The China Business Review

March–April 1986

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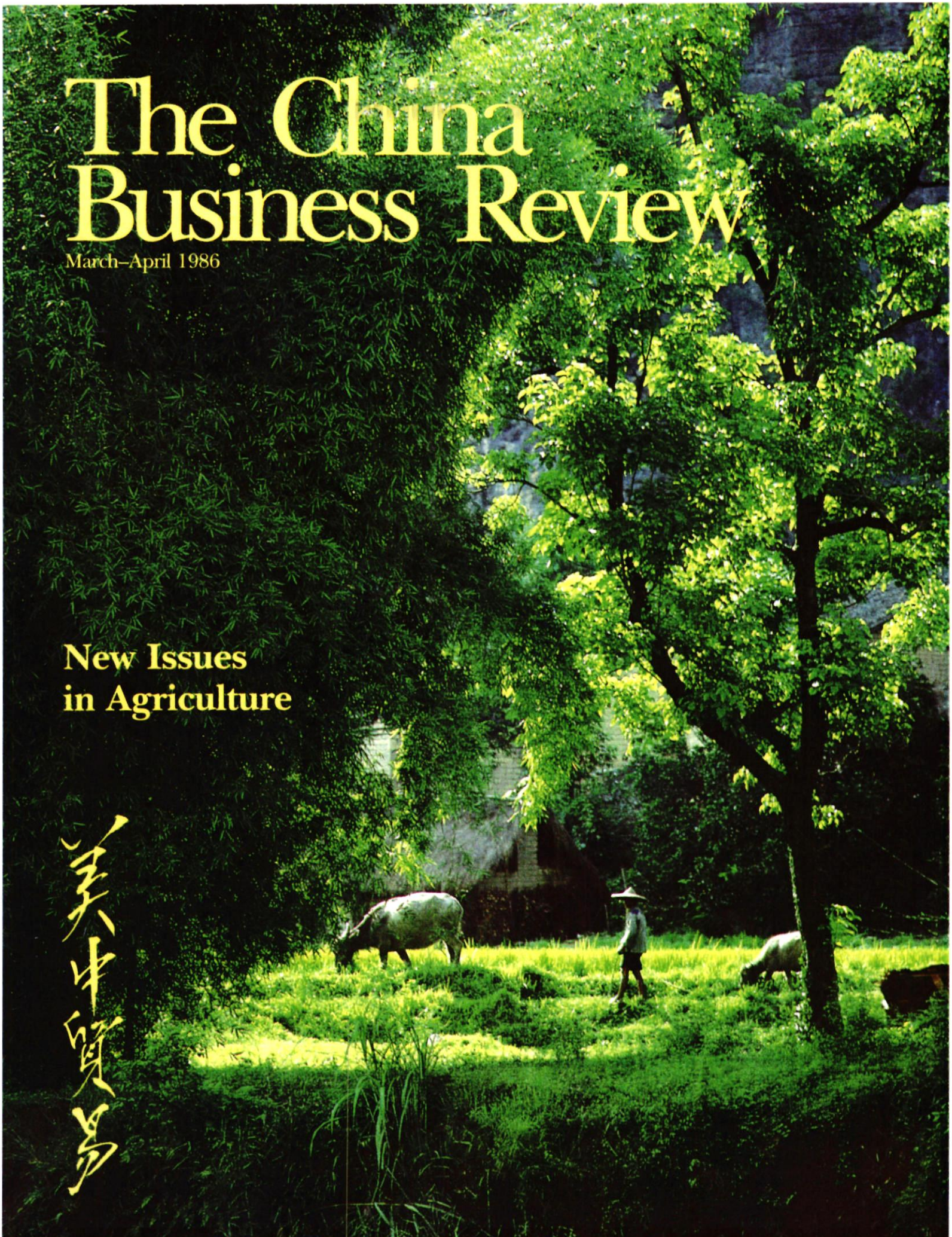

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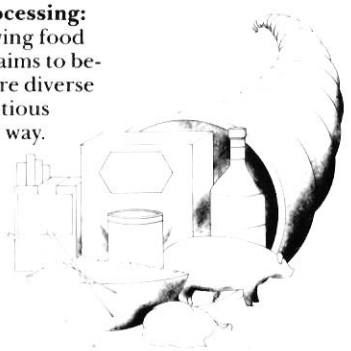
The China Business Review

The magazine of the National Council for US–China Trade

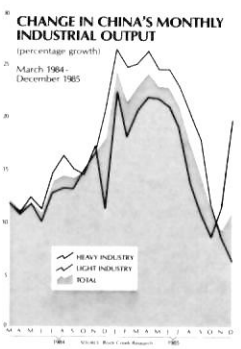
March-April 1986 Volume 13, Number 2

Cover: Agricultural reforms are changing rural life and creating new priorities for the government. *Photo taken near Guilin by Thomas Nebbia*

Food processing: The growing food industry aims to become more diverse and nutritious along the way. **Page 33.**



Industrial record: Monthly growth rates demonstrate that China's financial and industrial policies produce rapid results. **Page 44.**



Departments

摘要

A COTTON TALE

Few Chinese commodities have a history as checkered as that of cotton in the last two decades. Despite radical changes in policy, price, and output over the years, a stable balance between supply and demand has yet to be achieved.

From the late 1960s through the mid-1970s China's cotton-growing peasants bore a heavy burden, selling their cotton to the State at a low fixed price compared with staple food grains such as wheat. The price of cotton was kept artificially low, helping to make the manufacture of cotton textiles one of the most profitable industries in China. Not surprisingly, few peasants were motivated to grow cotton. Mao's agricultural policies exacerbated the situation by promoting self-sufficiency in grain production, discouraging specialization in nongrain crops even in the areas most suited for them.

As a result, cotton output began a steady decline—from 2.56 million tonnes in 1973 to less than 2.05 million tonnes in 1977. North China, which once supplied cotton mills nationwide, could no longer produce enough to supply its own textile centers such as Tianjin.

Anxious to increase cotton textile output, the government reversed its policy and extended a raft of incentives to cotton growers over the next few years. In 1978 the State procurement price was raised for the first time in a dozen years, from ¥2.1 to ¥2.3/kg. In 1979 it jumped again, and an above-quota premium price was paid to encourage additional production. The procurement price for cotton rose yet again in 1980 while grain prices lagged behind, increasing the relative profitability of cotton. Between 1978 and 1981 free markets and household farming made a comeback, while grain allowances were granted to encourage more farmers to specialize in cotton.

The result was increases in both output and area sown to cotton. Cotton output skyrocketed from 2.05 million tonnes in 1977 to 6.26 million in 1984. And as Mao's philosophy of self-sufficiency was abandoned, the land best-suited to growing cotton was turned over to it, while areas where cotton had been planted with poor results were switched to other crops.

But by 1983 the vast increase in raw cotton output had already far exceeded the textile industry's ability to absorb it. The problem was compounded by a shift in Chinese consumer preference to synthetic fibers. As demand dropped and domestic output rose, China ceased cotton imports in 1984, and began to re-evaluate its cotton incentive program.

The government decided to apply the brakes in 1984. After the 1985 cotton crop went on the market, grain awards and subsidies for cotton growers were abolished. Meanwhile, in the last two years the central procurement system has been decentralized, so that State supply and marketing cooperatives now sign yearly contracts with cotton households and production units before planting begins.

The reduction of incentives succeeded in cutting back raw cotton output by 1.8 million tonnes last year, but output still exceeded the State's purchasing quota of 4.25 million tonnes.

In 1986 the State will contract to buy the same amount of raw cotton, but will no longer guarantee to purchase production above the contracted amount. Efforts will also be made to improve the quality of the cotton harvest, still a major problem. As cotton becomes more readily available on the free market, prices should fall and cause some farmers to turn to other cash crops.

Incentives for increasing cotton production proved a spectacular success. Now China must fine tune these incentives so that cotton output does not contiue to far outstrip China's capacity to absorb it. —Karen Green

CHINA'S THIRTIETH PROVINCE

How do you handle the hundreds of thousands of people who will be displaced by the floodplain created in the course of building the world's largest dam, when their provincial governments balk at resettling them? One possibility is to set up a new province more amenable to the task. Hence, the Chinese government's deliberations on the formation of a new Sanxia Province, which would take its name from the proposed Three Gorges hydropower project in Hubei Province.

China's 30th provincial-level administrative region would coordinate the migration and resettlement of people, mainly from eastern Sichuan. If the proposed dam is built to a height of 150 meters, the Ministry of Water Resources and Electric Power estimates that 330,000 people will be displaced. If the dam is higher, the number of people displaced will also rise.

According to Hong Kong reports, the new province will be carved out of some 84,000 sq km where Hubei, Hunan, and Sichuan provinces come together. Although Sanxia would be the country's smallest province in terms of land area, it would have an estimated 18 million residents, larger than at least six other provincial-level units. The proposed capital is Yichang, now Hubei's 12th largest city with close to 400,000 residents.

No date for the administrative change has been announced. Given that the dam itself is an on-again, off-again project that has been on the drawing board since the 1950s, nobody is placing any bets on when Sanxia Province will become official. But it could be on the agenda as early as the National People's Congress meeting this spring. —MCR

FOREIGN EXCHANGE RELIEF

Foreign investors keep hoping that China will establish policies to rationalize the country's foreign exchange resources on a nationwide basis. But

despite new foreign exchange regulations that went into effect February 1, the system remains a hazy maze of rules and regulations that treats investment projects individually, with little consideration given to their overall impact on the economy.

One American manager responsible for an investment project in northwest China explains: "We have a well-equipped factory in China turning out a product that is meanwhile being imported into the country at a cost of at least $15 million a year . . . We could easily begin to supply that amount and more. But to reach an output value of $15 million, the factory would have to import $2.5 million in raw materials—and we can't get the foreign allocation to do so from the Chinese government. We're expected to come up with the foreign exchange by exporting, but the plant isn't internationally competitive yet. The demand here in China is terrific, but we can't get paid in foreign exchange."

Such short-sighted national planning of foreign exchange use, repeated again and again, defeats one of China's purposes in attracting investment: reducing import levels by manufacturing sorely needed products in country.

Many investors hope that the State Council's new "Regulations on the Balance of Foreign Exchange in Sino-Foreign Joint Ventures" will eventually improve the situation. However, many foresee the regulations being difficult to implement and requiring a great deal of additional red tape. Their most serious complaint is that the regulations maintain the basic contradiction in China's investment policy: holding each foreign investment project responsible for its own foreign exchange.

The new regulations define three categories of goods that may be sold for foreign exchange on the domestic market: sophisticated products manufactured with key technology provided by the foreign investor, import substitutes, and a vague catchall category for any other goods that receive approval from the State Foreign Exchange Control Bureau.

The impact of the regulations will become clearer after legal experts interpret them and foreign investors test them, but the extent to which they provide foreign exchange relief probably won't be known for some time. For instance, it may take many test cases to gauge whether the import substitution incentives are strong enough to compel Chinese buyers to pay foreign exchange for domestically made products.

Foreign investors say that the most significant change in China's investment policy would be a guarantee that domestic earnings of joint ventures could be converted into foreign exchange as needed to distribute dividends and royalties, repatriate profits, remit expatriate salaries abroad, make interest payments on loans, and pay for imported raw materials and equipment. The new regulations fall far short of such a sweeping guarantee, although they do relax some restrictions. Many investors are pleased with the fact that the regulations theoretically allow more leeway in the pooling of foreign exchange funds between different joint ventures involving the same foreign entity. One American representative overseeing a computer joint venture says his company has been "looking for a signal allowing us to draw foreign exchange surpluses from one joint venture to help another. There may be a lot of infighting on the Chinese side over taking foreign exchange from one partner to help out another, but our Chinese partners will go a long way to make our business work."

The new regulations also contain provisions designed to facilitate counterpurchase arrangements: Foreign exchange-short joint ventures may export nonjoint venture products to earn foreign exchange. When asked to clarify how free the joint venture will be to purchase goods for resale abroad, a MOFERT official emphasized that "foreign companies may not interfere with China's foreign trade business. They may only buy goods that are not exported now." Many businesspeople in Beijing fear this may lead to the countertrade catch-22: Only products without an export record can be considered as potential trade items—but after the first export sales contract, the product will have an export record and thus will no longer be eligible. Meanwhile the products being offered for counterpurchase are frequently of poor quality or unsuitable for foreign markets. In short, the good news is that China is giving priority to the foreign exchange issue. The bad news is they still have a long way to go. —Sebastian Bonner

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ISSN No. 0163-7169; USPS No. 320-050

US Military Sales to China

How long will the window-shopping last?

Roger W. Sullivan

It is now more than seven years since the United States government officially rescinded its opposition to sales of military equipment made by our allies to China, four-and-a-half years since former Secretary of State Alexander Haig announced the removal of China from the list of prohibited destinations for US munitions list items, and some two years since Secretary of Defense Caspar Weinberger and Chinese Defense Minister Zhang Aiping exchanged visits and began to discuss specific sales of munitions list items. Nevertheless, despite the rhetoric and exchange of high-level visits, large US military sales have not materialized to the degree expected. China seems to still be window-shopping and kicking tires.

It is not surprising that some companies discount press reports that the impending sale of US avionics equipment and technology for China's F-8 interceptor aircraft will be worth $500 million. The only significant US munitions list sale to be approved so far has been artillery shell technology. The press described this as a $98 million deal, but in fact the Chinese are expected to buy only the basic technology package, valued at $5 to $6 million. Initially, some observers thought the Chinese might spend as much as $700 million for artillery shell manufacturing equipment, but apparently they chose to start with a more modest program. Although China has the option to purchase more equipment, they seem likely not to spend more than the mimimum necessary to acquire the technology.

The purchase of 24 S-70C2 Sikorsky helicopters for the PLA army in 1984 and five General Electric gas turbine engines for the PLA navy in 1985 did make the overall arms sales picture seem somewhat brighter to US firms. But these were "dual use" items not controlled by the munitions list, and therefore not, strictly speaking, "arms sales."

Some have argued that China will not make large military purchases from the United States until certain outstanding political issues are resolved. The two most often cited obstacles to an expanding US–China defense relationship are the Taiwan arms sales issue, and an apparent shift in China's perception of the Soviet threat since 1980. Yet these issues have not prevented US–China government-to-government defense cooperation from expanding rapidly. The real issue holding back US arms sales is China's domestic modernization policy, and the implications it holds for military spending.

The Taiwan issue recedes

The issue of American arms sales to Taiwan, which long seemed an insuperable obstacle to the development of US–China defense cooperation, no longer stands in the way. Downgraded to a potential problem, it could obstruct the US–China relationship again only if the terms of the August 1982 Sino–American joint communiqué are violated. In that communiqué the PRC reaffirmed its intention to seek a peaceful solution to the Taiwan problem. The United States declared that it "does not seek to carry out a long-term policy of arms sales to Taiwan . . . [US] arms sales to Taiwan will not exceed, either in qualitative or quantitative terms, the level of those supplied in recent years since the establishment of diplomatic relations between the United States and China . . . .[The US] intends to reduce gradually its sales of arms to Taiwan, leading over time to a final resolution."

For almost two years prior to the signing of the communiqué, US–China defense cooperation, which seemed to be moving ahead smoothly and rapidly in 1979 and 1980, came to a halt over the question of continued US sales of arms to Taiwan. Suggestions in 1981 that the Reagan administration might agree to sell Taiwan a high-performance fighter aircraft brought the issue to a head. But after protracted and difficult negotiations, agreement was finally reached in 1982. In keeping with the spirit of the joint communiqué, the administration announced that it had disallowed the sale of the F-5G (now called the F-20) to Taiwan.

It took almost another year for mutual trust to be reestablished, but the September 1983 visit to China by Secretary of Defense Caspar Weinberger finally marked the end of the controversy and the resumption of US–China military cooperation. Weinberger's visit has been followed by a spate of high-level defense exchanges and even some symbolic breakthroughs. Although the planned debut of port visits to China by US navy ships on May 18, 1985, was postponed, evidence now suggests that the visit is likely to be rescheduled for later this year. Meanwhile, the two navies held their first joint exercise in the South China Sea in early January this year. Neither country gave this "first" in US–China military cooperation much publicity, but the symbolism of this event was doubtless clear to the intended audiences.

Yet the receding of the Taiwan is-

Roger W. Sullivan is executive vice-president of The National Council for US–China Trade. In November 1985 he led a US defense industry delegation to China to assess the China military market.

sue and improved US–China government-to-government defense cooperation has not led, at least in the short term, to increased military sales to the PRC. Some sales to China have taken place and there will almost certainly be others in the course of this year. Nevertheless, the dollar amounts are going to remain limited as a matter of Chinese modernization policy—probably throughout the 1986–1990 Five-Year Plan period.

Soviet threat real, but not immediate

China's relationship with the Soviet Union also does not pose a current threat to US–China defense cooperation. The Chinese have not changed their fundamental assessment that the Soviet Union remains a long-term threat to China's security and to peace in the region. Indeed, they are undoubtedly aware that the success of China's economic reforms may well increase the threat, given the likelihood that the Soviet Union will view a successful Chinese economic model (which explicitly rejects the Soviet model as a dead end) as a serious challenge to Soviet leadership of the socialist world.

The key variable is that the Chinese no longer feel an immediate threat from the Soviet Union. This view was explained in some detail at China's January 1986 "conference of cadres of central organs," the so-called 8,000 cadre conference. Vice-Chairman of the Military Commission Yang Shangkun, speaking on behalf of the armed forces, noted that "a new principle for national defense construction has been established [in light of] new historical conditions." These "new conditions" include China's assessment that the threat from the Soviet Union is not as imminent as believed in 1979. The Soviet Union is bogged down in Afghanistan and preoccupied with economic problems at home. The United States is pursuing a strong policy of opposition to Soviet expansionism and committing the resources necessary to make that position credible in Asia as well as elsewhere. The Chinese therefore seem to believe they are now in a period of relative invulnerability to the Soviet threat during which they can afford, with little risk, to follow the approach long favored by Deng Xiaoping: subordinating military modernization to economic development and reforming the structure of the PLA before attempting to modernize it.

It is doubtful Beijing was ever under the illusion that a rapprochement with the Soviet Union was possible, despite limited success in tactical efforts to reduce tension in the short term through talks with the Soviet Union. As this author noted in an earlier article (*see The CBR* May–June 1985, p. 6), there has been no change in Soviet policy, nor is there likely to be—either objectively or in China's perception of it. In the absence of a change in the Soviet policy that seeks to "surround and isolate" China, there can be no decrease in China's underlying concern. In recent months, Chinese officials have once again begun to say as much in public. Vice-Foreign Minister Qian Qichen, in an interview published in the *Beijing Review* in January, commented that "the Soviet Union has a misconception that it can get around these obstacles (the occupation of Afghanistan, support for Vietnam and Soviet deployments along the Sino–Soviet border) or that the obstacles will vanish by themselves." He added, "this calculation is unrealistic and unwise [because] on matters that concern China's security interests, China is unshakable in its resolve."

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Military modernization: a long-term perspective

China's leaders realize that their window of relative invulnerability will not last long and that they must begin soon to narrow, or at least prevent further widening of, the current conventional military capabilities gap with the Soviet Union. This will require China to build a professional military force equipped with modern weapons. "People's war under modern conditions," which is how the Chinese describe the new strategy and tactics that a restructured PLA will adopt, will require newer vehicles, weapons, and improved communications to execute combined operations; improved conventional interceptors to upgrade air defense; better command, control, communications, and intelligence to control operations in the various military regions; and more modern systems to counter the threat from the Soviet army.

But the current policy is to concentrate first on modernizing the structure and thinking of the PLA, before allocating more resources to equip it. Over the past year, as Yang explained to the January cadre conference, the main task of the Chinese armed forces has been reduction in force, reorganization, and structural reform. By decision of the Party Central Committee, the 4 million strong PLA is in the process of being reduced by 25 percent, the command structure is being streamlined, and the officer corps is undergoing a generational transition. During this phase, which Yang said would require "several years" to complete, the military is apparently going to have to be satisfied with the psychic rewards of "stressing the interests of the whole" and not complaining of their "difficulties." A major material upgrading of the forces will have to wait.

Cultivating long-term contacts: get to know the key players

What does this modernization policy mean for companies exploring opportunities in China for sales or co-production/co-assembly of military equipment? In the long term (1990 and beyond), China will almost certainly be a major market, since the leadership wants the PLA to be a credible deterrent against any Soviet

temptation to launch a conventional attack. But this takes money, and the PLA will have to wait for China's economy to generate those resources.

During the next five years, the Chinese defense establishment is going to be making decisions on mission requirements (e.g., what does "people's war under modern conditions" mean?) and specific weapons systems. Potential foreign suppliers can make a mutually beneficial contribution to this process, but they will need to be familiar with the key players on the Chinese side.

Companies would do well to begin by cultivating contacts in the National Defense Science, Technology, and Industry Commission (NDSTIC). It is an oversimplification (but a useful one) to say that the NDSTIC functions much like the US Office of the Secretary of Defense. The NDSTIC, under the policy guidance of the Central Military Commission chaired by Deng Xiaoping, validates requirements identified by the armed services, assesses resource availability, and works with the State Economic Commission on a weapons procurement budget for submission to the State Council. In the implementation phase, the NDSTIC allocates funds to the various ministries whose factories manufacture equipment for the military, as well as to the trading companies of those ministries for weapons, equipment, and technology to be purchased abroad.

Companies should also be familiar with China's PLA General Staff Department, and the senior officers of the armed services. The PLA General Staff Department functions somewhat like the US Joint Chiefs of Staff, the armed service chiefs, and the secretaries of the army, navy, and air force rolled into one department. The General Staff and the senior officers of the services are as close as foreigners are likely to get to the "end users" of military equipment. Contacts made with them in China or when military delegations visit the United States are difficult but well worth the effort. These contacts are particularly important now that China is filling responsible positions in the military leadership with professionals who are trying to sort out questions of military doctrine, as well as decide the most cost-effective ways of satisfying their military requirements. Companies interested in selling to the PLA will find it far more useful to work with the military leadership and the NDSTIC than with the trading companies or ministries.

Exploring short-term sales

Fortunately, companies do not have to put all their effort into influencing the weapons procurement decisions of the 1990s; there *are* current sales possibilities. Short-term purchases made for the PLA will emphasize technology for China's research and development program, along with some equipment and assistance in developing a manufacturing capability in China. The United States and China signed a Foreign Military Sales (FMS) agreement last June, and several sales in process and under discussion fall into this category (e.g., artillery, avionics, and TOW missile technology).

During the next five years, the Chinese defense establishment is going to be making decisions on mission requirements and specific weapons systems. Potential foreign suppliers can make a mutually beneficial contribution to this process, but they need to be familiar with the key players on the Chinese side.

But China is also in the market for mid-1970s technology and manufacturing equipment to produce and upgrade military equipment for export. China is the seventh-largest exporter of military equipment in the world, with foreign exchange earnings estimated in excess of $1 billion in 1985. China has already purchased a wide range of products and technology, including tank fire control systems, image intensifiers for night sights, laser range finders and radars for incorporation into Chinese-made military systems sold to Pakistan, South America, Thailand, Bangladesh, Sri Lanka, and the Middle East.

The approach to this export-oriented market in China is different from long-term marketing to the PLA. First, the key players are not the same. The PLA General Staff Department, the armed services, and even the NDSTIC, except as the ultimate approver of foreign exchange expenditures, are not the agencies with which foreign companies will work. Instead, the trading corporation of the appropriate ministry—or, if two or more ministries are involved, the New Era Corporation (*Xinshidai*), which is the commercial arm of NDSTIC—will be the buyer. Companies seeking opportunities in this area should develop contacts not only in the relevant trading corporations (e.g., Norinco for ordnance and CATIC for aircraft) but, to the extent possible, in the factories as well.

Under the economic reform program's enterprise responsibility system, factory managers in the defense industry are under pressure to make a profit—or at least earn enough to pay the bills. Until the PLA steps up its purchases from them, there are only two ways for factories to expand production: first, by improving the weapons systems they make in order to increase foreign sales, and second, by employing idle capacity to manufacture civilian goods, preferably for export but also for the Chinese domestic market. As an example, one imaginative manager of a Chinese aircraft plant is using scrap aluminum from his plant to make storm doors and windows. Most factory managers, however, do not seem as resourceful or imaginative and would welcome foreign advice and help. Companies that make the effort to talk directly to the factory level may find opportunities not only for sales of equipment and technology to upgrade military products, but also for cooperative ventures to apply idle capacity to a profitable civilian use.

Direct sales vs. FMS sales

Direct sales to China's defense industry tend to be easier than selling to the PLA. The US State Department's Office of Munitions Control, with the concurrence of the Department of Defense, will generally approve sales of hardware or technology that are five years or more

Until the PLA begins to buy more from them, there are only two ways for defense factories to expand production: first by improving the weapons systems they make in order to increase foreign sales, and second by employing idle capacity to manufacture civilian goods, preferably for export but also for the Chinese domestic market. Companies that make the effort to talk directly to officials at the factory level may find opportunities not only for sales of equipment and technology to upgrade military products, but also for cooperative ventures to apply idle capacity to a profitable civilian use.

behind state-of-the-art and that do not contribute to China's military power projection capability. Almost anything sold to China's defense industry for incorporation into export products will fall into this 'acceptable' category. Also, these sales are direct transactions between a buyer and seller, unlike Foreign Military Sales (FMS), which are government-to-government transactions.

Although the Department of Defense denies it, many companies have the impression that DOD requires China to use the FMS system for all purchases for the PLA. But many Chinese officials do not like the FMS system, although they will continue to use it when they have to. They see it as an arms-length system, because the Department of Defense acts as China's agent in FMS sales, selecting suppliers, negotiating prices, and guaranteeing quality.

Having to use DOD as an agent is not China's preferred way of doing business. Chinese ministries want to establish a direct relationship with their American supplier. When free to do so, the Chinese would probably select a supplier not only for the price and quality of the item being purchased, but at least in part on the basis of what other cooperative ventures might be possible with that company. This is why it is so important for firms to pursue a company strategy rather than a product-by-product approach to China's defense industry.

A few words of caution

In the defense area, as in other sectors of China's rapidly changing economy, new organizations and corporations appear from time to time claiming to have special access to foreign exchange and top decision makers. Be careful. The NDSTIC has made it clear that the front door for sales is through *Xinshidai* and the trading corporations attached to the several ministries (e.g., Norinco and CATIC). There are others, such as Polytechnologies Corp., that are clearly legitimate at the moment, but even these may prove to be temporary, special purpose organizations.

Be aware, as Vice-Chairman Yang Shangkun warned during the January cadre conference, that there are "unhealthy tendencies" in the PLA as well as elsewhere. Some military units apparently "opened companies of one kind or another to do profitable business" without official sanction. In some cases, Yang said, these illegal activities took place under the direction of "leading cadres" and even "pursuant to the decision of a few people on the Party committee." This practice is going to end. The PLA is going to "rectify" its work style from the top down, with senior cadres instructed not merely to examine their own behavior but to do a better job of "educating and supervising their children and relatives." Keep that in mind if a contact insists that a deal will go smoothly because he has "connections" with a relative of someone important.

A familiar refrain

Finally, there is concern among potential suppliers of military equipment that even if China's military goal is a lean, professional force equipped with modern weapons, the country's exaggerated emphasis on self-reliance will limit opportunities for foreign companies. China may only be willing to purchase technology and a few "quick-fix" items off the shelf.

Self-reliance is certainly the line foreign companies hear when they meet with representatives of China's defense establishment, but it would be a serious mistake to take these statements at face value. The petroleum bureaucracy talked the same way in the 1970s: all China wanted, or so it was claimed, was Western technology. The Chinese would do the oil exploration and exploitation themselves. Companies that refused to take those statements at face value were still around when China "learned truth from facts," recognized an urgent need to move ahead faster, and entered cooperative arrangements with foreign firms to develop their oil resources.

There is an analogous situation today in the defense area. China's defense establishment is as conservative as the "energy clique" of earlier days. A sense of urgency is still lacking and the defense industry—the last sector in China to be exposed to the open door—is repeating the behavior pattern of China's civilian sector a few years ago by exaggerating its ability to absorb and apply advanced technology.

This atmosphere could change rapidly, as it did in the petroleum industry, once the restructuring of the PLA is complete and the leadership decides it is time to get on with the task of turning the PLA into a modern and credible deterrent force. And while China will continue to emphasize self-reliance as a guiding principle, the leadership is well aware (from such failures as the attempts to build Spey engines and reverse-engineer the TOW missile) that blueprints do not equal technology transfer, and that trying to make everything domestically in China will not get them where they want to go. If developments in the military continue according to the petroleum model, the period of Chinese window-shopping and rhetoric will eventually give way to one of serious negotiations and cooperation with foreign firms. 完

UNDERSTANDING THE ELECTRONICS INDUSTRY

Insights into decision-making at the national level and in Shanghai

Denis Fred Simon and Detlef Rehn

One of the most perplexing aspects of doing business in China is understanding the structure and process of bureaucratic decision-making. Both veteran China traders and corporate personnel on their first visit have trouble pinpointing Chinese decision-makers during negotiations, and find the workings of the bureaucracy mysterious and unpredictable. While these problems are not unique to China, many alternative investment sites and potential trade partners in the Asian region have bureaucracies that are comparatively more open.

Studying the organization of the electronics industry highlights the problems posed by China's complex bureaucracy. During a month-long visit to Shanghai in the summer of 1985 and a similar visit to Beijing in January 1986, we interviewed municipal and central government officials as well as factory and institute personnel involved in electronics work in an effort to learn more about the industry's organization and decision-making processes.

MEI dominates national picture

China's electronics industry is characterized by the presence of multiple ministerial-level organizations involved in the research, production, and application of electronics technology, components, and equipment. Many of the key ministerial organizations are represented on the Leading Group for the Invigoration of the Electronics Industry (*see* chart). But a number of other ministries (e.g., Light Industry, Ordnance) are also involved in electronics-related activities. Intense rivalry and competition often emerge as each ministry attempts to build its own self-sufficient infrastructure to support all its electronics needs. This rivalry occasionally spills over into the foreign trade and investment area, forcing foreign companies to choose which ministry they will conduct business with.

The Ministry of Electronics Industry (MEI) plays the most important role in the electronics area. MEI recently had 170 enterprises under its direct control, and also has a hand in administering most of China's 2,400 electronics factories and research institutes, many of which report to local or provincial authorities.

There are two trading corporations within MEI: the China National Electronic Devices Corporation (CNEDC), which specializes in components manufacture and sales, and the China National Electronics Import–Export Corporation (CEIEC), which can handle import and export needs for all MEI units, and also serves other organizations that import or export electronics-related items. CEIEC has a number of branches around the country and operates relatively independently of MEI.

As currently structured, MEI is divided into four main industrial departments: broadcasting (television and communication); radar and navigation; electronic devices and components; and computers. Each MEI department theoretically controls manufacturing and research facilities. In practice, however, control is often shared with provincial, municipal, and even county governments to varying degrees. Overlapping jurisdictions and lack of clear-cut lines of authority make it difficult to determine who has ultimate responsibility for decisions regarding the source and price of inputs, management of particular projects, or completion of agreements with potential foreign investors or technology suppliers.

Decentralization creates new problems

Chinese officials in the electronics sector recognize that administrative interference in enterprise affairs has constrained overall efficiency and productivity, and MEI is one of the first ministries to publicly relinquish some control over its factories. In the last year and a half both MEI and the Ministry of Machine-Building Industry cut loose many of their respective enterprises. By August 1985, 51 of MEI's approximately 170 enterprises (13 in Beijing and 38 in Sichuan Province) were no longer under the direct managerial control of the ministry. Further divestment will take place throughout 1986, leaving approximately 10 percent of MEI's key enterprises under its control by the end of the year, most of them engaged in defense-oriented work.

This action is designed to give factory managers greater autonomy, while allowing central ministries such as MEI to focus on strategic issues such as industry-wide planning, better coordination among all electronics enterprises, and quality control. The ministry will also retain primary responsibility for such areas as education and training, research, technology importation, and technical renovation.

Now that MEI has given up some

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direct control, however, municipal and city bureaus in various localities are trying to "capture" its divested units, claiming that they cannot exist in an institutional vacuum: i.e., "either they belong to us or the central government." In Beijing a new office to manage the affairs of MEI's divested enterprises had to be set up to avoid potential problems.

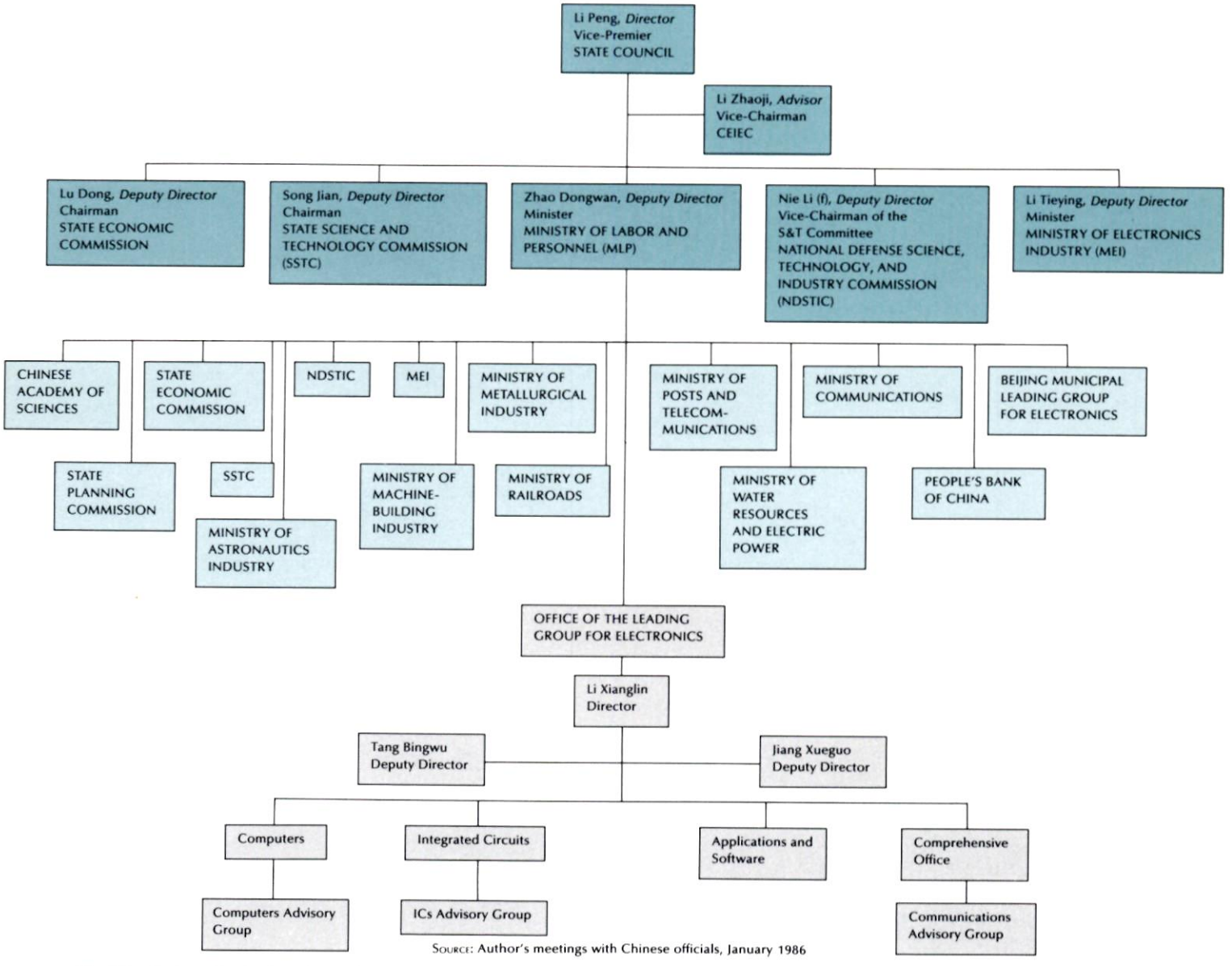
Foreign firms will find that this latest attempt to decentralize decision-making to the enterprise level has created new confusion. First, although electronics enterprises have greater overall discretion on matters of general management, decision-making authority is likely to be limited by the central government's recent tightening of controls over China's foreign trade. For instance, it seems clear that enterprise authority is still circumscribed by central controls on key variables such as the use of foreign exchange. And while the principle of divestiture is being given lip service, in reality ministries such as MEI plan to retain control over many key technologies and products, thereby reducing the full impact of the decision and further fragmenting bureaucratic responsibility.

The coordinating role of the leading group

The most prominent of the ongoing reforms in the electronics industry has been the creation of a Leading Group for the Invigoration of the Electronics Industry by the State Council in 1984. This leading group, now headed by Vice-Premier Li Peng, is designed to coordinate China's fragmented electronics industry by establishing a broad policy-making body that transcends a number of important ministries. The State Council expanded the leading group's mandate in January 1985 to include communications, a field previously outside its jurisdiction. Recently the leading group has concentrated on component production, such as the development of large-scale integrated circuits, to support advances in the domestic electronics industry.

The leading group functions on three levels. The first tier is made up of Vice-Premier Li Peng and five persons at the minister and vice-minister level. The second tier consists of approximately 15 organizations associated with research, production, and application in the electronics and computer industry, and also includes a representative from the Beijing

LEADING GROUP FOR THE INVIGORATION OF THE ELECTRONICS INDUSTRY



SOURCE: Author's meetings with Chinese officials, January 1986

Shanghai's strength—its independence from Beijing—is also its principal weakness. The city's reluctance to become captive to Beijing's policies has often caused it to be neglected in terms of central government investment and financial decisions.

Municipal Leading Group for Electronics. Beijing is the only geographic entity formally represented on the national electronics leading group, which may reflect the large number of electronics factories and research institutes in Beijing that are operated by the central government, such as electronics research institutes under the Chinese Academy of Sciences.

The third tier, which has the greatest substantive responsibility for China's overall electronics and computer development strategy, is the "Office of the Leading Group." Headed by Li Xianglin, a former MEI official, this office accepts policy inputs and makes policy recommendations. Staffed by about 20 permanent members, the office is divided into four functional subgroups. Advisory groups operate under most of the subgroups, composed of 10–15 scientists drawn from major research institutes and universities around the country. Expert advice provided to the office is reported to the ministerial and commission representatives in tier two.

The Office of the Leading Group gained an important degree of independence in early 1985, when the State Council agreed to pay the budget and salaries of its staff directly. In the past, members of the office were paid by their respective ministries, which may have compromised their objectivity. While the leading group does not have a specific budget to allocate funds to projects, it works directly with the State Planning Commission and other groups to ensure that funds are available for priority projects and technology imports.

The State Economic Commission also influences the electronics industry by providing funds for technical transformation and plant renovation. For example, in the Sixth Five-Year Plan, 148 of the 550 key projects in the machinery and electronics industries selected by the SEC to receive special funds for plant modernization involved the electronics industry. This sizable number demonstrates the importance the central government places on electronics. According to officials at MEI, even greater funds will be allocated to electronics development during the Seventh Five-Year Plan (1986–1990).

Shanghai: a locally run industry

What distinguishes the electronics industry in Shanghai is the fact that key enterprises in the electronics and computer industry fall directly under the control of the local authorities. By contrast, most electronics factories in Chinese cities are at least partially under the jurisdiction of MEI or one of the other central ministries involved in electronics development.

However, Shanghai's strength—its independence from Beijing—is also its principal weakness. The city's reluctance to become captive to Beijing's policies in electronics has often caused it to be neglected in terms of central government investment and financial allocations. The case of Shanghai reveals not only the problems of ministerial rivalry that beset the electronics industry, but also the country's fierce regional competition. The development of electronics in Shanghai demonstrates just how complicated the bureaucracy can be.

Functional responsibility for managing Shanghai's electronics industry belongs to the Shanghai Electronics and Instrumentation Bureau. The bureau reports directly to the municipal economic commission, which together with the city's planning, science and technology, and foreign economic relations and trade commissions determines the level of funding and support for electronics development in Shanghai. The bureau oversees planning, research, and production for all facets of electronics in Shanghai, and handles most product marketing, although items such as color television sets are still largely sold through State distribution channels.

The bureau has eight subsidiary corporations in charge of the following areas: broadcasting and television, electronics components, vacuum devices, optical instruments, electronic instruments, testing instrumentation, semiconductors, and imports and exports. Each corporation manages a number of factories, which are supported jointly by six research institutes. The Shanghai Computer Corporation, formerly one of these corporations under the bureau, was removed in 1984 and placed directly under the control of the municipal economic commission in order to give greater flexibility and visibility to Shanghai's computer development (*see The CBR*, March–April 1985, p. 37).

Within Shanghai, three organizations share responsibility for electronics import and export. First is the trading corporation under the Electronics and Instrumentation Bureau, the Shanghai Electronics Import–Export Corporation (SEIECO). MEI's import–export arm, CEIEC, also has a Shanghai branch. SEIECO ostensibly handles activities within Shanghai municipality, while CEIEC handles electronics trading in the other provinces that make up the Greater Shanghai Economic Zone, although this division of activity is sometimes ignored. Third, the Shanghai municipal commission of foreign economic relations and trade also participates in the review process required for decisions on municipal technology imports and foreign investment.

Paralleling developments at the central level, Shanghai created its own municipal leading group for electronics in 1984, headed by Vice-Mayor Liu Zhengyuan and reporting directly to the mayor's office. This municipal leading group provides some coherence to Shanghai's efforts to create a base for electronics industries. Unlike Beijing's municipal electronics group, Shanghai's leading group has no official representation in the central leading group for electronics—a strange omission, since

several of China's most advanced microelectronics facilities (the No. 5 Components Factory, No. 14 Radio Factory, and No. 19 Radio Factory) are located in Shanghai. This situation may, however, reflect the lack of cooperation between the center and Shanghai in the electronics field.

While MEI does not have any significant electronics production facilities under its supervision in Shanghai, other ministries are involved in electronics within the city's municipal boundaries—a situation that many Shanghai residents refer to as "systems within a system." The extent of compartmentalization sometimes reflects the amount of military-related activities carried out by these other units. For example, the Ministry of Space Industry has a number of key production facilities in Shanghai, producing both civilian and military goods, which seldom coordinate with the municipal government's plans. The National Defense Science, Technology, and Industry Commission (NDSTIC) also has an office in Shanghai to oversee the various ministerial and local units involved in NDSTIC-sponsored military projects. NDSTIC apparently maintains such offices in areas of the country involved in key military projects.

How local import decisions are made

Key cities such as Shanghai possess a certain amount of decision-making autonomy. In the area of technology and equipment imports, Shanghai's autonomy is set at the $10 million level. But in practice, this theoretical spending ceiling is far from straightforward. Detailed instructions on how to make import decisions and exceptions to the rules are sent to local officials in the form of central directives. Moreover, Shanghai officials often consult with central government officials on projects with values lower than the city's theoretical spending limit, especially when such projects have strategic importance to the industry as a whole. Even in cases where the central government is not consulted, Shanghai often reports its decisions on projects with a value above $5 million to the central government.

Foreign companies frustrated with delays in China should remember that the complex bureaucracy is a two-way street that can cause serious problems for their counterparts in

ELECTRONICS IMPORTS DECISIONS: THE SHANGHAI EXAMPLE

E. Step Five: Central government
(Makes final decision on all imports above $10 million)

Electronics import proposals may be handled in a variety of ways at the central level. MEI usually has the main voice. However, the Leading Group for Invigoration of the Electronics Industry and the State Planning Commission are also likely to participate in some decisions. If funds for the project come from the national budget for technical renovation, the State Economic Commission will also join the decision-making process. MOFERT may be involved, but its views tend to be subordinate to those of the SPC and SEC. Once a final decision is made, it will be reported back to the Shanghai municipal government, which will coordinate the disbursement of funds if the project has been approved.

D. Step Four: Shanghai municipal government
(May approve import projects up to $10 million)

For projects with a value between $5 and $10 million, the Shanghai government may theoretically make its own decision, although in practice it often consults with the central government. The city's economic commission, science and technology commission, and planning commission are all involved in the decision-making process. If the value of the project is below $10 million, the Shanghai government merely reports its decision to Beijing. If the value of the project is higher, Shanghai's recommendation is then passed on to Beijing for action.

C. Step Three: Shanghai Electronics and Instrumentation Bureau
(May approve import projects up to $5 million)

At the bureau, the import proposal is coordinated by SEIECO, the bureau's import/export corporation. The bureau's planning office and finance section are consulted. If approved at this level, the bureau will report its decision to the Foreign Economic Relations and Trade Commission of the Shanghai municipal government. If the value of the project is higher than $5 million, the bureau will pass its recommendation on to the Shanghai municipal government.

B. Step Two: Corporate level under Electronics and Instrumentation Bureau.
(May approve import projects valued up to $2 million)

The corporation's planning office, finance office, chief engineer, and director review the two factory documents. The review process is usually coordinated by the corporation's "introduction office" (similar in function to the introduction office at the factory level). If the value of the proposed import is less than $2 million, the corporation may approve the project on its own, reporting its decision to the bureau. If the value is greater, the corporation sends its recommendation concerning the import to the bureau.

A. Step one: Factory level

Factory X wants to import electronic component production line. Convenes meeting with chief engineer, factory director, planning, and finance departments. The factory's "introduction office" coordinates the import request process, and prepares two documents: 1) a detailed description of the equipment to be imported, potential suppliers, cost, and expected benefits, and 2) a feasibility study showing how costs and benefits were determined. These proposals are then transmitted to the appropriate corporation under the Shanghai Electronics and Instrumentation Bureau—in this case, the Electronic Components Corporation.

Chinese enterprises too. At the municipal level alone, "four stairwells and multiple steps in each stairwell" must be traversed by Chinese factories and research institutes buying a piece of expensive foreign equipment (*see* chart).

In an effort to short-circuit this cumbersome process, local enterprises have devised at least two ways to avoid the involvement of higher-level bodies. They may try to divide a product purchase into component parts, thereby lessening the value of each respective purchase in an effort to disguise the magnitude of the product or production unit being imported. Or the local enterprise may try to divide the project into stages—here again, to give the appearance of a series of smaller projects.

'Silicon valley' selection illustrates divisions between Shanghai and MEI

As part of the effort to revitalize the electronics and computer industry, Chinese leaders want to establish several electronics research-production centers, modeled on 'silicon valley' in the United States. These centers would receive central government funds to develop as technological hothouses in such strategic fields as large-scale integrated circuits, new materials, and microcomputers. Beijing has been chosen as one such area according to current reports, but the selection of a second site is embroiled in an ongoing debate between Shanghai and MEI. Shanghai advocates locating the site in the city's own Caohejing district, but MEI prefers Wuxi, a city in Jiangsu Province that is home to the Jiangnan Radio Equipment Factory —an MEI facility producing linear integrated circuits for color televisions using advanced imported equipment. Shanghai feels that MEI supports only its own facilities and interests, and argues that Caohejing should be the preferred electronics district because of its strong R&D and production base.

Vice-Premier Li Peng's visit to Wuxi early this year seemed to confirm that Wuxi would be the selected recipient of central funds to promote electronics development. But the debate concerns more than just geographical location. Also at issue is the overall relationship between a key local area (Shanghai) and the central ministry (MEI), and the question of

who should take the lead in determining China's overall strategy for electronics and computer development.

Another controversial proposal put forward by Shanghai advocates creation of a research–production alliance involving the city's No. 5 Components and No. 14 Radio factories, along with the Institute of Metallurgy of the Shanghai branch of the Chinese Academy of Sciences. The initial focus of this alliance would be to construct a manufacturing facility producing 64K DRAM integrated circuits at the 3-micron level, largely using imported foreign equipment. However, Shanghai and the central government have had great difficulty reaching agreement over whether this proposal, as well as the entire Caohejing effort, should be considered a "local" or "national" project. Progress has thus been slow, since the proposal will require substantial funding from the central government to proceed.

Compromises and plans in the making

In its role as oversight organization for China's entire electronics industry, the State Council's Leading Group for the Invigoration of the Electronics Industry will try to resolve the disputes between Shanghai and MEI. It is also hoped that the arrival of Shanghai's new mayor in mid-1985, the former minister of MEI, Jiang Zemin, will eventually improve the relationship between Shanghai and the central government in the field of electronics.

Discussions in Beijing in January 1986 with members of the State Council leading group for electronics suggest that a compromise may eventually be worked out between Shanghai and MEI in which the city of Wuxi will focus on ICs for consumer electronics, while Shanghai concentrates on the production of memory chips for computers and industrial applications. According to Li Tieying, the new minister of Electronics Industry, the country plans to establish 10 research and production complexes around the country, boosting the percentage of domestic components used in final products for the industry. This reflects China's recent concerns about excessive imports of final products, such as microcomputers, and over-reliance on foreign components such as large-scale integrated circuits. Thus China will be seeking more foreign production equipment to build up its indigenous manufacturing capability in the coming years.

Photo courtesy of New China Pictures

Technicians of the Beijing Institute of Electronic Computer Technology assembling BCM-III microcomputers.

In the immediate future the structure and process of electronics decision-making in China will continue to be plagued by bureaucratic rivalry and regional competition. Foreign firms can benefit from a good understanding of who they are dealing with, the administrative hierarchy to which their counterpart organization belongs, and the amount of decision-making autonomy possessed by the Chinese unit in question. Doing business in China may remain a frustrating endeavor, but it can at least become more intelligible by learning the answers to these basic questions early in the negotiation process. Both Chinese electronics enterprises and their foreign partners have a vested interest in working toward a rationalization of the system if they hope to develop long-term business relationships. 完

Rethinking Coal Development

Unexpected success leads to a new coal strategy

Martin Weil

China's coal industry is in a period of transition. Even as production soars to record levels and the industry appears poised to surpass its long-term targets of 1 billion tonnes in 1990 and 1.2 billion tonnes by the year 2000, the Ministry of Coal Industry's leadership is retreating from the grandiose plans and promises made during the last three to four years.

The ministry has quietly dropped its plan to develop five of the world's largest open-pit mines during the next five years. And it no longer plans to immediately develop high-quality deposits in the remote northwestern part of the country that would require large new infrastructure investments. It is even backing away from some new underground mines in less remote areas—including one in Shanxi Province for which the World Bank was about to conclude a loan agreement after four years of negotiations.

Unexpected growth at central and local mines

Possibly the very success of the coal industry in the last three years is contributing to the more cautious attitude prevalent today. Coal output jumped from 666 million in 1982 to 850 million tonnes in 1985. This rapid increase took the coal ministry by surprise—the Sixth Five-Year Plan, published in 1982, set a target of only 700 million tonnes in 1985.

While the output from mines controlled by the central government (i.e., the Ministry of Coal Industry) grew impressively from 350 million tonnes in 1982 to an estimated 416 million tonnes in 1985, the real surprise has been mines controlled at local levels—their output grew from 316 million tonnes in 1982 to some 434 million in 1985. Production from these mines is fast approaching the 500 million tonne goal set only three years ago by the Ministry of Coal Industry for the year 2000.

Local mines have responded to new financial incentives, including increased investment subsidies from the central government and lower taxes (*see The CBR*, March–April 1984, p. 41). The most significant new incentive, however, has been the decontrol of prices for coal sold from the approximately 50,000 small mines operated by peasants at the township and village level, which now account for over 50 percent of the output from locally run mines. Prices for coal from the central government mines remain controlled, averaging 25–30 yuan/tonne. However, in 1984 township mines were selling to coal-starved consumers in the lower Yangtze Valley at as much as 100–120 yuan/tonne, an indicator of how far below true value coal from the central mines is priced.

The 1985 surge in local mine production brought these free market prices down somewhat, according to Chinese reports, and led the Coal Ministry to claim that China's endemic coal shortage was easing. But the rapid increase in local mine production strained China's already inadequate coal transport system almost to the breaking point. Both factors—better supply/demand balance and saturated transportation offer some rationale for the Coal Ministry's shift to a more cautious coal development policy.

Renovating eastern mines

But the surge in local coal production does not tell the whole story behind the Coal Ministry's change in policy. In the first place, the Coal Ministry has ambivalent feelings toward the local mines—welcoming their contribution to easing the coal shortage, but opposing the tendency of local mines, especially in Shanxi, to encroach on, and interfere in, central mining operations.

The Coal Ministry and endusers are also well aware that quality control and reliability of the local mines is far inferior to that in central mines. Many of the hastily developed, low-technology local mines, particularly in the villages and townships, cannot be counted on to sustain their production year after year as easily minable deposits run out.

Thus the Coal Ministry still recognizes a need to develop the large central mines, although its thinking on how to do so has changed dramatically. First, geographic emphasis is shifting from west to east. While the ministry will proceed with all western projects for which construction it has already begun, it will undertake few, if any, new construction projects west of Shanxi in the next five years. This policy responds to the shortage of rail capacity to move coal from west to east, reflected in coal stockpiles of tens of millions of tonnes in Shanxi—which accounts for almost 25 percent of the nation's coal output—and provinces further west.

The ministry appears to have given up trying to force a reluctant transportation bureaucracy (which views other projects as more urgent) to immediately build new, expensive railroads whose main function would be to serve such proposed western projects as the Junggar and Shenmu open-pit mines in Inner Mongolia and Shaanxi provinces respectively. These mines, the ministry now implies, will be developed only when transportation is in place. Some of the railroads appear likely, in fact, to be built over the next few years—although not with the large capacities the Coal Ministry hoped for.

The cost of mining is generally more expensive in the east, where mines tend to be both deeper and more steeply sloped than those in the west. The quality of much eastern coal is also inferior to that of western deposits. But the eastern mines are closer to endusers, and the rail facilities are already developed. For this reason, the ministry is concentrating investment in eastern mining centers located in Heilongjiang, Liaoning, Shandong, and Shanxi far more than it planned to during the optimistic years of 1982 to 1984. Meanwhile, investments in Shaanxi, western Inner Mongolia, Ningxia, and Gansu are being cut back.

A change in emphasis from the construction of new mines to the renovation and expansion of old ones is also occurring. The ministry has always sunk some money into renovating existing mines, but the proportion is increasing now. The most dramatic symbol of this trend is the decision to drop the new Chengzhuang mine in Shanxi's Jincheng area from World Bank consideration, asking the bank to fund instead the renovation of several existing mines

at Jincheng. The major benefit of the shift toward renovation is a lower capital investment cost per tonne of new output, compared to the construction of a new mine.

High capital investment costs also appear to be the major factor behind the decision to downgrade the ambitious open-pit development program. Developing one mine to produce 15 million tonnes of coal requires billions of renminbi, and hundreds of millions of dollars in foreign exchange. Instead of the five large open-pit mines proposed in 1982, the Coal Ministry is proceeding with only one on the scale originally envisioned—the Antaibao No. 1 Mine at Pingshuo, Shanxi. Occidental Petroleum Corp. and the Coal Ministry finally reached agreement to develop this mine as a joint venture in the summer of 1985. Two other mines—the Huolinhe and Yiminhe lignite mines in northeast Inner Mongolia—will be developed, but on a smaller scale than originally planned—Huolinhe's capacity will be perhaps 10 million tonnes, and Yiminhe's considerably less.

The last two open-pit projects—Yuanbaoshan and Junggar in Inner Mongolia—appear to be postponed indefinitely. The US engineering firm Bechtel had already begun design work at Junggar when the Coal Ministry shifted priorities. Now the ministry says that when Junggar is finally built, it too will be well below the originally planned 25 million tonnes annual output of clean coal.

Reassessment of ambitious plans

The shift in coal development policy comes at a time when the general political and economic climate in China—particularly on issues pertaining to capital investment—is going through one of its cyclical swings in the conservative direction. The current mood results in more critical scrutiny of projects such as the five large open-pit mines than did the more open atmosphere of 1983, 1984, and early 1985. The imminent release of the new Seventh Five-Year Plan also exerts pressure for the reexamination of coal development policy, as it forces planners to make hard decisions on spending.

But there is reason to believe that considerable behind-the-scenes opposition to the grandiose thrust of previous coal development policy existed well before 1985—particularly

The Coal Ministry has ambivalent feelings toward the local mines—welcoming their contribution to easing the coal shortage, but opposing the tendency of local mines, especially in Shanxi, to encroach on, and interfere in, central mining operations.

in the State Planning Commission, which must approve all of the country's major investment projects. Sources say that the SPC forced the Coal Ministry to bring in Western consultants to study the feasibility of major open-pits before going ahead with them. Even in 1984 it was evident that the SPC was going to slow development of at least the three large northeastern lignite mines.

The SPC's skepticism was based on transport problems, high investment costs, and also, it seems, the foreign exchange costs of these large open-pit projects. The government's willingness to spend foreign exchange was predicated on the assumption that coal exports from these mines would be able to pay the money back. This assumption grew doubtful as world coal market prices dropped, and China's coal exports to Japan stagnated at the 3.5–4 million tonne level from 1983 to 1985. Hopes that foreign investment would take up the foreign exchange slack were dimmed by the length of time necessary to conclude the Pingshuo negotiations, and the failure of negotiations with foreign companies for a number of other projects.

High-level planners also assumed that technology for open-pit and major underground mining equipment would be transferred by Western companies, eliminating the need to spend foreign exchange. This overly optimistic assessment failed to take into account the time necessary both to negotiate such transfers and to absorb the technology.

New leadership brings new ideas

Opinion in the planning bureaucracy was already beginning to swing away from the old coal development strategy by the middle of last year, when a major change took place in the Coal Ministry leadership. Former Executive Vice-Minister Yu Hongen replaced Gao Yangwen as minister, and Chen Dun was promoted from the Anhui Coal Industry Company to the position of vice-minister in charge of capital construction.

Both Yu, Chen, and the other two vice-ministers—Ye Qing and Hu Fuguo—had long experience in coal mines prior to reaching high office. Former Minister Gao, on the other hand, was a revolutionary soldier and politician who, while willing to take risks, lacked practical knowledge of the coal mines. Much of the shape of the old grandiose coal policy reflected his own wishes for bureaucratic aggrandizement—particularly the emphasis on large open-pit mines and large-scale foreign investment.

The new leadership seems much more attuned to the practical difficulties of personnel training, investment, and transportation involved in realizing such schemes as the simultaneous development of five open-pit mines. Its thinking appears to be in harmony with, rather than at cross-purposes to, that of the SPC, the Ministry of Railroads, and other interested bureaucracies. This, as well as changes in the general political and economic climate, account for the timing of the change in coal investment policy.

There is room for debate about whether the new policy is wiser than the old one—particularly the emphasis on eastern versus western coal. The World Bank has concluded that there is no obvious correct answer in the short term to the question of which is more efficient: mining more coal in the east—where transportation is convenient, but mining costs higher and the quality generally inferior—or sticking with mines in Shanxi and points further west, where transportation is a problem, but coal quality and mining conditions are more favorable. In fact, the bank suggests that, in the long run, once transport facilities are better developed, China's western coal will become more and more economical.

But many foreign observers—including some from companies who stand to lose business in the short-term due to the change in policy—give the new leadership credit for more practical thinking than before. This is a favorable sign for the future of China's coal industry, regardless of the fate of individual projects. 完

Narrowing the Urban–Rural Gap

China's rural reforms move into the second stage

David Zweig

Although Mao Zedong was born a peasant and led China's peasants in the overthrow of the old order, Mao's post-land reform policies did little to improve rural incomes or fulfill rural economic potential. Throughout most of the Maoist era the State controlled all interaction—commercial, financial, technological, political, and social—between China's urban and rural sectors. In effect, Mao erected a new "Great Wall" between rural and urban inhabitants that exacerbated pre-existing inequities and contributed to a low rural standard of living. Of course peasants benefited from many Maoist policies that promoted health care, literacy, irrigation, rural mechanization, and the expansion of arable land. But ironically it has taken Deng Xiaoping's emphasis on market-oriented reforms to tap the full potential of China's peasantry by increasing economic freedom and interaction between the rural and urban economies. By following an East Asian, rather than Soviet model of development, Deng's strategy may prove more effective than Mao's for fulfilling China's centuries-old search for wealth and power.

Under Deng, the Great Wall separating urban and rural residents has begun to collapse. The first stage of rural reform, begun in 1978, re-established household farming and increased State procurement prices for peasant produce. These policies have redressed some urban–rural inequities and given peasants more freedom over the land they farm. But the second stage of rural reform, begun in 1983, has dramatically altered urban–rural relations and given China's peasant farmers a broader range of economic freedoms to use in the pursuit of their own prosperity.

Second stage allows more interaction

The second stage of rural reform has seen the gradual withdrawal of the long arm of State interference, as advocated by Party policy documents in 1984 and 1985. These policy directives have paved the way for greater interaction between the urban and rural sectors, often to the benefit of both sides.

Before the reforms, the State controlled the buying and selling of agricultural produce, blocking direct contact between producers and their markets. Peasants grew what they were told. Today peasants are responding more to consumer demand, and expanding commercial crop production. Individual peasants, private traders, and expanding collective businesses can now bring agricultural produce to market. Competition with private traders is forcing State-run markets to diversify and improve the quality of the produce they sell. As a result, city residents have a far richer and fresher selection of foods than in the past. In Nanjing the attractiveness of the free markets' produce has forced State sales agents to leave their shops and sell their produce in the streets alongside the peasants. In May 1985 widespread pressure for better and cheaper food supplies forced the lifting of a prohibition on peasants entering Beijing to market their vegetables. Cities such as Harbin and Shijiazhuang soon followed suit.

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Rural factories are also catering more to urban markets. While rural factories once promoted rural self-sufficiency, today they also process agricultural goods for urban residents and industries.

Shifts in residence and job patterns

Under Mao, a system of urban and rural 'residence permits' helped prevent excessive illegal migration from the countryside to the cities, and 17 million urban youths were sent to the countryside from 1968 to 1978 to limit the growth of China's cities. However, Chinese economists now admit that during the same period 14 million peasants gained urban employment, making China's rate of urbanization as high as most Third World countries. While urban inhabitants numbered 50–70 million in the early 1950s, there are over 150 million registered urban residents today.

Previous restrictions on rural migration are being relaxed in light of changing economic conditions. Household farming has already made over 30 percent of peasant labor redundant by improving agricultural labor productivity. Government plans call for 70 percent of China's peasants to leave farming by the year 2000. Peasants are being encouraged to move into cities of under 200,000 inhabitants, while also being allowed into 81 medium-sized cities with populations ranging from 200,000–500,000. There they receive 'living permits,' a new form of residence permit that allows them to reside in the cities without receiving the State subsidies, such as grain, given to urbanites. But if the flood of migrants to the urban areas becomes too great (an estimated 160,000 people arrive in Beijing every day by train—100,000 of them peasants), Chinese

leaders may reinstate strict controls on migration to medium-sized cities and concentrate on relocating redundant rural laborers to the small towns springing up in rural areas.

These rural small towns are eventually expected to become home to as many as 40 percent of China's nonagricultural laborers. Towns in wealthy coastal areas such as the Pearl River Delta, the Yangtze River basin, and the Shandong and Liaodong peninsulas near Korea and Japan are being encouraged to create new sources of income by turning agricultural produce into exportable commodities. In 1984 Wujiang County in prosperous Jiangsu Province earned over $50 million in foreign currency through agriculturally related exports, according to the county's magistrate.

Midpoints between city and country, these rural towns will also help to improve the flow of technology between urban and rural areas. There is a great need for scientific and technical knowledge in the countryside. Less than 12.5 percent of China's 328,000 agronomists worked in rural areas in 1985. Even when the 200,000 agronomists currently undergoing on-the-job training in the countryside are included in statistics, China still averages only 3.1 agronomists for every 10,000 peasants. To bridge the gap, peasants are hiring the services of urban research institutes, agronomists, factory managers, and lawyers. Some city residents are even moving temporarily to the countryside to make a quick profit as technical "consultants."

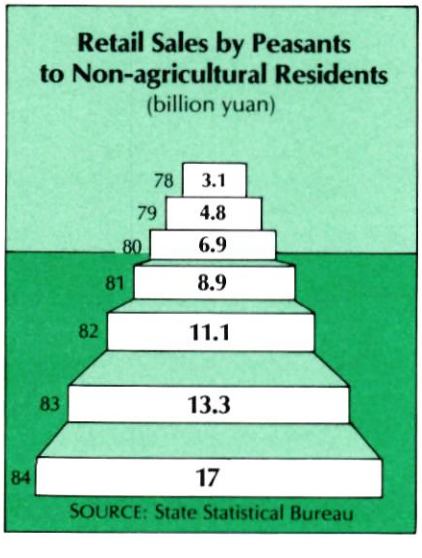
Rural residents, meanwhile, are expanding the service sector throughout urban and rural China. The service sector remained underdeveloped for many years due to Mao's hostility to it and the State's monopoly over it. Today, service sector jobs provide the major route for peasants to enter the cities. Unlike many urbanites who may find service jobs menial, peasants seldom suffer such a bias. Most would accept almost any job in the city and are taking advantage of new freedoms to do just that. The 10,000 young peasant girls now working as nannies in the homes of Beijing's urban middle class are a striking example. Similarly, in 1984, 160,000 peasants carried out one-quarter of the total capital construction work in Beijing. The percentage of rural workers employed in the service trades jumped from 18 percent in 1978 to 39 percent in 1983.

Rural reforms bring prosperity, problems

How have these changes affected the Great Wall that once separated urban and rural Chinese? Income is one important indicator. Before the introduction of household farming, the income of rural residents largely depended on the collective's profits, leaving most peasants poorer than their urban cousins whose salaries were fixed. The urban–rural income gap grew from 2:1 in the 1950s to at least 3:1 in the late 1970s according to Western estimates. Between 1979 and 1984, however, annual growth rates in family income have increased faster in the countryside (15 percent) than in the cities (8.2 percent).

Urban reforms introduced in late 1984 may widen the gap again, by raising workers' bonuses and increasing opportunities for moonlighting at second jobs. In fact, from 1984 to 1985 peasant income rose by 12.6 percent while urban income rose 10 percent, indicating that the rate of change has begun to turn in favor of the urbanites again. Moreover, average peasant income remained around ¥400 in 1985, while city residents earned an average of ¥750.

Rural residents may be benefiting from incipient changes in the pricing system. Under Mao, the State consistently overvalued the price of industrial goods and undervalued the price of agricultural produce. This "price scissors" allowed income from farming to subsidize urban development. Today, peasants resist buying low quality, overpriced machinery or chemical fertilizer—a practice that quietly transferred peasant wealth into workers' hands. Until urban industrial efficiency improves, however, the price scissors will continue to favor the urban sector.



Investment flows illustrate the transfer of wealth more sharply. In response to the new economic freedoms of the second stage of the rural reform, many peasants are accumulating capital, and some are investing in urban construction companies, service industries, and even factories. The State supports this more open flow of capital, which allows peasants and rural enterprises with excess cash to take advantage of good investment opportunities throughout the country.

Peasants, however, are confronting serious problems in their urban ventures. State employees and bureaucrats view peasants working in commerce and transportation jobs in the cities as a direct threat to their livelihood. There are reports of city residents harassing peasant vendors, smashing peasant buses, and forcing peasant hawkers to sell their food in small, out-of-the-way alleys.

Thus, while the reforms have helped the peasants, it is clear that a continuing urban bias may undermine the changes in urban–rural relations. Urban centers still hold a mystique, and are viewed as the locus of "the good life" in China. Many city residents shun goods produced in the countryside, and look down on "country bumpkins." Even some official practices seem to reflect this bias. Despite the new emphasis on efficiency, the State seems reluctant to let urban factories go bankrupt, but willing to allow the natural laws of capitalism to drive inefficient rural factories out of business.

Yet stage two of China's agrarian reform is slowly breaking down Mao's Great Wall by allowing goods, labor, capital, and technology to flow more freely between the city and countryside. Mao feared that the peasants' unbridled pursuit of their private interests threatened his goal of building a Communist society. But Deng is harnessing this rural energy to improve conditions in the countryside, while creating rural demand that will help fuel the entire reform program. This is a time of opportunity for rural residents—particularly those whose skills, finances, and geographic location maximize their access to the urban sectors. 完

The Grain Challenge

Improvements in handling and processing are needed to cope with China's growing grain harvests

Lew Erisman

Disastrous weather in many parts of China and a decline in the acreage sown to grain caused a precipitous drop in grain production in 1985. The 25 million to 30 million tonne decrease, representing one of the largest declines in grain output within the last 25 years, triggered memories of severe grain shortages in the past.

But in contrast to years like 1959 and 1960, when grain production declined by 28 and 25 million tonnes respectively, the subnormal harvest of 1985 has not precipitated a national crisis. Rather, thanks to dramatic increases in grain production for several successive years, China's stocks are generally adequate and some regions have sizable excesses. Although the government is responding to 1985's decline by reducing prices for fertilizer and giving loan priority to farmers who grow more grain, the drop does not signal a major failure of agricultural reforms.

In fact, the overall grain production picture in recent years has exceeded even the most sanguine expectations. Although total acreage sown to grain has declined by 12 million hectares (1 hectare [ha]=2.47 acres) or 10 percent since 1978, unusually favorable weather conditions combined to yield a net increase in grain output of 100 million tonnes between 1978 and 1984. Much of this increase stems from realization of the potential of long-term development projects in such areas as water control and land improvement. But it took the new agricultural policies introduced in 1978 to overcome the inhibiting effects of inefficient management and overly centralized planning in agriculture.

Most analysts agree that China's large grain harvests are here to stay—even the "poor" 1985 output was 25 percent higher than in 1978. In order to take full advantage of this, vast changes are needed in all aspects of grain handling and processing. The Chinese acknowledge that they have a long way to go, and lack the experience and technology to accomplish all the necessary transitions themselves. Thus their plans include utilizing a broad range of foreign technology, equipment, and investment to modernize the grain sector and ensure that, even if the country experiences poor harvests again, there will be an adequate margin of safety against disaster.

The transition to bulk handling

More grain is entering China's marketing system due to increased production and reform of the State purchasing system. Traditionally, most grain has been consumed locally. The remainder (between 15 and 20 percent of production) entered State marketing channels, where virtually all of it was transferred to urban areas or to grain deficit regions.

But this system became cumbersome as grain production began its rapid rise. Between 1978 and 1984 the quantity of grain procured and purchased by the State increased from about 62 million tonnes (20 percent of production) to 141 million tonnes (35 percent of production). As a fundamental part of agricultural reforms, the State monopoly over the purchase and distribution of grain was terminated in 1985, when State procurement was limited to the purchase of 75 million tonnes of rice, wheat, and corn. All excess grain is now sold on the newly emerging free market at prices theoretically determined by supply and demand. The State will buy additional quantities only if the free market price falls below a set level, assuring grain farmers a minimum income.

In the future, the State will continue to reduce its contracted purchases, forcing China's marketing system to accommodate an increasingly larger flow of grain. In essence, China is moving away from the traditional concept of regional self-sufficiency to interprovincial or interregional dependence and trade. Grain deficit provinces are encouraged to bypass State channels and negotiate directly with grain surplus provinces. This trend to commercial production and marketing will require investment in all facets of grain distribution in China, including handling, storage, and transportation.

- **Handling** Threshing and drying equipment are needed on individual farms to reduce post-harvest losses, condition grain by removing foreign materials and damaged kernels, and shorten the time it takes grain to enter marketing channels. The many types of simple threshing equipment currently in use vary in efficiency. The country's threshing and winnowing equipment were designed for relatively large-scale collective farming, and now need to be replaced with more efficient and smaller threshing, shelling, and winnowing equipment compatible with individual household farming operations. Larger equipment may eventually come back

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into demand if China's plan to reduce the number of farmers engaged in crop production by two-thirds by the end of this century is successful, but individual household purchases currently dominate the market.

After threshing, grain is usually air and sun dried—a process that may require as long as six to eight months. Losses, while normally relatively low, can be catastrophic should heavy rainfall occur during harvest or threshing. The introduction of small, energy-efficient driers will reduce losses and shorten the time it takes grain to reach the market.

Most of China's storing, elevating, and transporting facilities were designed for relatively small quantities of bagged grain. While more efficient methods to improve and gradually supplant the handling of grain in bags are being studied, bulk handling is being introduced to expedite movement of large quantities of grain. The transition to bulk handling will require specialized trucks and railcars to transport the grain, improved elevating equipment to move it into or out of storage and onto trucks or rail cars, and new unloading facilities.

Mechanical scales will also be installed to weigh grain at various points. At present weighing is generally limited to small manual scales located at rural grain collection and storage facilities.

Finally, the combination of sun drying and manual handling produce a problem of high stone, bag, and string content in Chinese grain. Equipment is needed to remove these foreign materials and dust so cleaner grain can meet the needs of consumers, more sophisticated processing, and trade.

• **Storage** Most current storage facilities are relatively simple, and inadequate for China's present needs. Storage varies by region; the relatively cooler northeast and parts of north China use small round bins, while flat storage is more popular in central and south China. The Chinese are seeking modern storage technology and facilities, and are particularly interested in steel bins. Better storage will reduce rodent and insect losses, and prolong storage time by controlling temperature, humidity, and oxygen.

• **Transportation** Inland transportation is the single largest bottleneck to getting grain to consumers. Most grain is currently bagged and moved by rail, but the railroads are also moving a small but increasing volume of grain in bulk. The use of hopper cars able to load grain through the side or bottom of the car is increasing. More hopper cars will be put into service, some of which may be imported. Facilities to unload them must be installed, ideally with enclosed belts or other means of conveyance to move grain directly into storage, port loading facilities, or processing plants.

Growing grain trade requires new port facilities

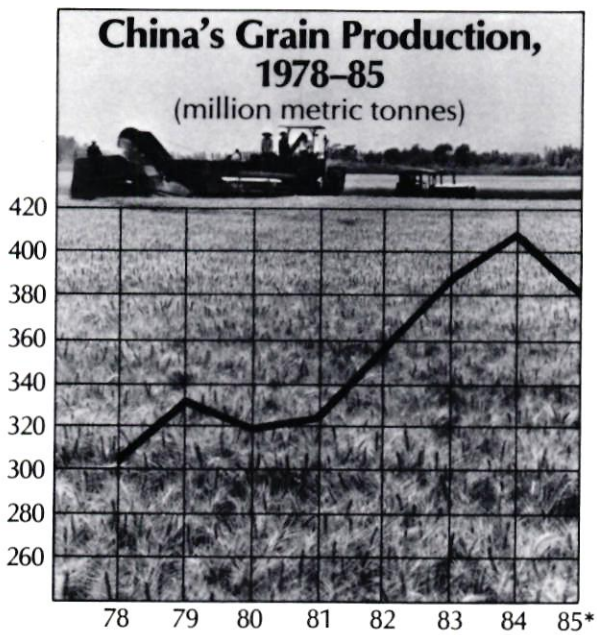
China has no specialized port facilities to handle grain, aside from grain elevators at Shanghai and Huangpu (near Guangzhou), which are used to discharge imported wheat, and a small silo in Dalian to load soybeans for export. General cargo berths were, and continue to be, used for loading bagged rice and small amounts of corn and sorghum for export and unloading wheat imports.

This situation was adequate until 1984 because China's major grain exports were limited to rice and, to a lesser extent, soybeans. Sporadic dislocations caused by temporary excesses of grain to be loaded or unloaded were the main problem.

But China's emergence as a sizable exporter of corn and sorghum (corn exports skyrocketed from less than 100,000 tonnes in 1983 to some 5 million tonnes in 1985) has forced authorities to recognize the need for specialized grain-handling facilities. The dramatic increase in China's foreign trade compounds the problem by creating intense port congestion and a severe shortage of general cargo berths.

Plans to install handling facilities to load corn for export (and also for delivery to newly developing markets in south China) are not far advanced, since exporting on a large scale only began in 1984. Northeastern China is expected to be the only region with large annual excesses of corn, so construction plans for corn-loading facilities have focused on the northeastern ports of Yingkou and Dalian, while a third site is being considered at Dandong. The grain berth at Yingkou should be completed by September 1986, more than tripling capacity to about 1 million tonnes a year. Facilities to further increase Yingkou's capacity to about 2 million tonnes in 1988 and to 2.6 million tonnes by 1990 are under consideration.

China plans to build its largest corn-loading facility at Dalian, and is considering an unusual arrangement to do so with Japanese firms. The Chinese have accepted a tender, but postponed a final decision on a Japanese bid to replace Dalian's coal-



SOURCE: State Statistical Bureau and various Chinese sources

*1985 figures based on preliminary estimates

Grain Production 1978–1985*
(Million tonnes)

	Rice	Wheat	Corn	Soybeans	Tubers**	Other***	TOTAL
1978	136.93	53.84	55.94	7.57	31.74	18.74	304.76
1979	143.75	62.73	60.03	7.46	28.46	29.69	332.12
1980	139.91	55.21	62.60	7.94	28.73	26.17	320.56
1981	143.96	59.64	59.21	9.32	25.97	26.92	325.02
1982	161.60	68.47	60.56	9.03	27.05	27.59	354.50
1983	168.87	81.39	68.21	9.76	29.25	29.80	387.28
1984	178.26	87.82	72.34	9.70	28.48	30.52	407.12
1985	167.00	86.00	64.00	9.70	24.00	29.30	380.00

* 1985 based on preliminary Chinese estimates
** In grain equivalent, 5 units of tubers = 1 unit of grain
*** Includes sorghum, millet, barley, oats, buckwheat, peas, beans, and other lentils

SOURCE: State Statistical Bureau, various Chinese sources

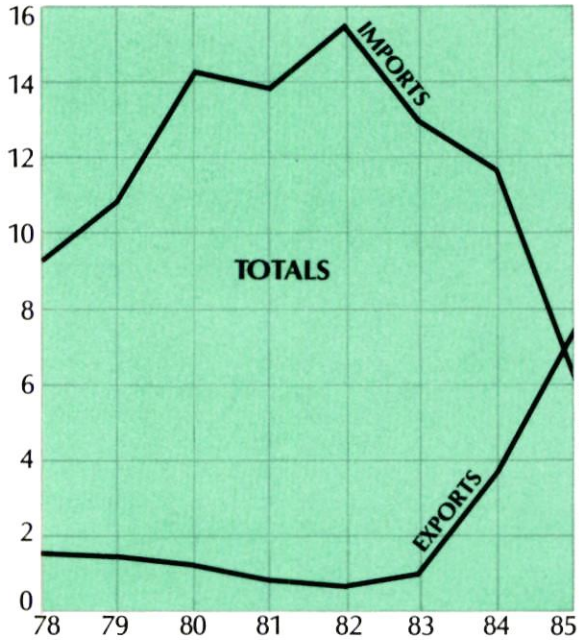
loading facility (now already being used for corn) with an 80,000 tonne corn export silo. A final decision is expected (at the earliest) in April 1986 on the project, which will have a maximum 2.8 million tonnes annual loading capacity. China would pay for the facility in kind: between 200,000 and 300,000 tonnes of corn (worth $25 million to $30 million) are being offered as compensation. As a general policy, the Chinese do not offer commodities for large compensation trade deals, indicating that this project must have approval from officials at the highest level.

Port improvements designed to facilitate the unloading of imported wheat are another high priority. Although good harvests enabled China to reduce wheat imports from a record 13.3 million tonnes in 1982 to an estimated 6 million tonnes in 1985, wheat usage is increasing rapidly due to changes in consumer preference. Thus most Western observers expect wheat imports to continue rising. Last year the Chinese purchased a pneumatic unloader from Simons Ltd., (UK), which will double Dalian port's capacity to unload wheat from 1.5 million tonnes to over 3 million tonnes a year. A similar facility was recently purchased for the port of Xingang in Tianjin. And Qinhuangdao's port will soon invite bids for construction of a grain wharf to unload up to 2 million tonnes of wheat annually.

Better processing needed as grain consumption diversifies

The shifting patterns of grain imports and exports reflect not just better harvests, but also changing consumer preference. With sizable quantities of grain in excess of basic food needs available for the first time, consumers may now exercise choice in the type and quality of grain they buy. In urban areas, consumers prefer high-quality rice and flour. In rural areas, rice and wheat are replacing low-quality grains such as sweet potatoes, corn, and other coarse grains, which historically have been the staple.

Most of China's surplus grain is of low quality and limited marketability. But China is seeking facilities to convert this low-quality grain into livestock and poultry feed, processed foods, and industrial materials. Provinces are taking much of the initiative to increase grain processing capacity, and are proving receptive to cooperative ventures as a means of acquiring foreign investment. Technology and equipment for flour mills, starch mills, feed mills, and food processing plants are the most common areas of interest. China also plans to improve its capability to process grain into fast foods, infant food, snacks, confectionary products, and beverages. Over 100 types of processed foods can be made from low-quality rice alone, which constitutes about 40 percent of China's rice production. Similarly, excess corn can be converted into flour, grits, and flakes.



SOURCE: State Statistical Bureau and various Chinese sources
1985 figures based on preliminary Chinese estimates

• **Flour milling** Consumption habits and preferences for wheat are changing in both urban and rural areas. The government is encouraging the introduction of wheat-based food in south and central China to improve and add variety to the traditional rice diet, while consumers in the north are eating more wheat products than ever. Consumption of traditional staples such as steamed bread, dumplings, and noodles is increasing, as well as the demand for relatively new foods such as bread, instant noodles, and sandwiches. Demand for high quality white flour is increasing, while Western-style restaurants, bakers, and noodle makers need specialty flour to produce new products and improve existing ones.

Projects to expand and improve milling capacity exist in virtually all urban areas in China's wheat belt. Most of the equipment being replaced in the cities is of 1930 vintage or older, and, if still useable, may eventually be relocated to rural areas. Southern China is moving to develop its own milling capacity by constructing new mills.

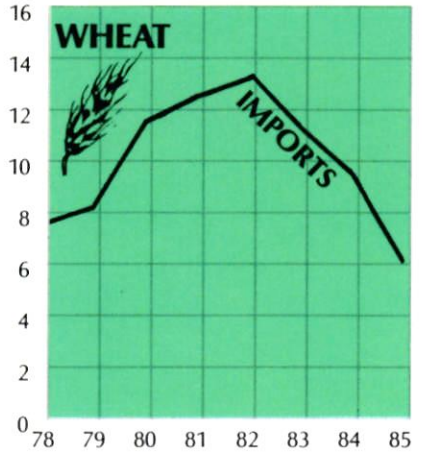
The extensive modernization of China's flour milling industry requires foreign technology and equipment. Since much of the wheat grown in or imported by China is red, the flour from these wheats is off-color, even if milled at a very low rate of extraction. Bleaching and enriching technology will be needed to provide the white flour now in demand, and improve its nutritive value.

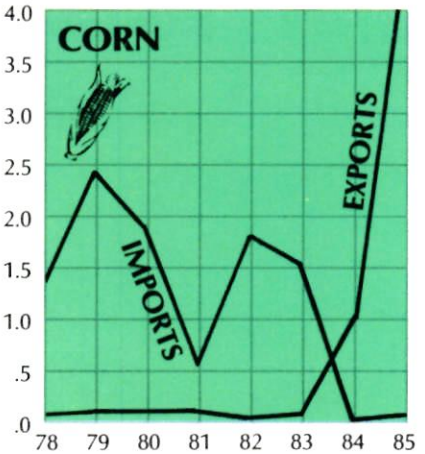
In general, only two grades of general purpose flour have been produced in the past. Specialty flours are a relatively new concept and China lacks experience in the technique of blending various classes of wheat and flour. Most mills now in operation can handle soft wheat, but specialized equipment will have to be installed to handle the high-protein hard wheat and higher gluten wheats that comprise a large portion of what is available for milling. The milling of hard wheat requires rollers made from strong steel alloys. Reportedly, some of these alloys are not produced in China.

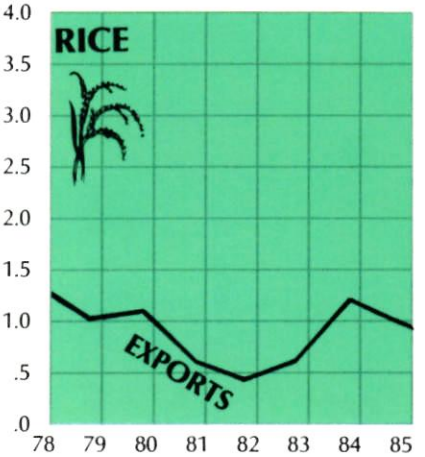
• **Corn milling** More corn is now available for milling as a result of larger harvests. The Chinese may not be aware of many of the 350–400 different uses for starch extracted from corn, but they are beginning to experiment with a broad range of industrial and food uses. Corn is milled in a few relatively small, obsolete mills that recover less than 80 percent of the useable components from corn. Even the country's leading corn producer, Jilin Province, has only 18 mills with a combined grind capacity of less than 100,000 tonnes of corn per year. The simple starches produced are primarily used for pharmaceuticals. Industrial alcohol and the glass and chemical industries are secondary endusers. Although China is short of high-grade vegetable oil, very little corn oil (a byproduct from the manufacture of starch) is used for food since few mills have the capability to de-gum it. Rather,

CHINA'S GRAIN IMPORTS AND EXPORTS

(million tonnes)







corn oil is most often used for such nonfood manufactures as antibiotics, soap, and lacquers.

Virtually all modern corn-milling technology and equipment will have to be imported. China lacks the technology to manufacture improved starches and expand the range of starch uses. They have purchased equipment such as centrifuges to renovate and upgrade existing mills and are considering the acquisition of new, modern mills. Technology to produce modified starch (primarily for pharmaceutical use), starch for textile and paper manufacture, high-fructose corn syrup (HFCS), and alcohol is also needed.

The nation's first wet mill incorporating foreign technology and equipment recently began operation. The mill, located in Anyang, Henan, has an annual grind of 25,000 tonnes of corn for processing into starch and other byproducts. Its primary products are starch for pharmaceutical and industrial use, corn oil, lysine, and single-cell protein. The byproducts—corn gluten feed and corn germ meal—will be used for high-protein livestock and poultry feed. The nation's first ethanol distillery (a dry mill) was recently purchased from Speichim (France). The mill will be located at Tianjin and will have an annual grind of about 50,000 tonnes of corn. A number of corn producing provinces, including Heilongjiang, Jilin, Liaoning, and Shandong, are interested in or negotiating for mills.

Provinces producing minor amounts of corn also hope to alleviate their shortages of sugar and industrial starch by milling imported corn or corn from other parts of the country. Virtually all sugar used in east China must be imported, but this region is planning large-scale canning, brewery, soft drink, baking, and other food processing industries, all of which will require large quantities of sugar. Wet milling would provide a source of dextrose, HFCS, and industrial starch. East and central China are also exploring the feasiblity of building plants to convert sweet potato starch into sugar.

The feed industry adopts long-range plan

The formation of a mixed feed industry is especially important because it directly or indirectly helps absorb excess grain, especially corn; improve the woefully low feed conversion ratios that now prevail; convert oil meals and other ingredients into highly nutritious foods; absorb underutilized rural labor; improve consumer diets by increasing the supply of meat, poultry, eggs, and dairy products. Animal husbandry used to be mainly a household sideline activity using whatever feedstuffs happened to be available. The need to mix feed to improve nutritional value became apparent in the mid-1970s as planners looked for a method to upgrade animal husbandry and arrest the chronic shortage of meat, poultry, and eggs. The post-1979 encouragement of specialized households and the establishment of large livestock and poultry enterprises near urban areas intensified the demand for mixed feed to raise efficiency and speed livestock development.

In February 1983 the State Council adopted the "National Program for the Development of the Feed Industry 1984–2000," establishing the ambitious goal of increasing mixed and compound feed production of all types to 50 million tonnes by 1990 and between 100 million and 120 million tonnes by the end of this century. These goals seem particularly optimistic when one considers the limited progress made since 1978, and the constraints on the industry.

China began importing mixing equipment from Hungary in 1978 and later purchased equipment from other countries, including the United States, Japan, and Switzerland. The first plant to manufacture mixing equipment using domestic technology was built in Shanxi Province in 1978. But by 1983 the approximately 3,500 feed mills in operation had a combined mixing capacity of only 5 million tonnes. Production reportedly increased to 8 million tonnes and 12 million tonnes in 1983 and 1984, but even these numbers must be viewed with some skepticism; the Chinese count any feed consisting of two or more blended ingredients as mixed feed. The proportion of compound (specially formulated to be complete and nutritionally balanced) feed is small, comprising only about 10 percent of total feed production in 1984; much of this fell short of even minimum nutritional standards.

Under the long range plan, the State and provinces will invest about

Corn is milled in a few relatively small, obsolete mills that recover 80 percent of the useable components from corn. Even the country's leading corn producer, Jilin Province, has only 18 mills with a combined capacity of less than 100,000 tonnes of corn per year.

¥1.5 billion ($500 million) during the first phase of the program, 1986–1990. Feed mills built with these funds will be administered by the Ministry of Commerce (MOC) and produce complete feed according to MOC standards. In addition, the plan calls for townships and villages to set up simple mixing facilities financed by local investment and administered by the Ministry of Agriculture, Animal Husbandry, and Fisheries (MAAF).

Most State and provincial investment in feedmills is earmarked for one large methionine plant, four or five lysine plants, 20 to 40 concentrate and feed additive plants, and an unspecified number of medium and large mixing plants. These plants will produce mainly compound poultry and dairy feeds according to MOC specifications, for distribution to relatively large poultry and dairy enterprises situated near urban areas and, to a lesser extent, for specialized households. The feed additive and premix plants will also supply small mills in the system with products to be mixed with locally available ingredients. Small mills will mainly produce comparatively low-quality mixed feed for hogs.

The feed industry's needs include equipment to mix feed to exacting specifications, assistance in the use of pre-mixes and feed additives in formulating balanced diets, and instruction in the role of protein (especially an acceptable amino acid profile).

Providing for future security

China's grain production will probably continue on its upward trend, but the 1985 decline indicates that the rate of increase will likely be much lower, and more difficult to attain than during the past six years. The Seventh Five-Year Plan (1986–1990) sets a grain production target of 450 million tonnes by 1990, an increase only one-half as large as that registered from 1978–1984. The 1990 target is attainable, but will require increased investment and accelerated introduction of scientific farming techniques.

Furthermore, agricultural policies may have to be adjusted to dispel the growing reluctance of some to grow grain. Given the existing price structures, it is often more profitable to grow nongrain crops, farm part-time, or work in higher paying local industries. Some farmers hesitate to grow grain because markets are uncertain, selling grain is difficult, and grain storage is not always available.

Under these conditions, grain producers may lack incentives to increase grain production as rapidly as the government plans. But if China's multifaceted program to improve grain handling and processing succeeds in getting grain to market faster and turning grain into higher-value products, farmers may have the incentive they need to grow grain. 完

US ORGANIZATIONS ADVISE CHINA ON GRAIN

With offices in Beijing, the US Wheat Association (USWA), the US Feed Grains Council (USFGC), and the American Soybean Association (ASA) are all positioned to help in the modernization of China's grain and feed sectors. The US Department of Agriculture cooperates with these and other industry- and American farmer-sponsored organizations to promote American agricultural commodities overseas.

The USWA sponsors programs to improve flour quality and promote flour consumption. Its model flour mill and bakery in Beijing and instant noodle plant in Shanghai include demonstration and training facilities to expose the Chinese to modern production techniques, equipment, and technology. USWA also opened a milling and baking school in Guangzhou in 1985.

The USFGC and ASA organize feeding trials and demonstrations to illustrate the advantages of modern feeding practices for animal and poultry husbandry. They also conduct technical seminars and feeding trials. USFGC and ASA, like USWA, sponsor or assist in the exchange of technical delegations and host study groups in the United States. USFGC recently established a model mill in Nanjing to manufacture vitamin/mineral/protein premixes for nonruminant animal and poultry feed. Technicians from all over China are being trained at this facility, and the Chinese plan to use the mill as a prototype for future large-scale mill construction.

To expose the Chinese to corn milling technology and the use of starch, the USFGC, the USDA Foreign Agriculture Service, and the US Corn Refineries Association have supported a number of visiting delegations in the past 18 months. In addition, the US International Trade and Development Cooperation Agency is funding a feasibility study for a large corn mill in Shanghai. If constructed, the mill's annual capacity would include 60,000 tonnes of alcohol, 20,000 tonnes of HFCS, 30,000 tonnes of syrup, 3,000 tonnes of citric acid, and 5,000 tonnes of modified starch. —LE

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AG TECH '86/CHINA INTERNATIONAL AGRICULTURE & FARMING EXHIBITION. June 3–8, 1986. Shanghai. Includes farm machinery; animal husbandry, irrigation equipment; agro chemicals and pesticides; dairy product and processing; packaging and labeling equipment; frozen and deep frozen food equipment; food processing, storage, packaging and canning technology and equipment; fisheries, processing and marine equipment; also computerized systems applicable to agro industry and laboratory and environmental equipment. *Contact:* Sharon Lipsky at National Council member company China Expo Management Corp. (USA), 6 East 39th St., Ste. 700, New York, NY 10016. Tel: 212/689-9580.

US FOOD PROCESSING/PACKAGING AND DAIRY EQUIPMENT CATALOG/VIDEO CATALOG EXHIBITION. June 9–20, 1986. Beijing, Shenyang, and Shanghai, China; and Hong Kong. This event is being promoted by the US Department of Commerce in conjunction with the Food Processing Machinery and Supplies Association, the Packaging Machinery Manufacturers Institute, and the Dairy and Food Association. *Contact:* Grace Wiggins, US Dept. of Commerce, Rm. H2119, Washington, DC 20230. Tel: 202/377-3973.

CORNTECH '86/2ND ANNUAL INTERNATIONAL CORN TECHNOLOGY EXHIBITION & CONFERENCE. August 18–22, 1986. Changchun, Jilin Province. Includes equipment and technology related to seed corn improvement; corn planting, harvesting, drying, and storage; wet and dry milling; corn (and potato) snack and other food production and corn derivatives. *Contact:* Walter Keats at National Council member company Middle West Consultants Ltd., 630 Green Bay Road, Kenilworth, IL 60043. Tel: 312/256-7887.

CHINA PACK/EX '86-INTERNATIONAL PACKAGING EXHIBITION & CONFERENCE. September 15–20, 1986. Shenzhen SEZ. Includes packaging machines, packaging auxiliaries and related equipment, processing machinery and equipment; metal produce, plastic products; bottling and canning machinery; storage and warehousing, and related business and professional services. *Contact:* Annabel M. Evans, International Trade and Exhibitions Ltd., 553/579 Harrow Road, London W10 4RH, United Kingdom. Telex 296023 or Nadine Persuad, ITE, 10 East 39th St., Ste. 903, New York, NY 10016. Tel: 212/213-8848.

INTER-FISHTEC '86/INTERNATIONAL EXHIBITION ON THE TECHNOLOGY & EQUIPMENT OF THE INDUSTRY OF FISHERY. September 22–27, 1986. Tianjin. *Contact:* Henry Tojee Chan, Hua Zhan Trade Promotion Co., Ltd., Rm. 1502, Jubilee Comm. Bldg., 44 Gloucester Rd., Wanchai, Hong Kong. Telex: 65088 HZTPC HX.

WASHINGTON D.C. TRADE EXPOSITION. October 9–15, 1986. Beijing. To follow up the successful "Beijing Trade Expo '85" held in Washington last fall, and in furtherance of the Washington–Beijing sister/capital city relationship, this exhibition has as its theme "municipal services" but will feature a "variety of related industries" including food processing and packaging equipment. *Contact:* Mary Ann Lynch at National Council member company Lynch & Associates, 1476 Carroll Dr., NW, Atlanta, GA 30318. Tel: 404/355-7390.

FISHERY CHINA '86/INTERNATIONAL FISHERY TECHNOLOGY & EQUIPMENT EXHIBITION (in conjunction with Marine China '86). November 12–18, 1986. Beijing. Includes fishing boats and equipment for deep-sea fleets, navigation and sonar devices; fishery products processing and refrigeration; live fish transportation; and fish farming. *Contact:* Stanley Chu, Adsale Exhibition Services, 21/fl., Tung Wai Comm. Bldg. 109-111 Gloucester Rd., Wanchai, Hong Kong. Telex 63109 ADSAP HX or Gerald G. Kallman, Kallman Associates, 5 Maple Court, Ridgewood, NJ 07450-4431. Tel: 201/652-7070.

AG CHINA 86/THE INTERNATIONAL AGRIBUSINESS AND FOOD PROCESSING EXHIBITION AND CONFERENCE. November 27–December 2, 1986. Guangzhou. Includes agricultural chemicals, biotechnology, breeding stock, farm machinery, dairy processing equipment, feed and grain technology and equipment, irrigation equipment, and processing equipment for fruits, vegetables, meats, and animal products. *Contact:* Mark Pond at National Council member company Cahners Exposition Group, 7315 Wisconsin Ave., P.O. Box 70007, Washington, DC 20088. Tel: 301/657-3090.

Compiled by Susan D. Baugh.

IFP/INTERNATIONAL FOOD & PHARMACEUTICAL PROCESSING & PACKAGING EXHIBITION. December 5–11, 1986. Guangzhou. Will include beverage and brewery equipment, dairy products processing equipment; processing and packaging for ready-to-serve foods; tablet processing; and ampule filling. *Contact:* Jessica Daniels at National Council member company SHK Int'l Services Ltd., One Liberty Plaza, 4th Fl., New York, NY 10080. Tel: 212/766-6192/3.

IFP EXPO '87/THE INTERNATIONAL FOOD PROCESSING & PACKAGING EQUIPMENT EXHIBITION & CONFERENCE. March 14–20, 1987. Beijing. Co-organized in conjunction with SEPAIC by National Council member companies China Expo Management Corp. (USA), 6 East 39th St., Ste. 700, New York, NY 10016, (*Contact:* Suzanne Lee Baird at 212/698-9580) and E.J. Krause & Associates, P.O. Box 70356, Washington, DC 20088 (*Contact:* Jim Carone at 301/986-7800).

INTERNATIONAL FOOD & PACKAGING INDUSTRY EXHIBITION. March 28–April 3, 1987. Xiamen SEZ, Fujian Province. *Contact:* Lawrence Ming, Bixpo Xiamen Int'l Trade Fair Co., Ltd., 1904–6 Alliance Bldg., 130–6 Connaught Rd., C., Hong Kong (Telex 86776 BIXPO HX) or Harry C. Lepinske, IMS, 1030 South La-Grange Rd., LaGrange, IL 60525-2845 (Tel: 312/354-3900).

FOODPACK '87. Spring 1987. Beijing. *Contact:* Mary Ann Lynch at National Council member company Lynch & Associates, 1476 Carroll Dr., NW, Atlanta, GA 30318. Tel: 404/355-7390.

TOBACCO, LIQUOR & DRINKS EXPO/CHINA '87. Late 1987. Beijing. *Contact:* Andrew Kay at China Promotion Ltd., Rm. 2503, Int'l Bldg., 141 Des Voeux Rd., C, Hong Kong (Telex 76270 CHOCH HX) or Ingrid Boyd, Glahe International, Inc., 1700 K Street, NW, Washington, DC 20006 (Tel: 202/659-4557).

AG CHINA 87/INTERNATIONAL AGRIBUSINESS EXHIBITION & CONFERENCE. November 1987. Beijing. *Contact:* Mark Pond at National Council member company Cahners Exposition Group, 7315 Wisconsin Ave., P.O. Box 70007, Washington, DC 20088. Tel: 301/657-3090.

China's Major Crop Production by Province

1984 output in million metric tonnes

Beijing	1984 output	Change since 1979
corn	.955	+53%
wheat	.730	+19%
fruit	.189	+25%
oil crops	.026	+115%

Tianjin	1984 output	Change since 1979
corn	.565	+33%
wheat	.330	+33%
oil crops	.055	+265%
fruit	.051	+91%

Hebei	1984 output	Change since 1979
wheat	7.16	+13%
corn	6.40	+2%
fruit	1.34	+70%
cotton	1.05	+808%

Shanxi	1984 output	Change since 1979
wheat	2.90	+58%
corn	2.35	–19%
fruit	.386	+41%
oil crops	.367	+380%

Nei Mongol	1984 output	Change since 1979
corn	1.48	–12%
wheat	1.44	+33%
sugar	1.41	+188%
oil crops	.598	+219%

Liaoning	1984 output	Change since 1979
corn	7.16	+14%
rice	3.31	+56%
fruit	.955	–7%
oil crops	.420	+144%

Jilin	1984 output	Change since 1979
corn	11.0	+107%
rice	1.91	+87%
sugar	.680	+19%
oil crops	.598	+320%

Heilongjiang	1984 output	Change since 1979
corn	6.42	+10%
wheat	3.82	+15%
sugar	4.23	+241%
oil crops	.259	+278%

Shanghai	1984 output	Change since 1979
rice	1.78	–2%
wheat	.140	–26%
oil crops	.116	–2%
cotton	.106	+19%

Jiangsu	1984 output	Change since 1979
rice	17.5	+34%
wheat	9.04	+69%
oil crops	.710	+87%
cotton	.665	+25%

Zhejiang	1984 output	Change since 1979
rice	15.1	+16%
wheat	1.02	+36%
sugar	.707	+6%
oil crops	.339	+25%

Anhui	1984 output	Change since 1979
rice	11.4	+28%
wheat	6.46	+65%
oil crops	.971	+118%
cotton	.234	+140%

Fujian	1984 output	Change since 1979
rice	7.31	+13%
tubers	.835	+2%
sugar	4.73	+52%
fruit	.241	+95%

Jiangxi	1984 output	Change since 1979
rice	14.9	+21%
tubers	.280	–5%
sugar	1.50	+90%
oil crops	.245	+23%

Shandong	1984 output	Change since 1979
wheat	11.3	+36%
corn	9.93	+41%
fruit	1.87	+6%
oil crops	1.82	+67%

Henan	1984 output	Change since 1979
wheat	16.5	+70%
corn	5.23	+9%
cotton	.869	+94%
oil crops	.525	+42%

Hubei	1984 output	Change since 1979
rice	15.7	+24%
wheat	3.78	+33%
cotton	.606	+35%
oil crops	.554	+73%

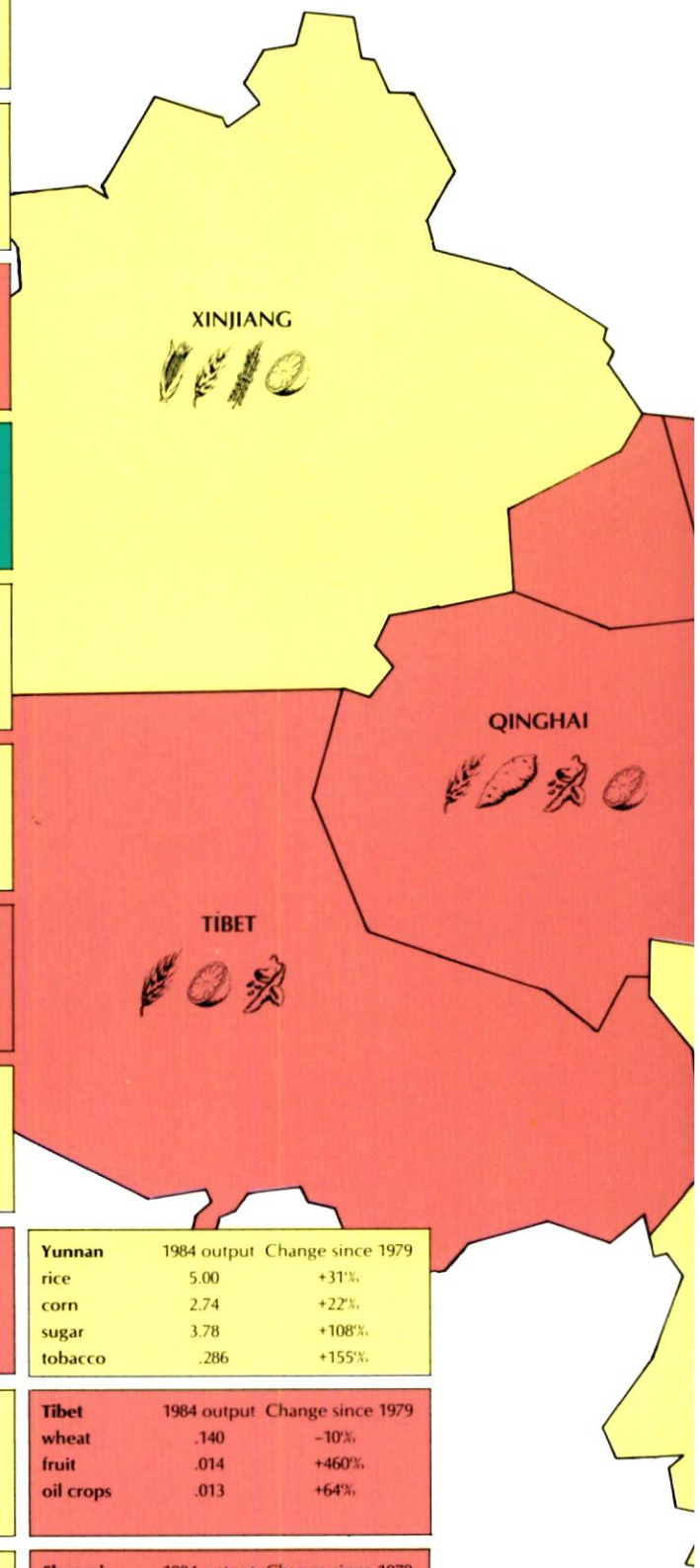
Hunan	1984 output	Change since 1979
rice	24.2	+21%
tubers	.915	–20%
sugar	1.08	+63%
oil crops	.384	+34%

Guangdong	1984 output	Change since 1979
rice	17.9	+16%
tubers	1.42	+2%
sugar	17.7	+115%
fruit	.792	+178%

Guangxi	1984 output	Change since 1979
rice	10.6	+6%
corn	1.04	+5%
sugar	7.22	+89%
fruit	.332	+113%

Sichuan	1984 output	Change since 1979
rice	20.3	+42%
wheat	7.03	+37%
sugar	2.26	+6%
oil crops	1.18	+81%

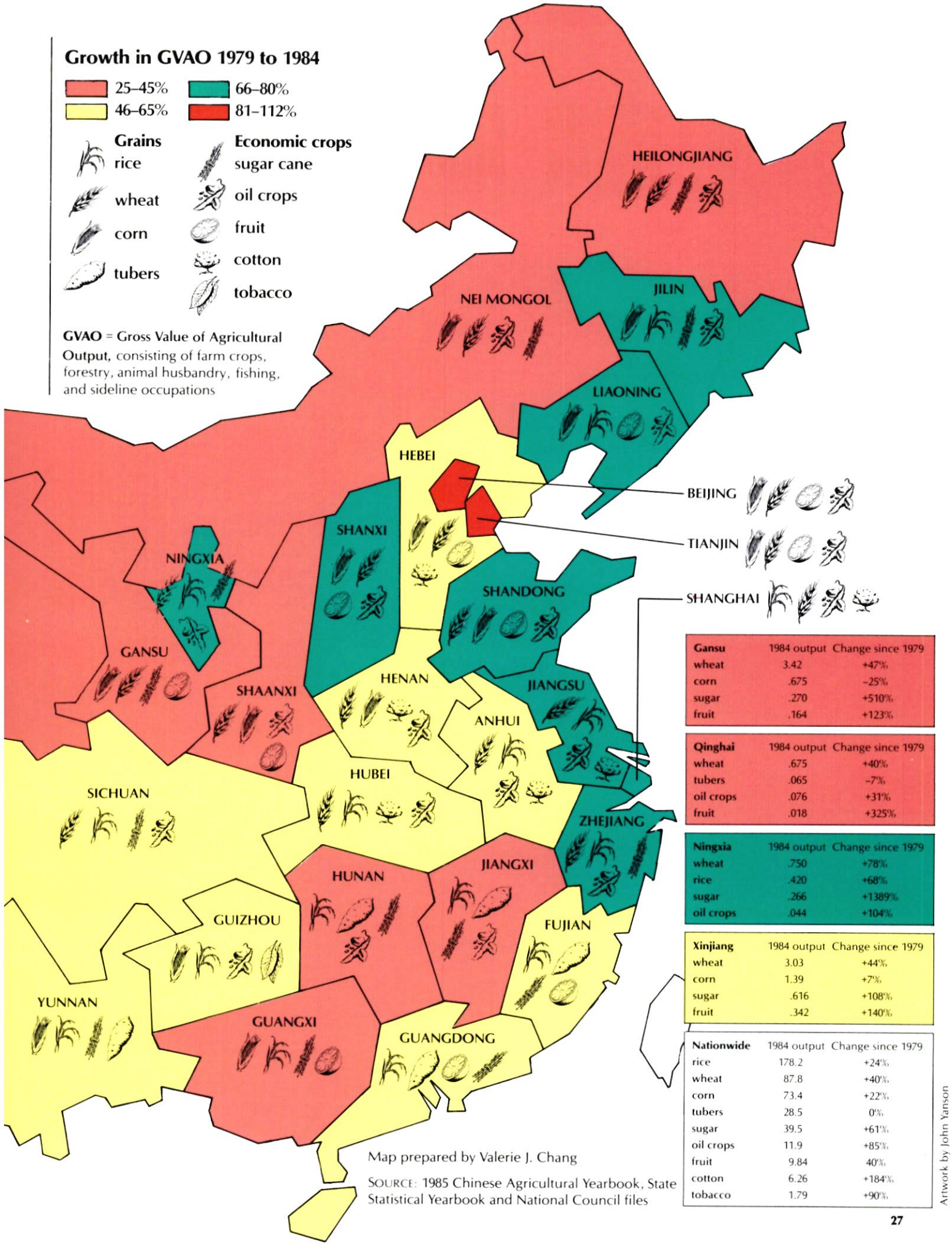
Guizhou	1984 output	Change since 1979
rice	4.07	+25%
corn	2.15	+21%
oil crops	.305	+180%
tobacco	.238	+124%



Yunnan	1984 output	Change since 1979
rice	5.00	+31%
corn	2.74	+22%
sugar	3.78	+108%
tobacco	.286	+155%

Tibet	1984 output	Change since 1979
wheat	.140	–10%
fruit	.014	+460%
oil crops	.013	+64%

Shaanxi	1984 output	Change since 1979
wheat	4.50	+25%
corn	3.13	+8%
fruit	.262	+103%
oil crops	.193	+101%



Gansu	1984 output	Change since 1979
wheat	3.42	+47%
corn	.675	–25%
sugar	.270	+510%
fruit	.164	+123%

Qinghai	1984 output	Change since 1979
wheat	.675	+40%
tubers	.065	–7%
oil crops	.076	+31%
fruit	.018	+325%

Ningxia	1984 output	Change since 1979
wheat	.750	+78%
rice	.420	+68%
sugar	.266	+1389%
oil crops	.044	+104%

Xinjiang	1984 output	Change since 1979
wheat	3.03	+44%
corn	1.39	+7%
sugar	.616	+108%
fruit	.342	+140%

Nationwide	1984 output	Change since 1979
rice	178.2	+24%
wheat	87.8	+40%
corn	73.4	+22%
tubers	28.5	0%
sugar	39.5	+61%
oil crops	11.9	+85%
fruit	9.84	40%
cotton	6.26	+184%
tobacco	1.79	+90%

Map prepared by Valerie J. Chang

SOURCE: 1985 Chinese Agricultural Yearbook, State Statistical Yearbook and National Council files

Artwork by John Yanson

Testing New Waters

China's aquatics industry eyes freshwater ponds, coastal lowlands, and the deep blue sea

Julia S. Sensenbrenner

The aquatics industry is struggling to meet the rising tide of consumer demand for adequate supplies of fish at reasonable prices. In the past, fish could seldom be found in the markets of China's inland areas, while city residents had trouble getting even their minimal allotted fish rations. Rising living standards and a growing nutritional consciousness are putting even greater pressure on the industry, which has begun to develop new sources of supply in response.

Fish caught in coastal waters provide the major portion of China's aquatic products, but overfishing has severely depleted these resources. Although attempts will be made to maintain traditional catches of naturally grown fish from oceans, lakes, and rivers, only minimal increases in harvests are believed to be possible. Thus, China is developing two principal new areas: aquaculture and deep-sea fishing.

Aquaculture potential being tapped

Aquaculture has significant untapped potential, since China has 5.6 million hectares (ha) of freshwater surface area and 5.3 million ha of coastal lowlands suitable for the artificial breeding and raising of fish, shellfish, shrimp, crabs, and kelp. For the government to achieve its very ambitious goals of 11 million tonnes total aquatic production in 1990 and 16 million tonnes by the year 2000, aquaculture production must expand rapidly. Freshwater aquaculture is targeted to contribute 58 percent of the aquatic harvest by the year 2000, up from 29 percent in 1984. Marine and freshwater aquaculture combined should account for 70 percent of the total, up from 40 percent in 1984.

An increased emphasis on land-based fishing is a logical outgrowth of agricultural reform policies promoting efficient land use and diversified production. Reforms permitting farmers to choose what they produce caused many to switch from grain crops into more profitable economic crops and sideline activities—such as raising fish. As a result, total aquaculture output doubled from 1978–1984, and freshwater ponds accounted for 85 percent of this increase.

Growing numbers of individual households and collectives are specializing in fish farming. State-owned breeding areas can now be contracted to them on an unlimited basis, as long as contract obligations are fulfilled. This reverses the situation in the past, when almost all waters were fished exclusively by State-run organizations. More than 4 million specialized fish farmers produce half of China's freshwater fish, while State-owned enterprises account for the other half.

Local enterprises and individuals are stocking previously uncultivated natural ponds, changing marginal land from rice to fish cultivation, and converting fallow areas of low-lying land to fishponds. Total area under aquatic cultivation grew to 3.5 million ha in 1985 due to these local efforts. In addition, the traditional method of raising carp in rice paddies also began to regain popularity as a source of additional income for rice farmers, with total area growing to 606,000 ha by July 1985, up 25 percent over the past six years. Twinned rice-carp crops supply fish for rural diets, while carp in the rice fields also help raise rice yields up to 10 percent by eating harmful insects in the paddy water (some species even eat mosquito larvae), freeing paddies of weeds, and fertilizing fields.

Drawbacks of small-scale efforts

The surge of farmers into aquaculture production may boost output levels for a few more years as area under cultivation expands, but to achieve hefty increases throughout the next decades, State-directed coordination efforts may be required. The trend toward decentralization and small-scale projects aimed at increasing local fish supplies has led to shortages of the technology and funds needed for upgrading aquaculture.

Individual efforts at fish farming tend to be very inefficient. According to a 1985 World Bank report, "much of [China's] fish farming area is not intensively managed, with[out] appropriate levels of productive inputs." The report blames high costs and low yields (up to seven times lower than intensively managed farms) on poorly designed pond layout, overbuilding of dikes or stone walls, insufficient depth of ponds, inappropriate breeds of fish or stocking rates, and poor feed management. Better management of local and regional fisheries and technical training courses could alleviate these problems. Although banks and government agencies have made loans worth millions of yuan to medium-sized fishery enterprises, the extent to which government organizations will commit funds to systematically improving breeding and raising projects is uncertain. If funds traditionally allocated to marine fishing were channeled into aquaculture, continued large increases in pond fish output would be possible through polyculture (cultivating mixed species at different water

depths) and increasing the number of central specialized hatchery communes to distribute high-quality fry on a wider scale.

Future aquaculture development must emphasize improving low yields and product quality. Fish feed, which enables fish to reach maturity faster than the traditional diets of wild grasses and animal manure, is now produced in limited quantities, but high prices constrain widespread use.

According to a Chinese foreign trade official, China seeks foreign cooperation in the areas of fish feed, fry supplies, breeding techniques, genetic development, and disease prevention. In March 1985 tariffs on the import of fish breeds were reduced to promote improved stock through introducing new breeds and cross breeding. For example, the water in northeast China is too frigid to support most pond culture, so salmon from the US Pacific Northwest are being introduced by the University of Washington School of Fishery and Shandong College of Agriculture. This will also help the region diversify its traditional catch of rainbow trout.

Marine aquaculture emphasizes exports

Marine aquaculture utilizes just 12 percent of the available coastal shoal, estuary, and mudflat areas, although the area under cultivation more than doubled since 1978 to 220,000 ha by mid-1985. Kelp and shellfish are the fastest growth areas, contributing the major portion of the 1984 record harvest of 649,000 tonnes of cultured marine products including shrimp, oysters, razor clams, kelp, and fish. China aims to produce almost six times this amount by the year 2000. In contrast to land-based aquaculture, State involvement in marine culture is a prerequisite to large-scale expansion because more advanced breeding and cultivation techniques are required, including those for scallops, abalone, and sea cucumbers, which are still considered to be in the developmental stages. China needs scientific cooperation in studying fish and shellfish pathology and the proper nutrition of cultured seaweeds, fish, and shellfish to speed growth and increase size.

State support for marine aquaculture is more likely than for freshwater aquaculture because many species can be raised specifically for export, and bringing a high value on the international market. An increasing portion of prawn, crab, clam, and oyster exports will come from these marine farms as natural supplies decline due to excessive harvesting.

Shrimp and prawn breeding attracts foreign involvement

Currently, 80 percent of China's prawn harvest is exported, chiefly to Japan and Hong Kong, earning close to $100 million in foreign exchange. Exports of frozen and dried prawns and shrimp comprise 13.7 percent of aquatic products by weight, but account for 37 percent by value. China's developing prawn export potential is clearly demonstrated by trade statistics. In 1984 the US imported 1,572 tonnes of shrimp from China worth almost $12.5 million, an increase of 51 percent over 1983. In 1985, the value of imports further increased to $21.3 million, a 70 percent increase in the last year. US importers are buying more high-quality shrimp at prices lower than those of US producers. As the Chinese search for means to increase foreign exchange supplies to pay for modernization efforts, cultivated prawn exports will continue to rise.

Several joint ventures between foreign companies and Chinese aquatics farms produce shrimp, some of which is exported to recoup investment costs. For example, Genossenschaftliche Zentral Bank AG (Austria) began a ¥36 million project in late 1985 to breed and raise prawns in cooperation with the Foreign Economic Commission of Xinjin County, Dalian. A Japanese seafood firm set up the Lianyungang Prawn Breeding Company in late 1984. These and other efforts have caused production of artificially bred prawns to quadruple in the past three years.

These projects may be just the beginning. Fully half of the aquatic projects at the 10-nation International Agricultural and Technological Exhibition, held last November in Beijing, involved shrimp production. These projects ranged from developing coastal shoals and expanding prawn culture to importing prawn breeding, freezing, processing, preserving, and transporting equipment.

China's fishery sector has also received help from several international organizations. One of the largest projects, in both scope and value, is the $18.9 million Bohai Bay Seafood Development Project sponsored by the World Food Program (WFP). The agreement concluded in December proposes to renovate 2,860 ha of marine prawn farms along the Bohai Coast as a model for the whole country. Development of this key shrimp-producing region should provide the foundation for continuing growth in shrimp cultivation throughout China.

Facing up to the problem of overfishing

For years, marine fishing policy emphasized only the quantity of marine products caught. This encouraged an overconcentration of fishermen, disregard for breeding seasons, and little development of new resources, leading to severe overfishing. For example, the popular greater yellow croaker catch—considered China's best-flavored affordable fish—has declined by 80 percent over the past 15 years, and 65 percent during the past five years alone.

In an effort to maintain current levels or increase catches slightly, marine policy now focuses on three areas: efficiency in catching and processing fish caught in coastal waters, exploration of deep-sea fishing potential in international and foreign waters, and institution of a marine resource management program aimed at preventing continued depletion of fish resources.

Deeper into domestic waters: Modernized fleet needed

The first step in increasing ocean catches is for China to declare a 200-mile exclusive fishing zone to take full advantage of the fertile coastal shelf and prevent continued overfishing by Japanese and Korean vessels. Due to the limitations of its primitive fleet and marine boundary disputes with Japan and South Korea, China has not claimed its 200-mile zone. A 12-mile territorial sea area is the country's only claim to date. But if the disputes can be resolved, China is expected to extend its claim to the 200 miles within the next year. A plan for enforcing the marine boundaries and managing the fisheries has already been submitted to the government.

China's fishing fleet is currently only equipped to fish shallow coastal waters, usually less than 100 feet deep. These smaller boats remain close to shore, and stay at sea less than two weeks since few contain

refrigeration or processing facilities, and ice-carry capacities are severely limited. But to maintain sizable catches, fleets must venture out into deeper waters—and in order to do so, the existing fleet must be modernized.

Since no Chinese shipyard currently specializes in producing advanced fishing vessels, China must import the boats it needs for longer voyages. Many local fishing companies have already begun motorizing their fleet, and the next step is importing larger, modern trawlers or establishing joint ventures to build these vessels. Tariffs on powered ships, including fishing vessels, were cut by over half in March 1985.

Modernizing the fishing fleets of all coastal provinces will require extensive involvement of foreign firms. Guangdong, one of the largest marine fishing provinces with a 600,000 tonne catch in 1984, plans to purchase 100 150-tonne, 500-hp fishing vessels and 100 80-tonne, 200-hp wooden trawlers for shrimping. It will also seek foreign help in modernizing 200 existing boats.

Hong Kong and Japanese companies have already begun selling boats to the largest ocean fishing enterprises. For example, the Second Zhoushan Sea Fishery, located in the Zhoushan Archipelago (one of China's richest fishing grounds off the coast of Jiangsu, Shanghai, and Zhejiang provinces) began a major joint venture with the Taiyo Fishery Company (Japan). The venture will invest about $1 million in open-sea fishing, including purchase of six pairs of advanced trawlers. But with medium and small-scale fishing operations now contributing 60 percent of the country's total output of aquatic products, smaller scale opportunities for cooperation are also possible.

Supplementary accessories for boats are needed to permit excursions into deeper waters, including communications equipment, fish finders and fishing aids, and radar and satellite navigation equipment. Foreign involvement in these areas has been limited to date. A fishing gear company was set up in Tianjin by the Kobe Friendship Trading Company (Japan) and the Tianjin Agriculture, Industry, and Commercial Corporation at the end of 1984, and Wishma (US) made a sale of advanced sonar fish-finding systems to a Zhejiang fishery in 1985.

Improving preservation techniques

Currently about 15 to 20 percent of the annual catch is lost to spoilage. Better preservation methods are thus key to increasing the amount of fish that reaches the market. China has only a few refrigeration vessels used by a small minority of the State fisheries. Most fishermen keep their catch on ice in the boat hold until depositing it at local onshore processing and distribution centers, which often lack refrigeration facilities themselves. Increasing the availability of ice, fitting newly purchased boats with refrigeration systems, and buying transport vessels with refrigerated holds will permit boats to stay at sea for longer stretches of time.

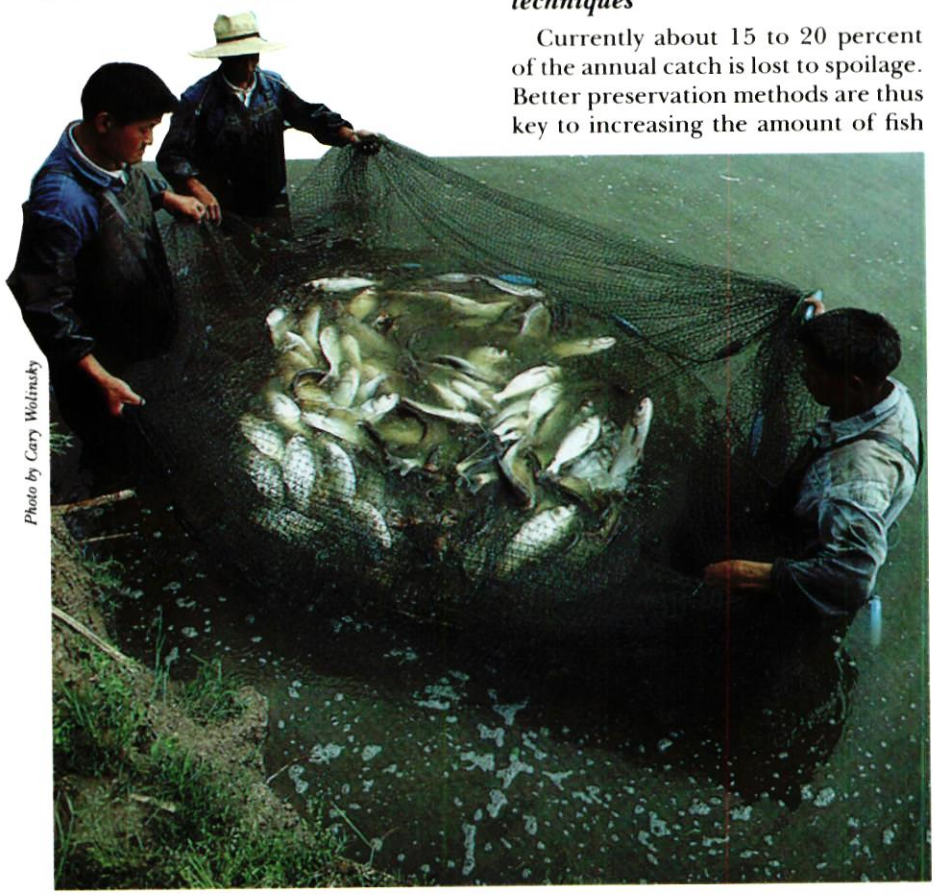


Photo by Cary Wolinsky

Cold storage, refrigeration, and freezer capacity in regional centers have grown in the past two years but remain insufficient. More than 500 small cold-storage plants are being built by individual households, fishing teams and brigades, fishing corporations, and processing facilities. These will be able to quick-freeze 2 million tonnes of fish for market annually—although at any given time cold-storage deadweight capacity is only 50,000 tonnes.

The food processing industry has long been underdeveloped (*see* p. 33), so it is not surprising that fish processing has received little attention until recently. Improved high-quality drying and canning facilitites are needed to guarantee that a larger percentage of aquatic products reach the market, and also permit increased exports. For these reasons, the aquatic products processing industry plans to expand its present capacity of 1.48 million tonnes to 5 million tonnes by 1990. Efforts will focus on local collection centers, where most processing takes place.

Testing foreign waters

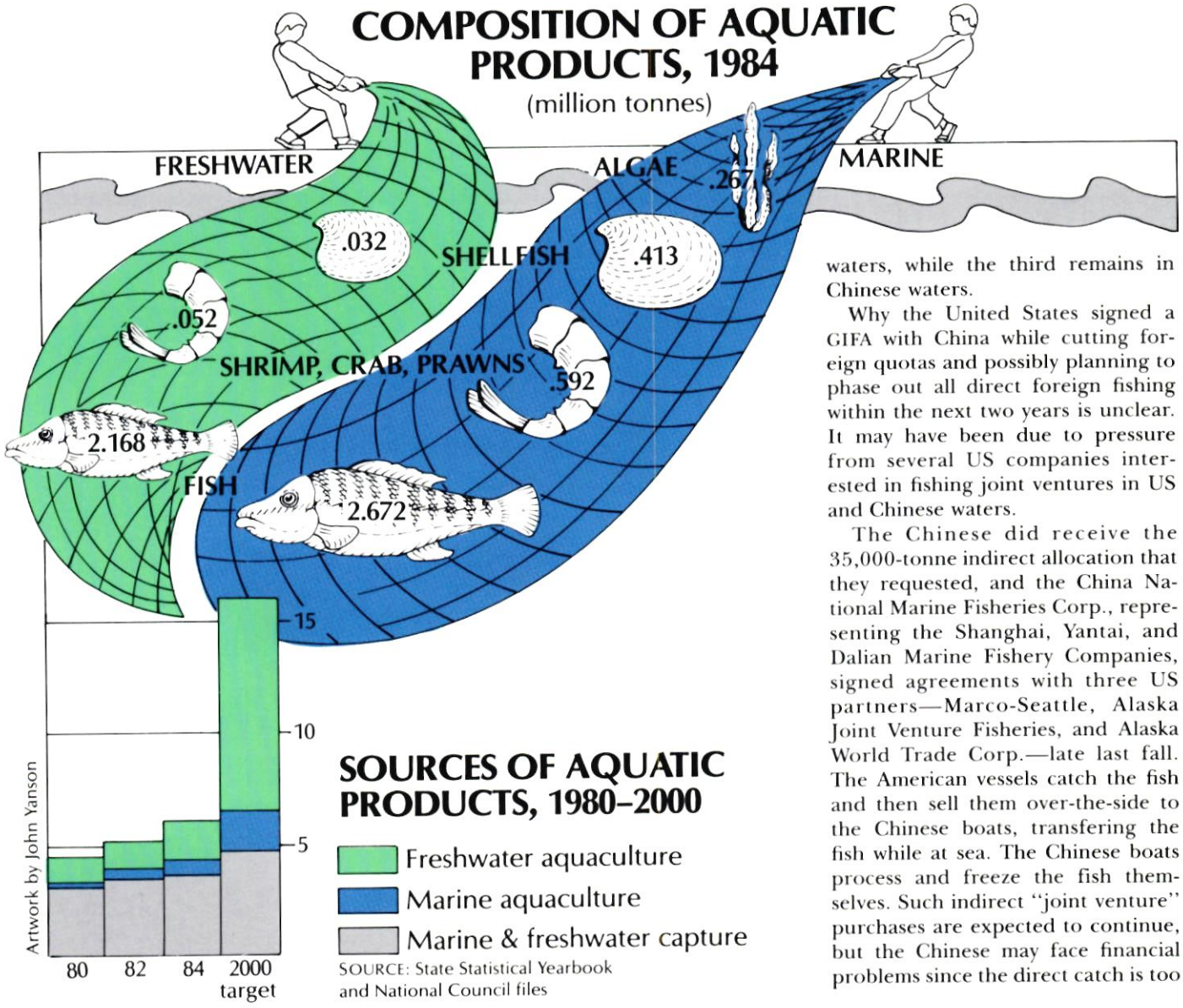
A major source of fish for the world's largest fishing powers are international fishing grounds and the 200-mile fishing zones that have been opened in other countries. China has never seriously explored these areas in the past because of a dearth of high-seas fishing technology. However, several recently formed joint ventures off the West African coast will allow China to explore this option. Four major Chinese fishing companies are involved (Yantai, Guangdong, Zhoushan, and Fujian marine fishery companies), as well as companies from Senegal, Guinea-Bissau, Sierra Leone, and the Canary Islands. A portion of the catch from this first ocean-going fleet to operate outside Chinese waters since 1949

goes toward paying local African taxes, while the rest of the catch is sold in Africa and China. But these deep-sea fishing ventures alone cannot alleviate Chinese supply problems, since each joint venture catches only 1,000–2,000 tonnes per year.

Large boats with sophisticated trawling equipment, fitted with freezing and processing units, will be needed to expand into foreign waters. Although expenses can be recouped through sales of fish, only a few vessels have been purchased. The African joint ventures now own about 25 boats operating off the coast of Africa. China also recently purchased two vessels to operate in the Falkland Islands area, and three for the Bering Sea, near the Alaskan coast. By 1990 the Chinese hope to have several dozen vessels operating off the coasts of Alaska, West Africa, southeast Asia, and Latin America, although this number would still be considered an insignificant fleet by world standards.

It will be difficult for China to establish her position in the international fishing community. More and more countries are closing their 200-mile coastal zones to foreign fishing to control resources and retain aquatic products harvests for themselves. The USSR closed its north Asian waters last year. China has also run aground of US intentions to phase down foreign involvement in US waters. Thus, although China and the United States signed a Governing International Fishing Agreement (GIFA) in July 1985 that permits fishing in each other's waters and encourages joint ventures between the two countries, little has come of it.

For 1986, China has asked the US for a 35,000 tonne direct allocation and a 35,000 tonne indirect allocation (fish caught by US vessels but sold over-the-side to Chinese vessels) in the Bering Sea and promptly began "joint venture" negotiations to contract with US fish-catching partners. But last December the Chinese found they had been allocated only 984 tonnes for the first quarter of 1986. The Chinese government has been pushing for a renegotiation of the allotment, but the United States maintains the treatment was fair considering how its other long-term trading partners fared. This can be of little consolation after China bought three West German trawlers of 3,000-tonne capacity equipped with filleting machines specifically for processing pollock fillets in US waters. As one Chinese official bitterly complained, "The quota is not even enough to send one boat." China currently has one of their boats in the Bering Sea, another in north Pacific waters, while the third remains in Chinese waters.



Why the United States signed a GIFA with China while cutting foreign quotas and possibly planning to phase out all direct foreign fishing within the next two years is unclear. It may have been due to pressure from several US companies interested in fishing joint ventures in US and Chinese waters.

The Chinese did receive the 35,000-tonne indirect allocation that they requested, and the China National Marine Fisheries Corp., representing the Shanghai, Yantai, and Dalian Marine Fishery Companies, signed agreements with three US partners—Marco-Seattle, Alaska Joint Venture Fisheries, and Alaska World Trade Corp.—late last fall. The American vessels catch the fish and then sell them over-the-side to the Chinese boats, transfering the fish while at sea. The Chinese boats process and freeze the fish themselves. Such indirect "joint venture" purchases are expected to continue, but the Chinese may face financial problems since the direct catch is too

small to cover the fleet's expenses.

New fishery law

The aquatic products industry is expanding rapidly and with very little planning: anyone can put a boat out to sea or dig up fertile land to create ponds. The Fishery Law, which will go into effect in June 1986, seeks to establish order in the industry and thus improve chances for long-term gradual increases in production. It provides guidelines for breeding and sets strict controls over fish resources. The document guarantees public and collectively owned units the right to lease public waters and then rent them to collectives or individuals. County fishery departments will be responsible for regulating waters in their districts.

The document controls the growth of the coastal fishing fleet and trawler operations through a licensing system for fishing enterprises, and by drawing boundaries for fishing zones. The administrative system is strengthened by establishing provincial-level responsibility for allocating and enforcing the central government limits on vessels, nets, and other fishing tools. Finally, county and provincial organizations will be responsible for "work[ing] out a unified plan for waters under their administration and adopt[ing] measures to multiply fishery resources."

The haphazard growth of the fishing industry must be supplemented by planned expansion and controlled management of aquatic resources. The success of central, provincial, and local governments in promoting higher yields and regulating the patterns of fishing will determine whether China can solve the age-old problem of supplying its citizens with enough fish to eat. 完

FISH MARKETS IN TRANSITION: THE SHANGHAI AQUATICS PRODUCTS BUREAU

Relying on aquaculture alone will not solve China's fish shortage. A March 1985 State Council directive on the aquatics industry takes a broader approach. It advocates deregulating purchase and selling prices, abolishing State purchase quotas, and permitting competition in supply and price by authorizing State-owned enterprises, collectives, and licensed individuals to compete in all markets. Shanghai's application of these principles to its aquatic products industry provides insight into China's price deregulation and market reforms.

The Shanghainese love to eat fish, and many are happy that increased competition has made fish more available at free markets. However, other citizens and officials complain that the increase in aquatic products' prices has been greater than that of most other foodstuffs, and prices of favorite varieties such as yellow croaker, silvery pom fret, shrimp, and crab continue to rise. Many consumers simply can no longer afford to buy fish.

Under the old system, the municipal Shanghai Aquatics Products Bureau controlled all catching, raising, processing, transporting, and marketing of fish. The bureau bought aquatic produce at high prices but sold it cheaply to urban consumers, subsidizing prices so that they remained constant from 1958 to 1979. But as the gap between costs to producers and consumers grew, so did the discrepancy between supply and demand in the marketplace. Shanghai made one price adjustment in 1979 that let prices rise by about 35 percent—still not enough to make up for 30 years of controls and low prices relative to other food prices.

After food prices were decontrolled on April 16, 1985, the aquatics bureau raised prices and reorganized in an attempt to become profitable. The only restrictions placed on the bureau were a maximum 20 percent markup in price from purchase to sale, and no more than 13 percent profit on total sales revenues. State prices increased rapidly during April and May to levels approaching those of free markets: rising 100–200 percent for ocean fish and 50–70 percent for freshwater products. Competition between the public and private sectors became keen, with quality the primary criterion for consumers after prices had become comparable.

Shanghai is encouraging more aquaculture by granting loans at favorable rates to suburban units that want to build ponds. The city set aside 26,400 ha of new land for fish ponds, raising the municipality's total to 59,400 ha. But the two to three year time lag between stocking new ponds and harvesting mature fish prevents a rapid increase in supplies to stabilize prices.

Reforms also allow more flexible purchasing and distribution systems. The Shanghai Aquatic Products Bureau still sends its own boats out to catch fish, and sends buyers to the countryside and ports to purchase fish. But producers are no longer required to sell their goods to the bureau, which now signs contracts with units and participates in the major trading markets that attract both public and private buyers and sellers. An average fish-producing unit can now get its products to the marketplace by several different methods. It can hire a private transportation company to send the fish to market, transport and sell the products themselves, or sell the fish to aquatic bureaus or private traders from Shanghai or other provinces (who then assume transport responsibilites).

By June 1985, 13 percent of all aquatic products in Shanghai were sold outside the bureau's system. At the centrally located Shanghai Aquatic Products Store, run by the bureau, business decreased by 40 percent after prices were decontrolled. A large share of customers switched to buying in the free markets, where fresher, better quality products are generally available at only slightly higher prices.

So far the free markets have been successful in competing with the State, and have broken the bureau's former monopoly. Producers reserve the largest and best quality fish to sell through private channels, because they earn more money on the free market. Since the bureau buys in large quantities, it cannot pick out the best fish, while private traders deal with smaller qualities and pay higher prices. Also, private traders are more motivated to deliver fresh, undamaged fish to the market to gain the highest possible selling prices.

The State organization's role is changing as its monopoly over aquatic products is broken. The manager of the Shanghai Aquatic Products Supply and Marketing Company says his company's functions have diversified under reforms. Before, the bureau only had to guarantee that it delivered to market the amount of fish set by the State plan. Now, prices must be determined and contracts signed. The company's power has also expanded, in that it can compete with other provinces. For instance, fish that are not popular in Shanghai can now be sold to Beijing. The company is beginning to sell some fish abroad to earn foreign exchange to pay for modern equipment. "Possessing up-to-date information and knowledge of the principles of pricing, and supply and demand is vital to our success in supplying enough fish and competing in the marketplace," the manager notes. —JSS

Progress in Food Processing

A new stress on conservation, variety, and convenience is changing the way China eats

Linda Gramling

Food has always held an important place in the daily life and holiday rituals of Chinese. Today, as incomes rise in China, the demand for high quality, long lasting, and convenient foodstuffs is placing tremendous pressure on the long overlooked and undercapitalized food processing industry. The power of the consumer is strong in this sector: in 1985 approximately 58 percent of average personal income went for food purchases.

Although food processing ranks as China's third largest industry, it is only in recent years that it has been considered an important part of China's modern industrial economy. Heavy industrial growth received top priority during the 1950s and 1960s, while agricultural policy focused on producing enough to feed a growing population. Development of food processing was a secondary concern. But the increases in agricultural output of recent years have produced significant crop surpluses that have caused a shift in emphasis from producing food to putting this food to better use.

By Chinese definition, food processing is a catchall term referring to any activity that changes basic agricultural goods into another edible or usable form, by either artificial or natural means. The State Economic Commission developed an "Outline for the Development of the Food Industry," which sets ambitious goals of raising the output of the food industry from ¥60 billion in 1980 to ¥300 billion by the year 2000, while boosting food processing from 11 percent to 15 percent of total industrial production.

The priority of food processing is also reflected in the Seventh Five-Year Plan (1986–1990), during which the State plans to invest ¥6 to ¥9 billion ($2 to $3 billion) in food processing, doubling the level of output. Currently, the food processing industry (one component of the overall food industry) produces goods valued at ¥45 billion per year.

To achieve these targets, corporate taxes have been reduced or waived for Chinese enterprises producing foods targeted under the plan. These products include canned foods, processed meats, bean products, edible oils, pastries, sweets, dairy products, preserved fruits and juices, condiments, and children's foods.

But to realize its goals, the food industry may also have to improve its chain of authority. Myriad ministries, corporations, and other enterprises are involved in food processing, making it difficult to see plans through from pasture to plate. For instance, although food production and variety are increasing as farming decentralizes, it is now more difficult to coordinate supplies for food processing factories.

Stress on nutrition

A new emphasis on nutrition, especially the need to increase the protein in the diet, has helped establish priorities for the food industry. A recent survey by Chinese dieticians revealed that, although sufficient in calorie count, the typical Chinese diet should include more meat, fish, dairy products, and fruit, with fewer calories coming from the cereal group. Calcium deficiencies are also a problem—children are currently getting only half the recommended daily amount of calcium.

In response to this situation China plans to upgrade the quality of meat and dairy products by setting up new cattle grazing areas, improving livestock feed processing, and renovating large and medium-sized dairy factories. Only 300,000 tonnes of meat, or about 10 percent of slaughtered animals, are processed each year in China. Milk consumption is already on the rise, reaching 4.4 million tonnes in 1984, up 13 percent from the year before. Development of high-nutrition children's foods is another priority in the plan. Milk formulas will be improved by adding more vitamin D and iron, and instant cereal production will be increased.

Canned foods gain in popularity

Reducing waste and making more efficient use of current agricultural production is one of the main challenges for food processing. Dr. David M. Lampton of Ohio State University, who recently surveyed Chinese fruit and tomato harvests with a team of US businesspeople, claims that "25–50 percent of the crops we studied spoiled before reaching the consumer."

Only 8 percent of the fruit crop is processed in China, creating a significant spoilage problem. Each year some 300,000 tonnes of defective and wind-damaged fruit that could be made into high-quality value-added byproducts such as preserves and juices are wasted. More and better facilities for food canning will improve this situation. The State Economic Commission would like to see the waste factor drop to around 5 percent of agricultural output by the year 2000.

The popularity of canned food has grown as the prices of fresh meat,

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poultry, fish, fruit, and vegetables rise on the free markets. According to Chinese statistics, since May of 1985 the average national price of fresh pork in Beijing rose by almost 50 percent and fresh beef 120 percent. Meanwhile, prices for the canned versions of meat products, as well as fruits and vegetables, remained relatively stable. Part of the reason behind this price stability lies in the fact that canning can be done at harvest time when prices are relatively low; canned goods can then be made available at relatively low prices year round. This helps offset seasonal and regional fluctuations in supply, and allows year-round nationwide consumption. For instance Beijing consumers can now buy popular items such as Sichuan oranges and Guangdong lychees even in winter, as canned goods. But Fred Surls, head of the USDA Economic Research Service's China section, points out, "about 90 percent of the foodstuffs being canned for domestic consumption are used locally, so peasants still generally eat what they grow." Of course, canning greatly increases the shelf-life of products, which in turn rounds out the seasonally available diet, albeit sourced from locally grown products.

The canning industry can be expected to grow rapidly over the next several years. Exports of canned foods are a valuable foreign exchange earner for the country, and are set to double in the Seventh Five-Year Plan. But domestic consumption is rising even faster. In 1984 the value of domestic canned food sales exceeded exports for the first time—retail sales of ¥878 million worth of canned foods were registered, compared to ¥856 million generated by canned food exports.

Canned food exports are actually declining by weight as their popularity on the domestic market increases; the percentage of canned food production being exported dropped from 60 percent in 1980 to 29 percent in 1985. The value of canned food exports has continued to climb, however, as China exports higher value and better quality canned goods. For instance, the percentage of canned pork exports is on the rise at the expense of lower value canned food such as fruits.

Freezing tops list of new preservation methods

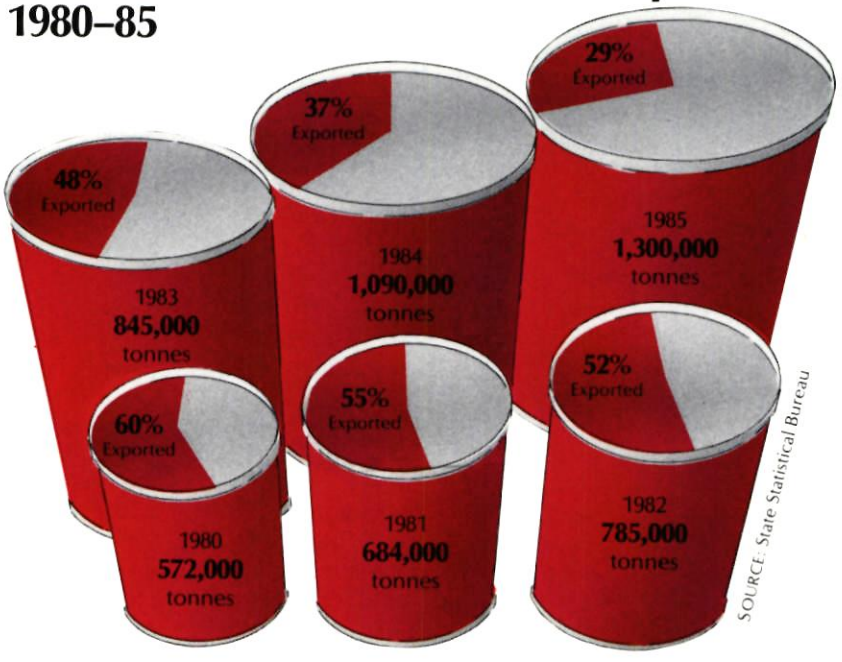
The technique of fast-freezing vegetables and fruits at extremely low temperatures was introduced in China only a few years ago. A dozen universities and research institutes in the PRC have now formed special research groups to study fast-freezing and develop the correlating special production equipment. The Ministry of Commerce is building deep-freeze plants throughout China. Existing cold-storage facilities, estimated at 2 million tonnes capacity, are also being upgraded for use with the fast-freezing method, which involves temperatures as low as minus 38 degrees centigrade.

Frozen Chinese food sells well in Japan and Europe. According to Cao Wangdong, president of CEROILS, developing frozen versions of Chinese dishes for export is "sure to be lucrative." Exports of such products are expected to grow as freezing capacity improves.

Irradiation is another nascent but promising preservation method in China. This technique uses radiation to kill bacteria in fruits and vegetables, enabling them to survive several months at room temperatures. But at the high radiation doses sufficient to completely inhibit sprouting in products like potatoes and onions, the product's texture can be impaired.

Atmosphere control is another technique being scrutinized by Chinese food technicians for use as a fruit and vegetable preservative. The apple industry in the United States already uses this method to provide a year-round supply of fresh apples. By storing fruit in air-tight chambers, the oxygen level is reduced and the carbon dioxide and nitrogen levels increased, lengthening the storage time of apples from one or two months to six months. Although the air-tight chambers are costly and can be dangerous to work in, the incentives to develop this technique are large: Chinese apples sold in Singapore, Japan, and Southeast Asia command only half the price of American apples due to low quality.

Canned Food Production and Exports 1980–85



SOURCE: State Statistical Bureau

Packaging drive will bolster food exports

China's export sales have been hindered by unappealing packaging and labels on food products that often fail to list ingredients and expiration dates. The China National Packaging Corporation reports that China suffers a loss in sales of over ¥10 billion each year attributable to poor packaging. Many Hong Kong re-exporters often have to repack goods received from China before shipping them elsewhere.

To tackle the packaging problem, China has launched a nationwide drive to improve the packaging of 22 major products, including foods such as fresh fruits, eggs, and aquatic produce. The availability of raw materials for packaging is now being guaranteed for export goods. But the industry still has far to go, as a survey of packaging methods reveals.

▶**Glass:** Most glass packaging takes place in the beverage industry. According to a foreign businessman familar with China's beverage industry, glass bottles tend be of uneven thickness, with weak spots that cannot withstand the pressure of modern, high-tech filling machines. The industry is also looking for ways to correct problems of high density and low translucency of glass bottles.

▶**Paper:** Aseptic packaging is ideal for a developing country like China because it significantly lengthens the potential unrefrigerated storage time for beverages. China has imported 20 production lines for aseptic packaging since 1980, including lines for milk and fruit juices. Currently, these lines all use imported paper as roll stock, mainly from Sweden. China signed a joint venture agreement in 1985 with the Swedish firm Tetrapak to produce roll stock for new aseptic packaging production lines. Output is estimated to reach between 600 million–1 billion packages in 1987, depending on domestic demand. Given the lack of refrigerators in many Chinese households, demand is expected to be high. More generally, China is trying to modernize paper packaging production and find new sources of wood pulp (Canada is currently the main supplier). While plant fibers are plentiful, the paper made from plant fiber is of lower quality than that made from wood pulp.

▶**Metal Containers:** The Chinese have begun to produce their own two-piece can production equipment. A plant in Shanghai under the Ministry of Machine-Building Industry (MMBI) recently produced the first domestic two-piece can production line. Now in trial production in Yichang, Hubei, the machinery produces 80–90 cans per minute.

In order to meet the huge demand for canning facilities, China purchased 11 two-piece can production lines from the United States, Italy, France, and England by 1985. All the lines are expected to come onstream by 1988, adding an estimated total output of 1.5 billion cans per year.

The government has now established stricter criteria for the import of further two-piece can production lines, since newly purchased capacity will go a long way toward meeting demand. Current opportunities for foreign firms include upgrading can-lining technology and developing production lines for cans with easy-

open lids. Other opportunities lie in helping the canning industry improve seam tightness, replacing sheet metal canning lines with aluminum, and phasing out the soldering methods used in the construction of three-piece cans. Soldering leaves a residue of lead inside the cans that can contaminate food. The US Food and Drug Administration recently prohibited entry of this type of container into the United States. In the past, more than 60 percent of China's canned food exports to the United States, valued at $42.6 million in 1984, came in such containers.

▶**Plastics:** Domestic demand for plastic packaging still far exceeds supply in China, and the industry is working to expand output and diversity. One advance has been the introduction of the retort pouch, or boil-in-bag, for convenience foods and vegetables. Among the factories involved in production of retort pouch food are the Beijing Can Factory, the Beijing Food Research Institute, the Guangdong Food Research Institute, and the Sichuan Food Research Institute. China already exports some prepared foods in retort pouches, including Kung Pao Chicken, sauteed pork with vegetables, and shredded beef.

Distribution systems in flux

Although significant strides are being made in food preservation and packaging, the food marketing and distribution system will also need to be changed to eliminate rural harvest waste and improve food availability. Until recently, most food processing facilities have been located in urban areas, where demand for processed foods is highest. But this necessitates high-volume transportation of agricultural produce from countryside to city. Many farmers complain of difficulty selling their crops at harvest time due to transportation bottlenecks, resulting in crop spoilage. According to one US businessman, peasant farmers with early, late, or small yields often wait for days for a pick-up from State storage trucks. And when the trucks *do* come, workers are often careless in their handling of produce.

A gradual shift of food processing centers from urban to rural areas may help this situation. To promote rural industry, the central government has called on urban food processing factories to set up branches in rural areas, sharing their technology and/or processing equipment. These county food processing centers are developing regional specialties to sell nationally.

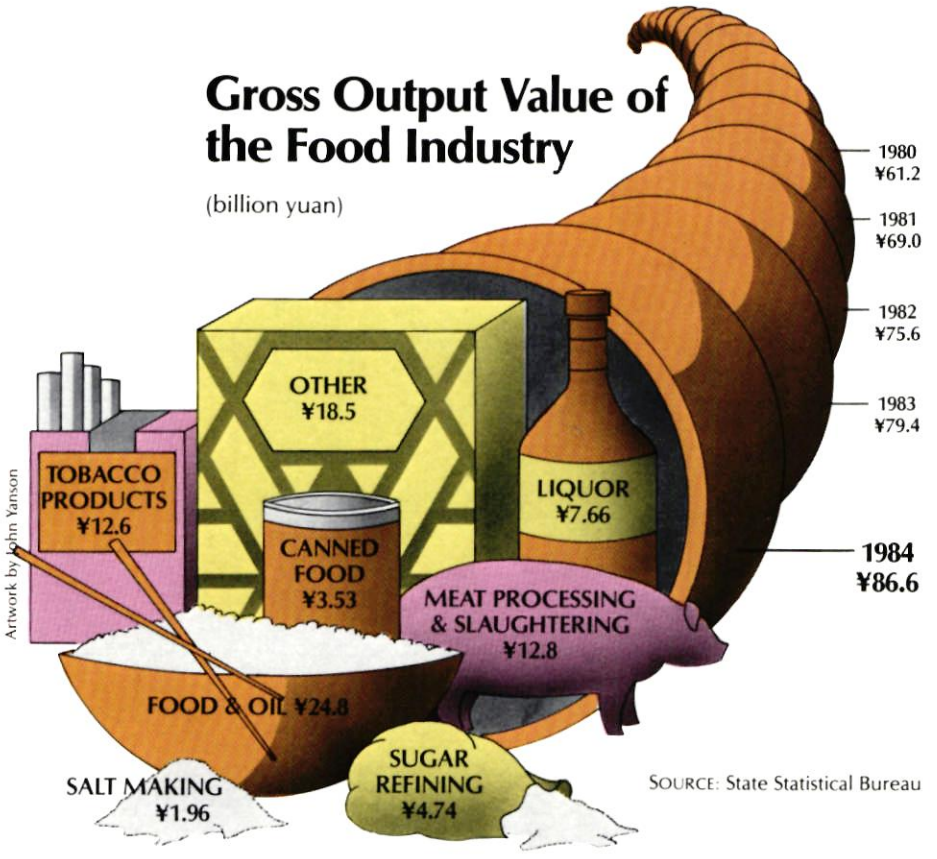
The shift in location of food processing facilities will benefit both farmers and consumers. First, road transportation will be reduced, since much traffic now consists of trucks carrying produce into the city. Other benefits include the fact that periodic rural surpluses can be more easily absorbed if processing facilities are nearby. Farmers can sell most if not all of their crops to processors when harvested, instead of relying only on the free markets. And, of course, foreign exchange could be generated by exporting a percentage of the processed food.

The actual relocation of processing facilities to rural areas will take place gradually, but other short-term solutions are possible. For instance, one US firm is marketing mobile food processing truck-trailers that can travel from village to village to mill grain and process dairy products, fruits, and vegetables. Although the firm has signed no contracts yet, they believe China will need such equipment to fill in food processing gaps for at least the next 10 to 20 years.

Convenience foods catch on

The average three to four hours spent buying, cleaning, chopping, and cooking traditional Chinese food every day is no longer economically feasible for many citizens. Sales of such convenience foods as instant noodles, snack foods, and instant baby food are growing rapidly in urban areas and are continually in short supply. The expanding convenience food market can be tied in part to China's new emphasis on productivity. In practical terms, the official shortening of the *xiuxi*, or midday rest period, from two-and-a-half hours to one hour on January 1, 1985, alters the lunch pattern for many Chinese workers who used to return home to eat. Getting a quick meal during working hours can pose a real problem.

The demand for instant noodles in Beijing is so high that the Beijing Food Industry Corporation boosted its working day from one to three shifts in just three months. Responding to the demand for tasty, inexpensive, fast foods, nonstaple food factories in Beijing are turning out not only instant noodles, but Western-style bread, cookies, and crackers. The Chinese still regard bread as a



novelty snack, but in the future it may compete with staples such as rice and millet for a dominant position in the Chinese diet.

Soda pop is another hot seller in the convenience food sector. Soft drink production hit a record 1 million tonnes in 1985, up 28 percent since 1980. The Ministry of Light Industry plans to expand soft drink production to 3 million tonnes by 1990 and to 10 million tonnes by 2000. Charles Diodosio of Beatrice Foods Company explains "when people have money to spend and want to treat themselves, they buy things like soft drinks." Beatrice and others are currently beginning to produce soft drinks, ice cream, and snack foods for the domestic Chinese market.

Restaurants and snack stalls improve variety and hygiene

Large cities are doing a brisk business in snack foods and many new snack stalls are being set up by China's budding entrepreneurs. Beijing has over 3,000 snack canteens, and added 1,100 breakfast stalls in the first nine months of 1985. An estimated three-fourths of the city's 4 million factory and office workers eat at these snack canteen facilities at least once a day, as does much of the large "floating population" of visitors to Beijing.

The snacks served in canteens and stalls are usually of the Chinese vegetable-and-rice variety, steamed buns with meat, or dumplings. These snacks generally sell for between $.18 and $.50 each and average between 2,400 and 3,200 calories.

Western-style food is also becoming available in Beijing and other large cities. Hamburgers, hot dogs, and fried chicken can be found in a few Chinese restaurants, like the Yili Food Company's Donald Duck Restaurant in Beijing, but rarely in street snack stalls.

While eager to increase the number of snack stalls and restaurants, government officials are also concerned with upgrading hygiene standards. Efforts have been made in the last several years to crack down on the relatively high incidence of food poisoning. More than 320,000 people were punished in connection with "food poisoning crimes" in 1984. Since the implementation of the Food Hygiene Law in 1983, food contamination cases have dropped to one-third of their previous level. Every food enterprise is now required to set up a food hygiene unit, and 2,670 inspection units have been established—up 25 percent since the law was promulgated. More than 95 percent of processed food reportedly now passes the State's hygiene regulations.

But many restaurants still do little more than cursorily rinse chopsticks in water, contributing to the spread of saliva-borne diseases such as hepatitis and dysentery. And many food processing facilities could benefit from the introduction of specialized cleaning chemicals and techniques.

Opportunities and issues for American firms

The Ministry of Commerce reports that China spent $100 million in 1984 on imported food processing equipment and technology, including 80 food processing production lines. The rapid development of China's food industry has created opportunities for both large and small US companies (*see* chart, p. 38). To step up its export of food products, China is buying foreign machinery and equipment to produce more food for export markets. Small firms offering easily operated, small-scale machinery and product lines may find opportunities for both leasing and selling equipment. They may also find opportunities to supply equipment to large US companies that have established food product joint ventures in China. Because China's food industry lags far behind the West, Chinese enterprises are still interested in buying food processing technology that may be considered obsolete by US standards. The recent concern over foreign exchange in China may make some sales more difficult, however. In 1985 China tightened import controls over fast food production and food packaging lines. Imports of these items will be subject to a 10 percent additional import regulatory tax, and must be negotiated with both MOFERT and the ministry directly involved.

Better business opportunities are presented by the following areas, which are viewed as important by central authorities: bakery equipment; dairy processing equipment; brewery equipment; soy texturization; corn processing and related product development; condiment processing equipment; margarine-making equipment; meat processing equipment; frozen foods; flour production equipment; and specialized processes for enzymatic operations, food preservation, and specialty ingredients.

While it is tempting for suppliers to think in terms of straight sales of

Photo courtesy of New China Pictures

Attendants fill mess tins at a snack stall in Beijing.

equipment, the Chinese are likely to request some form of investment in a joint venture or co-production arrangement. The Chinese feel that foreign firms supplying equipment and technology on a straight sale basis have little incentive to ensure that the equipment is installed and operated correctly. An investment arrangement indicates that the foreign company is interested in developing a lasting relationship, and supplies the industry with much needed capital. A shortage of funds is probably the major obstacle facing domestic food processors in China. The industry's fixed assets stood at only $14 billion in late 1985. Chinese food companies often have difficulty acquiring large sums of foreign exchange, unless the products they produce are specifically targeted in the five-year plan or are for the export market.

Several large US companies have already made significant investments in China (*see* chart). For instance, Nabisco Brands, Inc., among others, is venturing into the Western snack food market. Their joint venture with the Yili Food Company in Beijing will produce Ritz and Premium Saltine crackers, and market them under a combined Yili and Nabisco trademark. Most of the products will be sold domestically, but some will be exported to balance the joint venture's foreign exchange requirements. Scheduled to come onstream by mid-1986, the venture's initial annual output will be 5,000 tonnes of biscuits—with at least 500 tonnes marked for export.

The H. J. Heinz Company has formed a joint venture to produce instant baby foods, and is also getting involved in a number of other areas—the company has done research on growing tomatoes in China over the last few years, including varieties of top-quality hydroponic tomatoes. Heinz also recently established an institution devoted to the nutritional sciences, located within the joint venture's baby food factory.

Foreign investors must be willing to brave the tangle of food processing bureaucracy, and adapt to often difficult factory conditions. Technicians currently comprise only about 1 percent of the food industry workforce. And, as in other sectors of the Chinese economy, foreign investors will have to deal with the problem of how to repatriate profits made in China. Joint ventures will be expected to export a certain percentage of their output to balance their needs for foreign exchange.

On the bright side, food products enjoy priority in the Seventh Five-Year Plan, so companies investing in the industry are likely to receive tax incentives, guaranteed supplies of raw materials, and in some cases, preferential loan treatment. In the long term, China is a market many firms feel they cannot afford to pass up. Retail sales of food products grew from $46.7 billion in 1983 to $55.2 billion in 1984, and will keep rising. As wages rise, more money will be spent on food products. As long as consumerism plays a bigger role in China's economy, food processing will be an area of opportunity. 完

US–CHINA FOOD PROCESSING SALES AND VENTURES (SINCE 1984)

US Party/Chinese Party	Arrangement/Value	Date
Beatrice Foods Company/Guangzhou ITIC and Guangzhou Food Industry Corporation (Beatrice 50%, ITIC 10%, Guangzhou Food Industry Corp. 40%)	Joint venture to produce canned fruits, vegetables, soft drinks, sherbet, wafers. $20 million. Duration: 15 years.	Start up 10/84
Coca-Cola Company/Construction and Development Corp. of Xiamen SEZ	Licensing agreement to bottle Coca-Cola, Fanta Orange, and Sprite.	10/84
Coca-Cola Company/Zhuhai Beverage Company and Macao Beverage Company	Licensing agreement to bottle Coca-Cola, Fanta Orange, and Sprite beverages.	6/85
DeFrancisci Machine Corp/NA	Sale of pasta-making machines.	5/84
FMC Corporation/NA	Leasing 19 citrus juice extractors to several end users.	8/84
General Foods Corporation (US)/ Dongguan County Starch Factory (50%-50%)	Established joint venture, the Dongmei Food Company, to raise cassava to make starch for export and sale in the PRC. Duration: 15 years.	1/85
General Foods Corp./Tianmei Food Company, Tianjin (50%-50%)	Established joint venture, the Great Wall Food Factory, to produce instant coffee and breakfast drink for PRC consumption.	Est. 11/84
General Foods Corp./Guangzhou Dairy Products Factory, Guangzhou (50%-50%)	Established joint venture company, the Guangzhou Beverage Corp., to produce instant coffee for PRC consumption.	10/85
H.J. Heinz Co./United Food Enterprise Inc. (Guangdong) and the General Corporation of Agriculture, Industry, and Commerce (Guangdong) (US 60%, PRC 40%)	Formed joint venture, Heinz-UFE Ltd., to produce high-nutrition cereal for infants, primarily for use in the PRC. $10 million.	To begin mid-1986
Harry Langerman/Shenzhen (US 33%, PRC 67%)	Investment of $300,000 for fast food restaurant chain.	9/85
George J. Meyer Manufacturing/NA	Awarded contract for soft drink factory.	9/85
Orchid Foods Int'l, Inc./Tianjin (US 40%-PRC 60%)	Signed joint venture agreement to set up Tianjin Orchid Fast Food Co. $300,000. Duration: 10 years.	3/85
Nabisco Brands, Inc./Yili Foods Co. (Beijing), (US 51%, PRC 49%)	Set up joint venture, the Yili-Nabisco Biscuit and Food Co. Ltd., to produce biscuits and crackers. $8.8 million.	3/85
Neumunz Inc./Shanghai Foreign Trade Corporation	Awarded a contract for design, supply, and installation of a peanut processing plant.	6/84
Pepsi-Cola Int'l/Guangzhou Xinjiao Agro-Industrial Business Co. and Guangzhou Foreign Trade Corp.	Opened a joint venture bottling plant, the Guangzhou Beverage Factory, to produce 10 million cases of soft drinks annually.	2/85
Tyler Refrigeration Corp., (subsidiary of American Standard Inc.)/Luoyang Machinery Factory, Henan, CNTIC	Licensing agreement to manufacture refrigerated display cases, walk-in coolers, freezers.	7/85

Tractors Gain Ground

. . . as tractor policy struggles to catch up with demand

Valerie J. Chang

Agricultural mechanization has long been accepted in China by both officials and farmers as a means of improving productivity. But debate still rages over what policy should be adopted to manage the spontaneous forces behind mechanization and limit their ripple effect on the structure of the economy, the pattern of industry, and the routine of rural life.

Difficulties brought on by mechanization include balancing growing consumer demand for agricultural machinery with production constrained by scarce resources; providing credit for equipment purchases without straining national credit availability; and creating new employment opportunities for farmers displaced by mechanization. The task now facing Chinese leaders is to devise a policy that will resolve these issues while continuing to promote appropriate forms of mechanization.

Agricultural reforms change patterns of tractor ownership

The growing prosperity in China's countryside has boosted use of many forms of agricultural machinery including seeders, combines, harvesters, threshers, paddy transplanters, and agricultural spray planes. Tractors, however, have proven to be the most generally applicable and widely promoted and used.

The remarkable growth in the number of tractors in use (from 1,300 in 1952 to 4.15 million in 1984) has been spurred by the relatively recent introduction of the household responsibility system. Farmers, motivated to fulfill their contracts with the State and sell their surplus on the free market, have seized upon mechanization to boost production. Private ownership has skyrocketed as a result: by 1984, individual and combined farming households owned 75 percent of the 4.15 million tractors in use.

Tractors were formerly allocated by the State among collectives and State farms. But with average rural incomes rising steadily, farmers—often aided by bank loans—have the means to purchase their own tractors. And the government now classifies tractors as freely available commodities that may be purchased without restriction. The average price for a small 12-horsepower (hp) tractor in 1985 was ¥840—a sizable investment, but one that could quickly provide returns.

The majority of privately owned tractors are small models, generally defined as less than 20 hp. Following the 1979 agricultural reforms that abolished communes and emphasized the family as the production unit, the demand for small tractors, including popular two-wheel, hand-guided tractors, rose significantly. By 1984, 3.2 million small units were in use, double the number in 1979 and accounting for 77 percent of the country's tractor total. Well-suited to individual family plots, these small tractors can also be adapted to other vital uses. Attaching a trailer cart converts the tractor into a sturdy transport and hauling vehicle, an asset in rural areas with poor roads and underdeveloped transportation systems. Government subsidization of diesel fuel prices may have encouraged the use of tractors as transportation vehicles. The tractor engine can also provide a stationary source of power for tasks such as spraying, small-scale irrigation and draining, threshing, flour milling, and fodder cutting.

While rural reforms encourage individual ownership of small tractors, the diversification of the rural economy also renews demand for larger tractors. Farmers who are leaving the land to engage in other rural occupations, such as food processing, animal husbandry, and service industries, can rent their land to specialized farming households. These specialized farmers, who may contract several such agreements, have substantial tracts of land to work and require larger scale machinery. Prices are high, ranging from ¥3,300–¥4,200 for a 20-hp tractor and averaging ¥5,000 for a 50-hp model. Often farming families pool resources to invest in the larger machinery, while those farmers who do not wish to purchase their own large tractors can rent them from the collective stations operated by the State. Formerly management and administrative bodies, collective stations have become more service-oriented, providing fuel, repair services, and spare parts to farmers.

Use of tractors has far-reaching effects

Tractors are becoming a common sight throughout much of the Chinese countryside. Jiangsu Province, with 463,900 tractors, boasts the largest number of any province; Henan comes in second with 380,000. Links between rural prosperity and the level of mechanization are shown in the fact that Jiangsu and Henan rank first and fourth, respectively, in the nation in terms of agricultural output. Nationwide, tractors

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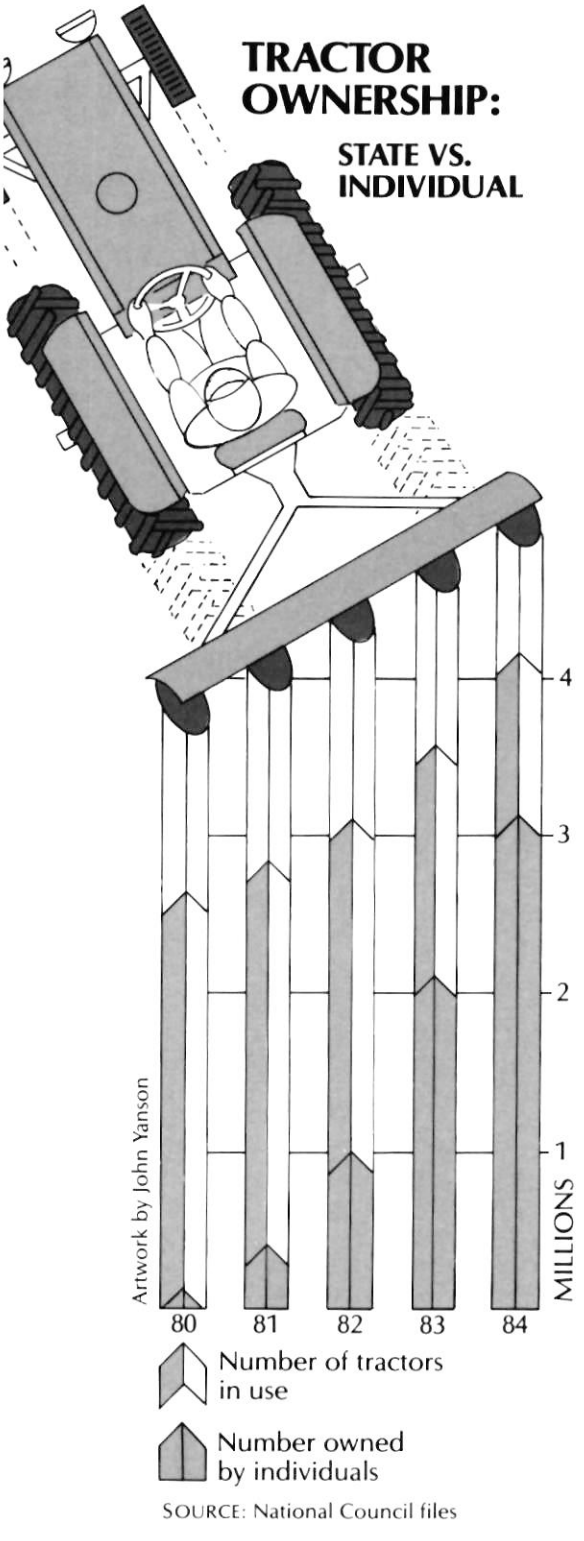
are used to plow 38.3 million hectares (ha) or approximately 39 percent of China's cultivated land.

Tractor use, along with fertilizer, improved seeds, and irrigation, has been instrumental in improving crop yields. A Chinese official noted that a major peanut-producing area in Shanxi Province could improve production by 30 percent if tractors were used for plowing instead of draft animals. In southern China, triple cropping requires farmers to harvest and replant fields in a matter of weeks. Tractors and other farm machinery have reduced the turnaround time and have made the activity less labor intensive, less arduous, and more efficient. A new form of tractor known as the "boat-tractor" has even been developed to navigate the wet paddy fields in the south.



SOURCE: National Council files

But the growth in tractor use has put a strain on some related sectors of the economy. Most tractor plants produce their own parts, which are not interchangeable with those of other producers; the incompatibility of parts, combined with the proliferation of models, has made repairs, service, and replacement of parts difficult. A shortage of trained mechanics and skilled machine operators further compounds this problem. Diesel fuel shortages and varying regional conditions have also restrained tractor use.

Viewed in a broader sense, mechanization has reached beyond agriculture to affect other aspects of Chinese society, changing the traditional patterns of rural organization and livelihood. Agricultural mechanization is viewed as a means of improving labor productivity, allowing more farmers to leave the land and seek employment in rural industry. Expanding rural industry, it is hoped, will then improve the economic status of the countryside, which has traditionally lagged behind that of urban areas (*see* p. 18). The desire to reduce the urban–rural gap has been a major factor behind the government's encouragement of mechanization. However, in some areas mechanization has occurred too quickly, idling rural labor due to the lack of other employment opportunities.

Fluctuations in tractor policy

To avoid thwarting the positive benefits of tractor use, the government needs to coordinate mechanization with overall rural development. Recent efforts to establish a tractor policy, however, have been the source of more problems than solutions.

Historically, the policy of agricultural mechanization has been highly debated. Early controversies in the 1950s centered on whether mechanization was desirable in China's labor-intensive agricultural sector. After its desirability was established, the debate turned to the management and optimal degree of mechanization. An overly ambitious program in 1978 called for 70 percent mechanization of the "main work" of agriculture by 1980 and 85 percent by 1985. However, this "basic mechanization by 1980" plan was abandoned in 1979.

The government began a new approach to mechanization at that time, allowing the tractor industry to grow in response to increased consumer demand. But this laissez-faire tractor policy has come under scrutiny recently. The government appears unsure of how to proceed, issuing directives that seem to work at cross purposes with one another.

A flurry of articles published in the State-run English-language newspaper, *China Daily*, last year illustrates the confusion. Articles with headlines such as "Farmers Queue up for Mechanization" and "Large-Scale Farms in Comeback with Modern Machinery" appeared in the early months, lauding the benefits of mechanization and decrying tractor shortages. Tractor factories were encouraged to increase production to meet growing demand.

But in August a surprising headline screamed from the front page: "Tractor Sales Plunge as Credit Squeeze Bites." Tightening of government credit in the spring had slashed consumer buying power and reduced tractor sales drastically, leaving factories with stockpiles. At the Luoyang Tractor Factory in Henan, almost 4,000 orders for large tractors, or 23 percent of the plant's contracts, were cancelled or postponed last year. In mid-October, yet another ironic headline appeared: "Imported Tractors Dent Domestic Industry Sales." Some 10,000 tractors imported from the Soviet Union and East European countries had cut further into the sales of domestically produced tractors. Yet the year ended on a hopeful note with an article proclaiming signs of a revitalized farm machinery industry, and restating the need to meet market demand and improve product quality.

The failure of government attempts to stabilize the tractor market during 1985 illustrates the difficulty of formulating a plan for tractors that balances consumer demand, production capabilities, credit availability, and regional needs. The year-end commitment to meeting demand

suggests that the government will not revert to establishing strict output levels, but will use the market to guide production levels, establishing output ceilings if demands on material resources become too heavy.

Modernizing tractor production

In contrast to the pre-1958 period, when all tractors were imported, China's agricultural machinery industry is now basically able to meet domestic needs. Every province, autonomous region, and municipality (except for Tibet), has at least one tractor manufacturing facility. Important plants producing large-scale machinery operate at the provincial level, while most low-horsepower machines are produced in county-level factories. Production volume in 1984 was more than double that of 1980 (*see* table). Small tractors now account for a larger proportion of total output, but production of larger riding tractors is also on the rise in response to expanding demand.

A recent market forecast of the tractor sector made by the Industrial and Commercial Bank of China outlined plans for the industry during the Seventh Five-Year Plan (1986–1990). Demand for tractors in 1990 is expected to reach 5.69 million units, composed of 1.06 million medium and large units and 4.63 million small models. To meet this demand, 16 factories will be designated as key producers of medium and large tractors. The annual growth in production of these tractors is expected to average 11 percent so that by 1990, 100,000 units will be produced. Meanwhile, annual small tractor production will be held to under the current 600,000 unit level. The bank believes that this combined output level of approximately 700,000 units, which is close to current production levels (although different in composition), can be sustained by domestic producers.

Although growing steadily, tractor production has encountered problems. Shortages of raw materials such as steel and pig iron were expected to limit tractor production in 1985. Although orders for large and medium-sized tractors reached 60,000 units, only some 53,000 could be produced. Following the abolition of communes in 1979, the government ordered certain factories to shift from manufacturing large to small

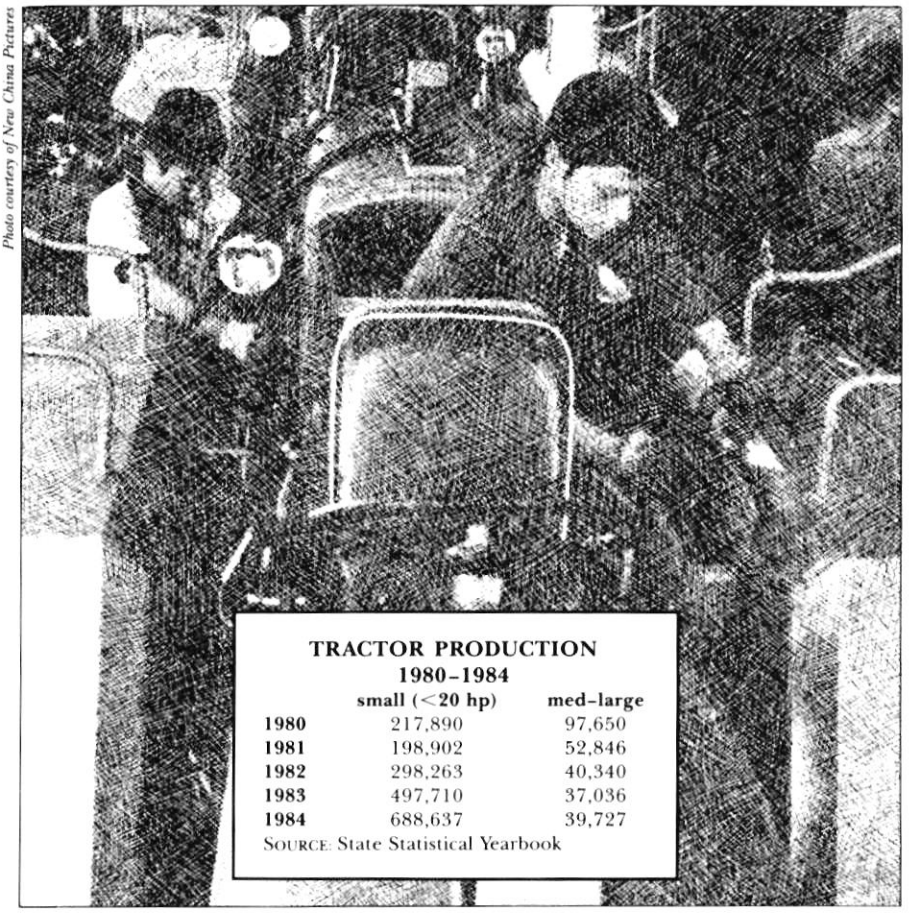
tractors to satisfy growing demand for small-scale machinery. But the subsequent, unanticipated rise in demand for large machinery led to further market imbalances as supply lagged behind demand in both areas.

Most large tractors are produced in five major plants throughout the country. China's largest and oldest tractor factory is the Luoyang Tractor Factory in Henan Province, which produces a 75-hp crawler tractor modeled on 1950s Soviet technology. Output at this plant reached nearly 12,000 units in 1984, a remarkable increase from its 1983 production of 4,000 units. Important plants in Shanghai and Tianjin produce tractors in the 50–55 hp range. At the Tianjin Tractor Factory, which produces the domestically popular "Iron Ox" model, output hit 10,000 tractors in 1985. The Changchun Tractor Factory is the country's largest producer of wheeled tractors, producing a 25-hp model, while the Shijiazhuang Tractor Factory produces mainly smaller tractors.

Photo from National Council files

Boat tractors are used in wet paddy fields

Photo courtesy of New China Pictures



TRACTOR PRODUCTION
1980–1984

	small (<20 hp)	med-large
1980	217,890	97,650
1981	198,902	52,846
1982	298,263	40,340
1983	497,710	37,036
1984	688,637	39,727

SOURCE: State Statistical Yearbook

Foreign technology aids domestic production

Tractor production falls under the jurisdiction of the Ministry of Machine Building Industry's Agricultural Machinery Bureau. Formerly the center of decision-making, the bureau now limits itself to formulating policies and drawing up development plans. Day-to-day managerial authority has devolved to local governments whose powers also include the ability to negotiate directly with foreign firms.

Many producers have turned to foreign firms for infusions of technology. Although China can basically fulfill domestic tractor demand, much of the existing farm machinery and designs are antiquated. One *China Daily* article claimed that over 70 percent of China's existing farm equipment is at least 25 years out of date.

China hopes to obtain more advanced tractor technology, especially for larger wheeled tractors. Large crawler tractors, such as the ones produced in the Luoyang plant, lack the maneuverability, speed, and efficiency of wheeled models. With this in mind the China National Technical Import Corporation negotiated an agreement in late 1983 with the American company John Deere. Deere will provide the design and know-how to produce wheel tractor chassis for six models in the 44–160 hp range. The Tianjin Tractor Factory, Changchun Tractor Factory, and Shenyang Tractor Manufacturing Works will produce the new models, all for the domestic market. These factories are currently adapting existing facilities to manufacture the new tractor models; production is expected to begin within the next couple of years.

The Agricultural Machinery Bureau negotiated another agreement for the transfer of tractor technology with the Italian company Fiat Trattori in 1985. Under the $90 million contract, which includes Italian government aid in the form of a $30 million soft loan and a $5 million grant, Fiat will provide technical assistance and parts to two tractor factories in Shanghai and Luoyang. These plants will produce 50–100 hp

tractors under Fiat license beginning in 1987. Again, the Chinese are interested primarily in the wheel technology; the Fiat-licensed tractors will be fitted with Chinese diesel engines. Both Fiat and Deere are training technical and managerial personnel from the factories as part of their technology transfer deals.

A growing confidence

China is not, however, limited to relying on imported farm machinery technology. Some domestic tractor models incorporate advanced technology: for instance the 50-hp Jiangsu 504 beat Western models to garner prizes for its performance in contests such as weight-pulling at international agricultural equipment shows. Chinese farm equipment, including small tractors, diesel engines, pumps, and agricultural implements, have been exported to countries in Southeast Asia, Africa, Latin America, and Europe. Most of the 1985 exports, valued at approximately $8 million, went to Southeast Asia.

In 1984 a line of Taishan brand tractors, manufactured at the Jinan General Tractor Works in Shandong Province, was exported to the United States with much fanfare. Taishan models of 12-, 24-, and 55-hp were billed as high-quality, lower priced alternatives to their American counterparts. The 55-hp model was priced approximately $5,000 less than a comparable American model. By late 1985, however, the California importer of the Taishan tractors was no longer in business. One tractor dealer in the midwest commented that American farmers had been hesitant to buy Chinese tractors, fearing problems in replacing parts. Although the dealer noted that the Taishan tractors were sturdily built, some features, such as the small radiator, did not satisfy potential American customers. Unable to sell either of the two models she had purchased, the dealer subsequently incorporated the Taishan models on her own farm with satisfactory results.

The Chinese are aware of the potential of their products, both at home and abroad. Though the American Taishan sales campaign was not successful, the Chinese plan to promote agricultural equipment abroad more aggressively as their technology improves and their prices remain highly competitive.

The growing demand for sophisticated agicultural machinery and services at home will also keep pressure on manufacturers high. China has established over 2,500 farm machinery sales and service centers, the largest being the Huanyu Company founded in Beijing in 1985. The Huanyu Company, affiliated with the China Agricultural Mechanization Corporation under the Agricultural Machinery Bureau, is to develop new products and technology and provide consultancy services.

Setting up such centers should help promote agricultural mechanization. The government needs to support the continued use and growth of mechanization. Past experience indicates that the country needs to coordinate policy, research, and production among various sectors and firms involved in agricultural mechanization. But the government can and should continue to allow farmers to determine appropriate levels of tractor production and use. For their part, farmers have proven that mechanization raises their productivity. They will continue to demand more and better machines as long as benefits can be gained from them. 完

MECHANIZATION ON A DIFFERENT SCALE

In China's northeasterly corner lies Heilongjiang, the country's coldest province with the shortest growing season—only three to four frost-free months per year. The short growing season permits only one grain crop, usually wheat. Yet Heilongjiang has become China's breadbasket, supplying large amounts of surplus grain, sugar beets, soybeans, and potatoes to other parts of the country. Heilongjiang's agricultural success is due largely to an intensive reclamation program that has converted vast tracts of wasteland into crop land suitable for mechanized plowing, seeding, irrigation, drainage, tilling, and harvesting.

Unlike most parts of China, much of Heilongjiang is cultivated by large-scale State farms, which operate in areas either too isolated or technically difficult to be left to traditional farming. In Heilongjiang, State farms account for approximately 2 million of the province's 8.5 million hectares of cultivated land. Huge tracts of flat, dry field lend themselves well to these large State farming operations. To fully utilize the fertile land and beat the short growing season, mechanization of the State farms is indispensable.

Heilongjiang possesses 11 percent of the nation's medium and large tractor stock, and nearly 60 percent of its combine harvesters. Although the demand for such large-scale equipment is high, Heilongjiang has little capacity to produce it. In 1984 the province made only 960 large and medium-sized tractors. Factories in the rest of the country can be of only limited help, since China still lacks the technology to produce efficient machines above 100 hp. Heilongjiang has therefore been a logical place for foreign involvement in large-scale mechanization projects linked to the needs of the State farms.

In 1978 John Deere became one of the first American companies to explore these opportunities, providing equipment for a 2,000-ha pilot evaluation project known as the Friendship Farm. Deere supplied tractors, combines, and farm implements for the mechanization of wheat, soybean, and corn production. Other American companies provided irrigation and drying and storage equipment.

In 1980 a larger project was begun at the Honghe Farm. International Harvester supplied $13 million worth of tractors, combines, and tillage tools for the reclamation and cultivation of a 20,000-ha tract of land. Financing was provided by Nichimen, a Japanese trading company that accepted loan repayment in soybeans.

The province's next major project involving foreign firms dwarfed the earlier ones in scope. This $270 million 200,000-ha land reclamation project received an $80 million loan and credit package from the World Bank in 1983. The agricultural equipment alone will cost nearly $90 million. In the first round of bidding for farm equipment, companies from the United States (Caterpillar and John Deere), Japan (Mitsubishi, Hitachi, and Komatsu), West Germany (John Deere and Bomag), and Sweden (Dynapac) received contracts to supply the required infusions of Western technology and know-how. In the second round of bidding in October 1984 contracts were awarded to American and Canadian companies.

This project is slated to produce over 440,000 tonnes of grain and soybeans annually when completed this year, or some 3 percent of Heilongjiang's recent grain and soybean harvest. The large-scale farming techniques being used in Heilongjiang differ greatly from the intensive farming practiced throughout much of the country—but they get the job done. —VJC

China's 1985 Industrial Record

Volatile swings and new policy tools

Albert Keidel

China's 1985 industrial record began with a burst of productivity, followed by six months of slowdown and decline. Reviewing the 23 percent growth in 1985's first half and comparing it to the decline in output that occurred during the second half, one wonders what reforms, incentives, and new policy measures could have produced such an unstable industrial performance.

For China watchers, the industrial record resembles a sudden volcanic eruption. Industrial heavings during the first half of the year indicate pent-up pressures, accumulated over decades, that finally found issue in the current environment of industrial management reform. Judging by the early 1985 performance, these reforms hold the potential for releasing volcanic outbursts of production, overheated investment flows, and inflationary eruptions.

Monthly data reveal year-end downturn; effect of new policies

Comparing China's average annual industrial growth rate in 1985 to the previous year's reveals nothing strange: overall growth accelerated to 17.7 percent, an increase over 1984's 13.6 percent, but consistent with a five-year upward trend in growth rates (*see* Table 1).

But something is amiss; the year's record was anything but uniform, and included not only a slowdown in growth but an actual decline in output. Only by looking at monthly growth rates do the year's events become clearer. The industrial surge was first noticed in January 1985, when output compared to the same month a year earlier was suddenly up 24 percent. Before analysts realized what was happening, the same 20–25 percent growth rates were continuing through February, March, and eventually through July.

Official growth rates started to decline rapidly in August, continuing until the official measure showed growth of only 11 percent in December. The decline from 21 percent growth in July to 11 percent growth in December is even more pronounced than it appears. These rates measure growth over a 12-month period—in other words, to derive growth rates, each month's output is compared to output in the same month one year earlier. What they do not show clearly is the fact that industrial output in the last six months of 1985 actually declined, and never recovered to the ¥74.3 billion output level achieved in June. (When seasonally adjusted measures of growth, rather than official monthly growth rates, are evaluated, the trends appear even more precipitous. Seasonal growth rates compare each month with the month before, correcting for changes averaged over many years and thus highlighting growth rates that are significantly different from the trend.)

Table 1

CHINA'S INDUSTRIAL GROWTH RATE 1980–1985

	Total	Heavy	Light
1981	3.7%	−5.2%	13.6%
1982	7.8	8.6	5.7
1983	10.5	13.8	8.6
1984	13.6	14.2	14.0
1985	17.7	16.8	18.6

SOURCE: Rock Creek Research

China first introduced a broad package of reforms targeted at the country's industrial enterprises in October 1984. These industrial reforms hold out the promise of major productivity and income gains and maturing new markets, especially for labor and capital. However, industrial reform is much more difficult to carry out than rural reform because the control of productive assets is so much more complex in industry than in agriculture: It is far easier to divide land among tillers than split up factories among workers.

Monthly data are critical for measuring the impact of China's experiments with new management and industrial policies. The economy is responding quickly to many of these new reforms, and annual data do not adequately reflect their impact. A closer look at the industrial record reveals interesting insight into the effects of the industrial reforms.

The simplest explanation for China's industrial instability in 1984 and 1985 is that when the central government relaxed various financial and administrative controls, the economy took off. When restrictions, some new and some old, were reimposed in the middle of the year, industrial activity was immediately affected.

Light industry and collectives respond most rapidly

The growth swings for light industry were particularly exaggerated, from a high of 26 percent in April to a low of 4 percent in December (*see* Table 2 and graph). During the months of rapid growth, light industry—made up of consumer manufactures and many rural industry products—outpaced heavy by five percentage points. Late in the year, as growth slowed, the light industrial growth rate fell much more sharply than heavy industrial growth rates. Whatever is influencing these growth

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patterns is having a greater effect on light industry than on heavy.

It seems that light industrial enterprises responded much more quickly to the range of incentives and management reforms introduced in 1984, and were more greatly affected by corrective policies. This can be explained by a number of factors. Light industries' scale of production is generally smaller than that of heavy industrial plants, so start-up of new capacity is faster. They are usually more labor-intensive, requiring less capital for the expansion of production. Light industrial enterprises benefited from liberalized credit policies in early 1985, because they are more dependent on bank loans for working capital than heavy industry with its substantial State financial support. (The rapid growth of rural villages is closely linked with the relaxed rural credit policies of 1984 and early 1985.) Finally, light industries are much more sensitive to household demand fluctuations than heavy industries, since they are generally engaged in the production of consumer goods. With the tighter controls over wages and bonuses introduced in mid-1985, demand for consumer goods must have fallen significantly, contributing to the faster decline in the light industrial sector.

Enterprise ownership statistics reveal another interesting trend in the 1985 industrial performance. The growth rate in output from collective enterprises was more than double that of State-owned units throughout the year. It seems that collectives, which generally have more independent management forms, were better able to take advantage of new policies to promote growth. This may be due to the fact that they are generally freer to make investment, personnel, and product decisions without seeking approval from many levels.

In the industrial slowdown of the second half of the year, both ownership forms experienced similar deceleration rates (*see* Table 2). But because collective enterprises maintained growth rates roughly two times greater than State enterprises even during the second half, it is not likely that the slowdown represents any major reversal of the industrial reform movement itself.

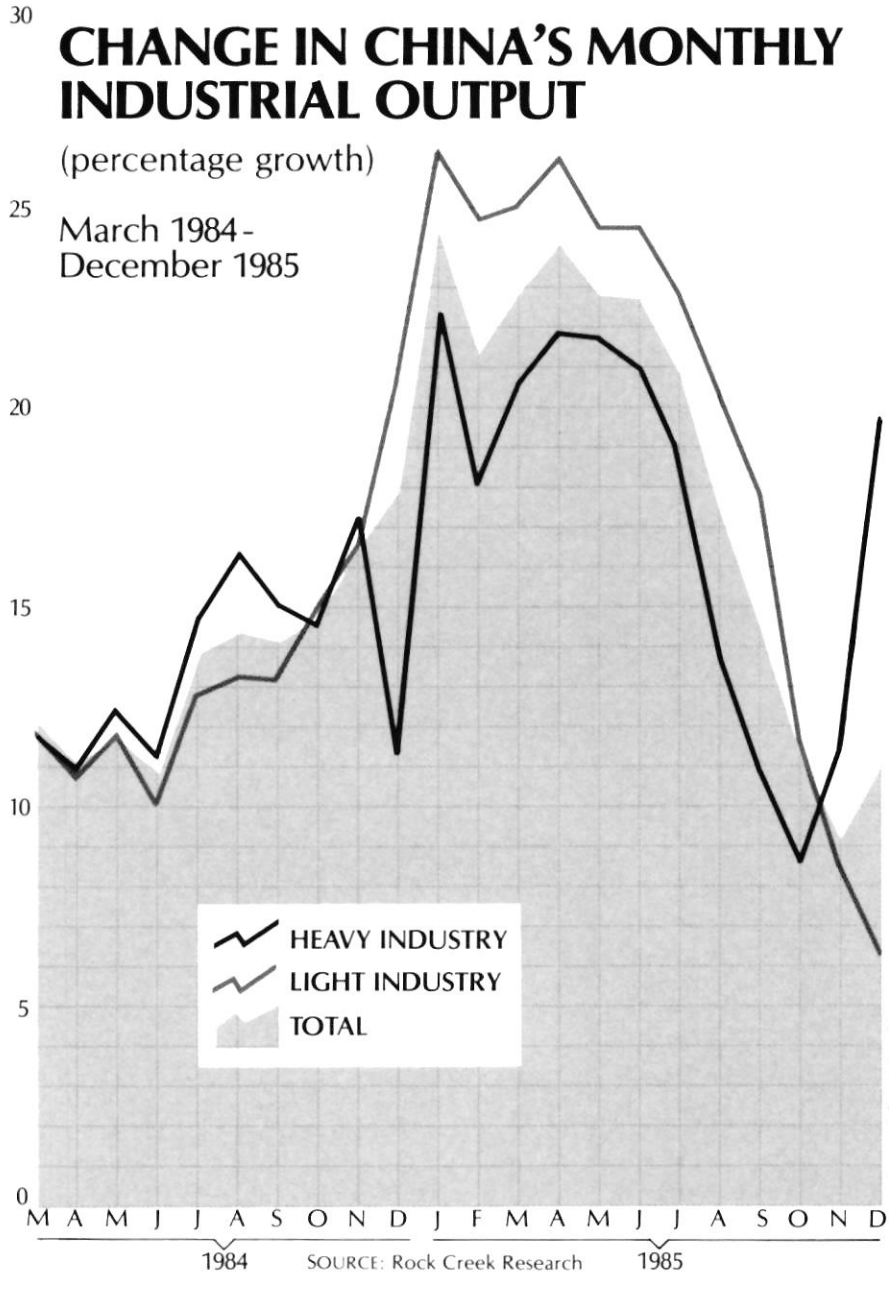
Bank reforms increase liquidity

The most catalytic of the management reforms influencing the industrial growth boom were those in banking. Just when factory managers were being encouraged to make decisions based on the goal of maximizing profits, local bank branches were being urged to make more loans to promote industrial growth.

Both the industrial and banking reforms began to be implemented on an experimental basis up to a year and a half before the sweeping reform announcements in October 1984. Local bank branches made larger and more frequent loans to local enterprises for plant and equipment purchases as well as for working capital. Evidence of the early impact of these banking reforms is found in data on the growth of China's money supply, which began to expand rapidly in mid-1984.

The loans reached their peak toward the end of 1984, when officials recognized the inflationary pressure exerted by more money in circulation. Subsequent criticism of this loose loan policy revealed that many loans were made with little analysis of the soundness of the investments. The government admitted there had been no effective national control over bank lending, either in the form of administrative restrictions or reserve requirements.

One of the reasons this expansion of credit could take place so readily was the close relationship at the local level between bank managers, enterprise managers, and Party officials. Subsequent accounts indicate that in-



terested parties from these three groups acted together to ensure that their localities benefited as quickly as possible from expanding business opportunities. The well-publicized Hainan Island scandal, although on a much greater scale than other local activities, represents this commercial ambition in its most unrestrained form.

As early as mid-1984, the experimental banking reforms also produced a widespread increase in urban wages and bonuses. This, combined with record harvests in 1984 that greatly enhanced rural incomes, further inflated consumer demand in both urban and rural areas, creating a critical shortage of consumer goods. The boom in consumer spending also encouraged local entrepreneurs to take advantage of what seemed to be nearly infinite possibilities to profit from new investments.

Resulting boom brings swift policy crackdown

The combined forces of these financial, industrial, and rural phenomena propelled the "miracle" industrial growth that first prompted official concern in January 1985—but which in fact had begun as early as July 1984. Official reaction to the rapid growth in credit and consumer demand in 1984 began well before mid-1985, and actually had two parts. Officials acted first to meet the growth in consumer demand, but then moved swiftly to control the situation when things began to get out of hand.

Steps were taken to accommodate consumer demand and absorb excess money in circulation in 1984 and early 1985 by importing large volumes of consumer goods and by utilizing traditional methods to absorb the greater liquidity that normally comes at harvest time, such as releasing gold in large quantities for sale as jewelry. For several months domestic production of consumer goods also received official encouragement, helping to explain the much more rapid growth for light industry than heavy during the most exaggerated months of the industrial boom.

However, 1985 brought measures to regulate credit and control the future expansion of consumer demand. A major leadership change at the People's Bank of China, China's central bank, initiated a strong disciplinary movement within the banking system. Reserve requirements were introduced and regulations limiting loans enforced. In particular, loans to rural industry and to enterprise projects outside the State plan were strongly discouraged. Parallel fiscal steps reduced State outlays for construction projects, and stricter wage and bonus regulations were introduced in July.

Inflation stiffened official policies

Traditional Chinese concern about inflation heightened the severity of policies to contract the economic expansion. 1985 had been hailed as a year for implementing the price reforms announced as part of the October 1984 urban industrial reforms.

Table 2

1985 MONTHLY INDUSTRIAL GROWTH RATES*

(percent)

1985	Total	Heavy	Light	State	Collective	Individually owned
Jan	24.5%	22.3%	26.4%	17.0%	50.5%	68.0%
Feb	21.3	18.1	24.7	12.8	55.3	124.2
Mar	22.9	20.5	25.0	15.3	43.5	74.0
Apr	24.1	21.9	26.2	16.7	48.3	45.5
May	22.8	21.7	24.4	14.2	47.1	38.2
Jun	22.7	21.0	24.4	14.5	46.7	42.9
Jul	20.8	19.0	22.8	12.9	42.1	22.0
Aug	17.4	13.9	20.3	11.1	34.7	43.7
Sep	14.3	10.8	17.9	9.3	28.0	54.4
Oct	11.2	8.5	12.7	7.7	20.7	60.5
Nov	9.1	11.5	8.6	6.3	14.4	25.3
Dec	11.0	19.8	4.3	9.2	12.6	13.6

* Based on constant price data, corrected for inflation

SOURCE: Rock Creek Research

Photo courtesy of New China Pictures

Light industries have responded quickly to new industrial reforms.

But by September 1985 the pace of inflation and general economic expansion led officials to react with strong measures.

Price reform in China takes place on two tracks, which helps explain how the situation got out of control. The most direct method of price reform is changes in State prices announced by ministries and other official price administrators. These are the economy's most visible price changes, as in the case of meat, fish, and vegetable price changes introduced in May 1985.

Equally significant, however, have been the price changes "at the margin" of the economy for non-State controlled goods. The new management reforms encouraged financial measures of enterprise success. Managers seeking profit began to buy inputs as economically as possible and sell their products at the highest possible prices. The reforms specifically allowed this kind of activity for transactions at the margin—that is, for sales not involving controlled items.

Prices of final products and raw materials in these marginal, sometimes called "free-market," transactions are not reported systematically, but scattered accounts verify that prices for some products increased by as much as 50 percent. Household survey data on unit values for consumer items also reveal inflation rates much higher than reported by official indexes, which reached double-digit levels only in the third quarter of 1985. A price index for rural consumer goods showed 30 percent inflation by the end of the summer. Since prices in China have remained basically stable since 1949, these inflation rates are extremely high, and signaled to some officials and consumers that the reforms were getting out of hand. The need to combat this criticism made slowing economic growth even more imperative.

A learning experience?

The 1985 industrial record represents the potential for industrial expansion, showing just how powerful the entrepreneurial element can be if granted certain economic freedoms. China's leaders demonstrated a poor ability to anticipate the scale of the outburst and then appear to have over-reacted in an attempt to repair the damage done.

But if Chinese policy-makers learn to better harness and direct this energy, prospects for the economy are bright. The sudden industrial slowdown in late 1985 reveals that new central government policy tools are at least effective in capping inflationary overheating of the economy—despite China's limited experience in the application of such policies. Planning and command economics were the order of the day until 1984, when experimentation with new policy mechanisms, both monetary and fiscal, began.

The 1985 cutback in credit and reduction in State budget outlays may have seemed excessively stringent to some. But these actions worked, and may introduce a new period of policy sophistication in China—one perhaps more suited to a market economy than a Marxist one.

The Chinese leadership seems to be doing what it has done for much of the period since Mao's death—learning from its mistakes and adjusting to the lessons. 1986 may bring new attempts to use the recently instituted monetary discipline to govern industrial expansion at a pace more consistent with China's material and human constraints. 完

书刊介绍

1985 Almanac of China's Foreign Economic Relations and Trade, compiled by the Editorial Board of the Almanac of China's Foreign Economic Relations and Trade. Hong Kong: China Resources Trade Consultancy Co., n.d. Distributed by Current Publications Ltd., 504 Enterprise Building, 238 Queen's Road Central, Hong Kong. Bilingual, 1,244 pp.; 851 pp. in English, contains advertisements. $80 including airmail postage.

This is the second volume of a series compiled annually by the Ministry of Foreign Economic Relations and Trade. Similar in format to the previous edition (*see* Bookshelf, *The CBR*, July–August 1985), this work contains documents and speeches reflecting changes and milestones in China's foreign trade during 1984. The new edition also provides texts of foreign trade legislation promulgated in 1984 as well as trade and investment statistics for the same time period.

One chapter not in the previous edition contains brief descriptions of the foreign trade activities of China's provinces, municipalities, autonomous regions, and the cities of Wuhan, Chongqing, and Shenyang. Another welcome feature of the *Almanac*'s commodity trade data is a variety of unique tables listing China's selected commodity imports and exports by country. More detail about commodity trade is given here than in the quarterly journal, *China's Customs Statistics*. Some useful tables from the earlier edition are not repeated, however, namely those listing contractual and wholly owned foreign ventures. Also, the question arises as to why the book lists only 440 of the 741 joint ventures officially announced in 1984.

The 1985 edition supplements the earlier volume that contains information for 1950–1983. One should refer to both editions of the *Almanac* to obtain a comprehensive collection of foreign trade laws, trade figures, and investment data.

China Urban Statistics 1985, compiled by State Statistical Bureau. London: Longman Group Ltd. (21-27 Lamb's Conduit St., London WCN 3NJ) and China Statistical Information and Consultancy Service Centre, 1985. 703 pp. £60.

This reference book of 1984 urban statistics is the first of a planned annual series that offers hitherto unavailable data on 295 Chinese cities. Divided into three sections, Part One contains general economic, historical, and social information about cities with populations over 1 million or those that have been designated special economic zones or open coastal cities. Hainan Island is also described here.

Part Two, the main section of this work, provides the reader with detailed tables of major economic, social, and cultural indicators for almost 300 urban areas. Information on population, agriculture, industry, and construction are included as well as data on commerce and foreign trade. Also listed are indicators for infrastructural development—transportation, posts and telecommunications, and public utilities. In addition, figures for public finance, wages, education, public health, and culture are included.

Part Three contains an appendix of Chinese weights and measures, and a glossary of Chinese city names in English and Chinese.

Money and Banking—the Chinese Mainland, by Katharine H. Y. Hsiao. Taipei: Chung-Hua Institution for Economic Research, 1984. Distributed by University of Washington Press, P.O. Box C-50096, Seattle, WA 98145-5096. 97 pp. $15 plus $1.50 postage and handling.

This slim volume describes China's major banking institutions, analyzes how they perform their traditional functions of allocating money and credit according to State plans, discusses the relationship between the budget and money supply, and speculates on whether the role of banking has changed as a result of the introduction of economic reforms since the late 1970s.

The author attempts to determine whether the Chinese economic system has been radically transformed by market-oriented reforms or whether the new developments are essentially minor modifications to the traditional style of central planning that China borrowed from the Soviet Union. Professor Hsiao is uniquely qualified to assess these issues—her earlier book, *Money and Monetary Policy in Communist China* (Columbia University Press), is still the most complete description of the Chinese banking system.

Unfortunately, this book suffers from an unusually long time lag between research and publication. Most of the data in the book cover only the period from 1979 to 1981; Hsiao's analysis of events in that time period is also unnecessarily truncated. She is unable to examine the final impact of the deflationary policies of the period because she uses the planned budget information for 1982 even though the book was not published until mid-1984.

Hsiao tentatively concludes that basic changes are underway. She notes that the People's Bank of China is beginning to act more like a central bank, in that it focuses on using indirect controls over money supplies, interest rates, and credit allocations to achieve the goals the planners desire. By the time the book was published many of Hsiao's speculations had already come about. The banking system had become more complex and decentralized, interest rates had

Books and business guides submitted for possible review in The China Business Review *should be sent to the National Council's book editor, Jennifer Little.*

risen substantially, banks were being encouraged to assess projects on their merits (as opposed to making sure they were supported by local officials), and banks were increasingly undertaking an activist role in raising savings and redistributing them for economically viable projects.

Despite limitations, the book will be of interest to those looking for an analysis of the banking system during the first three decades of Chinese central planning. The book will only whet the appetite of many readers, however, who might wish that Professor Hsiao had taken advantage of the richer data available after 1981 to assess these extremely important issues. —DD

Chen Yun and the Chinese Political System, by David M. Bachman. Berkeley, CA: Institute of East Asian Studies, University of California, 1985. 177 pp. $15.

This political biography represents perhaps the first full-length Western study of Chen Yun, one of China's most influential economic planners. It follows the 1983 publication of *Chen Yun's Strategy for China's Development*, a collection of Chen's speeches from 1956–1962 (*see* Bookshelf, *The CBR*, September–October 1983), and the two books complement each other well—the former presenting Chen mainly in his own words and the latter providing historical background and analysis. The appendix in the latest book will be particularly useful for the researcher: it lists all known writings and speeches of Chen Yun through June 15, 1984, noting translations where available.

The first two chapters trace Chen Yun's ideas and activities chronologically from 1905 through 1984, and assume the reader has both a knowledge of key Chinese leaders and events and an interest in the subtleties of leadership relationships. Chapter III, on Chen's economic thought, and Chapter IV, on politics, bring Chen into the larger perspective of trends in modern China. The general interest reader may want to read these chapters first, for they provide a useful framework in which to understand the events described in Chapters I and II.

The fifth and final chapter is a brief but interesting analysis of the points of similarity and divergence in the economic thinking of Chen Yun, Deng Xiaoping, and Zhao Ziyang. Over the years Chen has taken a cautious approach to economic planning and reform, consistently emphasizing the need for balance and central planning guidelines, while being more wary of the open door policy than the other two leaders. But Bachman concludes that the differences among these three leaders do not outweigh their ability to work together. (In fact, Chen Yun's widely reported dissenting speech at the September 1985 Party conference may be viewed as his most recent attempt to rationalize economic forces, and act as constructive counterweight to reform enthusiasts. In this speech Chen pointed out the need to reemphasize basic agricultural pursuits and restrain an overheating economy.)

Bachman, an assistant professor of politics at Princeton University, stresses several themes throughout the book. He notes that, unlike many modern Chinese leaders, Chen Yun is a specialist rather than a generalist. Chen's focus has been on economics, and his philosophy of balanced growth has remained relatively consistent through the turmoil of modern Chinese politics. While the author views Chen as "one of the giants of the Chinese Communist movement," he adds that Chen is "ultimately not one of the pivotal figures in the history of the PRC." This judgment is based on the fact that Chen has often worked behind the scenes and been a less-than-effective advocate for his ideas, few of which have been implemented as long-term policies. But this may underestimate Chen's tenaciousness, and the fact that he is one of a tiny handful of Chinese leaders who have earned the respect of ordinary Chinese citizens for integrity and advocacy of the economic interests of the less powerful. Ultimately, the long-term influence of his ideas may far exceed the actual power he has wielded during his lifetime. —MCR

BOOKS RECEIVED

The Demand and Supply of Primary Energy in Mainland China, by Chuyuan Cheng. Seattle: University of Washington Press, 1984. 186 pp. $22.

China: The 80s Era, edited by Norton Ginsburg and Bernard A. Lalor. Boulder, CO: Westview Press, 1984. 378 pp. $30.50.

Financial Policy and Reform in Pacific Basin Countries, by Hang-Sheng Cheng. Lexington, MA: Lexington Books, 1986. 370 pp. $33.

The Pacific Century: Economic and Political Consequences of Asian-Pacific Dynamism, by Staffan Burenstam Linder. Stanford, CA: Stanford University Press, 1986. 154 pp. $18.95 hardcover; $7.95 softcover.

China, Taiwan, and the Offshore Islands, by Thomas E. Stolper. Armonk, NY: M. E. Sharpe, 1985. 170 pp. $30.

The China Question, by Yu San Wang. New York: Praeger, 1985. 164 pp. $35.95.

The Entrepôt Trade of Hong Kong with Special Reference to Taiwan and the Chinese Mainland, by Ronald Hsia. Seattle: University of Washington Press, 1984. 86 pp. $15.

Forecasting Political Events: The Future of Hong Kong, by Bruce Bueno de Mesquita et al. New Haven: Yale University Press, 1985. 198 pp. $22.

Three Visions of Chinese Socialism, edited by Dorothy J. Solinger. Boulder, CO: Westview Press, 1984. 154 pp. $16.

Power and Policy in the PRC, edited by Yu-ming Shaw. Boulder, CO: Westview Press, 1985. 370 pp. $32.50.

China, by Hiroji Kubota. New York: W. W. Norton and Co., 1985. 204 pp. $65.

From 1978 to 1984 Japanese photographer Hiroji Kubota was given unprecedented access to China's provinces, resulting in this breathtaking collection of 186 color photos. Divided into 10 regional chapters, this photographic collection captures the immense variety of China's terrain, people, and culture from many unique angles. The book takes veteran China travelers on a return trip, and offers would-be travelers a tantalizing glimpse of a still very exotic land. —PT

我会活动

In February the National Council moved into new offices on the fifth floor of 1818 N Street, NW, in Washington, DC. We take this opportunity to show our new facilities and introduce the staff and their activities. (The Council's Beijing office has also recently expanded; and will be highlighted in the May–June issue.)

Photos by Bill Barke and Ray Crowell

Receptionist Pree Glenn works the switchboard at the Council's new offices

Council President Christopher H. Phillips with Executive Assistant Barbara Peet

BUSINESS ADVISORY SERVICES

The Business Advisory Services Department, whose expertise is organized along industrial sector lines, provides consulting and marketing assistance to member companies in support of their China programs. Fee services available include individualized market research, briefings, negotiation assistance, and expatriate staff orientations. BAS market program managers are Department Director Dick Gillespie (defense, transportation, and service industries); Karen Green (chemicals and imports); Peter Deneen (telecommunications and electronics); Carolyn Dowling (energy); Sue Jean Lee and Bill Johnson (investment); and Linda Gramling (general industry). The support staff consists of Mary Clare Kenzie, Susan Jonkel, and Abigail Jahiel.

BAS Director Dick Gillespie

Sue Jean Lee and Bill Johnson review foreign investment issues for a briefing

Executive Vice-President Roger W. Sullivan

DEVELOPMENT AND GOVERNMENT RELATIONS

The Development and Government Relations department handles press and public relations and membership development, monitors and researches government relations issues, and plans and organizes Council seminars, conferences, and receptions. It consists of Director John Callebaut and Administrative Assistant Palmer Golson.

The BAS staff from left to right: Bill Johnson, Karen Green, Abigail Jahiel, Linda Gramling, Dick Gillespie, Carolyn Dowling, Peter Deneen, Sue Jean Lee, and Susan Jonkel

John Callebaut and Palmer Golson

INFORMATION SERVICES

Information analysis and transfer is the business of the Information Services Department, headed by Marianna Graham, director. Through the department's publications, market research, and library services programs, Council members are provided with comprehensive, up-to-date information on China.

The China Business Review staff produces the Council's bimonthly magazine and monthly members-only newsletter, *China Market Intelligence*, and consists of Madelyn C. Ross (editor), Julia Sensenbrenner (associate editor), Priscilla Totten (production coordinator), and Betsy Saik (editorial assistant). Sue Partyke handles advertising and marketing for both *The CBR* and other Council publications.

The research staff is heavily involved in the market study program as well as in the preparation of other Council publications. Assistant directors David Denny and Martin Weil and research assistant Kelly Shea are also regular contributors to *The CBR*. Andrea Van Arsdale is production assistant for market studies, while Judy Taylor handles publications sales and assists with departmental research projects.

COUNCIL LIBRARY EXPANDS

The Council's move permitted a long overdue expansion of the library. Seating capacity doubled, allowing more room for library users, while additional shelving and filing cabinets make information more accessible. The files hold a vast collection of current press clippings, considered one of the best sources of information available on doing business with China. The 700-plus different information categories dealing with China's economy and trade are updated daily. The library also collects information on Chinese organizations, statistics, and laws.

The library subscribes to over 80 magazines, several English-language newspapers, and 15 Chinese-language periodicals. Library staff includes head librarian Jennifer Little, Dorota Dyman (reference librarian), Donna Meszaros (technical services librarian), Beverly LoPinto (research intern), and assistants Margaret Wade and Jerome Turtola. Council members are encouraged to visit the library to take full advantage of the extensive collection of information.

The Information Services staff from left to right: Kelly Shea, Martin Weil, Madelyn Ross, Margaret Wade, Sue Partyke, Marianna Graham, Dave Denny, Betsy Saik, Julia Sensenbrenner, Priscilla Totten, and Andrea Van Arsdale

Director Marianna Graham

CBR staffers Julia Sensenbrenner, Priscilla Totten, and Madelyn Ross meet with magazine artist John Yanson

Martin Weil, Kelly Shea, Dave Denny, and Andrea Van Arsdale review a market research project for a member company

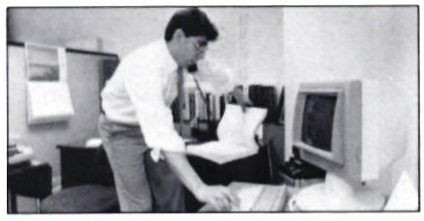
The library staff consists of Dorota Dyman, Beverly LoPinto, Margaret Wade, Jennifer Little, Jerome Turtola, and Donna Meszaros

Administration Director Susan Baugh

Comptroller Rick Peterman and Assistant to the Comptroller Sandra Bucci

ADMINISTRATION

The administration department oversees the Council's efficient operation on a day-to-day basis. The staff includes Director Susan Baugh (personnel and facilities administration), Michael Bellafiore (shipping and receiving), and Precilla Glenn (reception). The director also plans and coordinates the Annual Membership Meeting each May as well as other special Council events.



Database Administrator Ramin Sepahi

Administrative Assistant Michael Bellafiore

Price Hikes and the Foreign Business Community

Andrew Ness

Officials in China are not shy about charging foreigners prices far higher than those paid by Chinese citizens for numerous items from soft berth train tickets to meals in exclusive sections of restaurants. This is justified on the basis of foreigners' desire for superior accommodations as well as the simple fact of their greater ability to pay. But foreign businesspeople, particularly hard hit by recent hefty price hikes, are beginning to wonder if officials are overestimating the depth of foreign pockets.

The Beijing Pricing Bureau, which monitors and initiates all price adjustments in the city, justifies the increases by citing appreciation of the currencies of its three major foreign trading partners against the yuan. However, prices of virtually all services required by the business community have risen so precipitously that many foreigners suspect prices are simply being set as high as the market will bear to take advantage of the strong seller's market.

Beijing is already among the costliest places in the world to maintain expatriate staff. According to a report released in March by the US Embassy in Beijing, rents for office space in Beijing's four joint venture hotels now average $11.8 per square foot per month, making it far more costly than the equivalent space in Hong Kong Central.

And no end is in sight. In the latest round of price hikes effective March 1, 1986, the State Pricing Bureau ordered State-owned hotels serving foreigners and overseas Chinese throughout the country to once again raise their rates. Upper market and luxury hotels had to increase prices 30 to 60 percent, while middle-market hotels raised rates 17 percent for transient guests—but 30 percent for long-term business residents. The manager of one hotel recently confided candidly that "foreigners are a small, isolated group here and therefore can't effectively resist [such cost increases]."

Living and office space prices are far from the only problem. The price of food in all Beijing's hotels rose approximately 35 to 40 percent in August 1985. While this reflected the 30 to 35 percent increase in urban food prices following the government's relaxation of price controls on many formerly subsidized nonstaple food products, the food prices in Beijing's four joint venture hotels have continued to rise since then. The majority of China's foreign business residents live in hotel suites without cooking facilities, and thus have no other alternative for their meals.

The cost of hiring office help through the Foreign Enterprise Service Corporation (FESCO), a government monopoly, threatens to join the upward spiral. The monthly wage for a competent bilingual secretary rose 62 percent in 1985, from ¥800 to ¥1,300. FESCO's general manager recently declined to comment on a rumor that an additional hike of between 50 to 100 percent will take place later this year. This would make the wages of office support staff among the highest in Asia. It should be noted that the workers themselves only take home about 10 percent, and sometimes less, of the total sum.

In addition to the major expense of rent and labor costs, a number of other expenses rose in 1985, considerably adding to the cost of doing business. The July 1985 readjustment of customs tariffs, primarily aimed at choking off the import of Japanese electronic consumer goods, also made acquisition of new office equipment much more expensive—the tariff on an IBM PC rose from 50 to 90 percent, on a xerox machine from 50 to 130 percent, and on a car from 120 to 200 percent.

Local transportation costs and related expenses have also gone up. Most foreign companies in Beijing rent chauffeured taxis from the Capital Taxi Company, which raised its minimum car rental fee this year from ¥2,640 per month to ¥2,880. And the Beijing Hotel has begun charging a monthly fee of ¥300 for each foreign-owned car parked in front of the hotel, while charging drivers of taxis rented by foreign companies hourly fees for parking at the hotel. It is rumored that other hotels may soon adopt this practice.

Prices are rising so quickly and unexpectedly that office managers find it increasingly difficult to plan their annual budgets. In a recent poll of foreign companies maintaining representative offices in Beijing, conducted by Nigel Campbell of the Manchester Business School, the overwhelming majority of US, Japanese, and European companies surveyed concurred that the prices foreign companies are being charged across the board are unreasonable.

Many foreign businesspeople resent the fact that Chinese authorities treat them as if they simply want to squeeze the maximum amount of money from the foreigners in the minimum amount of time. The arbitrary and capricious nature of the price increases, as well as their magnitude, creates an unnecessary atmosphere of antagonism not in the long-term interest of either side. The question is how much worse the situation must get before foreign companies begin to pull up stakes and set up offices offshore, in Hong Kong for example, where their overhead would be roughly equivalent or perhaps less, and where conditions for their expatriate staff would be more comfortable.

Andrew Ness is deputy representative of the National Council's office in Beijing.

中外贸易

Judith S. Taylor and Betsy Saik
Research Assistants

The following tables contain recent press reports of business contracts and negotiations exclusive of those listed in previous issues. Joint ventures, licensing arrangements, and other forms of business arrangements are included if classified as such in Chinese and foreign media reports. For the most part, the accuracy of these reports is not independently confirmed by *The CBR*.

National Council members can contact the library to obtain a copy of news sources and other available background information concerning the business arrangements appearing below. Moreover, member firms whose sales and other business arrangements with China do not normally appear in press reports may have them published in *The CBR* by sending the information to the attention of Betsy Saik.

中外贸易 CHINA'S IMPORTS THROUGH JANUARY 31

Foreign Party/ Chinese Party	Product/Value/ Date Reported
Agricultural Commodities	
NA (US)/ Dairy technology team	Sold 300 dairy cows. 11/85.
(Malaysia)	Received order for logs and timber. $700,000. 1/8/86.
(Thailand)	Initialed agreement to buy 200,000 tons of rice. $31.2 million. 1/24/86.
Agricultural Technology	
Massey-Ferguson (Canada)	Signed contract for 60 tractors and 90 self-propelled grain swathers. $3 million. 11/85.
(Australia)	Signed memorandum of understanding to set up agricultural unit in Heilongjiang and supply five crop-dusting aircraft. 12/9/85.
Chemicals and Chemical and Petrochemical Plants and Equipment	
Ballestra (Italy)/Chengdu Soap Plant	Sold 15,000 tpy methyl esterification and sulphonation plant to produce tallow-based lime soap dispersing agent. 10/85.
BASF (W. Germany)	Will build 40,000 tpy phthalic anhydride plant at Nanjing and 2,000 tpy maleic anhydride plant at Zibo. $25 million. 12/6/85.
Construction Materials and Equipment	
International Glass Engineering Co. (Italy)/ Guangdong Float Glass Co.	Will build glass factory in Shekou to produce building and vehicle glass. $55.5 million. 1/86.
Gerland (France)/China National New Building Materials Corp.	Will supply vinyl floor covering equipment, technology, and training for Changzhou, Jiangsu plant. $4.5 million. 1/13/86.
Consumer Goods	
TFL (UK)	Will equip and provide know-how for furniture factory in south China. $2.9 million (£2 million). 6/14/85.
(Malaysia)	Received order for palm staerin and olein. $820,000. 1/8/86.
Electronics and Electrical Equipment	
Toshiba and Nissho Iwai (Japan)	Received order for 10 air-traffic control radar systems. $8 million. 5/85.
Perkin Elmer (US)/Central Iron and Steel Research Institute of Ministry of Metallurgy	Received order for 3252XP 32-bit machine for research, 3205 32-bit machine for process control, and two 7350/A supermicro computers. $900,000. 7/12/85.
Datapath (UK)	Received order for 500 terminals that translate Roman alphabet into Chinese. $1.4 million (£1 million). 10/18/85.
Applied Physics (UK)	Received order for computer controlled laser machine to cut, splice, and scribe silicone chips used in domestic appliances. $216 million (£150,000). 10/22/85.
The Rochester Corp. (US)/MACHIMPEX	Will provide expertise for establishment of electric wireline cable facility at Zhengzhou Cable Works. 11/85.
Systems Maintenance & Service International (UK), subs. of Total Technical Services Inc. (US)	Will supply peripherals for IBM mainframes. $5 million. 11/8/85.
Semicon, Inc. (US)	Provided semiconductor technology and equipment. $3.5 million. 11/11/85.
Charles River Data Systems (UK)/Tianjin Computer Factory	ASSEM: Received contract for production of Universe 68 computer systems. $5 million. 11/24/85.
Wayne Kerr, sub. of Bognor Regis (UK)/Tianjin No. 6 Radio Factory	Signed contract to supply microprocessor-controlled LCR meters for use in electronics industry. $1.4 million (£1 million). 12/4/85.
General Electric Co. (US)/ CNTIC, Ministry of Water Resources and Electric Power, and China National Chemical Engineering Corp.	Signed contract for 60 CALMA CAD systems for process and hydro-electric power plants and dams. $7.8 million. 12/11/85.
Honeywell Inc. (US) and affiliate Yamatake Honeywell (Japan)/ Sichuan Instrument Complex, CNTIC, Bureau of Instrumentation Industry, and National Planning Committee	LIC: Signed agreement to transfer hardware and software manufacturing technology for TDC 3000 digital process control system. 12/11/85.

NA = Not available.

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*. Leasing (LEAS), Licensing (LIC), Compensation (CT), and Assembling (ASSEM) deals are now included in the "China's Imports" section.

Far East Computers (Singapore), subs. of Hindustan Computers (India)/ Institute of Software Research, Institute of Automation, and Chinese Academy of Sciences	Sold CAD and manufacturing systems through a joint venture in Beijing. $379,000 (S$800,000). 1/9/86.

Electronics (Consumer)

VIDEOTON Industrial Foreign Trading Corp. (Hungary)/LIGHT INDUSTRY	ASSEM: Concluded agreement for sale of 110,000 TV assembly kits. 12/9/85.
Matsushita Electric Corp. (Japan)/Hubei Shashi Refrigerator Factory	Signed contract for joint production of "Shasong" refrigerators. $5.9 million. 1/86.
Clarion Co. (Japan)/ Guangdong	ASSEM: Began assembly of car radios and air conditioners. $2.5 million (J¥500 million). 1/15/86.

Finance, Leasing, and Insurance

Banque de l'Union Europeenne (BUE) (France)/SPC, BOC, and MOFERT	Agreed to provide financing for light industrial investments in Sichuan. 11/21/85.

Food Processing

Nichirei Corp. (Japan)/ Hsinchiao Hotel and Sapporo Breweries Ltd. Joint Venture and Food Stuff Cos. of Hebei and Sichuan	Signed contracts to export ham and sausage manufacturing facilities (Beijing) and two bread baking plants (Hebei) and (Sichuan). $147,000 (J¥30 million) and $589,000 (J¥120 million) respectively. 11/85.
Krupp Industrietechnik, subs. of Fried (W. Germany)	Signed contract to construct factories to produce edible oils at State farms in northeast China. $5.4 million (DM14 million). 12/5/85.
California Sunshine Fine Foods (US)	Provided processing technique produce caviar. 12/85.
Italian National Cooperative and Mutual Aid League (Incamal)	Will install fruit-juice production plant, melon-processing plant (Xinjiang), and candied-fruit factory; expand rabbit meat factory (Hebei), and modernize marble-working factory (Hebei). $57 million. (100 billion Lira). 1/86.

Machine Tools and Machinery

CompAir BroomWade Ltd. (UK)/Beng Bu Compressor Co., part of China Compressor Corp. Co., and China Investment Bank	Signed agreement for export of 3000 series reciprocating air compressors. 10/85.
ELGA (UK)	Will install water purification systems. $720,000 (£500,000). 10/85.
Holcroft/Loftus, subs. of Thermo Electron Corp. (US)/China National Automotive Industry Import/Export Corp.	Will supply three heat treatment furnace systems to be installed at First Auto Works in Jilin and Second Auto Works in Hubei. $3.5 million. 10/85.
Multi-Arc USA, subs. of Multi-Arc Vacuum Systems, Inc. (US)/Chengdu Measuring and Cutting Tool Factory, Hanjiang Tool Works, and Harbin No. 1 Tool Works	Sold three physical vapor deposition (PVD) ion bond coating systems. $3.3 million. 11/85.
Paloma Industries Ltd. (Japan)/EQUIMPEX	LIC: Concluded 5-year contract to provide manufacturing technology for instant water boilers, related facilities, and parts to Shenyang plant. $7 million (J¥1.5 billion). 11/20/85.
Morris Paperboard Plant (US)/China National Packaging Corp.	Sold Morris Paperboard Plant. $1.76 million. 12/85.
CTM Co. (UK)/Dalian Machine Tool Factory and Dalian Combined Machine Tool Research Institute	Signed agreement for pliable manufacturing system for installation at Dalian Machine Tool Factory. 1/86.

Medical Equipment

P.P.B. Inc. (US)	Awarded contract to manufacture and install radiation shields in cancer treatment centers. $500,000. 10/21/85.

Metals, Minerals, and Processing Technology

BP (Australia)	Awarded coking coal contract for shipment of 100,000 tonnes to Baoshan Steel Works. 10/85.
Kembla Coal and Coke (Australia)	Awarded coking coal contract for shipment of 50,000 tonnes to Baoshan Steel Works. 10/85.
Krupp Industrietechnik (W. Germany)	Received order for copper rod mill capable of producing 60,000 tonnes of copper rod diameters ranging from 8-18 mm. 10/85.
Kentucky Energy Research Center (US)/China Institute of Coal Science	Signed agreement for cooperation in coal science and technology, including exchanges of specialists and scholars and joint research programs. 11/26/85.
Drever Co. (US)/Wuhan Iron and Steel Corp.	Received contract for iron powder annealing and reduction furnace line and related protective atmosphere equipment. 12/85.
Kobe Steel Ltd. (Japan)/ China State Shipbuilding Corp.	Agreed on 10-year technical cooperation agreement for supply of welding electrode manufacturing technology. 12/14/85.
(Malaysia)	Received order for sponge iron. $19.3 million. 1/8/86.
(Malaysia)	Received order for aluminum foil paper. $2.1 million. 1/8/86.
Kaiser Engineers & Constructors Inc., and Lummus Crest Inc., subs. of Combustion Engineering Inc. (US)/Ministry of Coal Industry	Will conduct feasibility study for 2 million cubic meter/day plant at Yuxian, Hebei, that will convert subbituminous coal into medium-BTU gas. 1/14/86.

Military Equipment

Marconi Co. (UK)	Received contract for tactical switchboard systems. 12/85.
Defense Department (US)/NDSTIC	Negotiating deal for modernization of Chinese-built F-8 interceptors under FMS agreement. Potential value: $500 million. 1/7/86.

Mining Equipment

Enviro-Clear Co. (US)	Sold industrial thickener for gold mine in Xingang, Hebei. 10/85.
Mannesman Demag Bergwerktechnik (W. Germany)/CNTIC	Received order for 6-meter tunnel boring machine and backup system for Shanxi. 10/85.
Giddings & Lewis Fraser Ltd., part of AMCA International (Scotland)/Coal Mining and Machinery Manufacturing Co., Xian, and Taiyuan Mining Machinery Co., Shanxi	Awarded order for machine tools and accessories for mining-equipment manufacturing industries. $2.9 million (£2 million). 10/4/85.
The Moore Co., Inc. (US)	Shipped overhead lockerbasket storage system to accommodate miners' clothing at Pingshuo coal mine in Shanxi. 11/22/85.

Packaging

Mitsubishi Corp., Ltd. (Japan)/Dalian Fruit Co.	Signed contract for soft drink bottling production line. 10/85.
E.W. Bliss (UK)/ Guangzhou	Received order for can-making machinery parts and equipment. $216,000 (£150,000). 10/14/85.
Ayres and Grimshaw (UK)	Will supply tobacco packaging equipment. 10/19/85.
Elecster Milk Co. (Finland)/Hebei	Will export two sets of milk sterilization and plastic bag production lines. 1/86.

Petroleum, Natural Gas, and Related Equipment

Nairb Air, Queniborough (UK)	Built two filters for oil exploration. $86,000 (£60,000). 10/8/85.

Four M Oilfield Services Ltd., Redwater (Canada)	Completed order for 13 four-wheel-drive vehicles designed to load, transport, and spool electrical cable for submersible oilwell pumps in Daqing field. 11/11/85.
McDermott International Inc. (US)/SINOPEC	Will provide engineering procurement and construction of drilling and production platforms, wellheads, and pipelines. $48 million. 12/5/85.
(Singapore)	Will process 100,000 bpd of Chinese crude. 12/5/85.
JGC Corp. (Japan)/ China Petrochemical International Co.	Received order for butane and methyl tertiary butyl ether gasoline additive for Zibo, Shandong, petrochemical complex. $5 million (J¥1 billion). 1/86.

Pharmaceuticals

Coppee-Courtoy, subs. of Coppee Lavalin (Belgium)/X'ian-Janssen Pharmaceutical Ltd.	Will provide assistance in engineering of pharmaceutical Xi'an, Shaanxi plant. 11/25/85.

Power Plants and Equipment

Petbow (UK)	Will supply parts and transfer technology for generating set. $720,000 (£500,000). 10/31/85.
Kraftwerk Union, AG, subs. of Siemens, AG (W. Germany)	Expecting letter of intent for design and procurement of two 1,000 MW pressurized water reactors. $1.5 billion. 11/21/85.
HMZ WindMaster (Belgium)	Sold five turbines. 12/85.
Electricité de France (France)/Guangdong	Negotiating design contract for Daya Bay nuclear power plant. 1/3/86.
Framatome SA (France)/ Guangdong Nuclear Power Plant Venture Co.	Signed memorandum of understanding for construction of two nuclear reactors at Daya Bay power plant. $700 million. 12/27/85.
General Electric Co. (UK)/Guangdong	Signed memorandum of understanding to supply turbine generators for Daya Bay power plant. $360 million. 1/3/86.

Property Development

On Tai (US)/Anhui	Will build 200-unit four-star hotel in Hefei, Anhui. $7 million. 10/16/85.
NA (Malaysia)/Xi-Hongmen County, Beijing	Signed agreement to design and construct housing estate and do interior decoration for Kunlun Hotel's restaurant. $197.5 million (Ringgits: 480 million) and $308,578 (Ringgits: 750,000), respectively. 1/8/86.

Scientific Instruments

Leitz (W. Germany)/ Zhongyuan Oilfield	Signed contract to buy complete sets of microscopes. $174,000 (DM450,000). 1/86.
Wild Corp. (Switzerland)/ Zhongyuan Oilfield	Signed contract to export seven sets of M-8 and M-5-A stereoscopic microscopes. $44,500 (SFr94,700). 1/86.

Shipping

Kawasaki Kisen Kaisha Ltd. (Japan)	Will transport parts and components for 25 DC9 aircraft from Long Beach, CA. to Shanghai via Tokyo. 12/85.
Seebeckwerfts (W. Germany)/COSCO	Received order for container vessels. 10/15/85.
Flakt Marine AB, div. of Flakt Group (Sweden)	LIC: Signed agreement to manufacture ducts and associated equipment. 10/17/85.
Union Traffic Industry Co. (Japan)/CAAC	Started door-to-door delivery service between Japan and China. 12/14/85.

Telecommunications

Photon Kinetics Inc. (US)/ Tianjin	Signed agreement for sale of an FOA-2000 automated optical fiber analysis system. 9/85.
Delta Electronics (US)/ Shanghai Foreign Trade Corp.	Sold broadcast equipment model OIB-3 operating impedance bridge and model RG-4 receiver/generator. 10/85.
Lynch Communication Systems Inc. (US)/Research Institute and Post, Telegraph, and Telephone of Guangdong	LIC: special service plug-in products. 10/28/85.
Philips Electronics (Netherlands)/Ministry of Posts & Telecommunications	Signed agreements on supply and technology transfer of fiber, cable, transmission equipment and possibility of joint ventures. 11/85.
Alcatel Thomson (France)/Beijing	Will supply and install 14 digital telephone exchanges and transmission equipment. $47.7 million. 11/11/85.
LTT, subs. of CGE (France)	Will supply 112 miles of multimode fiber optic cable to link exchanges. 11/11/85.
Societe d'Etudes des Systemes d'Automation (France)	Will supply DPS-25 packet switching systems to Beijing, Shanghai, and Guangzhou. $2 million. 11/11/85.
Northern Telecom Inc. (Canada)/Shekou Telecommunications Co.	Installed two digital central office telephone switching systems. 11/18/85.
Northern Telecom Inc. (Canada)/Beijing Telephone Administration	Received contract to supply three digital telephone switching systems. 11/22/85.
(Malaysia)	Received order for electric cables. 1/8/86.
GTE Directories (HK) Ltd., subs. of General Telephone & Electronics (HK)/China Telephone Directory Corp.	Signed contract to produce Chinese-language version of China telephone directory. 1/22/86.

Textiles and Textile Plants and Equipment

Laces & Textiles (UK)/ Liaoning	Won order for 100,000 meters of lace. 7/85.
Hong Kong Woolen Mill Co. Ltd./Kaiping County, Guangdong	CT: Built Changyong Wool Mill in Guangdong to produce 600,000 woolen sweaters per year. 12/11/85.
Bangkok Chaoyang Co. Ltd. (Thailand)/Chaozhou City Electrostatic Flocking Material Factory	Exported complete set of electrostatic flocking equipment, technology, and services. $1.1 million. 1/86.
Tokyo Juki (Japan)/CNTIC	Signed contract to transfer technology and supply facilities for high-speed sewing machine production in Shanghai. 1/4/86.
Mitsubishi Electric (Japan)/CNTIC	Signed five-year contract to transfer production technology and parts for high-speed automatic thread-cutting sewing machines. $20 million (J¥4 billion). 1/4/86.

Transportation Equipment

Souriav (France)/CATIC	LIC: Will produce connectors for Chinese-built Aerospatiale Dauphin helicopters. 7/29/85.
Aerospatiale (France)	Received order for six Super Puma helicopters. 10/28/85.
Outsign (UK)	Received order for 150 Ford Cargo chassis and cab lorries, one-year parts package, and Telehoist tipper bodies. $2.1 million (£1.5 million). 10/23/85.
Canadair/ Polytechnologies, Inc.	Signed agreement to sell three Challenger CL-601 corporate aircrafts. 11/4/85.
ADL International Co. Ltd. (Japan) and NA (HK)/ Guangzhou Bicycle Industrial Co. and South China Sewing Machine Industrial Co.	Signed agreement to sell equipment and technology for motorcycle production. $9.8 million. 1/86.
Isuzu Motors (Japan)/ Xinjiang	ASSEM: Began assembly of eight-tonne trucks. 1/13/86.
Mitsubishi Motors Corp. (Japan)/China National Automobile Industry Import/Export Corp.	ASSEM: Signed agreement to assemble 300 light commercial vehicles per month in Liuzhou, Guangxi. $9.9 million (J¥2 billion). 1/23/86.
Suzuki Motor Co. (Japan)/Yuxing Industries Corp., Chongqing	ASSEM: Will supply major parts including engines and transmissions for assembly of 5,000 light trucks and vans. 1/31/86.

Miscellaneous

Dorries (W. Germany)	Received order for two safety paper plants. 10/85.
RC Sports. Inc. (US)/Cho Zhaoqing	Will oversee installation of roller skating rink and sell 500 pairs of roller skates. $65,000. 10/14/85.
Gerd B. Hoffman Enterprises (US)/Shanghai Television Studios	Reached agreement to sell commercial air time and obtain programming. 11/13/85.

中外貿易

JOINT VENTURES AND DIRECT INVESTMENT THROUGH JANUARY 31

Foreign Party/ Chinese Party	Arrangement/Value/ Date Reported

Agriculture Commodities

US Feed Grains Council/ China National Feedstuffs Corp.	Dedicated joint premix feedmill in Nanjing for production of vitamin/mineral premixes and concentrate feed. 10/22/85.
International Ocean Opportunities, North Pacific International, and Marco-Seattle (US)/China National Marine Fisheries Corp.	Established joint venture in which fish caught in Alaskan waters by American boats are transferred to Chinese vessels for processing. 1/86.
Pacific Enterprise Corp. Ltd. (US)/Hubei	Signed 10-year contract to manage chicken farm. $2.1 million. 1/86.

Construction Materials

(France)/Nanchang Architecture-Related Decoration Materials Factory, Jiangxi	Signed cooperative management agreement to produce plastic ceiling materials and plastic-coated blocks for decorative use. 1/86.

Consumer Goods

Dreamland Spring Sdn. Bhd. (Malaysia)	Established joint venture to open refurbished Tianjin factory to produce fiber and wire mattresses. 9/85.
Banque Vernes et Commerciale de Paris and Parfums Jacques Bogart (France)/CITIC, Nantong United Economic Development Commission, Nantong Menthol Factory, and Nantong Flavor Factory	Signed contract for joint venture to produce perfume and cosmetics. $633,000 (Ffr5 million). 11/21/85.
Dainichi Sangyo K.K. (Japan)/Shanghai Furniture Co.	Signed contract to set up Shanghai Dainichi Furniture Co. to manufacture wooden furniture. Will export 40% of output to Japan. $2 million (J¥400 million). (50–50). 11/21/85.
ACE Packing Co. Ltd. (Japan)/LIGHTINDUSTRY/ Fengxi Industrial Corp.	Formed Shanghai ACE Luggages and Bags Co. Ltd. to produce soft nylon bags. 11/25/85.
Li Dehui and Wu Bixiang (US)/Dayong City, Hunan	Invested to build color photo finishing workshop using Kodak equipment and workshop for chopsticks production line. $190,000. 1/86.
NA (US)/Xiamen SEZ Construction and Development Company and Xiamen Porcelain Works	Formed joint venture Xiamen Zhonghua Porcelain Co. Ltd. to produce porcelain. 1/86.

Electronics and Electrical Equipment

Labtam International Pty Ltd. (Australia)/China Academy of Sciences	Formed joint venture to develop 32-bit Unix prototype computer using Chinese and English software. 10/25/85.
VCL Communications (HK)/Shenzhen Cultural Service Depart.	Formed VCL/Cosmos joint venture for video duplication and distribution. 11/85.
Rhode and Schwarz Co. (W. Germany)/Oriental Scientific Instruments Import/Export Corp.	Opened Beijing electronics center to service sound, measurement, and broadcasting systems products. 11/21/85.
Joint Electronic Teller Services (JETCO) and NCR (HK)/Nantong Bank of Macau	Installed automatic teller machine in Zhuhai. 1/13/86.
Pro-log Corp. (US)/Computer System Engineering Research Institute of MEI	Signed letter of intent for co-developing STD single-board computers. 1/23/86.

Engineering and Construction

Celpap Consulting Co. (Sweden)/Beijing Light Industrial Engineering Consulting Co.	Conducting feasibility study on expanding Qingzhou Pulp Mill in Fujian. 1/86.
Taisei Corp. (Japan)/ China National Construction Engineering Corp.	Will set up joint venture to undertake construction projects. $312,000 (¥1 million). 1/86.
Bechtel Group (US)	Signed letter of intent to form engineering and construction joint company. 11/22/85.
Anxin Engineering Co. (HK)/Guiyang Fengda Building Co. Ltd.	Signed agreement for joint management of Zhugang Company to undertake civil engineering projects, install ventilation and electrical equipment, and construct apartment and household electrical appliances and equipment. Reg. Cap. $558,000 (HK$3.5 million and ¥350,000). 1/86.
Haifo Enterprise Development Corp. Ltd. (HK)/ Dalian General Minle Industrial Corp. and Dalian Haile Construction and Repairing Corp., Ltd.	Began joint venture to supply architectural designs, construct and repair buildings, and offer technical consulting services. 1/86.
Mantong Co. Ltd. (HK)/ Dalian No. 4 Construction Engineering Co.	Signed agreement to jointly set up Dalian Tongli Decorative Material Co. Ltd. 1/86.

Finance, Leasing, and Insurance

Panin Group Corp. (HK)/ Fujian branch of Industrial and Commercial Bank of China, Xiamen Construction and Development Corp., and Fujian Investment and Enterprise Corp.	Opened Xiamen International Bank joint venture. 12/2/85.
Jeuro Container Transport Inc. (Japan)/ SINOTRANS	Signed agreement for joint container leasing firm. $1 million. (Japan:45%–PRC:55%). 12/19/85.

Food Processing and Food Service

Sapporo Breweries Ltd. (Japan)/Xinqiao Hotel, Beijing	Established joint venture in Beijing. 11/85.
(HK)/Zhengzhou Henan	Jointly invested in Songshan Food Co. Ltd. to process meat products. $250,000 (¥$800,000). (HK:49%–PRC:51%). 11/27/85.
Pacific Enterprise Corp. Ltd. (US)/Wuhan	Will jointly produce champagne. 1/86.
Grands Moulins de Paris (France)/CITIC and Beijing Research Institute of Food Industry	Signed 15-year contract to set up Beijing-GMP Foods Co. Ltd. joint venture to produce French bread. Reg. Cap. $593,000 (¥1.9 million). (50–50). 1/18/86.

Machinery

Babcock & Wilcox (US)/ Beijing Boiler Works	Signed agreement to form Babcock & Wilcox Beijing Co. (China) Ltd. joint venture to increase boiler making capacity. 1/86.
Japan Screen Co./China Printing Co.	Signed agreement to jointly establish plate-making technology center in Beijing. $540,000 (J¥110 million). 1/86.

Medical Equipment

Abbott Laboratories (US)	Awaiting approval to open liaison office and set up joint venture to manufacture health care products. 11/18/85.
Genetic Diagnostics Corp. (US)	Agreed to organize company to produce monoclonal antibodies and various biotechnology diagnostic kits. 11/22/85.

Minerals and Metals

(Chile)	Planning joint project to build copper rod plant. 11/14/85.
Kanthal Co. and SWEDFUND (Sweden)/ China Shoudu Iron and Steel Complex	Will fund resistant steel wire factory and provide advanced equipment for making electric appliances. $4.1 million (¥13 million). (50–50). 1/86.

Mining Equipment

Galactic Resources Ltd. (CAN)/Xinjiang Nonferrous Metals Corp.	Will establish joint gold mining company. (50–50). 11/85.

Packaging

(Japan)/Changzhou Packaging Material Co. Ltd.	Signed agreement ot establish (Nanhe) Plastic Material Chemical Co. Ltd. 7/16/85.

Petroleum, Natural Gas, and Related Equipment

Offshore Joint Service Co. (Singapore)/China Nanhai Petroleum Maintenance Service Corp.	Signed agreement establishing Nanhai Oil Equipment Repairs and Maintenance Services Co. joint venture for offshore repairs, maintenance, and service requirements in South China Sea. 10/28/85.
Chevron Overseas Petroleum Ltd., sub. of Chevron Corp., Texaco Petroleum Maatschappij B.V., sub. of Texaco Inc. (US), and Agip Overseas Ltd., subs. of Agip S.p.A. (Italy)/CNOOC	Signed agreement for oil and gas exploration in South China Sea. (US:33.3%–Italy:33.3%–PRC:33.33%). 12/23/85.
Nippon Mining Co., Japan Petroleum Exploration Co., and Huanan Oil Development (Japan)/ CNOOC.	Concluded contract for oil exploration and development in South China Sea. (Japan:49%–PRC:51%). 11/20/85.

Pharmaceuticals

Shidai Pharmaceutical Co. Ltd. (HK)/Baoding No. 1 Engineering Co. of the Ministry of Post and Telecommunications	Formed Baoshi Traditional Chinese Medicine Co. Ltd. Joint venture to produce traditional Chinese medicine. Reg. Cap. $531,000 (¥1.7 million). (HK:35.3%–PRC:64.7%). 1/86.

Ports

Senchang Group Corp. (Singapore)/Shenzhen Development Service Co. of South China Sea Petroleum Co.	Will establish Haixing Port Development Co. to develop Mawan port on Nantou peninsula, Shenzhen. $160 million. 12/5/85.

Power Plants and Equipment

Atomic Energy Research Institute (Japan)/Ministry of Nuclear Industry	Will begin joint research on disposal of low-level radioactive wastes from nuclear power plants. 1/13/86.

Property Development

Realty Development Corp., subs. of Lamar Financial Corp. (US)/Tien Ho Economic and Trade Co.	Will build 62-story multi-use office tower in Guangzhou. $200 million. 11/19/85.
Indar Group (HK)/Shanghai Foreign Trade Corp., Shaanxi Provincial government, Shanghai government, Shanghai Chinese Medicine Academy, and Beijing Oriental Song and Dance Co.	Will build four hotels in Shanghai, Beijing, and Xi'an. $180 million. 12/5/85.
SARA-Hotels (Sweden)	Will establish six joint venture hotels. 12/5/85.
SI Construction Corp. Ltd. (HK)/Beijing Civil Aviation Administration	Signed contract for construction of Beijing Airport Hotel. $10.6 million (¥30 million). (50–50). 12/13/85.
World China Trade, Inc. (WCT) (US)/Beijing Light Industrial Union	Signed final contract to develop Beijing office-hotel-apartment building complex. $25.5 million. (50–50). 12/25/85.
Dahua Industrial Stock Co., Ltd. (US)/Shenyang ITIC	Signed contract to jointly manage Shenyang International Trade Center. 1/86.
International Paint Corp. (UK)/Shanghai Shipbuilding Industry Corp.	Set up bonded warehouse. 1/13/86.
Globe Trading (China) Ltd. (HK), sub. of United Industrial Corporation Ltd. (Singapore)/Yantai Dongshan Guesthouse	Obtained approval to purchase half-share in guesthouse, which it will own and develop. $6.1 million (S$12.8 million). 1/23/86.

Shipping

Norton, Lilly & Co. Inc. (US)/COSCO	Signed contract to form COSCO North America Inc. joint venture shipping line to act as agent for COSCO in North America. 11/2/85.
Hong Kong Trident Shipping Agency Co. (HK)/ Guangzhou Economic and Technological Development District General Commercial Service Co., Huangpu Harbor Bureau, and SINOTRANS, Guangdong branch	Formed International Transport Enterprise Co. (INTEC) joint venture to improve Huangpu area overseas container shipping. 11/14/85.
LEP International (UK)/ SINOTRANS	Will operate joint container freight service. 11/15/85.
Hart, Fenton & Co. (UK)/ Hudong Shipyard of Shanghai	Signed agreement to develop an advanced offshore support vessel design. 11/15/85.

Telecommunications

China Telecom Systems (HK) Ltd., subs. of Millicom Inc. (US)/ Shenzhen Telecommunications Development Co.	Concluded joint venture agreement to provide cellular radio telephone service in Shenzhen. 9/85.
Lynch Communication Systems Inc. (US)/Yunnan Telecommunications Equipment Factory, Xiaoba, Kunming	Concluded 10-year joint venture agreement to supply selected products for telecommunications and telephone markets. 10/20/85.

Textiles and Textile Plants and Equipment

Bright Bleaching and Dyeing Factory Ltd. (HK)/ CHINATEX, Shanghai Knitwear Branch	Formed Shanghai New Rainbow Bleaching and Dyeing Co. Ltd. Joint venture for woolen knitwear bleaching and dyeing. 11/25/85.
Huabiao Co. Ltd. (HK)/ Shijiazhuang No. 2 Textile Machinery Plant	Formed Huashi Machinery Co. Ltd. joint venture with 10-year contract to produce label attaching machines. Reg. Cap. $250,000. 1/86.
Brothers Industries Ltd. (Japan)/Shenyang	Established service center for sewing machines. 1/4/86.

Transportation

Neoplan Coach Sales (US)/Bus Factory No. 1 Co.	Signed letter of intent for joint venture to produce city transit buses. 10/85.
Daiwa House Industry Co. (Japan)/Civil Aviation Administration of China	Will establish joint company to build 18-story airport terminal building in Dalian. $1.2 million (¥4 billion). (50–50). 11/30/85.
General Railway Signal Co. (US)/China Railway Signal & Communication Corp.	Signed 20-year joint venture contract to form Casco Signal, Ltd. in Shanghai factory to introduce US railway signaling technology and manufacturing methods. $4.8 million (50–50). 12/2/85.
Machinery Lindberg, subs. of General Signal Corp. (US)/CATIC	Signed coproduction agreement for manufacture of heat treating systems for use in manufacture of aircraft components. 12/19/85.

Ministry of International Trade (Japan)	Agreed to study joint design and development of a 30-40 passenger commuter aircraft in one-year feasibility study. $297-$396 million. 12/20/85.

Miscellaneous

British Broadcasting Corp./CCTV	Will jointly produce 28-episode series "Follow Me to Science" in English and Chinese. 10/28/85.
Cultural Center (Philippines)/Film Bureau, Ministry of Culture	Established joint venture to coproduce "The King and the Emperor." $5 million. 10/30/85.
China Engineering Industries Co. (UK)/Tianjin New Technology Development Co., and Tianjin Beiyang Science and Technology Development Co.	Signed contract forming Tianjin Management Service Co. joint venture to select college graduates and secretaries to be trained as senior management personnel at Oxford and Birmingham Universities. Reg. Cap. $200,000. (50–50). 11/25/85.
NA (US)/Zhejiang ITIC, and Jingjiang County Firework and Firecrackers Factory	Reached agreement on 10-year joint venture to produce fireworks and firecrackers. 1/86.

CORRECTION: In the January-February 1986 China Business on page 57 under Telecommunications, Pacific Telesis (US) was not involved in the agreement.

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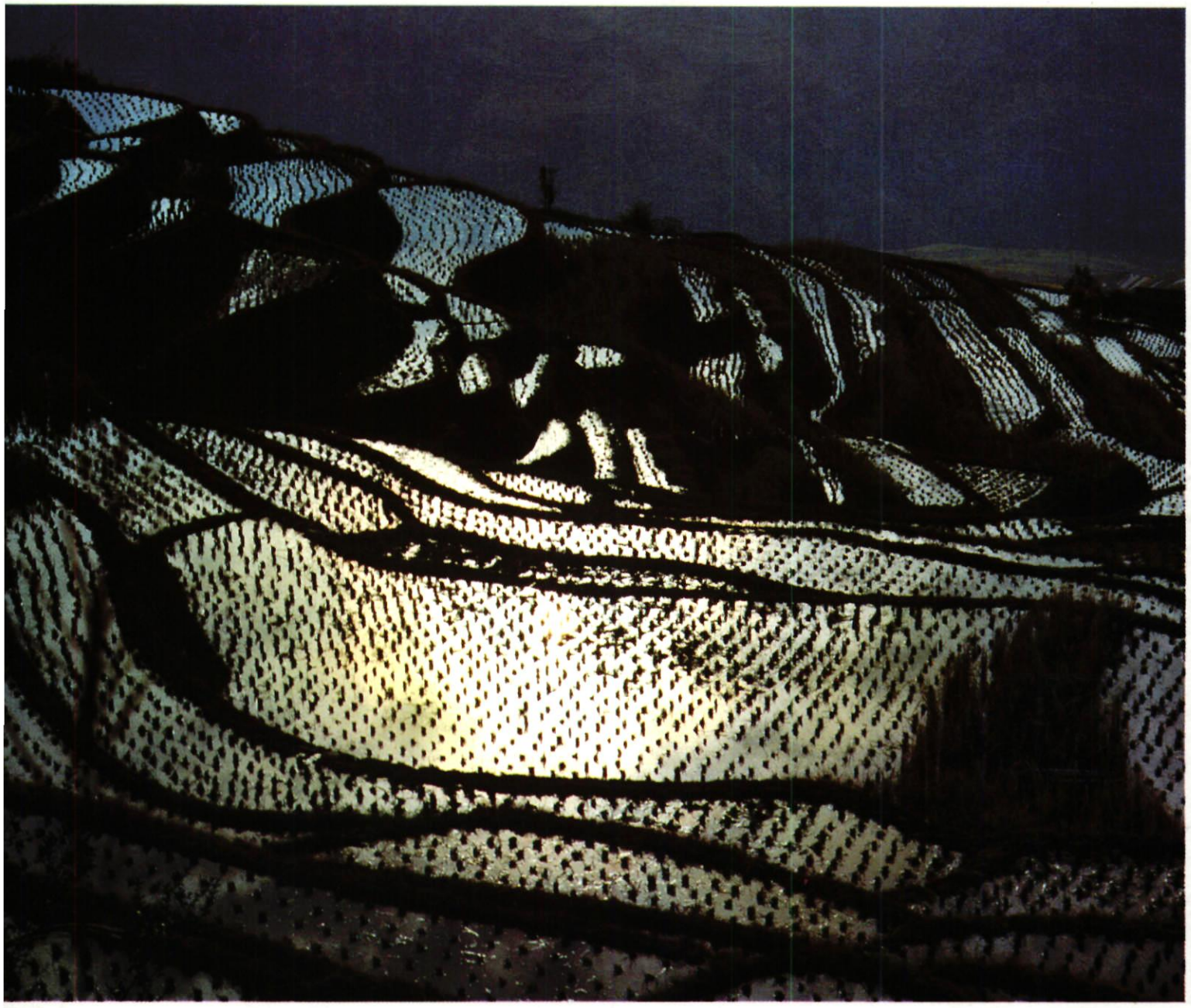

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