion Engine Repair Factory has a staff of 1,200 workers, almost all of whom came out to greet the American delegation.

Like the Zigong rig, this factory was the best-maintained and cleanest of those which delegation members had seen before in China. They commented that it looked like a real operation and not a show. The factory had five workshops, four for the manufacture of small drilling parts and one for the repair of engines used in drilling. Most of the machine tools were Chinese-made from factories located in Beizhou, Jiangsu Province; Dalian; Shenyang; Dezhou, Shandong Province; Fushun; Shanghai; Beijing; and Jinan, Shandong Province. In addition, there was some machinery manufactured in Poland.

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Council Activities

The highlight of the National Council for US-China Trade's conference on "Selling Technology to China" (December 5-6) was the participation of two Chinese officials from the legal affairs department of the National Council's counterpart, the China Council for the Promotion of International Trade. Mr. Ren Jianxin, director of the legal affairs department, addressed a number of issues of concern to American businessmen interested in negotiating joint ventures with Chinese enterprises.

The basic message underlying Ren's speech was that Beijing views joint ventures as a key tool for realizing the Four Modernizations and will take every step to ensure mutual benefit and legally protect the rights and interests of the foreign participant. He stressed that in drafting regulations to implement the law, China is seeking to follow standard international business practice.

Mr. Tang Houzhi, chief of the arbitration section of the CCPIT, delivered a presentation on the Chinese approach to friendly negotiations, conciliation, and arbitration.

In preparation for the conference, the National Council published a 350-page workbook that provides a thorough and detailed analysis of the state-of-the-art in four main areas of selling technology to China: licensing agreements, engineering and design contracts, countertrade, joint ventures. The workbook is available from the Publication Sales Department.

AT LAST, AN OFFICE IN BEIJING

Richard Glover, previously co-director of the National Council's delegations department and who speaks Chinese fluently, is now settled and well in suite 1105 of the Beijing Hotel. In other staff news, Richard Gillespie, a West Point-educated former attache with the US consulate general in Hong Kong, has joined the staff of the National Council as an assistant director of Exporter Services.

COMMITTEE EXECUTIVES MEETING

On November 27 a meeting was held of all the chairmen of the export committees of the National Council. The committee chairmen, representing the most active American companies in the China trade, addressed the question of the future direction of export committees and generated a number of recommendations including one for the establishment of an Executive Steering Committee in an advisory capacity to the National Council and its Board of Directors.

PHILLIPS TESTIFIES ON TRADE AGREEMENT, TRANSFER OF TECHNOLOGY

Christopher H. Phillips, President of the National Council, testified on November 2 before the House Ways and Means subcommittee on trade in support of passage of the Sino-US trade agreement.

Mr. Phillips' main points were that both most-favored-nation tariff status and Exim Bank facilities are essential to the long-term development of Sino-US trade. Another statement was provided by Mr. Phillips to the Senate Finance Committee hearings on the trade agreement on November 15.

Both the House and Senate Committees approved passage of the agreement, the former by 24-8, the latter unanimously. Copies of Mr. Phillips' testimony are available from the National Council.

Mr. Phillips also gave extensive testimony on November 15 on transfer of technology to the People's Republic of China before a subcommittee of the House Science and Technology Committee. Export controls were the main focus of this testimony, copies of which are also available from the National Council.

RONG YIREN ON JOINT VENTURES, SEEKS US MANAGEMENT EXPERTISE

The board chairman of the China International Trust and Investment Corporation, Rong Yiren, was called upon to explain and to clarify China's new Joint Venture Law during a month's tour of ten US cities which began October 8. Over two dozen US companies have reached the stage in their talks where further clarification and new legislation on China's part is essential to the continued advancement of joint venture negotiations. Rong's party of six was hosted by the National Council as well as by several of the companies whose joint venture proposals are under discussion. (See page 52.)

Ren Jianxin and Tang Houzhi picked up where Rong left off during a one-week stay in New York (December 7-13) under the sponsorship of the American Arbitration Association. Ren and Tang also paid visits to American law firms and attended a seminar by the Practicing Legal Institute of New York.

The Council hosted its second delegation of the year from the State Economic Commission, November 5 to December 7. Led by Yuan Baohua, a vice chairman of the commission and chairman of the newly formed China Enterprise Management Association (CEMA), the 18-man mission visited US government agencies and some 50 American firms and private associations in industries from energy to shipping. (See page 47.)

Urban development, organization, and financing were key issues of interest to the vice mayors of Beijing, Shanghai, and Tianjin.



Bell's helicopter bears the initials of the Civil Aviation Administration of China.

Coproduction in the PRC

Bell Helicopter Lifts Off

Amidst the exploration of new forms of trade with China—joint ventures, countertrade, pure engineering contracts—a new option has begun to figure in more and more business discussions with the Chinese: cooperative or joint production. For well over a year the Chinese have been discussing joint production with foreign firms of helicopters, jets, compressors, and steam turbines, among other items. Many of these deals have begun to surface in the last few months.

What is cooperative production? In the Chinese context, it is a form of technology transfer in which a foreign firm helps the Chinese to set up a factory to produce an item under license by giving extensive technical assistance in stages. In the early stages, the Chinese import large parts of the product and do the final assembly in their own factory. Gradually, the Chinese take on more complex parts of the manufacturing process until after several years they can produce the entire product or nearly the entire product from their own materials.

Joint production, sometimes called coproduction, is not usually a part of a joint venture because there is no equity investment by a US firm. The production

facilities are entirely Chinese-owned.

In the minds of some US executives, "cooperative production," as Kang Shien, head of China's State Economic Commission called it (see *CBR* 6:4, p. 17), may be more important in the PRC's future industrial development than equity joint ventures.

Joint production usually includes a production license agreement but it goes beyond that. In fact, the first known case of a joint production arrangement with the Chinese points to an apparent failure on China's part earlier to produce sophisticated equipment under license. This was an agreement with the Italian firm Nuovo Pignone, publicized in mid-October, to jointly produce centrifugal compressors. Back in 1976, the Chinese signed a license agreement with Nuovo Pignone for production of centrifugal compressors. Yet the Chinese continued to import compressors from the Italian company—buying about 50 over the past five years for \$50 million.

The Nuovo Pignone joint production arrangement will call for China to start by producing 10 per cent of the compressor parts while the Italian firm will make the other 90 percent. Gradually the Chinese will

undertake more and more of the production until, by the end of the ten-year contract, the Chinese will be able to produce the product without any outside assistance or parts.

Siemens AG of West Germany, which licensed the Chinese its technology to produce 150 Mw steam turbines in 1975, has also reportedly been asked by the Chinese to make a proposal on joint production.

Cooperative production does not, however, necessarily include a license for sale of the product in third countries.

The Chinese consider joint production especially appropriate in the field of aircraft. Within the last few months, a new corporation called the China National Aero Technology Import-Export Corporation (CATIC) has signed preliminary agreements with McDonnell Douglas for joint production of DC-9 Super 80 jets and with Bell Helicopter Textron for production of helicopters. Both companies are continuing negotiations with the Chinese to firm up details of the contracts and are consulting with the US government to gain export approval.

Bell Helicopter's Arrangement

Bell Helicopter signed a "memorandum of understanding" with CATIC on October 31, calling for assistance in the production of Bell's Model 212 and Model 412 helicopters in the Harbin Aircraft Factory.

China's strong interest in the Model 212 was shown in February 1979, when the Chinese ordered eight of the helicopters for seismographic surveying, forestry management, and oil exploration. The contract was delayed for six months, however, mainly because of need for export approval for one part—a high-frequency radio. All of the helicopters were delivered in the last quarter of 1979.

Since then, Bell has been discussing with CATIC its proposal for a six-phase joint production program over four years. That program would begin with the purchase of whole helicopters and include various stages of production, ranging from Chinese assembly of Model 212 helicopters that had been disassembled in the US, to full production in China of Model 412 helicopters. At the conclusion of the final phase, China would be capable of producing the entire helicopter using materials of Chinese origin, according to Robert Ramsey, director of International Marketing in Bell's Washington office.

Bell proposed a program to expand the Harbin Aircraft Factory to produce 50 of the twin-engine helicopters under the coproduction program within a four-year period. The first 20 helicopters would be Model 212s, to be assembled in China. The final 30, to be produced cooperatively in China, would be Model 412s, an updated version of the Model 212 which is scheduled to be in production here by 1981.

A major part of the transfer of technology would involve training of Chinese engineers and manage-

ment personnel in Bell's Fort Worth, Texas, plant and the dispatch of Bell engineers and managers to the Harbin factory. As part of the earlier agreement for the sale of helicopters, Bell trained 16–18 Chinese technicians in its Texas plant for about two-and-a-half months. Five of these Chinese recently participated in a major demonstration program of new Bell products and advanced technology. The program would also involve sale of some manufacturing tooling to China, although the Chinese will produce as many parts as possible from their own tools.

A delegation of twelve Chinese officials from the Harbin factory, and CATIC visited Bell in late October for 12 days and ended their trip by signing a "memorandum of understanding" on cooperative production as outlined in Bell's proposal.

Ramsey estimated that the first eight helicopters cost the Chinese about \$14 million. He said that it would be hard to measure the cost of the coproduction or assembly program because it is still under negotiation. Bell acknowledged the importance of procuring components from China, and has agreed to make a strong effort to buy back helicopter parts, not to exceed 30 percent of the contract price. As another break for the Chinese in terms of payment, Bell may arrange for its parent, Textron, to market Chinese exports through its other divisions. Textron has already been active in buying and marketing Chinese exports. The Chinese have not yet discussed financing in detail with Bell.

The US government gave Bell a license to export Model 212s in a commercial configuration last July, but the company has not yet obtained export approval for the technical data release for manufacturing or for the Model 412s. The Model 212 comes under the jurisdiction of the Commerce Department, which has estimated that it might take about six months to obtain approval. Model 212s in a different specification are used by the US Air Force and Navy, but the configuration to be produced by the Chinese is for commercial uses. Model 412s are similar to 212s but have a four-blade rotor system.

Bell made its first contact with the PRC in 1973 through the Chinese Liaison Office in Washington, DC. The company subsequently was invited to send a delegation to China to discuss possible Chinese purchase of helicopters, but no sale was made at the time. China initiated contacts again in October 1978, and invited a delegation to the PRC for technical and commercial discussions in December 1978. The team was invited to return in January 1979, and signed the eight helicopter contracts on February 14, 1979. Bell hopes to be able to sign a final agreement with the Chinese on cooperative production within a few months. US government approval, though, might take much longer.

The Bell Model 212 helicopters presently use a Pratt and Whitney engine.

—DJ 光



Credit: Bob McNeely

Vice President Walter Mondale discusses Sino-American cooperation with the president of Beijing University, Zhou Peiyuan, August 1979.

A New Era of Technology Cooperation

China's S & T Policies Pave the Way for Modernization

Karen A. Berney

In the long run, China's present program to upgrade its technological manpower and develop training programs with Western countries will have a lasting effect on our science, technology, and commercial relations with the PRC. The massive—and multifaceted—science and technology cooperation programs China is developing with the US and other countries will have an impact five and ten years from now that should be assessed by anyone with an interest in long-term Sino-US economic relations. In a very real sense, the technology cooperation agreements China is signing today may represent areas of potential commercial competition tomorrow.

"The ultimate objective of each is fundamental and similar: to help China realize rapid economic growth through the acquisition, development, and application of advanced technologies."

THE FRAMEWORK FOR US-CHINA GOVERNMENTAL COOPERATION IN SCIENCE AND TECHNOLOGY

During the past year since President Carter announced his epoch-making decision to establish full diplomatic relations with the PRC, the Secretaries of Treasury, Commerce, and HEW, the administrator of NASA, and Vice President Walter Mondale have visited China, concluding seven concrete agreements that broaden and intensify the scope of two-way cooper-

ation in such areas as education, energy resource development, oceanology, management, space, and trade. The initialed Sino-American trade accord, now awaiting ratification by the US Congress, is the final key to unlocking the door to the greatly increased commercial interactions now needed to facilitate progress in the numerous technological areas of mutual interest.

The results of these cabinet-level missions to the PRC, climbing to six with Secretary of Defense Brown's January 1980 trip, lend strong credence to the view that Beijing regards access to American science and technology as an essential aid to its modernization program.

The signing of an "umbrella" science and technology (S&T) agreement by Vice Premier Deng Xiaoping and President Carter (January 31, 1979) has so far paved the way for no less than eleven S&T protocols encompassing almost every type of technology transfer (see table).

For example, China just hosted a joint Sino-US symposium on polymer chemistry and physics (October 5-14), the first ever held between the scientists of each country. In return, a symposium on pharmacology at the US National Academy of Sciences (October 29-November 2) brought ten Chinese participants to deliver papers on topics ranging from Chinese medicinal herbs to new anticancer agents.

These two symposia were inaugurated as part of the expanding exchange relationship between the Scientific and Technical Association of the PRC (STAPRC) and the Committee on Scholarly Communication with the PRC (CSCPRC), the organization based in the National Academy of Sciences with primary responsibility for implementing the US-China student exchange program. This program will result in several thousand Chinese studying on US campuses over the next few years.

Each one of the S&T protocols between Beijing and Washington addresses specific fields of activity and provides for the development of annexes in which the details for exchanging data, scientists, and equipment, and for collaborative research can be set forth. But the ultimate objective of each is fundamental and similar: to help China realize rapid economic growth through the acquisition, development, and application of advanced technologies.

Science and Technology Exchanges with the Private Sector

Since the beginning of 1979 the National Council for US-China Trade has sponsored 40 delegations to and from China, including two Chinese groups to the US from the State Economic Commission which is particularly interested in scientific management. Add to this the numerous academic missions traveling back and forth, lecture tours, and the private exchanges between individuals and commercial enter-

prises, and some 400-450 Sino-US economic, scientific, and trade-related exchanges will have visited each other's country this year alone. Business and private institutional interflows now overshadow the involvement of the US government in China's S&T community.

Chinese academic centers have already initiated reciprocal faculty and student exchange programs with at least eight leading American universities, including

CHINA'S FIRST CONGRESSIONAL TESTIMONY—ON TECHNOLOGY TRANSFER

On November 15, Mr. Li Wei, first secretary of the Commercial Section of the Embassy of the People's Republic of China, was the first Chinese official ever to give testimony in Congress. He did so at the House Science and Technology Committee hearing on "Transfer of Technology to the People's Republic of China." Mr. Li's testimony is reproduced here, as given.

Mr. Chairman, I am much delighted to be invited to the hearing, and glad to learn of the views of the speakers of the science and technology transfer to China.

With the normalization of relations between our two countries, the growth of economic and trade ties has been greatly speeded up. The Sino-US trade relations agreement was signed, but the legal procedure of this agreement on the part of the USA has yet to be completed.

All of these signal a new period of economic and trade relations between our two countries.

It is expected with great interest that the legal procedure of the agreement would be finalized, certainly, so as to broaden the paths of the development of trade.

We believe that the prospect of Sino-US trade is promising. And to this juncture, the subcommittee on Science, Research and Technology is holding hearings here on science and technology transfer to China.

This is certain to be conducive to the development of bilateral trade.

Frankly speaking, we all know that there exist certain artificial obstacles. The flow of some commodities and technology from the USA to China has been brought about, but certain contracts agreed upon and signed by both sides remain pending.

It goes without saying, that this will not do any good to the expansion of trade. It should be brought to an end, in my opinion.

Mr. Chairman, China now throughout the country is sparing no efforts in propelling the normalization of agriculture, industry, science, technology, and national defense.

Our policy is to rely on our own efforts to learn from abroad important advance technology and equipment. A number of countries have already surged ahead in their cooperation with China. I am hopeful that the USA will catch up with them by taking all necessary steps to remove obstacles in the interest of the people of the USA and China.

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SINO-US AGREEMENTS FOR COOPERATION IN EDUCATION, SCIENCE AND TECHNOLOGY, January 1980*

US Government Agency/ PRC Government Agency	Date Signed	Fields of Cooperation	Two-way Exchange
Department of Agriculture/ Ministries of Agriculture, Forestry, and Agricultural Machinery	Understanding on agricul- tural cooperation appended to general S&T accord. Ne- gotiated by Secretary of Agriculture Bob Bergland, November 1978.	Agriculture: Agricultural machinery and production technology. Exchange of information and data on forestry management, grain production and marketing, germ plasma, pest control, food processing, and feed manufacturing.	Mutual exchange of study teams: Chinese technical groups to receive 3-4 months of training in US in computer methods, soil surveying and testing, and remote sensing.
National Oceanic and At- mospheric Administration (NOAA)/State Meteorologi- cal Bureau of China	Protocol on cooperation in the field of atmospheric science and technology, S: May 8, 1979.	Atmospheric Science and Technology: Cooperation in fields of numerical weather prediction, use of meteoro- logical satellite data and mesoscale observations and research. Establishment of a weather station over China with US technical training assistance.	Exchange of data, scien- tists, equipment, and col- laborative research. Chi- nese scientists have just completed work at the Na- tional Severe Storms Lab- oratory and will study at the National Center for At- mospheric Research.
Various Private and Public Agencies	Implementing Accord for Cultural Exchanges be- tween the US and the PRC, S: August 28, 1979. Ap- pended to January 1979 cultural agreement.	Culture: Art, Literature, Edu- cation, Cinema, Language, Sports, Social Science, Translations, National Park, and Documents Preserva- tion.	Exchange of art exhibitions, cultural delegations and a US cinema group and dance troupe.
Committee for Scholarly Communication with the PRC/Ministry of Education	Memorandum of Under- standing Covering Educa- tional Exchange 1979-80, S: June 23, 1979. Specific accord on student and scholarly exchanges nego- tiated October 1978.	Education: Exchange of scholars and students, pro- grams for elementary and secondary school teachers, eleven specific activities in- cluding 2 joint language symposia and exchange of textbooks and educational materials.	Various governmental pro- grams and exchanges be- tween US and Chinese universities will provide op- portunities for more than 650 scholars, researchers, and students to study in US and 170 Americans to study in China during 1979-80 academic year.
Department of Energy, De- partment of Interior, Army Corps of Engineers and TVA/Ministries of Electric Power and Water Conserv- ences	Protocol on cooperation in hydroelectric power and water resources manage- ment, S: August 28, 1979.	Energy: Hydroelectric pow- er, high-voltage transmis- sion, and water conserv- ancy.	Governmental, academic and commercial exchanges to assist China in the de- sign, construction, and management of hydropower projects. Training of Chi- nese engineers, technicians at US energy centers.
Department of Energy/State Scientific and Technologi- cal Commission with the Chinese Academy of Sci- ences	Implementation agreement on cooperation in the field of high-energy physics, S: June 12, 1979.	High-Energy Physics: US will provide assistance in training and technology in the building of a \$100 mil- lion nuclear particle accel- erator of 50 billion electron volts.	Exchange of groups from the joint Sino-US commit- tee on high-energy physics.

**SINO-US AGREEMENTS FOR COOPERATION IN EDUCATION,
SCIENCE AND TECHNOLOGY—Continued**
January 1980*

US Government Agency/ PRC Government Agency	Date Signed	Fields of Cooperation	Two-way Exchange
National Technical Information Service/Institute of Scientific and Technological Information	5-year Protocol for cooperation in the management of science and technology and scientific technological information, S: May 8, 1979.	Management in Science and Technology: Industrial R&D systems theory and data banks, administration and diffusion of innovation.	Exchange of lecturers, scholars, personnel in the management of industrial S&T for training purposes, information, and publications. Joint conferences, symposia, and courses.
National Bureau of Standards/State Bureau of Metrology with the Chinese Academy of Sciences	Protocol on cooperation in the field of metrology and standards, S: May 8, 1979.	Measurement and Standards: Metrology of electrical and cryogenic sciences and engineering; materials research; protocols for computer software and networking, analytical chemistry research.	Exchange of Chinese researchers at the NBS and lecture tours in China by US specialists, as well as data, samples, instruments, and scientific components.
Health, Education and Welfare/Ministry of Public Health	Protocol for cooperation in the Science and Technology of Medicine and Public Health, S: June 22, 1979.	Medicine: Infections, cardiovascular and parasitic diseases, cancer, public health and health service research, medical information science, immunology and medical genetics: Subsequent areas include: pharmacology, hygiene, organ transplantation, burns, microsurgery, mental health, and biomedical engineering.	A Joint Committee for Cooperation in medicine and public health will administer exchange of medical delegations, biological standards, bacterial and viral strains, reagents and samples and other laboratory materials. Joint seminars, conferences, and lectures. Columbia Univ. has a proposed agreement with the Chinese Academy of Medical Sciences to improve infant nutrition.
National Oceanic and Atmospheric Administration/Chinese State Bureau of Oceanography	Protocol on cooperation in the fields of fishery, marine science and technology, S: May 8, 1979.	Oceanography: Marine sedimentation processes, instrumentation, environmental services, and engineering; aquaculture.	Exchange of scientists and specialists. In June, Columbia University reached an agreement with China for a joint research project on the study of the South China Sea basin.
NASA/Chinese Communications Satellite Corporation under the Chinese Academy of Space Technology	Understanding on cooperation in space technology appended to general S&T agreement. Negotiated during NASA's Nov.-Dec. 1978 visit.	Space Technology: Satellite broadcasting and communications technology. Landsat technology.	NASA will oversee China's purchase of a domestic communications satellite and a ground receiving station from US suppliers and the installation of a Landsat ground station.
Protocols under Discussion:** Environmental Protection Agency/Chinese Environmental Office		Environmental Protection: Air, water, and automobile pollution control.	
US Geological Survey/Chinese State Bureau of Geology		Geological Sciences: The use of advanced technology for acquiring, studying, and processing geological data.	

* These S&T protocols are covered by the 5-year Scientific and Technological Cooperation Agreement signed by Vice Premier Deng Xiaoping and President Carter, January 31, 1979.

** Other protocols under discussion include cooperation in transportation, housing, and statistics.

SUBJECT INTERESTS OF FIRST GROUP OF CHINESE STUDENTS IN THE US*

Physics	58
Radioelectronics	50
Computer Science and Engineering	45
Mathematics	30
Chemistry	30
Medical Sciences	29
Life Science	25
Materials Sciences and Technology	15
Control Engineering	15
Aeronautical Engineering	15
Space Technology	15
Agricultural Sciences	11
Mechanics	10
Nuclear Engineering	10
Construction Technology	10
Metallurgical Engineering	10
Chemical Engineering	10
Mechanical Engineering	8
Meteorology	7
Astronomy and Astrophysics	6
Other Subjects	24
TOTAL	433

*Source: Committee on Science and Technology, US House of Representatives, January 1979. This information was provided by Zhou Pelyuan, president of Beijing University, during discussions in Washington, October 1978. It is a preliminary list but reflects the Chinese emphasis on fields of applied technology.

FIELDS OF STUDY OF THE SECOND GROUP OF AMERICAN RESEARCHERS AND STUDENTS SENT TO CHINA (1979-1980)*

Politics-History	12	State vs. Local Elites: Southern Dynasty Efforts to Regain Control
Language & Literature	9	Social Analysis of Contemporary Fiction in Chinese Cities
Law	4	
Agriculture	3	Rural Development: The History of a People's Commune
Archaeology	3	The Evolution of Tombs in the Han Dynasty
Geology	3	Earthquake Research in the PRC
Biology	2	Study of High Incidence of Esophageal Cancer in China
Chinese Medicine	2	
Drama & Theater	2	
Astronomy	1	Rings of Uranus Occultation Study
Economics	1	Study of Land Tenure Systems in Traditional China
Education	1	Survey of China's Institutions of Higher Learning
Mathematics	1	Linear Programming Study of the Economics of Triple-Cropping in Southern Jiangsu
Mechanical Engineering	1	Optical Testing Methods
Oceanography	1	
Philosophy	1	An Analysis of the Thought of Chang Tsai
Public Health	1	Mother's Age and Parity and Pregnancy Outcome

*Source: China Exchange Newsletter, Vol. 7, No. 3, (June 1979).

Harvard, Stanford, and MIT. The University of Massachusetts, engaging in the first formal affiliation with a Chinese medical school, has established a cultural and scientific exchange program with Shanghai First Medical College. Under the agreement, Chinese physicians will gain access to advanced technological capabilities, while American doctors hope to learn about the benefits of China's approach to primary health care.

The two countries may have much to gain from cooperation in the health care area. According to a *Medical World* report (8/6/79), US medical care costs each American an average of \$800 per year as opposed to \$3 a year for each Chinese. The PRC, which has experienced a Western-like rise in the incidence of cardiovascular disease, needs US expertise to bring its heart research up to world standards.

In addition to cultivating bilateral ties with US academic institutions, the Chinese are stepping up invitations to private individuals and professional groups. More than 140 foreign professors from 13 industrialized countries will lecture for a year or more in Shanghai's institutes of higher education.

Americans are teaching English in China's Foreign

Trade Institute and several hundred Chinese-American scientists, including Nobel laureate physicist Dr. Yang Chenning, are making periodic and extended trips to lecture, conduct joint research, and even advise top Chinese scientific and political leaders. Suggestions from Chinese-American scientists have encouraged Beijing to increase investment for basic research and expand exchanges.

So far, most of these exchanges have comprised specialists in the natural sciences and applied technology, but Beijing's three-year economic readjustment program, emphasizing the importance of effective management, has added a new twist to Sino-American cooperation. China's economic commissions, now focusing on enterprise management, quality control, and production technologies, are sending teams to the States to master the unique and distinguished experience of the US in the management and administration of S&T.

The de facto abolition of the social sciences during the Cultural Revolution has also created an acute demand for planning and statistical expertise in China. This fall, ten US economists and a delegation of US government specialists in quantitative methods

visited Beijing to discuss statistical planning, rural development, and foreign trade with their colleagues in the Chinese Academy of Social Sciences and in the research institutes of the Ministries of Finance and Foreign Trade and the State Planning Commission. This trend is likely to continue as Beijing shows more concern in adopting measures to ensure the effective absorption and integration of foreign technologies.

Role of American Corporations

By far the most important and most utilized channel for transferring Western technology is through the sale of industrial licenses, patents, technical know-how and equipment to Chinese end-users. Although the initial focus of this effort was Western Europe and Japan, normalization has greatly increased Beijing's interest and demand for American products and technology. But even before the removal of political barriers to US-China trade, Beijing had been showing a preference for American proprietary technologies.

Since 1973, fifteen US companies have earned about \$200 million in licensing fees through the sale of process technologies associated with turnkey plant contracts; the total value of the contracts involving the US licenses, 1972-79, has exceeded \$2.2 billion.

Although Beijing's technology and equipment imports have been scaled down from what was originally spelled out in the 1978-85 eight-year development program, current plans accord the highest priority to areas in which American industry still maintains a competitive and technological edge.

During the first three quarters of 1979, the US government approved validated licenses for the export of over \$240 million in aircraft seismic survey equipment, petrochemical data, and other technologies to China. US manufacturers are now gearing up to supply the PRC with a domestic communications satellite and associated ground equipment as well as a Landsat earth-receiving station.

Clearly, China has a wide choice of trading partners as potential technology suppliers, but in some areas such as energy and telecommunications, American corporations are well-placed to help leapfrog China into the twentieth century.

The participation of the US business community in China's economy is not limited to a sale of equipment or licensing agreements appended to plant contracts. Buyback arrangements, China's new law on joint ventures, and detailed (yet to be announced) regulations of corporate law relating to tax codes, property rights, and arbitration procedures are all designed to actively promote the flow of foreign capital to China. A Chinese patent law, now in draft, is nearing completion.

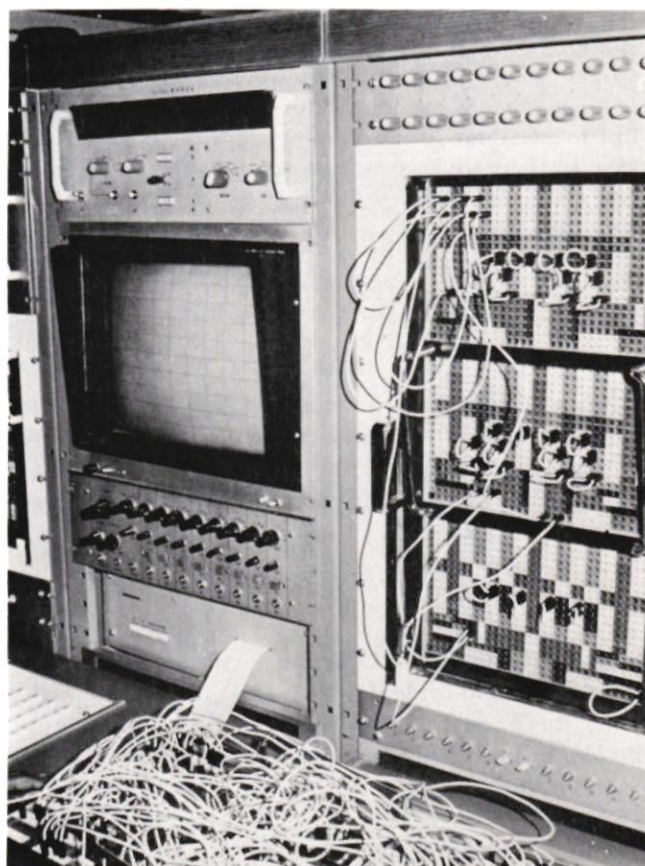
McDonnell Douglas and Bell Helicopter have reached a tentative agreement encompassing coproduction to enable China to purchase and manufacture

aircraft and helicopters. At least three US agricultural machinery companies are known to be working on a deal that could lead to a joint venture or service contract to upgrade and modernize China's largest tractor factory in Luoyang to produce 30,000 60-100 h.p. tractors a year.

On a more intermediate level of technology transfer, American firms now rival the US government in providing scores of Chinese with opportunities for an advanced education. The training of eager-to-learn Chinese scientists, engineers, and plant operators is an integral component of doing business with China. Attached to business contracts are detailed provisions for technical assistance, tailored to ensure that China's technology imports yield maximum educational benefits.

To date, chemical process companies have the most experience conducting technical training programs. Pullman Kellogg has instructed more than 100 Chinese specialists in design engineering, construction, management, and the execution of process plant projects as a result of its contracts with the PRC. UOP, which has seven licensing agreements with the PRC, provides teams of 10-15 Chinese at a time with six weeks of classroom lectures covering such topics as control processing by computer and then moves on to hands-on exposure either in simulated plant setups or directly in its licensee's factories.

A Chinese-made analog and digital computer.



Credit—Walter L. Keats

But technical training as part of a contract is only the beginning of increased Sino-US industrial cooperation. Two international law firms, Baker and McKenzie and Haight, Gardner, Poor & Havens, have each arranged to train two Chinese officials specializing in foreign trade in Western legal procedures related to commerce. The Chinese will attend law courses at American law schools as well as receive in-house experience with the law firms.

The American Packaging Foundation has submitted a proposal to Beijing on three options for sending Chinese students and professors specializing in food processing and packaging to US universities to attend related courses in the physical sciences and engineering. The US packaging industry will cover the cost of travel, education, and living expenses.

Such programs, aimed at cultivating enduring industry-to-industry relations, suggest a prominent role for US companies as vehicles for educating bright Chinese anxious to absorb the intricacies of subjects ranging from the process for producing diesel fuel to American management and marketing techniques.

In this way, not only can American industry help China provide the means of establishing a sound technological infrastructure, but it can also help the PRC alleviate its chronic shortage of S&T manpower—the most immediate stumbling block to its planned modernizing of agriculture, industry, defense, and science and technology.

Reciprocity—What's in It for US?

China is like someone who has been hungry for ten years and now wants to swallow anything he can lay his hands on. . . . Maybe we must have a special difference in our understanding of reciprocity. In the short run we would like to stress our learning from you. Taking the longer view I believe we have an equal chance of learning from each other.

—Huan Xiang, Vice President of the Chinese Academy of Social Sciences, in a speech to the American Academy of Learned Societies, June 1979

Chinese capabilities in most areas of science and technology lag well behind ours, which often prompts the question, "But what is in it for us?" Will America gain as much as China from cooperative S&T agreements and exchange programs now reaching unprecedented proportions? There are many aspects to this question.

According to Benjamin Huberman, associate director of the White House Office of Science and Technology policy responsible for US S&T exchanges with China, there are a number of areas covered by the Sino-US protocols under which mutual payoffs are imminent, including:

—Areas in which China is a pacesetter in research: acupuncture, medical burn therapy, biological control



College students study electrical engineering at a Chinese university.

Credit—Walter L. Keats

of pests, herbal pharmacology, pharmaceutical chemistry, microsurgery, and contraceptive technology.

—Fields that would benefit from access to China's geographical conditions: zoology, botany, and other earth sciences.

—Fields for which the global sharing of information is vital: weather prediction, oceanography, astronomy, and energy conservation and recycling.

—Academic disciplines that can enhance our understanding of traditional and modern Chinese society: literature, history, sociology, and economics.

These are specific areas in which the US will gain concrete advantages from cooperation with China. There are other less apparent benefits including the development of personal ties with China's future scientific leadership.

But both Chinese and American sides agree that it is unrealistic to expect an immediate, significant Chinese input into the world science and technology community at this stage in the game. As Vice Premier Fang Yi stated recently: "Taking the overall situation into consideration, China is backward as compared with the West and Japan. It is no loss of face to admit backwardness. On the other hand, we want to catch up and eliminate this gain."

At present, the basis of Sino-American S&T relationships is to strengthen the PRC's economic system and thereby the policies of the current regime—an insurance against possible future political reversals that could once again shut China's door to the West. Yet over the long run, Mr. Huberman and others contend that the world can expect great inventions from the people who gave us paper, the printing press, gunpowder, and the compass.

CHINA'S DOMESTIC SCIENCE AND TECHNOLOGY POLICY—REVITALIZATION OF ACADEMIC EXCELLENCE

On October 23, 1978, a few months after China had inaugurated an eight-year science and technology plan to produce 800,000 top ranking scientists—500,000 more than it had that year—with the goal of placing the PRC only 10 years behind the high-technology giants by 1985, Beijing announced that it was sending between 500 and 700 of China's best and brightest to American institutions of higher learning for the 1979–80 academic year. The expansion of China's international student exchange program to include the US as well as other technically advanced countries is an integral component of its blueprint for the modernization of science and technology which will underwrite the development of agriculture, industry, and national defense over the next few decades.

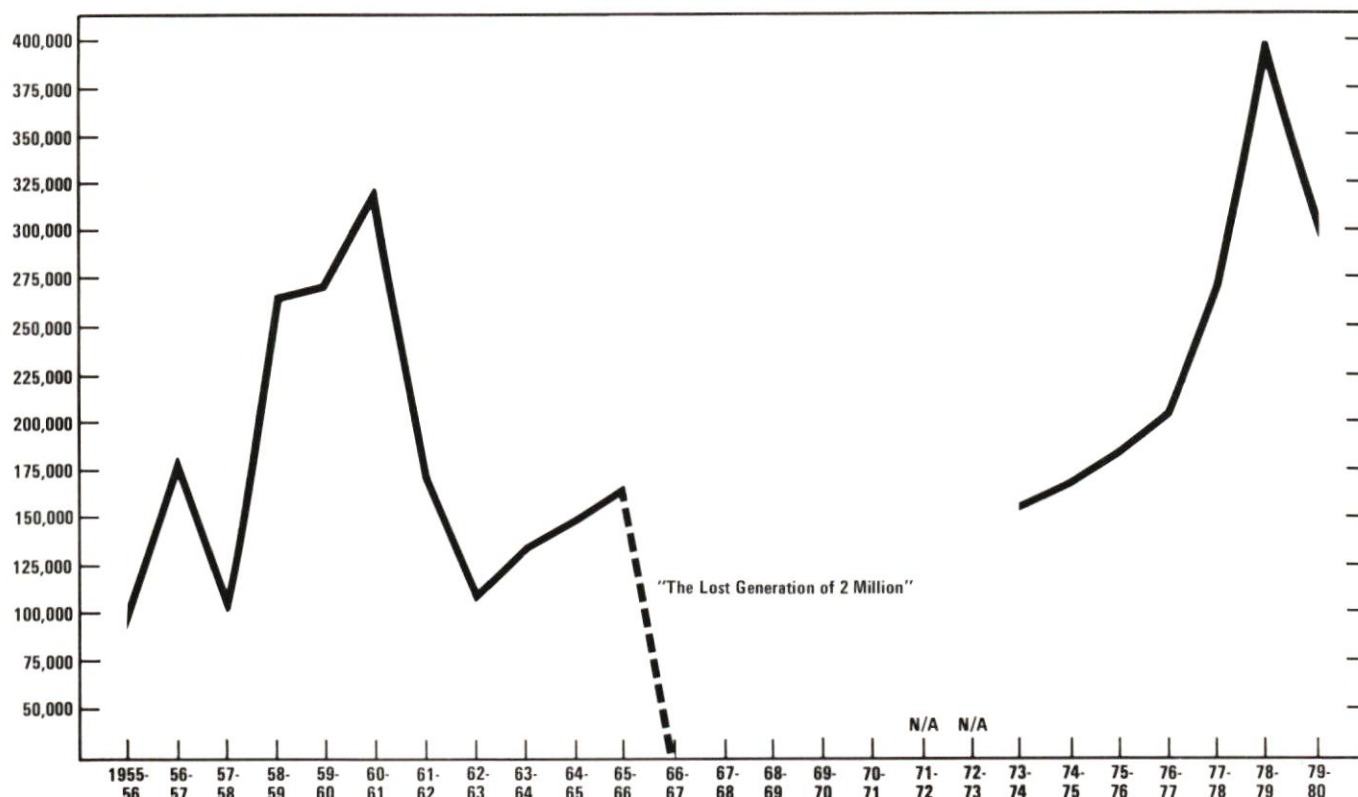
China's problem today is not just that a potential generation of two million scientists and technicians has been lost since 1966 under Cultural Revolution educational reforms. The introduction of advanced technology and equipment must be integrated with a

scientific and technical infrastructure to absorb, manage, and update it. Beijing can ill afford to wait for the revival of its educational system if it hopes to fully utilize and absorb the technology included in China's \$15 billion worth of foreign imports this year.

Thus, several thousand students and scholars will go abroad in 1979 to further expedite the process of rebuilding China's diminished pool of university professors, scientific researchers, and factory engineers. With a scientific and technology manpower force of 5.9 million, of which only 310,000 are engaged in front line R&D activities, China's scientifically trained personnel represents only .03 percent of its total population, an abysmally low figure compared with other industrialized nations. At present, over 620,000 scientists and engineers, .26 percent of the population, are employed full time in R&D sectors in the US.

The sending of legions of Chinese students to Western college and university campuses—selected on academic qualifications rather than political rectitude—affirms Beijing's repudiation of the antiforeign educational policies of the Cultural Revolution designed to make education and culture "serve proletarian politics."

FRESHMAN ENROLLMENT IN THE PRC's INSTITUTES OF HIGHER LEARNING* (1955 - 1980)



*Sources: 1955-66, 1977-80 figures, Xinhua, May 17, 1979 and June 27, 1979.

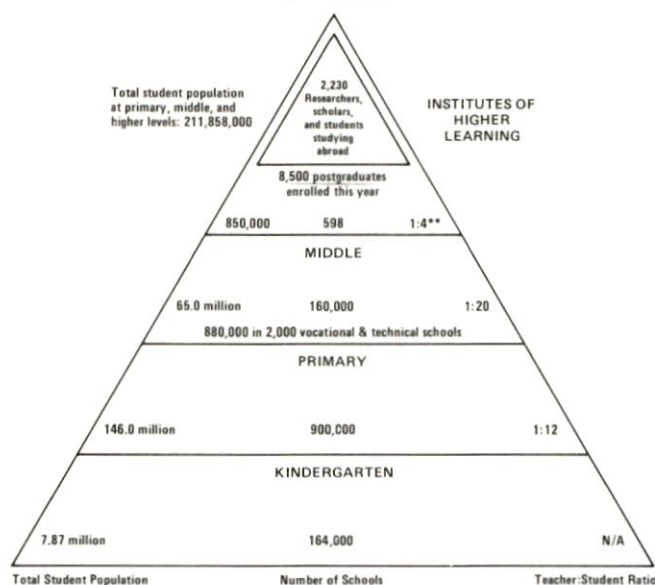
1973-75, figures, Martin K. Whyte "Inequality and Stratification in China," The China Quarterly (December 1979).

1975-1977 figures assume a 10 percent annual increase in the enrollment of new college students.

The China Business Review

CHINA'S EDUCATIONAL PYRAMID*

(1979 - 1980)



*Source: Xinhua, September 23, 1979; not including 500,000 workers enrolled in part-time factory-run universities and 68 million people in spare-time secondary schools.
 **This low faculty-student ratio probably includes graduate students acting as part-time instructors and other teaching personnel not qualified as full-fledged professors.

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The 1966-69 Cultural Revolution's impact on China's educational system was probably most drastic at the university level. Educational reforms grounded in the belief that science and education should be the basis for instilling the moral values of the "new communist man" resulted in the dismantling of universities and their graduate programs, diverting scientific pursuits from research to manual labor, and revising academic curricula to include large doses of political theory. Faculty members at Nanjing University told one group of American visitors that until the recent decision to restore educational quality, scientists were spending about half their time on political studies and more time working in factories and communes.

Cultural Revolution educational policy also involved abolishing university entrance examinations in favor of ideological and class criteria. According to one analyst, many university freshmen enrolled during the 1966-76 10-year hiatus "actually had only one or two years of post-primary education," making it even more urgent for China to breed a new elite to replace unqualified scientific and technical personnel.¹

The disastrous educational reforms engineered during the Cultural Revolution have since been terminated. Since the fall of 1977, with the reestablishment of the State Commission on Science and Technology, headed by Vice Premier Fang Yi, and the widely publicized National Science Conference (March 18-31, 1978) and National Conference on Educational Work (April 22-May 16, 1978), Beijing has demonstrated unequivocal support for achieving a generational jump in Chinese science and technology.

At these two major planning conferences, it was made explicit that the commitment to achieve sus-

tained scientific-technological progress would hinge on restoration of stress on educational quality, competition, and discipline. The 1978-79 academic year introduced new educational policies, representing Beijing's adoption of the Western educational model, designed to cultivate intellectual talent by structuring educational opportunities in the form of a pyramid. A number of important changes are underway.

A Larger Slice of the Budget for S&T

The upgrading of China's S&T infrastructure will cost the state ¥5.87 billion (\$3.715 billion) this year with about 10.5 percent allocated for the operating expenses of the Chinese Academy of Sciences and the State Scientific and Technological Commission and their more than 100 affiliated research centers.² While this is a 10 percent increase over 1978 national expenditures, and a doubling of the 1977 figure, it accounts for only 0.7 percent of China's estimated GNP for 1979.

In contrast, total R&D spending in the US is expected to reach a current-dollar level of \$57.3 billion in 1980, with slightly less than 50 percent funded by the federal government. R&D activities in various sectors of the economy are expected to comprise 2.2 percent of US GNP in both 1979 and 1980.

While financial outlays for R&D can be expected to soak up a larger slice of the state budget over the course of China's modernization drive, for the immediate future the crucial bottleneck is manpower rather than a shortage of financial resources available to Beijing's science and technology program.

Revival of Academic Excellence

The desire to improve educational quality has led to the newly revived Ministry of Education reasserting its control over the formulation and implementation of educational policy. Last February the former Minister of Education, Liu Xiyao, was replaced by Jiang Nanxiang for resisting the pace of educational change.

At a recent ceremony to mark the 30th anniversary of the Chinese Academy of Sciences (November 2), Vice Premier Deng Xiaoping reassured scientific personnel that their status and work has been elevated to new heights of respectability. A movement is underway to rehabilitate scientists and technicians demoted during the Cultural Revolution along with improving their salaries and working and living conditions.

Moreover, intellectual merit, as opposed to seniority, is to be the sole criterion for career advancement. At the anniversary commemoration, Deng Xiaoping emphatically said, "As long as an individual contributes and as long as his performance conforms to the criteria set for researchers and professors, we should promote him to these positions and confer on him the suitable academic degrees and technical job titles, even if he is only 30 years old . . . we should do this

as quickly as possible because it is conducive to cultivating and recognizing qualified personnel." (Xinhua, Nov. 1).

Emphasis on Individual Achievement—the New Exams

The upgrading of higher education in China centers on the system of "key" universities, numbering 100 and covering all academic fields. These elite institutions in turn recruit students from key middle schools that receive priority funding and are assigned the most qualified teachers.

China's future scientific and technical manpower will be drawn from the ranks of high-flying scorers on the competitive college entrance exam. The standardized exam has been administered twice; the most recent one was held July 7–9. This time only one out of fifteen test-takers gained admission to a university (4.7 million applicants to 300,000 enrollees), better than the one out of thirty in the previous 1978 test, but still very restrictive.

Moreover, China's new freshman class, of which 67 percent is enrolled in scientific and technical departments, contains only 4 percent of this year's senior middle graduates, compared to 60 percent of all US high school graduates who continue on to institutions of higher education.

Competition is even stiffer for admission to key schools. One visiting scholar was informed that the minimum score needed for acceptance to a key university was at least 40 points higher than the 320 points (out of possible 500) needed for regular schools. Moreover, postgraduate students, 8,500 enrolled in this fall out of 600,000 applicants, must first pass entrance exams in their provincial capitals to be qualified to take national examinations for postgraduate courses in the science and research units of universities.

In conducting a nationwide talent search, the Chinese Academy of Social Sciences just announced that it will hold competitive examinations in May 1980 to select research fellows in such fields as economics, law, and history.

A recent analysis of China's 1978 college entrance examination, however, characterized the physics and chemistry sections as comparable to the syllabus of standard physics and chemistry courses taught in US high schools. The math sections were oriented towards the approach of 20–30 years ago and stressed memorization rather than problem-solving.

China's policy is not without problems. The re-establishment of the "key point" educational system, as well as ability tracking within schools, will generate a new privileged elite composed primarily of urban residents and the children of intellectuals. Beijing's policy makers are already sensitive to public opinion on the question of egalitarianism and well aware of opposition emanating from those social groups—peasants and rural youth as well as the gen-

eration that lost its education—which stand to lose under the package of current educational reforms.

Resentment has already surfaced in Beijing where 400 young people staged a sit-in (September 10) to protest educational discrimination. They claimed to have been denied admission to a university despite achieving high scores on the July college entrance exam. Continuing dissent is likely from this minority who fail in the competition for educational opportunities. Beijing is seeking to minimize such contention and rally mass support by officially denouncing elitism, responding to pent-up pressures for higher living standards, and developing special vocational learning schools to absorb the surplus of knowledge-thirsty Chinese.

Expanded Dissemination of Modern Science and Technology Information

In response to the need to accelerate the popularization of science and technology, a national program has been launched to supplement China's 6,000 independent research institutes with 300,000 science extension centers throughout the country. They will be used for training classes, exhibitions, demonstrations, and lectures on science and technology.

The publishing of S&T literature is also on the upswing with 34 new S&T journals emerging this year on top of 1,500 new popular science books and 24 science gazettes.

In January 1980, 25,000 issues of a translated version of *Scientific American*, entitled *Ke Xue*, will go on sale in China for between \$5 and 6 and be available, thereafter, by subscription only. With ads costing \$10,000 a page, the publisher and the Chinese will enjoy lucrative profits to be split down the middle.

There are now 5,000 main branches of China's primary bookstore, Xinhua Shudian, carrying books from 100 indigenous publishers. The largest of Shanghai's 95 bookstores and 45 bookstalls are said to accommodate 50,000 browsers on a busy day.

Bookstores in Beijing and Shanghai specializing in industrial data and technical standards have sold out. These bookstores are especially important for disseminating technical information to factory managers and engineers who have little contact with professional scientists and technicians.

Business, Professional, and Technical Training

While 96 percent of China's middle school graduates will not be able to attend college, Beijing does not plan to neglect the professional manpower potential of the over 60 million denied access to a university education. The middle school educational structure is now being revised to curtail the expansion of general middle schools in favor of technical and vocational schools to train students in commercial fields which are experiencing severe personnel

shortages such as tourism, management, electronics, and automation technology.

According to official statistics (Xinhua, August 17) for the cities of Beijing and Tianjin, the ratio between general senior middle schools on the one hand, and technical and vocational schools on the other, is twelve-to-one and five-to-one, respectively, in favor of general senior middle schools. Almost fifteen years ago, in 1965, it was one-to-one in both cities; this has been cited as the appropriate ratio to aim for.

In addition to building more specialized middle schools, a variety of commercial institutes and trade schools is being set up to provide educational advantages for both middle school graduates and the existing labor force. According to a seven year plan (1979-1985) drafted at a national planning meeting for commercial and business education (August 21), schools one level below institutes of higher learning, for training administrative personnel, technicians, accountants, and trade service workers, are to increase from the present 131 to 321 by 1985, with total enrollment of 185,000 and a yearly graduating class of 60,000.

At the level of higher education, China is directing scarce resources toward the development of manpower in the field of finance and scientific management which, Chinese officials concede, is still at the level of the 1950s. At the Second National Conference on Higher Education in Finance and Economics (August 17-31), representatives from the ministries of education, foreign trade, finance, and commerce stressed that decentralization measures allowing enterprises more control over production and financial decisions must be coupled with objective business practices, especially as learned from foreign countries.

The Chinese also realize that commercial development is necessary for enabling the PRC to master sophisticated marketing strategies and techniques—a prerequisite to entering the export competition with other Asian countries.

Management skills, only recently recognized as essential, but severely backward, at present are to be acquired through full-time study as well as on-the-job training for cadres and workers in grass-roots commercial units. Professional managers and business experts have now joined the ranks of scientists, researchers, and teachers as key personnel for China's development drive.

By 1985 China plans to add 10 new institutes to its existing base of 22 commercial facilities: 3 foreign trade institutes, 4 commerce colleges, 1 customs school, cereals college, culinary art school, and finance college. With these new specialized schools China hopes to bring 40,000 managerial experts on stream, a doubling of the current managerial work force. This nucleus of Western-style administrators and managers will be expected to turn state-run enterprises into profit-maximizing, high-quality production units.

International S&T Cooperation— Unprecedented Scale

China's unprecedented program to send as many as 10,000 students and scholars to Western university campuses by 1985 parallels the strategy of the early 19th century Meiji restoration, when Japan sought the massive infusion of modern technology via foreign trade and the placing of thousands of students in Western libraries and laboratories.

Over the past two years the PRC has adopted an aggressive approach toward initiating scientific and technological cooperation with the industrialized countries of the West. This new openness, signifying Beijing's willingness to expose its intellectuals to diverse ideologies and lifestyles, began in early 1978 with the signing of a five-year S&T agreement with France and an accompanying two-year cultural accord for the exchange of scholars and teachers.

Since then, China has reached verbal understandings or signed formal agreements for S&T cooperation and student exchanges with at least eight other industrialized countries including Japan, Italy, the Federal Republic of Germany (FRG), the United Kingdom, Sweden, the United States, Canada, and Australia (see table).

Chairman Hua Guofeng's recent 22-day, business-like sweep through France, West Germany, the UK, and Italy, yielded S&T accords with all four and trade agreements with France and West Germany, underscoring the competitive aspects of China's plans for S&T cooperation with the West. His eagerness to discuss loans and financing suggests that the most important factor for applying such agreements may be the competitive strength of each country as a source of long-term credit, rather than differences in S&T levels.

China in International S&T Organizations, Conferences

In addition to cementing bilateral ties with Western nations and their scientific and technical communities, China is demonstrating a stronger interest in governmental and nongovernmental organizations at the international level, reflecting Beijing's multifaceted strategy for taking evolutionary jumps rather than steps.

The PRC has just become a member of the World Petroleum Congress (September 14) and can be found present at almost every international S&T gathering, including the recent UN conference on Science and Technology for Development (August 21), where the Chinese delegation joined the Third World chorus in calling for greater cooperation from the developed world in technology transfer and knowledge-sharing.

For years, the PRC refused to join international organizations unless Taiwan was ousted, but, recently, experts from both Taiwan and the PRC were seen at a workshop organized in Honolulu on the world fer-

**CHINA'S PROGRAM FOR EDUCATIONAL, SCIENTIFIC AND
TECHNICAL COOPERATION WITH THE INDUSTRIALIZED WORLD
(December 1979)**

Country	Government Agreement ¹	Academy Agreement ²	Size of Educational Exchange Programs ³	
			Current Academic Year (1979-80)	Projected in Each Country
France ⁴	5 year S&T Accord with 2-year cultural agreement, S: 1/21/78. General economic, technical, commercial agreement up to the year 2000, cultural exchange program for 1980-81, S: 10/17/79.	CAS*-French State Center of Science and Research, S: 10/20/78. CAS-French Atomic Energy Commission, S: 8/79.	200 researchers	500
Japan	Article 3 of Peace and Friendship Treaty covers educational exchange, S: 8/12/78. Cultural agreement, S: 12/7/79.	CAS-Japanese Society for the Promotion of Science, S: 9/17/79. Japan-China Science and Technology Exchange Association, founded: 12/17/77.	425 Chinese: 385 researchers and scholars, 40 post-graduates for 5-year stays. China to provide scholarships for 20 Japanese.	500
Italy	Cultural, Scientific-technological agreement, S: 10/6/78. Declaration of intent for cultural and scientific-technological cooperation S: 11/6/79.	CAS-National Research Council of Italy, S: 5/14/79.	Reciprocal agreement for each government to provide 144 monthly installments to cover tuition and living expenses for unspecified number of students.	300
United Kingdom	5-year agreement on educational and cultural cooperation S: 11/1/79.	CAS-Royal Society of Britain, S: 11/10/78.	350 Chinese researchers and scholars. China to provide scholarships for 25 British students with additional 50 sponsored by the UK.	1,000
Federal Republic of Germany ⁵	Minutes of talks on S&T cooperation in 11 fields, S: 10/9/78. Agreement on cultural cooperation S: 10/24/79.	CAS-Max Planck Institute, S: 9/15/78.	200 Chinese: 100 undergraduates, 100 research scholars and graduate students. Chinese to provide scholarships for 30 Germans.	500
Sweden	Agreement on Industrial Scientific and Technical Cooperation, S: 12/5/78.	CAS-Royal Swedish Academy of Sciences, S: 10/19/78.	20 now, 70-80 graduate students expected in 1980-81. China to provide scholarships for 10 Swedes.	100
Canada	Agreement to further educational exchange and cooperation, S: 6/7/79.	—	100 Chinese research scholars.	500
Australia	Agreement on Science and Technology Cooperation, S: 6/6/79.	CAS-Australian Academy of Science S: 1977.	100 Chinese: 59 researchers, 41 graduate students. China to provide scholarships for 30 Australians.	100 to be expanded to 200 a year.

tilizer trade and at a meeting on nuclear energy in Tokyo, a clear sign that "science has taken command over politics."

In mid-July the PRC agreed in principle to separate membership for Beijing and Taipei in the sixteen scientific bodies of the International Council of Scientific Unions in Paris. And, for the first time in twenty-five years, athletes from both the PRC and Taiwan will appear together in the 1980 winter and summer Olympic Games.

On October 25, the Executive Board of the International Olympic Committee unanimously adopted a resolution recognizing the Chinese Olympic Committee (COC) as the "representative of all China," and the Chinese Taipei Olympic Committee as a "provincial organization" of the PRC. Song Zhong, secretary-general of the COC, later held a press conference to endorse and welcome the decision, adding that the COC "gladly hopes that both the athletes residing on our continent and in Taiwan will appear together, shoulder-to-shoulder at the Olympic games" (Xinhua 10/26/79).

China's determination to expose its students, scholars, and high-ranking officials (including vice ministers and provincial leaders) to the mainstream of Western science and technology achievements is not without limits. China still has a long way to go before it encourages the study of Western philosophy and literature or embraces Western notions of civil and political liberty.

But the present expanding cooperation in science and technology will be reciprocal in the most basic sense, in that it will permit Chinese and Western individuals to be exposed to each other's culture on a long-term basis. While the personal relationships engendered by technology exchanges cannot be quantified, they provide the basis for enduring links between nations that normally transcend politics. This can only be a good thing for the long-term relationship between China and the United States. 完

¹ Susan L. Shirk, "The Politics of Education in Post-Mao China," prepared for the China Council of the Asia Society, April 1979.

² This does not include ¥20.3 billion (\$13.0 billion) to be sent by the military sector which conducts important R&D activities in aircraft and space technology, for example.

CHINA'S PROGRAM FOR EDUCATIONAL, SCIENTIFIC AND TECHNICAL COOPERATION WITH THE INDUSTRIALIZED WORLD—Continued (December 1979)

Country	Government Agreement ¹	Academy Agreement ²	Size of Educational Exchange Programs ³	
			Current Academic Year (1979-80)	Projected in Each Country
US	Agreement on Science and Technology Cooperation, S: 1/31/79, Memorandum of Understanding on educational exchange programs, 1979-1980, S: 6/23/79.	Bilateral agreements concluded between Chinese and American universities; the CAS is negotiating one with the US National Academy of Sciences.	850 Chinese: 400 researchers, scholars, 100 undergraduates on national program, 175 on bilateral and private sponsorship. US grants for 60 American scholars and students to study in China; 100 privately sponsored, 15 on university programs.	To approach 1,000
Total number of students currently in 33 countries			2,230.	
China's projected student population in the West and Japan			4,600.	

* Chinese Academy of Sciences.

¹ Formal government science and technology agreements represent an umbrella for direct cooperation and exchange protocols between private institutions, government agencies, and Chinese authorities. They are a complement to trade agreements, providing the basis for industrial and commercial exchanges between private enterprises and Chinese trading corporations.

² In general, agreements between the CAS and other academies involve the exchange of scientific data and personnel, arranging joint symposia and conferences, and promoting the exchange of publications samples and equipment in relation to research and development. The fields covered range from agriculture to telecommunications.

³ Not including independent scholarly exchange agreements between Chinese institutions and Western universities, foundations, and research councils or Chinese students sponsored by private individuals.

⁴ Under the Sino-French Science and Technology Agreement at least 13 10-year protocols have been signed in the electronics field; specifically noteworthy is a protocol of a cooperation agreement under which the French computer industry and Fourth Ministry of Machine Building in China will develop Chinese computer and electronics industries. The recent \$69 million computer sale by the US Control Data calls for \$43 million of software and specialized equipment to be supplied by Control Data France. At least 11 French computer firms are negotiating possible sales to China.

⁵ One of the most important protocols under the S&T understanding was signed between the Chinese Bureau of Weights and Measures and the Economy Ministry of West Germany on October 29 during Chairman Hua Guofeng's official visit.

市場

第 3 号

1979年11月1日
农历己未年九月十二

中华猕猴桃鲜果

出口首次成功

陕西省农副畜产品进出口公司收到日本客商发来的贺电，祝贺他们九月下旬发往日本的中华猕猴桃鲜果完好无损，首次成功。

陕西省盛产中华猕猴桃，往年出口鲜果运到日本后，腐烂变质的很多。今年，他们采取科学的办法，认真抓好出口的各个环节。首先把好采摘关。经仪器测定，果子含糖率达到标准时，立即组织人力细摘轻放，避免损伤碰坏；其次，及时运出，精心加工。鲜桃摘下后，在三天之内运到冷库储存，按不同规格严格挑选、装箱，并用冷藏集装箱运到港口，迅速装船外运。因此，今年第一批出口的七吨多鲜果到销地后色泽新鲜，果质不变。

李长群 李安达

上海冬令补品供应充足

一批冬令补品已陆续投入上海市场。如名牌产品“蔡同德洞天长春膏”已安排六十万瓶，比去年增加百分之六十二。人参再造丸、乌鸡白凤丸分别增配十二万粒和十五万粒。还在闹市区的七家门市店增加富有特色的商品供应，挑选较好的党参、黄芪、当归等八个品种供应出



换财场退采等文营由地始答于感读
资经一用（）章业各邮征。我谢者、本
料部四刊三后每二室地局求一在们社此培作

A new Chinese financial journal, entitled **Market**, hits the newsstand.

An Interview With the Bank of China

The Deputy General Manager of the Bank of China, Lin Jixin, recently responded to questions submitted by the China Business Review on the topic of China's international finances and the borrowing policies of the Bank of China. The following answers were received from the Beijing headquarters of the Bank of China on September 18.

China has recently signed or negotiated loans valued at approximately US \$13 billion in government-guaranteed export credits, and about US \$9 billion in commercial bank credits. Could you please indicate China's loan requirements for the remainder of the three-year plan (1979-81) and through the year 1985?

The loan agreements with foreign countries which have been signed and negotiated by the Bank of China are to support the introduction of advanced technology and equipment according to national construction needs and possibilities, especially pay-back capability. Recently, the signing of government-guaranteed export credits has been determined by the rate at which trade contracts have been signed. Presently our country is beginning a 3-year phase of adjustment, reform, consolidation, and advancement.

The extent to which we utilize foreign funds in the next ten years will depend on the results of economic adjustment at each phase.

Could you please discuss the principal instruments, such as commercial loans, Exim Bank credits, or bonds, with which China intends to raise foreign exchange in the future?

Presently the BOC's main methods of raising foreign exchange are by suppliers' credits, mutual deposits, and bank-to-bank loans. We are willing to consider using any methods used by international banks that are not detrimental to our country's sovereignty and can be done in accord with the principles of equality and mutual benefit.

Is China presently considering issuing dollar-denominated bonds in the US, commonly called "Yankee bonds?"

We have not yet considered the question of selling bonds in China or abroad.

China has indicated a preference for loans denominated in dollars. On what criteria is currency selection based?

In selecting currency for loans, exchange rate fluctuation must be considered, but not that alone. Interest rate levels and prices of capital goods must be considered together.

Recently, Vice Premier Deng Xiaoping and other government officials have indicated an interest in obtaining government-to-government loans. What such loans does China need from the US? From what other countries does China seek government-to-government loans?

We are willing to consider government loans from any country that offers them, as long as it is friendly to China and the loan is not detrimental to our country's sovereignty. What kind of government loans we might obtain from America and other countries will depend on the possibilities offered by such loans from friendly countries.

Private bank loans are normally governed by the laws of a particular country, such as the United Kingdom or US. Does China accept such a customary legal framework?

We believe that when a loan agreement is signed under relations of mutual goodwill and trust by both parties, if a disagreement should arise, it can be solved by friendly consultations. Many of the loan agreements we have with foreign banks were signed in this manner. Under some circumstances, mutually agreed-upon arbitration clauses have been written in.

Will China's foreign borrowings be guaranteed by the Bank of China in all cases? If not, what state entities in China are authorized to guarantee China's foreign borrowing?

Not all foreign loans to China need be guaranteed by the BOC, and not under every circumstance or condition will the BOC give a written guarantee.

Chinese officials have expressed an interest in participating in the IMF, World Bank, and Asian Development Bank. Has China initiated talks to enter any of these bodies?

After China resumed her legal seat in the United Nations in 1971, she successively resumed her legal seats in each of the UN specialized agencies. However, China's seats in UN financial institutions are still occupied by Taiwan. This is the obstacle to China's participation in UN financial institutions. China is a founding member of the IMF and the World Bank. Taiwan is just one part of China. Representatives of Taiwan cannot represent China. Therefore Taiwan's credentials to represent China in these financial organizations must be revoked and China's legal seat returned. We made our attitude on this clear long ago. This is the precondition for China's participation in relevant UN financial institutions. Only if this precondition is fulfilled can other issues be discussed and negotiated.

Is China willing to provide the IMF with the economic and financial information required under Article 8, Section 5 of its Articles of Agreement?

If the question of legal representation rights is resolved, and China formally participates in financial institutions like the IMF, China will of course conform to the IMF Articles of Agreement and provide the information required. The IMF Articles of Agreement also mention that the IMF should consider the differences in ability by member countries to provide information, and member countries have no obligation to provide information so detailed as to reveal related confidential information.

The government recently announced that the Bank of China will soon open a branch in New York City. When will it officially open, and what functions will the Bank of China office in New York perform?

Foreign branches of the BOC have been established in Hong Kong, London, and Singapore, and the new branch established this year in Luxembourg has already begun operations. Preparations for establishing a New York branch of the BOC have begun. When it begins operation will be determined in the future according to the needs of developing US-China trade and economic contacts.

What other foreign branches of the Bank of China are also under consideration?

In order to suit the needs of developing China's foreign trade and economic contacts, we are planning to gradually establish branches, representative offices, and joint equity banks in Tokyo and other international financial centers.

Does the Bank of China intend to train some of its personnel abroad? In what countries and financial institutions?

During the last two years some friendly banks have trained some of our personnel, which has given BOC

personnel a greater understanding of foreign banks' international business practices and reinforced the friendly relations between our banks. According to our needs and possibilities, we intend to arrange for personnel at different levels to train abroad.

The Bank of China was recently placed directly under the State Council, and balance of payments planning work was reportedly turned over to the General Administration of Exchange Control. Please enumerate the changes in the Bank of China's responsibilities that may have resulted from this administrative reorganization.

The State Council approved the establishment of the General Administration of Exchange Control to be directly under the direction of the State Council, and also placed the BOC directly under the State Council. The BOC is designated as China's bank specializing in foreign exchange and managing international banking matters. The General Administration of Exchange Control manages China's foreign exchange. After the structural reform of the BOC, the scope of its management was enlarged and its responsibility increased. In order to support the introduction of advanced technology and advanced equipment imports, we are accumulating foreign funds in a planned way. We are developing processing and compensation trade and other international business methods which are the new tasks to suit China's new mission.

Chinese press reports mention foreign exchange accounts held by provinces, municipalities, and even enterprises. Could you please discuss these foreign exchange accounts with regard to:

1. The type of projects the funds are for;
2. The formula used in allocating foreign currency to provinces, municipalities, and enterprises;
3. What authorization from superior bodies, if any, is required before these funds may be drawn down?

We have implemented a foreign exchange reserve system. According to differing circumstances we give localities, government departments, and enterprises a fixed share of foreign exchange, so that they have the ability to acquire equipment, improve production capacity, improve transportation equipment at harbors, increase transportation capacity, provide construction materials, and provide materials and equipment required for the development of tourism. The BOC is in charge of supervising the use of foreign exchange reserve funds.

When and where will foreign bank offices be able to open in China? When will regulations concerning these offices be issued? What kind of business will these offices be able to transact in China?

Two English commercial banks have long been operating in Shanghai. Following the improving trade

and financial contacts between China and other countries, several foreign banks have requested permission to establish themselves in China. Currently, due to limitations of accommodations, equipment, and so forth, we cannot yet satisfy these requests, and must solve this problem gradually. The relevant rules and regulations on this matter are currently being drafted. 完

**US BANKS WITH FULL CORRESPONDENT
RELATIONS WITH THE BANK OF CHINA
December 1979**

Bank	Date Full Relations Established
	1978
1. First National Bank of Chicago	January
2. Manufacturers Hanover Trust Company	November
3. Chase Manhattan Bank, N.A.	December
	1979
4. Morgan Guaranty Trust Co. of New York	January
5. Bank of America National Trust and Savings Assn.	January
6. United California Bank (Los Angeles)	January
7. American Security Bank, N.A. (District of Columbia)	February
8. First National Bank of Boston	February
9. Rainier National Bank (Seattle)	February
10. American Express International Banking Corporation	February
11. Chemical Bank (New York)	February
12. Citibank, N.A.	March
13. Wells Fargo Bank, N.A.	March
14. Bankers Trust Company	March
15. Manufacturers National Bank of Detroit	March
16. Commerce Union Bank (Memphis)	April
17. Michigan National Bank of Detroit	April
18. First National Bank in Dallas	April
19. Crocker National Bank	July
20. Provident National Bank (Philadelphia)	July
21. The Philadelphia National Bank	July
22. First City National Bank of Houston	July
23. Seattle First National Bank	July
24. Pittsburgh National Bank	July
25. First National Bank of Minneapolis	August
26. Security Pacific National Bank	August
27. Republic National Bank of Dallas	August
28. Texas Commerce Bank	October
29. Continental Illinois National Bank and Trust Company of Chicago	November

In March 1978, Vice Premier Fang Yi listed nuclear energy, high-energy research, and nuclear-fusion research as Chinese priorities. Since then, however, China's nuclear plans seem to have fallen by the wayside. But, in this story by Kevin Fountain, a clear picture emerges of China's new research priorities—including the fact that the PRC has affirmed its commitment not only to nuclear technology and controlled thermonuclear fusion, but also to basic research in high-energy physics.

For the time being, China has put its plans to build nuclear (fission) power plants on the back burner. Basic research in related areas such as high-energy physics and controlled thermonuclear fusion will continue, and substantial investment in this research is forthcoming. But Beijing has postponed its program for nuclear power generation. On May 18, Liu Lanbo, minister of Power Industry, announced through the *People's Daily* that the general line of China's energy policy was to develop hydropower and coal resources,

in accordance with local conditions. "China will rely mainly on coal," Liu declared, "and not on oil or uranium."

Over the last two years, it was regarded as a foregone conclusion that at least one nuclear power plant would be built in China by 1985. Parades of Chinese delegations passed through France, West Germany, Italy, Switzerland, Belgium, Yugoslavia, Australia, Canada, and the United States, meeting with Western nuclear scientists and touring nuclear energy installations.

The Chinese entertained delegations from a number of nations. When French Premier Raymond Barre traveled to China in January 1978, the chairmen of Alstom and Creusot-Loire went with him. West German visitors included top-level scientists, military men such as General Johannes Steinhoff, former head of the Luftwaffe, who visited nuclear test facilities, and nuclear equipment manufacturers including Bayer AG, Deutsche Babcock and Wilcox, Kraftwerker Union, and KWA, a subsidiary of Sloman.

Dr. Chih Wang of the Radiation Center at Oregon

Energy

On the Back Burner: Nuclear Power in China

Kevin Fountain

SEC delegation gazes from atop
the mine-mouth of a nuclear power plant,
Homer City, Pa., November 1979.



State University was one of many distinguished Chinese-American nuclear scientists who encouraged and monitored Chinese efforts. Dr. Wang headed a delegation from the American Nuclear Society that visited China during April and May 1978. The ANS delegation included Joseph R. Dietrich of Combustion Engineering, Ersel Evans of Westinghouse-Hanford, William R. Kimel of the University of Missouri, Allied Chemical Company's Harry Lawroski, Corwin Rickard of the General Atomic Corporation and Octave Du Temple, Executive Director of the ANS. Mr. Du Temple concluded "It's clear that China will acquire probably two or three nuclear reactors from the West within the current eight-year plan."

In April 1977, the Chinese had also discussed nuclear power with Iran, and even offered to help Pakistan build a nuclear reprocessing plant. If there was any lingering doubt about China's positive attitude toward nuclear power, Vice Premier Fang Yi's major speech of March 18, 1978, affirmed that China should "speed up the building of atomic power plants. We should also step up research in solar energy, geothermal energy, wind power, tidal energy and controlled thermonuclear fusion."

Finally, on December 4, 1978, a seven-year trade agreement was signed with France. Under the terms of this \$14 billion pact, France agreed to sell two 900-Mw nuclear power plants to China. US approval, required because the Creusot-Loire subsidiary, Framatome, uses technology licensed by Westinghouse, came within the month.

In mid-January, 1979, a three-year scientific cooperation agreement was signed in Beijing between Academia Sinica and the French Atomic Energy Commission. It was reported that Framatome had spent \$6 million to clinch the sale of the plants.

But in May, the Chinese suddenly canceled the order with Framatome. The volte-face was the result of a careful assessment of the relative costs, risks, and potentials among energy alternatives. In the competition for capital investment in the PRC, nuclear power lost out to coal, hydropower, and oil.

The country with the second largest coal reserves in the world and the world's greatest hydropower potential gave the nod to coal and hydropower and postponed plans for nuclear fission.

The nuclear power plants China was intending to buy from France were expensive—over \$1 billion each. This enormous capital outlay was matched by an extremely long construction cycle. Lead time for achieving generating capacity from nuclear power plants could be eight years and might easily run past ten years.

China is already waiting for other energy projects to get off the ground. For example, it is waiting for the development of offshore oil. China's new offshore "fields" in the Yellow, East, and South China Seas are not likely to come on stream before 1985. Coal production, on the other hand, can be stepped up

THE INSTITUTE OF ATOMIC ENERGY IN BEIJING

The IAE was founded in 1950. Wang Ganchang has succeeded the original director, Qian Sanqiang. The IAE has three accelerators: a 1.2 cyclotron bought from the Soviet Union which is being reworked into an AVF-3 sector machine; a Van deGraff also bought in the Soviet Union; a Cockroft-Walton type made at Vanguard. There are two reactors at the Institute: a 10 Mw_d cooled and moderated; a seven-meter swimming pool type.

As in other institutes, a shift from nuclear to particle physics reflects the emphasis on particle physics characteristic of the Four Modernizations era. The institute has some make-up work to do after time lost in the Cultural Revolution. Expertise lies more in applied nuclear science than in structure or dynamics.

In November 1978, the IAE signed a contract with the High Voltage Engineering Corporation to buy a model HI-13 Tandem Accelerator. The machine will be used for fundamental research in nuclear physics. Three shipments over a 30-month term will bring the accelerator to Beijing. The HI-13 contract was signed for \$5.2 million.

immediately and relatively cheaply. The lead time and capital investment required for huge hydropower projects are similar to the nuclear power plant. But hydroelectricity is clean, its source is "renewable," and investment can be recovered through flood control and irrigation as well as electricity.

Costs were not the only reasons that China changed her direction. The delegation of the Chinese Nuclear Society headed by Wang Ganchang, vice minister of the Second Ministry of Machine Building and president of the Chinese Nuclear Society, and including Zhang Zhenhuan of the National Science Defense Commission; Wei Zhaolin, director of the Fifth Bureau of the State Scientific and Technological Commission; and Zhang Bin, vice minister of the Ministry of Electric Power, had been in the United States only a few days when news of the late March accident at Three Mile Island broke and dominated the media. The delegation followed the story closely as the American people agonized over a potential catastrophe.

In the People's Republic, television broadcast the news of the crisis. As the highly charged American debate was not limited to events at the nuclear station, the Chinese were exposed to a range of issues involving safety, the disposal of nuclear waste, thermal and radiation pollution. China's community of nuclear scientists was not frightened away from nuclear power by the Three Mile Island incident, but safe management of fission had become a concern. Perhaps political decision-makers in Beijing were affected by the worldwide loss of credibility suffered by the nuclear industry in the aftermath of the acci-

dent at Harrisburg. In any case, the French were unable to answer China's questions on risks and security measures.

The Chinese decision against buying Framatome's power plants was the second setback suffered by the French this spring. On April 9, Iran declared that construction of two 900 Mwe nuclear reactor units supplied by French companies would be halted. Iran complained that work being done by Framatome, Alsthom-Atlantique, and Spie-Batignolles at Darkovin on the Korun River was proceeding too slowly. In contrast, construction of similar projects by the West German company, Kraftwerker Union, was over 50 percent completed. This tardiness of construction, denied by the French, was the reason given for the halt by Fereydon Sahabi, chairman of the Atomic Energy Organization of Iran.

Authorities in the American nuclear community feel strongly that despite Three Mile Island, the Chinese were highly impressed with US nuclear technology, hardware, and basic research. When China reenters the field of nuclear power and activity is resumed, American companies should have the initiative.

Reinventing the Wheel: The Direction of China's Nuclear Research and Development

To the nuclear scientist, fission, fusion, and high energy physics are distinct areas of endeavor. But to the public and to the politicians who make nuclear policy, they are essentially related, if not identical.

The vice mayors of Beijing, Ye Lin, and Shanghai, Han Zheyi, tour the control room of Penn Electric's thermal nuclear power plant.



Fang Yi's March 1978 speech quoted above, before Academia Sinica, called for stepped-up efforts in all three areas.

When Beijing began to reassess all its foreign spending, the "nuclear budget" came under review. The People's Republic had already inked an agreement to pay for US help in building China's largest nuclear accelerator at the Institute of High Energy Physics in Beijing. Cost for the 50 GeV proton synchrotron—fourth largest in the world—is expected to reach at least \$100 million, but may run to double that figure.

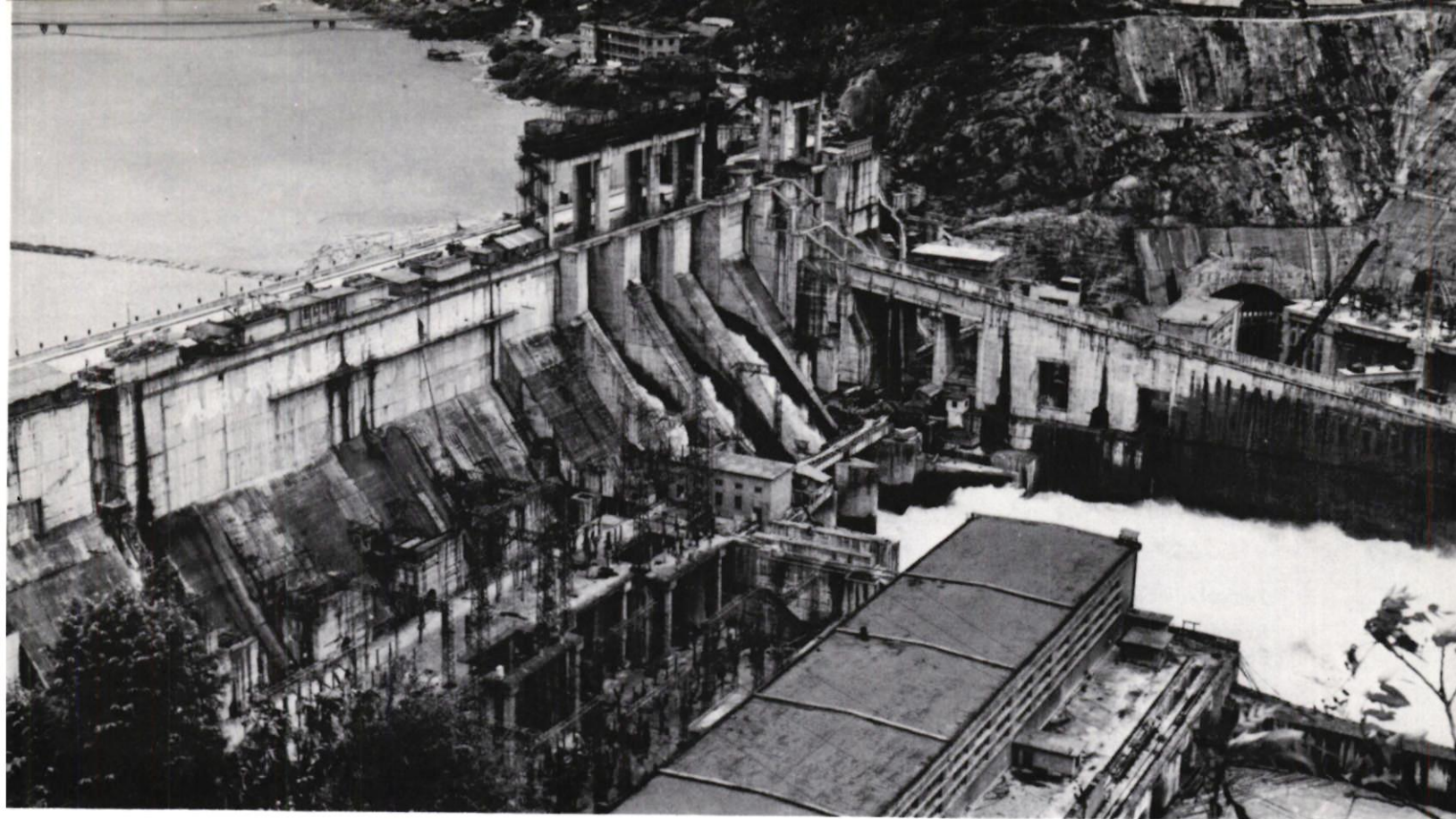
Nuclear power refers to the energy derived from fission or fusion nuclear reactions. All existing nuclear power plants produce energy from the fission of heavyweight atoms. Three isotopes are used as fuel: uranium-235, uranium-233, and plutonium-239. Fusion, on the contrary, involves controlled binary collisions between light nuclei which cause them to fuse, produce new products, and release energy in the process. The primary fuel for fusion—heavy water (deuterium)—occurs naturally and abundantly in seawater. Fusion is a potentially inexhaustible source of low-pollution energy, but there are Herculean problems still unsolved.

Fusion will not produce commercial energy until well into the twenty-first century. A fusion reaction can only occur if the nuclei have sufficient kinetic energy to overcome their mutual electrostatic repulsion, and if they can be confined together long enough for binary collisions to occur. There are two basic approaches to confinement for controlled thermonuclear fusion: magnetic and inertial. The sun's system of confinement actually represents a third method—gravity—but it is at present impossible for us to build a reactor which could encase a mass the size of a star.

Inertial confinement may be achieved through the use of lasers or ion-beam drivers. Laser fusion occurs when very powerful laser radiation heats and compresses a hollow pellet filled with deuterium and tritium. The process is so rapid that fusion occurs before the material can fly apart. It is confined by its own inertia. Magnetic fusion can take place when a superhot plasma is compressed by a magnetic field.

The Chinese are interested in fusion, but should they not take the cash (fission) and let the credit go? The leaders in fusion are, of course, the US and USSR. But the goal is still a long way off, and perhaps the Chinese feel there is time to catch up.

Nuclear research in China has been closely related to weapons development, but the PRC has the experience and technology to develop a nuclear energy program immediately. Nonenergy, nonmilitary applications have included medicinal uses, ion implantation for integrated circuits, techniques for mining and petroleum development, the characterization of iron, archaeological analysis, and earthquake prediction. However, China has experimented with light and



In the competition for capital investment in the PRC, nuclear has lost out to coal, hydropower, and oil.

heavy water Tokomak magnetic confinement fusion reactors.

The top level of Chinese nuclear scientists was trained in the West or the Soviet Union. Qian Sanqiang, the father of China's nuclear program, received his highest degree in France; Wang Ganchang in Germany; Yang Chengzhong, director of the Chinese "Los Alamos" at Lanzhou; and Dai Chuanzeng, deputy director of the Institute of Atomic Energy, in Great Britain. Wang Ganchang was formerly deputy director of the Joint Institute for Nuclear Research in Dubna, USSR, where 1,000 Chinese were trained.

According to Dr. Pierre Perrolle of the Committee on Scholarly Communication with the PRC, who has accompanied American nuclear delegations to China and Chinese nuclear groups touring the US, there is a generation gap between these older scientists and their successors-to-be. The foreign-educated maintained a "real sense of direction and a well-rounded feeling for international developments." The new generation is only beginning to "derive an appreciation for the international scope of nuclear developments, and does not have the same instinctive feeling for the way science is planned or organized outside China."

The result is that Chinese scientists display a tendency to devote themselves to problems that have already been solved or shelved elsewhere. But this proclivity to "reinvent the wheel" also reflects China's apprehension toward technological dependency.

With active assistance from Fermi, Lawrence Berkeley Laboratory, Brookhaven, and SLAC, the Chinese themselves will build the 50 GeV proton accelerator at the Institute of High Energy Physics. They have the skills to accomplish the tasks. The US Nuclear Physics delegation, headed by Professor Allan R. Bromley, chairman of the Physics Department at Yale, became the first visitors to the Vanguard Electrical Works in Shanghai. Vanguard is the main factory for accelerator parts and electrostatic parts. The delegation saw an extremely high level of technological competence there, comparable in some respects to the High Voltage Energy Corporation and the National Electrostatics Corporation in America.

Dr. Bromley feels that the proton accelerator project is of immense importance to Sino-American relations. The accelerator must be built with American assistance and built well. To a people who lately, perhaps even more than traditionally, have steadfastly refused outside help, this centerpiece in a program of technology transfer is of pivotal significance.

With or without US help, the Chinese will eventually develop a nuclear power program. For this century, they will most likely emphasize first coal and hydropower, then oil and alternative energy sources. Oil, the Chinese insist, is a hydrocarbon far too sophisticated to be wasted in combustion. Nuclear power will be approached but only very carefully. If you follow a tiger, be careful not to step on his tail. 完

Modern Engineering Technology gets fast response from Chinese readers — engineers and technocrats in the PRC

The first issue of the first international technology magazine actually typeset and printed in China obtained fast response for advertisers from the United States, Europe and Japan. Only a week after distribution over 200 inquiries had been received. . . and they are coming in daily.

Sample of inquiry cards. . .

Typical titles and organizations. . .

Researcher
Beijing Municipal Water Supply Co.

Engineer
Bureau of Capital Construction

Deputy Chief Engineer
Beijing First Machine Tool Factory

Engineer and Secretary
Electronic Society of Liaoning Province

Engineer
Beijing Municipal Design Institute
Division of Bridges & Roads

Section Chief
Automation Company

Deputy Dean
Power Engineer Department
Huazhong Engineering College

Engineer
Pipe Design Institute of the
Ministry of Petroleum

Technician
Loyang Mining Equipment Institute

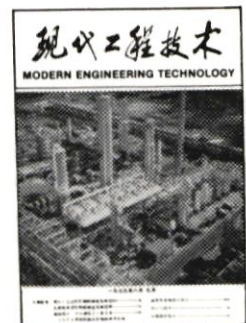
Technician
Beijing Municipal Bureau of Machinery



There were also excellent comments on the quality of Modern Engineering Technology's Chinese. All translation is under the direction of Li May Phipps, President of the National Council for U.S.-China Trade Translation Service Inc.

Send for sample copy of Modern Engineering Technology and media information.

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Notes from GUANGZHOU 46

Fewer US Traders Attend, but They Do More Business

In sharp contrast to last spring's Fair, the 46th Chinese Export Commodities Fair was characterized by good planning and effective coordination. In an effort to avoid the terrible overcrowding of last spring's Fair, Hong Kong firms were allowed to send only one representative per company.

In addition, the Chinese placed a strong emphasis on selling during the first two weeks of the Fair and buying during the last two weeks. In fact, many Chinese buyers did not even arrive until the beginning of November. This helped moderate attendance and alleviate the extreme overcrowding on the first days of the Fair that so dismayed visitors last spring. Still, some American business people complained that they did not hear of this selling/buying division before the Fair started.

Roughly 700 US business representatives from about 400 American companies attended the Fair, about 30 percent fewer than last spring. Yet US companies did roughly \$120 million worth of business, according to National Council estimates—an increase of \$20 million over last spring's Fair, but still short of the record-breaking fall 1978 Fair. American companies bought about \$55 million worth of Chinese goods at this fall's Fair, while Chinese purchases of US goods totaled roughly \$65 million, mostly in chemicals.

A total of 25,000 business people from 97 countries and regions attended the Fair. Business with Japanese firms was down considerably, possibly reflecting Chinese preference for conducting major deals with Japanese in Beijing and Shanghai.

China National Native Produce and Animal By-Products Import and Export Corporation (CHINATUHSU) was this Fair's most successful corporation, selling about \$18 million worth of goods, an increase of 50 percent over last Fair.

The most spectacular growth in exports was posted by one of China's newest FTCs, the China National Machinery and Equipment Export Corporation (EQUIPEX). This corporation's sales of \$2.5 million—mostly lathes, machine tools, and chain blocks—represented a 200 percent increase over last Fair's sales.

Hong Kong Enterprising Spirit Follows Its Dollars

Is Guangzhou merging with Hong Kong? Many traders wondered, as hotels, shops, and even cabbies in Guangzhou began demanding payment in Hong Kong dollars. The Dongfang Hotel was operating its new foreign currency restaurant, and it was inviting hotel guests to pay all bills in Hong Kong dollars. Retail stores

using foreign currency opened up both at the Fair and in town. Cab drivers were requesting payment in Hong Kong dollars. Hong Kong films were shown at the Fair cinema for tickets in Hong Kong currency.

The black market in Hong Kong currency was flourishing, undermining the official exchange rate of HK \$100 to ¥30 by such amazing rates as HK \$100 to ¥50 and HK \$100 to ¥100. Local Chinese queued up outside the Fair's retail shop to buy bicycles, tape recorders, and televisions with HK dollars. Enterprising Chinese were selling foreign consumer goods on the streets at outrageous renminbi prices, too, showing that Hong Kong had spread more than just dollars to Guangzhou.

Visa cards were accepted at Guangzhou's Bank of China branches, allowing cardholders to draw renminbi up to a limit of HK \$5,000 (US \$1,000) for a four percent commission fee.

Injecting a Note of Socialist Competition

The foreign trade monopolies in China are slowly cracking, as policy decisions come down from above to inject a further note of competition. At the fall Fair, for the first time, foreign trade corporations (FTCs) were competing with one another to sell the same product.

One FTC official explained that a policy change allowing for handling of the same product by two FTCs was passed down in early October. At the Fair, examples of the new policy abounded. Both INDUSTRY and EQUIPEX displayed electric fans, cameras, film projectors, porcelain insulators, and electric wires. Both CEROILS and TUHSU pushed canned foods, medicinal wines, and dried fruits. Negotiations for the sale of industrial fasteners were held by both EQUIPEX and MINMETALS. ARTCHINA lamented that its Gung Fu shoes and slipper sales were down because LIGHT INDUSTRY was selling the same product.

FTC officials at the Fair complained that the new practice had resulted in fighting and price competition among the FTCs. Although some importers also expressed confusion, and although misunderstandings may result, especially concerning exclusives, the new development heralds a greater openness in China's foreign trade practices.

Another sign of moves in that direction was the presence at the Fair of representatives from Xinjiang, Tibet, and Heilongjiang Province for business discussions.

China Shifts to Beijing C&F

The increased competitiveness among US shipping lines in China, among other factors,

has caused a change in China's shipping policy. In a departure from China's past preference for buying on an f.o.b. US port (shipped) basis during this Fair, many purchases by China National Chemicals Import and Export Corporation (SINOCHEM) were contracted for on China port (landed) terms (c&f).

This can be explained in part by China's difficulty in chartering foreign vessels due to foreign exchange constraints, as well as increasingly competitive rates of US vessels, such as the Lykes ships. Also, provincial branches, which now do more and more of their importing direct, appear to be unable to secure vessels from the centrally controlled fleet, which already lacks vessels suitable for certain needs.

The Future: Mini-Fairs, Foreign Exhibitions, Year-round FTC Offices

Rumors abounded about the future of the Fair and fairgrounds. It seems that the biannual Guangzhou Fair will continue as in the past with full FTC participation. But the fairgrounds will be used more fully in the future, as the Guangzhou Trade Center.

During non-fair periods, the FTCs will hold mini-fairs on the fairgrounds--sometimes even two at a time. Invitations and visas for the mini-fairs will be handled as usual, through head offices.

Some products displayed during the Fair will remain on display in the exhibition hall and grounds, and the Guangdong branches will maintain offices in the exhibition hall year-round for business discussions. The Fair's retail store using foreign currency will expand its operations and remain open year-round.

As announced earlier, foreign firms will be invited to exhibit during non-fair periods, and some of the Fair facilities will be used for technical presentations and seminars by foreign firms. However, there are presently no accommodations for permanent foreign exhibits or offices.

Available space includes 2,000 square meters indoors and 3,000-6,000 square meters outdoors for foreign displays. Companies interested in arranging exhibits on the fairgrounds should contact Wu Guyi, deputy secretary-general of the CCPIT Guangzhou subcouncil. Cable: COMTRADE GUANGZHOU; telephone: 35468, 32662.

Main Purchases from US: Chemicals

The bulk of Chinese imports from the US consisted of some \$60 million worth of purchases by SINOCHEM, which outweighed in value all of China's sales to US companies put together. The Chinese bought roughly \$20 million worth of plastics, reflecting the recent decision to increase imports of light industrial raw materials by 17 percent in 1979. Other major purchases included a record \$5 million of medical equipment. Surprisingly, there were no purchases of US agricultural chemicals and China for the first time was offering 23 types of agrichemicals for export.

SINOCHEM's sales of \$5 million to American firms were smaller than last Fair's, but included a 60 percent increase in pharmaceutical

sales. Paraffin wax, a big seller in the spring, had no takers at the fall Fair. All in all, SINOCHEM's worldwide purchases of \$200 million far exceeded its worldwide sales of \$45 million. Overall, the volume of chemical transactions increased some 60 percent.

In a further effort to promote chemical trade with the US, SINOCHEM will send a permanent representative, Tang Xieliang, to the US in late December or January.

Metal Buyers Complain of High Prices, Tight Supply, As MINMETALS Reorganizes

China National Metals and Minerals Import and Export Corporation (MINMETALS) experienced another relatively poor Fair, as exports to US firms totaled a mere \$3.5 million, although the overall volume of transactions in metal and mineral products increased by 90 percent. Some traders complained that the MINMETALS price structure was quite unrealistic--in fact, Chinese mercury prices were consistently 10 to 15 percent above the LMB. The Chinese said that their prices reflected high domestic costs and low inventories. All items were said to be in tight supply, and no copper or tin was available.

MINMETALS has completed its reorganization into nine departments: four import departments, one import-export department, and four export departments, as follows: Department 1: steel imports; Department 2: nonferrous metals imports; Department 3: imports of wire, door frames, fencing, etc.; Department 4: pipe and sheet metal imports; Department 5: cement and coal imports and exports; Department 6: steel and iron exports; Department 7: hardware and nail exports; Department 8: exports of non-ferrous alloys and high-purity metals; Department 9: mineral exports.

ARTCHINA Shows Design Flexibility

Importers commented that ARTCHINA showed increased flexibility and genuine willingness to manufacture according to specifications and design. A new feature in the Beijing (Peking) Jewelry Branch room was a designer available to work with customers on special designs.

US companies bought \$10.2 million worth of ceramics, embroidery and table linens, antiques and reproductions, and cloisonne at the fall Fair. Limited quantities of handicraft items, especially embroidery, and slow shoe sales due to the American Selling Price restriction on Gung Fu shoes and competition from similar styles offered by INDUSTRY kept sales down.

--Based on reports from John Kamm, National Council liaison in Hong Kong, and Carolyn Brehm, director of Importer Services. 完

CORRECTIONS, CBR 6:5

On page 21, paragraph 4, the date is July 11, not May 11. On the same page, column 3, the last paragraph should read: "New loans to Asia in fiscal 1978 . . ." On page 22, paragraph 3, the name Irving Trust Company should be substituted for Bankers Trust Company. On page 59, the table on suspended Japanese contracts should have been dated September 1979, rather than 1977.

China's Import Priorities

Yuan Baohua

In an interview with China Business Review on November 10, 1979, Yuan Baohua, vice chairman of China's State Economic Commission, discussed the significance of China's technology import strategy and other issues under the readjustment policy. He later presented his thoughts in a short article that follows below.

Problems

In the first few years following the enactment of the modernization plan, China will need time to readjust. The economy was so seriously sabotaged by the Gang of Four that it was close to collapse. Readjustment of our national economy consists mainly of:

- the need for balanced development of various industrial sectors in the economy and for better coordination between sectors;

- the need to restructure existing enterprises sabotaged by the Gang of Four;

- the need to modify the existing economic management system to meet the conditions essential for economic modernization;

- the need to raise standards of both general and technical management.

These policies were adopted during the second meeting of the Fifth National Congress. For details, please refer to the report made by Premier Hua Guofeng.

Although the policies apply only to our readjustment, they have caused many to wonder what has happened to China's Four Modernizations. Our foreign friends say that readjustment is a sensible move, but ask whether we still intend to import or buy foreign tech-

nology and equipment during this period.

I can say this: during the period of readjustment, we need to absorb foreign technology and equipment. We need foreign technology and equipment most of all during this period in order to lay a firm foundation for modernization. We will, therefore, continue to import advanced technology and equipment to improve existing plants.

China wants to import advanced technology and equipment from the US; but we must export a comparable amount of our products in order to cover costs and in order to achieve balanced trade. We can export petroleum, fuel, various minerals, and many types of light industrial products. Therefore, if the American business community can help China improve production quality and variety of her light and textile industries, I am sure that trade between the US and China will develop quickly.

If, on the other hand, we only buy technology and equipment and do not increase exports we will create an imbalance. Even if the US were willing to give China loans, it would require a long period for repayment. But, regardless of the means we will use in the future, we must develop China's productivity now in order to improve our repayment capacity. I am sure our American friends can understand this view. Let's take the machinery industry as an illustration. Our production capacity for machinery is considerable, but production quality and variety are not ideal. We want to explore means of developing these products for export with our American friends. For some machinery or machine tools, the

cost of production is high in the US while it is low in China. We believe that such labor-intensive products—machinery, machine tools, and some parts—can be made in China. I believe that we can work together on this in the future. We might, for instance, import the equipment needed to manufacture the above-mentioned products in order to improve the quality and increase the variety.

Utilization of imported technology and equipment is another problem. For instance: suppose we imported a lathe whose daily output is 100 units. And suppose 30 percent of the products are rejected because they did not meet standards. Then, the lathe's productivity is only 70 percent. Now, if we can improve management and quality control, and eliminate the 30 percent of rejected pieces, we will be able to increase the productivity by 30 percent.

The present problem, I think, is not merely one of technology or equipment or management, but one of the lack of people with advanced management capabilities to manage the advanced technology and equipment. I think people with these skills are much more important than advanced technology itself.

When we were visiting Japan and Western Europe, we were told that these countries suffered through an extremely difficult period after World War II. How did they develop so quickly? The reason is that they had effective managers of business enterprises and the economy.

Last year, I wrote an article on training technical people for the *People's Daily*. The article, entitled, "Technical Training of Staff and



Yuan Baohua with National Council officers and members of the SEC delegation, November 10, 1979.

Workers Is of Great Urgency," states that the most pressing need now is to provide training for workers and staff to raise their technical standards. The article was published in August 1978.

Priorities

As to the questions you have raised on the types of technology and equipment China would like to import from the United States, I think our American friends should be clear about this. Since last year, many Chinese delegations and technical groups, most of which have been decision-makers, have visited the US. They are looking to see what kinds of American technology and equipment match with China's needs. After completing our investigation and study, the material collected will benefit us in our collaboration with other countries or foreign companies. Although Chinese government authorities have contacted US companies on a number of projects, we are still in the process of studying the situation and establishing our list of priorities:

Energy—Of primary importance is the technology and equipment necessary for the development, exploration, and production of energy. China is rich in energy resources, such as coal, petroleum, gas, shale, and water resources for hydropower stations. The US has already sent delegations to China to study the situation. Some of the projects, such as one hydropower station, are enormous in scale and for these a longer planning period is needed.

Chemical Industry—Second in importance is the chemical industry, particularly the petrochemical industry. China has already constructed a num-

ber of plants in this area and further needs to improve other existing plants.

Mining and Metallurgy—The third in the sequence of priorities is the industry for mining ferrous and non-ferrous metals. This includes mining, processing and fabricating. The US has sent technical delegations to China to investigate the situation, especially groups interested in iron and steel. We need rolling mills for fabricating steel products. China has a few rolling mills built during the 1950s which need renovation. We especially need to import technology to improve our iron and steel industries.

Construction Materials—Another area of importance is that of construction materials. We feel that we must make improvement in this industry, particularly after our visits to the US. We need to develop the production of modern construction materials.

Light and Textile Industries—Important also are light industry and the textile industry. American friends are aware of the rapid development of our light and textile industries. But, in order to improve the quality and increase variety and production, we need advanced technology and advanced equipment.

Transportation—During the implementation of the Four Modernizations, China must improve her transportation system. A few days ago, in a conversation with a member of the Department of Transportation, I said that China's transportation means and methods are not very modern. She told me that there are only five locomotives left in the US with steam engines fueled by coal; in China, 90 percent of our locomotives are based on steam. The Chinese rail system also is in need

of modification and electrification. We have investigated the situation in Japan and Western Europe. Personnel from our transportation organizations have also visited the US. There are many ways in which we can collaborate with the US, such as in the modernization of our port facilities, expansion of our fleet, production and modification of our transportation vehicles, and development of our airlines.

Because American industry, technology, and equipment are so advanced, there are many aspects where we need to learn from you.

Laying the Foundations

Our work in the last two years has actually been preparatory work. We are laying a firm foundation. Our goal to achieve modernization is self-evident, but if we wish to realize better or more quickly, we must learn from actual experience. We have been to Western Europe, Japan, and now we have come to the US; our main purpose is to study and absorb methods and experiences which may be helpful to the achievement of our goals.

It is not only advanced technology and equipment that we need, we also need advanced management. It is like the use of a computer: software is as essential as the hardware. The question of advanced management is also one of the aims of our delegations.

As I have told Mr. Phillips, president of the National Council for US-China Trade, we have established the China Enterprise Management Association. I am the chairman, and Mr. Zhang Yanning is the secretary-general. Our purpose, with the collaboration of government and private organizations, is to improve our management and the state of our economy, along with the import of technology and equipment.

We are doing our best in all of these areas. We have just begun relationships with Japan, West Germany, Switzerland, and other European countries. If possible, we would like to establish similar relationships with our American friends. I am sure our efforts will bear fruit.

We must evolve an import strategy through direct experience of the technology before we can efficiently utilize imported equipment. With efficient utilization, we can import even more in the future. These are my hopes for future trade between the United States and China.

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Implementing China's Plans

An Interview with Zhang Yanning

The director of the Production Coordination Bureau of China's State Economic Commission, Zhang Yanning, was interviewed by CBR staff members on November 10 and 11. Mr. Zhang is one of eighteen delegates on a National Council-sponsored US tour led by the vice chairman of the State Economic Commission, Yuan Baohua, who also agreed to a CBR interview on November 10 (see page 45). The following questions and answers touch on planning, joint ventures, and management reform. The last topics are of special interest to Mr. Zhang, who is concurrently secretary-general of CEMA, (the Chinese Enterprise Management Association).

How has the new 3-year readjustment plan (1979-81) and the setting aside of the 10-year plan (1976-85) changed the SEC's responsibilities and the basic orientation of its work?

During the readjustment period of our national economy, there is still a need for constructing some new plants. But due to the fact that the capital we have in China is limited, it is impossible for us to build many large-scale plants. So our main emphasis is on remodeling of existing plants . . . especially plants built in the 1950s and 1960s. In the modification of existing plants, which is the task of the SEC, management plays a very important role.

The future trade between China and the US should pay attention to this emphasis. Trade should not be limited to the supply of new equipment or the construction of new plants, but should focus on the remodeling of old equip-

ment and upgrading management at existing plants. This type of trade has broad prospects in the near term.

When an existing factory undergoes expansion in China, how is the project approved and where does it obtain financing in the case of a:

- small plant under municipal control?
- medium-size factory under a province?
- large-scale factory directly under ministry control?

The SEC specializes in the management of medium- and large-size enterprises, although on certain occasions the SEC will lend assistance to small-scale collective enterprises that local governments have difficulty managing.

In the case of a plant under provincial control, the plant will report to the province. If it is under the control of a central ministry, then it will report to the ministry. Plants which wish to expand must report to their higher authority. So provinces are responsible for putting together the expansion plans from different plants, and must organize these proposals into an overall plan. A ministry will do the same. And then the province, or the ministry, must submit a proposal to the SEC. The SEC then discusses and negotiates this matter with the State Planning Commission to see how much capital we can invest in remodeling existing plants. And then there is the State Planning Commission which makes an overall national plan. Then we decide what projects may go ahead, and what projects must wait. That is the general procedure.

In the above example, is the ap-

proval process the same when a new plant is built?

If it is a new plant, or a major expansion of an existing plant, then the project is passed on to the State Capital Construction Commission and the State Planning Commission.

How is the line drawn between large, medium, and small plants?

It is very complicated. There are no immutable standards distinguishing between large, medium, or small enterprises. For example, a chemical fertilizer plant that produces over 100,000 tons in a year is called a big one. But a few years ago a plant was called big if it produced 50,000 tons. In the future we may pick 100,000-tons capacity as medium-sized.

We learned from a previous SEC delegation that investments above RMB 10 million ("above norm projects") require the approval of central authorities.

It depends on what projects we are talking about. These sorts of criteria are flexible rather than absolute.

How many of the 120 projects that were mentioned in connection with the 10-year plan (1976-85) are still under construction? Could you please comment on the status of the projects?

These are the projects which are needed for the Four Modernizations of China. The National People's Congress has suggested that we need three years for the readjustment of our national economy. The reason for the three-year readjustment is to lay down a very solid and good foundation for the Four Modernizations. During these three years of adjustment there will



Vice Chairman Yuan Baohua examines electronics panel with Chang Lunkai, interpreter, and Zhang Yanning, secretary-general of CEMA.

be some adjustments, so I think there will also be some change in the 120 projects. Some of the projects will go ahead, go faster, and some will go slower.

We understand that the SEC and CEMA conduct management training classes. Who attends these courses?

These classes are sponsored by the SEC and CEMA. We are beginning our fourth class for training management people. There are about 100 people in every class, and each is for about one or two months. The people trained are the chairmen of economic commissions, and members of provincial, municipal, and autonomous region economic commissions, department directors of different industrial ministries, economic commissions of big or medium cities, and the responsible members of large enterprises in China. Besides these classes, provinces, big cities, regions, and all industrial ministries have their own classes for training managers, so tens of thousands of people are receiving such training.

Can US businessmen who are interested in establishing joint ventures in China attend these courses in order to learn about China's tax system and enterprise management system?

If foreign companies want to have a better understanding of joint ven-

tures in China, they had better go to the China International Trust and Investment Corporation.

Earlier you mentioned management rules and regulations. Does the SEC issue such regulations?

It depends on what kinds of regulations you are talking about. For management and operations, yes.

What about the planning of joint venture enterprises. What will be the SEC's involvement?

If we are going to establish joint ventures in the future, the control of SEC over these enterprises is something that we must discuss. I think that if we are going to have an organization for managing joint ventures, the SEC may indeed become involved.

At the present time, we are collaborating with foreign countries and foreign companies in order to find ways to establish joint ventures with existing plants in China. So we are arranging some technical exchanges and exchanges of views between Chinese enterprise and relevant enterprise abroad.

Could you please explain how the SEC coordinates its work with local planning offices?

Every province and city has an economic commission, planning commission, and a capital construction commission. The State Economic Commission has a relationship with local economic councils.

Are not these the branches of

the SEC, the State Planning Commission, and other central government bodies?

They are not the branch offices. For example, the Shanghai Economic Commission is in charge of the operations of industry and transportation in that area. They are independent. The people who are directly leading them are the provincial or municipal governments. However, they must also accept the leadership of the SEC, the State Planning Commission, and the State Capital Construction Commission.

Exactly what authority does the SEC have over these local economic commissions?

The economic commissions of provinces, autonomous regions, and cities must report to the SEC every month. Every quarter the SEC will send out instructions, and every month they are supposed to report, or to telephone, to the SEC and say what they have achieved in their tasks.

With regard to all major sectors of industry and transportation?

All sectors.

What happens when there are disagreements?

When there is conflict between two enterprises, two departments, or two ministries, then it is the SEC who advises them how to solve the problem. Of course at the beginning we will have some negotiations and some discussions. Sometimes we don't have time to do that, and then the decision of the SEC must be carried out by the enterprises and the local governments. As we say in China, local interests must accommodate the national interest.

In view of the SEC's broad responsibilities in all aspects of annual planning in industry and transportation, what responsibilities are left to the ministries?

The SEC has a small headquarters staff of only about 300 people. We are very careful that we do not replace the ministries. We need the ministries to take care of plants. We become involved only when a ministry does not pay enough attention to a particular problem, or when there is a conflict of interest between two ministries. We alert them to what they ought to focus on. Every month we hold meetings with ministry heads to discuss such problems.

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China Liner Services Approved

The final agreement signed in July between Lykes Brothers Steamship Company and China Ocean Shipping Company (COSCO) established the first regularly scheduled cargo liner service between China and the US since 1949, but it disturbed several other shipping companies also eager to ply Chinese waters. Lykes, which sent the first US-flag ship to the PRC in March under a preliminary agreement with COSCO reached in February, sent six ships to China under the preliminary pact, docking in Shanghai, Qingdao, and Huangpu (Whampoa). The Chinese bulk carrier *Liu Lin Hai* has twice called at US ports under the preliminary pact with Lykes, first at Seattle in March 1979.

Soon after Lykes filed the agreement with the Federal Maritime Commission (FMC), Sea-Land Service Inc. registered an opinion recommending approval only if the agreement was opened to all US-flag carriers. The one-year Lykes/COSCO arrangement calls for a minimum of three sailings by each party per year, mutual help in

each other's ports, separate cargo bookings, and an exchange of information.

Sea-Land objected to this last provision, saying it was exclusionary. When Lykes declared that the agreement was not exclusive and that the information provided would be "of a general nature already in the public domain," Sea-Land said it would withdraw its objections. FMC approved the Lykes/COSCO pact on October 31.

Among other companies said to be negotiating to begin direct service to China are Waterman Marine Corporation, American President Lines, and Seatrain Lines. American President Lines sent a ship to China in October, its first since 1950. APL's *President Wilson* discharged cotton at Xingang and picked up 93 containers of Chinese exports.

Lykes and three other US shipping companies are also trying to negotiate an arrangement for shipment of Chinese cargos in containers to US ports by transshipping them through third-country ports, in Japan or Hong Kong. US Lines, Inc., began such an

arrangement in late May when it loaded containers on a small freighter in Huangpu (Whampoa) Port near Guangzhou and hauled them to Hong Kong for transshipment to the US.

It now has a twice-monthly container service to China based on transshipment, using Chinese container vessels. Other transshipment routes out of Shanghai and possibly Tianjin (Xingang Port) via Hong Kong are under consideration and may be added later.

Maersk Line recently signed an agreement with China Merchants Steam Navigation Co. Ltd. for through container service from the US and Canada to China. The accord calls for Maersk to ship containers to Hong Kong and for China Merchants to transship them to major Chinese ports.

Japan-China Liner Service

Japanese ship-owning companies and Chinese officials have established a subcommittee to discuss a Japanese proposal concerning the opening of regular liner service beginning April 1, 1980, and the unification of freight rates and tariffs. The Japanese presented these proposals during a visit of a delegation to China in early September. The subcommittee is also to discuss such issues as the number of sailings, routes, cargo collection methods, availability of berths, and mutual cargo shares.

Japan began liner service on a trial basis in late May to the ports of Shanghai, Xingang, and Qingdao, and the two countries began operating four sailings a month. COSCO had been reluctant to accept some international practices, such as application of unified shipping rates and announcement of the rates, but Japanese officials learned this summer that the Chinese would consider accepting some of these conditions.

—DJ 完



"It's Harrison in Beijing. He says we've got a deal if you'll take payment in cuttlefish..."

Pan Am Agreement Raises Competition Issue

After thirty years with no direct air service between the US and the People's Republic of China, December 1979 marks two "firsts": the first nonstop flight from the US to China open to the public, and the first time China's national airline, CAAC, will operate public flights from the United States.

Both are charter flights in a series of six San Francisco-to-Shanghai flights this winter under an agreement between Pan American World Airways and the General Administration of Civil Aviation of China (known as CAAC for its former name, Civil Aviation Administration of China). CAAC operated two charter flights to the US this fall, but both were special one-time flights, not open to the public: one was a cargo charter, the other carried a cultural troupe.

For its three charter flights this winter, CAAC has leased a Boeing 747-SP jumbo jet and cockpit crew from Pan Am for each flight in order to gain familiarity with the handling of 747s and with the tourist market in the US. The Chinese have ordered three Boeing 747-SPs, which will be delivered in early 1980.

For the CAAC charter flights, the leased 747 jet will have Pan Am markings on the outside, but cards inside the jet will show that it is a CAAC flight, and the passengers will hold CAAC tickets issued for the Chinese by a newly formed New York travel agency, China Horizons. As part of the agreement, Pan Am will also operate, at staggered dates, three charter flights to Shanghai. CAAC will pay Pan Am a total of \$89,080 per flight. Each airline will handle ground operations for the other in its own country. Pan Am also agreed to train

eight Chinese pilots and four flight officers in the US.

Pan Am and CAAC applied in mid-August to the Civil Aeronautics Board (CAB) for permission to carry out their lease agreement, and CAAC filed for an exemption to the CAB's rule that allows only foreign air carriers holding a CAB permit to service the US. The two airlines also asked the CAB to speed up the process and give them an answer by September 15.

Question of Competition

Fear that the agreement might preclude competition among US carriers for the US-China service was the major point of contention in the CAB approval process. In the government-to-government negotiations over a US-China civil aviation agreement, the Chinese made it clear earlier in 1979 that they preferred to deal with a single American airline, while the US government's position has been that several American airlines ought to be able to fly to China.

Seven other US air carriers have filed with the CAB requesting the right to schedule air service to Chinese cities. Of these, Pan Am, Northwest, and TWA had CAB certification for flights to China before 1949, and Pan Am and Northwest were actually operating flights to China before service was cut.

Pan Am, which first became involved in Chinese aviation in 1933 by acquiring the American interest in China National Aviation Corporation, then China's national airline, was one of the first American airlines to establish links with the PRC after trade was reopened. It has flown several private charters to China in the past year,

such as one for the Boston Symphony. These flights were special-purpose charters not open to the public. Pan Am's wet-lease agreement with CAAC for the six charter flights this winter seems to be further evidence of its close relations with the Chinese.

The CAB staff hesitated on the Pan Am/CAAC application initially because it questioned the Chinese assertion that CAAC routinely grants foreign charter requests "subject, inter alia, to the availability of ground accommodations." The staff asked for more information from China on its policy toward Pan Am and other airlines in terms of allocation of ground accommodations (such as hotels and interpreters). "We are concerned that this proposal not confer on Pan American a preferred position that would harm the interests both of other US carriers seeking entry into the US-China market and of the traveling public."

The day after the CAB staff announced its decision not to speed up the application process, the State Department "submitted its views" to the CAB in a statement supporting Pan Am and CAAC's request. It said that the State Department did not know of any occasions when the Chinese had turned down the request of another US airline to run charters since normalization, noting also that the Pan Am/CAAC agreement would not, in its view, have any anticompetitive effects because it was limited to six flights. The State Department has been largely responsible for negotiating a civil aviation agreement with the Chinese government, and it stated that the CAB should not try to use this administrative proceeding to resolve the "host of basic questions" remain-

ing on US aviation relations with China.

CAAC also responded through its Washington lawyer by reiterating that CAAC has already granted US carriers the right to operate charters to China, subject only to the constraints of China's tourist infrastructure. It stated that there was "absolutely no basis" for the speculation that China might not allow other US carriers this right.

Two other US airlines also filed statements: both TWA and World Airways stated that they did not oppose the agreement, on the assumption that the Chinese would not preclude them and other American carriers from approval to conduct charter flights.

Beijing's New International Airport to Open

Beginning in early 1980, the new Beijing International Airport, adjacent to the old airport, will be open to passengers. According to the *Beijing Review*, the main structure is the

new five-story terminal, nearly six times larger than the present terminal. It has two "satellite" wings, each of which can handle eight planes; altogether, the terminal can handle up to 1,500 passengers an hour. The terminal also contains a 500-seat restaurant for transit passengers, as well as a lounge for the reception of visiting dignitaries and offices for some 30 foreign airlines.

The terminal's main halls are decorated with more than 50 murals, traditional Chinese paintings, oil paintings, and prints. According to Xinhua, these works of art have "caused a sensation in Beijing"; Xinhua also notes that "it is a miracle that the art field could achieve such an accomplishment in such a short period after the downfall of the 'Gang of Four'."

On either side of the terminal building are new 3,000-meter runways designed for use by jumbo jets such as the Boeing 747s that China has ordered. The automatic dispatching system and the telecommunication facilities at the airport were imported,

but all the other automatic equipment, of which there are over 1,000 pieces, was designed and made in China.

In addition to the terminal the Chinese have built a six-story, 300-bed hotel, as well as a 400-car parking lot. The new airport also includes "a lookout for welcoming and seeing off passengers, a hangar for inspection and overhauling, a control tower, an overpass, a general fueling station, and a works for the disposal of polluted water," according to the *Beijing Review* report. Construction on the new airport, begun in 1975, was finished in time for the National Day celebrations on October 1, 1979.

The Chinese also recently completed a new airport at Harbin in Northeast China, and they are building or expanding airports in Hefei in Anhui Province and Urumqi in Xinjiang. They recently opened a newly expanded airport in Tianjin and plan to begin building a modern airport capable of handling jumbo jets in Wuhan soon.

—DJ 完

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Rong Yiren Responds to Questions on Joint Ventures

Following his address to National Council members at the Washington Hilton on October 9, 1979, the President and Board Chairman of the China International Trust and Investment Corporation, Rong Yiren, agreed to answer questions from the floor. The first two questions were asked by the forum's chairman, Walter Sterling Surrey:

The first question I would like to ask you, sir, is whether the joint venture law is primarily intended for enterprises which will earn foreign exchange?

The main purpose of the law on joint ventures is to attract foreign capital. That includes joint venture enterprises in order to accelerate the pace of our Four Modernizations. Of course we hope that foreign investors can earn foreign exchange. But I should like to make it clear that this should be for the purpose of promoting our construction work. And I would like to make it clear that the foreign exchange would be remitted home so far as foreign investment is concerned.

Thank you very much. My second question refers to a report in the *New York Times* of October 1st of an interview with you in which it is reported that there would be a guarantee of profits for the foreign joint venturer. We were not quite clear what this really meant.

When we say we guarantee foreign investment in China, we mean that we guarantee that foreign investors will have legitimate profits in China. Generally speaking, an enterprise with advanced technology, production methods, and scientific management, can earn a profit. And from our point of view when we establish an enterprise we also would like to make a profit in order to expand our reproduction. Consequently there would be no enterprise in which only China makes a profit and the foreign participant cannot make a profit. That's why I say we can guarantee.

When can we expect China to enact the taxes on companies and on individuals?

This taxation law question is a question of concern to all. I don't know when the taxation law will be promulgated, but I know that it is being drafted and I believe that before long it will be completed.

Can you tell us when you expect the company law to be enacted?

That probably has to come after the taxation law. But it is also being drafted.

Can you say anything about the patent law, when that will be enacted?

About the patent law, I would like to say that it will be included [in the contract] between the parties when they reach agreement. The patent law is also being drafted.

You have enacted one foreign exchange control law dealing with blocked assets. Are you proposing to enact another foreign exchange control regulation?

We are going to have another foreign exchange control regulation.

One question that has puzzled some of us is how China will determine the value of land and buildings which are contributed by the Chinese member of a joint venture.

The valuation of land and the buildings will be decided through discussions of the parties concerned.

Article 5 of the joint venture law states that technology contributed by the foreign participant will be truly advanced and appropriate to China's needs. Is it possible that these two concepts could conflict with each other, since what may be appropriate in the circumstances of a particular industry at this time may not be the most advanced technology?

What is meant by advanced technology can only be relative. Whether it is advanced or not can be decided only when the parties sign the agreement. And about Article 5, I would like to say that what is meant by genuinely advanced is that, when it is provided in the agreement of the parties, that they would mean what they say by being truly advanced. And if the result goes counter to the provision of the agreement, then a dispute would arise.

Will there be detailed regulations promulgated to explain the general language of the joint venture law?

We are considering the implementation of certain supplementary regulations. But more specific regulations have to be stipulated in agreements signed by the parties concerned.

Is the China International Trust and Investment Corporation the appropriate group with which to discuss ventures where the foreign entity wants to have 100 percent ownership?

We can also consider 100 percent foreign investment provided it's conducive to China's Four Modernizations.

Do we have any idea what the time limit may be on a joint venture?

That would be decided by the parties concerned through consultations. Maybe five years, or ten years, or even twenty years.

Will the Bank of China be in a position to provide working capital and term loans for a joint venture?

When the joint venture is set up it can consult the Bank of China on this question.

In a joint venture, can the investment of the foreign entity entering the joint venture consist in whole or in part of technology that it provides to the joint venture?

Technology can be counted as a kind of investment.

When considering a joint venture proposal, is there a time limit within which the joint venture will be expected to earn foreign exchange for China?

There is no such limit.

Will CITIC be involved in any way in the negotiations of joint ventures which American oil companies may work out with the China Petroleum Corporation for exploration and production?

So far as I know, certain American companies have already talked about this question with [the authorities] concerned, even before the establishment of the CITIC. So they can continue their talks. If those parties need us to take part, we can also participate.

You have just invited a lot of people to come and visit you. Will joint ventures take place in the agricultural sector, such as sea production, irrigation equipment, poultry, swine production, etc.?

Yes, of course it can be considered. Agriculture is an important aspect of our national economy.

Will priority be given to companies which help expand exports from China to the hard-currency market?

We should give priority consideration to those enterprises which are beneficial to our Four Modernizations and, of course, we should also give a special welcome to those enterprises which will increase our foreign exchange income.

How will decisions be made when the foreign investor owns more than 50 percent of the enterprise?

On this I would like to say something about the spirit of our joint venture law. The joint venture enterprises in China should be established on the basis of equality and mutual benefits. No matter whether they have a bigger proportion of capital or not, the joint enterprise will be protected, which means that legitimate rights and interests will be guaranteed and protected by the Chinese government. And when you say a joint venture you mean that you have two parties, a Chinese party and a foreign party. And sometimes this party has more capital and sometimes the other party has more capital. In order to be fair we have to protect both parties. Both the party with more capital and the other party with less capital. So in one enterprise, no matter whether the amount of capital is big or small, matters can be decided only by unanimous consultation.

Consequently, we provided in our joint venture law that decisions will be made in the board of directors through the methods of consultation, and not in proportion to the stock. So when the Chinese side has more investment in the enterprise, or when it has less investment, the vote is all the same. And so far as the question of the chairman of the board of directors, I think you can probably appreciate that as China is the host country a Chinese should be the chairman of the board. In addition, we have provided clearly that the vice chairman of the board would be a foreigner. We have no specific stipulations with concern to the general manager and the deputy general manager. They may be a Chinese or a foreigner.

In the case of unproductive workers, based on your answer, I assume that they could be removed by joint consultation of management as a whole?

I think so. But I would like to say that, first of all, we have to educate the workers. And if we have to dismiss a worker that will be something which you would like to do only when it's really compulsory.

At the present time there is in China a consolidated tax. Will joint ventures which are entered into be subject to the consolidated tax, or will they only be subject to the forthcoming income tax?

The consolidated tax is a different concept from the income tax law to be promulgated. The consolidated tax only concerns goods. And the new law which is being drafted concerns only income taxes.

Will the foreign investment commission be able to inject itself into the negotiations to modify agreements if it finds that the agreement submitted is not satisfactory, or will its role be only to accept or reject a joint venture proposal?

The commission takes care of approval mainly. It does not take part in drafting the agreement, but of course it can also take a part in and put forward opinions about the investment.

Will CITIC establish an office in the United States which can have a role in the preliminary negotiations?

Since CITIC has been established only recently, we have to make further considerations in the question of whether a branch office will be set up in the United States.

How does an American firm contact CITIC?

They can write to us or they can communicate with us by telex. We are not afraid of having business.

Can you say anything about joint venture agreements which have already been reached? Their nature, the total investment, type of industry, and whether it is in servicing or manufacturing?

I think they [feel the same] as you ladies and gentlemen present here. They would like to keep their business affairs within the circles in which they have trusted.

There have been certain provinces which have established financing institutions for financing joint ventures in that province. What will their role be in joint ventures?

Do you mean Guangzhou or Guangdong Province and Fujian Province?

That's correct, the Fujian Investment Corporation which has been established.

These two provinces, Guangdong and Fujian, they have great power of autonomy. Therefore, certain matters can be decided by them.

Will the joint venture law permit a joint venture with a foreign firm with a joint venture company based, say in Hong Kong, or in another third country outside of the People's Republic?

You mean the joint enterprise would be set up in Hong Kong, or invest in Hong Kong?

No, would the joint enterprise be established in Hong Kong, outside of China, subject to the rules of the joint investment law?

There is no such stipulation in the law that such enterprises cannot be established outside China.

Wages, Price Hikes, Decontrol of Market Items

Across-the-board prices have risen in China, with local prices upped according to total conditions. China's new, though limited, market economy could mean higher prices for foreign importers dealing with local foreign trade offices. But the new policies may also herald an era of increased competition in the PRC, stimulating for both domestic and foreign buyers.

The recent round of price and wage hikes in China is best understood as part of a conscious policy derived from their understanding of the current situation, its tasks, and past experience. The Western press has used the word "inflation" to describe the situation, and indeed it did seem as if foreign journalists had found an unexpected echo in the news from the PRC. In Beijing, a housewife winced at the price of eggs and shook her head: "At this price we simply won't be able to afford them any more."

Retail food prices rose dramatically all over China on November 1. In the capital, pork, poultry, beef, mutton, eggs, fish, and aquatic products now cost about 33 percent more than they did in October. But despite the similarity of journalistic vocabulary—"price rises," "wage hikes," "decontrol"—these price increases represent a deliberate effort in the face of inflationary pressures to heighten rural demand, strengthen the domestic market and stimulate agricultural production.

Overcome Egalitarianism

Since the founding of the People's Republic thirty years ago, prices and wages had been held quite stable. However, in November of this year, not only food prices went up, but a sub-

sidy of five to eight RMB a month was announced for urban workers and rural stockherders. Wage hikes for 40 percent of China's urban working force of 100 million are expected shortly.

This will be the third round of wage increases since the death of Chairman Mao Zedong and the fall of the Gang of Four. A 46 percent raise was granted in 1977 and a 2 percent raise in 1978. These wage hikes will be awarded on the basis of "merit." They will go to industrial workers, technicians, scientists, teachers, medical personnel, athletes, service workers, and cadres.

Merit is determined by work attitude, technical proficiency and, most important, contribution to one's "unit." The wage increases are designed to implement "the principle 'from each according to his ability, to each according to his work,' and to help overcome egalitarianism."

Ironically in a Communist nation, egalitarianism has become a dirty word. The Chinese now recognize that equal reward to the indolent and the industrious encourages the former and disheartens the latter.

Price Decontrol for 10,000 Items Creates Market Economy—The Lessons of Stalin and Mao

In the continuing deviation from Maoist policy, decontrol on prices for more than 10,000 items has been announced. Most of the products at issue represent the output of small-scale rural and cottage industries—ink, brushes, scissors, fruits. The prices of these commodities will now change according to "market supply and demand." Controls on such "private market" items had stood since 1957.

The current reformation of China's

wage and price structure yields insights into the economic dimensions of de-Maoization. Mao avoided Stalin's grosser errors, but maintained a basic respect for the Stalinist paradigm for development, which posits heavy industry as the primary area for capital investment. The Chinese know that the Russian economy was in shambles following the October (1917) Revolution. A "scissors crisis"—a widening graphic gap between the high prices for industrial goods and excessively low prices for agricultural products—dramatized the absence of an internal market for Russian industry.

Subsequently, Lenin implemented the New Economic Policy (NEP), under which peasants were allowed to maintain private ownership in the hope that agricultural production would be stimulated. Many responded to Bakhunin's call to "get rich." The resultant class polarization—richer peasants hired wage labor on large farms—spurred collectivization of agriculture and rapid industrialization by Stalin only after 1928. Stalin never overcame his distrust for the peasantry and continued to extract an agricultural surplus for reinvestment in heavy industry.

The Soviet experience has been alluded to in recent Chinese news articles which have also described a "scissors" graph—a large gap between urban and rural purchasing power. Furthermore, in late September, an economics commentator from Hainan proclaimed: "We advocate that under the socialist system, anyone who becomes wealthy is honorable. . . . The wealthier a person becomes, the greater his contribution to state and society."

Current Chinese policy represents

real investment in agriculture, not just lip service to the peasant body of an agrarian society, still less a flashback to an unfortuitous foreign example.

Prices and the Plan—What's Happened Locally

The decision to build a foundation for the Four Modernizations by giving top priority to agriculture was taken at the Third Plenum of the Eleventh Central Committee of the Chinese Communist Party in December 1978. An official from Liaoning Province explained: "On the basis of the guidelines of the 3rd plenary session of the 11th Party Central Committee and the instruction of the State Council, the purchasing price of the major agricultural products has been raised this year in order to promote agricultural production, increase peasants' income, boost their enthusiasm for selling agricultural and sideline products, supply more commodities for the markets and meet the people's daily needs."

The party's policy of raising retail food prices is calculated to reallocate an estimated \$8.4 billion to the countryside. In June of this year, state procurement prices for agricultural commodities had already been upped. The state paid peasants about 20 percent more for their state quota of grain and 50 percent more for grain sold to the state above the quota.

Provinces, municipalities, and autonomous regions were instructed to raise prices by a joint circular of the Party Central Committee and the State Council. These local government bodies in turn raised prices according to local conditions. For example, the average increase for some thirty-odd agricultural products in Zhejiang is 24 percent.

In Xinjiang, purchase prices for hogs rose 24 percent, oxen 36 percent, goats 24 percent, eggs 30 percent, sugarbeets 25 percent and—textile importers may wish to note—silkworm cocoons 21 percent, cashmere 50 percent.

Both provincial party and government—revolutionary committee—organs implemented the price hikes with considerable input from counties and even enterprises. In Hunan Province, the Shimen County Planning Committee supervised the price readjustments, compiled and distributed price tables, investigated unauthorized raises, and called upon "price personnel" of production units for feedback.

In Guangdong, local revolutionary committees are urged to "get to work personally" to supervise the increases.

Comrade Xu Jiatur, who is both first secretary of the Jiangsu CCP and chairman of the provincial revolutionary committee, explained the chain of command for authorized price increases in a warning to violators in his province. "If the trades and professions concerned want to increase commodity prices they must bring their cases to the provincial CCP and revolutionary committees for discussion. No price increase is allowed before a decision is made by the provincial CCP and revolutionary committees." A circular from Chongqing Municipality, Sichuan, also insists that price adjustments "must be implemented in accordance with the regulations of the upper levels."

The wage and price hikes should be understood in the context of the three-year readjustment period, during which an agricultural foundation can be constructed for the coming modernization drive. The party hopes to mobilize the enthusiasm of the peasants for production, to increase demand and create a market in the hinterland for the industrial production of China's cities. Rural purchasing power puts the commune and production brigade in a better position to buy the machinery and fertilizer that should upgrade its output.

Signs of heightened demand in the countryside were abundant even before the November 1 price hikes. By July, rural savings deposits in Sichuan had risen by 53 percent. Bank savings were reported by the People's Bank of China and the Chinese Agricultural Bank to be the highest ever. Total

rural savings accounts amounted to only about one-sixth of urban accounts, but countryside savings rose at a faster rate—32.6 percent. Peasant buying in the rural areas surrounding Shanghai soared by over 27 percent through July. *People's Daily* reported a trend in rural buying away from basic necessities and toward "better quality, more expensive items."

Perhaps the increase in available goods associated with the price rises may act as a damper to inflation in the long run, but the new policy has by no means been free of problems. The situation in Henan Province calls to mind arbitrary price hikes assessed by American gas station operators at the pumps. Zhengzhou Municipality inspectors uncovered 900 cases of "unscrupulously fixed and increased prices."

"Disguised price increases" have been reported from many areas. Sellers substitute substandard products or package less than the specified product weight. These disguises are not new. For centuries, Chinese peasants used the old soggy rice trick (wet rice weighs more) or the sand-in-the-rice-bucket trick to cope with avaricious tax collectors.

Some of the unauthorized price increases grow out of personal plans for profit, but others, no doubt, are a result of confusion as to the actual extent of decentralization in price regulation. Localities are eager to spur on the decentralization process. Open talk is now heard of the "right" of communes, production brigades and teams to "self-management." One writer has stated bluntly: "It should be made clear that all state plans for farm produce are only for reference."—KF 完

The purchase price of silk has increased



Credit—Xinhua

Export Controls

New Policies Spell Clarity



About 50 representatives from Westinghouse recently held two weeks of 21 technical seminars in Beijing and Shanghai; the group led by Douglas Danforth poses in the Great Hall of the People with Vice Premier Kang Shien.

US-VALIDATED EXPORT LICENSES APPROVED FOR SALES TO THE PRC* (in million US \$)

	Value (January 1-September 1979)**	Percentage
Aerospace Equipment, Aircraft and Spare Parts	167.98	67.5
Geophysical Technology and Equipment ¹	51.73	20.8
Electronic Computing Equipment ²	10.34	4.1
Numeric Control Equipment and Technology for Manufacturing Steam Turbine Engines	7.59	3.0
Communications Equipment ³	3.36	1.3
Electronic Testing Equipment ⁴	3.65	1.4
Basic Materials Research System	3.28	1.3
Pollution Control and Energy Research Equipment	0.63	0.25
Miscellaneous	—	0.35
TOTAL	248.56	100.00

* 1979 figures include only export and temporary licenses and not values for the sale of technical data.

** Figures are only approximated and not actual values.

1. During 1979 this has consisted primarily of seismic surveying and processing equipment for oil and gas exploration.

2. Not including \$69 million sale of CDC computers to China, announced May 1979.

3. Including integrated circuits, magnetic recording equipment and communications devices for navigation and aviation.

4. Including measuring, scientific, and medical instruments, and machine tools.

The new Export Administration Act should sharpen the competitive edge for American exporters of high technology items to China. The next item on the agenda, a technology transfer policy specifically for the PRC, is beginning to form as the Sino-US trade agreement heads toward floor debate in Congress.

US policy concerning the export of high technology to Communist nations is spelled out in the new Export Administration Act signed by President Carter, September 29, 1979. The new package of amendments includes the major common features of the House (H.R. 4034) and Senate (S. 737) bills and the compromises agreed to during the joint conference committee.

For years the question of US export control policy has pitted the advocates of freer trade against defense proponents who argue that tighter export restrictions are needed to hamper and postpone the military capability of the Communist bloc. The solution to this dilemma of maintaining and developing a large export business while simultaneously protecting US national security interests has focused on identifying and protecting the "critical technologies" behind the production of end-products, rather than the end-products themselves.

The US Congress has endorsed the critical technologies approach since it was recommended in the 1976 Fred Bucy report. The Department of Defense has been grappling for three years with a critical technologies list which, so far, has resulted in the removal of 162 commodities from the export control list.

Now, to ensure permanent attention to this approach for the guidance of licensing decision-makers, the new Act requires the list to be completed by October 1, 1980.

Export of civil training aircraft with

inertial navigation systems and below 600 horsepower has also been eased by a provision in the Act exempting such aircraft from control under the Arms Control Export Act, overseen by the State Department. Control of these kinds of aircraft has been transferred to the Commerce Department under the licensing rules of the Export Administration Act.

Recently, the State Department refused a sale to Beech Aircraft Corp. on the grounds that its large turbo-prop aircraft was equipped with inertial navigation gear. With the more export-oriented Commerce Department taking the lead for such licensing cases, US aircraft manufacturers should face fewer export licensing delays, denials, and uncertainties.

A further effort to narrow and sharpen the scope of the commodity control list involves indexing the performance levels of goods and technologies to facilitate the removal of those that become obsolete relative to US national security and technology advances. The indexing provision will not lead to the automatic decontrol of items that are obsolete by US standards. According to one State Department official, it will have a bearing on only 10 percent of the commodities on the control list.

However, to the extent that it is technically feasible to predict obsolescence dates, indexing will add more reason and planning to the export control process. For example, if a company's product is indexed as eligible for an export license approval within two years time, it can gear up now for marketing, and eventually selling, the product abroad without government constraints. In seeking to sell computer telephone-switching equipment to the USSR, Western Electric used the indexing argument, claiming that by the time the sale was consummated, the only markets left for the technology would be Communist countries. Thus, from the standpoint of management and planning, indexing may create a greater sense of business security among American exporters.

Licensing Delays: The Impact on Competition

During House hearings on the Export Administration Act, the American Electronics Association revealed the findings of a membership survey showing that over \$1 billion dollars was

JAPAN POISED TO MODERNIZE CHINA'S ELECTRONICS INDUSTRY

The Japanese electronics industry, led by Matsushita, and supported by the Japanese government, is also considering a large-scale invasion of the Chinese consumer and industrial electronics fields. Following discussions with Vice Premier Deng Xiaoping in June, the pioneering Kosuke Matsushita revealed that Beijing is keenly interested in a Japanese plan to upgrade China's electronics industry through a massive 50-50 joint venture, with one Japanese partner taking a 25 percent share and the other 25 percent divided among 10 major Japanese firms.

Although the plan has been approved in principle by Tokyo, it is doubtful that the government will endorse and help finance a scheme that could trigger antitrust actions in both the US and Europe. A less grandiose arrangement, entailing 10 regional joint ventures specializing in the renovation and modernization of some 200 Chinese electronics facilities is thought to be closer to government approval for an initial \$2 billion worth of investment loans.

Since both Japanese and other foreign companies now discussing concrete proposals for just a single joint venture operation in China are experiencing immense difficulties over such issues as the quality and price of Chinese labor, some regard Matsushita's mammoth project as highly imaginative and ambitious but unlikely to surface above still imponderable and untested waters. Closer to earth is Hitachi's recent agreement to supply the Bank of China with six computers—a deal which will be facilitated by the opening of a Hitachi office in Beijing.

lost to the US electronics industry in 1978. These deals were denied, not on the grounds of national security, but because there were export licensing delays, refusals, and plain unpredictability.

According to most American sellers of high technology, the cumbersome nature of the licensing regulatory process not only erects obstacles to the development of Chinese markets but also undermines US credibility throughout the world as a reliable supplier.

American exporters, of course, would like a license approval or rejection as promptly and expeditiously as possible. But they tend to regard 90 days as reasonable for cases not requiring interagency or multilateral review. Currently though, it can take up to 30 months to get a validated US export license for telecommunications, computer, and electronic equipment.

US suppliers also suffer considerably more delay than their Western competitors for the sale of goods and technology subject to the unanimous approval of the informal 15-nation COCOM group. Whereas as a US exporter can expect a licensing decision in 90 days under the most favorable circumstances, other Western governments—working hand in glove with

their industries—grant domestic licenses within 30 days, and then catapult the case through COCOM in a matter of weeks. The West German government has a further incentive to rush pending approvals through the COCOM mechanism—by law it is liable for late shipment or delivery costs that a company may incur as a result of COCOM delays.

Especially now, when China's quest for American imports falls into "sensitive" categories under American or COCOM control, US businessmen are worried about losing their competitive edge due to the issue of reliability. From January 1 to October 20, 1979, COCOM reviewed 1,225 cases, of which 178 were for sales to the PRC. US companies accounted for 48 percent of the Chinese cases, predominantly in the areas of seismic survey gear, computers, and aircraft. An encouraging sign is that about 90 percent of the sales destined for China were approved during this period.

Once again, the US Congress has written its concern over the adverse impact of licensing delays on the competitiveness of US firms into the new Export Administration law. The statute establishes licensing deadlines, reaffirming a 90-day maximum for uni-

FRANCE BREAKS INTO THE CHINESE ELECTRONICS MARKET

The May 1979 announcement of Control Data's \$69 million contract to supply the PRC with 10 Cyber 172 machines, followed by a smaller order for \$2.3 million worth of Burroughs software, has awakened the temptation to conclude that the Chinese electronics market offers a long string of lucrative business arrangements for American high technology manufacturers. But the US industry may find itself preempted by its French competitors.

The French, recently recovered from the Chinese cancelation of a \$2.3 billion contract for two 900-megawatt nuclear power stations, recently signed an outline five-year agreement with Beijing covering 13 specific projects in data processing and electronics.

One of the most important protocols, paving the way for extensive cooperation between the Fourth Ministry of Machine Building and the French computer industry, was signed on October 4 by Wang Zigang, minister of Posts and Telecommunications.

At least a dozen French manufacturers are already discussing submitting proposals to the Chinese for projects envisaging the export of complete plants, licensed production of components in China, and the training of Chinese personnel in France.

The companies known so far and their interests are listed below. At least six of them have US ties and if French companies sign the numerous contracts implied under the protocols, there could be a substantial amount of business flowing to their US partners.

Control Data France—Control Data, US, plans to pick up \$33 million of its \$69 million contract from its French subsidiary and another \$11 million worth of plant equipment will be supplied by Compagnie Generale de Geophysique (CGG).

CHB—France's largest computer hardware manufacturer, a subsidiary of Honeywell Inc., US, is considering licensing the production of central processors and printed circuits.

Thomson and subsidiaries—Export of solar minicomputers and peripherals.

CAP Sogeti—Providing service assistance to set up a Chinese National Software Development Center, possibly involving its US subsidiary, CAP Gemini.

R2E—Licensed production of microcomputers. Benson, Logabax, FRB Connectron, Sagem (all with US subsidiaries), Piro Controle, TRT (a subsidiary of Hungary's Telephongyar), SAT and Iostat—are also investigating opportunities to cash in on computer sales to China under the Sino-French protocols.

lateral decisions and specifying a 60-90 day timeframe for each stage of the interagency review. Except for the complicated cases, a licensing decision involving the consulting federal agencies should not exceed 17.5 months. If it is then sent on to COCOM the applicant must be notified of a decision within 60 days; otherwise, the license will be issued automatically.

What makes this procedure different from the past is that bureaucrats now have an added reason to meet deadlines. If action is not taken within the time limit specified, exporters may ap-

peal to the Secretary of Commerce for compliance with such limits. If the situation is not resolved within 30 days the applicant can file a case in a US District Court. This provision is designed to make licensing officials more responsive to deadlines by assigning them individual responsibility for late cases reaching the highest level of the Commerce Department.

Foreign Availability—Equalizing the Competition

The US is the most conservative member of COCOM regarding restric-

tions on high technology exports to Communist bloc nations. American businessmen complain that US officials bring a large arsenal of technical criteria to bear on the deliberation process, whereas our allies have a more commercial slant and looser definition of what technologies and materials should be banned. As a result, our competitors receive approvals for products and technology on the ragged edge of what is permissible under COCOM guidelines; similar sales for US companies would probably be cut off during unilateral assessment and never even make it to COCOM.

One of the main objectives of the new law is to equalize competition by decontrolling goods and technologies which are available without restriction from sources outside the US in significant quantity and comparable quality. With respect to controls imposed despite proven foreign availability, the President is directed to negotiate with foreign governments to secure their cooperation in imposing boycotts.

The significance of foreign availability is evidenced in the authorizing of \$1.25 million in the 1980 fiscal year for establishing a capability in the Office of Export Administration to monitor and gather information on foreign availability of goods and technology subject to export controls.

A China Technology Transfer Policy?

While the basic thrust of the new export control amendments is to spur US exports by balancing commercial and economic needs with strategic military considerations, it does not specifically address the issue of US practices and policies on technology transfer to the PRC. With Sino-US normalization resulting in new trade opportunities for US industries and the political stability of the Beijing regime partly dependent on its ability to enhance living standards through a technology-import strategy of modernizations, China analysts are raising questions about the efficacy and desirability of stringent export controls.

From the standpoint of US-China trade, it is argued that it makes more sense to treat China as a developing country in need of advanced civilian technologies rather than a Communist one posing a direct military threat to the US. Even more significantly, it is noted that the risk of military diver-

sion of high US technology destined for China's economic sectors is quite low, given the PRC's past performance in honoring its agreements and its current capability to alter a particular technology's designed end-use.

With Chinese authorities now agreeing to fill out and complete official US end-use documents, and grant on-site inspection rights to American companies, there is an urgent need for the US government to demonstrate the same degree of good faith and flexibility by enunciating a coherent policy on technology transfer to the PRC.

—KAB 完



Credit—Bob McNeely

Competition for a share of the Chinese electronics market is fierce.

RMB: DOLLAR RATES AS OF DECEMBER 5, 1979

	RMB/US\$	US\$/RMB
September 7		
Bid	1.5414	64.8761
Offer	1.5338	65.1975
Median	1.5376	65.0364
September 21		
Bid	1.5260	65.5308
Offer	1.5184	65.8588
Median	1.5222	65.6948
September 28		
Bid	1.5184	65.8588
Offer	1.5108	66.1901
Median	1.5146	66.0240
October 5		
Bid	1.5245	65.5953
Offer	1.5169	65.9239
Median	1.5207	65.7592
October 9		
Bid	1.5336	65.2061
Offer	1.5260	65.3680
Median	1.5298	65.3680
October 11		
Bid	1.5290	65.4022
Offer	1.5214	65.7289
Median	1.5252	65.5652
November 29		
Bid	1.5198	65.7981
Offer	1.5122	66.1288
Median	1.5160	65.9631
December 1		
Bid	1.5122	66.1288
Offer	1.5046	66.4628
Median	1.5084	66.2954
December 4		
Bid	1.5062	66.3922
Offer	1.4986	66.7289
Median	1.5024	66.5602
December 5		
Bid	1.5137	66.0633
Offer	1.5061	66.3967
Median	1.5099	66.2296

Source: Standard Chartered Bank, Ltd.

SINO-US SPACE TECHNOLOGY COOPERATION IS ON FIRM GROUND

NASA Administrator Robert A. Frosch, testifying before a House subcommittee during hearings on technology transfer to the PRC (November 15), told US congressmen that during his May visit to China he received a personal assurance from Chinese Vice Premier Yu Qiuli that Beijing will purchase from the US a domestic communications satellite with associated ground equipment. NASA's role is to act as the US government spokesman in conducting liaison between the Chinese Communications Satellite Corporation, recently formed to manage the acquisition of the satellite system, and US suppliers.

Frosch admitted that China is pursuing potential space technology exchanges and purchases with West European manufacturers, but suggested that US vendors focus on satisfying COCOM export control regulations rather than on the competition. Meanwhile, Chinese Vice Premier Fang Yi told a West German senator on October 10 that a Chinese delegation was preparing for a trip to Hamburg to explore the construction of a television satellite. US officials believe that these discussions are for a second generation of satellites to follow the launching of the American-made satellite.

Frosch informed the House committee that discussions on China's acquisition of a Landsat ground station are progressing with due speed. A Chinese team from the Academy of Sciences recently toured Landsat users in the US and held informal discussions with Lockheed, TRW, and General Electric about ground station equipment. A Landsat Memorandum of Understanding with NASA is expected to be signed within the next few months. Signing of this agreement is a precondition for commencing formal technical and commercial negotiations between the two sides. No export applications have been submitted yet for either the Landsat or satellite arrangements although TRW, Rockwell International, Hughes, and GE have already conducted seminars and presentations in Beijing.

While the space technology transfers will provide the US with an immediate dollar payoff (estimated at \$150 million for the satellite and \$20 million for the Landsat ground station plus a yearly charge of \$200,000 for the photographs) Frosch stressed the less tangible, long-term benefits to the US. "We will be contributing to building permanent links with another country by applying US advanced technology to real needs and to bettering the conditions of hundreds of millions of people who need help in educating and feeding themselves. We will be contributing to establishing the pattern of mutual benefits that always results from friendly relationships between two countries."



MINMETALS export catalog.

Bauxite I

Minmetals On China's Bauxite

The following is an abridgement of an article written by the Shandong Province Branch of the China National Metals and Minerals Import and Export Corporation (MINMETALS), in which US technological assistance is suggested, perhaps in a compensation arrangement, to develop sales of Chinese bauxite to the US. It was submitted to the National Council for exclusive publication in The China Business Review.

Chinese Calcined Bauxite

Since the end of the 1960's China has emerged on world markets as an important supplier of calcined bauxite with Japan, UK, and other countries in Europe as principal buyers. In the US, one firm, Comets, accounts for the majority of imports.

Chinese calcined bauxite is available in refractory grade and abrasive grade and also welding grade and surfacing grade. Rich resources guarantee regular supplies to buyers, and low iron content makes Chinese calcined bauxite unique as a high alumina refractory raw material.

Despite the fact that world production of bauxite is enormous, low iron-content materials are scarce and precious. China has huge deposits, essentially of diasporite type. Bauxite deposits are scattered over many regions in China, as far north as Liaoning, Shandong, Shanxi, and as far south as Guangxi and Guizhou.

Chinese bauxite with an alumina (Al_2O_3) content of 70–75% in its raw condition, when calcined, yields an alumina content of more than 85%, an iron content of less than 2%, and a silica content of less than 7%.

After mining, the material is crushed into the required sizes and then washed to remove clay slimes before going to calciners. Both shaft and rotary kilns are provided to calcine the bauxite to a temperature in the range of 1600–1650° C and then sintered to a bulk density over 3g/cc for the refractory grade. The calcination temperature for the abrasive grade is about 1200° C.

Quality control is carried out throughout the bauxite operation from mining to the time of shipment. Testing is carried out regularly on samples taken from each kiln discharge to ascertain the bulk density, and the calcine is analyzed for alumina, iron, silica, and titania, and also the loss on ignition.

Chinese calcined bauxite is low in iron (typically below 1.5%) and high in alumina (typically over 88%), with a bulk density of minimum 3g/cc; thus, it is very suitable for the manufacture of high alumina refractories.

Another important grade has a silica content of less than 6% and an alumina content of more than 86%, and consequently becomes an ideal material for the manufacture of fused alumina for making abrasives. The welding rod industry also finds Chinese calcined bauxite a very suitable material, as it conforms to the specifications, particularly the low content of sulfur and phosphorous, as laid down by the welding rod industry.

The road surfacing grade not only provides an excellent resistance to skidding but also resists polishing under the action of traffic.

Production and Trade

After the founding of the People's Republic of China, the Chinese began to produce and export a range of

alumina-silicate raw materials with alumina content ranging between 45% and 65% for refractory uses, with Japan as the main importer. Since the end of the 1960s China has emerged on world markets as an important supplier of a complete range of high alumina raw materials, beginning with calcined flint clay, with 45% alumina content, calcined diaspore with 50%, 60%, and 70% alumina, up to calcined bauxite with alumina content at 80%, 85%, and over.

Apart from meeting domestic uses, Chinese calcined bauxite is currently exported to more than 30 countries throughout the world, with Japan, UK, Canada, Italy, Germany, and Australia as the principal importers. The United States has become a major importer in 1979.

China currently exports about 150,000 tons of 80% and 85% grade bauxite, about 80,000/100,000 tons of medium grade, and about 50,000 tons of flint clay each year, making a total of approximately 300,000 tons. With the growth of the socialist economy, China is step-by-step acquiring mechanization in mining, technological improvement in beneficiation and calcination, and modern shipping facilities. As a consequence, export qualities will be greatly improved and export volumes will be substantially increased. China will become an important and indispensable supplier of various refractory raw materials to world markets on a long-term basis.

The US Market

Although the United States is endowed with its own deposits of high alumina clays, the more scarce and higher quality materials have to be imported from other countries. As a result of the diminishing resources of diaspore in Missouri, China began shipping abrasive-grade calcined bauxite in 1938 and refractory-grade calcined bauxite in 1949.

US domestic production of bauxite grades with alumina content over 70% has been estimated at about 40,000 tons* per year. A breakdown of US consumption of bauxite used for nonmetallurgical purposes by industry shows that refractories form the largest nonmetallurgical area of consumption, followed by chemicals and abrasives.

About 45% of the bauxite requirement in chemicals and miscellaneous industries is met by domestic materials, but less than 20% in refractories and less than 10% in abrasives. In other words, more than 80% of US requirements for refractory-grade calcined bauxite and more than 90% for abrasive grade are dependent on imports. The US consumes about 350,000/400,000 tpa** refractory-grade calcined bauxite, mainly supplied from outside.

The general trend in the steel industry in the US, as in other countries in the world, is to reduce the volume of refractories used by switching to more costly but longer-lasting bricks. This is the main reason for the ever increasing demand for calcined bauxite which is widely used in the manufacture of high alumina refractories to be used in steel-making furnaces.

Prospects and Problems

Several things favor marketing Chinese calcined bauxite in the US. Some highlights are:

—Whereas China is a potential supplier of calcined bauxite, the US is an important user and importer of this material.

—With current availability backed by vast resources,

Chinese calcined bauxite can meet the US end-users' requirements on a long-term basis.

—Chinese quality is of diaspore type, the excellent characteristics of which, as a refractory raw material, are well known to the US refractories manufacturers as they have had rich experience in using domestic diaspore and diaspore clays produced in Missouri.

—The chemical and physical specifications of Chinese calcined bauxite basically conform to the specifications required by the refractory industry and abrasive industry in the US.

—Despite the relatively low value of this material and the long distance between China and the United States, business is still warranted by making bulk deliveries in chartered vessels at moderate freight rates.

It is strongly felt that in order to market Chinese calcined bauxite in the US successfully, nothing is more important than to make the right product and to make long-term supply plans for the US market. However, there are certain problems to be overcome in the expansion of business in this material. The following three aspects seem to be particularly pertinent.

—Method of Calcination

The largest problem in the development of refractory grade calcined bauxite is the method of calcination.

Since a major percentage of Chinese calcined bauxite is produced in shaft kilns, the calcined bauxite thus produced is not as consistent and stable in quality as a calcine produced in a rotary kiln. In order to ensure perfect quality for the export tonnage, the calcine discharged from the shaft kilns usually undergoes further processing by selection and sorting which involves extra expense, thus influencing the pricing of the goods.

While every effort is being made by the producers in China to further improve the quality and the output of the refractory-grade calcined bauxite, US technology for mining, processing, and calcination of the material will be of assistance in the solution of the problem. The feasibility of compensation trade should be studied.

—Lack of Close Contact Between US End-Users and Chinese Producers

This is perhaps another problem in the development of business. Contacts—particularly technological dialogue between the two sides—will no doubt be of assistance to better understanding each other's needs and further improving the quality of the goods. Hence, such contacts should be encouraged for mutual benefit.

—Need for Revised Specifications

Relating to the US national stockpile specification for refractory-grade calcined bauxite, it is felt that if the type of the calcined bauxite specified could be extended to include the monohydrate type (diaspore and boehmite) instead of being confined to trihydrate type (Gibbsite), it would be of advantage to both the sellers and the buyers. 完

*The US Bureau of Mines considers this estimate too low, although figures are not available—Eds.

**The US Bureau of Mines estimates 300,000 tons—Eds.

Bauxite II

The US Experience: Cometals Spurs Imports

An article on the preceding pages, outlined by the Shandong branch of MINMETALS, describes China's calcined bauxite available and the problems of selling it to the US market. These problems, relating to national stockpile specifications, are discussed in this article, along with solutions.

Five years ago, when the first shipments of calcined bauxite from the People's Republic of China arrived in the US, the refractory companies that had ordered it found it unusable. After that first bad impression, the US companies refused to take a risk on any more of the Chinese material.

Earlier this year, a New York trading firm gave the Chinese "a second chance to make a first impression," and the results have exceeded their best hopes. US firms are now importing Chinese refractory-grade calcined bauxite in increasing quantities and seem pleased with the quality.

The turnabout in attitudes came about in part because of critical supply problems from the traditional source of bauxite for the US industry: Guyana. The flow of bauxite from Guyana has been disrupted by a series of labor problems, including some 41 strikes in the first six months of this year, and an especially damaging two-month strike during the summer.

Given the shortage on the market, Cometals, Inc., a subsidiary of Commercial Metals Co., convinced a few

refractory firms to take a big risk on the quality of Chinese calcined bauxite. The trading firm collected orders for 16,500 tons of the material, which were delivered in Baltimore in April. Each of the firms had a personal representative waiting nervously at the pier. Cometals ran a quality check, and also hired an independent laboratory to do so, and the results came out very positive.

"We took a very large gamble, and so far we've been pleased," noted Larry Lebauer, technical director of General Refractories Corp., which had taken the biggest risk by ordering 10,000 of the 16,500 tons. "The quality was good, the delivery was good, the weights were good."

General Refractories, like several other firms, had examined Chinese calcined bauxite in 1975 and found some inherent problems with it. The bauxite imported earlier did not have the proper uniform bulk density, had an alumina content that was too low, and was not uniformly burned (calcined).

For this latest shipment, though, the Chinese instituted stricter quality control, including manual inspection and sorting. When tested for bulk density and alumina content, and when examined for evenness of calcination, the latest bauxite imports gained high marks on all counts.

Given the firms' positive response to the Chinese material, Cometals ordered a second shipment of 10,000 tons of

Chinese calcined bauxite for delivery in mid-October and also booked tonnage for a further 10,000 tons for delivery in late November and 10,000 tons for January delivery. Some 40,000 additional tons have been purchased for shipment in January through June 1980, and Cometals expects to import some 40,000-50,000 tons in the second half of 1980. Other American firms, also, have been discussing importation of bauxite with the Chinese.

"Within three years, they expect to supply 25 percent of the US demand," Harry Bauer, president of Cometals, said of the Chinese. "If they can count on selling 100,000 tons per year to the US industry, that would enable them to increase production."

In addition to introducing US consumers to higher grades of Chinese bauxite, Cometals has also encouraged imports of lower grades of bauxite—with 75 percent or 80 percent alumina content. These grades are usually more difficult for foreign countries to market.

Calcined bauxite—that is, bauxite that has been burned in a kiln to reduce impurities—is used in the manufacture of high alumina refractories, which in turn are used to make bricks to line steel furnaces.

"The steel companies were made aware of the situation" with Chinese bauxite, Lebauer said, "and there's been only favorable response." Since Chinese bauxite is harder than Guya-

nese bauxite, the processing is somewhat different, and not all companies have been as successful with it as General Refractories.

Looking for US Technology

In addition to selling bauxite, the China National Metals and Minerals Import and Export Corporation is actively discussing with US companies the purchase of better calcination technology. Most Chinese kilns are static shaft kilns, which tend to burn unevenly. The Chinese are interested in acquiring more rotary kilns, which turn in order to ensure a more even burning. Also, rotary kilns can do in a few hours a job that takes several days in a shaft kiln.

The Chinese do have two rotary kilns, but they use them mainly for domestic production. They are likely to import modern technology for one mine first on an experimental basis.

National Stockpile Specifications

In addition to calcination problems, the Chinese have pointed out another problem: their refractory-grade calcined bauxite does not conform to US National Defense Stockpile purchase specifications. According to Paul Krueger, acting chief of the Stockpile's Policy Division, stockpile specifications are usually based on the type of materials in use by the US industry. Since the refractory industry was until recently using calcined trihydrate bauxite—the type imported from Guyana—the National Defense Stockpile specifies this type of material. Chinese bauxite is a harder material—of diaspor, or monohydrate type.

The eventual goal of the US stockpile is to collect over two million tons of calcined bauxite, and they have collected only about 175,000 tons so far. The Chinese see this as a great potential market.

However, according to Krueger, the

stockpile will not be ready to buy any calcined bauxite for some years. First of all, it needs to have money authorized and appropriated by Congress for its general purchasing program of some 97 materials. Secondly, once the money is allocated, stockpile personnel must decide which materials are of highest priority and must therefore be purchased. In addition, the law prohibits the stockpile from making purchases that would disrupt the normal market, and the present shortage of calcined bauxite will probably prevent them from buying bauxite for some years.

Krueger said that if the stockpile personnel notice that the refractory industry is using more and more Chinese bauxite, they will try to update the specifications to include all the standard grades used by industry. If the industry considers Chinese bauxite acceptable, they will change the specifications to include Chinese bauxite.

—DJ 完

INSTITUTE OF ASIAN AFFAIRS



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The Institute of Asian Affairs in Hamburg is concentrating its efforts on political, social and economic problems of contemporary Asia. The results of the research-work of the staff members and cooperating scholars are published in monographs (there are three series: *Schriften*, *Mitteilungen* and *Sonderveröffentlichungen*) as well as in the periodicals of the Institute, *CHINA aktuell*, *PRC Official Activities* and *North Korea Quarterly*. Please ask for further information

Wolfgang BARTKE (comp.)

The RELATIONS between the FEDERAL REPUBLIC OF GERMANY and the PEOPLE'S REPUBLIC OF CHINA in 1978 as seen by Hsinhua News Agency A Documentation

This documentation contains all the articles published by the Chinese News Agency "Hsinhua" (now "Xinhua") on the relationship between the Federal Republic of Germany and the People's Republic of China in 1978. The material is arranged in groups of articles dealing with agreements, delegations, diplomatic representations, commentaries, and China's relations with Communist groups in the FR Germany.

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RECENT JOINT VENTURE AGREEMENTS AND NEGOTIATIONS TO NOVEMBER 15, 1979

Western Party	Chinese Party	Technology Product	Status/Date Announced
Chrysoberyl River Development Ltd. (HK)	Tung Shan Housing Authority	Residential project in Guangzhou. Will be built in 4 stages; 1st stage will consist of 750 units, divided into 25 eight-story buildings	Contract completed 6/79*
Tokyo Maruichi Shoji Company (Japan) Joint venture firm: Kyowa Co. Ltd.	Peking Commercial Service Co.	Setting up chain of Peking duck restaurants in Japan; 51% Japanese ownership, 49% Chinese ownership	Contract signed 9/13/79*
General Motors (US)	1st Machinery Corporation	Building and operating of heavy-truck manufacturing plant	Negotiation 9/17/79
McCann-Erickson Worldwide, Jardine Matheson & Company (US, HK) Joint venture firm: McCann-Erickson Jardine (China) Ltd.	Shanghai Advertising Corporation	Handle advertising in China for Western corporations and advertising in the West for Chinese foreign trade corporations and other organizations	Negotiation 9/27/79
Baxter Travenol Laboratories (US)	NA	Manufacturing of administration sets for intravenous solutions	Exploratory talks 10/27/79
Isuzu Motors Ltd. (Japan)	First Ministry of Machine-Building	Modernization of truck factory in Nanjing; plan to raise production from 15,000 units to 50,000 units/year	Negotiation 11/15/79

*Date contract signed. All other dates when sale or negotiation was announced.

RECENT COUNTERTRADE AGREEMENTS AND NEGOTIATIONS TO NOVEMBER 15, 1979

Company/Country	Technology/Product	Status
Ide Sharyo Co., Ltd. (Japan)	Cooperation agreement to build agricultural vehicle plant (100,000 units/year)	Contract concluded 7/79
New China Roadbuilding Corp. (US)	Three-year compensation agreement to manufacture Stevens cement spreader (12-ton, 250 hp)	Agreement signed 8/22/79
Chronicle Lam (HK)	Compensation agreement for 8 light-bulb factories	Contract signed 8/79*
Javelin Co., Ltd. (HK)	Compensation agreement for marine container plant (about 10,000 steel or aluminum containers/year) in Guangdong Province	Negotiation 9/5/79
Romania	Counterpurchase agreement for development of coking plant	Contract signed 9/79
Nichimen Co. (Japan)	Compensation agreement for development of farm in Heilongjiang Province	Basic agreement reached 9/79; formal agreement not yet signed
Fuji Marden (HK)	Business cooperation agreement for the manufacture of steel bars	Preliminary negotiations 9/26/79
The O'Brien Corp. (US)	Equipment and production know-how to modernize China's paint industry	Negotiation 10/8/79
Trafalgar Housing Co. (HK)	Compensation agreement for prawn farming	Has been concluded in principle 10/31/79

*Date contract signed. All other dates when sale or negotiation was announced.

CHINA: 1979 SALES AND NEGOTIATIONS TO NOVEMBER 15

The following chart contains recent reports of sales and negotiations exclusive of those listed in previous issues. The format for this table and ones in future issues of *CBR* is slightly different from that used previously. In the past, contracts were simply divided into sales or negotiations. Henceforth, the status of deals will be listed more precisely. Some examples are contract signed, Letter of Intent, proposal, or order received.

The total value figure for sales will include only

those deals which are listed as contracts or deals signed/won/secured/concluded. All others will be counted as negotiations. In previous tables, orders for plant/equipment/technology were also included in the total sales figure. Orders will now be counted as negotiations. This distinction is important to keep in mind when examining the cumulative total figures at the end of the chart, since they incorporate both formats; i.e., previous ones which included orders as sales and the following chart, which does not.

Company/Country	Product/Plant/Technology	Value Million US \$ (Local currency if known**)	Status Date Announced
Agricultural Commodities			
Interbras SZ (Brazil)	Soluble coffee (200 tons)	NVG	Shipment begun 6/13/79
Australian Paper Manufacturers Ltd. (Australia)	Corrugated paper (up to 10,000 tonnes)	NVG	1st three shipments sent 9/79
General Cotton Organisation (Sudan)	Long- and medium-staple cotton (100,000 bales)	\$35	Agreed to supply 9/12/79
EEC)	Corn (300,000 tons)	NVG	Preparing to sell 10/14/79
NA	Sugar (20,000-30,000 tons)	NVG	Bought 10/16/79
(Malaysia)	Logs (6,000 cubic meters)	Approximately \$1.27	Negotiations underway 10/31/79
	Refined palm oil (21,000 tons) November 1979-March 1980	\$9.3	Deal concluded 10/31/79
Algomex (Mexico)	Six-year agreement 50,000 bales cotton from 1979-80 crop; 100,000 bales/year from next 5 crops	\$360	Agreement signed 11/5/79
Agricultural Technology			
Heid Corporation (Austria)	2 seed-grain stations	\$0.43 (Sch 5.8 million)	Contract to deliver 6/13/79
Namoi Cotton Cooperative Ltd. (Australia)	Setting up of cotton farm (200-hectare site) in Sinjiang	NVG	Final stage of negotiation 9/12/79
(New Zealand)	Setting up model New Zealand cattle farm (1200-hectare) in Kwangsi region of Southern China	NVG	Agreement signed 9/17/79
Chemical Plants and Equipment			
Sekisui Chemical (Japan)	Polyethylene foam manufacturing plant and related technology	\$6.71+ (¥1.5 billion+) Expected to be settled in cash	Package contract concluded 9/4/79

CHINA: 1979 SALES AND NEGOTIATIONS TO NOVEMBER 15—Continued

Company/Country	Product/Plant/Technology	Value Million US \$ (Local currency if known**)	Status Date Announced
Kinetics Technology International (Netherlands) (subcontracted by Lurgi (W. Germany))	Design, procurement, construction services for 5 hydrogen reformer furnaces for 2 aromatic complexes and a coal-based methanol facility in Shanghai, Nanjing, and Tayun	NVG	Landed subcontract 9/14/79
Bingham-Willamette Co. (US)	Pumping equipment for new fertilizer plant (30,000 tons synthetic ammonia/month)	\$0.5	Contract announced 9/17/79
Chemicals			
(Japan)	Ammonium chloride (143,000 tons)	\$13.6 (¥3 billion)	Deal signed 8/7/79
Coal Mining Development and Processing			
Montan-Consulting Gmbh (W. Germany)	Plans for coal mine to produce 4 million tons/year	NVG	Have been ordered 6/13/79
Electronics			
Matsushita Electric (Japan)	Educational video tape recorders	NVG	Negotiation 6/13/79
Philips Singapore (Singapore)	130,000 black-and-white and 25,000 color TV sets	\$25	Order received 6/13/79
Sangamo Weston (US)	Aluminum electrolytics	NVG	Contract inked 8/27/79
Food Processing and Packaging			
Suntory Ltd., Hitachi Shipbuilding and Engineering (Japan)	Expansion of beer plant (output increase from 40,000 ton/year to 100,000 ton/year, Shenyang, Liaoning Province)	\$44.8 (¥10 billion)	Provisional agreement 9/26/79
Machinery			
Frank'schen Eisenwerke (W. Germany)	High-pressure cleaning machine	\$0.05 (DM 100,000)	Has sold 6/13/79
Rheinmetall Maschinenbau (W. Germany)	Chain-making machines for coal mining (200,000 meters/year capacity)	\$2.33 (DM 4.3 million)	Contract signed 6/27/79
Dainippon Ink and Chemicals Inc., Western Japan Trading Co. (Japan)	3 offset printing machines	\$0.9 (¥200 million)	Contract awarded 9/26/79
Webster Griffin (subcontracted by Constructors John Brown) (UK)	2 fully automatic bagging and palletizing lines for installation at high-density polyethylene plant (140,000 tons/year), Shandong Province	NVG	Has been subcontracted 10/31/79
Metal Mining and Processing			
(Japan)	Feasibility projects to explore 2 copper mines in Anjin, Anhui Province, and Tonshankou, Hubei Province; reports to be submitted early 11/79	NVG	Will conduct studies 8/14/79

CHINA: 1979 SALES AND NEGOTIATIONS TO NOVEMBER 15—Continued

Company/Country	Product/Plant/Technology	Value Million US \$ (Local currency if known**)	Status Date Announced
Mining Equipment			
Hall and Pickles (UK)	12,000 tools with a variable geometry tip, for use on large rock-cutting tunneling machines	\$0.1 (£48,000)	Order placed 8/20/79
T. I. Brookes (subcontracted by Dowty Mining Equip- ment) (UK)	178 mm. cut-off lathe for hydraulic mining equipment	\$0.15 (£65,000)	Order 8/25/79
Nonferrous Metals and Products			
Condelco (Chile)	Copper (45,000 mt)	NVG	Purchase completed 9/12/79
Petroleum and Natural Gas Development and Refining			
BHP, CSR, Ampol Exploration (Australia)	Participation in offshore exploration	NVG	Invited to participate 9/29/79
Japan National Oil Corp.	Joint oil probe in Bohai Gulf (14,000 sq. meters in southern part, 11,000 sq. meters in western part); confined to oil survey	NVG	Contract signed 10/79*
Power			
Alsthom-Atlantique S. A., Stein Mueller Industrial Group (France, W. Germany)	Joint construction of 600,000 kilowatt thermal-electric power plant	\$245	Contract awarded 10/1/79
Scientific Instruments			
Hoya Corp. (Japan)	Eyeglass factory (capacity of 10 million lenses/year)	\$2	Order received 11/14/79
Defiant Weighing Ltd. (UK)	Weight monitoring equipment for polyethylene plant in Shandong Province	NVG	Contract awarded 8/15/79
Nuclear Enterprises (UK)	2 large plastic scintillator radiation detectors	NVG	Have been purchased 9/8/79
Horstmann Gauge and Metrology Ltd. (UK)	Rotary table equipment	\$0.1 (£47,000)	Order secured 9/26/79
Kanematsu-Gosho Ltd. Machida Manufacturing Co. (Japan)	Technology for endoscope production	\$0.9 (¥200 million)	Jointly signed contract 10/31/79
Shipping			
MAK Maschinen Fabrik (W. Germany)	Eight 1,750 hp and four 3,300 hp MAK engines for ships	NVG	Contract signed 6/27/79
Multinational Maritime Co. (Hong Kong)	Container leasing agreement; will provide logistics and technical support in development of container depots; authorized to arrange with all international container lessors accepting and leasing of containers in China	NVG	Deal completed 8/24/79

CHINA: 1979 SALES AND NEGOTIATIONS TO NOVEMBER 15—Continued

Company/Country	Product/Plant/Technology	Value Million US \$ (Local currency if known**)	Status Date Announced
(Yugoslavia)	100 river craft	\$130	China considering awarding 9/17/79
Astilleros Espanoles (Spain)	Two bulk carriers (15,000 dwt)	\$19.4 (\$9.7 each)	Accord signed 10/29/79
Steel and Steel Products			
Acerinox (Spain)	Stainless steel (up to 120 tons)	NVG	Will export 9/3/79
(Japan)	Steel (830,000 tons) for period from July–December 1979	NVG	China officially has decided to set volume of orders 10/2/79
Telecommunications			
French Post and Telecommunications Organisation	Development of telecommunications system	NVG	Agreement signed 10/9/79
RCA Communications Inc. (US)	Coordinate tests to evaluate benefits of the Marisat space satellite system for maritime communications	NVG	(RCA) Has been chosen 11/8/79
Textiles			
(Japan)	Japanese-made synthetic fibers (5 million sq. meters) to be shipped between October 1979 and March 1980	NVG	Have reached basic agreement 9/11/79
Transportation Equipment			
Toyota Motor Co. (Japan)	Car maintenance plant	NVG	Negotiation 9/5/79
Litton Industries	9 inertial navigation systems for 3 Boeing 747SP jetliners operated by CAAC	NVG	Ordered 9/8/79
Boeing, CTDC group, Aeritalia (US, Japan, Italy)	Number of Boeing 767 medium-haul aircraft at present under development	NVG	Reported to be considering buying 9/10/79
R. A. Hanson Co. (US)	Design and construction of canal construction machinery (reportedly to be used on a 100-km-long canal project)	NVG	Contract signed 9/17/79
Hong Kong Aircraft Engineering Co. (Hong Kong)	Parts and airframe maintenance contract for planned Boeing 747SP fleet in early 1980	NVG	Negotiation 10/3/79
General Motors Holden (Australia)	16 Holden Kingswoods (sedans) to be deployed in 5 cities for tourists	NVG	Have been delivered 10/17/79
Nissan Motor Co. (Japan)	286 commercial vans	NVG	Order received 10/24/79
Miscellaneous			
Institute of Electrical and Electronics Engineers, BNC Enterprises (agent) (US)	IEEE publications	\$0.25+	Agreement that took effect 7/79

CHINA: 1979 SALES AND NEGOTIATIONS TO NOVEMBER 15—Continued

Company/Country	Product/Plant/Technology	Value Million US \$ (Local currency if known**)	Status Date Announced
Thomas J. Valentino (US)	Use of Valentino's Major Production Music and Sound Effects Libraries for TV in Guangzhou	NVG	Contract signed 9/79
Mitsukoshi, Ltd. (Japan)	Business tie-up agreement with Beijing Department Store; will provide managerial know-how, including sales technique, and cooperate in supply of commodities	NVG	Agreement signed 9/14/79
Mitchell Beazley (UK)	"Joy of Knowledge" encyclopedia; copies will be printed in China when translation has been completed	NVG	Has sold 9/14/79
Ming International (US)	Develop planning, technical, and chemical packages for tannery	NVG	Has been asked by China 9/17/79

Total Value of 1979 Sales Listed through November 15:

\$694.37 million+

Total Value of 1979 Negotiations Listed through November 15:

\$201.42 million+

Cumulative Total Values of 1979 Sales Listed through November 15:

\$ 7.19 billion+

Cumulative Total Values of 1979 Negotiations Listed through November 15:

\$ 2.66 billion+

NVG=No Value Given

NA=Not Available

* Date contract signed. All other dates are when sale or negotiation announced.

** Dollar conversions at month-end rates quoted in IFS (IMF).

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Letter from Beijing

The leaves have turned red in the Fragrant Mountains to the west of Beijing, marking the close of autumn and the onset of winter. The change of seasons brings with it a desire to sum up the events of the past few months. This is far from an easy task, however, since the months just past have been filled with a variety of seemingly contradictory events, some trivial, some serious.

Perhaps the most startling change in the look of this city came all of a sudden last September when the ubiquitous "Mao Board" came under furious assault. Within three weeks all these boards which featured the sayings of the late chairman had either been reduced to rubble and carted away, or painted over, with Mao's Quotations replaced with advertisements for Chinese-made art supplies (a nice touch of irony there) or surrealistic murals of Chang An Boulevard portraying the impossible in Beijing—orderly traffic flows.

The city's parks have also taken on a touch of the unreal, becoming the settings for carnivals, snake exhibitions (an old Chinese tradition) and martial arts demonstrations, none of which have been seen since before the Great Leap Forward in 1958.

Despite the international pessimism about the future of dancing here in China, Bei Hai Park was the scene this fall of spontaneous dance parties. People would bring cassette recorders and tapes to the park, set up in a small pavilion and dance to Hong Kong or Taiwan music. These parties became too popular, however, and are now banned in the park as a public nuisance.

Contemporaneous with this was the official "rehabilitation" of the electric guitar, condemned as decadent during the Cultural Revolution. But now in Beijing's parks and other public places one can often hear the strains of Fender guitars playing, of all things, Hawaiian love songs or "The Red River Valley."

It has also been discovered that bell-bottom trousers are not a foreign product but were, in fact, worn by all classes of Chinese as far back as the Tang Dynasty. Bell-bottoms, or "trumpet pants" as they are named here, are consequently suitable attire for modern Chinese. This last item appeared on a TV show which repudiated the "blue ant" image of Chinese fashion universalized during the Cultural Revolution, and encouraged everyone to dress in brighter colors and in more modern designs. In fact, the street scene in Beijing has brightened consistently over the past few months and this trend has continued despite the onset of cold weather.

The series of demonstrations in front of the main gate to Zhong Nan Hai, where China's top leadership lives, may be more portentous indicators of social change. Throughout the autumn a large group of rough-and-tumble peasants from the Northeast staged a sit-down demonstration requesting an investigation into a wide number of alleged

wrongs perpetrated against them during the Gang of Four era. After a long time their request was met and investigations have reportedly begun.

Following the peasants came the recent large demonstrations by faculty and students from Chinese People's University. These marches down Chang An Boulevard, culminating at Zhong Nan Hai, were aimed at getting units from the Army's 2nd Artillery off the university campus where they had been stationed since 1968, the year Mao used the Army to put the lid on the more "revolutionary" excesses of the Cultural Revolution. Now the students and faculty wanted to reclaim their campus, if not as a matter of principle, then simply because of the crowded living conditions that existed.

Moreover, the State Council had long ago passed a directive ordering the 2nd Artillery to "withdraw," but it apparently took these demonstrations to force the issue to a resolution, and they did. A good portion of the troops has moved elsewhere and a timetable is set for the rest.

Similar concerns over living conditions also caused a flurry of posters criticizing the administration at Beijing University. There students are jammed into dormitories eight to a room due to the fact that the last class of "worker-peasant-soldier" students, who matriculated under the educational policies of the Cultural Revolution, did not graduate on schedule. Rather, they were held back an additional semester to further upgrade their education.

In addition to crowding, the students complained about poor food, short bathing hours, poor study conditions and a host of related items. In no way was this a political movement reminiscent of days gone by. To the contrary, here as well as at People's University, the demands put forward were premised on the desire to contribute to the Four Modernizations.

It is in this positive light that these demonstrations should be seen. They should not be interpreted, as some have done, as a criticism of China's leadership. To the contrary, these actions were taken in the certainty that now for the first time in 15 years the leadership is listening to the people. This fact, added to the almost universal support for the ideals embodied in the policy of the "Four Modernizations," is what separates the majority of the Chinese people from the tiny minority who have gained worldwide attention through the Democracy Wall movement.

It is unfortunate that one of the latter movement's most outspoken members was convicted of treason and counter-revolution recently, yet the fact remains that the dissident movement here in China is simply a sideshow toward which the majority of Chinese remain indifferent. They know the consequences of a fixation on political polemics already, and they would like to find out what a similar devotion to economic development will bring. There are high expectations that the consequences will be good. —Carl Walters 完

Update

POSITIONS

Changes within the leadership of the Chinese Communist Party (CCP) have strengthened the position of Vice Premier Deng Xiaoping, who is also a vice chairman of the Party. In late September four new members were added to the CCP Central Committee: Bo Yibo, a moderate economic pragmatist appointed a vice premier on July 1 (see CBR 6.5, p. 71); Zhou Yang, a former cultural commissar; Guangzhou mayor Yang Shangkun, 74, who worked closely with Deng in the 1950s and was purged during the Cultural Revolution; and Lu Dingyi, a former propaganda chief who earlier this year published a blunt attack on the late Chairman Mao Zedong.

The fourth plenum of the 11th Central Committee also appointed to the ruling Politburo former mayor Peng Zhen, and Sichuan provincial party chief Zhao Ziyang, 60, a relatively young Deng protege, both purged during the Cultural Revolution.

ORGANIZATIONS

A new organization under the Chinese Academy of Space Technology, the China Communications Satellite Corporation, was formed earlier this year with the sole mission of procuring a communications satellite system from the US. A high-level NASA delegation learned about the corporation during China trip in May and June.

According to NASA officials, the organization will implement the purchase of the US-manufactured satellite from start to finish: it will organize personnel to participate in system design and manufacturing, monitor the various stages of contract implementation, and take part in launch and test activities.

President of the new corporation is Sun Jiadong, vice president of the Chinese Academy of Space Technology. Surprisingly, NASA officials said that the corporation does not seem to include a representative from the Ministry of Posts and Telecommunications, which would be an important end-user of the satellite.

Corporations established to deal with foreigners are experiencing a gradual increase in autonomy. The China Oil and Natural Gas Exploration and Development Corporation, a subsidiary of the Petroleum Corporation of the PRC, is apparently authorized to sign agreements with foreign firms, for example.

And certain important provinces and provincial-level municipalities—Beijing, Shanghai, Tianjin, Guangzhou, Fujian—are beginning to establish trading bodies ("general import-export corporations") and municipal development corporations under import-export management commissions. These commissions will

supervise the branch offices of FTCs within their jurisdiction, under general policy guidance from the FTC home offices.

SOCIETIES AND ASSOCIATIONS

A number of new societies and associations have been set up, indicating increased interest in establishing horizontal linkages between organizations otherwise operating under vertical lines of command.

The Chinese Arts and Crafts Society was founded on August 11, with Xie Xinh, vice minister of light industry, as president. Its main task will be to organize members to carry out research in promoting development of arts and crafts for export. Branches are to be set up in various areas of China.

The Chinese Association for Popularization of Science and Technology and Inventions was established in Beijing on August 20. Dong Chuncai was elected chairman and Wang Mailin secretary-general.

The Chinese Solar Energy Society was established during the second national seminar on solar energy, held in Xian in September under sponsorship of the State Scientific and Technological Commission and the State Economic Commission. The society elected twenty-nine Executive Council members, who in turn elected Wang Puxuan—deputy director of the thermal engineering section of Qinghua University—as president. The society immediately held its first convention, at which 150 papers were received on the use of solar energy, concentration of light rays, generation of electricity, instrumentation, and photochemistry. One hundred and seventy scientists and technicians attended the convention.

Organizational meetings were also held in September for a new China Communications Society, under the aegis of the Ministry of Posts and Telecommunications. President of the society is Wang Zigang, minister of posts and telecommunications. The society appears to be in competition with the China Electronics Society, which recently changed its name to the Chinese Institute of Electronics. Traditionally the CES was the professional organization for electronics engineers. The CES is under the Fourth Ministry of Machine Building, which is involved in production of telecommunications equipment.

REORGANIZATION OF BEIJING'S INDUSTRIAL SYSTEM

Four hundred and forty-six factories within Beijing's urban and suburban districts have been put under the jurisdiction of municipal bureaus since the beginning of this year, according to an October 17 report from Xinhua, the official Chinese news agency.

Omitted from this reorganization are twenty-three machine repair, wooden furniture, printing, and agricultural support enterprises and "five small" (service) enterprises, as well as neighborhood "May 7" factories.

Xinhua reports that Beijing's industrial reorganization has now entered a second stage, with readjustment of factory and enterprise plans "according to the principle of product specialization."

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