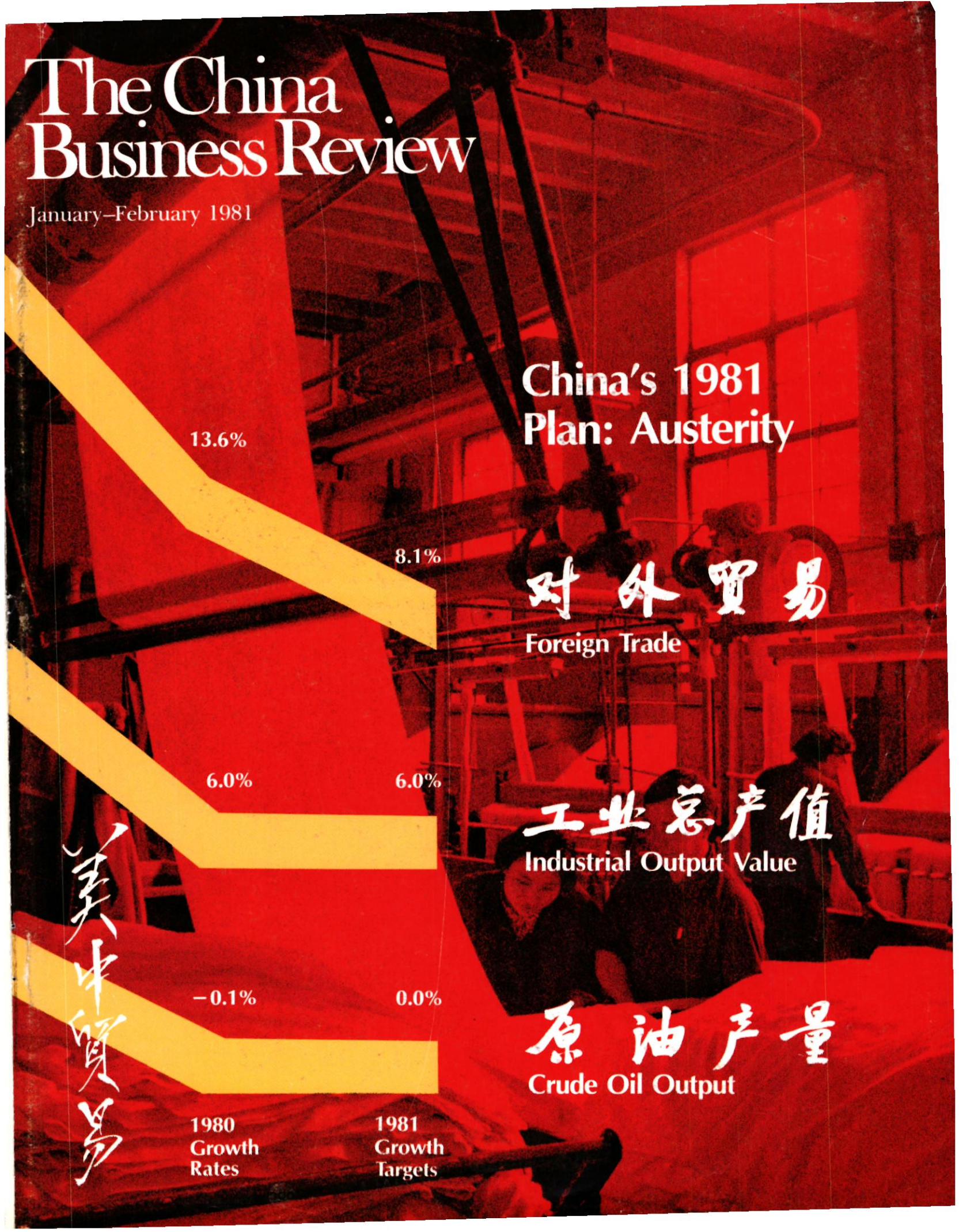
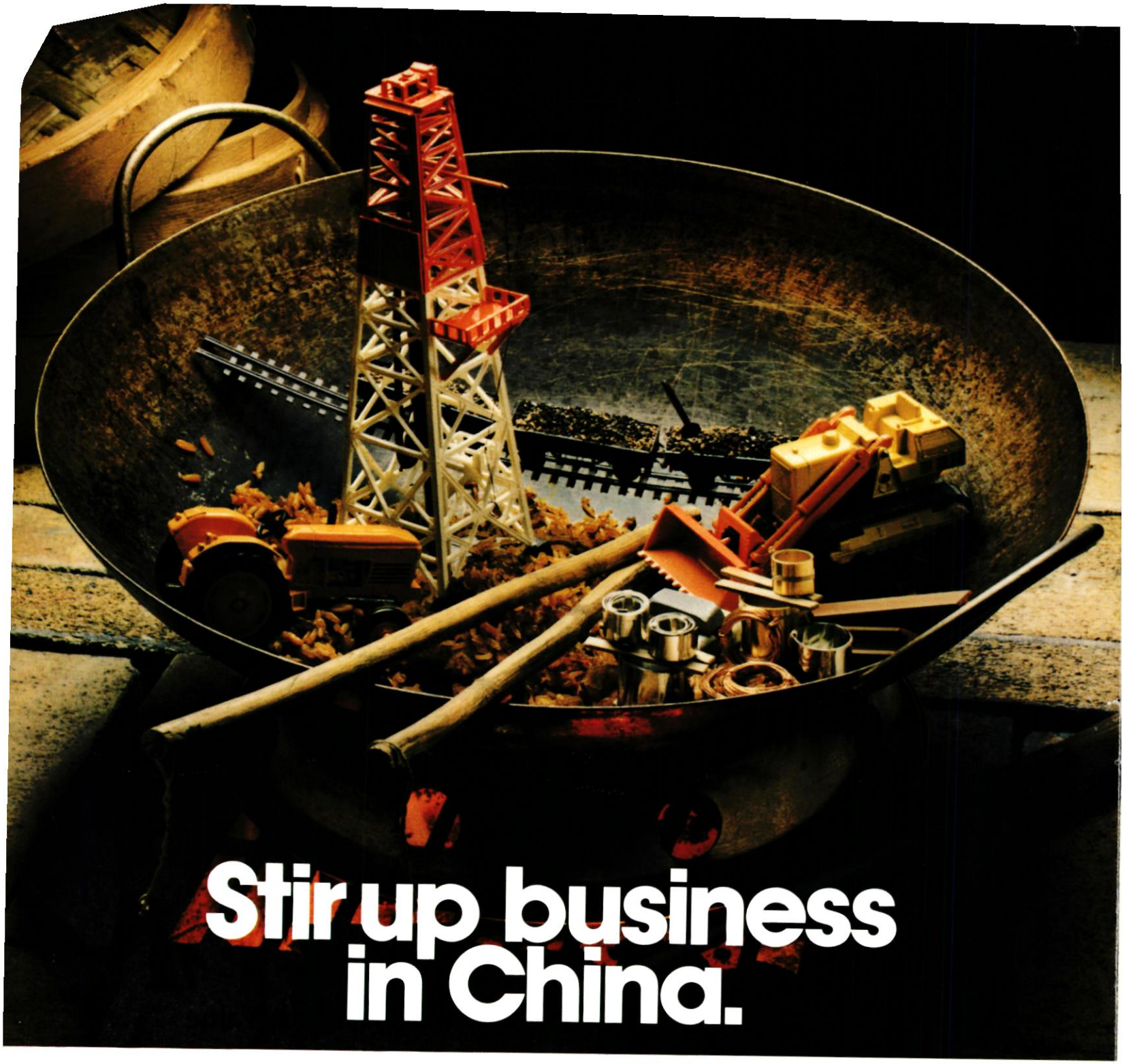
The China Business Review

January–February 1981

China's 1981 Plan: Austerity





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China Wire

What Companies Can Expect in 1981—New Economic Directions

After a rough year in 1980, Beijing has mapped out new directions for the next few years that should be heeded by every company doing business with the PRC—every firm confused by reassigned contracts, canceled orders, halted negotiations, lack of funds, and the impact of decentralization.

Last year saw positive developments, such as the spread of self-management (and import-export decisions) among enterprises, new trade authority given to the provinces, increased growth in light industry (China imported a record number of TV sets last year), and development of a partly market-regulated economy.

But problems were serious in China in 1980. Agriculture suffered from severe flooding in the south and drought in the north, thus reducing total grain output. And many industry sectors were plagued by overruns, poor planning, and unrealistic targets.

Priorities in 1981

Economic realism is expected to prevail at the 12th Party Congress in May 1981. The five-year 1981–85 plan, still not announced, may be issued in May, but the first two years at least (1981 and 1982) will continue to be years of "readjustment"—slower growth.

Readjustment now will have priority over "restructuring," but decentralization will definitely continue. According to a December *People's Daily* editorial, "China must slow down or suspend those restructuring measures that are in conflict with our readjustment task, even if they are appropriate to the long term." In other words, in the near term the achievement of certain economic goals has priority over the basic revamping of the economic system. What economic goals have priority?

Consumer goods. For visible improvement in people's livelihood, the orderly development of light industry will be pushed.

Agriculture. Agriculture will have top priority, with emphasis on nongrain crops, livestock, forestry, scientific farming, and improved irrigation. Mechanization will be downplayed in the near term.

Transportation. Until major plans are in place, development of rail, road, air, and waterway systems will be slow.

Natural resources. "Those processing industries that consume excessive amounts of energy and raw materials and are not urgently needed will be reduced."

Energy. The new State Energy Commission will work on long-term plans aimed at improving both distribution and output of major energy sources. Meanwhile, coal output will decline, and oil production will mark time until at least 1985 or 1986; all oil burning furnaces in industry and power generation are to be phased out by 1985 and strict energy conservation measures enforced. In coal, disproportion between tunneling and open-pit mining will see the emerging China Coal Corporation focus on major mine projects and the development of unit-trains to increase efficiency. No nuclear power can be expected until 1992 at least (*see* p.32).

Construction. Priority will go to projects in energy, transportation, communications, light and textiles industries, and urban housing. Strict controls will be enforced on all new projects to monitor economic feasibility. Projects costing too much, taking too long to build, or lacking adequate technology to produce decent profit margins will be curtailed.

Project responsibility, much of it under the general aegis of the new head of the State Capital Construction Commission, Han Guang, will be assigned according to level of government:

- The state commissions and ministries. Big, costly long-term projects for energy conservation, large coal mines, oilfields, power stations, main railways, important harbors and river-harnessing projects (all carried out in cooperation with local construction bureaus).
- Provinces and municipalities. Projects in agriculture, light and textile industries, building materials, urban public utilities, environmental protection, commercial service trades, culture, education, and public health facilities (some will be carried out in conjunction with central ministries).
- Local departments and enterprises. Projects involving workers' housing production safety measures, environmental protection, energy conservation, improvement of quality, and variety of products.

While plans and priorities have yet to be more specifically spelled out, long-term planning will continue to be strengthened during the next two years, aided by the UNDP computer system set up for the June 1981 Chinese census, thence to report on China's industrial output. Plans for energy, transportation, communication, light and heavy industry, and agriculture, will be prepared, studied, and revised more thoroughly than ever before until a realistic, nationwide plan is ready.

Beijing will be assisted by World Bank economists, currently preparing reports of six different facets of China's economy, and by consultants in almost every sector. "We must never again do such silly things as puffing ourselves up at our own cost," said *Renmin Ribao*, pointing to the need to coordinate "all activities of the nation like pieces in a chess game."

Even though the next two years may not feature dynamic growth in China, future prospects look good if the PRC's plans are fully in place by then.

Impact on Foreign Trade of Continued Readjustment

Foreign companies will still have plenty of China business but should anticipate the following:

- China's foreign trade will not grow as quickly as in the past, this year, or in 1982. The PRC's 1981 trade target is the equivalent of $37.3 billion, only 8 percent higher than in 1980 (*see* p.16).
- Massive agricultural shipments to China in 1981 owing to the poor harvest last year will probably help the US up its China trade about 40 percent in 1981 to the $6 billion level. But the increased outlays for grain will reduce

Beijing's available foreign exchange for technology imports.

• While China has plenty of reserves—it was over $1 billion in the black on the eurocurrency market as of June 1980 according to the BIS—the near-term emphasis will be on renovation of existing plants, not the importation of new whole plants and equipment.

• The FTCs remain in control of some 50 or so key products as of January 1, with ministries, provinces, and municipalities taking or sharing authority for all other items. For example, CEROILS will only handle a handful of major grain crops.

• Joint ventures, now that comprehensive implementation regulations have been issued, will move more quickly now. But companies must still be cautious, focusing on practicalities.

These changes offer strategic opportunities. Lose no time in developing opportunities with ministry and provincial/municipal trade units, and help them develop their expertise in foreign trade. If they do not develop this expertise, China's overall foreign trade may be recentralized and thereby constrained in its future growth. Check out new forms of financial arrangements with local authorities and enterprises too.

Check out every opportunity offered by Japan's OECF loan (another $260 million was made available at 3 percent on December 1), as well as by possible UNDP, World Bank, and US AID projects. Low-cost aid financing through these agencies will be a prime avenue for billions of dollars sales to the PRC in the next few years.

Carefully assess China's hierarchies and bureaucracy relating to any joint venture, cooperation arrangement, or countertrade contract. Find out who's really the boss, if you can. It's critical, if the deal is to work (*see* p.14).

—Nicholas H. Ludlow

China Calendar

Exhibitions in China

☐ **Guangzhou, February.** Packaging Technology Exchange, organized by the United Kingdom's Industrial and Trade Fairs International, Ltd., with the Guangzhou Packaging Corporation and the Second Light Industry Bureau, will be China's first international packaging exhibition.

☐ **Tianjin, March 9–15.** China's first international trade show to be sponsored by a private company—South Carolina-based Bobbin Publications, Inc.—will be entitled Bobbin/China Apparel Equipment Show. The PRC's Ministry of Light Industry has guaranteed that 30,000 factory managers, factory technicians, provincial officials, and technical staff will attend the exposition.

☐ **Beijing, March 12.** A Japanese textile industry fair under the joint auspices of the Association for the Promotion of International Trade, Japan; and the China Council for the Promotion of International Trade (CCPIT) will feature spinning, weaving, dyeing, and finishing machinery at Beijing's Central Exhibition Hall

☐ **Shanghai, March 17–26.** A British scientific instruments exhibition will be organized by the Scientific Instrument Manufacturers Association of Great Britain in association with the 48 Group of British Traders and the CCPIT.

☐ **Beijing, March 25–April 14.** Mike Rossell & Associates will conduct a medical, dental, and environmental equipment exhibition. For information, contact Mike Rossell & Associates, 119 Merchant Street, #408, Honolulu, HI 96813; (808) 523–7755 (Telex: 8703 SHOW HR).

☐ **Guangzhou, April.** An exhibition of coatings and adhesives COTECH 81, is expected to draw 20,000 visitors, according to its Hong Kong-based organizer, Y. Cee Chemicals, Ltd. Coorganized with the Guangzhou Municipal Hardware, Communication, Electrical, and Chemical Corporation, COTECH 81 will be the second such exhibition to be held in China.

☐ **Guangzhou, April.** Wen Wei Enterprises is the organizer of an international food processing, packaging, and machinery exhibition.

☐ **May 10–24.** A 25,000-title exhibit of US books, funded by the International Communications Agency and the Association of American Publishers, will travel to Beijing, Shanghai, Wuhan, Chengdu, Xian, and Shenyang. Publishers will be charged a fee of $2 per title exhibited and may exhibit as many titles as they wish.

☐ **Beijing, May 15–28.** May Lee International, Inc., will stage an exhibition entitled "New Sources of Energy, Environmental Protection Systems, and Other New Products." Booth rental fees are reduced for National Council members. For information, contact Ben Buxbaum or Claire Li, May Lee International, Suite 1617, 11 Broadway, New York, NY 10004; (212) 425–4397.

☐ **Beijing, June 1–10.** Mike Rossell & Associates will organize a light industrial products show. For information, contact the company at 119 Merchant Street, #408, Honolulu, HI 96813; (808) 523–7755 (Telex: 8703 SHOW HR).

☐ **Guangdong, June 1–10.** Plasprint 81, an international plastics processing and printing machinery exhibition, organized by the Hong Kong-based Industry and Trade Consultant Corporation with the CCPIT, is to be held at the Guangdong Exhibition Center.

☐ **Guangzhou, June 20–July 1.** US-China Food Technology Fair, organized by Mike Rossell & Associates in conjunction with Guangzhou Foreign Trade Center, will introduce to Chinese visitors the latest technology and techniques employed in the production, processing, handling, and distribution of food and food-related products. For information, contact Mike Rossell & Associates, 119 Merchant Street, #408, Honolulu, HI 96813; (808) 523–7755 (Telex: 8703 SHOW HR).

☐ **Beijing, September.** The owners of Denver's Driscol Art Gallery plan to open the first modern American art exhibit in Beijing's National Academy of Art. 完

Council Activities

Council President in China

Council President Christopher Phillips represented the private sector in the Commerce Department delegation to the US National Exhibition in Beijing, November 17–28. By invitation of the secretary of commerce, Phillips participated in the exhibition's opening ceremonies. He also held a series of meetings with Chinese officials including Vice-Premier Bo Yibo, whose September visit to the US was hosted by the Council; China Council for Promotion of International Trade (CCPIT) Chairman Wang Yaoting; State Council Deputy Secretary General Zheng Xiyuan; and Foreign Investment Control Commission Vice-Chairman Wei Yuming. Discussion centered on Council programs, future exhibitions, and issues related to foreign investment and compensation trade.

Phillips also arranged for the Council's fourth Board of Director's delegation to China, to be led by Board Chairman David S. Tappan, Jr., in March. The delegation plans to hold discussions with new political leaders, and to continue trade facilitation discussions initiated by government officials during Phillips' trip (*see* p. 30).

Importer Activities

Back in the US, the Importers' Steering Committee hosted a well-attended reception December 9 for members of the Chinese Exhibition trading delegation to celebrate the opening of the Chinese exhibition in New York. On December 11, the Textile Committee held a meeting in New York, at which it was decided to draft a letter to the Department of Commerce protesting the call for consultations between the US and Chinese governments over China's export of wool sweaters.

Exporter Committees

The National Council officially formed its Exhibitions Committee in New York December 10. Ted Krause of New York-based Clapp and Poliak was elected committee chairman. The group will prepare an exhibitions policy for Council directors' consideration. Discussions already have been held with officials of the Chinese exhibition in New York. One of the committee's projects will be a telecommunications show in November 1981.

The Telecommunications Committee October 9 heard from Dr. Vitali Garber, deputy under secretary of defense, on the loosening of export licensing requirements for military and dual-purpose technology items. Participants later met with Chinese Minister of Posts and Telecommunications Wang Zigang, and President Li Zhengang of the newly formed China Electronics Import and Export Corporation, whose primary interest is micro-

Veronica Yhap (center) with CHINATEX officials during the corporation's first US tour, 1975.

Veronica Yhap

Veronica Yhap, the "Dragon Lady" of America's new era of China trade, is sorely missed. Her sudden death from cancer removed a dynamic, sparkling personality from the China trade community, a star whose warmth and electric temperament combined to assure her a place in many hearts.

Veronica was the first American woman to visit the Canton Fair in the fall of 1971, and one of the first two American traders ever to do so.

In August 1972, she was one of the handful of Americans to meet CCPIT Vice-Chairman Li Yung Ting, and Lu Feng Chun of the CCPIT's exhibitions abroad department, in Toronto, Canada. In the eight years that followed, Veronica saw the China trade evolve to the point of reciprocal exhibitions in the United States.

As a founding member of the National Council, and its Importers' Steering Committee, and as cochairman for many years of the Textile Subcommittee, Veronica Yhap was a dynamic force in the development of our economic relations with the PRC.

Her total involvement in the development of the new China trade, her enthusiasm, optimism, and success at her own business, Dragon Lady Traders, Inc., were a major contribution to the development of Sino-US trade as we know it.

Many of us who traveled the long road side by side with fiery Veronica—all of us involved in the China business—will remember her fondly.

—Nicholas H. Ludlow

electronics.

Other recent meetings include: the Banking and Finance Committee December 1, which considered sending several regional banking delegations with varied interests to China in 1981; Petroleum Production and Processing committees November 12; Mining/Metallurgy Committee October 30, and the Transportation Committee December 1. Also on December 1 committee chairmen met with the Council Board of Directors to exchange views on future committee policies.

Delegations

A Council-sponsored offshore petroleum machinery delegation, led by State Machine Building Commission Vice-Chairman Fan Muhan, intensively investigated possibilities of joint production of a variety of equipment for China's offshore development program with US companies, November 25 until Christmas Day. Delegation members hoped China would be able to supply a significant proportion of the equipment for projects overseen by foreign oil companies.

A nuclear instrumentation delegation headed by Yang Yanbin, deputy manager of the China Nuclear Energy Industry Corporation of the Second Ministry of Machine Building, visited the US from January 7 to 29 under Council auspices. Its main purpose was to discuss joint production possibilities.

The Council is now preparing to receive a broad-based delegation of the State Energy Commission, one of the first of the new "super agencies" gradually being formed to supersede the ministries under the State Council. Led by Coal Minister Gao Yangwen, the delegation will concentrate on the coal, hydropower, and nuclear industries.

In addition to the Board of Directors' trip, the Council plans to send three delegations to China in the early part of 1981. These include a group which will discuss pharmaceuticals and pharmaceutical technology with the State Pharmaceutical Administration in March, a construction group in early April, and a telecommunications group in May.

On December 15 the Council hosted a luncheon in Washington for a Chinese delegation from the North China Industry Corporation (NORINCO), a trading subsidiary of the Fifth Ministry of Machine Building that specializes in conventional land armaments. Several member firms made presentations to the NORINCO group, headed by Fifth Machine Building Minister Zhang Zhen, which is interested in technical cooperation for production of a wide range of military and civilian products.

Conference

The National Council and the Louisiana State University Law Center jointly sponsored a conference on current developments in doing business with China, January 28–30, in New Orleans. Participants in this wide-ranging discussion of organizational, legal, economic policy, and financial issues in China's trade included Ren Jianxin and Tang Houzhi, heads of the Legal Affairs Department and Arbitration Section of the CCPIT, as well as Council attorney Walter Sterling Surrey and Publications Director Nicholas H. Ludlow.

New Beijing Representatives

On January 1, Scott Seligman, former assistant director of the delegations department, replaced Richard Glover as the Council's Beijing representative. Glover's accumulated expertise after his year in Beijing will add greatly to the Council's business advisory services upon his return to the Washington office. It is expected that Stephen Markscheid, currently Delegations Department associate, will join Seligman early in the year, bringing the number of full-time employees in the Beijing office to two Americans and one Chinese assistant. 完

"The difference between the right word and the almost right word is the difference between lightning and the lightning bug."

Mark Twain

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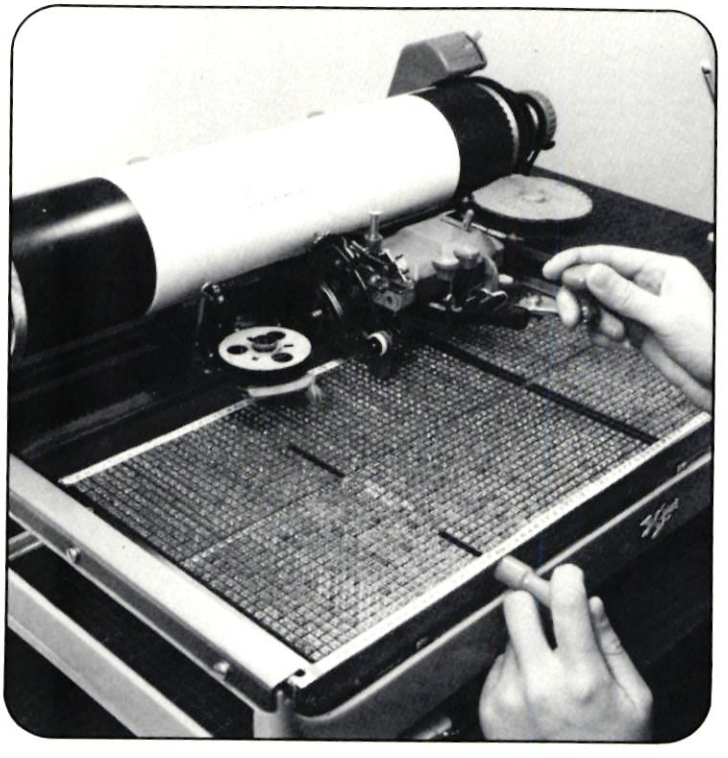

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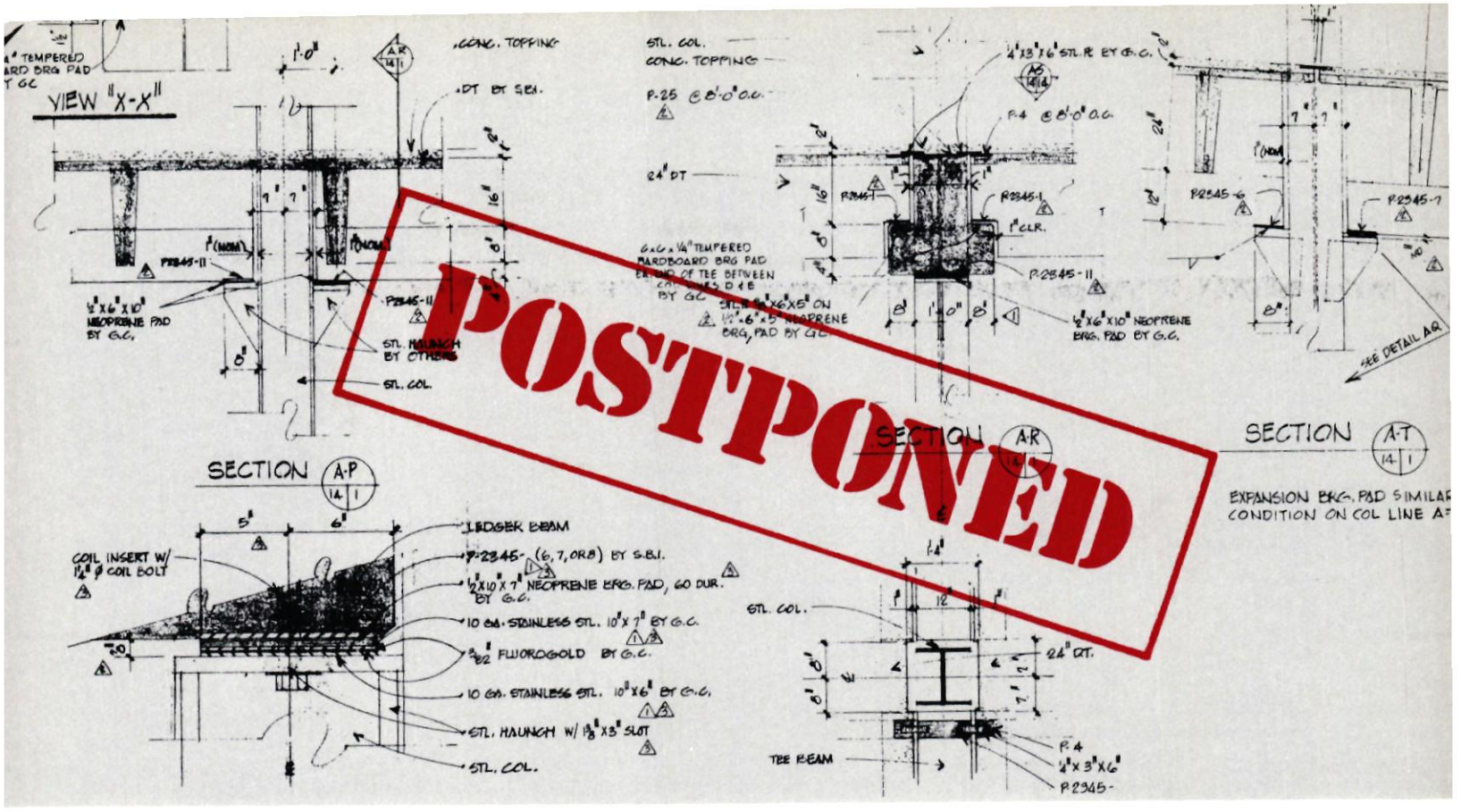


The Collapse of Construction Projects

"Most of the complete sets of large equipment we imported . . . consume much energy and this has exacerbated the shortage of fuel and power. We must never do this again in the future."—*Beijing Review*, August 25, 1980

Martin Weil

Several US and foreign firms, caught in a tug-of-war between Chinese leaders, received disheartening news in late 1980 of the "postponement"of major mining and chemical projects in which they had already invested millions of dollars.

These developments signal a new, more intensive phase of China's economic readjustment policy, which Chinese leaders now say will last well beyond the originally targeted 1979–81 period.

They also point to a new phase in the struggle among China's leaders over economic priorities. New leaders, mostly brought to power by Vice-Chairman Deng Xiaoping, genuinely seem to be trying to shift investment priorities from heavy industry to agriculture, light industry, and programs to improve popular living standards. But the Soviet economic model of the 1950s has come to haunt them, as powerful lobbies in the ministries of Metallurgy and Chemicals push forward their pet projects.

Dramatic signals of the onset of China's second economic reevaluation are:

- Scathing criticism of the Baoshan steel plant, followed by a decision to delay construction of its second phase;
- Collapse or suspension of negotiations for virtually all other comprehensive metallurgical developments, many of them involving American firms;
- Cancellation in midstream of construction of the Dongfang Chemical Works near Beijing;
- An apparent decision to postpone construction of several other petrochemical complexes for which equipment contracts were signed with foreign firms in 1978 and 1979.

These developments are attributable in part to such factors as:

- Difficulties in providing auxiliary facilities, including energy and transportation;
- Raw materials supply difficulties;
- Desire to switch from turnkey plant purchase toward improving China's domestic manufacturing and managerial capabilities; and
- Conflict, hesitation, and lack of coordination within the overlapping bureaucratic layers with interests in specific projects.

Resistance at the Top

The most important consideration, however, is the desire of top leaders such as Vice-Chairmen Deng Xiaoping and Chen Yun to shift priorities from heavy industry to light industry, agriculture, and improving living standards, while at the same time significantly reducing the overall scale of capital construction. These have been prominent themes since the readjustment policy was launched in April 1979.

Powerful interests in the heavy industry ministries have been resisting this policy quietly behind the scenes ever since. As the *People's Daily* indicated on December 3, "Projects that should have been suspended have not been suspended. . . . Projects that should not be started have been started one after another."

Evidence of this resistance at even the highest levels of the State Planning Commission appears in the figures for total capital construction outlays, which have remained as high as ¥50 billion per year since 1978 and are targeted to continue to do so in 1981. Even though the central government has reduced direct allocations for many projects, special interests have obtained money through other channels, such as local government budgets, ministry reserve funds, bank loans, and special funds for technical renovations.

Political Changes

The new push to curtail heavy industrial capital construction projects appears to flow from political changes supporting the retrenchment advocates. The elevation of allies of Deng Xiaoping such as Zhao Ziyang to the Politburo Standing Committee and Wan Li to the Party Secretariat in February 1980 was one such change. This was followed by the discrediting of the "oil clique" at the National People's Congress in September. This was in fact part of a broader attack on a nexus of heavy industrial interests which, as the Hong Kong magazine *Cheng Ming* puts it, favor a policy of "enthusiastically building large chemical, petroleum, and iron and steel industries, neglecting agriculture and light industry, showing no concern for the actual life of the people (preaching 'production first, life second'), and failing to attach importance to comprehensive balance." (*See CBR*, Nov.–Dec., 1980, p.33.)

The replacement of Yü Qiuli, long associated with petroleum interests, by Yao Yilin as State Planning Commission head, may well have removed a covert supporter of heavy industry from a key role in overseeing economic development. The elevation of Zhao Ziyang to the role of premier undoubtedly brings a more dynamic force into the top economic policy administration office.

The December dismissal of Gu Mu, for 12 years the head of the State Capital Construction Commission, also seems directly related to the drive to control construction more tightly.

Baoshan's Ups and Downs

A misleading US press report in November, coupled with harsh Chinese criticism of the Baoshan steel complex, temporarily cast doubt on a series of recently signed contracts for steel facilities at Baoshan, including an $80 million share won by Wean United of Pittsburgh.

None of these contracts has been suspended or cancelled, *CBR* has learned. As of November 1980 the Chinese had given assurances they intended to honor all signed contracts, according to representatives of several companies concerned.

The press report belatedly announced the Chinese decision to suspend phase two of the construction of the Baoshan complex. Phase one, however, is proceeding at full speed, according to recent eyewitnesses. Companies involved report that phase one is defined to include one 4,000 m^3 blast furnace, two 300-ton basic oxygen furnaces, a roughing mill, a continuous caster, a 500,000-ton seamless tube mill, a 4 million-ton hot-strip mill, a 2.1 million-ton cold-strip mill, coke ovens, a sintering plant, a power plant, and various auxiliary facilities (*see CBR*, July–Aug., 1980, pp. 47–49, and Sept.–Oct., 1979, pp. 58–59). After phase one is completed, Baoshan's capacity will be approximately 3 million tons of pig iron and crude steel. Contracts have been awarded for all aspects of phase one except the continuous caster. Negotiations for this facility, without which it would be difficult to operate the finishing mills, were proceeding in November.

Before being suspended indefinitely, phase two was to include one blast furnace, probably one basic oxygen furnace, coking ovens, and other equipment necessary to bring total capacity from 3 to 6 million tons of iron and steel. No contracts have been awarded for this phase. If and when phase two resumes, it is expected to involve a significantly higher ratio of Chinese equipment. Nippon Steel officials reportedly believe that it is uneconomic to build phase one with all its supporting infrastructure without proceeding with phase two.

The Chinese timetable for bringing the plant into operation is unclear, as is the current thinking about the exact mix of domestic-foreign iron ore. The Chinese originally planned to use imported Australian ore, but because of the cost planners are now considering some domestic ores as well. Low-grade domestic ores, however, are not technically appropriate for a large blast furnace without pelletizing plants, which China lacks. The objections to the Baoshan complex raised in the last few months have been:

Construction cost. There has been a major overrun from the originally estimated 20 billion yuan ($13.3 billion) because of failure to include the costs of many auxiliary projects.

Location. The complex is being built on swampy ground, which reportedly requires more than 300,000 tons of steel supporting piles; the shallow Yangzi River estuary cannot accommodate large draft ore-shipment boats, necessitating transshipping from an expensive and distant newly built port, Beilun.

Pollution. No environmental assessment was undertaken. The complex is located less than 30 kilometers upwind of China's largest city, and has no solid waste disposal plant. It is unclear how much carcinogenic substance will be released.

Raw material costs. With imported Australian iron ore, pig iron production costs are estimated to be almost twice that of other plants using domestic ores (due in part to the arbitrary Chinese internal price structure). Low-ash coals for coking reportedly are not available domestically.

Overreliance on foreign equipment. Justifiably or not, Chinese enterprises claim they could manufacture much of the equipment that is to be imported, such as drill-rod coupler machinery, which will cost $8.5 million in foreign exchange.

—Martin Weil

Under his leadership the commission proved conspicuously unable to perform its primary role of regulating construction.

Metallurgical Projects: A Running Controversy

The unveiling of the Four Modernizations program in February 1978, with its ten major steel and nine major nonferrous construction projects, led to a blizzard of negotiations with foreign mining and metallurgy firms. By January 1979, contracts had been signed with Japanese interests for the development of phase one of the giant 6 million-ton Baoshan steel plant, an 80,000-ton-per-year aluminum smelter in Guiyang, Guizhou Province, and a 90,000-ton copper smelter at Guixi, Jiangxi Province.

Feasibility and engineering contracts were signed for iron ore mine developments at Shuichang (Bethlehem), Sijiaying (Kaiser) in Hebei Province, Nanfen (Kaiser) in Liaoning Province, and for a copper mining and processing project (Fluor) at Dexing, Jiangxi Province. All were then high on the list of China's priorities.

But with the initial economic reevaluation in early 1979, virtually all outstanding negotiations for major steel plants were terminated. Contracts for the aluminum smelter and for Baoshan were temporarily suspended in line with a clause permitting the Chinese government to withhold approval. There was strong sentiment even at that time for postponing the Baoshan steel complex for a longer period. (*See CBR*, Sept.–Oct., 1979, pp. 58–60.)

Vice-Premier Li Xiannian was quoted in a Hong Kong newspaper in early 1979 as saying that a project of Baoshan's size "cannot be completed in one or two years, and profits cannot be guaranteed immediately after it becomes operational. Its foundation work has now started, and should be temporarily delayed until the conditions for reconstruction are right." Reports were leaked to foreign diplomats that the delay might be as long as two years.

However, metallurgical interests within China fought back and succeeded in reinstating the Baoshan contracts, albeit with more generous repayment terms, as well as the aluminum smelter contracts.

Metallurgical Minister Tang Ke defended Baoshan at the National People's Congress (NPC) in September 1980, arguing that greater domestic steel output was needed to stem the tide of steel imports. He announced that China imported 46.48 million tons of rolled steel products at a cost of $13.89 billion in the 1970s, and that as much as 55 million tons costing $22 billion might be needed in the 1980s.

Nonferrous Metal Projects

Some of the major nonferrous metal projects seemed relatively safe. Chinese leaders began strongly encouraging the development of industries with export potential, and the ministries were given greater powers to negotiate directly with foreign firms. Through its newly formed subordinate, the Metallurgical Import-Export Corporation, the Metallurgical Ministry explored developments based on payback through metals exports and told some companies it would be able to sign contracts on its own accord if they met the right financial terms.

Justifiably or not, Chinese enterprises claim they could manufacture much of the equipment that is to be imported for the Baoshan steel project.

The government media published a report in January 1980 that a slightly scaled-down version of the Dexing copper complex would be developed by Fluor. The report also stated that "China will build four other nonferrous metal enterprises with foreign investment." *CBR* learned in February that those highest priorities with central government approval were tin complexes at Gejiu, Yunnan Province, and Dachang, Guangxi Province; a molybdenum deposit at Jinduicheng, Shaanxi Province (discussed with AMAX); and a tungsten development at Shizhuyuan, Hunan Province. *CBR* was also told that the development of the Jinchuan nickel-copper deposit, discussed with INCO (Canada) had received central government approval.

A potential 600,000-ton integrated aluminum hydropower complex was under serious discussion with Alcoa and other international firms, although the immensity of the construction task and lack of electric power facilities made it a less certain prospect than some of the smaller projects. The fact that feasibility study contracts were awarded to Davy McKee and Wright Engineering for gold mines in Shandong Province would appear to have placed them high on the list of priorities as well, although gold is handled separately from other nonferrous metals in the ministry.

Projects Collapse

The turning point may well have been a series of high-level meetings in May 1980 that critically examined major construction projects. From this time onward many companies report that negotiations for further phases of their projects broke off—usually without definitive explanations from the Chinese side. From these meetings emerged a considerably scaled-down plan for the Jiangxi copper project, and probably more modest versions of other projects as well.

The issue that probably broke the metallurgical lobby's back was Baoshan, which was devouring a staggering proportion (probably 5–10 percent) of the national capital construction budget. It was disclosed at the May meetings that the ¥20 billion ($13 billion) figure for Baoshan's total costs used by Metallurgy Ministry officials did not include many of its auxiliary projects, and that the true costs, which the ministry had not calculated, might be 30–40 billion yuan ($20–27 billion).

It is likely that a tentative decision was reached at the May meeting to postpone expansion of Baoshan to 6 million tons (*see box*), and that the Ministry of Metallurgy vigorously resisted this behind the scenes. At that point, the strengthened anti-heavy industry forces increased the pressure by going public.

First, Vice-Premier Bo Yibo expressed disillusionment with Baoshan's "financial burden" in early July. Then in August the Chinese press for the first time publicized the fiasco of the $500 million ultramodern rolling mills imported from Japan and Germany for the Wuhan steel complex which, due to electricity shortages and the inability of Chinese managers and technicians to master the technology, has only been able to operate at around 20 percent of capacity since going on line in 1979.

Finally, at the NPC in September the long-simmering dispute boiled over in public, with Metallurgy Minister Tang Ke and his subordinates subjected to withering criticisms for the project's

many problems. The coup de grâce was delivered November 26, when Nippon Steel was reportedly informed that phase two had been postponed, a decision that primarily will affect Japanese companies (*see box*). Minister Tang is widely believed to be in danger of losing his job in the aftermath.

Current Prospects

The major contracts that China has signed, such as phase one of Baoshan, the Guiyang aluminum smelter, and the Guixi copper smelter, are all proceeding unimpeded, according to Chinese press and visitor reports. Likewise, the contracts for engineering studies at the copper and iron ore mines have been or are being carried out to the letter, according to Fluor, Bethlehem, and Kaiser—despite the fact that there are no immediate plans to carry out the studies' recommendations.

Although some companies hope that more favorable financial terms or buyback arrangements might induce the Chinese to resume some of the stalled major projects in their original form, there seems little prospect that this will be the case. Negotiations are not moving forward even for feasible projects in tin, molybdenum, and gold, which have a practically guaranteed rapid payoff through exports, a phenomenon all the more ironic insofar as Baoshan, the project with the most foreign exchange expense, is a much less economically attractive investment.

If and when the Chinese decide to go ahead with some of these projects, they are apt to be revised. The outline of the scaled-down Jiangxi copper project provides a model of some of the likely features of future metallurgical projects, including:

Piecemeal development. Rather than a massive integrated 200,000-ton complex, the project is limited for now to the 90,000-ton smelter purchased from Japan and the development of a mine at Yongping considerably smaller than the one planned originally for Dexing.

High proportion of Chinese equipment. Metallurgical Ministry engineers developed their own plan for the Yongping mine, and the Chinese are purchasing only selected pieces of equipment like grinding (ball) mills. The concept of developing a large-scale facility comprehensively using imported state-of-the-art equipment has fallen out of favor.

Emphasis on acquiring technology rather than equipment. The contract signed with Allis-Chalmers in mid-1980 for two ball mills at Yongping contains a provision for the company to assist China in manufacturing a third mill under a one-time license. This reflects major pressures from above to link virtually all equipment purchases to improvement of China's domestic technological capabilities.

Attention to supporting infrastructure. Among the prominent early investments are a power plant in Guixi, and several feeder railroads to the mines.

Chemical Projects

Chinese authorities signed a series of contracts during 1978–79 for complete petrochemical plants totaling more than $2.5 billion, making petrochemicals one of the most favored sectors for foreign exchange allocations. However, like the Baoshan contracts, they have become an "obstacle to progress" and a "burden," as one NPC deputy put it. As part of the effort to cut heavy industrial construction, the Chinese have apparently decided to delay development at several petrochemical complexes, including:

• Nanjing. Vice-Premier Gu Mu reportedly informed Japanese government ministers in December of the intent to defer the Toyo-Lummus ethylene plants at this site. This decision in all likelihood has also forced the postponement of downstream plastics and polyester plants. The polyester plant, at 530,000 tons, would have been one of the largest in the world. At the NPC, deputies testified that crude oil feedstock for the two 300,000-ton ethylene plants, amounting to some 5 million tons per year, could not be "guaranteed." Production at the Shengli oilfield, the plant's projected supplier, is believed to be stagnant or decreasing.

• Beijing-Yanshan. According to a recent US visitor, plant authorities indicated a metacresols plant (end product used to make agricultural chemicals) and accompanying hydroxytoluene facilities provided by Pullman Kellogg would not be assembled in the immediate future, despite the fact that the various components were observed lying neatly on the ground at the site.

• Urumqi, Xinjiang. According to an NPC deputy, detailed construction plans for an ammonia-urea complex to be furnished by the Japanese Ube Company have not received central approval for more than a year and a half. The Urumqi refinery, undoubtedly intended to provide feedstock, has not been allowed to go into operation. Xinjiang Province's limited oil supplies are shipped instead to the underutilized Lanzhou refinery.

Other complexes could suffer similar fates, including:

• Shengli. At the NPC, it was mentioned that the construction plans for the Toyo-Lummus ethylene plant there had not received central approval.

• Shanxi Province. The construction site of a fertilizer complex based on a Toyo-supplied nitric acid facility has been shifted three times in the past year and a half, according to one NPF deputy.

After a long controversy, the State Council decided in November not to build the Dongfang chemical complex near Beijing, the main end product of which would have been 30,000 tons of acrylic resin to be used in acrylic-based paints. Reasons included excessive use of scarce groundwater, pollution in China's capital, problems in feedstock supply, and anticipated difficulties in marketing the end product. A tentative ethylene plant contract for the Dongfang complex with Toyo-Lummus was canceled in the summer of 1979, but acrylic acid and ester plant contracts with Mitsubishi Heavy Industries had been reinstated.

As far as can be determined, the terms of the petrochemical plant contracts with foreign firms are being carried out despite the decisions to delay or cancel construction. For at least several plants, including the Nanjing ethylene and Yanshan metacresols facilities, equipment shipment is already well advanced. It appears, however, that once the equipment is received, there will be no move to actually build the plants. What changes might be requested in cases where shipments have not begun, such as the second of the two Nanjing ethylene plants, is not known.

The Mitsubishi contracts present a case believed unique in China's foreign trade, as shipments had already begun when the decision to cancel the Dongfang plant was made. As of mid-December, Mitsubishi had received no word to halt them.

Tug-of-War

As with the metallurgy projects, the suspensions in the chemical industry are the result of intense power struggles.

The case of the Dongfang plant offers a classic example of how a central ministry with the support of powerful Party officials can subvert normal procedures. It also demonstrates why the central government has had so much difficulty reducing the scope of capital construction.

Because of the opposition it aroused, this plant never received final State Capital Construction Commission approval of its construction plans, without which no construction is supposed to take place. However, while plans were being debated, plant supporters succeeded in laying foundations and pipelines, appropriating more than 10 million yuan by:

- Juggling funds between projects. The Chemical Ministry reportedly transferred 3 million yuan from the Shanxi Chemical Fertilizer plant to Dongfang.
- Use of ministry reserve construction funds. Another 2 million yuan came from this source.
- Use of local government funds. The Beijing Municipal Bureau of Chemical Industry appropriated an additional 5.7 million yuan, probably at the instigation of Beijing First Party Secretary Lin Hujia, one of the plant's most powerful supporters.

Dongfang's supporters hoped through such maneuvers to advance construction to the point that cancellation would be unthinkable.

At Nanjing as well, ministry construction units using their own funds broke ground for the ethylene project without approved plans.

The sharp attack on the chemical industry and its backers for these and other maneuvers is reflected in the recent discrediting of several prominent Chemical Ministry officials. Vice-Minister Li Guocai was forced to resign in November following disclosure of fraudulent technical claims about a boiler he designed and his despotic treatment of those who tried to expose its flaws. Vice-Minister Yang Yibang was charged at the NPC with accepting foreign bribes, according to the *South China Morning Post* in Hong Kong. Attacks on personal malfeasance usually signify that deeper policy issues are at stake as well. Vice-Minister Yang has reportedly been protected by the discredited Vice-Premier Kang Shien, formerly a prominent petroleum industry official, as well as Beijing First Party Secretary Lin Hujia, Dongfang's major promoter.

A Situation in Flux

China's apparent success in reining in its heavy industrial interests is remarkable. Many developing countries lack such self-discipline, and manage to turn back from overly ambitious schemes only under the watchful supervision of foreign bankers.

Despite suspension of the projects the battle over priorities is not finished. Some of the more feasible projects could be revived in modified form following thorough review, perhaps after the unveiling of five- and ten-year development plans at the Party Congress planned for the spring of 1981. Current trends, however, point toward the probability that very few will be restored to the original scale. 完

Who's the Boss?

After Ten Years They Still Don't Know

Nicholas H. Ludlow

The frustrations experienced by many foreign companies in dealing with China are often due to factors beyond their control. The following story, based on a report in the August issue of the Beijing monthly, Economic Management, *describes the bureaucratic nightmare endured by one Chinese factory. The story exposes some of the management problems that can make it difficult for Chinese factories to develop profitable, long-term business relations with foreign firms.*

Paradoxically, the Beijing Picture Tube Factory, a "progressive unit" that had won numerous awards for its 9- and 12-inch black and white tubes, ended 1979 about ¥3.4 million ($2.2 million) in the red. Production costs were higher than elsewhere, despite the plant's better-than-average technical facilities, and output in 1979 was 40,000 tubes, only one-third the production of a Shanghai plant that employed the same number of employees.

Supply Problems

Glass casings, or screens (the front cover of the tube), originally came to the Beijing factory from eight other cities in 1969–70, namely Dalian, Shijiazhuang, Tianjin, Nanjing, Qingdao, Shanghai, Chengdu, and Wuxi. They were of poor quality because only leftovers were supplied, and of such insufficient quantity that the factory was frequently forced to stop production.

In addition, prices of the screens were too high—12-inch screens from Shanghai, for example, cost ¥6 each against ¥4.88 for the same screens sold locally in Shanghai Municipality. In other words, there had been a 23 percent markup on screens leaving Shanghai. Who profited from the markup is not clarified in the report.

Transportation, packaging, loss in transit, profits, and tax allowances allegedly increased the plant's unit cost by more than four times the cost of making the screens itself.

Bureaucracy Makes its First Kill

Following a decision to manufacture its own screens, the enterprise sent out teams to study glassmaking and to obtain an appropriation to install special equipment such as vacuum pressure machines, crushing machines, and a special furnace. But the investment was revoked and the machines removed before they were even used when upper echelons decided to transfer control over the plant to "another department."

Back to Square One

A glimmer of hope that the plant's circumstances might improve came in March 1974 when Beijing Municipality decided to give a local glass factory a standing order for the screens to supply the Beijing Picture Tube Factory. Along with this order came a ¥3 million investment grant. After four years, reliable supplies at last seemed assured.

But not for long. Six months later, in September 1974, the municipality placed the tube factory under the Municipal Instruments Bureau. In June 1975 the Bureau decided the factory originally supplying the screens should cease production in favor of an electronic tube plant under its jurisdiction.

But by early 1976 the electronic tube plant remained unable to produce the screens. So, in March 1976 the original factory was asked to resume production of the screens.

By the end of 1976, however, production of the screens by the electronic tube plant had improved sufficiently for television tube purposes, that the original suppliers of the screens was again asked to stop production and the electronic tube plant asked to begin.

Then in 1977 control over the electronic tube factory passed to a central ministry. The ministry, however, did not fancy its electronic tube factory making screens for TV tubes, so it halted production at the plant and ordered the original screen producer to begin production again—for the third time.

By the time the original factory had finished tooling up again, it was almost the end of 1978. Not surprisingly, in the meantime, the production of tubes at the Beijing Picture Tube Factory had halved.

In the seven years from 1973 to 1979, the tube factory had stopped production for a total of three years and ten months. The nearly ¥1 million in work-stoppage expenses were charged to production costs.

Despite recent entreaties to higher authorities, supply problems persist at the Beijing Picture Tube Factory. In the first three months of 1980 the screen factory could only supply enough screens for three weeks' work at the Beijing factory. Workers at the plant had work to do only one week in every four.

The "Inverted Pagoda" Problem

Meanwhile, Beijing's two television factories produce about 700,000 sets a year, but the one factory in the city producing TV tubes, the Beijing Picture Tube Factory, has a capacity of only 40,000 units. And its chief supplier, the screen factory, can only produce about 60 percent of the screens

needed by the tube plant. The upside-down supply situation was aptly described as an "inverted pagoda."

Solving Quality-Control Problems the Slow Way

Aggravating all of these problems was the fact that the Beijing Picture Tube Factory could only deal with its suppliers through certain channels. Indeed, nine steps—both ways—were observed whenever the plant made a quality-control request to its supplier in Beijing:

1. Production workshop formulates request.
2. Beijing Picture Tube Factory forwards request to parent company.
3. Beijing Broadcasting and Television Company forwards request to its parent bureau.
4. Beijing Electronic Instruments Bureau forwards request to municipal planners.
5. Municipal planners pass down final decision to entity in charge of supplier.
6. Beijing Municipal Light Industry Bureau passes down decision to subordinate level.
7. Beijing Glass Manufacturing General Factory informs supplier.
8. Beijing Glass Casing Factory (making screens) orders appropriate workshop to comply.
9. Workshop implements order.

No wonder that a minor dispute in 1974 stopped production for four months until the question was finally taken to Qinghua University for resolution. At least ten different departments of the municipality alone have been involved in dispute resolution, always apparently with enthusiasm, sympathy, and convinced that "the problem must be solved at once."

Pricing: Always Higher in Beijing

The plant's prices have always exceeded those in Shanghai due to the higher prices it must pay for screens procured in Beijing. In 1974 the price for a 9-inch screen was ¥13 per set, compared to Shanghai's ¥9; by 1978 the price differential was lower—¥4 for Beijing against ¥3.5 for Shanghai.

But these were cross-border prices. In Shanghai, the 1978 price for the same item, if bought and sold within the municipality, was only ¥1.86.

The interesting aspect of these prices is that the Beijing Picture Tube Factory must add ¥10 to the cost of each screen to cover the cost of work-stoppages and waiting for supplies. And its per-unit production costs per tube is more than twice as high as that of its Shanghai rival, the No. 4 Electronics Factory, suggesting the squeeze between costs and prices may be so tight as to produce a permanent loss for the Beijing factory.

R&D: How to Keep Ahead Despite Everything

The continuing lack of its own screen workshop has cost the Beijing Picture Tube Factory plenty of opportunities to produce new products. Orders for various 4-, 5-, and 7-inch tubes required by Chinese scientific, defense, industrial, and medical organizations, have been turned down. Since the Beijing

Bureaucracy Checklist

For Foreign Companies Contemplating Any Kind of Business in China

Aim for an Integrated Operation

As the accompanying story shows, any involvement with outside suppliers creates the risk of poor quality, delivery problems, higher prices, and above all, problems with bureaucracy that may reduce efficiency.

Identify Every Organization Involved

Be sure you have identified every bureau, department, organization, and factory involved in your operation. Any one of them can create bigger problems than you can imagine. Establish clear quality-control standards, and workable dispute settlement procedures.

Understand the System

So far as is possible, spend at least as much time trying to understand the Chinese system and how it is changing, as in negotiating the business. That understanding may be more important in the long run to your operation than your face-to-face contacts.

Assess Your Partner's Circumstances

Will your Chinese partner be reorganized, merged, split-up, or eliminated in the near term? How will decentralization and other economic reforms affect it? Bear in mind that decentralization may actually reduce a factory's management autonomy. By transferring power from a Beijing ministry to a local bureau, a factory's boss is in effect moving closer, and may insist upon playing a greater role in a plant's operations.

Establish Your Pricing in China

If sales are contemplated in China, what entity will set your product's prices? Apart from the State Bureau of Prices in Beijing, which sets prices of strategic commodities under the state plan (*see CBR*, Nov.–Dec., 1980, p. 18), each province and city in China has its own price bureau regulating prices of locally manufactured goods. Will the local or national bureau set the interprovincial and intraprovincial prices for your supplies and finished product? Can you adjust your prices relative to cost? Be certain.

Assess the Industry in China and its Plans

Are you doing business with the right plant? Insist on obtaining a full profile of the industry in China. Check out all the plants in the industry. If you cannot, you may end up backing the wrong horse. Also find out about the plans of the province and city where your Chinese partner is located. Is there a chance that the local bureau has targets that are too low or too high? Are the plans realistic? Does the plant have much leeway under the plan? And how will it be affected by the plans of other factories and organizations?

—Nicholas H. Ludlow

plant was unable to produce them, the orders went elsewhere.

The struggle to improve the factory's product line has been handicapped by a lack of capital. Eight out of China's 20 TV tube factories recently received foreign exchange allocation to buy production equipment, mainly from Japanese firms. Not so the Beijing tube plant.

Undaunted, workers at the plant in late 1979 and early 1980 collated more than a thousand items of data on each of a collection of 12-inch black and white tubes made in Japan, the USSR, Singapore, the Philippines, and Taiwan. Following the investigation that convinced the workers their products were "not far below" the standards of foreign tubes, they determined to catch up with advanced world levels.

Seeking a Remedy

Attempting to strike an optimistic note, the report about the Beijing Picture Tube Factory points out that most TV tube plants in China currently make their own screens. This was the solution favored by the factory ten years ago.

In November 1979, the Beijing Municipal Economic Commission authorized the screen factory to be placed under Electronic Instruments Bureau jurisdiction, thus consolidating the beleaguered factory and its chief supplier under one authority.

By mid-1980, as it turns out, the decision had apparently not been carried out. The employees at the factory are once again disheartened, and the leading cadres involved claim they can do nothing. The solution to the factory's woes is still out of sight. The workers at the plant at last report were "infused with a spirit of daring to wage difficult and hard struggle." They are determined to "press forward bravely."

But is greater self-reliance the answer? Chinese factories are famous for their capacity to make their own inputs, ostensibly to avoid the headache of buying the same things from outside suppliers. But total self-sufficiency cannot solve the problem. Is not China's bureaucracy—and its injurious effects on trade—the real culprit? China must establish clear-cut responsibilities and accountability among managers if modernization is to work. Foreign companies cooperating with Chinese enterprises increasingly want to know who's the boss. 完

Economy

Beijing's Continuing Retrenchment

James B. Stepanek

New Year Targets Released

China's economic targets for 1981 have been set very low, apparently in an attempt to inject realism into economic planning (*see* p.17). "We must resolutely overcome the wrong practice of setting high targets without taking our actual capabilities into account," the *People's Daily* explained.

Industrial output in 1981 is projected to grow by only 6 percent, the same as last year. The agricultural growth target is set at 4 percent. Only coal, cotton, sugar, and investment in capital construction (increased by 10 percent to ¥55 billion) have been assigned higher growth targets than in 1980.

The sharp reduction in the growth rate of foreign trade from 28 percent in 1979 to a target of 8 percent in 1981 is undoubtedly a reaction to China's huge $2 billion trade deficit in 1979. The projected trade deficit for 1980 is $400 million, based on official trade figures for the first half of the year.

Despite the high priority assigned to consumer welfare by the third session of the Fifth National People's Congress in September last year, the output targets of cotton yarn, bicycles, sewing machines, and watches are all lower than in 1980. Retail sales are expected to rise by only 7.3 percent.

Missing the Targets

So startling is the gap between many of China's original targets and actual year-end results, that the accuracy of China's newest targets is called into question. A recent case in point:

	Economic growth rates in 1979	
	Planned	Actual
Gross value of industrial output (GVIO)	8.0	8.5
Gross value of agricultural output (GVAO)	4.0	8.6
Central government:		
Revenues	−0.1	−1.6
Expenditures	0.8	14.7
Total foreign trade (fob/cif)	20.9	28.0
Exports (fob)	20.0	26.3
Imports (cif)	21.8	29.6
Output of:		
Steel	0.7	8.5
Coal	0.3	2.8
Crude oil	5.7	2.0
Grain	2.5	9.0
Bicycles	10.8	18.1
Sewing machines	8.7	20.8

SOURCES: *Beijing Review*, June 29, 1979; *CBR*, July–Aug., 1979, p. 37, Jan.–Feb., 1980, pp. 62–63, and May–June, 1980, pp. 54–56.

If even short-term forecasts by Chinese planners are fraught with inaccuracies (the above plan targets were released in mid-1979), how much weight should be given to the 1981 targets, or for that matter to China's forthcoming five-year plan targets that may be released this spring?

Reserves Up

Chinese Vice-Premier Yao Yilin revealed to Kyodo News Service on November 7, 1980, that China had "more than $6 billion dollars in gold

China's 1978–79 Economic Results and 1980–81 Plan Targets

Macro Indicators (billion ¥ and $)	1978	Percentage Change	1979	Percentage Change	1980 Targets	Percentage Change	1981 Targets	Percentage Change
Total gross industrial and agricultural output[1]	¥569.0	12.3	¥617.5	8.5	¥651.4	5.5	¥687.2	5.5
	$338.3	23.6	$398.6	17.8	$434.3	9.0	$458.1	5.5
Gross value of industrial output[1]	¥423.1	13.5	¥459.1	8.5	¥486.7	6.0	¥515.9	6.0
	$251.5	24.9	$296.4	17.9	$324.5	9.5	$343.9	6.0
Of which:	¥242.4	—	¥261.1	7.7	¥275.2	5.4[2]	¥287.5	4.5
Heavy industry	$144.1	—	$168.6	17.0	$183.5	8.8	$191.7	4.5
Light industry	¥180.7	—	¥198.0	9.6	¥211.5	6.8[3]	¥228.4	8.0
	$107.4	—	$127.8	19.0	$141.0	10.3	$152.3	8.0
Gross value of agricultural output[1]	¥145.9	8.9	¥158.4	8.6	¥164.7	4.0	¥171.3	4.0
	$86.7	19.8	$102.3	18.0	$109.8	7.3	$114.2	4.0
National income (current prices)	¥315.0	12.0	¥337.0	7.0	—	—	—	—
	$187.3	23.3	$217.6	16.2	—	—	—	—
Total investment by all levels of government	¥47.90	31.3	¥50.00	4.4	¥50.0	0.0	¥55.0	10.0
	$28.48	44.6	$32.28	13.3	$33.3	3.2	$36.7	10.0
Foreign Trade (billion ¥ and $)								
Total trade (fob/cif)	¥35.54	30.4	¥45.5	28.0	¥51.7	13.6	¥55.9	8.1
	$21.13	43.6	$29.4	39.1	$34.5	17.3	$37.3	8.1
Exports (fob)	¥16.79	20.2	¥21.20	26.3	—	—	—	—
	$9.98	32.4	$13.69	37.2	—	—	—	—
Imports (cif)	¥18.75	41.2	¥24.30	29.6	—	—	—	—
	$11.15	55.5	$15.69	40.7	—	—	—	—
Industrial Production (million metric tons unless otherwise indicated)								
Steel	31.78	33.9	34.48	8.5	—	—	35.0	—
Coal	618.0	12.4	635.0	2.8	610.0	−3.9	620.0	1.6
Crude oil	104.05	11.1	106.15	2.0	106.0	−0.1	106.0	0.0
Electricity (billion kwh)	256.55	14.8	281.95	9.9	300.0	6.4	312.0	4.0
Timber (million cubic meters)	51.62	3.9	54.39	5.4	—	—	49.1	—
Cement	65.24	17.2	73.9	13.3	—	—	78.0	—
Chemical fertilizer[4]	8.693	20.1	10.654	22.6	—	—	12.3	—
Motor vehicles (thousand units)	149.1	18.9	186.0	24.8	—	—	160.0	—
Tractors (thousand units)	114.0	14.8	126.0	10.5	—	—	97.5	—
Agricultural Production (million metric tons unless otherwise indicated)								
Grain	304.75	7.8	332.115	9.0	332.5	0.1	342.5	3.0
Cotton	2.167	5.8	2.207	1.8	2.3	4.2	2.55	10.9
Sugar	2.27	25.0	2.5	10.1	2.5	0.0	2.6	4.0
Consumer Goods (million units unless otherwise indicated)								
Bicycles	8.54	14.9	10.09	18.1	12.6	24.9	14.84	17.8
Sewing machines	4.86	14.6	5.87	20.8	7.2	22.7	8.6	19.4
Watches	13.51	22.4	17.07	26.4	21.0	23.0	23.6	12.4
Detergents (thousand metric tons)	324.0	26.1	397.0	22.5	430.0	8.3	480.0	11.6
Paper	4.39	16.4	4.93	12.3	5.0	1.4	5.2	4.0
Cotton yarn	2.38	8.0	2.63	10.5	2.775	5.5	2.865	3.1
Total value of retail sales	¥152.75	8.3	¥175.25	14.7	¥205.0	17.0	¥220.0	7.3
(billion ¥ and $)	$90.81	19.2	$113.14	24.6	$136.7	20.8	$146.7	7.3

NOTE: Conversion to US dollars based on monthly average exchange rates of 1.682 yuan per US dollar in 1978, 1.549 in 1979, 1.500 in 1980, and 1.500 in 1981.

[1]Based on 1970 constant prices.

[2]Output value increased by 6.0 percent during the first six months of 1980 compared with the same period last year.

[3]Output value increased by 24.2 percent during the first six months of 1980 compared with the same period last year.

[4]Calculated on the basis of 100 percent effectiveness.

SOURCES: Report by Vice-Premier Yao Yilin to August 30 session of National People's Congress, released by Xinhua news agency the same day; and State Statistical Bureau Communiqué, released by Xinhua on April 30, 1980 (*see CBR*, May–June, 1980, pp. 54–56). Table by James Stepanek

and foreign exchange." This means China holds nearly $5 billion in gold reserves, inasmuch as it currently maintains only $1.3 billion in net deposits in eurocurrency banks, according to the Bank of International Settlements (*see chart*).

The BIS data also show that China's 1979 trade deficit took a large bite out of the country's foreign exchange reserves, which fell by almost $1 billion to a four-year low of $449 million. However, the dramatic upturn in the first half of 1980 may encourage the government to reverse its current retrenchment policies.

"Internal" Exchange Rate Adopted

Vice-Premier Yao Yilin also announced in November 1980 that China would not devalue the yuan, and yet that is precisely what the government did January 1.

The new rate is set at 2.8 yuan for one US dollar, according to an unofficial report by *The Wall Street Journal* December 8—almost double the current official exchange rate. The new rate applies to all foreign trade activities, except tourism, which will continue to operate at the old rate.

The devaluation means that local Chinese importers have to pay 79.5 percent more yuan (2.8 yuan instead of 1.56 yuan, the official rate as of late December) for every dollar's worth of foreign goods.

The additional revenues paid to China's foreign trade corporations, which still handle practically all of China's foreign trade despite decentralization, will permit the corporations to pay higher prices to exporting enterprises. The government is determined to reduce subsidies to exporters, many of whom are being paid to export so that the country can earn the foreign exchange necessary to buy capital goods.

So far IMF officials have failed to obtain details about the new exchange system. Will the foreign trade corporations be responsible for implementing the new system? Will the Bank of China, or the trade corporations, receive the profits from the rate change? Article 4, Section 1 of the Fund's Articles of Agreement requires member countries to provide the Fund with an explanation of changes which occur in a country's exchange rate system.

Meanwhile, the Chinese government vehemently denies that a devaluation has taken place. "There is no possibility of a devaluation. . . . In dealings with foreign countries, there is, and will continue to be, only one exchange rate for RMB," the General Administration of Exchange Control announced on December 15. The new rate is for the "internal settlement of accounts," it emphasized.

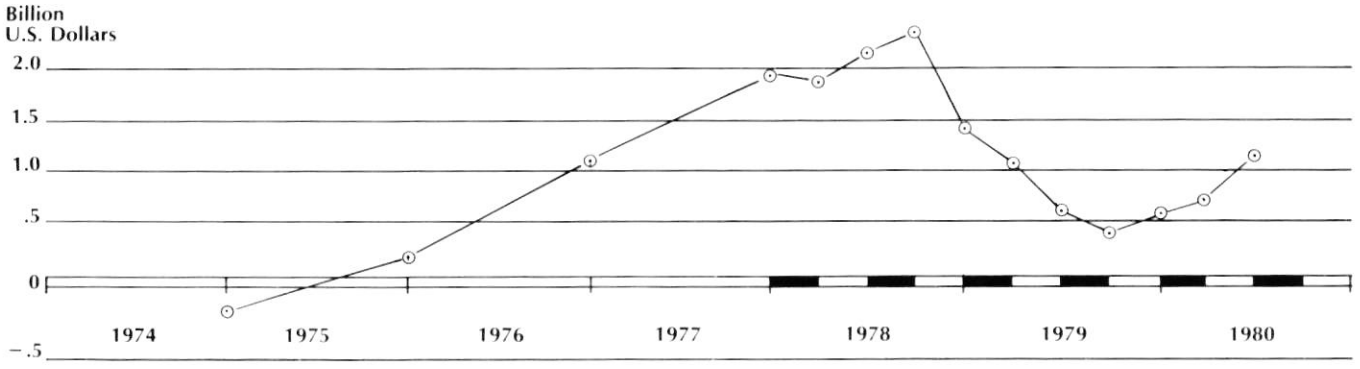
Thus far US companies have ignored the argument that the new rate is an "internal" matter. Many importers with contracts in dollars are already trying to renegotiate their prices to reflect the devalued yuan. They are telling Chinese exporters that since every dollar's worth of exports will earn them 2.8 yuan—almost twice what they normally make—they should lower their prices to US importers in order to export even more. The *CBR* has learned that one Chinese factory recently agreed to sign a contract with a US importer at substantially lower prices in dollars, so some Chinese enterprises are apparently receptive to the argument.

Upset at the controversy it has aroused, the Chinese government has hinted that the new system has really operated on an *ad hoc* basis all along. A US textile executive was recently told that the new measure merely broadens and standardizes the foreign exchange surcharges previously paid by certain Chinese importers.

Moreover, a system much like the new two-tier exchange rate system was implemented in China in the 1960s, one Chinese official told the *CBR*. At that time, Western firms doing business with China were unaffected. Therefore, why the sudden interest now, the official queried.

An obvious answer is that China's foreign trade in the 1960s was not decentralized to the extent that it is today. Local foreign trade corporations are no longer under Beijing's tight control, and some factories are allowed to sign their own foreign trade contracts. With decentralization has come competition, as Chinese enterprises and trading corporations try to undercut the prices of rival units. Since the devaluation has made exporting even more attractive, the competition will surely intensify.

CHINA'S FOREIGN EXCHANGE RESERVES IN EUROCURRENCY BANKS



SOURCE: Bank for International Settlements, *International Banking Developments*, various dates. Reserve figures are obtained from China's net deposits (assets minus liabilities) in eurocurrency banks in Austria, Belgium, Luxembourg, Denmark, France, FRG, Italy, Netherlands, Sweden, UK, Canada, and the offshore branches of US banks. Data from eurocurrency banks in Ireland, Switzerland, Japan, and the US are less than complete. Reserves are measured on December 31 each year since 1974, and at the end of each quarter since 1978.

Table by James Stepanek

PROTECTIONISM

Several US industries form a front in Washington against burgeoning Chinese imports

Carol S. Goldsmith

The elements that figure into the US-China trade scene could be fashioned into an intriguing screenplay. Stock characters would include the ambitious, overzealous Americans who've set aside three days to win multimillion-dollar deals; the seemingly eager, unassuming Chinese who meanwhile coax all the information they can from the talks without ever signing a contract. Long hours are spent across the bargaining table, heads shaking, palms sweating. Behind the scenes are the Chinese and US governments, whose quixotic on-again, off-again encouragement to US-China trade lends an aura of perplexity to the scene.

The US government, despite some political efforts to facilitate trade with China, has been caught up in the newly conservative climate. A host of bills promoting export trading companies died with the 96th Congress. Commerce Department plans to open a special countertrade advisory office stalled with the election results. More momentum in recent months has been stirred by protectionist lobbies representing US industries fearful of revenues and jobs being washed away by a rising tide of Chinese exports.

These sentiments are understandable, despite the fact that US exports to China (more than $3.2 billion in 1980) are leaping ahead at twice the growth rate of China's exports here (about $870 million in 1980).

Already quotas have been clamped on nine categories of China's most important exports, and at least one other category of Chinese goods is being attacked by a large trade association as threatening. And several product areas the Chinese may choose to promote are being watched quietly.

Menthol

A second link has just been added to the chain of events that could restrict importation of Chinese natural menthol. On January 7 the Department of Commerce made a preliminary determination China is underselling menthol here, and shipments or warehouse withdrawals should be assessed at 13.5 percent fob (free on board) invoice value. Effective immediately, importers must post a bond or some other form of security equal to the 13.5 percent figure until the ITC finally determines damage (if any) to the domestic industry—which in this case boils down to one, or at best two, US producers.

The three-part investigation stems from a preliminary determination by the International Trade Commission (ITC) in July that there is "a reasonable indication" US producers are threatened with material injury by imports of Chinese menthol at less than market value. After comparing worldwide prices, Commerce decided China was engaging in unfair pricing by undercutting both its own production costs and those of competing countries. The ITC now must determine whether the damage or threat of injury is serious enough to impose DOC's recommended duties, probably sometime in July.

That China has entered the menthol market in a big way no one doubts. Figures from the departments of Commerce and Agriculture show dramatic increases in China's natural menthol shipments since imports began in early 1977. That year saw nearly 5,900 pounds of Chinese menthol come into the country at a value approaching $193,000, still a small sum compared to Brazil's $15 million sales. But 1978 told a different story. The PRC increased US shipments to a value of nearly $2.9 million, while Brazil's sales dropped to $12.6 million. In 1979 the ratio narrowed further: $3.7 million in sales from China compared to $6.5 million from Brazil. By September 1980, China's US sales had come to within 79,000 pounds, or $1.19 million, of Brazil's shrunken volume.

The granting of most-favored-nation status on February 1, 1980, also contributed to China's high sales and low prices, prompting the call for protective action—at least by one domestic firm.

Haarmann & Reimer, a New Jersey-based menthol manufacturer, in July filed a petition with the ITC requesting that the US tack onto Chinese menthol a protective tariff of $1.19 per pound. That would more than offset the price difference between China's natural and H&R's synthetic menthol. To put things in perspective, H&R has been struggling to sell its synthetic menthol here since opening its South Carolina *l*-menthol plant in 1978. ("*l*-menthol," either natural or synthetic, is used in manufacturing tobacco products, confections, dental products, analgesic balms, personal hygiene products, and perfume and flavoring materials—although some manufacturers prefer not to substitute synthetic for natural in flavoring.) The decision to build was made during a period of unusually high menthol prices, owing to Brazil's 1973–74 crop failures. While DOC figures show that Brazil's menthol sold here for $4.45 per pound in 1973, the reduced 1975 supplies went for more than $10 per pound. At about that time H&R determined it must receive $7–8 per pound over the life of its new menthol plant to recoup the $15 million investment.

With competition down in 1975, that return sounded reasonable. With China in the market two years later, H&R's plant began losing money.

Two questions figure prominently in this case. One is whether H&R's problems stem from China's unfair market competition, or merely reflect a bad business decision. The other is whether the damage to US producers warrants protective relief.

Four firms comprise the domestic menthol industry, of which only two produce the type of menthol under

Photo by Ruder & Finn of Mid-America

(Upper left) several categories of Chinese cotton knit blouses, shirts, and trousers have been restricted under the bilateral quotas; (lower left) China's footwear shipments to the US have increased 136 percent in the last three years; (right) fine Chinese needlepoint enjoys a thriving US market and does not compete directly with American crafts.

discussion. A third firm, SCM Corporation's turpene products division, produces synthetic *l*-menthol for fragrances, flavors, turpentine, and pharmaceutical products. But it decided not to join the petition.

"We're just interested bystanders," says Group Vice-President Ralph E. Close. "We're making and selling a lot less menthol than we planned at this time, and less than we sold in the past. But our equipment is flexible," he adds, noting that production could be diverted from *l*-menthol without a catastrophic loss.

Originally just bystanders themselves, the Chinese finally entered the fray. Representatives at the New York office of CHINATUHSU (China Native Produce and Animal By-products Import-Export Corporation) followed up the first ITC hearing by contracting a top New York law firm in September, leaving little time to prepare the case. Initially, counsel had been concentrating solely on the question of less than fair value (LTFV) pricing, arguing that China's "prices are representative of production costs. State controls don't reach into this product area."

Now that Commerce has decided otherwise, counsel is shifting emphasis to disprove domestic claims of material injury.

Textiles

Not long after the September signing of the US-China textile agreement, which set quotas for specific import categories, US Chief Negotiator Reiter Webb mused that all sides were complaining loudly, which must mean they had struck a fair accord.

The three-year agreement signed by President Carter and Vice-Premier Bo Yibo ended as much as 15 months of unilateral restraints on: cotton work gloves; women's, girls', and infants' cotton knit blouses; men's and boys' woven cotton shirts; women's cotton shirts; cotton trousers and synthetic fiber sweaters. The agreement raised first-year quota levels about 40 percent above the unilateral levels (*see CBR*, Sept.–Oct., 1980, p. 6).

It also created a consultative

mechanism for further quota negotiations, which already has been invoked to curb the wool sweater crisis. Shortly after the category 645/646 quota came about buyers began switching from synthetic to wool sweaters. Imports started soaring—from a mere 17,000 dozen in 1979 to 400,000 dozen by October 1980. Manufacturers called for relief under the bilateral, and December's meeting should have set the quota. But the talks unraveled. So now, until the two sides can reach a new accord, this year's wool sweater shipments should dock at around 113,000 dozen.

US manufacturers naturally view such ceilings as much too high. "Totally unnecessary and unjustified" changes at the twelfth hour of the bilateral talks disturbed certain sensitive areas as acrylic sweaters, cotton trousers and blouses, complains Seth Bodner, executive director of the National Knitted Outerwear Association.

"When you had [unilateral] controls at 100, say, you could have continued at that," he says. "Instead you jump it to 110."

Not surprisingly, importers see those same levels as much too low, especially in the case of synthetic fiber sweaters. Peter Handal, president of Victor B. Handal & Brothers and chairman of the American Importers Association textile group, points out that China's quota level is out of sync with the Far East. While the PRC is limited to 550,000 dozen synthetic fiber sweaters this year, Taiwan's US quota approaches 4 million dozen. Marc Kunen, president of Maven International, notes that China's quota seems even smaller when shared by all the US importers. His firm alone purchased 50,000 dozen acrylic sweaters last year.

There is naturally a price associated with competition. And some importers say the Chinese have begun *selling* their quotas, often by adding a surcharge to their textile prices. Kunen claims he's seen Chinese acrylic sweater prices jump 10–15 percent since the September agreement; other importers note price spurts varying greatly among items.

The quotas have made it hard for established firms to maintain their previous shares of the market. Newer firms are having an even harder time breaking in. True to form, China prefers to honor long-standing friendships. Men's Wear International, a division of Phillips-Van Heusen Corporation, alone captured nearly a fifth of the 1981 quota for men's and boys' cotton shirts because of previous relationships. Explains President Heineman, "We were the first importer to do a substantial amount of business in men's shirts with China."

The firm signed its initial contract in 1973, and even during last year's embargo its shirt-buyer continued to pay the Chinese courtesy calls. Men's Wear relies on Chinese shirts to supply about 25 percent of its needs, and in 1982 hopes to match this year's roughly 108,000 dozen order. But Heineman says he has no guarantees.

Much speculation has centered on another importer concern; namely what the quotas will bode for joint ventures and compensation trade deals involving textile goods. Textiles comprise one of the few countertrade buys with ready-made markets in the US, and businesses fear the quotas may restrict their exchange. Likewise, China's intense desire to earn foreign exchange may cause the government to reserve much of its textile quota for Chinese-owned enterprises.

Variety also has suffered under the new quotas. Peter Handal believes China prefers to spend its quotas on the most profitable goods. More men's trousers, consequently, may be sold at the expense of infants' trousers. Along with that, the quotas are forcing importers to move into unrestricted textile categories to make their buys—thereby creating the likelihood those items soon will join the domestic hit list. Already the industry is looking at woven pants and knit and woven shirts as possible targets, Seth Bodner confides.

Other categories soon could join the domestic hit list as well. Seth Bodner says the industry may target woven pants and knit and woven shirts next, then see what other items step in the line of fire.

"The government has got to face up to some fundamental decisions," remarks Bodner, noting that this process could go on forever. "If they keep [establishing quotas] one item at a time, one country at a time, they let new import areas build up and eventually the whole industry will be destroyed."

Mushrooms

Efforts to curtail rising mushroom imports to the US have been going on the better part of two decades now. In the last few years especially, such efforts have taken on an increasing air of urgency.

The ITC in 1973 first reported to the president the threat of serious injury to the domestic canned mushroom industry by imports, which reached 40 million pounds the previous marketing year. Four years later the commission recommended a quota level of 48 million pounds. After some consideration, the president turned that down. Then in November 1979 the American Mushroom Institute (AMI) repeated its call for relief when imports reached 86.2 million pounds for 1978/79.

RMB:DOLLAR RATES AS OF DECEMBER 20

	RMB/ US$	US¢/ RMB
November 7		
Bid	1.5317	65.2869
Offer	1.5241	65.6125
Median	1.5279	65.4493
November 15		
Bid	1.5178	65.8848
Offer	1.5102	66.2164
Median	1.5140	66.0502
November 18		
Bid	1.5284	65.4279
Offer	1.5208	65.7549
Median	1.5246	65.5910
November 20		
Bid	1.5162	65.9544
Offer	1.5086	66.2866
Median	1.5124	66.1201
November 21		
Bid	1.5238	65.6254
Offer	1.5162	65.9544
Median	1.5200	65.7895
November 29		
Bid	1.5329	65.2358
Offer	1.5253	65.5609
Median	1.5291	65.3980
December 2		
Bid	1.5405	64.9140
Offer	1.5329	65.2358
Median	1.5367	65.0745
December 10		
Bid	1.5529	64.3956
Offer	1.5451	64.7207
Median	1.5490	64.5578
December 11		
Bid	1.5653	63.8855
Offer	1.5575	64.2055
Median	1.5614	64.0451
December 20		
Bid	1.5402	64.9266
Offer	1.5326	65.2486
Median	1.5364	65.0872

SOURCE: Standard Chartered Bank, Ltd., New York.

This time Carter acted. Faced with figures that showed foreign mushrooms accounting for 56 percent of the 1979/80 US consumption rate of 114 million pounds—and facing an uphill election battle with the business sector—he decided to levy three-year import duties on prepared and preserved mushrooms, effective November 1, 1980. The levels: first year: 3.2¢ plus 30 percent *ad valorum* (of the value); second year: 3.2¢ plus 25 percent *ad valorum;* third year: 3.2¢ plus 20 percent *ad valorum.*

It wasn't quite what the industry had in mind. The AMI, after initially recommending a tariff-rate quota system,* had opted for absolute five-year quotas. Those would have held imports to 78 million pounds (drained weight) in each of the first two years and increased the fifth-year ceiling to 104 million pounds. Carter's order also failed to satisfy the ITC, which had earlier recommended three-year quotas starting at 86 million pounds and winding up at 103 million pounds in the final year, 1982/83. The Chinese, caught unprepared, were astonished by these developments.

"The duty is very high," remarks Wang Yongkang of the New York CEROILS branch. "If we export to the USA on the basis of our original [1980] prices, that means importers cannot get a profit and we lose a lot of money."

And there's quite a bit to lose. With the granting of MFN status last February, China's canned mushroom duties dropped, and sales immediately soared. In December 1979, for instance, PRC mushrooms had snitched a mere 0.97 percent of our import market, according to ITC figures. But in March 1980, following the first full month of MFN, they captured roughly 10 percent of the import market. That share remained fairly steady throughout 1980, and signaled to many a continuing trend.

Now, in the wake of Carter's decision, all sides are carefully watching each other's moves.

China, according to Wang, is watching the price fluctuations of Korea, Taiwan, and Hong Kong to determine how much of the tariffs it can afford to swallow. Wang says CEROILS will lower the price as far as possible to compete, but probably not enough to cover the 20 percent duty-hike the new tariff represents. (The old tariff amounted to a 13 percent composite rate of duty compared to the new 33 percent composite rate.) Too-low a price would force China to divert its supply elsewhere, he says.

A White House task force of industry and government officials, set up under Carter's tariff order, is preparing regular reports for the president on the tariff's effect on mushroom sales and pricing patterns. Interested parties on Capitol Hill, like Pennsylvania Senators Richard Schweiker and John Heinz (of "57 Varieties" fame), are awaiting the practical effects of the tariffs before considering taking matters in their own hands.

Says a top Heinz aide, "We'll give it eight or ten months to see how well the tariffs work." If imports remain too high, he adds, "We'll consider what legislative avenues we might take."

Footwear

From a global perspective, China's nascent footwear industry may be hobbling about on a broken heel. Production is limited in style and volume. Exports, while growing, represent a small fraction of Taiwan's and South Korea's foreign sales. Yet from a US industry perspective, China's footwear business is making threatening strides into the domestic market.

US footwear exports from China have increased 136 percent in the last three years. Purchases for the first time passed the million mark in 1980, according to ITC figures; the US bought 1.4 million pairs in the first nine months alone. That's up dramatically from the 1979 total of 874,000 pairs, which is more than double China's 1978 shipments here. US footwear officials fear that with lower MFN duties and China's greater official interest in the fledgling industry, further incursions are bound to come. Twice now the American Footwear Industries Association (AFIA) has warned Congress of the growing threat from China, and is expected to apprise the ITC of its views. In June that commission will decide whether to extend the three-year orderly marketing agreements (OMAs) now holding South Korea's and Taiwan's footwear shipments to 38 million and 131 million pairs, respectively. One ITC analyst expects the China question to be broached at that time, but believes the matter will only be followed up if China's exports over the next few months maintain their record growth.

By all accounts China certainly is trying. The Kunming Leather Shoe Factory, the largest in this industrial section of Yunnan Provice, has steadily increased exports since opening in 1978. An October *Footwear News* report says the factory last year shipped to the US about 130,000 pairs, or 30 percent of production. The plant is now eyeing new French equipment, like the 100 machines recently installed in a Shanghai footwear factory and hopes to increase US sales in 1981 to 300,000 pairs. There has also been much talk with American machinery manufacturers—like Compo, USM, and American Shoe Manufacturing Company—to update China's scattered factories. Genesco Inc., which supplies some 12,000 footwear retailers in the US, came closest to sealing a deal. In 1979 it negotiated a countertrade deal to renovate a Shanghai factory and receive leather workshoes in return. But in its final stages, the deal fell through.

American importers are giving China's footwear industry an added boost. New York's Manow International and Jardine Matheson last year joined the growing list of ventures formed to purchase Chinese footwear for US retailers. The Hong Kong-based firm, Manow Trading, Ltd., set up shop to take advantage of the 10–15 percent price difference Vice-President Henry Cooke says exists between China and other countries' shoes. Then the company sells to US chain stores—which is making the industry more than a little nervous.

"When you hear about other companies going over there buying shoes," says an AFIA spokeswoman, "it shows they're [the Chinese] looking at footwear as a major export item. And we're just trying to warn them against getting involved in this market in a big way."

What's Next

Other warnings will come as new import problems, or new political pressures, arise. It should be interesting to see how the business-oriented Reagan administration balances the conflicting pleas of importers and domestic manufacturers. It also will be interesting to see how and if Carter reacts to one last quota issue before leaving office. In December the Department of Agriculture asked him to increase temporarily the stiff, long-standing quota on one popular American snack food: peanuts. 完

*A tariff-rate quota system levies a duty on imports surpassing the recommended quota level.

PROVINCIAL DATA

Sichuan Province

Despite its image as a pacesetter in economic reform, Sichuan Province in Southwest China is still an underdeveloped area compared with eastern and northeastern China. Industrial output in 1979 was only 5.2 percent of China's total, even though its population of 98 million constituted 10 percent of the national total. Agricultural output, which had risen considerably from previous years, still accounted for only 8.3 percent of the national total in 1979. The province's per capita production of grain, salt, paper, sewing machines, radios, and watches were all below the national average in 1979. Only per capita production of chemical fertilizer, oil-bearing crops, and natural gas exceeded the national average. Wages in state-owned Sichuan enterprises in 1979 were 5 percent below the wages of workers elsewhere in China.

Sichuan's 57-43 ratio of heavy to light industrial output, about equal to that of the country as a whole, reflects the stress placed on heavy industrial investment since 1949. Important projects in the province include China's only domestically designed large steel mill at Dukou (with a 1979 output of 1.5–2 million tons), major gas fields at several locations (producing 45 percent of the nation's gas), and major fertilizer and synthetic fibers complexes.

Under Sichuan's 1981–85 preliminary five-year plan, provincial leaders hope to expand light industrial production more rapidly to deemphasize heavy industry. The chief sectors within heavy industry that continue to receive top priority in this plan are infrastructure projects and industries with high export potential, such as machine tools and the mining of titanium, tin, valladium, marble, asbestos, and granite. Despite its large gas production, and possession of one-quarter of the nation's hydroelectric potential, Sichuan produced only 5.5 percent of the nation's power in 1979, not enough to satisfy its own demand.

In agriculture, Sichuan's main priority is to increase the supply of grain, which is grown primarily in the "ricebowl" of the Chongqing-Chengdu plain. However, in line with one of the major thrusts of Sichuan's economic reforms, diversified production of cash crops will be emphasized along with the forestry, livestock, and fisheries industries. Likely growth products include silkworm cocoons, oil-bearing crops, and hogs, of which Sichuan already supplies 27.5, 10.1 and 15.9 percent, respectively, of the nation's total. Fertilizer application is already 39 percent above the national average, suggesting that other farm input and increased mechanization may receive greater emphasis in Sichuan than elsewhere in China.

New financial incentives were probably a major cause of the 50 percent jump in exports in 1979—a trend authorities would like to see continue. Once state export targets are exceeded, the province is allowed to retain a fixed portion of foreign exchange for its own use according to the following formula:

- In the case of 16 crucial commodities, such as natural gas, oil, and steel, including also leather and feathers, the province may retain 20 percent of its above-target earnings, while the central government retains the remaining 80 percent.
- In the case of all other commodities, Sichuan may retain 60 percent of its above-target export earnings, according to the JETRO *China Newsletter*.

Sichuan's exports, consisting overwhelmingly of textile, agricultural, and light industrial products, seem to fall mainly in the second category. In 1979 the provincial government retained export earnings worth $50 million. —Martin Weil

KEY INDICATORS	Sichuan Province 1978	1979	Percent change	Percent of national total
Total value of industrial and agricultural output (billion yuan)	¥33.48	¥37.05	10.7	6.0
	$19.90	$23.92	20.2	—
Total value of agricultural output (billion yuan)	¥12.04	¥13.21	9.7	8.3
	$7.16	$8.53	19.1	—
Total value of industrial output (billion yuan)	¥21.43	¥23.85	11.3	5.2
	$12.74	$15.40	20.9	—
Of which: Heavy industry (billion yuan)	¥12.19	¥13.63	11.8	5.2
	$7.25	$8.80	21.4	—
Light industry (billion yuan)	¥9.26	¥10.22	10.4	5.2
	$5.51	$6.60	19.8	—
Population (million at year-end)	97.075	97.742	0.7	10.0
Of which: Urban	—	8.59	—	—
Rural	—	89.15	—	—
Birthrate (per 1,000 people)	13.08	13.58	3.8	—
Death rate (per 1,000 people)	7.02	6.88	−1.7	—
Natural population growth rate (per 1,000 people)	6.06	6.7	—	—
INDUSTRY (million metric tons output unless otherwise indicated)				
Raw coal	37.92	38.38	1.2	6.0
Natural gas (billion m^3)	6.08	6.47	6.4	44.8
Electric power capacity (mw)	—	2,200	—	4.1
Electric power (billion kwh)	13.93	15.64	12.3	5.5

Steel	2.381	2.929	23.0	8.5
Rolled steel	2.020	2.515	24.5	10.1
Pig iron	2.240	2.744	22.5	7.5
Iron ore	8.98	10.11	12.6	—
Timber (million m^3)	3.756	4.222	12.4	7.8
Cement	4.546	5.192	14.2	7.0
Sulfuric acid (thousand m t)	500	567	13.4	8.1
Motor vehicles (units)	2,536	3,282	29.4	1.8
Large and medium-sized tractors (units)	1,264	1,841	45.6	1.5
Hand-guided tractors (units)	22,380	27,056	20.9	8.5
CONSUMER GOODS				
Cotton yarn (million m)	560	614	9.6	—
Cotton fabric (million m)	518.07	566.77	9.4	—
Silk (tons)	5,000	5,343	6.9	18.0
Wool fabric (million m)	1.70	1.73	1.7	—
Silk fabric (million m)	24.26	27.27	12.4	4.1
Machine-made paper and cardboard (thousand m t)	264	314	18.9	6.4
Leather (million sheets)	1.816	2.412	32.8	—
Canned food (thousand tons)	38.7	49.5	27.9	—
Alcoholic beverages (thousand tons)	206	265	28.6	—
Sugar (thousand tons)	126	172	36.5	6.9
Crude salt (million tons)	1.28	1.27	−0.5	8.6
Television sets (thousand units)	8.468	35.374	317.7	2.7
Sewing machines (thousand units)	40.04	60.581	51.3	1.0
Radios (thousand units)	104	108	3.8	0.8
Watches (thousand units)	181	280	54.5	1.6
AGRICULTURE (thousand metric tons output unless otherwise indicated)				
Cultivated area (million ha)	—	6.7	—	5.0
Irrigated area (million ha)	—	2.3	—	5.8
Grain (million t)	30	32.01	6.7	9.6
Cotton	148.14	111.25	−24.9	5.0
Oil-bearing crops	584.98	652.25	11.5	10.1
Of which: Rapeseed	441.7	521.6	18.1	21.7
Sugarcane	460.92	527.75	14.5	2.5
Hemp and flax	70.6	100.8	42.7	9.3
Tobacco	91.6	57.6	−37.1	—
Tea	27.05	28.35	4.8	10.2
Silkworm cocoons	52.2	74.5	42.7	27.5
Stock of pigs (million head, year-end)	42.61	50.92	19.5	15.9
Stock of large domestic animals (million head, year-end)	9.264	9.477	2.3	10.0
Of which: Cattle	8.902	9.116	2.4	12.8
Stock of sheep (million head, year-end)	10.332	10.921	5.7	6.0
Chemical fertilizer (million t)	1.105	1.187	7.4	11.1
Of which: Nitrogenous fertilizer	0.888	0.976	9.9	11.1
Average use of chemical fertilizer (kilos per ha)	—	151.4	—	138.9
Chemical insecticides	15.358	17.201	12.0	3.2
Stock of large and medium-sized tractors (units)	17,230	21,000	21.9	3.1
Irrigation machinery (million hp)	2.71	3.339	23.2	4.7
CAPITAL CONSTRUCTION				
Total investment (billion yuan)	¥2.65	¥2.77	4.6	5.5
	$1.58	$1.79	13.3	—
Of which: Investments by localities or enterprises (billion yuan)	¥0.40	¥0.67	65.7	—
	$0.20	$0.43	115.0	—
New fixed assets (billion yuan)	—	¥2.63	—	15.9
	—	$1.70	—	—
Residential construction (million m^2)				
Begun	5.216	7.731	48.2	6.4
Completed	—	4.2	—	—
TRANSPORTATION AND COMMUNICATION				
Total postal and telecommunications business (million yuan)	—	¥78.65	—	6.3
	—	$50.77	—	—
Passenger traffic (million persons)	—	190.54	—	—
Total length of railway in use (km)	—	2,616	—	—
Total length of roads usable by motor vehicle (km)	—	83,332	—	—
Total cargo traffic (billion ton km)	4.74	24.86	0.5	—
Of which: Rail	17.68	17.38	−1.7	3.1
Road	2.01	2.14	6.3	8.0
Water	4.79	5.03	5.1	1.1
Other	0.26	0.31	19.2	—

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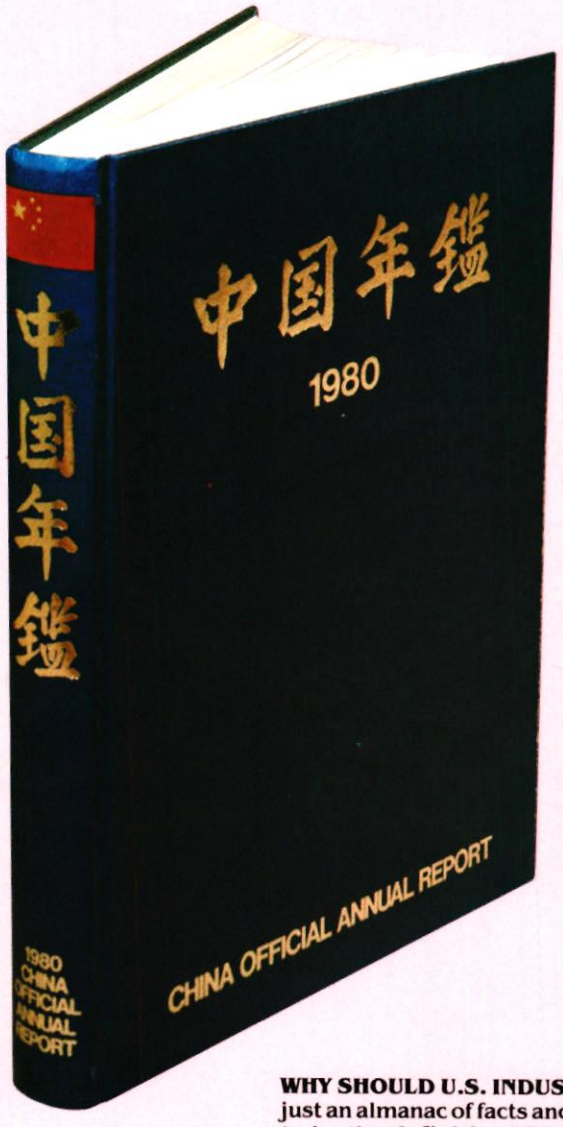

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FOREIGN TRADE

Total value of exports (million yuan)	¥501.67 $298.26	¥750.00 $484.18	49.5 —	3.5 —
Export categories as percentage of total				
Textiles	—	31.4	—	—
Food	—	21.6	—	—
Chemicals and pharmaceuticals	—	11.6	—	—
Native produce, animal byproducts, and tea	—	22.1	—	—
Light industrial goods	—	6.7	—	—
Metals and minerals	—	2.8	—	—
Machinery equipment	—	1.7	—	—
Arts and crafts	—	1.2	—	—
Other	—	0.9	—	—

PROVINCIAL COMMERCE

Total value of provincial retail sales (million yuan)	¥10.4 $6.7	¥12.31 $7.95	17.9 —	7.0 —
Of which:				
Pork (thousand t)	557	692	24.2	—
Sugar (thousand t)	197	249	26.4	—
Alcoholic beverages (thousand t)	205	239	16.6	—
Cotton fabric (million t)	599.47	660.02	10.1	—
Wool fabric (million m)	5.242	9.599	83.1	—
Rubber shoes (million prs)	27.08	30.52	12.7	—
Bicycles (units)	222,000	217,000	−2.3	—
Sewing machines (thousand units)	198	205	3.5	—
Watches (thousand units)	701	1,066	52.1	—
Radios (thousand units)	339	530	56.3	—
Television sets (units)	16,200	52,416	223.6	—

EMPLOYMENT AND INCOME

Number of workers and staff (million)	6.523	6.877	5.4	6.9
Of which: Employed in state-owned units (million)	5.110	5.285	3.4	6.9
Average annual wage in state-owned units (yuan)[1]	¥619 $368	¥671 $433	8.4[2] —	95.2 —
Per capita income of commune members from collective farming (yuan)[3]	¥71.9 $42.7	¥80.1 $51.7	11.4 —	96.0 —
Per capita grain allocation to commune members (kilos)[3]	246	261	6.1	—

HEALTH

Hospital beds	187,335	191,000	2.0	9.9
Professional medical workers (thousand)	217,000	232,000	6.9	8.8
Of which: Doctors of traditional Chinese medicine	—	41,000	—	15.9
Senior doctors of Western medicine	—	25,000	—	6.4
Junior doctors of Western medicine	—	35,000	—	8.0
Nurses	—	33,000	—	7.8
"Barefoot" doctors (rural paramedics)	—	126,000	—	8.0

EDUCATION

Personnel engaged in scientific and technological work	323,000	353,000	9.3	13.3
Institutions of higher learning	26	42	61.5	15.0
College student enrollment	54,000	65,000	20.4	6.4
Technical secondary schools	250	255	2.0	—
Technical secondary school enrollment (thousand persons)	98	112	14.3	9.3
Middle school enrollment (million persons)	3.92	4.725	20.5	8.0
Technical training school enrollment (thousand persons)	36	71	97.2	—
Primary school enrollment (million persons)	14.7	15.425	4.9	10.5

CULTURE

Movie theaters	—	8,806	—	—
Artistic troupes	—	248	—	14.0
Cultural centers	—	461	—	—
Libraries	—	98	—	5.9
Radio broadcasting stations	—	4	—	24.7
Television stations	—	1	—	3.8
Newspaper circulation (million copies)	—	530.0	—	4.0

[1]Does not include the vast majority of peasant commune members who receive workpoints.
[2]Real wages increased by only 2.9 percent when adjusted for inflation.
[3]Does not include income earned from sideline activities and private plots.

SOURCES: Sichuan Economic Commission, March 1980; *Sichuan Ribao (Sichuan Daily)* of various dates; other national and local media sources obtained in National Council provincial files.

Table prepared by Myles Breiner.

Liaoning Province

The CBR *received the following economic survey of Liaoning Province from the province's Foreign Affairs Office in September 1980:*

Liaoning today is one of the most important industrial bases in all of China. Metallurgy, machine building, electronics, coal, petroleum, power generation, petrochemicals, textiles, and light industries are particularly well developed. In 1979 the gross value in industrial output from the more than 13,000 industrial enterprises operating in the province totaled 41.64 billion RMB, ranking second in the country. The figure represents a 44-fold increase in value over the 1949 level and in itself accounts for 88.1 percent of the province's combined industrial and agricultural gross output value.

Liaoning leads the nation in the gross output value of heavy industry. With current steel production at 8.85 million tons, and pig iron at 10.12 million tons, this combined output of Liaoning accounts for a full quarter of the nation's total production.

The 1976 opening of the Liaohe oilfield placed Liaoning among the premier oil-producing areas in China (*see CBR*, Sept.–Oct., 1980, p. 52). At present nearly one-third of China's oil-refining industry is concentrated in the province.

In light industry, Liaoning ranks fifth in the country for gross output value. It has continued to expand product lines and raise production rates in well-established industries such as textiles, papermaking, glass, leather, hardware, and food processing. Meanwhile, it also has engaged in the development of new industries for the manufacture of watches, radio sets, cameras, television sets, tape recorders, washing machines, synthetic fibers, plastics, and other products.

Liaoning abounds with kaolin (Chinese sorghum), maize, and soybeans, and also prospers from such key money crops as peanuts, cotton, tussah, tobacco, and fruit. Of these, tussah cocoon production measured 810,000 hectoliters in 1978 and tussah silk production amounted to more than 70 percent of China's total output.

Foreign trade has been expanding. The main manufactured goods and minerals for export are machine tools, textile fabrics, jade carvings, talcum, and naphtha. Apples and tussah silk constitute the major export crops; aquatic products also sell overseas. In 1979 the port of Dalian handled more than 30 million tons of freight at a total export value of $2.6 billion.

Liaoning's population of 24,420,000 represents more than 30 different nationalities, including the Han, Manchu, Mongol, Hui, and Korean. (Of these the Han comprise the overwhelming majority.)

The provincial government administers a total of 10 cities, 2 prefectural cities, 43 counties including 2 Mongol autonomous counties, and 1,141 people's communes. The provincial capital is Shengyang Municipality.

Liaoning Province				
GENERAL	**1978**	**1979**	**Percent change**	**Percent of national total**
Total area (square km)	—	145,700	—	1.5
(square miles)	—	56,240	—	1.5
Total arable land (million ha)	4.9	4.9	0.0	3.6
Total industrial and agricultural output value (billion yuan)	—	¥47.26	—	7.7
	—	$30.51	—	—
Total agricultural output value (billion yuan)	—	¥5.62	—	3.5
	—	$3.63	—	—
Total industrial output value (billion yuan)	¥39.25	¥41.64	6.1	9.1
	$23.34	$26.88	—	—
Of which: Light industrial output	¥10.08	¥11.20	11.1	5.7
	$5.99	$7.23	—	—
Heavy industrial output	¥29.17	¥30.44	4.4	11.7
	$17.34	$19.65	—	—
Population (million, year-end)	—	34.42	—	3.5

INDUSTRY (million metric tons output unless otherwise indicated)				
Steel	6.80	8.85	30.1	25.7
Steel inventories	3.8	—	—	—
Pig iron	6.35	10.12	59.4	27.6
Total value of electronics industry output (billion yuan)	—	¥1.44	—	—
	—	$0.93	—	—
Hydroelectric power (billion kwh)	—	2.05	—	—
Crude oil	—	5.0	—	4.7
Gas production (million m^3)	—	1.7	—	0.01
Oil wells (units)	—	1,800	—	—
Oil and gas storage and shipping facilities	—	160	—	—
Total value of industrial loans (million yuan)	—	¥300.0	—	—
	—	$193.7	—	—
AGRICULTURE (million metric tons output unless otherwise indicated)				
Grain	10.7	11.0	2.8	3.3
Rice	—	2.075	—	1.5
Peanuts (thousand tons)	—	8.5	—	0.3
Cotton farmland (thousand ha)	—	106.9	—	—

Application of fertilizer (kilos per ha)	—	640.0	—	487.2
Chemical pesticide output (thousand tons)	58	—	—	10.9
Stock of medium- and large-sized tractors (thousand units)	39.9	—	—	6.0
State purchase of agricultural products (million yuan)	—	¥485.96	—	—
	—	$313.72	—	—
Total agricultural investment (million yuan)	¥243.26	¥296.66	22.0	—
	$144.63	$191.52	—	—
WELFARE				
Total wages of staff and workers (million yuan)	—	¥800.0	—	—
	—	$516.5	—	—
Average per capita income of commune workers	¥91.3	¥104.0	13.9	—
	$54.3	$67.1	—	—
Total number of workers and staff (million persons)	—	1.2	—	1.2
Total income of the people's communes (billion yuan)	¥4.6	—	—	—
	$2.7	—	—	—
Residential housing completed (million m²)	1.13	4.13	265.5	3.4
Total medical personnel	—	127,350	—	4.8
Hospital beds	—	110,140	—	5.7

NOTE: Values in yuan are accompanied by dollar equivalents based on 12-month average exchange rates of ¥1.682 per $1 in 1978, ¥1.549 in 1979, and ¥1.500 in 1980.

SOURCES: Liaoning Province Foreign Affairs Office; Liaoning Subcouncil of the China Council for the Promotion of International Trade; Xinhua news agency of various dates; and National Council provincial files. Table prepared by Myles Breiner

Guangdong Province

Guangdong Province, the economic hub of South China, is one of the country's major centers of light industry. In 1979, per capita light industrial output exceeded the national average by 14 percent; in the case of bicycles, sewing machines, cotton yarn, and detergent, the margin averaged 31 percent. Refined sugar output was fully 34 percent of the national total, reflecting Guangdong's importance as a sugarcane grower (1979 output was 42.3 percent of the national total).

Heavy industrial output in 1979 was only 3.1 percent of the national total. In per capita terms, it was only about half of the national average. Steel and coal output accounted for even a smaller share of the country's annual production. Guangdong lacks coal resources, as well as major hydroelectric potential. Indeed, electric power output met only 61 percent of industrial demand in 1979, although the province has more small-scale hydro installations than any other in the country.

Agriculture is concentrated in Guangdong's fertile Pearl River Basin, one of the nation's most important rice-growing areas. Efforts to diversify agricultural production in this province of 57 million people will likely concentrate on expanding sugarcane cultivation, and developing the fisheries industry, which already accounted for 14.2 percent of the national total in 1979.

A five-year (1981–85) provincial economic plan is likely to be completed early next year. The major objectives of the plan are:

- Changing the structure of agriculture to promote diversification. One proposal would allow production brigades to retain a portion of sugarcane profits.
- Continuing emphasis on light industry, with focus on improving quality.
- Increasing energy supplies. Serious consideration is being given to building two 1,000 mw nuclear power plants in the 1980s.
- Improving rail, road, and water transportation facilities.
- Increasing promotion of tourism, and developing the Shenzhen special economic zone.

Potential heavy industrial projects that would come under the aegis of national plans include exploitation of the province's offshore oil, and of lead/zinc resources near Shaoguan.

Guangdong is likely to remain in the forefront of efforts to decentralize managerial authority and strengthen the role of market forces. In the service sector, the city of Guangzhou had already certified 6,800 private enterprises by August 1980, although this was far below the precollectivization figure of 64,500 in 1954.

In the area of foreign trade, Guangdong accounted for a disproportionately high 13 percent of the nation's exports in 1979 (although a portion may have originated from other provinces). Textiles and light industrial products led the way. The priority given to increasing these exports is reflected in the 44 percent increase in Guangdong's exports in 1979.

The province is being given somewhat greater leeway to retain foreign exchange earned through exports than other regions of China, and is making great efforts to attract foreign exchange in export-oriented industries. More than 1,900 countertrade, investment, or processing contracts have been signed since 1978. The value of such deals reportedly amounted to $377.7 million in the last six months of 1979. The province has ruled that foreign investments of up to $2 million in Guangzhou, $1 million on Hainan Island, and $500,000 in other prefectures can be made without the approval of provincial authorities.

A special investment law and new provincial-level authority was established in late August 1980 to control the development of Guangdong's special economic zones at Shenzhen, Shekou, and Zhuhai (*see CBR*, Sept.–Oct., 1980, pp. 54–56). New infrastructure investments in Shenzhen, which reportedly total $32 million (according to the US consulate in Guangzhou), are being split between provincial and central government authorities. —Martin Weil

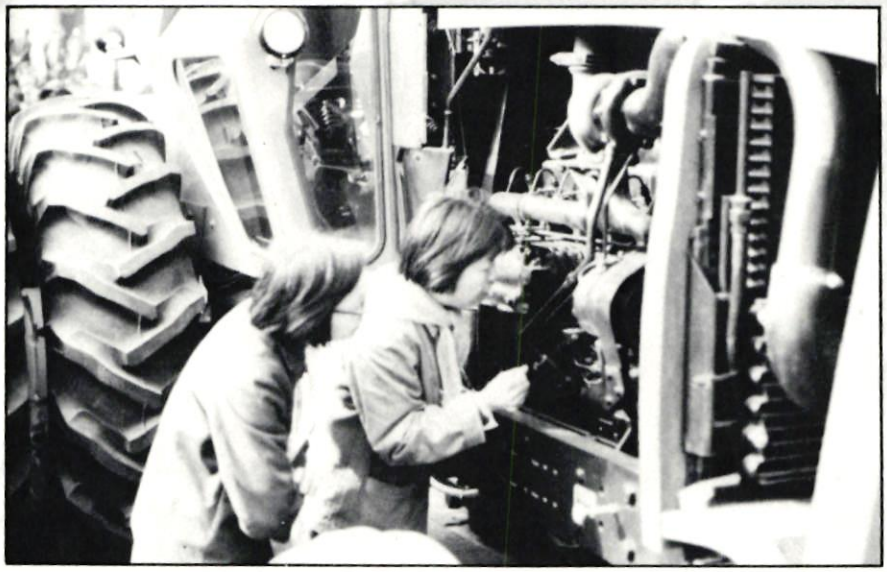
KEY INDICATORS	Guangdong Province 1978	1979	Percent change	1980 targets	Percent of national total
Total gross industrial and agricultural output value (billion yuan)	—	¥29.2	—	—	4.7
	—	$18.9	—	—	—
Gross value of industrial output (billion yuan)	¥19.84	¥21.0	5.8	—	4.6
	$11.80	$13.6	15.3	—	—
Of which: Heavy industry	—	¥7.98	—	—	3.1
	—	$5.15	—	—	—
Light industry	—	¥13.02	—	—	6.6
	—	$8.41	—	—	—
Gross value of agricultural output (billion yuan)[1]	—	¥8.20	—	¥8.53	5.2
	—	$5.29	—	$5.69	—
Population (million, year-end)	—	56	—	—	5.8
Gross value industrial and agricultural output per capita	—	¥521.4	—	—	82.0
	—	$336.6	—	—	—
FOREIGN TRADE					
Exports (million yuan)	¥2,297	¥2,756	20.0	—	13
	$1,366	$1,779	30.2	—	—
Of which: Heavy Industry	¥938	¥806	−14.1	—	11.9
	$558	$520	− 6.8	—	—
Light and textile industry	¥1,359	¥1,950	43.5	—	20.4
	$808	$1,259	55.8	—	—
INDUSTRIAL PRODUCTION (million metric tons output unless otherwise indicated)					
Steel	0.34	—	—	—	1.1
Coal	10.0	—	—	—	1.6
Iron ore	5.0	—	—	—	—
Rubber (thousand tons)	81.1	83.0	2.4	85.0	—
CONSUMER GOODS					
Bicycles (thousand units)	—	—	—	900	7.1
Sewing machines (thousand units)	—	—	—	520	7.2
Wrist watches (thousand units)	—	—	—	800	3.8
Television sets (thousand units)	—	—	—	65.2	—
Cotton yarn (thousand pieces)	—	—	—	220	7.9
Paper (thousand tons)	—	—	—	291	5.8
Detergent (thousand tons)	—	—	—	3.5	8.1
Sugar (thousand tons)	—	—	—	850	34
Crude salt (thousand tons)	—	—	—	750	—
Books published (billion copies)	3.7	4	8.1	—	—
AGRICULTURAL PRODUCTION (million metric tons output unless otherwise indicated)					
Grain	—	17.6	—	17.75	5.3
Sugarcane	8.95	9.1	1.7	9.5	42.3
Aquatic products (thousand tons)	—	610	—	650	14.2
Stock of pigs (million heads)	—	10	—	11	3.1
BUDGET (million yuan)					
Total revenue	—	¥3,420	—	¥3,500	3.3
	—	$2,200.8	—	$2,333	—
Total expenditures	—	—	—	—	—
Of which: Capital construction	—	¥840.3	—	¥500	1.3
	—	$542.5	—	$333.3	—
Renovation of existing enterprises	—	¥107.2	—	¥53.6	0.8
	—	$69.2	—	$35.7	—
Circulating funds for enterprises	—	¥149.7	—	¥100.0	2.7
	—	$96.6	—	$66.7	—
Geological prospecting	—	¥67.1	—	¥71.85	—
	—	$43.3	—	$47.90	—
Commune agricultural investment	—	¥317.44	—	¥317.44	4.1
	—	$204.93	—	$211.63	—
Maintenance of urban areas	—	—	—	¥77.96	—
	—	—	—	$51.97	—
Culture, education, science, and public health	—	¥581.08	—	¥621.76	—
	—	$375.10	—	$414.51	—
Military relief funds	—	¥79.6	—	¥55.73	—
	—	$51.4	—	$37.20	—
Administrative expenses	—	¥215.8	—	¥227.88	3.9
	—	$139.3	—	$151.92	—
Sum of expenditure components	—	¥2,358.22	—	¥2,026.2	—
	—	$1,522.41	—	$1,351.8	—

[1]GVAO includes the output of farm products, forestry, animal husbandry, sideline occupations, fisheries, and the output of brigade-run industries.

SOURCES: Guangdong Province Draft Economic Plan for 1980, released by Xinhua December 21, 1979; Xinhua news agency releases of various dates; Tu Kung Pao, December 18, 1979; and State Statistical Bureau, Communiqué on the Fulfillment of China's 1979 National Economic Plan, released by Xinhua April 30, 1980.

Table prepared by Terri Tyminski.

US-CHINA EXHIBITIONS



Exhibition visitors examine a Caterpillar tractor.

In less than two years' time since normalization bridged the 30-year gap in US-China relations, both governments have moved ever closer to binding their friendship with economic ties. This fall, major trade fairs were launched in both directions. As China's highly publicized three-prong exhibition moved its caravan of goods and products from San Francisco to New York, the US Department of Commerce set up its first national exhibition of equipment in Beijing.

National Council President Christopher Phillips flew with Under Secretary of Commerce Robert E. Herzstein to open the November exhibition in Beijing, and lent Council support through advisory meetings and offices at both affairs. Former Beijing Representative Richard Glover, who just returned to Washington after manning the Council's office at the exhibition, describes the fair's promotional success in this report, contributed to by Welt International Corporation President Leo G.B. Welt. And Jean Hoffman, assistant director of the Council's Importer Services Department, reports on China's San Francisco-Chicago-New York displays.

US National Economic and Trade Exhibition in Beijing

If the success of the November 17–28 trade show can be measured from sheer numbers, the United States' first national exhibition was indeed a success. The show brought 254 US manufacturers and $10 million worth of equipment to the unwavering attention of nearly a quarter million Chinese. (Estimates vary between 230,000 and 250,000 visitors.) Reports have it that manufacturers concluded some $11.6 million in sales during the exhibition in five equipment categories: power generation and distribution; petroleum exploration and extraction; transportation; agriculture; and textile and consumer goods production. An additional $15 million in prenegotiated sales were reportedly signed and approximately $3 million in sales negotiations were initiated in the 24,000 square meters of reserved space.

Things went relatively smoothly with the 134 technical seminars conducted by the Americans. Equally popular were the two commercial displays coordinated by the Department of Agriculture with related trade associations, and the Commerce Department with the aid of the China Council for the Promotion of International Trade.

The end of the show saw business pick up dramatically. Eaton Corporation's AIL Division, which displayed alongside such heavyweights as McDonnell-Douglas, Boeing, and Bell Helicopter, signed a $1.5 million contract during the show to supply air traffic control equipment. Geosource Corporation received an order for its Petty-Ray Geophysical Division to train Chinese crews and carry out the seismic prospecting. The company currently is fulfilling a $34 million order for seismic exploration equipment.

Deere & Company was able to sell between 75 and 90 percent of its agricultural equipment (including a large combine), according to different sources, although it hoped to do slightly better. Additional contracts were being drawn up when the Beijing Economic Development Corporation (BEDC) came back to say that higher authorities had frozen all unsigned contracts for the rest of the year, one representative reported.

BEDC, incidentally, was out to profit from the US exhibition. Its representatives volunteered to act as go-betweens—finding buyers for the American equipment—while collecting a 5 percent commission themselves.

Photos by Richard Glover

Council President Christopher Phillips and Chinese Vice-Premier Bo Yibo meet in Beijing to review the current obstacles and opportunities in US-China trade.

Exhibition of the People's Republic of China in the US

Approximately 8,400 visitors from the general public paid an average of $5.00 a head to view the array of handicrafts, apparel, food, entertainment, and even laser acupuncture treatments that combined a Chinese trade show and cultural showcase into one lavish production. The three-city exhibition closed in New York on December 28 after 16 days each in San Francisco and Chicago and 23 days in New York. San Francisco's attendance of 250,000 greatly surpassed the number of visitors in Chicago (150,000) and certainly in New York, where the apparently poor turnout prompted the Chinese to keep the total to themselves.

The Chinese viewed the exhibition more as a vehicle for meeting potential buyers than for solidifying sales. Yet representatives managed to ring up sizable sales totals in two of the cities: $8 million worth of business in San Francisco (mostly with old customers outside the exhibition), and $6 million in Chicago. New York's exhibition reportedly turned up few new customers and "disappointing" sales, according to some Chinese.

The exhibitions also provided the Chinese with a forum for exchange with various groups in the China trade. The National Council, which operated booths in both San Francisco and New York, participated in a briefing session in New York, conducted by the Commerce Department and attended by the Agriculture Department, Food and Drug Administration, Consumer Products Safety Commission, Fish and Wildlife Service, and the US Postal Service.

Eighty-seven Chinese traveled with the exhibition, including representatives from ten foreign trade corporations, the Shangdong and Tianjin foreign trade bureaus, and the CCPIT, which selected the New York-based US-China Business Development Corporation to organize the affair. Partial financing came from the Wells Fargo Bank in San Francisco, First National Bank of Chicago, Manufacturers Hanover Trust in New York, and banking affiliates of Midlantic Banks, Inc., along with donations from Fluor Corp., General Motors, United Airlines, Avis, and Japan Air Lines.

In each city a different department store set up a retail operation for the Chinese products: the Emporium in San Francisco; Carson Pirie-Scott in Chicago; and Bloomingdales in New York. Sales in all three were lively indeed. Though precise final figures were not released, Bloomingdales estimated mid-way through the New York exhibition that sales were averaging just under $50,000 a day.

The variety of goods on display was impressive. The 150,000-square foot hall housed a museum of embroidered silk robes, ethnic costumes, porcelain and ceramic pieces, and contemporary scroll paintings. Demonstrations covered the fine arts of paper cutting, cooking, dance, and puppeteering. And visitors were able to purchase such souvenirs as postmarked stamps from the Beijing Post Office, tee-shirts, and stone rubbings from a concession called China Direct Sales—in the best tradition of American tourism. 完

Nuclear Power: Back on

Dori Jones

China's nuclear scientists have recommended the construction of six nuclear power plants by 1991. Unless something is done, they say, China's disappointing oil output and dire coal shortage in the South will keep China's energy-starved industry running at roughly 70 percent capacity.

The Chinese have put nuclear power back on their national agenda, but they are still thrashing out the details of their long-range nuclear energy program. How many power plants to construct, what type and size of reactors, where to build them, and the extent of foreign involvement in the overall program are questions that will be decided within the next few years.

Nuclear power has had its ups and downs in recent years among China's priorities. In December 1978, senior Vice-Premier Deng Xiaoping, personally announced the decision to import two nuclear reactors from France. Only six months later, after the Three Mile Island incident and a major cutback in China's import plans, the plans for nuclear power were scrapped.

At that point, China's nuclear proponents retreated and retrenched. Then, in February 1980, a barrage of arguments in favor of nuclear power poured forth at the first congress of the Chinese Nuclear Society, again at the second congress of the Chinese Scientific and Technological Association in March, and in feature articles in the *People's Daily* and *Guangming Daily*. The lobby's major spokesman has been a rising star in the nuclear industry named Jiang Shengjie, newly appointed a vice-minister of the Second Ministry of Machine Building Industry, which handles China's nuclear industry.

The pressure intensified in July and August when China's top two nuclear physicists, Qian Sanqiang and Wang Ganchang, gave lectures on nuclear energy to Communist Party and government leaders, including Hua Guofeng, Li Xiannian, Yü Qiuli, Yao Yilin, Hu Yaobang, and Wan Li. In September, Vice-Premier Deng personally assured the French foreign trade minister that France was maintaining its place in the competition for the sale of nuclear power stations to China.

In late October a group of nuclear scientists and energy specialists held a week-long meeting on nuclear power, which they concluded by recommending construction of six nuclear power stations by 1991. At the same time a special nuclear energy panel, composed of members from six ministries and headed by Jiang Shengjie, was set up to generate concrete proposals.

So far, the State Energy Commission, charged with formulating a comprehensive, long-range plan for developing energy resources in China, has not yet endorsed the idea of nuclear power. Its long-range plan must be established and approved by the State Planning Commission and the State Council before any action can be taken on construction of a nuclear power plant in China.

Although the Chinese are still debating the type of reactor to be built and the extent of foreign involvement, they seem to have reached a basic consensus to go ahead with nuclear energy.

"We have had many, many kinds of proposals from various sources," deputy director of China's Institute of Atomic Energy Wang Dexi told the *CBR* recently. "But what's in common is a strong belief that nuclear energy should be an integral and indispensable part of overall energy planning in China. I think our leading cadres of the central government and the Party will pay a great deal of attention to this recommendation. My personal belief is that they will give it favorable consideration."

"There is no antinuclear movement in China," noted one of China's foremost nuclear scientists and president of the Chinese Nuclear Society, Wang Ganchang, in a speech to the American Nuclear Society conference in Washington in November. "Some people are questioning the safety of nuclear power and are concerned over the radioactive pollution that might occur. We believe that, once public information and education are properly established, this concern could be readily overcome." Wang Ganchang is also director of China's Institute of Atomic Energy and a vice-minister of the Second Ministry of Machine Building Industry.

As part of this public education campaign, a series of speeches and articles over the past year have pointed out the merits of nuclear power and refuted objections to it (*see box*). But some basic questions are still unresolved, which include the following:

Unresolved Issues

- What type of nuclear power plants should be built: a pressurized water reactor or a heavy water reactor?
- What size reactors should be built, and can China's power transmission system cope with the additional power?
- Where should the plants be located?
- How many reactors should be built, and within what time frame?
- Should China seek foreign technical assistance to help build nuclear power plants? If so, what type is best?

The extent and type of foreign in-

the Agenda

volvement is not at all clear at this point. The Chinese are "playing the field" by talking with many nuclear technology suppliers from different countries and discussing various types of cooperative arrangements.

Type of Reactor: PWRs Most Likely

The Chinese seem to have decided that their first nuclear power plant will have a pressurized water reactor (PWR). PWRs are widely seen as the most advanced and reliable type of reactor for power generation. However, the Chinese are still considering a type of heavy water reactor. They have developed numerous small heavy water reactors for their weapons research and naval programs, and thus have a great deal more experience dealing with this type of technology. If they were to rely entirely on their own efforts, they would probably choose to build a heavy water reactor for power generation, according to Octave DuTemple, executive director of the American Nuclear Society (ANS), who has been to the PRC twice and has escorted several Chinese nuclear delegations around the US.

An ANS delegation to China last fall learned that the Chinese have formed a special group to design a 125 mw heavy water reactor for power generation. Six months ago, DuTemple said, the Chinese were negotiating with the Canadian firm Atomic Energy of Canada, Ltd., to build a heavy water (CANDU) reactor. Canada, which built the world's largest heavy water reactor near Toronto, reportedly is still eager to sell China one or two 600 mw heavy water reactors for power generation.

The Chinese are still taking CANDU into consideration, according to Wang Ganchang, because (*a*) it has good records of successful operation, (*b*) it can relieve the pressure on enrichment needs and has a better potential for efficient utilization of uranium resources, the Chinese believe; and (*c*) the Chinese have a substantial heavy water production capacity. In fact, China presently has an excess of supply and in November sold two tons of heavy water to Mitsui and Company in Japan, which plans to buy more if this sample meets its standards. Heavy water is deuterium oxide—that is, water with an extra hydrogen atom. It is used to slow down the neutrons in a nuclear reaction, thus making the reaction more efficient. Heavy water production facilities are expensive to build.

Which Size and Where: 900 mw Reactors in Three Locations

A group of Chinese nuclear scientists recently advocated the construction of six 900–1100 megawatt reactors, and earlier proposals and discussions with the French called for 900 mw reactors. Reactors in this range are economically more efficient, and if two such reactors are built side-by-side, as the Chinese propose to do, the savings would be even greater.

The group recommended building a pair of reactors in each of three locations: South China (Guangdong Province), East China (probably the Shanghai area), and Liaoning Province (in Manchuria). All three of these regions are industrial areas, where population and demand for electricity are likely to grow rapidly over the next 15–20 years. South China is lacking in coal, and coal production in coal-rich North China is projected to be insufficient to fuel industrial growth in Shanghai, China's light industrial center, and in Manchuria, China's center of heavy industry. After four months of investigation and study, a group of Chinese specialists recently determined that the cost of electricity generated by nuclear power would be about 10 percent lower than by coal-fired power in Guangdong and 5 percent lower in East China.

Guangdong Province is a particularly appropriate site for a nuclear power plant, the Chinese have said, because of the severe shortage of power the province faces. A representative from Guangdong's Electric Power Bureau testified before a group of nuclear scientists in late October that the province had lost ¥7.5 billion in industrial output value in 1979 because only 61 percent of its electrical power requirements could be met.

Guangdong has about 2,000 mw of installed capacity. Even though fully a quarter of 1980s local capital construction budget in the province was invested in electric power generation, the electricity generated in 1980 was expected to grow only about 8 percent over 1979, according to a provincial broadcast. The Chinese anticipate a 500 percent increase in Guangdong's electric energy consumption within the next 20 years.

China's largest power plants today are only in the 300 mw range; hence the country's present transmission system, fragmented into small regional grids, could not at present handle an influx of 1100 mw or 2200 mw in one area. Given a ten to 12 year construction time lag, though, the Chinese would have time to augment their transmission capability.

Hong Kong would be expected to absorb some of the electricity generated by China's first nuclear power plant in Guangdong Province. Hong Kong's present generating capacity is about 3,500 mw. Since April 1979, Hong Kong has been supplying about 40 mw a year to Shenzhen, across the border in China, but in the long term, the electricity is likely to flow the other direction, given Hong Kong's shortage of land.

A few years ago, Hong Kong conducted a feasibility study for a nuclear plant within its borders and concluded that it was not viable because the colony's electric needs were not great enough to justify a nuclear plant of the minimum size needed to realize economies of scale. However, since then, Hong Kong's energy needs have grown, and by the late 1980s, it could absorb an additional 660 mw of power

provided by a nuclear reactor, according to a China Light representative.

China Seems Overoptimistic

Wang Ganchang, in his speech to the American Nuclear Society last November, said China could build nuclear power stations with capacities of 2,000–4,000 mw by 1990 and 15,000 mw by the end of the century. To reach this capacity would require the installation of two to four reactors of 1,000 mw each over the next nine years, and another 11–13 to be completed within the following decade. At a meeting in late October a group of Chinese nuclear scientists proposed the construction of six nuclear power plants to be completed between 1988 and 1991.

Most American observers consider both these proposals to be too optimistic.

"My estimate is that they won't have a nuclear power plant until 1995," DuTemple said. "If they have it by then, they will have done a magnificent job."

"I don't think they could have even one by 1991 unless it was an absolute turnkey project using somebody else's regulations and technology," said a representative of Babcock and Wilcox, which has been trying to sell boiler technology and parts to China.

Other American observers believe the Chinese target of six reactors by 1991 is credible.

"If they order them in the next three or four years, yes, it's realistic," said a representative of Combustion Engineering. "It's a question of whether they have the money and are willing to go ahead."

China cannot afford to import many nuclear power plants at once, given the $1 billion price tag on each reactor. Given the relatively advanced state of China's nuclear technology and scientific community, the Chinese are unlikely to import more than four to six nuclear reactors over 25 years, according to DuTemple's estimates. One role of the imported reactor would be to tutor Chinese technicians, who could then proceed confidently with the fabrication of a Chinese-built nuclear power station.

"I believe that to speed up construction of a nuclear power plant, you have to buy something from abroad," Wang Dexi told the *CBR*. "We need to buy a few complete plants to get experience and to speed up the development of our own nuclear power industry. But we couldn't buy indefinitely; we don't have the financial resources. Conditions in our country's nuclear technology field are not so bad; we could buy a plant and then learn how to build them ourselves."

The Chinese are quick to point out their own technical expertise in the nuclear field.

"China already has the basic conditions for the development of nuclear power plants and has masses of scientific and technological personnel to work in nuclear energy science and technology," stated Jiang Shengjie. "It must be clearly pointed out that there is no technical difficulty which cannot be overcome in China in developing nuclear power plants," Jiang said in an address to the first congress of the Chinese Nuclear Society last February.

Why China Wants Nuclear Power

The Chinese seem to have reached a basic consensus in favor of nuclear energy. The arguments Chinese nuclear proponents use to support nuclear power or to refute objections to it are the following:

Cost. Although the cost of building a nuclear power plant is as much as 50 percent higher than for a combustion power station, the cost per kilowatt hour generated is much lower. "According to British statistics," noted an article in the Chinese magazine *Economic Management*, "the cost per kwh generated by atomic energy is 25 percent and 50 percent lower than that of coal and petroleum respectively."

Nuclear advocates also point out that nuclear power plants are not so expensive to build, relatively speaking, when one compares the cost of mining and transporting coal with that of uranium, which has a high density and small volume. A report by 12 Chinese engineers and scientists, after a four-month study, concluded in September that "the investment required for constructing a nuclear power station in Southeast China—including the fuel supply system—is about the same as that needed for building a thermopower station of a similar scale—including a fuel supply system using coal."

Distribution of energy resources. China's coal resources are concentrated in the North, and transporting coal to the South and East has long been a major problem.

"At present, the transportation of coal and oil constitutes 43 percent of the total railway traffic and 52 percent of the main waterway traffic, but the needs of the energy-lacking regions still cannot be met," Wang Ganchang, president of the Chinese Nuclear Society, told a conference of the American Nuclear Society in November. "This situation will not change in the foreseeable future. Therefore, nuclear energy would be the best approach to the energy problem in those energy-lacking regions."

Wang explained that China will continue to rely on coal and hydropower as its most important energy sources, but that nuclear power will "unavoidably be the most important supplementary source of energy" in energy-deficient regions such as East China, Guangdong, and Northeast China.

China's major hydropower resources are in the Southwest, but China would need long, high-voltage transmission lines to get power to industrial centers.

Safety. The Chinese press and nuclear spokesmen have strongly defended the safety of nuclear power.

"The safety, reliability, and economy of nuclear energy in power generation have been verified by practice," noted nuclear expert Jiang Shengjie in his speech to the Chinese Nuclear Society congress. "The amount of radiation [released by a nuclear power plant] is much smaller than that of a coal-fired power plant, which released uranium, thorium, and other impurities."

An article in the official *People's Daily* in March 1980 played down the signif-

"If foreign countries refuse to supply us with their technology, it is entirely possible for us to rely on our own strength to design and build nuclear power plants. . . . We must rely mainly on our own efforts while making foreign assistance subsidiary."

Despite the strong strains of self-reliance among China's nuclear experts, they are very aware of the international advances in nuclear power technology and of the time they will gain by importing power plants.

In his November speech, Wang Ganchang spelled out two alternative approaches China could take with regard to foreign technical assistance.

"We might seek technical help from a friendly country well-advanced in nuclear power and undertake with her an all-out cooperative program, like that between Brazil and the Federal Republic of Germany, so as to realize technical transfer in the shortest time, leading to a capacity of designing, building, and operating a commercial nuclear power plant by ourselves in the 1990s.

"As an alternative," Wang said, "we might also choose to rely mainly on self-reliance with a limited amount of technical help from abroad. In this alternative, demonstration nuclear power plants of smaller capacity are to be built and operated as a first step before full-sized commercial plants are constructed."

Of the two alternatives, Dr. Wang supported the first—an all-out cooperative program with a friendly country. West Germany's agreement with Brazil calls for technical help in building eight nuclear power plants and the transfer of technology needed to enrich uranium and to reprocess spent fuels, both of which the US refuses to transfer to developing countries. The Chinese, though, have already developed both of these technologies as part of their nuclear weapons program. The main advantage of this type of cooperative arrangement would be the promise of close cooperation between nuclear scientists of China and the friendly country to speed up the transfer of nuclear power technology. The Chinese might also expect attractive government-backed loans to accompany such an agreement.

The second alternative Dr. Wang mentioned would significantly delay the start-up of China's full-fledged nuclear power program.

China's final decision will probably lie between these two extremes, meaning importation of anywhere from one to six nuclear reactors over many years, with intensive training of Chinese engineers and technicians.

"I think what they will do is buy the first one or two or three, maybe from different companies, and then enter into a licensing agreement to transfer the technology for plants they build themselves after that," said one US nuclear industry official.

How the Chinese conduct negotiations for the South China plant, which type of technology they choose, which companies they sign contracts with, and how smoothly the construction goes will largely determine the future course of China's nuclear power program. 完

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icance of the Three Mile Island accident. Its greatest adverse effect was on people's minds, the article said, since those residents most seriously exposed to radiation during the accident had received less than in a routine X-ray and since milk found near the plant was still fit for consumption. Another article three months later noted that, with "strict quality control over manufacturing and installation of equipment, the possibility of any major accidents occurring in nuclear power stations and causing deaths is far lower than a breach in a dam or a plane crash."

Chinese nuclear proponents also point to the long record of safe operation of nuclear plants in other countries and to predictions that nuclear's share of the total electric energy produced worldwide will grow substantially by the end of the century.

Need to employ nuclear specialists. China's nuclear lobby consists of large numbers of experts who were trained to develop the nuclear weapons program. As civilian economic growth takes priority, they are pushing for nuclear energy out of self-interest.

"We basically have the conditions for developing nuclear power in China," a *Guangming Daily* article by a Second Ministry official noted in December 1979. "We have a contingent of specialists in relevant fields and rather complete scientific research installations. . . .We must see that if the human potential is not brought into play, the existing contingent will be lost."

A June 1980 *People's Daily* article put the argument even more forcefully: "If we do not make an early decision about the principle of development for nuclear energy and allow things to be put off, this will not only be detrimental to the development of the nuclear industry but will also bring about waste and loss among the nuclear power science and technology forces. Such losses will be irreparable."

Rich resources of uranium and thorium. "The identified resources of uranium are enough to meet the demand for the development of nuclear power in the immediate future," Wang Ganchang told the American Nuclear Society.

China has been relatively reticent about revealing information on its uranium reserves, but in the last year or so, information on several deposits has been disclosed. The most important deposit seems to be a 100-square kilometer area in the Nanling Mountains, in South China's Guangdong and Hunan provinces. This deposit, discovered in 1956, has reserves equivalent to 14 large mines in 100 rich veins, according to a Xinhua report. A geological exploration team from Guangdong was commended at a national conference in April 1980 for its work since 1964 in discovering uranium deposits in the province. A smaller uranium deposit, "large enough to support a medium-sized mine," was discovered in Liaoning Province in October 1979. A research institute in Shanghai was commended for its success in extracting uranium from seawater. By no coincidence, these three locations—Guangdong, Liaoning, and Shanghai—have been recommended as sites for nuclear power plants.

Some 85 percent of China's uranium ores must be mined underground, while 15 percent is open-pit mined, Wang said. He added that most of China has not been explored for uranium, and prospecting has been limited to shallow deposits. Thus China may find even more deposits of uranium-bearing ores in the future.

—Dori Jones

South China Project

China's First Nuclear Plant

Is China really ready for nuclear power? Some major snags may slow down the ambitious plans the Chinese are making for their first nuclear power station, which they hope to build in Guangdong Province by 1989. Such difficulties as finding the money to pay for the project, establishing nuclear regulations, negotiating a safeguards agreement, evaluating the various technological alternatives, and resolving bureaucratic disputes may delay start-up until well into the 1990s.

In mid-December, Guangdong Power Company and the Hong Kong utility, China Light and Power Company, Ltd., signed a joint feasibility study recommending the construction of a nuclear power station with two reactors of about 900 megawatts (mw) each in Guangdong Province. The two companies plan to form a joint venture company to build and operate the station. Although the joint venture has not yet been formed, Hong Kong press reports say that Guangdong would probably own about 60 percent and China Light 40 percent of the station. When it first began operating, most of the electricity would go to Hong Kong; in later years, as Guangdong Province's population and industry grew, China would absorb a greater share of the power generated by the station, according to some reports.

China Light issued a statement in December saying that if the project starts in 1981, the two reactors can be in commercial operation in 1988 and 1989 respectively, and the joint venture will continue to 2009. This would be the first China-Hong Kong joint venture to extend beyond the 1997 expiration of Britain's lease of Hong Kong's New Territories from China. It would serve to reassure Hong Kong investors that the Chinese do not plan any dramatic changes in Hong Kong's status after that year.

The Guangdong nuclear power station, called by some the South China project, was first proposed in mid-1978. Last March, Guangdong Province's electric bureau and China Light decided to conduct a joint feasibility study. For this study, Guangdong Province hired as a consultant the California-based Nuclear Services International, a subsidiary of Quadrex, a highly regarded energy consulting firm. For its part, China Light and Power turned to the United Kingdom Atomic Energy Authority for technical advice.

The joint feasibility study examined the trade-offs between a nuclear power plant and a coal-fired power plant in Guangdong. It compared the merits of numerous sites in Guangdong Province, finally recommending Mirs Bay and Daya Bay, both located northeast of Hong Kong, as suitable sites.

The study considered various types of reactors, finally recommending two pressurized water reactors (PWRs) side-by-side.

The study, highly detailed and specific, was sent off to Beijing, London, and Hong Kong for government approval.

Beijing's approval may take some time. The plan must be examined and approved by the State Energy Commission, the State Planning Commission, and the State Council before any bids can be solicited. Although some decision may be made at the Communist Party Congress in early 1981, the final go-ahead probably will not be given for another six months to a year, according to Wang Dexi, deputy director of the Institute of Atomic Energy in Beijing.

In the meantime, Guangdong Power Company and China Light plan to set up a joint venture company before soliciting bids. As of last fall they reportedly were considering various options, including sale of equity to other Hong Kong investors. The joint venture company then must prepare an inquiry document detailing the specifications, which could take several months. Finally, it can invite bids from foreign companies—perhaps as early as mid-1981.

The Chinese plan to hold competitive bidding on the nuclear plant, according to John Lingafelter, president of Nuclear Services International. He said Westinghouse, Kraftwerk Union of West Germany, and Framatome of France figure among the companies to be invited to bid on the nuclear steam system, and at least four companies will be invited to bid on the turbines.

Guangdong Province Deputy Governor Wang Chuankuo told the American Nuclear Society (ANS) delegation in October that German, French, and Japanese companies would be invited to bid on the project, but *not* American companies, since they are not permitted to export to China without a government-to-government agreement on safeguards. The ANS group strongly urged the Chinese to invite American bids, anticipating a signed agreement by the time they were ready to select a supplier. In late November Lingafelter said he understood that US companies would be invited to bid after all.

The bidding process itself may take several months. Then time is needed to arrange the bid responses into comparable categories in order to identify the best offers.

Possible Negotiating Snags

Further negotiations will take anywhere from a few months to a few years depending on the urgency with which the Chinese view the project. Several American observers estimate the entire process will take several years, and believe a final contract may not be signed until 1982 or 1983.

The time needed for negotiations also depends on:

Number of Suppliers. The Chinese may decide to go for a turnkey project—a fixed-price contract with one foreign company—or select several suppliers for various components. A turnkey project would bring the power on stream sooner but cost more and minimize the transfer of technology. The second alternative probably would require the Chinese to hire one or several foreign architect-engineers to help them select separate suppliers for the reactor, turbines, engineering and construction management, and other components of the project.

Foreign exchange availability. The

Guangdong provincial authorities reportedly are eager to begin the project quickly and arrange financing themselves through Hong Kong. But the central government in Beijing has balked at the huge foreign exchange expense. Two 900 mw reactors would cost some $3 to $3.5 billion. A project of this magnitude will certainly be reviewed carefully in Beijing. The Chinese recently postponed several major capital construction projects mainly because of a shortage of funds.

Nuclear regulations. Each of the major industrialized countries has its own regulations on building nuclear power plants. China must either draft and approve its own regulations—a time-consuming process—or accept those of the country from which it imports, with *ad hoc* modifications.

Desire for maximum technology transfer. China's clearly stated preference for domestic rather than imported equipment and materials, its need to employ Chinese technicians wherever possible, and the desire to conserve hard currency suggest a turnkey plant is unlikely. Considerable negotiating time probably will be taken up with such details as training operators and ensuring the participation of Chinese engineers in the design and management of the project. The Chinese side also must make an inventory of parts and materials it can supply itself, such as concrete, structural steel, pipes, and valves. The foreign contractor thus will have to examine Chinese production capabilities before determining a final price offer.

Buying second-hand facilities. China may choose to import plans or parts already ordered for nuclear power plants that were later cancelled in the US or other countries. The Chinese have contacted several American companies about this possibility. One such firm, Northern States Power Company in Minneapolis, offered some nine months ago to sell the plan and parts for the cancelled Tyrone project in Wisconsin to the Guangdong Power Company. Since the Chinese did not move quickly though, the company had to cancel most of the contracts it had signed with suppliers. Northern States, through the Snupps group of utilities, still is trying to sell the reactor design, but the major savings the Chinese might have made by taking over the contracts at reduced prices and lowered interest expense now are no longer available from the Minneapolis company.

Picking a Supplier

At the end of the long negotiating process the Chinese finally must decide: from whom should they buy the reactor?

When the French signed an "agreement in principle" with China in mid-October to sell two 900 mw reactors, thus reviving hopes that went back five years, it seemed France once again had the inside track. Some American suppliers believe this is misleading.

"As far as we can tell, China has not yet signed any purchasing agreement; they have only signed an option," said Harry Lawroski, president of the American Nuclear Society, after the society's visit to China last fall. "The French have agreed that they would sell but the Chinese have not yet agreed to buy."

Some Chinese leaders are even skeptical about French participation. Vice-Premier Fang Yi, who is chairman of the State Science and Technology Commission, told a Swedish official in November that he had some reservations about French methods of dealing with nuclear waste and criticized French companies for being "too secretive."

Safeguards: Americans at a Disadvantage

Currently, American companies face a major stumbling block—they are not permitted to sell nuclear reactors to the PRC. The reason: the US and China have not yet signed a bilateral treaty on cooperation in peaceful uses of nuclear energy as required by US law. But many industry experts predict this hurdle will not be hard to overcome. Said one specialist: "I don't think the safeguards issue will stand in the way if the Chinese decide they want to buy American."

The US government has informed China of its interest in such an agreement and provided proposals for review by China, but formal discussions have not yet begun.

The Chinese have spoken strongly against any nuclear agreement with a foreign country that requires inspection to ensure the nuclear material is used solely for civilian purposes. Since they already have nuclear weapons and have shown responsibility and caution by refusing to export nuclear equipment or technology, the Chinese see no need for inspection of nuclear power plants by foreign powers or international agencies.

US law does in fact allow the government some flexibility in negotiating a nuclear agreement with China because the PRC already possesses nuclear weapons. While China still would need to sign an agreement on nuclear cooperation with the US, the provisions for safeguards within that agreement would be less rigorous for China than for countries lacking nuclear weapons. The US law sets forth strict requirements on safeguards and inspections for nonnuclear-weapons states, but it is not specific about requirements for states *with* nuclear weapons, according to a State Department official. As a matter of policy and practice though, the US government always has required some sort of assurance on safeguards before allowing the sale of nuclear reactors or fuel. In essence, it will be up to the Reagan administration to develop a nuclear policy toward China and to decide how rigorous a provision on safeguards the US will require.

Most nuclear cooperation agreements signed by the US call for inspection by the International Atomic Energy Agency (IAEA). China has refused to join this agency, even though Taiwan has vacated its seat there, because the PRC considers it to be dominated by the United States and the Soviet Union. The Chinese reportedly are considering membership but they have not yet taken any specific steps to join. However, the nuclear safeguards required by the US government would not be changed by virtue of China's membership in the IAEA.

After the South China project began to look promising early last year, Westinghouse officially raised the question of a safeguards agreement with China to the Department of State. The company's argument was that US firms should be allowed to sell nuclear reactors and equipment to China directly since the Chinese already have access to US nuclear technology through the French company Framatome, a Westinghouse licensee.

President Carter gave his approval in December 1978 for Framatome to sell two reactors to the PRC with Westinghouse technology, but in May 1979 the Chinese "deferred" the project as part of their economic program. US government approval was needed because the French sale would have to be okayed by COCOM, the Coordinating Committee on Exports Controls to Communist Countries, to which the US

and France belong. US law does not otherwise restrict sales of nuclear reactors containing US technology by foreign companies to third countries.

Negotiations between the US and China on a nuclear cooperation agreement could take months or years, depending on the urgency the Chinese assign to it and the concessions each side is willing to make. At first, the US government is likely to demand stringent safeguard arrangements—such as direct inspection—unacceptable to the Chinese, but the US may be forced to settle for a lower level of safeguards, one industry official predicts.

Once an agreement is initialed, the US bureaucratic cogwheels could prevent it from taking effect for another four to six months. The agreement must be prepared for review by the president, the views of the Nuclear Regulatory Commission must be solicited, and the agreement must be recommended by the secretary of state and the secretary of energy. When the president gives his approval the agreement must be formally signed and forwarded to Congress, which may disapprove it by concurrent resolution. If the agreement has not been disapproved within 60 days of continuous session, it will go into effect. Only then will American companies be permitted to sign contracts with China for nuclear equipment sales.

At that point the export-licensing procedure begins. American companies must apply to the Nuclear Regulatory Commission (NRC) for a license; then an interagency group must review the application before the NRC can make its decision. This process normally requires 60 to 120 days. Immediately after a new agreement has been approved by the president and Congress, though, the process could be speedier, a State Department official said.

The Chinese will weigh several other factors, along with safeguards, in their choice of a manufacturer. These include technical capability, financing terms, proven performance, and political considerations.

Technology. The choice between the US, France, and Germany is fairly equal when it comes to nuclear power technology. The French company Framatome uses Westinghouse pressurized water reactor technology. According to a Westinghouse spokesman the Chinese have expressed a preference to buy Westinghouse technology directly, rather than through the French. US companies have an advantage because, as leaders in nuclear power technology, they have the research and development backup to solve problems that might arise during construction.

However, the French do have an edge in their current knowledge and the availability of both technical personnel and suppliers of "nuclear-grade" equipment, which must undergo rigorous quality-control tests in order to meet standards worldwide. In the US and West Germany, where no nuclear orders have been sold for several years, there is great concern that suppliers of nuclear-grade equipment are dropping out of the market, leaving the major builders of nuclear power plants without the needed supply backup.

The Hong Kong-based press has reported a strong interest in the Guangdong plant on the part of the United Kingdom, as well. The British are unlikely to win an order for a nuclear reactor, though, since they have little experience building pressurized water reactors (PWRs). Their domestic nuclear energy program is based on advanced gas-cooled reactors (AGRs), which are generally seen as outmoded. However, the General Electric Company of Britain is a strong contender to supply components for the nuclear plant. Because of the likely participation of China Light of Hong Kong, the British government probably will be involved in the project, and it may push for contracts for British companies. According to some reports, the French and British are considering forming a consortium to bid on the South China project.

Though the Chinese seem to prefer a PWR for the South China project, their decision is not final. In their overall nuclear program they still are considering the boiling water reactor, made by General Electric of the US and by its Swedish licensee, ASEA-Atom, and the heavy-water-type reactor, CANDU, made by Atomic Energy of Canada, Ltd. The Canadian firm sent a delegation of nuclear experts to China last May that met with Vice-Premier Yü Qiuli, then chairman of the State Planning Commission and now head of China's State Energy Commission.

Financing. When French President Valéry Giscard d'Estaing visited China last October he announced a breakthrough in the financial terms the French could offer China for a nuclear power plant. The terms were not announced, but they undoubtedly involve a low-interest loan (probably 7.5 percent or lower) with a long payback period.

US exporters are hampered in their ability to offer attractive government-backed financing. The US Exim Bank has financed nuclear power plant exports in the past, but US companies recently lost a major contract in Korea to Framatome because of unattractive credit terms, difficulties in getting American government licensing, and the Koreans' preference to diversify their suppliers.

Nuclear plant exports are exempt from the so-called "gentleman's agreement" among industrialized nations that puts a lower limit on the interest rates charged by Exim-type banks. But loans for nuclear plants are limited to 90 percent of the project cost and the repayment period cannot exceed 15 years, according to one US Exim Bank official. Hence, the competition in financing nuclear power deals is much more intense than for other types of exports.

According to Lingafelter of Nuclear Services International, the Chinese hope to finance most of the South China project with government-backed Exim-type loans and to make up the remainder with commercial credits arranged through Hong Kong. For China's first nuclear power plant, Guangdong Province's joint venture partners in Hong Kong are likely to arrange part of the financing and may well have a say in which company is chosen.

Proven performance. The Chinese probably will select a supplier that is competitive not only in terms of cost but also in terms of proven performance, including safety, reliability, shutdown time, and availability of power over long periods of time.

"I think the Chinese are becoming more sophisticated in this way," said a representative of Combustion Engineering. "They will consider not just the cost but the overall economy of the project over, say, a 20-year period. For instance, an important thing on a nuclear power plant is availability [of power]. If you look at Framatome's record, their availability per year is not as good as that of most American companies, if you take in maintenance costs and shutdown time over a 20-year period."

Political considerations. In the final analysis, the Chinese will not invest in

foreign nuclear power technology without carefully weighing the political impact of such a decision. The high-level interest shown by France's president and the long-range French willingness for friendly cooperation may sway the Chinese in France's direction. On the other hand, if the US government were to back direct sales sometime in the future, diplomatic and military considerations might tip the balance in this direction.

Building the Plant

The Chinese are planning to start up the South China nuclear power plant by 1988–89. Many observers believe this schedule is not feasible.

"I think they're overoptimistic," says Octave DuTemple, executive director of the ANS. "No matter how much they think they can do, it's not a bridge or a civil engineering project, it's high technology. I think I'm taking a more realistic look by saying that construction time would take as long there as it does here."

Several factors have been cited that may slow down construction in China. Among them are:

- Poor infrastructure, including transportation, communications, and raw materials supply;
- The possible need to make design improvements during construction, incorporating technological breakthroughs;
- Possible shifts in import policy due to a shortage of funds or to a readjustment of economic priorities, such as the policy decisions that recently delayed several major projects undertaken by the American engineering companies Fluor, Bechtel, and Kaiser;
- Possible bureaucratic infighting. The Guangdong Power Company has conducted most of the talks with foreign companies so far. The Second Ministry of Machine Building Industry is responsible for choosing a type of nuclear technology and probably will handle project management as well, according to Lingafelter. The First Ministry of Machine Building Industry probably will build the plant, the ANS delegation was told in October. The end-user of the electricity generated would be the Ministry of Electric Power, which also may act as coordinator or liaison for the whole project. The State Capital Construction Commission will also have a major role in coordinating resources for the project. Differences of opinion between these and other bureaucracies may cause delays.

If construction of a nuclear power plant takes as long in China as it does in the US, and if the first contracts were not signed until 1982 or 1983, China's first reactor probably would not be operational until 1992–95.

—Dori Jones

PRC Offices in Hong Kong

Anita Li

China's decision to give greater foreign trade autonomy to Beijing, Shanghai, Tianjin, Guangdong, and Fujian has led each of these cities and provinces to establish trading offices in Hong Kong. These offices will make it possible for foreign companies to obtain the necessary information to develop marketing strategies tailor-made for each of the five regions. The functions, personnel, and addresses of these offices:

The home of China watchers is quickly becoming the new listening post of China's commercial representatives.

TIANJIN

Tsinlien Trading Co., Ltd.

Incorporated in Hong Kong in August 1979, the Tsinlien Trading Company is currently staffed by nine officials from Tianjin. Its early start was attributed to the efforts of Li Jianzhi, deputy director of the Tianjin Foreign Trade Bureau, who had acquired excellent connections in Hong Kong during his years as a department manager in the China Resources Company (*see below*).

Tsinlien was set up under the aegis of the Tianjin Import and Export Commission (TIEC), which is in charge of overall foreign trade planning in the municipality of Tianjin, and also oversees three major trade and financial organizations:

- Tianjin Foreign Trade Corporation
- Tianjin Economic and Technical Services Corporation
- Tianjin International Trust and Investment Corporation (TITIC).

Tsinlien's primary functions are to arrange Chinese official delegation visits from Tianjin to Hong Kong, assist foreign businessmen interested in doing business with Tianjin, and act as a liaison between the Tianjin Import and Export Commission and foreign companies that wish to discuss trade, technical services, trusts, joint ventures, sole-proprietor shops, processing, and compensation trade.

Tsinlien also supplies data on Tianjin's industry and investment potential, and is currently collecting trade and market information on behalf of the Tianjin Import and Export Commission. The future role of Tsinlien in handling direct trade relations between Hong Kong and Tianjin's foreign trade corporations is expected to increase. However, contracts are still handled by the China Resources Company.

General manager: Li Jianzhi
Deputy general manager:
Zhu Mingjiu
Business manager: Zhang Hengzhi
Address: 30–32 Cameron Road,
2/F, Kowloon, Hong Kong
Cable: TSINLIENTC HONG KONG
Telex: 37476 TSINS HX

Telephone: 3–669536,
3–7210402–7

BEIJING

Representative Office of the Beijing Foreign Trade Corporation

Established in April 1980 at the former address of the China Resources Company, the office is staffed by five officials from Beijing headed by Mr. Yuan Yonghou, deputy general manager of Beijing Economic Development Corporation. The office is authorized to conduct business negotiations and discuss processing, compensation trade, and joint venture proposals with foreign companies. Samples and catalogues of export products are on display at the office. A wholly owned subsidiary set up by the office, the Techmodern Business Promotion Centre, reportedly will provide translation services and act as an agent for foreign companies.

Hong Kong representative director and deputy general manager: Yuan Yonghou
Representative and deputy manager of the First Business Department: Li Daokui
Address: Room 1102, 10/F, Bank of China Building, Bank Street, Hong Kong
Cable: 1458
Telex: 61090 TMBPC HX
Telephone: 5–245098

FUJIAN

Hua Min Company

Inaugurated officially in October 1980, Hua Min acts as the sole agent for all business departments under the Fujian provincial government with activities in Hong Kong and Macao. The company has six business departments: cereal oil and foodstuffs; native produce and animal by-products; light industrial products and arts and crafts; chemicals, machinery, minerals, and metals; investment; and transportation. Hua Min gradually will take over all trade negotiation and liaison work now performed by China Resources and its affiliated companies.

General manager: Zhang Jiyang
Deputy general managers: Zhang Hua and Cai Xinian
Address: 11-12/F, China Merchants Building, 152–155, Connaught Road, Central Hong Kong
Cable: HMINCO 7044
Telephone: 5–459166, 5–437638

GUANGDONG

Guangdong Enterprises, Ltd.

Established in early 1980, the company is staffed with approximately 80 officials from Guangdong Province and acts on behalf of the Guangdong External Economic Commission. It is headed by a vice-director of the commission, Mr. Yan Shangmin.

Guangdong Enterprises, Ltd., is most interested in processing, compensation trade, and joint ventures in Guangdong (including Guangdong's three special economic zones in Shenzhen, Shekou, and Zhuhai).

A Special Economic Zone Construction Liaison Department was established recently within the company to promote investment in these zones. It works closely with the Guangdong Provincial Administrative Committee in charge of special economic zones, which also sets policy over the province's three special zones (*see CBR*, Sept.–Oct., 1980, p. 56).

Managing director: Yan Shangmin
Address: 152–155, Connaught Road, Central, 13–14/F, Hong Kong
Cable: KWATUNGHK 5620
Telephone: 5–451939, 5–454083, 5–445620

SHANGHAI

Shanghai Liaison Office

Shanghai still maintains a very low profile in Hong Kong. The office is staffed by several officials from the Shanghai Foreign Trade Corporation, and from industrial departments under the municipal government. They collect trade and marketing information. Although the office has no immediate plans to undertake direct business discussions with foreign firms, it may do so as it expands.

Shanghai Foreign Trade Bureau representatives: Yin Dongchuan, Yi Zhanyun
Address: Room 1105, Bank of China Building, Bank Street, Central Hong Kong
Telephone: 5–255770

CHINA RESOURCES COMPANY

This company acts as the Hong Kong agent for six national foreign trade corporations, and remains heavily involved in trade between Hong Kong and the five regions that have received greater foreign trade autonomy. Its staff of more than 400 is headed by General Manager Zhang Guangdou, and nine deputy general managers: Zhang Xiancheng, Pei Zesheng, Zhang Zheng, Li Jingtang, Ye Ping, Qiao Wenli, Ji Guanghui, Ye Jinghao, and Yu Dunhua.

There are seven administrative departments in the company (general management, personnel, finance, market research, electronic data processing, transport, and general affairs), and four business departments:

• *Machinery and Instruments Department:* Hong Kong agency for the China National Machinery Import and Export Corporation (MACHIMPEX), the China National Machinery and Equipment Import and Export Corporation (EQUIMPEX), the China National Instruments Import and Export Corporation (INSTRIMPEX), and the China National Technical Import Corporation (TECHIMPORT). Manager: Wang Tongshan; submanagers: Gao Wangsheng, and Xu Tingmei. Telex: 73277 CIREC HX.

• *Metals and Minerals Department:* Hong Kong agent for the China National Metals and Minerals Import and Export Corporation (MINMETALS). This and the above-mentioned departments originally belonged to the Industrial Products and Minerals Department which recently split in two. Manager: not yet appointed; submanagers: Ji Guangchuan and Xu Zhengcheng.

• *Petroleum and Chemicals Department:* Business representative in Hong Kong for the China National Chemicals Import and Export Corporation (SINOCHEM). Manager: Lin Baokang; submanagers: Guo Zhiqiang, Hu Jin, Dong Hengtao, and Lin Zhihua. Telex: 65053 CIREC HX.

• *Enterprise Development Department:* Responsible for investment and development activities in real estate, industry, and commerce. Manager: Chao Yongsen; submanagers: Zhou Deming, Yan Zhenwen, and Yang Shengye. Telex: 63433 CIRIM HX.

Address: China Resources Company, Causeway Centre, Gloucester Road, Hong Kong
Telephone: 5–7569111
Cable: CIRECO HONG KONG, or 0230 HONG KONG
Telex: 73277 CIREC HX

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Launching an Export Drive

Dori Jones

Chang Shan, Hudong shipyard

Photo by Ted Scull

Chang Qing, 25,000 dwt, Hudong shipyard

Photo by Ted Scull

Jian She, 6,600 dwt, Jiangnan shipyard

Xinhua photo

An Hu, 24,700 dwt, Hongqi shipyard, Dalian

Xinhua photo

In the midst of a major ship importing spree, the Chinese are conducting a major ship export drive. This apparent contradiction is only one of several that have puzzled close observers of China's shipbuilding industry.

As the Chinese hand out colorful brochures advertising ships they can build to order, a leader of the China Corporation of Shipbuilding Industry (CCSI) announces that their production capacity is saturated with orders for ships of more than 10,000 deadweight-tons (dwt).

The Chinese are offering to build and export 50,000 dwt and 80,000 dwt oil tankers, but the largest they have built to date—a 50,000 dwt tanker with 16,000 horsepower (hp) engines named *Xihu*—has not been seen in use since its launching in 1976. A shipyard in Shanghai, where the draft limit is 20,000 dwt (for a loaded ship), is planning to build a 60,000 dwt ship. In one bright orange brochure, Dalian Shipyard offers to build for export a jackup drilling platform with Continental Emsco equipment, but it has completed only the first of five such rigs it is building, and that finished rig is still untested.

One US company ran into these contradictions head on, when, after spending time and effort at CCSI's request to find a buyer interested in ordering several Chinese ships as part of a countertrade arrangement, the company was told that CCSI could not build the ships after all.

"It seems to me that the way the Chinese government is doing things is not logical," noted a Chinese-born American shipping expert. "The Ministry of Communications is buying ships while the Sixth Ministry of Machine Building is building ships for export." On the other hand, another US analyst believes that the strategy makes sense, since the experience gained in building ships for export will undoubtedly upgrade China's own shipbuilding standards.

At present the Chinese are building six 27,000 dwt freighters for two Hong Kong companies, and they plan to build two 27,000 and two 36,000 dwt vessels for export to Sir Y.K. Pao's Worldwide Shipping in Hong Kong (*see* p.43). Their largest ship completed for export so far, a 17,500 dwt multipurpose container ship, was launched amidst much fanfare in April 1980 and was due to be delivered in late 1980.

The Chinese hope that these orders will establish their reputation and pave the way for a spate of orders in the future. The China Corporation of Shipbuilding Industry (CCSI), founded in 1977 under the Sixth Ministry of Machine Building, has opened an office in Hong Kong and established contacts with numerous potential foreign buyers. CCSI recently began distributing a "Ships Export Catalogue," offering to build tankers of up to 80,000 dwt, freighters of up to 25,000 dwt, passenger/cargo vessels, tugboats, barges, special-purpose engineering ships, and small boats (*see* p.44). The catalogue lacks one major detail, however: prices. According to Hong Kong press reports, Green Island Cement Company paid $13 million each for the first two 27,000 dwt freighters it ordered, but the Chinese have in general been very secretive about prices.

As this export drive unfolds, the China Ocean Shipping Corporation (COSCO) under the Ministry of Communications has continued to buy secondhand bulk carriers from Greek and other shipping companies at a furious rate (*see CBR*, Nov.–Dec., 1980, pp. 60–61). Although many of these ships are in the 30,000 to 80,000 dwt-class range, COSCO has also purchased some of the same types of ships CCSI is building and offering to build for export—namely, 10,000 to 36,000 dwt freighters.

Still in Infant Stages

The shipbuilding industries in Japan, Korea, and Taiwan have shown Beijing's leaders how lucrative the industry can be as a means to augment foreign exchange earnings. But China's shipbuilding-for-export industry is only in its infant stages by world standards. It is not likely to emerge as a full-fledged competitor for at least five and probably 10–15 years.

"Their best strategy would be to build an entirely new, modern shipyard," notes Charles Dragonette, a China merchant marine analyst for the US government. "I am afraid, though, that they will probably make the mistake of trying to patch together and expand the yards they have." Most of China's shipyards are located in crowded urban areas with little room for expansion.

The Chinese say they have more than 200 shipyards which built over 700,000 tons of steel-hull ships in 1979. (How they calculate tonnage to arrive at this figure is unclear.) Most of the ships built are simple bulk carriers, small tankers, tugboats, and barges, although the Chinese have begun building more specialized ships such as research vessels, cable-laying ships, dredgers, hovercraft, and oil exploration vessels. The Chinese have

China's Ship Exports to Date

Foreign Buyer	Type of Ship	Shipyard	Delivery Date	Date of Order	Comments
Ships on order					
Regent Shipping, Ltd.	Two "Lakes-fitted" 27,000 dwt bulk carriers	Dalian	NA	First, 5/14/80; second, 7/30/80	Ships to be classified by Lloyd's Register and equipped with B&W engines
Green Island Cement Co. (associate of Cheung Kong Holdings, Ltd., Hong Kong)	Four 27,000 dwt "Lakes-type" freighters	Dalian	Mid-1982	First two, 6/80; others, 7/80	Under construction; to be classified by Lloyd's Register; $13 million each for first two
Worldwide Shipping Group (Hong Kong)	Four bulk carriers: two 27,000 dwt, two 36,000 dwt	Jiangnan, Hudong	Within two years of contract signing.	Letter of intent, 4/30/80	Final contract not yet negotiated
Baker Marine Engineering Corp. (US)	Two jackup drilling platforms	Dalian	Late 1981	11/80	Baker to provide blueprints and some main equipment; China to provide rolled steel and to overhaul an existing rig for Baker
Ships already delivered					
Malaysian International Shipping Co., Ltd.	*Bunga Saga*, 3,700 dwt freighter	Zhonghua	8/28/77	early 1976	Equipped with 5- and 10-ton booms
China-Poland Shipping Co., Ltd. (jointly owned by China and Poland)	*Shaoxing*, 10,000 dwt freighter	Shanghai Shipyard	9/23/78	NA	Equipped with imported radar equipment, gyrocompass, satellite navigational aids, and meteorological facsimile receiver; flies PRC flag
Guinea	Floating drydock	NA	NA	NA	NA
Guinea	Two trawlers	NA	7/22/76	NA	NA
Romania	Four tugboats	NA	NA	NA	NA
Hong Kong Ship Service Corp.	One 17,500 dwt multipurpose container ship	Zhonghua	Launched 4/15/80; delivery 12/80	Spring 1978 Guangzhou Trade Fair	500 TEU capacity; heavy lift facility; B&W engines
China Resources Corp. (Hong Kong)	Two high-speed 300-ton perishable goods cargo freighters	Guangzhou	NA	12/79	Imported main diesel engine and other equipment; flies PRC flag
Wantong Corp. (Hong Kong)	Two 950-ton barges	Guangdong	6/79, 12/79	NA	NA
Nucleus Co. (Hong Kong)	1,200-ton oil tanker	NA	NA	NA	NA
East Haven Marine, Ltd. (Hong Kong)	30-foot fiberglass racing yacht	Guangdong	2/9/80	8/79	American-designed yacht with all materials imported from Japan
Pakistan	Two submarine chasers	NA	5/80	NA	NA

NA = Information not available
TEU = 20-foot equivalent units
dwt = deadweight tons
SOURCES: Chinese and foreign press reports.
Table prepared by Dori Jones.

announced plans to increase production of 20,000 and 30,000 dwt vessels by 1985, and eventually to build 100,000 and 150,000 dwt ships. A Hong Kong expert recently predicted that China's annual ship export capacity is likely to reach 2 million tons by 1982 and 4–5 million tons by 1985–90. Given the present facilities at China's shipyards, though, this estimate seems too high (*see* p.47).

Problems to be Tackled

If China is to expand its ship export industry in a major way, its shipyards must first solve several problems.

Obsolescent technology and poor management. Within the last six months, two of China's shipyards signed agreements with Japanese shipbuilders to help them upgrade their shipbuilding technology, improve management, and raise product quality and productivity. Dalian, China's biggest shipyard, signed a three-year technical assistance agreement in October with Hitachi Zosen, which will also help Dalian design China's first 100,000 dwt ship. Jiangnan, the most important of some five shipyards in Shanghai, signed a two-year $450,000 technical assistance agreement with Mitsubishi Heavy Industries in August.

Meanwhile, Guangdong Province's Marine Industries Corporation has reportedly held talks with British, American, and Japanese interests about redesigning some of the five shipyards under its jurisdiction. Two years ago, the British yard, A&P Appledore, announced the signing of a consulting contract to modernize the Guangzhou Shipyard, but no further announcements were made about progress on the agreement, which has probably fallen through.

As one incentive to improve management without foreign assistance, China plans to restructure its shipbuilding industry to allow enterprises to keep a portion of their profits for investment or for bonuses for their workers. China's shipyards will also be able to retain some of the foreign exchange they earn and use it to import advanced equipment, CCSI Deputy Managing Director Wang Ze told a Hong Kong conference in late November.

Lack of specialization or standardization. Because of China's past policy of encouraging enterprises to be self-sufficient, each of China's major shipyards manufactures not only ship hulls but also all components for ships, including diesel engines, turbochargers, forgings, hydraulic deck machinery, safety equipment, and propellers. In addition, each yard designs its own ships. Because of this, there is a widespread duplication of effort resulting in a morass of different types of ships, engines, and other components that have not been sufficiently standardized to allow shipyards to order parts from one another. This lack of standardization has increased the costs of shipbuilding and complicated the task of ship repair. Recently, the Chinese have been trying to standardize, and to encourage serial production of widely used ships, but they admit their standards do not yet meet international levels.

Need for more advanced engines and other components. To attract customers, CCSI offers to install imported equipment on ships built for export. At the same time, the Chinese are also signing more and more agreements to produce engines and other equipment

Ships Offered for Export by China Corporation of Shipbuilding Industry

Type of vessel	Deadweight tonnage or other specification	Shipyard/ location
Oil tankers		
(classification by capacity)	1,000 dwt	Hudong, Shanghai
	3,000 dwt	Hudong, Shanghai
	15,000 dwt	Dalian, Liaoning
	24,000 dwt	Dalian, Liaoning
	50,000 dwt	Dalian, Liaoning
	80,000 dwt	Dalian, Liaoning
Cargo ships		
Refrigerated cargo ship	300 dwt	Guangzhou, Guangdong
Coastal freighter	800+ dwt	Guangzhou, Guangdong
Cargo ship	3,700 dwt	Zhonghua, Shanghai
Log carrier	10,000+ dwt (7,000 m^3)	Dalian, Liaoning
Dry cargo ship	12,000+ dwt	Dalian, Liaoning
Bulk carrier	16,000+ dwt	Jiangnan, Shanghai
Multipurpose ship	17,500 dwt	Zhonghua, Shanghai
Bulk carrier	20,000+ dwt	Jiangnan, Shanghai
Oceangoing freighter	25,000 dwt	Hudong, Shanghai
Passenger/Cargo Vessels		
Coastal ship	900+ ton displacement	Jiangnan, Shanghai
Coastal ship	1,600+ ton displacement	Jiangnan, Shanghai
Coastal ship	2,300+ ton displacement	Guangzhou, Guangdong
Passenger/cargo ship	3,500+ ton displacement	Qiuxin, Shanghai
Passenger/cargo ship	7,500 ton displacement	Hudong, Shanghai
Tugboats		
Coastal tugboat	400 hp	Zhonghua, Shanghai

under license to highly respected foreign firms. So far, European companies have been the chief beneficiaries: the Chinese are now licensed to build Pielstick and M.A.N. medium-speed diesel engines, Sulzer and B&W low-speed diesels, and BBC turbochargers (*see* p.46).

China's acceptance of these licenses represents a major shift in policy. In the mid-1970s, China's shipbuilding industry was embroiled in controversy over the issue of imported technology. At that time a group of leaders now identified with the "Gang of Four" criticized the policy of importing technology as evincing a "slavish compradore mentality." They strongly attacked former head of state Liu Shaoqi for his statement that "building ships is no better than buying them, and buying them is no better than chartering them." Press reports of the time said that Hudong Shipyard in Shanghai "suppressed the workers' enthusiasm by buying foreign patent rights" for production of marine diesel engines.

A licensing agreement with Sulzer for engines signed in the early 1970s was allowed to lapse, apparently a victim of this controversy. Nonetheless, Sulzer signed another licensing agreement with CCSI in 1978 and production has begun.

Certification. Until recently the Chinese refused to allow foreign inspectors into their shipyards to observe construction for purposes of classifying and certifying Chinese-built ships. The policy apparently was changed in October 1980, when China's Register of Shipping and Lloyd's Register of Shipping signed a "working agreement" for joint survey of ships in China for classification by Lloyd's. Lloyd's will classify several of the 27,000 dwt bulk carriers under construction in China now for export to Hong Kong.

The American Bureau of Shipping (ABS) has been negotiating an agreement with China's Register of Shipping and expects to sign one soon. Baker Marine Engineering Corporation of Texas requested ABS certification for the two drilling platforms it ordered from China in November. If the agreement goes through, ABS will send a surveyor to Dalian early this year to attend onboard the platforms as they are constructed.

In August 1980 the Japan Marine Association (Nippon Kaiji Kyokai) signed a cooperation agreement for technical survey of ships, but it is unclear whether this agreement provided for certification by NKK surveyors of Chinese-built ships. The Chinese claim they have signed mutual technical survey agreements with Bureau Veritas of France, Det Norske Veritas of Norway, and Germanischer Lloyd of West Germany, as well as with Lloyd's.

Outdated yard equipment. Charles R. Cushing, an American ship expert who visited China in 1979, reported a "curious mix" of old and new techniques in China's yards, but added that the Chinese were continuing to make and install newer equipment. Several of China's larger shipyards have 40- to 100-ton gantry cranes, overhead traveling cranes, and floating cranes.

Last July, one of China's factories signed a four-year contract with Liebherr of West Germany for joint production of five types of marine cranes. It is possible that the Chinese will continue to look abroad for licenses to produce modern yard equipment as well as onboard equipment.

Yangzi River tugboat	540 hp	Zhonghua, Shanghai
Coastal tugboat	600 hp	NA
Coastal tugboat	1,800 hp	Dalian, Liaoning
Salvage tugboat	2,600 hp	Wuhu, Anhui
Oceangoing salvage tugboat	9,000 hp	Zhonghua, Shanghai
Barges		
Motorized cargo barge	200 dwt	Qiuxin, Shanghai
Coastal cargo barge	800 dwt	Huangpu, Guangdong
Cargo barge	1,000 dwt	Wuchang, Hubei
Deck barge	1,500 dwt	Hudong, Shanghai
Oil barge	3,000 dwt	Dalian, Liaoning
Engineering ships		
Bucket dredger	50 m^3/hour	Dongfeng (Chongqing, Sichuan)
Cutter-suction dredger	80 m^3/hour	Zhenjiang, Jiangsu
Dredger	200 m^3/hour	Yiyang, Hunan
Dredger	350 m^3/hour	Zhonghua, Shanghai
Dredger	500 m^3/hour	Hudong, Shanghai
50-ton floating crane	—	Jiangnan, Shanghai
Liquefied petroleum gas ship	500 m^3	Dalian, Liaoning
Ocean research ship	—	Hudong, Shanghai
Offshore drilling platform	—	Dalian, Liaoning
Refrigerator ship	500 dwt	Hudong, Shanghai

Miscellaneous small vessels
Aluminum yachts, fiberglass-reinforced plastic yachts, work boats, traffic boats, fishing boats, and other small vessels can be designed and built according to customer's specifications.

NOTE: The China Corporation of Shipbuilding Industry advises its customers that the above oil tankers, passenger/cargo ships, and other vessels can also be built according to the design and with foreign-made equipment as requested by the customer.

dwt = deadweight tons
hp = horsepower
m^3 = cubic meters
NA = Information not available

SOURCE: *Ships Export Catalogue*, November 1980, published by the China Corporation of Shipbuilding Industry, 10 Yuetan Bei Xiao Jie, Beijing, China. Telex: 22335 CCSI CN. Telephone: 895947.

Table prepared by Dori Jones

Foreign Technology Imported by China Corporation of Shipbuilding Industry

Area of Cooperation		Type of agreement/ date signed	Country	Company	Chinese factory
Equipment or technology	Design models				
Medium-speed, four-stroke, high-power diesel engine	PC-2, PC2-2, PC2-3, PC2-5, PC2-5BTC, PA6, PA6BTC	License agreement for production; late 1978	France	Société d'Études des Machines Thermiques (SEMT) - Pielstick	Hudong Shipyard, Shanghai; Xingping Diesel Engine Factory, Shaanxi; Fenglei Machinery Works, Hubei
Four-stroke, medium-speed diesel engine	L20/27, AS25/30 series	License and long-term cooperation agreement on engine production; 10/80	West Germany	Maschinenfabrik-Augsburg/Nürnberg AG (MAN)	Xinzhong Power Machinery Plant, Shanghai
Low-speed, two-stroke crosshead marine diesel engine	RLA56, RLB56, RLA66, RLB66, RLA76, RLB76, RLA90, RLB90, RND68M, RND76M, RND90M	Licensing agreement; 8/78	Switzerland	Sulzer Brothers	Dalian Shipyard, Liaoning; Zhengguang Machinery Works, Hubei; Shanghai Shipyard, Shanghai
Low-speed, two-stroke crosshead marine diesel engine	K/L45GFCA, GSCA, L55GFCA, GSCA, K/L67GFCA, GSCA, K/L80GFCA, GSCA, K/L90GFCA, GSCA	License agreement; mid-1980	Denmark	Burmeister & Wain	Hudong Shipyard, Shanghai
Turbocharger	"0" series, "1" series, "4" series; altogether 19 products	Technical cooperation and license agreement; late 1978	Switzerland	Brown Boveri & Co., Ltd. (BBC)	Xinzhong Power Machinery Plant, Shanghai; Jiangjin Turbocharger Plant, Sichuan
Marine gearbox	GW, GSC/H, GUC/H, GV series; many types, with different deceleration ratios	Unknown	West Germany	Lohmann & Stolterfoht	Yongjin Machinery Works, Sichuan
Shaft coupling and shock absorber	Two types	Licensing agreement; 5/79	Austria	Geislinger	Yongjin Machinery Works, Sichuan
Marine cranes (Liebherr's Austrian plant will provide technical know-how and spare parts and will buy back part of the products)	Five categories: B type, D2XB type, SB type, D2XSB type, and PBW type	Four-year contract for joint production; July 1980	West Germany	Liebherr-Werk Nenzing GmbH	Nanjing Marine Auxiliary Works, Jiangsu
Marine hydraulic deck machinery	Hydraulic pumps, hydraulic motors, hydraulic loading machines, etc.	Unknown	Japan	Ishikawajima-Harima Heavy Industries	Wuhan Marine Machinery Works, Hubei
Technical cooperation in shipbuilding technology and management	—	$450,000 contract for two years; 8/19/80	Japan	Mitsubishi Heavy Industries	Jiangnan Shipyard, Shanghai
Machine works technical cooperation (one-time)	—	June 1979	Japan	Ishikawajima-Harima Heavy Industries	Dalian Shipyard, Liaoning; Xingping Diesel Engine Plant, Shaanxi
Crankshaft and forging technology	Poland Technical Service Center (POLSERVICE) designed TR forging technology	Unknown	Japan	Japanese steelmakers	Wuhan Forging Plant, Hubei
Joint ship design of 100,000 dwt iron ore bulk carrier	—	August 1980	Japan	Hitachi Shipbuilding and Engineering Co.	Dalian Shipyard, Liaoning
Technical assistance in construction and repair of ships and building of engines and other marine machinery; management assistance	—	Three-year agreement; 10/80	Japan	Hitachi Shipbuilding and Engineering Co.	Dalian Shipyard, Liaoning

SOURCE: *Ship World (Technical Paper)*, special issue published by the Sixth Ministry of Machine Building, November 1, 1980. Information on type of agreement and final two items based on press reports. Table prepared by Dori Jones.

China's Major Shipyards

Dalian Hongqi Shipyard

Established: 1898

Products: Oil tankers up to 50,000 tons, jackup offshore drilling rigs, freighters up to 40,000 tons, tugboats up to 13,000 hp, floating docks, pile-driving ships, refrigerated ships, log carriers, fishing boats, and floating cranes.

Annual shipbuilding capacity: 250,000 tons. Annual repair capacity, 100,000 tons.

Area: Total area over 1 million square meters; workshop area over 500,000 square meters.

Facilities: Seven separate yards, specializing in building ships from 3,000 dwt to 50,000 dwt. Four shipbuilding berths:

1 berth, 185.5m × 20m, can build 5,000-ton-class ships.

2 berths, 255m × 27m can build 30,000-ton-class ships.

1 berth, 289.4m × 50m can build 100,000-ton-class ships.

Lifting equipment includes four 100-ton gantry cranes, two 75-ton gantry cranes, two 40-ton gantry cranes, one 20-ton gantry crane, one 15-ton tower crane, one 100-ton floating crane, and one 25-ton floating crane.

Repair capability: Can repair and refit 50,000-ton ships. Two repair docks:

1 dock, 135.19m × 16.49m × 8.35m, can repair 5,000-ton-class ships.

1 dock, 164m × 21.6m × 9.14m, can repair 15,000-ton-class ships.

Achievements:

1968: Began series production of seagoing 15,000-ton tankers.

1972–present: Builds jackup rigs.

1974: Built *Daqing No. 61*, China's first seagoing 24,000-ton tanker.

1976: Launched *Xihu*, China's first 50,000-ton tanker, with 16,800 hp engines and cruising range of 15,000 nautical miles and speed of 15.2 knots.

1981: Plans to build first Chinese-built 100,000-ton combination ore/bulk/oil carrier.

Propulsion: Shipyard builds own Chinese-designed low-speed diesel engines; low-speed, high hp diesel engines built under license to Sulzer. Total machine-building production capability: 100,000 hp/year.

Foreign technical assistance: In October 1980, signed three-year agreement with Hitachi Zosen for technical assistance in construction and repair of ships and building of main and auxiliary engines; also for managerial guidance, information exchange, and joint design of 100,000-ton tanker.

Ships for export: Now under construction: two 27,000-ton bulk log carriers for Regent Shipping, Ltd.; four 27,000-ton freighters for Green Island Cement Co. Signed contract in late November 1980 to manufacture two drilling platforms and to repair a drilling platform for Baker Marine Corp. of Texas.

Number of Employees: 16,000

Xingang Shipyard

Location: Tianjin

Products: 7,000-and 10,000-ton freighters, 15,000-ton tankers.

Annual production capacity: At least two 7,000-ton freighters and one 15,000-ton tanker per year.

Area: 590,000 square meters.

Facilities: 180-meter berth for 25,000 dwt ship; 120-meter berth for 5,000 dwt ship.

Repair capability: Has drydock capable of accommodating a ship of 30,000 dwt capacity, and one for 3,000-ton ships.

Achievements:

1969: Launched 10,000 dwt freighter, *Tianjin*.

1974: Launched 15,000 dwt tanker, *Daqing 40*.

1980: Commenced serial production of 7,000 dwt freighters.

Propulsion: Main propulsion 8,100 hp and 3,100 hp low-speed diesels.

Number of Employees: 6,000

Jiangnan Shipyard

Established: 1865

Location: Shanghai

Products: Freighters, tankers, and ferries. Total tonnage capacity, 30,000 tons.

Area: 720,000 square meters; building space, 260,000 square meters.

Facilities: Complex of seven yards includes main workshops for hulls, machinery maintenance, equipment fitting, steel casting, painting, carpentry, and forging. Three docks:

No. 1 dock: 152m × 16m × 8.8m, with 30-ton capacity gantry crane.

No. 2 dock: 184m × 24m × 9m, with 15-ton capacity overhead traveling crane.

No. 3 dock: 232m × 40m × 10.5m, with 50-ton and 150-ton overhead traveling cranes, now being expanded to repair 60,000-ton ships.

Mechanical equipment includes two 40-ton cranes, 15 15-ton cranes, 17 factories, 12,000-ton hydraulic press, 300 tons of machinery and tools.

Repair capability: 328 meter-long repair quay can repair and refit various kinds of ships up to 15,000 tons, as well as main and auxiliary engines and boilers; has repaired more than 2,500 ships since 1949; as of summer 1980, offers to repair foreign ships. Average time for repairs at dock: 7 days.

Achievements:

1959: designed China's first 10,000-ton oceangoing freighter. Launched in 1960, it was berthed in the Huangpu River for five years until engines were installed. Built two space-event support ships of about 20,000 gross tons and the 10,000-ton research ship *Xiangyanghong 10*.

Propulsion: Builds diesel engines of up to 12,000 hp.

Foreign technical assistance: August 18, 1980, signed agreement for technical cooperation with Mitsubishi.

Ships for export: May be building freighters for Worldwide Shipping Group, along with Hudong Shipyard.

Hudong Shipyard

Location: Shanghai

Products: 25,000-ton freighters, 1,000- and 3,000-ton tankers, geophysical exploration vessels, petroleum prospecting vessels, high-performance passenger liners, passenger and cargo ships up to 10,000-ton class, barges, oceanographic research ships.

Area: More than 670,000 square meters.

Facilities: Two berths can build 30,000-ton-class ships, eight berths can build 3,000-ton-class ships. Within the next few years plans to build a new berth for 60,000-ton ships. Dock area currently more than 600 meters long.

Nearly 3,600 pieces of equipment, including 100-ton elevated crane and

large lathes designed and built in Hudong Shipyard.

Achievements:

1970: Started building 10,000-ton vessels.

1971: Built first 25,000-ton freighter and first 12,000 hp marine diesel engine.

1974: Built *Kantan No. 1* drilling vessel from two cargo ships joined together with a drilling deck between them.

1966–77: Built more than 400 ships with tonnage 1.5 times that of all ships in 1954–66.

1978: Completed *Xiangyanghong No. 9*, an oceanographic survey vessel of 9,500 hp.

Propulsion: Can build (1) 3,000 hp, 4,500 hp, and 12,000 hp marine low-speed diesel engines, including some under license to Burmeister and Wain; and (2) 8,000 hp and 12,000 hp marine medium-speed diesel engines, including some under license to SEMT-Pielstick. Hudong-designed 6ESD243/82B-type diesel engine won a national silver medal in 1979.

Foreign technical assistance: None known

Ships for export: Now building 36,000-ton bulk carriers for export to Y.K. Pao's Worldwide Shipping.

Number of employees: More than 10,000.

Shanghai Shipyard

Products: Freighters up to 25,000-ton class, passenger ships, 400 hp tugs, ferries.

Facilities: Recently built new workshops with floor space of 220,000 square meters and added hundreds of machine tools and 150 cranes. Also maintains a 3,000-ton slipway, a 25,000-ton slipway, a diesel workshop, and a 25,000-ton floating dock.

Achievements:

1958: First ship built with 2,000 hp engine (previously was repair dock).

1950s: Built 150 and 300 hp steam tugs.

1970: Built first 10,000-ton ocean-going freighter, *Fenglei*, on 3,000-ton berth.

1978: Built first 10,000-ton freighter for export, *Shaoxing*, delivered to China-Poland Shipping Co., Ltd., September 23, 1978. Has built more than ten ships of 10,000 tons and over since 1969.

1949–79: Built 350 ships totaling 350,000 tons.

Propulsion: Main propulsion 9,000 hp diesel engines; also builds low-speed 10,000 hp engines.

Number of employees: More than 7,000.

Zhonghua Shipyard

Location: Shanghai

Established: 1920s

Products: Freighters up to 20,000 tons, passenger/cargo ships, dredgers, tugboats, engineering ships, fishing vessels, and floating cranes.

Ships for export:

1977: Delivered *Bunga Saga*, 3,700-ton ship with 5- and 10-ton booms to Malaysian International Shipping Corp.

1980: Launched first container ship for export, a 17,500-ton ship.

Number of employees: Several thousand workers, engineers, and technicians.

Qiuxin Shipyard

Location: Shanghai

Products: Various types of ships up to 5,000 tons, including cargo vessels, icebreakers, tugboats, fishing boats, oil prospecting ships, survey ships, barges, high-speed communications boats, yachts, and hydrofoils.

Area: 120,000 square meters

Facilities: Two ship berths, 120m × 24m; two 40-ton cranes, three 18-ton cranes.

Guangzhou Shipyard

(One of five shipyards associated with Guangdong Marine Industries Corporation)

Products: Freighters and passenger ships up to 20,000 tons, 1,700-ton floating dock, 33m double-decker communications ships, and 2,350-ton passenger/cargo ships.

Offers to build and repair bulk carriers up to 20,000 tons, oil tankers, multipurpose container ships, 5,000-ton class passenger-cargo ships, ocean-going research vessels, and all kinds of engineering ships and small boats.

Area: 502,100 square meters.

Facilities: Two shipbuilding berths can build 10,000-ton-class ships; one can build 5,000-ton-class ships. Drydocks: One drydock for 10,000-ton-class ships; another for 2,000-ton-class ships.

Shipbuilding and repair wharves in western (main) section, altogether 710m long. Cranes: one 100-ton, two 40-ton, one 30-ton. Repair wharves use 25-ton and 15-ton overhead cranes. Also has machine shops and container factory. Repair berth 400m long. Other facilities include 20–35-ton amphibious crane, 6–25-ton crane, 2–5-ton crane.

Repair capability: Can repair and refit 10,000-ton ships of various kinds.

Ships for export: Two 300-ton refrigerator cargo freighters to Hong Kong (flying PRC flag); two 950-ton hatchway barges to Hong Kong. Now building 800-ton hatchway barges and traditional wooden junks. In November 1980, negotiated with US company to build shiplift platform and its parts for export.

Foreign technical assistance: January 22, 1979, signed consultancy contract with A&P Appledore for detailed plan evaluating investment needed for modernization.

May 1980: Negotiating shipyard redesign with American, British, and Japanese companies.

1980: With assistance from Container Transport International, built factory to produce 20-foot and 40-foot marine containers.

December 1980: Guangdong Shipbuilding Corporation, which operates shipyards at Guangzhou, Huangpu, Xinhui, Jieyang, and Dongguan, signed a joint venture agreement with Wah Chang International of Singapore for technical advice and equipment to promote export shipbuilding.

Number of employees: 8,000

Wuhu Shipyard

Location: Anhui Province on Yangzi River

Products: Passenger/cargo vessels up to 5,000 tons, passenger boats, yachts, communications boats, ocean salvage tugboats, hydrofoils, racing boats, oil tankers, oceanographic survey ships, and ocean supply boats.

Area: 280,000 square meters.

Facilities: One berth, 26m wide × 136m long in summer flood season; 170m long in fall and winter. Can build 130m long boats in summer, bear 4,000 tons weight in low-water season. One fixed dock, 138.6m × 15m. Heavy lift equipment: two 40-ton cranes, one 15-ton crane, three 10- and 15-ton gantry cranes. 9,100-square meter outdoor shipbuilding platform. Facilities include steel products cold-working equipment.

Number of Employees: More than 400 engineers and technicians.

—Dori Jones

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Cleaning Up China's Environment

Beijing residents endure a pollution level ten times worse than that of New York City.

In the past the government often refused to discipline or shut down polluting factories because output quotas were sacred.

Martin Weil

The polluted air in many Chinese cities is usually the first exposure foreign visitors have to Chinese urban life. Despite the obvious environmental problems, however, China's leaders have begun only recently to adopt stern pollution-control policies. As these are enforced, they will increasingly affect domestic and foreign firms alike. The most significant measures:

- The adoption in 1979 of the first national environmental protection law, supplemented by more detailed provincial and local laws for fining, relocating, or even shutting down seriously polluting factories.
- An edict that all new factories must include pollution-control equipment.
- A decision, based largely on environmental grounds, to cancel construction of a major chemical plant near Beijing involving foreign equipment.

All US firms contemplating joint ventures in China will have to take these new antipollution policies into account. Foreign companies have, in fact, been required to provide sophisticated air and water pollution-control equipment for virtually all complete plant projects since 1973. According to companies negotiating recent contracts, environmental concern has increased steadily over time. Solid waste contamination, previously neglected, is now receiving particularly close attention in negotiations with foreign firms.

But the new antipollution policies may offer licensing opportunities for pollution-treatment technology. Air pollution treatment has been a part of licensing negotiations with US firms for thermal power plant technology, and some US electrostatic precipitator manufacturers have been approached regarding licensing.

Foreign engineering or consulting services may also be needed to help China design and manufacture its own pollution-fighting equipment. The New Jersey firm Burns and Roe, for example, signed a protocol to aid a newly formed group in the First Ministry of Machine Building. However, for all the new awareness, the government realizes that cleanup costs are massive, and there are urgent demands on the country's very limited funds for other pressing priorities.

Extent of the Problem

The rapid development of the chemical, metallurgical, petroleum, electric power (primarily originating from coal), textile printing and dyeing, and pulp and paper industries since 1949 has created a major pollution problem. Estimated emissions of the so-called "three-waste" effluents in 1979 totaled 36 billion cubic meters of gas, 28.5 billion tons of water, and 450 million tons of solids. The estimated 15 million tons of sulfur dioxide released was approximately 55 percent of the US figure.

In urban areas the problem has been exacerbated by coal emissions, the primary residential cooking and heating fuel. Rural areas suffer from the problem of agricultural chemicals.

Chinese environmental officials estimate that 90 percent of discharged water in China remains untreated, and the situation with regard to waste gases and solids is probably not much different.

Only a few large plants constructed in the past decade include air or water treatment facilities as part of their design. In older plants, pollution-control equipment has been added only in piecemeal fashion. Chinese officials recently told one Western businessman that among China's 400,000 enterprises only 200–300 electrostatic separators are in operation, and these of uncertain efficiency.

A somewhat larger number of scrubbers may have been built, but these are less effective than precipitators in controlling particulate emissions, the country's most pressing air pollution problem. Only a few of the older cities, such as Shanghai, have municipal secondary treatment plants that can deal with water once it leaves a factory.

A provision allowing factories to retain profits generated from recycled materials from solid and water effluents supposedly has created an incentive for treatment over the years. But in spite of periodic press reports of successes in "changing what is harmful into something beneficial," only in sporadic cases have factories taken advantage of the offer.

As a result, the air quality of China's large cities ranks among the poorest in the world, with particulate levels up to ten times that of major US cities. All major rivers are polluted to some extent, and the Chinese press has esti-

mated that more than 40 cities have polluted water supplies. The Huai River in Anhui Province was once too polluted even for industrial use, and the Songhua River in Northeast China reportedly receives more than 159 tons of mercury per year from chemical plants.

As in the US, problems associated with careless solid-waste disposal may not be discovered for years. An ominous example comes from a November Agence France Presse report that several deaths and a high percentage of cancer cases occurred in a Sichuan college located on the grounds of a former chemical factory that emitted radioactive waste.

The policy of spreading industry around the country and encouraging construction of small-scale rural plants has to some extent spread the pollution problem throughout the country, since smaller plants are the least-equipped to deal with pollution.

New Pollution-Control Measures

Laws. China's first air and water standards were promulgated in 1963, copied almost verbatim from the Soviet Union. (For a list of these standards as well as for a useful discussion of other environmental issues, see *Environmental Protection in China*, published by the National Council in 1979.) Lax by Western standards, they never were seriously enforced, despite the formation in 1973 of the country's first anti-pollution administrative organ, the Environmental Protection Office (EPO), under direct State Council jurisdiction.

The first sign that the EPO might be given some real power came in 1979 with the "trial" implementation of the first national law on environmental protection. This law, covering land use and plant and animal protection, as well as industrial pollution, was more a sweeping statement of principle than a concrete program. It did stipulate that factories meet state emission standards; that the state has the right to levy fines against, force the relocation of, or even close down offending plants; and finally, that environmental protection offices be established at local levels. However, no guidelines for its enforcement were provided, nor was it indicated how environmental standards would be interpreted.

National standards now are being jointly formulated by the EPO, the Health Ministry, and industrial ministries. In the meantime, provincial- and even municipal-level units have been encouraged to devise more specific regulations. Many already have done so, probably using the old standards.

Fines. An example of the type of regulation being drafted comes from Guangzhou, which will fine local factories ¥20 ($13.80) for discharging 50–100 tons of waste water containing from 100 to 200 percent more pollutants than permitted. Higher fines will be levied for greater concentrations and volumes, and penalties will increase by 50 percent per year until the problem is solved. Under the laws of some other localities, factory managers face fines or criminal charges for exceeding pollution standards.

Since the new regulations went into effect, according to EPO sources, 1,500 factories have been assessed fines by various administrative bodies. The largest known fine was collected by the Hubei provincial government from a large copper complex near Daye for the equivalent of $1.3 million. A paper-mill near Suzhou was fined at the rate of 3.8 percent of its monthly production cost.

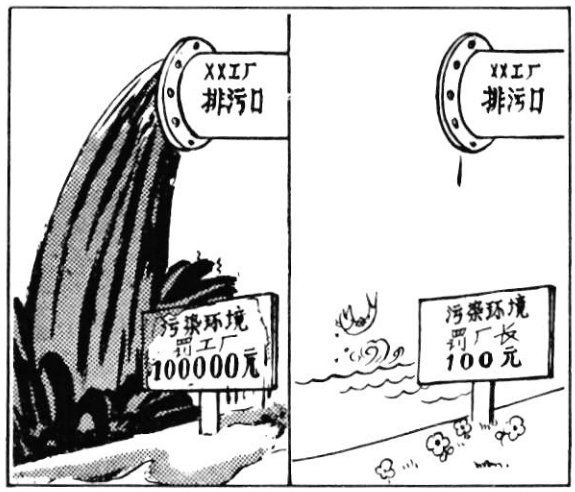
Plant closing or relocation. Due to the virtual absence of urban planning in China, many polluting factories are situated in the middle of cities and residential neighborhoods. Now there is growing pressure to relocate them in satellite towns outside population centers, to force them to close, or to include them to switch to nonpolluting product lines. According to one Western report, fully 167 plants nationwide have been threatened with shutdown if pollution is not alleviated.

An important target of these efforts is the world-renowned tourist city of Guilin, which was unwisely developed into an industrial city. Twelve plants, including metallurgical works, were shut down, and 47 are scheduled to be moved.

Equipment in new plants. Periodic calls have been made to include pollution-control equipment in all new plants, but a November 1980 circular issued jointly by the EPO, and the State Planning, Economic, and Capital Construction Commissions appears to have more teeth than earlier appeals. It mandates that funds for environmental protection equipment be listed as a line item in estimated, budgeted, and final accounts for all projects under the state plan, and that the state organs inspecting completed projects not allow them to go into production without effective pollution-control equipment.

The circular designates China's highest level planning authorities as responsible for the installation of such equipment, which should reduce the loss of pollution-control funds in the competitive negotiations for allocations from the central treasury.

Manufacturing antipollution equipment. Another apparent result of the new legislation was the 1979 formation of the General Machinery Technical Corporation under the First Ministry of Machine Building. The corporation reportedly is led by competent and in-



The sign beneath the gushing factory waste pipe threatens: "Factories polluting the environment fined 100,000 yuan." But flowers bloom and fish frolic where the sign reads: "Managers of factories polluting the environment fined 100 yuan."—Translation by Katy Ehrlich

July 5 *Renmin Ribao*

MORE ACCOMPLISHED WITH LESS MONEY

formed engineers who hope to win orders from Chinese enterprises to build air and water treatment equipment. The company actually made a bid for the pollution-control facilities at the Baoshan steel works, although the order eventually went to more experienced Japanese firms. This corporation can be said to represent the beginning of an antipollution industry in China.

Impact statements. Amidst the torrent of criticism of the Baoshan steel plant—located upwind of Shanghai with no plans for solid residue disposal—a deputy to the National People's Congress noted that "While carrying out an industrial project, we should take the whole environment into consideration and make an 'assessment of the environment.' Has the Ministry of Metallurgical Industry made such an analysis?" The vice-minister assured him the ministry was doing so, albeit after the fact.

Further evidence of the growing interest in impact statements is the pending establishment by EPO of a research institute, where some 300 people would 'study and formulate methods of assessment, cost/benefit analysis, and the establishment of standards.

Improving Beijing's environment. The most concerted antipollution effort in the country is being carried out in Beijing. In a "four-point" circular published in April 1980, the Central Committee called for a halt to the rapid industrialization of the capital area and for its transformation into a political and cultural center. (Beijing is home to 2,600 factories, of which 1,400 are in the city proper, including more than 40 chemical and 60 metallurgical facilities.)

By August, five factories had moved out of town, 40 had merged with others on the outskirts, and 43 had switched to nonpolluting product lines. An additional 37 plants reportedly were contemplating similar steps.

Dramatic evidence of the government's determination was its November decision to cancel construction of the Dongfang Chemical Works in Beijing's eastern suburbs, despite the fact that construction had begun and contracts for equipment had been signed with Japanese firms (*see* p. 12). The danger posed to the area's groundwater, the primary water source for 2 million Beijing residents, was apparently a main factor in the cancellation.

Similar problems seem likely to stop

Selected Sales of Pollution-Control Equipment to China

Date	Equipment	Company	Comments
1973	Wastewater treatment system	Mitsubishi	For 115,000 tons/year ethylene plant in Shanghai.
1974	Wastewater treatment system	Kurita Nippon Steel Chiyoda Chemical	Surface water recirculation and disposal, desulfurization plant for coke oven gas, Wuhan steel complex. Includes cooling equipment and conveyor. Total value: $100 million.
	Reverse osmosis water treatment system	Franco Tosi, SpA, Italy	To purify boiler water for imported 640 mw thermal power plant in Tianjin. Consists of 34 eight-inch DuPont B-9 permeators; capacity 303,000 gallons/day.
1975	Water pollution control system	Sumitomo	For removal of oil slicks, and removal of oil from leaking tankers. Total value approximately $2 million.
	Air and water pollution monitoring equipment with truck	Beckman Instruments	
	Cyclone separators	Envirotech, Marubeni	As part of fluid bed process in imported acrylonitrile plant.
1977	Electrostatic precipitator	Toyo Engineering	For Wuhan steelworks. One of few purchases not tied to complete plant sale. Capacity 186,000 m^3/hr.
	Desulfurization system	Dowa Koi	For pyrite pelletization plant in Nanjing. Capacity: 52,300 m^3/hr. Reduces SO_2 content from 2,100 to 120 parts/million.
	Power recovery system	Ingersoll-Rand	Converts waste gas from catalytic cracker at oil refinery to mechanical energy. Includes Envirotech cyclone separators.
1978	Four pollution control ships	A Fai and Kanmon	200 gross register tons.
	Factory draining system, includes electrostatic precipitator	Ebara Infilco, Japan Electrostatic Precipitation	For imported television picture tube plant.
1979	Two electrostatic precipitators	Research Cottrell, through German and Belgian subsidiaries	For thermal power plants sold by European companies. Total value approximately $6 million.

NOTE: The sales listed above exclude many made as part of complete plant transactions.

SOURCE: National Council for US-China Trade, *Environmental Protection in the People's Republic of China*, 1979, p. 195; and press reports. Table prepared by Martin Weil.

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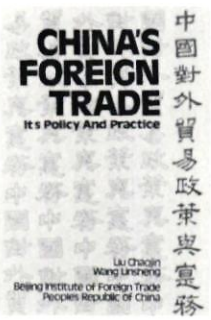

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both construction of a textile dyeing and printing mill just one kilometer away from a canal linking Beijing to a major reservoir, and plans for expanding a coal-fired power plant in the city proper.

New treatment projects. An increasing number of treatment projects appear to be under construction, although their size and capability are difficult to assess. In 1979 the province of Hunan, for example, embarked on a program to build 335 water treatment projects in factories and cities along the Xiang River, which reportedly will reduce the amount of untreated water by over 100 million cubic meters. In addition, a number of cities, including Beijing, Shanghai, and Xian, are either planning or constructing municipal secondary treatment facilities.

International exchanges. China has initiated contacts with academics, firms, and government agencies all over the world to become more familiar with approaches to pollution control.

The US Environmental Protection Agency has signed a protocol with the EPO calling for cooperation in environmental health research, pollution control, and research into environmental processes and effects, and is negotiating cooperation in environmental impact assessment studies. A tentative agreement has been reached to carry out joint studies of the epidemiological effects of residential coal burning in Yunnan Province, and organic contamination of drinking water in Shanghai. Discussions of joint studies on the flow of pollutants from one place to another are in more preliminary phases.

Finding a Least-Cost Solution

An immediate full-scale assault on China's pollution problems is financially impossible. Given the shortage of funds there is a clear need to set priorities. The government is dealing first with the most immediately health-endangering pollution, i.e., phenol, heavy metal, and the contamination of water by other toxic substances. In air pollution, particulate control appears to be taking precedence over other emissions, including sulfur dioxide. In addition, projects with a relatively high payoff in terms of recyclable waste are being favored. But recent visitors have pointed out that a detailed program to optimize resources remains to be worked out.

Chinese researchers are trying to save money by developing indigenous, low-cost technologies. US EPA officials were told, for example, of a pilot plant using local algae to remove petrochemical waste from refinery effluents.

There is some question, however, as to whether China is matching its anti-pollution rhetoric with hard cash even within the context of its limited resources. "Nonproductive" sectors in the Chinese economy (housing, education, and medicine) historically have received the short end of the stick in the budget allocations. While leaders claim the central government's pollution-control budget has increased in recent years, their refusal thus far to make public any hard figures suggests embarrassment at its size. Complaints about the government's unwillingness to fund cleanup projects have surfaced. The tourist city of Guilin was assigned the highest cleanup priority, but has received only about 20 percent of the ¥24 million it requested in 1979.

In the absence of strong support from the state budget, plants are forced to rely on the more limited resources available from local budgets, depreciation funds, or "their own resources;" namely, profits retained from recycling waste materials or, under recent reforms, profits retained for exceeding state targets. But even when the funds are available, central planners sometimes fail to allocate the needed equipment and materials. Visitors report a strong sense of local frustration with central restrictions.

Other problems that slow pollution-control measures:

Ineffective enforcement. With a reported staff of only 50–60, soon to be supplemented by a research institute of about 300 people, the EPO is clearly in no position to compel compliance with China's new pollution-control laws or to devise a coherent, up-to-date set of standards. Provincial and local environmental protection offices, whose programs may vary in tone and effectiveness, are likewise poorly staffed. The scientific manpower appears to reside in research institutes under universities, the Chinese Academy of Sciences, and industrial ministries, which have little coordination.

Industrial ministries administering large state-owned plants undoubtedly play a major role in carrying out pollution-control decisions. However, their concern is production, rather than pollution control, and the Chinese press has hinted that they resist environmental appeals. How a local government can collect a fine from a plant operated by the central government has not been made clear. Even regulations regarding pollution-control equipment for new plants have proved difficult to enforce. Indeed, nine out of 12 major construction projects in Inner Mongolia in 1979 did not include the required equipment.

Difficulties in monitoring pollution. Despite the supposed presence of 6,000 people in 297 pollution-monitoring stations in China's large cities, visitors to severely polluting plants report a dearth of monitoring activities. Chinese monitoring equipment is described as often badly outdated or inaccurate.

Many visitors believe major impact studies currently planned or undertaken by the Chinese are flawed by the tendency to take exhaustive quantitative measurements that generate mountains of nearly unanalyzable data. A less rigid approach based on sampling and geared to searching out important environmental interactions would, to some minds, yield more meaningful results.

Some visitors have also noted that in discussions of environmental standards there is a tendency among Chinese officials to parrot the standards of other countries rather than to analyze systematically what is most appropriate in the Chinese context.

Backward technology. China's domestic pollution-control technology is based primarily on that used in the Soviet Union in the 1950s. Electrostatic precipitators, wet scrubbers, and baghouses are manufactured only in small quantities, often on a makeshift basis by plants that use them. Efficiencies are as low as 70 percent in some cases.

Most water-treatment facilities include mechanical separation, flotation, biological treatment, and sedimentation. More sophisticated processes such as ion exchange and reverse osmosis are rare, though they have been instituted in some imported plants. The Chinese press recently described as "mere window dressing" the claims by petrochemical plants in Beijing and Shanghai that their wastewater was purified by raising ducks. Such examples amply demonstrate that—in addition to the need for funds and strong leadership—the lack of practical engineering experience is the main constraint on China's pollution control efforts. 完

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The State Agricultural Commission

Charles Y. Liu

The State Agricultural Commission (SAC), established in March 1979, is one of 13 specialized commissions that coordinate ministries' activities. The commissions include the State Planning Commission, State Economic Commission, and State Energy Commission, to name a few. Directly under the State Council, all are headed by vice-premiers. The SAC chairman is Vice-Premier Wan Li, who oversees all ministerial agencies related to agriculture. These are:

Agency	Head
Ministry of Agriculture	Vacant
Ministry of Forestry	Yong Wentao
Ministry of Water Conservancy	Qian Shengying (f)
Ministry of Agricultural Machinery	Yang Ligong
Ministry of State Farms and Land Reclamation	Gao Yang
General Bureau of Aquatic Products	Shao Peng
Central Meteorological Bureau	Lu Xuzhang

Most of these agencies were reorganized or established in the last two years. The former Ministry of Agriculture and Forestry split into the Ministry of Agriculture and the Ministry of Forestry in February 1979. The Ministry of State Farms and Land Reclamation and the General Bureau of Aquatic Products (which has ministerial rank) were both spin-offs of the former general bureaus of Agricultural Reclamation and Fishery under the Ministry of Agriculture and Forestry. The Ministry of Agricultural Machinery emerged from the First Ministry of Machine Building, while the Ministry of Water Conservancy came into being in February 1979 when it separated from the former Ministry of Water Conservancy and Power.

The SAC's chief functions are to:

- Formulate, execute, and evaluate agricultural policy and plans, both annual and longer-term, under the overall economic policy of the State Council;
- Coordinate the implementation of policy and programs among the ministerial agencies, especially those programs involving more than one ministerial agency; and
- Coordinate with other commissions and ministries on major policies and programs related to agriculture.

Two levels, with somewhere between 50 and 100 employees, comprise the organizational structure of the SAC. The top, policy-making level includes SAC Chairman Wan Li, the heads of SAC's seven ministerial agencies, the head of the All-China Federation of Supply and Marketing Cooperatives, Niu Yinguan, and other special duty commissioners.

The secondary level involves the planning and operational staff. Five vice-chairmen, each charged with major functions, are responsible for operations at this level:

Vice-Chairmen	Responsibility
Zhang Pinghua (first vice-chairman)	Day-to-day operations
Li Ruishan	Planning
Du Runsheng	Agricultural production and management
Li Xiushan	Unknown
He Kang	Science and education

Five offices function under the chairman and vice-chairmen of the SAC:

Office	Head
Office of Administration	Xie Hua
Bureau of Science and Education	Zhang Chengyao
Divisions:	
Education	Unknown
Science and Technology	Wen Kongjia
Resources	Zhang Gongyie
Bureau of Planning	Luo Zicheng
Divisions:	
Administration	Unknown
Comprehensive Planning	Unknown
Capital Construction Planning	Unknown
Production Planning	Unknown
Office of Policy Analysis	Unknown
Office of Foreign Affairs	Zhang Chenghua

The SAC differs from agricultural agencies in the US government in important respects. As a fairly new bureaucratic level between the State Council and the ministries, the SAC started with a very small staff—many of whom hold concurrent positions in ministries. This will change gradually as the size of the office staffs expands. However, the size of the SAC headquarters staff is not representative of the total staff working on national agricultural programs, since much of the work is done in the ministries and agencies under the SAC.

The SAC wields considerable authority at the local government level. Serving as its arm in the implementation of plans and programs are agricultural commissions at the provincial, prefectural, and county levels. The commissions' internal structure by and large mirrors that of the SAC, depending on the particular local situation. A vice-governor normally chairs the provincial agricultural commission, which answers to both the provincial government and the SAC on agricultural matters. Agricultural commissions at lower levels also fall under the "dual leadership" of the SAC and local prefectures or counties.

Unlike the US Department of Agriculture, the SAC and ministries do not have economic analysis support within their structure. Both analytical support and formal training of cadres are undertaken by such entities as the economics department of the People's University in Beijing, the agricultural economics department of Beijing Agricultural University, and the agricultural economics research institutes of the Chinese Academy of Social Sciences and Chinese Academy of Agricultural Sciences. However, the analytical support contributed by these institutions is still somewhat limited, since all were recently established or reinstituted with staffs below pre-1966 levels. 完

Dr. Charles Y. Liu is head of the PRC Section of the Agriculture Department's International Economics Division. During his October visit to China, Dr. Liu met with State Agricultural Commission officials in Beijing.

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EXPORTS TO CHINA: 1980 SALES AND NEGOTIATIONS THROUGH DECEMBER 1

The following chart contains recent reports of sales and negotiations exclusive of those listed in previous issues. The total value figure for sales includes only those deals listed as contracts or deals signed/won/secured/concluded. All others are counted as negotiations. The tables are prepared by the Council's assistant librarian, Catherine Yelloz.

Company/Country	Product/Plant/Technology	Value	Status Date Announced
Agricultural Commodities			
(New Zealand)	850 tons of scoured wool a year for next 17 years	$20 million	agreement announced 11/12/80
Australian Wheat Board (Australia)	1 million tons of wheat next year	NVG	agreement announced 11/10/80
Gold Coin, Ltd. (Singapore) and Far East Consortium, Ltd. (Hong Kong)	Have formed joint venture to make animal feed in China	NVG	announced 11/6/80
(US)	Agreement to sell 6–9 million metric tons of US grain	NVG	agreement signed 10/22/80
World Food Programme	Will provide food assistance in support of China's economic and social development projects or to meet emergency food needs	NVG	agreement signed 10/20/80
Agricultural Technology			
Guthrie Corp. (UK)	Joint venture with Overseas Chinese Enterprise Co. to establish an oil palm estate at Teng Mai, on Hainan Island	$45 million	concluded 10/14/80
Chemicals			
ANIC SpA (Italy)	Fertilizer	$17 million	will supply 10/80
Coal, Other Mineral Mining Development and Technology			
Elgin National Industries (US)	Will provide technical know-how, equipment, and technicians to oversee the construction of a coal cleaning complex and preparation facilities (contract requires approval from Chinese and US governments)	$30 million	contract signed 10/7/80
Gustave Mæs (Belgium)	Joint venture with MINMETALS to import 200,000 metric tons of Chinese coal and coke and to sell the product to Common Market countries with exclusive sales right for Belgium and Luxembourg	NVG	contract announced 9/16/80
Electronics			
Elekstronska Industrija (Yugoslavia)	Joint production of desk-top and pocket calculators	$600,000	agreement announced 10/29/80
Matsushita Electric Industrial Co. (Japan)	Two agreements to establish service facilities for its products	NVG	agreements announced 10/29/80
Toshiba Corp. and Toshiba Glass Co. (Japan)	Fluorescent-lamp manufacturing plant	NVG	order received 10/22/80
Taihan Electric Wire (South Korea)	140,000 black and white TVs to China through a Japanese trading company	NVG	contract signed 10/21/80
Canon Inc. (Japan)	Agreement with Beijing Municipal Optical Industry Bureau to assemble Canon cameras	NVG	agreement concluded 10/7/80
Sprecher and Schuh (UK)	Microprocessing system for a polyethylene plant being built in Shandong Province	$62.4 million (£26 million)	completed 10/6/80
Sanwa Denki Kogyo K.K. (Japan)	Three-year processing trade contract for the production of tape recorders	NVG	contract signed 10/3/80
Angelo Brothers Co. (US)	Sole US and Canadian importer and distributor of Chinese-made decorative light bulbs	NVG	has been chosen 10/80

Company/Country	Product/Plant/Technology	Value	Status Date Announced
Philips (Hong Kong)	a) 100,000 TVs b) 130,000 portable radio recorders in kits, to be assembled in Beijing c) color TVs to be installed in several hotels	$10.14 million	contracts announced 10/80
Mitsubishi (Japan)	Hotel computer system to be installed in the Guangzhou White Swan Hotel	$300,000	order announced 9/80
NA	Friskem-AF 500 airport weapons-detector	NVG	announced 9/80
Machinery			
Bray Chromalox (UK)	Eight oil circulation heaters	NVG	sold 10/80
Petroleum and Natural Gas			
(Venezuela)	Is willing to share its technology and experience in the oil industry	NVG	announced 11/13/80
Petroleos Mexicanos (Mexico)	Is considering taking part in hydrocarbon and drilling exploration on the continental shelf	NVG	announced 10/30/80
Statoil (Norway)	Will advise Chinese government on legal, technical, and economic aspects of granting concessions to foreign oil companies for offshore exploration and development	NVG	announced 10/21/80
(Kuwait)	May sell 1 million tons of petroleum	NVG	announced 10/7/80
Power			
(France)	Two 900 mw reactors for China's first nuclear electric generating stations	$2 billion	agreed in principle 10/20/80
Allis-Chalmers Corp. (US)	Long-term cooperation in producing hydroelectric power generating equipment	NVG	agreement signed 10/10/80
R.W. Transmission, Ltd. (UK)	15 special gearboxes to be used at three power stations	$1.8 million (£750,000)	order won 10/1/80
Westinghouse Electric Co. (US)	15-year contract to provide China with know-how on the manufacture of electric generating equipment	NVG	contract signed 9/29/80
Shipping			
Lloyd's Register of Shipping (UK)	Joint survey of ships	NVG	"working" agreement signed 11/3/80
(Hong Kong)	Four 27,000-dwt bulk carriers to be built by the Dalian Shipyard	NVG	order placed 10/4/80
Mitsubishi Heavy Industries (Japan)	Will send experts and technical personnel to help upgrade the Jiangnan Shipyard	NVG	announced 10/80
Charters Maritime Corp. and Doric Maritime Corp. (Liberia)	General cargo motorship, "Crocus," 10,190-dwt, 5,595 gross, built Imabari, 1975 General cargo motorship, "Dorico," 10,162-dwt, 5,595 gross, built Kochi, 1975	$9 million for both	sold 9/16/80 sold 9/16/80
Glafki Shipping Co. (Greece)	a) Freedom-type vessels, "Sea Eagle" and "Sea Falcon," 15,200-dwt, 9,422 gross, built Chita, 1977 b) Freedom-type vessel, "Sea Swan," 14,960-dwt, 9,370 gross, built Yokohama, 1977	$24.5 million for the three	sold 9/16/80
East Haven Marine, Ltd. (Hong Kong)	Collaboration with MACHIMPEX in Guangdong Province for building a 30' fiberglass yacht	NVG	announced 9/80
Textile Plants and Equipment			
Mitsubishi-York, Ltd., and Mitsubishi Heavy Industries (Japan)	Two 500-ton chillers	NVG	order placed 11/3/80
Camber International, Ltd. (UK)	Possibility of selling textile machinery	$4.8 million (£2 million)	announced 9/30/80
Schubert & Salzer (NA)	Order for various roving frames and rotospinners which will begin a new technique and technology in spinning mills	NVG	order received 9/80

Company/Country	Product/Plant/Technology	Value	Status Date Announced
Textile Products			
Triana (Spain)	Joint venture with CHINATEX	NVG	agreement inked 10/17/80
Blanket Industry Group (Thailand)	Wide range of products, including polyester fiber, texturized fabric, and T/R fabric	$19.5 million	agreement finalized 10/80
Manow International Corp. (US) and Jardines (Hong Kong)	Joint venture to trade footwear exclusively with China	NVG	negotiations announced 9/8/80
Transportation			
Honda Motor Co. (Japan)	Factory to produce 150,000 motorcycles a year	NVG	negotiations announced 10/30/80
Japan Popular Mechanics Co. (Japan)	a) 50 secondhand buses b) standing export contract for 10,000 and 30,000 used Japanese motorcycles	$97,765 (¥ 21 million) NVG	will be shipped 10/21/80 announced 10/21/80
Manufacturers Hanover Leasing Corp. (US)	15-year leveraged leasing agreement for a Boeing 747-SP	$51 million	agreement signed 9/26/80
Toyota Tsusho Kaisha, Ltd. (Japan)	580 used commercial vehicles, including station wagons and vans	NVG	contract concluded 9/23/80
Miscellaneous			
Scheuer International Trading Inc. (US)	Set up Huafang Trading Co. joint venture with CHINATEX to be located in New York and to trade in the US Chinese cottons, polyester/cottons, polyester-spun viscose, and spun viscose gray cloth as well as yarns	NVG	negogiations concluded 11/11/80
Ikegai-Goss (Japan)	Four sets of high-speed web offset printing presses for Beijing's *People's Daily*	$14.5 million (¥ 3 billion)	agreement clinched 10/24/80
Armco (US)	26,400 tons of wire rods	$8.4 million	will supply 10/23/80
ITT Rayonier (US)	16,000-ton order of wood pulp (7,000 tons shipped)	NVG	order announced 10/13/80
(Australia)	Joint venture for the construction of two residential buildings and an activity center to be built near Nanjing	NVG	announced 10/3/80
San Ichi Co. (Japan)	Set up a China Products Co. joint venture with Beijing branch of China Handicraft Co. to be involved in wholesale and retail sale of some 40 kinds of handicraft items in New York	NVG	opened 10/2/80
Sekaicho Rubber Co. (Japan)	Export processing agreement for their rubber shoe production	NVG	announced 10/80
Worldvision Enterprises (US)	Action series about World War II, "Garrison's Gorillas," and two animated Hanna-Barbera cartoons, "Gulliver's Travels" and "Five Weeks in a Balloon"	NVG	sold 9/23/80
Licenses			
B&W Diesel A/S (Denmark)	Licensing agreement to build the engines in B&W Diesel's latest two-stroke program	NVG	agreement signed 10/14/80
Sales and Negotiations to Overseas Chinese Enterprises			
Allis-Chalmers (US)	Processing equipment to be installed at a new 4,500 metric-ton-per-day cement plant to be built in Hong Kong by China Cement Co. (US, Hong Kong, and PRC)	$18 million	order awarded 12/1/80

Total value of 1980 sales listed through December 1 ..... $4.1 billion+
Total value of 1980 negotiations listed through October 15 ..... $4.8 billion+
Cumulative value of sales from January 1, 1979, through December 1 ..... $11.5 billion+
Cumulative value of negotiations from January 1, 1979, through December 1 ..... $6.7 billion+

CHINA'S EXPORTS: 1980 SALES AND NEGOTIATIONS THROUGH DECEMBER 1

Company/Country	Product/Plant/Technology	Value	Status Date Announced
Foreign Aid			
Kenya	a) Construction of a sports complex outside Nairobi b) Help in developing their light industries and agriculture c) Technical assistance in the construction of a hydroelectric power station and in rice-growing techniques	NVG	announced 11/80
(Africa)	Contribution in support of the UN-FAO World Food Programme	$100,000	announced 10/22/80
Metals and Minerals			
(Philippines)	Possibility to sell coal	NVG	announced 11/14/80
(US)	59 tons of titanium for 1980	NVG	contract signed 10/29/80
Military Equipment			
(Pakistan)	Supply of China's latest fighter-bombers and sophisticated ground-to-air missiles	NVG	announced 11/1/80
Power			
East Bay Municipal Utilities District (US)	Will purchase three turbine generators	$2.6 million	announced 11/28/80
Trade Agreements			
(Oman)	A framework trade agreement providing for increased trade with China, including construction opportunities in Oman for Chinese contractors	NVG	agreement signed 10/14/80
Miscellaneous			
(US)	Purchase of chemical and light industrial products, food, handicrafts, and 10,000 bicycles to be reexported to South America	$2.7 million	agreement reached 11/11/80
(Philippines)	Loan agreement to supply the Philippines with mini hydroelectric plants	$30 million	loan approved 11/80

Total value of 1980 sales November 1 through December 1 ..... $32.7 million+
Total value of 1980 negotiations November 1 through December 1 ..... $2.7 million+

NVG = No value given
NOTES: Contracts denominated in foreign currencies are converted into US dollars at the most recent monthly average rate quoted in *International Financial Statistics* (IMF).
Contracts concluded over two months ago are also included if they were not reported in the last issue of the *CBR*.

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Paris:	Ken Davey 720-3342
Milan:	Roberto Laureri 86-90-617
Frankfurt:	Irmgard Oettinger 72-01-81
Tokyo:	Akio Saijo (581) 9811/5

"我不知道你是谁
" I don't know who you are.
我不知道你的公司
I don't know your company.
我不知道你的公司的产品
I don't know your company's product.
我不知道你的公司代表什么
I don't know what your company stands for.
我不知道你的公司有那些顾客
I don't know your company's customers.
我不知道你的公司办得怎样
I don't know your company's record.
我不知道你的公司的声誉如何——
I don't know your company's reputation.
那么，你到底要卖些什么给中国？"
Now – what was it you wanted to sell us?"

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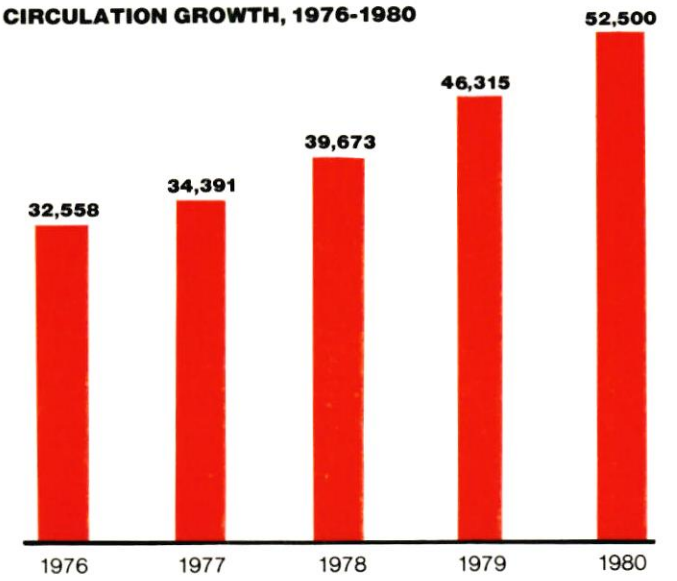

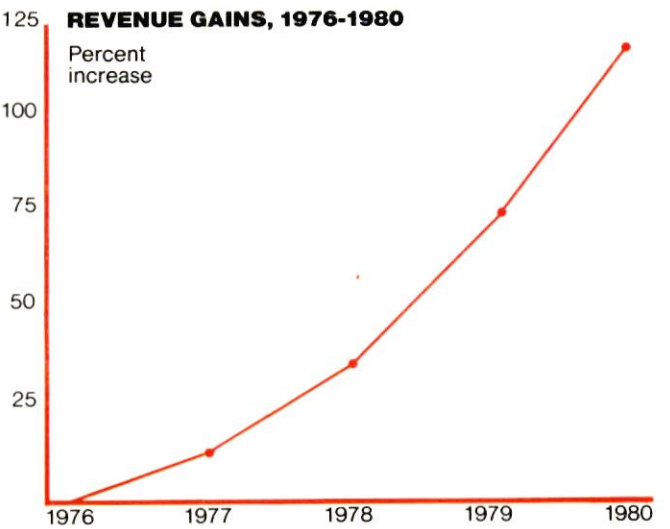

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