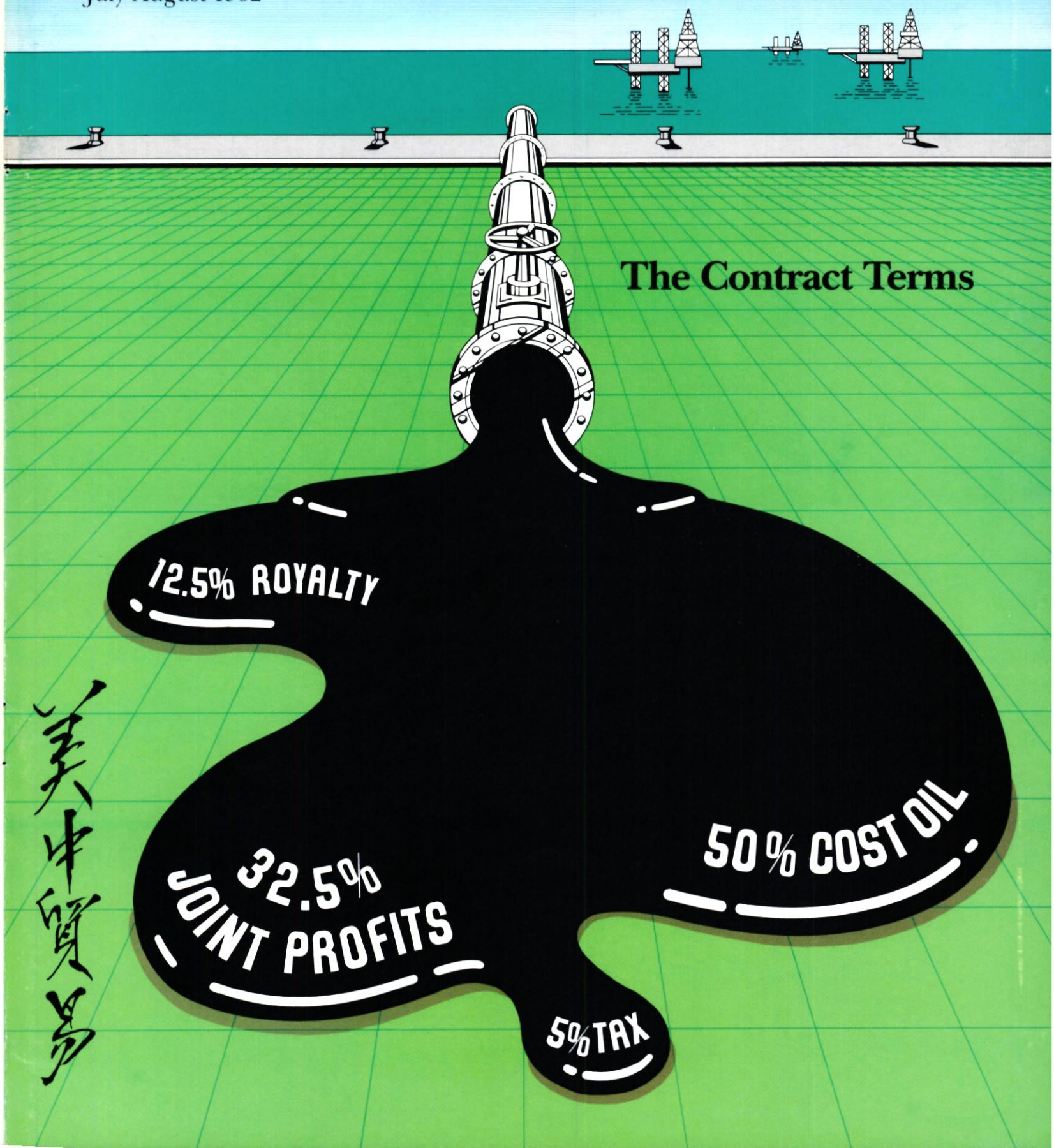
The China Business Review

July-August 1982



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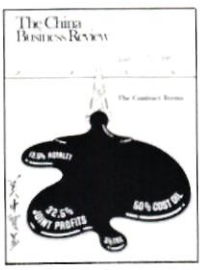
The China Business Review

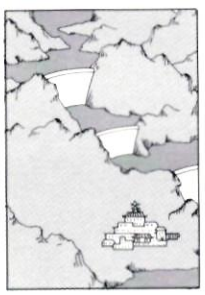
The magazine of the National Council for US–China Trade

July–August 1982 Volume 9, Number 4

Cover: China's 80-page model contract for offshore oil affirms the country's determination to gain access to foreign technology. It also reveals an important question: Will foreign firms be able to live with the terms? **Page 34.** *Artwork by John Yanson.*



Hydro policy: The 10-dam Hongshui River development scheme offers US engineering firms the best opportunity in years to participate in a major Chinese hydroelectric project. **Page 9.**



Politics: Usually when the faces change, so do the policies. But this time Deng Xiaoping is trying to bring about a smooth succession *without* political surprises. **Page 26.**

摘要

ARCO WITHDRAWS TEAM

As bidding begins for China's offshore oil contracts, the closely watched ARCO agreement remains in limbo. Since its signing last June, the production-sharing contract between the China National Offshore Oil Corp. (CNOOC) and US companies ARCO and Santa Fe, has been considered a bellweather for negotiations to come. Indeed, the troublesome issue standing in the way of an operating agreement for ARCO has already become a source of anxiety for companies planning to submit bids on August 17.

ARCO has withdrawn its negotiating team and CNOOC President Qin Wencai has even talked of putting ARCO's area up for bid. The central issue, according to Qin, is ARCO's unwillingness to acknowledge CNOOC's authority. ARCO says that it does not question CNOOC's authority as such, and hopes to see negotiations resume in August.

But the real issue, according to other industry sources, is CNOOC's lack of clout, and the Petroleum Ministry's refusal thus far to cosign future offshore oil contracts. Without such a strong commitment by the ministry, companies fear that CNOOC will lose out in interagency disputes over offshore policy, and not be accorded the status necessary to carry out long-term agreements.

RETIREMENT PARTY

China's leaders are now girding themselves for the climatic political event of the year: the national Communist Party Congress, an oft-postponed event that now seems likely to be scheduled for late summer or fall.

The Party Congress, more than any other forum, grants legitimacy to both policy and leaders. The forthcoming Congress would be only the 12th in the Party's 61-year history, and the first since 1977, when Mao's more radical policies still held sway.

Debates going on in provincial Party meetings have dropped clues as to what the Congress will produce: targets for the remainder of China's 1981-1985 five year plan, and support for Deng Xiaoping's proposal to remove himself, Yejianying, Chen Yun, and Li Xiannian from their vice-chairmen and Politburo Standing Committee positions on grounds of age.

The real battle will be over who replaces them. Deng hopes that by having positioned his proteges Chairman Hu Yaobang and Premier Zhao Ziyang on the Standing Committee already, he can control the situation behind the scenes. But more conservative leaders like Ye and Li may be pushing their own proteges as a *quid pro quo* for retiring.

Finally, US-China relations are bound to come up during pre-Congress maneuvering, and may even carry over into the Congress itself if the Taiwan arms sales issue is not resolved.

THE FIRST STEP

A frustrated executive was recently heard to exclaim: "Are there *any* foreign enterprises in China that are operating successfully?"

A few major foreign investment projects in China undeniably have problems. Two US manufacturers in Shanghai reportedly are debating whether to call it quits, a US construction firm has already pulled out of a half-completed project in Beijing, and two major consumer goods producers in Hubei and Fujian have been struggling unsuccessfully for over a year to gear up production.

But smaller projects in China that call for less advanced technology and simpler forms of joint management appear to be doing better. Examples include subcontracting and processing deals, where Chinese factories make forgings, castings, or simple automotive parts, usually without running into labor or quality-control disputes that seem to bedevil large-scale joint equity ventures.

The problem appears to be that Chinese factories want technology that is two, three, or four steps ahead of their current capabilities, while forgetting that the management and quality control systems that back up the technology might be overstepping the bounds of political tolerance observed by conservative local officials.

NEED A LOAN? SEE CHINA

China is now increasing its loans to the West. Since January, the Bank of China reportedly has joined other banks in making syndicated loans to the government of Denmark, the cities of London and Edinburgh, and to a number of corporations in Brazil and Venezuela.

Like any good banker, China is reinvesting its abundant hard currency earnings from exports ($22 billion in 1981, in balance with imports), shipping revenues, tourism receipts, and remittances from overseas Chinese. These funds are pouring into China's reserves, which now stand at about $10 billion.

The country's strong financial position of course puzzles businesspeople who have to arrange compensation trade deals in order to induce cash-poor Chinese factories to import their technology. (Observers believe that enterprises seen by Beijing to be potential exporters are not eligible for foreign exchange allocated under the state plan, so the enterprises *must* seek foreign assistance to expand).

MORE MIDDLEMEN

A rather sudden and striking new tendency among Chinese trading organizations is to channel business through the mushrooming community of Chinese expatriate companies in Hong

Kong and abroad. Many are formed by the Chinese themselves and by savvy traders with friends or relatives in China. Often these traders, with the full knowledge of the Chinese principals, steer business their way and away from firms that lack their contacts in China.

The growing US community of expatriate Chinese companies includes 9 joint equity ventures, and at least 19 representative offices of Chinese trading companies. Even a few US firms that have been dealing directly with Beijing for years suddenly have been told to deal with these middlemen, or ones in Hong Kong.

CITS—NY

Interested in finding out which US tour operators go to China? Ask the Chinese.

CITS—the China International Travel Service—has opened an office on New York's 42nd Street to "promote tourism from the US to China." It is neither a sales office nor a reservation center, according to Director Li Tieying. The three-man staff is here to "offer advice" on arranging tours.

That advice does not, as some firms had feared, include recommendations on which US agents to use. Li says that CITS can single out firms geographically from its list of some 50 US tour operators, and provide those names to potential customers. If you are from Texas, the reasoning goes, you may want an operator from the Southwest.

Tour operators should pass along their tour proposals and gripes to CITS New York, says Li, since a big part of its job is communicating with the head office. The address is 60 E. 42nd Street, Suite 465, New York, NY 10165.

HIGH-TECH BLOCK

US export control policy has taken an ominous turn, with the recent blocking of high-technology exports to Hong Kong companies with Chinese ties. In a sudden shift of policy, licenses have been denied in recent months to at least two Hong Kong companies.

The Hua Ko company of Hong Kong has been prevented from purchasing some $1.3 million worth of US equipment. The denials included ion implantation equipment from Varian Associates, testing equipment from Fairchild Test Systems Group, and other equipment from Thermco Products Corp. Hua Ko, which is building a plant to manufacture CMOS semiconductor chips in the colony, is owned 100 percent by Hua Yuan Company, the local trading arm of the China National Light Industries Corp. A subsidiary of Hua Ko, Chipex Inc. of San Jose, reportedly was raided by US customs agents in June. A second Hong Kong company, Systems Data Semiconductor Ltd., also was blocked from importing US equipment. Systems Data's ties with China are not known.

In the past, Hong Kong was treated as a "free world destination." High technology exports were routinely approved regardless of a company's ownership. At present, the only two companies manufacturing semiconductors in Hong Kong have PRC ties. Both of these, RCL Semiconductor Ltd. and Elcap Electronics Ltd., imported much of their equipment from the US during the Carter Administration. The present policy shift appears to be part of an overall effort on the part of the Reagan Administration to tighten constraints on technology leaving the country. Although this effort is primarily aimed at East Bloc countries, its rigors spill over into the control process for China, and for "free world" allies as well.

NEW CHINESE WATCHDOG

By year's end, Beijing will have established a government watchdog agency modeled after the US General Accounting Office, according to *CBR* correspondent Karen Berney. The charter of the new audit office calls for improved cost-effectiveness in government operations by identifying management problems and cost overruns.

According to a four-man Chinese fact-finding team that visited the GAO's headquarters in May, the new audit office will be formally set up by the National People's Congress later this year.

Sheng Huande, auditor general-designate and currently budget director in the Ministry of Finance, told GAO officials that the new agency will have a nationwide staff of 50,000 auditors. The United Nations Development Program is considering funding a training program in Beijing and abroad for the agency's employees.

Sheng indicated that the only body new engaged in auditing activities is the Finance Ministry's Supervision Department. With a staff of 4,500, it is supposed to clamp down on fraud and corruption, a job it has apparently failed to do satisfactorily.

It will be the new office's responsibility to audit all state enterprises and foreign investment projects as well as the entire spectrum of government activities.

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US Agricultural Exports

Changing crop patterns in China have altered the market climate for a number of American export staples.

Julia Sensenbrenner

The downward trend in the value of US agricultural exports to China in 1981 continued in the first four months of 1982. Though China held first place in 1981 as America's largest overseas market for wheat and cotton, and the fifth largest agricultural market overall, a sudden decline so far this year underscores the skittishness of the agricultural trade.

Between January and April, US agricultural exports fell 22 percent in value compared with the same period last year, with the largest declines in cotton (−53 percent), soybeans (−28 percent), and wheat (−11 percent). In the same period, yellow corn exports nearly tripled, owing to corn's price decline relative to wheat.

The decision to purchase less American agricultural products, except for corn, is probably due to good harvests, the desire to rectify its largest trade imbalance with the US, and the decision by Chinese peasants to switch from grain to cash crops such as cotton and oilseeds. The last rather remarkable development reflects the waning power of communes to force peasants to grow crops according to quota, and conversely, the greater latitude given by local authorities to small cooperatives and even individual families to grow what is most profitable. Thus far, six million hectares (6 percent of the country's total cultivated land) has been taken out of grain cultivation in the last three years. Most of this has gone over to cash crops, causing a decline in imports of cotton, soybeans, and soybean oil.

Cotton. The 34 percent decline in US cotton exports to China in 1981 was a consequence of two developments. A 4 percent increase in area under cotton cultivation, and a 5.5 percent increase in yields resulted in a 9.7 percent growth in total cotton production. Second, the tightening of foreign markets for cotton products due to the recession and international multifiber agreements served to constrain China's textile exports. The continuance of these trends is demonstrated by the 52.8 percent drop in the value of cotton shipments through April, a decline significant enough to remove China from the position of number-one cotton importer, and to move it behind Japan, Korea, and Taiwan.

The US Department of Agriculture predicts continued declines in US cotton exports to China due to the upturn in Chinese production. The bumper harvest expected this year could easily exceed last year's record 13.5 million tons. The slowly rising consumption of cotton products in China cannot offset these rapid production gains.

Soybeans. The value of US soybean exports to China continues to decline: down 16.4 percent in 1981 and 28.4 percent through April 1982, compared with the first four months of 1981. This trend is the result of a 17 percent increase in production (the area under cultivation increased by 9.3 percent, and yields by 7.3 percent), gains that are explained by American Soybean Association (ASA) analysts by China's decision to raise the purchase price of soybeans by 33 percent. This year's crop is expected to reach 10 million tons, an 8.7 percent increase over 1981.

ASA officials believe that in the long run, China's infant livestock industry will create a large demand for soybeans as a protein source for animals. Meanwhile, the decline in exports to China has been made up by increased sales to other Asian countries.

Soybean oil. Chinese imports of soybean oil have now declined to a negligible level as a consequence of increased production of other oilseed cash crops, such as rapeseed, sunflower seed, peanuts, and sesame seed.

Wheat. Slightly higher yields have made it possible for China to maintain fairly stable wheat production levels in the face of declining areas under cultivation. Yet, imports of US wheat by China have grown rapidly over the last four years due to population growth, increasing incomes, and demands for improved diets. In the first four months of 1982, wheat exports to China declined 11 percent, but major shipments are anticipated later this year to augment the mediocre harvest.

Two-thirds of China's winter wheat crop was damaged by the ongoing drought north of the Yangzi River that has affected Shandong, Shanxi, Henan, Beijing, and Tianjin. The summer wheat, rice, and coarse grain harvest will compensate for some of the shortfall, bringing up the total grain harvest to around the 1981 level of 325 million tons.

US wheat dealers now anticipate total sales of 6–9 million tons worth roughly $1.3 billion. The slow start this year is attributed to Chinese uncertainty over future US–China relations due to the Taiwan arms sales issue, and declining world wheat prices, which have now stabilized.

The US has an agreement with China to export 6–9 million tons of grain per year, but dealers would prefer to be in the 10–12-million-ton range. Standing in the way is increased competition from Canada, which recently agreed to export 3.5–4.2 million tons a year; Australia, with a pact for 1.5–2.5 million tons; Europe, which contracted for 0.5–0.7 million tons; and Argentina, with an agreement for 1.0–1.5 million tons in 1982. Sales by Europe and Argentina are lagging this year, while the US had already contracted for 5.5 million tons through June 17. Dealers feel the US has adequate stocks to fulfill any increasing demand this year.

Corn. Another commodity to watch is yellow corn. After a year of very low US exports to China, shipments are now up

Principal Agricultural Exports to China*

(Million US$)

Brisk corn sales, and a rebound in wheat sales, are expected in 1982.

	1980	1981	Percent change	Jan.–Apr. 1981	Jan.–Apr. 1982	Percent change
Wheat	1,039	1,269	22.1	445.4	397.2	−10.8
Cotton	701.3	464.0	33.8	333.3	157.8	−52.7
Soybeans	155.2	129.7	−16.4	66.1	47.8	−28.4
Soybean oil	56.5	17.1	−69.7	—	—	—
Corn	224.5	62.5	−72.2	17.4	67.8	289.7
Total	**2,176.8**	**1,942.3**	**−10.8**	**862.2**	**670.6**	**−22.2**

*Other 1981 exports of linseed oil, tobacco, seeds, nub, and orange juice comprised only 0.23 percent of total US agricultural exports.

SOURCE: Trade Analysis Division, Office of East-West Policy and Planning, US Commerce Department.

290 percent during January–April. The Chinese agreed to buy 576 thousand tons by June 17, an amount that tops total 1981 sales of 525 thousand tons. Since the Chinese use corn as a food grain as well as for feed, the decline in corn prices relative to wheat is believed to be responsible for the switching of a few deals from wheat to corn at the last minute. Some traders think the long-expected shift to feed grains is beginning, a factor that could buoy up corn sales for some time to come.

The decline in US agricultural exports to China demonstrates the success of China's current agricultural program. At the same time China's policy shift also commits it to a continuing dependence on foreign wheat growers as Chinese peasants turn their energy to more lucrative cash crops. 完

Julia Sensenbrenner joined The China Business Review *staff in June as a summer intern. This fall she will be a senior at Princeton University, where she is majoring in East Asian Studies with an emphasis on socioeconomic developments in China.*

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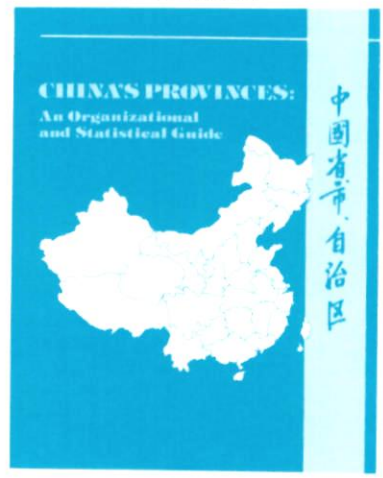

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HYDROPOWER

Now that the plans are ready, the next step will be raising money and deciding the extent of foreign assistance.

Martin Weil

In line with Premier Zhao's call to "gradually shift" the nation's emphasis from thermal to hydroelectric power, China is ready to launch a concerted effort to develop its hydropower potential, the largest in the world. Hydropower stations currently account for 30 percent of the PRC's total generating capacity, but represent only about 5 percent of the country's theoretical hydropower potential.

The recent pooling of resources under one ministry—the new Ministry of Water Conservancy and Electric Power—not only gives greater bureaucratic weight to hydropower interests vis-à-vis thermal power, but it also consolidates the country's scattered hydro planning agencies. Moreover, it brings a firm advocate of water development, Qian Zhengying, back to her former position as China's number-one power administrator. Qian headed up the Ministry of Water Conservancy and Electric Power before it split into two in 1979; she stayed with the Water Conservancy Ministry until the groups merged again in March.

The bureaucratic reshuffle coincides with the announcement of China's first major hydro construction plan in several years. It calls for an ambitious effort to harness the Hongshui River in Guangxi, which would add some 11,000 megawatts (mw) to the nation's capacity by the turn of the century. Hongshui construction is the centerpiece of an emerging plan for comprehensive development of the Pearl River Basin. More importantly, by integrating dam construction into an overall river development program, it indicates the broader scope of planning the Chinese will probably adopt for future river development schemes.

Even though the planners are ready to move ahead, the government's tight investment budget makes it doubtful that China can increase its hydropower generating capacity by more than about 1,500 mw per year by the year 2000. Last year's capital construction funding for new plants, at ¥1.9 billion is only sufficient to add about 1,400 mw (given the Chinese estimate that each megawatt of new capacity costs ¥1.4 million). Chinese and foreign engineering firms alike are looking to Eximbanks and the World Bank to fill part of the financial void.

Political obstacles also remain. The inundation of farmland by new dam construction will always be an explosive political issue, and conflicts between Qian's new ministry and other agencies and local governments will not be eliminated by the bureaucratic restructuring.

Finally, despite an overall impressive Chinese record of dam and power station construction since 1949, there remain certain technical obstacles to rapid expansion, including inexperience with earth and rock dams, and unfamiliarity with state-of-the-art turbine technology. China seems willing to turn to foreign assistance in some of these areas, a most welcome sign both for US firms and China's eager hydropower advocates. The key question will be how much money China is willing to spend for such assistance.

HYDROPOWER

The Politics of Hydro Planning

Investment decisions are sometimes made on the basis of the political strength of interest groups, rather than on technical issues.

Hydropower's rising star in recent months is reflected in a March 8 *People's Daily* editorial that declared: "As a strategic measure, special attention should be given to developing hydroelectric power. . . so as to replace oil and coal consumption in certain places." This type of editorial usually indicates that Beijing has made a major policy decision and wants to give notice to former footdraggers to get back in line.

The editorial virtually coincided with the merging of the two water-planning ministries into the new Ministry of Water Resources and Electric Power. It is unlikely that the two events were unrelated. Whereas hydro interests previously had been fragmented, they now are reunited under one minister, Qian Zhengying, whose entire career has been based on water projects.

One of Qian's first tasks will be to keep the hydro and thermal interests in her ministry from crossing swords. Hydro supporters have complained that the artificially low price of coal in China (about one-half the world market price of around $50 per ton) gives an unfair advantage to thermal power planners, who claim that coal is a cheaper form of energy than hydropower. Hydro supporters also accuse the thermal people of omitting the cost of transporting coal from their calculations and of criticizing the lengthy construction time for hydro dams while ignoring the costly lead times necessary to build coal mines. Not surprisingly, investment decisions sometimes have been made on the basis of the political strength of one or the other interest group rather than on economic or technical issues.

The leadership of the new ministry seems inclined to take the side of the hydro advocates. This does not mean an abandonment of thermal development, of course, but a more rational integration of thermal and hydro. Hydro would provide mainly peak load power in the relatively water-scarce and coal-abundant east and north, and base load power in the water-rich south and southwest.

The merging of the two ministries eliminates a layer of the bureaucracy that has traditionally stifled hydro projects. The Ministry of Water Conservancy, whose main concern was flood control and irrigation, and the Ministry of Electric Power had battled over construction priorities and funds, as well as for control of disputed projects. As the *Guangming Daily* put it, "Regarding such water conservancy and hydroelectricity engineering projects such as those at Danjiangkou (a large dam on the Han River in Hubei) and Sanmenxia (a troubled project begun with Russian assistance on the Yellow River in Henan), there had been incessant argument for many years about . . investment, application, management, repair, and profits. Disputes were taken all the way to the State Council."

Even when projects were allocated to one ministry or the other (generally on the basis of whether the project's "main" function was flood control or power generation), both ministries had input in the planning. Disagreements could hopelessly deadlock the approval process, since what were optimum specifications for one ministry for flood control—in such areas as dam height, storage volume, and reservoir management—were often different from those for power generation. This is undoubtedly one reason why very few major projects were launched during the period the ministries were separate.

Now these disputes presumably will be ironed out within the ministry, rather than at the State Council level, which can only speed up planning. The pooling of the talent of the design institutes of the two ministries can likewise better integrate the different aspects of dam planning, and perhaps more fully tap China's water planning expertise.

Conflicts of Interests Remain

Of course, the merger will not eliminate all bureaucratic difficulties. The Communications Ministry, which represents water transportation interests, will still have some say in dam planning. The ministry almost always demands major investments in ship-handling facilities beyond those the power generation people feel are necessary, or insists on the release of a large amount of reservoir water to facilitate shipping. This is often done without more than a cursory analysis, their detractors claim, of the economics of the improved water transport. A major battle over shipping is shaping up in the Hongshui development (*see* p. 16). The Ministry of Forestry often makes comparable demands with regard to log-transportation gates.

A greater danger is that the merger of the ministries may strengthen flood control interests at the expense of power generation. Flood control has always been a vital concern of economic planners, given the historically devastating effects of floods and the importance of

the agricultural sector. Minister Qian is also widely believed to have a strong personal interest in flood control.

Evidence that her leanings may be affecting water planning already has surfaced regarding the project that is both the biggest bone of contention between the two sides and one of the largest proposed dams in the world: the Three Gorges project on the Yangzi River near the Hubei-Sichuan border, involving a 200-meter dam, 70 billion square meters of storage, and 25,000 mw of generating capacity. Flood control interests have pushed the project for more than 20 years as the best way to safeguard agricultural land on the middle and lower Yangzi valley. Minister Qian talked to US Bureau of Reclamation experts on the subject for seven hours.

Power-generation interests opposed the scheme. They cited the 15-year construction time that would be required before electricity could be produced, the risk of concentrating so much capacity in one location, the ultra-advanced turbine technology that would be necessary, and the high costs.

The project was believed to have been shelved for budgetary reasons, but recently a call was issued in Shanghai's *World Economic Herald* to begin preparations for construction next year. The *Herald* has had an impressive record of presaging policy changes on several issues. The *Far Eastern Economic Review* has reported that the Three Gorges dam is now tentatively included in the sixth five-year plan (1981–85).

term. . . . Therefore, investment should be shared among all the departments concerned. . . . If it is impossible to do so, the projects should be postponed until conditions are ripe."

The publication of this attack means that power-generation interests still have some support in the Party and State Council as well as in the new water power ministry itself (where two of the three vice-ministers, Li Peng and Li Daigeng, were high officials in the old Ministry of Electric Power). Nonetheless, the chances are good now that plans for the Three Gorges dam will be realized in one form or another.

Land Inundation and Environmental Issues

Land inundation and displacement of farmers by new dam construction will continue to embroil the ministry in controversy. A number of proposed hydro projects lie in fairly densely populated areas, and provincial governments seem able in some cases to block or delay their construction, even when the projects are included in the national plan. Inundation of 13,000 hectares of land is a major reason for the indefinite postponement of the proposed 1,500-mw Wuqiangxi dam in western Hunan, whose preparations were so advanced that cheap Japanese government loans were lined up in 1980, Beijing's *China Reconstructs* recently revealed.

When they cannot stop a project, the provinces have the power to extract sizable compensation. For the proposed Shuikou dam in Fujian, for example,

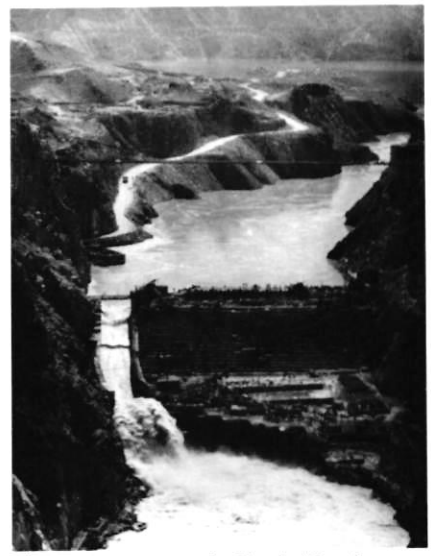


Photo by New China Pictures Co.

The Longyang Gorge in Qinahai Province under construction.

Whereas hydro interests previously had been fragmented, they now are reunited under one minister, Qian Zhengying, whose entire career has been devoted to water projects.

Three Gorges was probably very much on the mind of the power-generation advocate who recently published the following broadside against flood control and transportation in the *People's Daily*: "As we know, many hydropower projects have comprehensive uses. . . . At present, all the investments are made only by the hydropower departments. The other departments are not responsible for investment and do not take into account the economic rationality of the plans. They give too much thought to long-term interests and often put forth excessive demands that are unrealistic in the short

which would inundate 2,000 hectares of farmland and displace 54,000 people, the old Ministry of Electric Power estimates that approximately ¥210 million in compensation would be required, amounting to ¥105,000 per inundated hectare, or almost ¥4,000 per person. It is not clear how this money would be distributed.

Yet, for all the problems they pose, the agricultural interests can be helpful at times to power-generation interests in their bureaucratic battles. The power people have used the land inundation problem as an argument against reservoir projects which they think are unnecessarily large.

As in the American west, China's water authorities must wrestle with disputes over water rights. The most notable recent example was the Luanhe dam project (generating 450 mw and storing 3 billion m^3) in arid Hebei Province, from which it was decided to divert water to Tianjin. There were apparently strong objections from both the new water conservancy ministry and Hebei Province. A number of State Council-level "coordination meetings" of all the parties concerned were necessary before an agreement was finally reached in late 1981.

Environmental concerns seem to have played a relatively small role in hydro project planning thus far. Such objections as have been raised by environmental interests have mainly concerned the blocking of fish migration, to which the hydro planners have proposed artificial breeding upstream of the dams. There is believed to have been considerable opposition by environmental scientists to the giant Gezhouba dam under construction on the Yangzi, but they appear to have been more or less swept aside; it was reported in the *Beijing Review*, for example, that "no consensus was reached" on the environmentalist demand for a passageway for fish.

China has certainly had experience with the detrimental consequences of poor environmental planning. An example is the rapid silting of the Sanmenxia dam on the Yellow River. Environmental concerns seem more important to the planners now than

previously, at least in their discussions with foreigners. It will be years, however, before China's environmental lobby develops strength like that of the one in the US.

Coordinating the Planners

It has proven extremely difficult in China to draft coherent, rational hydro development plans. As important a reason as the various conflicts of interest may be the lack of detailed analysis of load growth. Ministry-level design institutes rely instead on a few rough figures for this purpose. It is the job of senior officials to do the load planning. But when high-level plans change dramatically, the detailed plans are thrown completely off. This has occurred many times—after the Great Leap Forward, during the Cultural Revolution, at the beginning of readjustment in 1979, and during the intensification of readjustment in 1981. So large is the number of discarded hydro-development schemes that some river systems have had as many as three radically different development plans proposed and discarded.

The compartmentalized atmosphere, furthermore, encourages special interests to push projects without much regard to how they fit into the overall picture of electricity supply and demand. Closer integration between project managers and energy planners would ameliorate this problem considerably. Reportedly, a comprehensive study of future power demand was recently completed by the Ministry of Water Resources and Electric Power, which may help clarify the situation.

At the same time, the Chinese are moving to develop comprehensive river-basin planning through the formation of regional commissions under the water power ministry. The Pearl River Water Conservancy Commission is taking charge of all hydro developments on the Hongshui and other tributaries. Similar commissions reportedly have been or are being set up for all other major river systems, including the Yellow, Yangzi, Huai, and Songhua.

Even after these are set up, there is a still deeper problem: how to effectively reconcile and coordinate the exigencies of power planning, and those of overall river basin development, including transportation, flood control, and irrigation. Resolving these two complex sets of demands would be mind-boggling in any country, and promises to bedevil the Chinese planning system for years to come.

Debunking the Small Hydro Myth

Julia Sensenbrenner and Martin Weil

China's small hydropower plants have mushroomed spectacularly since 1970. The approximately 90,000 such stations now in existence—which average 70 kw per generator, with a maximum of 1,200 kw per generator or 12,000 kw per station—produce about 30 percent of the nation's total hydropower. They have won international acclaim for providing electricity to rural China using low-cost, intermediate technology. But in the view of China's central leadership, they are often more trouble than they are worth.

A report put out by the Planning Office of the old Ministry of Electric Power cited the following serious problems with small hydro stations:

Construction costs are twice those of larger plants on a per-kw basis.

Poor construction quality has resulted in the poor performance of many plants. Because local funds are limited, and state subsidies usually only cover the cost of equipment, construction work is often inferior.

Utilization rates average only about one-third to one-half those of large and medium stations. One reason is that small plants have little if any storage capacity, and are thus unable to save water for the dry season. Also, since construction subsidies are granted on a per-kw basis, there are incentives to build stations with larger capacities than needed.

Competition between small and large plants is the most important objection of the central authorities. All of the inefficiencies could be excused if the small hydropower plants supplied electricity to areas that would otherwise have none, but the Ministry's report emphasizes that the small plants tend to be located in the water-rich southern provinces, areas that are also served by large and medium-sized plants.

During the wet season, small hydropower plants generate more electricity than can be consumed locally. Political pressures have forced the larger provincial and centrally operated grids to purchase the excess power from small plants. But the total demand in the wet season is often not sufficient to accept the electricity and operate the large plants at full capacity. To integrate electricity from the small plants into the grids requires a greater number of transformers; line loss, at 20–30 percent, is much higher than for the larger stations. Yet, under current arrangements, it is the large stations that are forced to dump water in order to let the smaller plants keep generating inefficiently.

The solution, in the view of the Planning Office:

- Develop new small hydropower plants mainly in areas not served by existing grids, and change the policy of subsidizing their construction on a per-kw basis.
- Upgrade existing small plants, and shut down those that are too uneconomic.
- Integrate small plants with medium and large ones under a unified plan, and require small stations to receive central approval before joining a larger grid.
- Prohibit local governments from raising the price of hydropower from small plants delivered to the grids.
- Encourage localities to invest in larger hydrostations run by higher authorities in exchange for a guaranteed portion of electricity supply.

HYDROPOWER

Project Priorities

The Hongshui River offers the best conditions for hydro development in China. It also excites the greatest interest among US construction and engineering firms.

China has retreated from its impossible pre-1979 goal of building 20 large hydroelectric dams by 1985 having a total megawatt capacity in the tens of thousands. Today's more modest objective is to concentrate resources on the major projects already under construction. Scheduled to be completed by 1985–88, these have a total capacity of about 10,000 mw.

The most recent long-term goal, published in the Beijing magazine *Shuili Fadian (Water Power)*, calls for 40,000–50,000 mw to be added in 1981–2000; 4,000 by 1985; 9,000–10,000 in 1986–90; 12,000–16,000 in 1991–95; and 15,000–20,000 in 1996–2000. Although hydro is likely to play a progressively more important role, this is undoubtedly an overly optimistic projection. US government experts predict that the hydro portion of total generating capacity could rise from the present 30 percent to 40 percent by the end of the century. A reasonable estimate, in light of current financial and technical capabilities, is that an average of about 1,500 mw per year could be added by the end of the century, yielding a total of about 50,000 by that time.

The details of China's hydro construction plans are far from clear. What is built will of course depend on the availability of funds, and that depends on the share of the pie left over should China decide to go ahead with the colossal Three Gorges Dam.

China's 600-foot Great Wall

The cost would be staggering. The Three Gorges' latest price tag of ¥9.6 billion ($5.3 billion), spread over a 15-year construction period, would average out to ¥640 million per year, or approximately one-third of the nation's total hydro construction budget in 1981. Obviously, to fund this project domestically (and there has been no sign yet that foreigners would be invited to participate) would mean forgoing a number of other projects.

The Three Gorges scheme was believed until recently to be on the shelf (*see The CBR*, May–June 1980, p. 16–23). The rivalry between the old Ministry of Water Resources—which favored the project—and its nemesis, the Ministry of Electric Power, supposedly abated early this year when both were merged into one ministry, the Ministry of Water Resources and Electric Power. Such a cosmetic change, however, would not fool a structural geologist, and in fact the reorganization has not so much reduced rivalry as elevated to the top ranks of the new ministry those who favor hydro projects in general, and specifically the Three Gorges dam.

This, however, does not mean actual work will begin any time soon. Even its most ardent proponents do not plan on starting Three Gorges before the late-1980s completion of Gezhouba, which would become its regulating dam. Design work will be done which in the meantime, could reveal unforeseen complexities. In that period of time, the political scene could change. The new water power ministry, furthermore, will have to find a solution to the gigantic problems of inundation (as far upstream as Qongqing, affecting 44,000 hectares in all) and the displacement of 1.4 million people, difficulties that have torpedoed far smaller dams.

To overcome bureaucratic resistance, the ministry might have to either scale down the project or devise a method to build it in stages. This would also free up funds for other projects. One suggestion apparently under serious consideration is to build a 6,000-mw low dam at Three Gorges instead of the high dam.

Developing the Pearl River and Hongshui

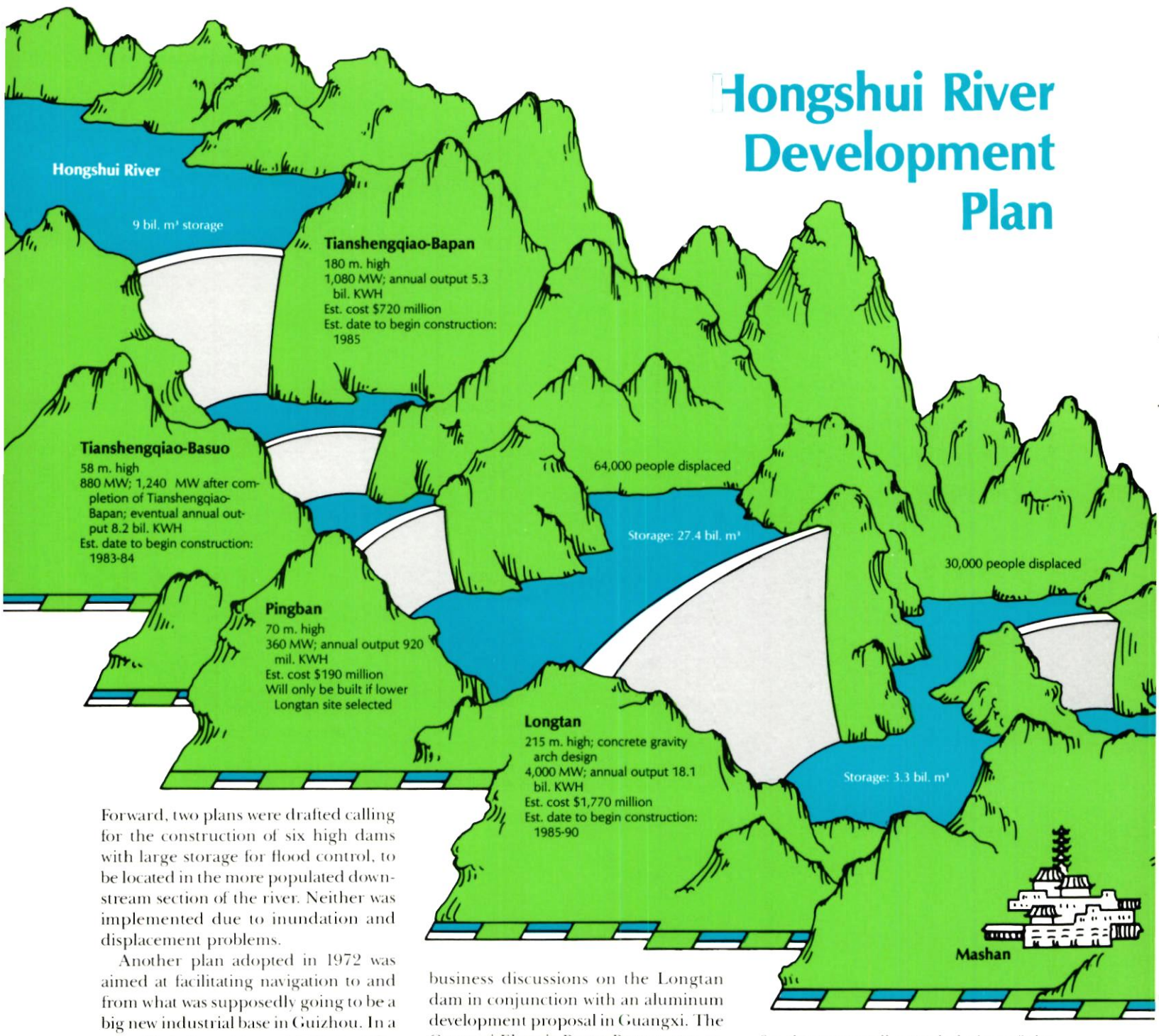
China's 10-dam, 11,000-mw plan for the Hongshui in Guangxi is of far more immediate priority.

The Pearl River system, which includes the Hongshui, boasts China's largest annual runoff after the Yangzi—34 billion cubic meters, 8 times the volume of the Yellow River, despite the fact that its drainage area is only one-fourth as big. Along the mountainous headwaters of the Hongshui, the gradient is steep and the population density and area of cultivated farmland are relatively small. The former Ministry of Electric Power estimated last year that only 180,000 people would have to be relocated for the entire 10-dam plan.

In addition, the area is within striking distance by 500-kv transmission line from major load centers in Guangdong and Hong Kong. Thus, the Hongshui offers the most ideal conditions for hydro development in China. The Chinese now put it in a class with the Upper Yellow River, which will be almost fully developed when the key Longyang station is completed in the late 1980s.

The genesis of the current Hongshui scheme reveals much about the historical vagaries of hydropower planning. In the enthusiasm of the Great Leap

Hongshui River Development Plan



Forward, two plans were drafted calling for the construction of six high dams with large storage for flood control, to be located in the more populated downstream section of the river. Neither was implemented due to inundation and displacement problems.

Another plan adopted in 1972 was aimed at facilitating navigation to and from what was supposedly going to be a big new industrial base in Guizhou. In a one-sided attempt to avoid the inundation and displacement problems of the earlier plans, it went to the other extreme, calling for a series of 12 low-head dams with minimal storage. This would have resulted in an enormous waste of the river's power resources. Eventually work began in the mid-1970s on two of the dams from the 1972 plan: the 60-mw Etan project completed last year, and the 400-mw Dahua dam scheduled to come on stream in 1983. Both are located along the Hongshui's less mountainous downstream section.

In 1978 a more ambitious power development plan again surfaced, first becoming known to foreigners through business discussions on the Longtan dam in conjunction with an aluminum development proposal in Guangxi. The Guangxi Electric Power Bureau was assigned the task of developing what turned into the 10-dam plan, which was approved by the State Council at the conclusion of a major conference in late 1981.

The 10-dam plan encompasses a 1,050-km section midway down the Hongshui, beginning at the Nanpanjiang River along the Guangxi-Guizhou border, and ending at Datengxia in Guiping. Development on tributaries does not fall within the plans' purview, which is the major reason why only 11,000 mw of the river system's 25,000-mw potential is included in the plan. Despite this limitation, the plan takes by far the most well-rounded view of the river's development to date.

The basic concept calls for high-head dams upstream, and low-head dams along the more populated downstream areas at sites selected on the basis of surveys conducted over a 20-year period. The four high-head dams are Tianshengqiao-Bapan, Tianshengqiao-Basuo, Longtan, and Yantan. Datengxia, the farthest downstream of the sites, would play the most important role in promoting river navigation. The large storage capacities at Longtan and Bapan would facilitate flood control.

Basuo has been selected for development first since it is medium-sized

(1,240 mw), relatively cheap (¥1 billion), able to be finished by 1990 (before the others), well researched, and requires a fairly straightforward low concrete gravity design. Funds for Basuo's site preparation were appropriated in 1982.

Next in line for construction prior to 1985 are Yantan and Tianshengqiao-Bapan. Yantan, at 1,400 mw, is more moderately priced than Bapan; its geological conditions are the most favorable in the entire valley, and its survey work is further advanced. But there is still some sentiment for proceeding first with Bapan, because of its large storage (9 billion cubic meters, second only to Longtan) and the potential for integrating it with Basuo. Bapan probably could not begin construction until after 1985, which may swing opinion back towards Yantan.

Longtan, a proposed 4,000-mw dam with a storage capacity of at least 24 billion cubic meters, is the so-called "dragon's head," the key to controlling the whole valley for both power generation and flooding. Its size, complexity, and cost precludes any attempt to start construction before 1985; the Chinese are debating whether to try to target the completion of Longtan, and the plan as a whole, by the year 2000. An alternative is 2005, but the dates only represent general guidelines at present.

One scheme under consideration is to construct Longtan in stages, which would provide power more quickly, though this might increase the dam's per-unit cost.

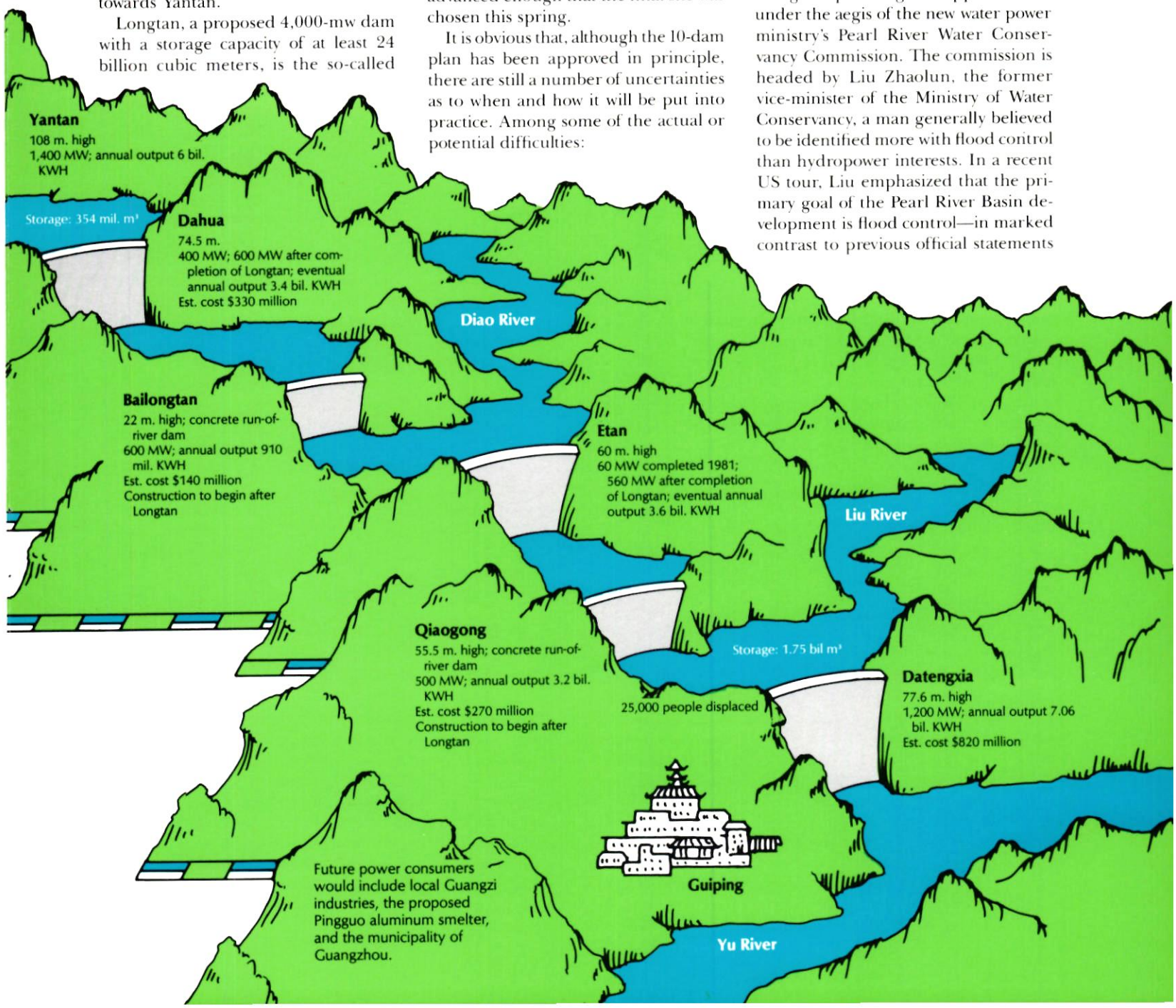
Progress at Longtan will determine the construction schedules of the downstream plants. Survey work at the run-of-the-river plants is still at a very preliminary phase. At Datengxia, it is advanced enough that the final site was chosen this spring.

It is obvious that, although the 10-dam plan has been approved in principle, there are still a number of uncertainties as to when and how it will be put into practice. Among some of the actual or potential difficulties:

Geology. Much of the Hongshui Valley lies on porous limestone, or karst, of the type so famous in the nearby tourist city of Guilin. The Chinese are confident that none of the dam sites are located on karst, but some foreign companies still fear that the geological conditions might be unstable.

Funding. The total cost of the 10-dam plan is estimated at about ¥12 billion ($6.7 billion). Approval of the plan, however, only means the beginning of efforts to secure financing from sources as diverse as the World Bank and individual Chinese enterprises. This separation of engineering planning from financial planning is apparently quite common in China.

Bureaucratic snafus. Originally under the old Ministry of Electric Power, Hongshui planning now appears to fall under the aegis of the new water power ministry's Pearl River Water Conservancy Commission. The commission is headed by Liu Zhaolun, the former vice-minister of the Ministry of Water Conservancy, a man generally believed to be identified more with flood control than hydropower interests. In a recent US tour, Liu emphasized that the primary goal of the Pearl River Basin development is flood control—in marked contrast to previous official statements



that power generation would be the main goal. This raises the possibility that flood control projects on other rivers in the system could take precedence over the 10-dam plan once the commission completes a basin-wide survey in 1984.

Technical disputes. Conflicts between flood control and power interests are more likely to flare over the 10-dam plan itself. One dispute is over the height and storage of Longtan. Power generation interests want a 225-meter, 4,000-mw dam, and flood control people are pushing for a 265-meter, 6,000-mw dam, which would practically double storage to 55.5 billion cubic meters. The 1981 national conference clearly favored the 225-meter dam, but Liu's commission will probably try to overturn the decision when more specific planning is done on Longtan. The displacement/inundation issue may come to the aid of the hydropower interests.

A related issue is that of run-of-the-river dams, which power interests support and flood control oppose. If the higher Longtan dam is accepted, there would be no need for the Pingban dam immediately downstream. Chairman Liu has argued in favor of enlarging the scale at Etan, and eliminating the Bailongtan run-of-the-river dam.

Datengxia. The most serious dispute probably is over Datengxia, the farthest downstream dam. Even before the merger of the ministries, Liu stated that flood control should be as important as power generation at Datengxia. Flood control interests seem to want to push Datengxia construction faster, due to its proximity to the downstream areas that face the greatest flood threat. They favor a larger reservoir capacity than the 2 billion cubic meters recommended by the old Ministry of Electric Power, and want the dam to be managed as a flood control facility in terms of when the decision is made to release water from the reservoir.

The Datengxia debate has drawn in the Ministry of Communications, which is campaigning for locks to accommodate 1,000-ton vessels. Power advocates, alarmed by the expense of this proposal and its effects on water management, insist that 500-ton boats would be sufficient. As one power engineer said at the 1981 conference, "The Hongshui should not be thought of as the important waterway. . . . It is only an alpine inland lake—a channel without an outlet." It must gall the power advocates even more to realize that water transport planning on the Hongshui is not being coordinated with the rail expansion schemes of the Southwest Energy Development Corporation.

The 1981 conference took a much less clear-cut stand on the Datengxia issues than on Longtan, which suggests that the power-generation position is not as strong politically. A detailed feasibility study reportedly being carried out by the Ministry of Communications may resolve the conflict.

Other Dam Schemes

Although the Hongshui is now capturing the most attention, there are numerous other dam development schemes in the Pearl River system, many of them apparently under provincial sponsorship. For the Li (also known as Gui) River that runs through Guilin, for example, there is a proposal to develop a four-dam cascade system; Canadian engineering firms are reviewing one of them.

Other parts of the country with active hydro development:

Southeast China. Water resources are abundant, but in general only low-head development is possible in this area. The January 1981 issue of the *Shuili Fadian* reported a tentative plan to develop 13–15 low-head stations by the 1990s with a total capacity of 4,200–4,600 mw. The key station would be the 1,400-mw Shuikou plant in Fujian, whose construction may begin with World Bank assistance after 1985. Others include the 240-mw Shaxikou station and two others in Fujian; five stations in southern Zhejiang, including enlarging the Hunanzhen station on the Wuxi River and 300- and 250-mw stations on the Ou River, where Japanese interests already have begun survey work; and three in Jiangxi, including the Xiashan station in the western part of the province and Guting on the Shangyou River, upstream from the 500-mw Wanan station now under construction. Many are likely to be built with provincial funds.

Northeast. Large-scale hydro construction began in the 1930s under Japanese occupation. Thus far, development has been concentrated mainly along the Yalu River (in cooperation with North Korea), and along the upper Songhua in Jilin. The 190-mw Taipingwan and the 390-mw Weiyuan stations are under construction on the Yalu. When completed in the mid 1980s, the 900-mw Baishan station and the 200-mw Hongshi station that will use Baishan's tail water will tap a significant part of the Songhua's 3,300-mw potential. The Chinese are seriously considering adding 600 mw to Baishan at a later date. But hydro interests would also like to construct more dams in other, more remote sections of the northeast. There are reportedly proposals to build 250-500 mw stations at Buxi on the Nenjiang River, and at Lianhuapao and Changjiatun on the Mudanjiang River in Heilongjiang. However, the potentially richest source of hydropower in the whole northeast, the Heilongjiang (Amur) River itself, will not be exploited any time soon due to its position on the Sino-Soviet border.

Sichuan. The upper reaches of the Yangzi (Jinsha) River and its tributaries, as well as the large rivers of Tibet and upper reaches of the major Southeast Asian rivers in Yunnan, contain by far the most abundant of China's hydro resources. But the region's remoteness means that the vast majority of favorable dam sites will not be developed in the foreseeable future.

Several very large dams on the Jinsha and Yalong rivers in Sichuan were given serious consideraton in 1978–80, but these all appear to have been postponed indefinitely, including the Ertan project examined by US firms and the US government, due to lower projected demand for the area. The hydropower design institute in Chengdu has recommended that planning in Sichuan be concentrated on the Dadu and Yalong Valley, and on the downstream section of the Jinsha from Dukou to Yibin, leaving the upper Jinsha for the future.

Immediate investments in Sichuan are to be concentrated in three projects: the 600-mw Tongjiezi station on the Dadu near Leshan, which is beginning construction this year just upstream of just upstream from the already completed Gongzui station; the 180-mw second stage of the Yuzizi project; and the 120-mw stage of the Nanya River project.

In the near term, new investments will probably go toward medium-scale projects. Advanced plans for the 640-mw Baozhusi station near could be implemented next if the inundation and relocation problem can be solved. On the Yalong River, attention has shifted from Ertan to the proposed 400-mw Tongziling station near the river's juncture with the Yangzi. Design work is also proceeding on the Pengshui station on the Wu River. The upper Min River rounds out the list of the next priorities. ₹

HYDROPOWER

Budget Constraints

Hydro planners may be forced to tap local funds, foreign loans, and private investors.

Even though the high priority of hydro last year led to a small funding increase in both relative and absolute terms, fiscal retrenchment poses a major constraint on growth. As the *People's Daily* recently pointed out, "investment will not be great," despite the great importance attached to water power development.

The US government estimates that China spent ¥2.7 billion ($1.5 billion)—50 percent of the total investment in electric power—on hydro last year. But probably about ¥0.8 billion of this went to upgrading or renovating existing stations. Only about ¥1.9 billion was allocated to building new capacity—an amount sufficient to add about 1,300mw.

Tapping Local Funds

A critical energy shortage may jolt Chinese leaders into appropriating more for hydro. But the government probably will pursue other avenues of financing first.

One possibility is to tap the budgetary surpluses of provincial governments, as well as the excess cash controlled by enterprises under the decentralizing reforms. In the coal and thermal power sectors, for example, ¥1.4 billion recently was raised from local authorities for projects financed in part by the central government. In some cases, energy-consuming enterprises are either receiving a fixed return on their money in the manner of Western bonds, or are guaranteed a quota of coal or electricity from projects in which they invest.

It is only a matter of time before these methods will be applied in the hydro sector as well. The *People's Daily* recently called for hydro "joint ventures between central and local authority, and some by the joint efforts of localities themselves."

Though some local funds may be used for large projects, reliance on local funds is likely to mean that a considerable portion of hydro construction will consist of small and medium-sized projects on smaller rivers. According to the *People's Daily*, such projects could add as much as several hundred megawatts per year in stations with 30–50 mw generating units in the water-rich southern provinces.

Not only are these stations cheaper to build, but they can be completed more quickly than the larger projects—an attractive feature for localities that want power immediately. These advantages do much to offset the higher unit costs of the smaller facilities. The potential for coordination problems between the large and small plants is the only real drawback to this scheme. Small plants on river tributaries under provincial control sometimes seem to be proceeding independently of central-government plans to develop larger rivers. This poses problems for electrical load and water management.

Tiny plants of several tens or hundreds of kilowatts already account for about 6,500 mw, or 33 percent of China's total hydro-generating capacity. The central power authorities have complained about the effects of smaller hydro plants on the larger stations, and it remains to be seen whether better coordination will be achieved in the future.

Foreign Capital

Another important alternative for funding is foreign investment. The most promising sources are nonprivate lending agencies, particularly the World Bank and the Japanese government.

The World Bank is actively considering three hydro projects. Of these, the 600-mw Lubuge dam on the Huangni River in Yunnan is likely to proceed the most quickly as it is the smallest and least expensive, and preparations are the furthest along. The Chinese had begun excavation work before readjustment brought things to a standstill two years ago. It is conceivable that loans in the $100–$200 million dollar range could be made as early as mid-1983.

Some site preparation work also was done in the late 1970s at the Tianshengqiao-Basuo site on the Nanpan River along the Guangxi-Guizhou border. The World Bank, however, is unlikely to fund this 2,400-mw project for at least another 3 years. The 1,400-mw Shuikou dam in Fujian would probably receive money even later, although consulting firms are currently reviewing this project, as well as Lubuge, under World Bank auspices.

Any bank funding will require a meeting of the minds between the bank and the Chinese on procedures and rules—including the role of outside consultants and contractors. Since the Chinese are usually slow to reach such understandings with foreign agencies, this issue could very well push back the timetable.

The availability of money is an equally serious problem. Already, it appears that over $100 million dollars of cofinancing will be required from non-bank sources for each of the three projects.

This is no more assured than China's acceptance of what could be high interest rates. The bank funds themselves, for that matter, undoubtedly will be made available through its IBRD interest rate (currently 11.7 percent), rather than concessional IDA rates.

The most likely candidate for cofinancing is Japan's Overseas Economic Cooperation Fund (OECF), which has charged a mere 3 percent interest on 30-year loans. It, however, is already going its own way in China. Several hundred million dollars were in fact committed to China in late 1979 for the 1,500-mw Wuqiangxi dam in Hunan as part of a 6-project package. As the Chinese have suspended its construction, with no guarantee as to when or whether it will start up again, the Japanese have shifted the funds to other strapped projects such as the Baoshan Steel Mill. Yet reports in the Japanese media, citing "informed sources", are suggesting that the Japanese will begin funding 2 new small dams of 300- and 250-mw capacity on the Ou River in southern Zhejiang in a few years. Soil surveys at the sites reportedly are being conducted under Japanese government auspices. Whether the Japanese would cofinance World Bank projects as well is still unclear.

There has been some government-to-government discussion of Brazilian financing of a 240-mw project at Shaxikou on Fujian's Min River. Brazilian hydro engineering firms reportedly are using Chinese labor on some Middle East projects, which could conceivably become a part of a larger package deal.

The Chinese also are seeking private investment, particularly in the southwest. Guangxi Province approached Hong Kong financiers for billions of dollars for hydropower projects. Most schemes for attracting this kind of money involve the export of electricity to Hong Kong, or minerals and metals exports developed with the benefit of the hydropower.

But the feasibility of exporting hydroelectricity has not been ascertained. The demand may not be there, and the hydro interests could easily come into conflict with the Southwest Energy Development Corporation, a consortium of ministries and provinces that is trying to attract Hong Kong capital to develop Guizhou coal for Hong Kong's power plants.

Developing mineral resources in conjunction with hydropower will also require a degree of bureaucratic and regional cooperation which has eluded the Chinese in the past, not to mention willingness in Beijing to spend some domestic funds. Moreover, the international demand for minerals and metals is soft. Given these uncertainties, the prospects for significant foreign investment in China's hydro development are by no means assured.

HYDROPOWER

Over Budget, Over Due

China's dams tend to take longer and cost more to construct than originally planned. The reasons are easy to find.

The Chinese have accumulated considerable hydro dam expertise in the course of constructing more than 30 projects larger than 100 mw since 1949. The 2,700-mw Gezhouba project, a giant by world standards, will be a testimony to Chinese engineering and technology when it is completed. American hydropower engineers almost without exception praise the technical capabilities of their Chinese counterparts.

But China's dam construction is plagued by the twin problems of long construction times and cost overruns. At a 1982 national meeting on electric power, it was admitted that whereas "construction of a large or medium-sized project generally required 3 and 5 years to complete" up to the mid-1960s, "it now requires 5 and 10 years." Frequently, the Chinese have predicted 10-year construction cycles for projects that American engineers feel they could complete in 6 or 7 years.

The average cost also has increased since the mid-1960s, from ¥1,024 per mw to more than ¥1,400 per mw now. The most spectacular cost overruns and construction delays in recent years have affected the 1,400-mw Longyang dam on the Yellow River in Qinghai (completion delayed until 1987, 2–3 years behind the original 7-year construction schedule, with costs increasing from ¥900 million to ¥1.4 billion), and the 900-mw Baishan station on the Songhua River in Jilin (completion delayed until 1985, 3 years beyond the 7-year schedule, with costs rising from ¥360 to ¥880 million). This does not even mention Gezhouba, which was halted completely for 2 years in the mid-1970s.

One important cause of the delays and overruns is that resources have been spread over too many projects. In essence, China's readjustment policies mean reducing the number of such projects so that a few can proceed at full throttle.

There also has been a tendency at times, given the intensely political nature of the struggle for investments, to seek central government approval for projects before the engineering problems are ironed out. Consequently, serious problems may surface—and delays ensue—when construction begins. This was certainly the case at Gezhouba, which was pushed forward by Premier Zhou Enlai. The central government hopes to solve this problem by demanding feasibility studies.

There are, however, technological reasons for some of the difficulties the

Chinese have encountered in dam construction. To mention a few:

Geological analysis. The Chinese tend to gather an enormous amount of geological data before starting a project; the many bore holes and small caves along hydro sites attest to that. Still, some observers feel that cooperation between geological engineers and the structural or hydraulic engineers is not all it could be. Bureaucratic divisions between geology and design personnel may be part of the problem. At any rate, there are some striking examples of geological problems encountered in the midst of construction. According to the Hong Kong Communist newspaper *Wen Wei Po*, builders at the Longyang site discovered three faults during construction, requiring large volumes of extra cement for grouting. This was a major reason for construction delays and cost overruns. In addition, it necessitated a reduction in the planned generating capacity from 1,600 to 1,280 mw.

Dam design and construction. The Chinese have tended to follow Soviet prejudices, favoring concrete gravity and arch structures over earth and rock. They lack experience with earth and rock. But earth-rock dams, where the geological conditions are appropriate, can save a considerable sum of money in construction material cost. Sometimes materials that would have to be removed anyway during dam excavation can be used.

A related issue is that of construction equipment and machinery. To build a large, modern earth-rock or concrete dam expeditiously requires much larger and more efficient earth-moving and transportation machinery than is currently made and used in China.

Turbines. Powerhouse construction techniques resemble those in the US. But turbine technology lags behind. China's largest power turbine to date is 300 mw. The inability to build larger capacity units restricts the size of hydroplants at some sites where the physical space available can house only a few turbines.

Moreover, Chinese turbines deliver about 10 percent less power than Western turbines of similar size, and require considerably more steel to build.

Experience with large Francis Kaplan (high-head) and with all types of (low-head) turbines is believed to be particularly lacking. China's most ambitious leap into Kaplan technology has been the manufacture of 170-mw units by the Dongfanghong plant in Sichuan; these units may be the largest of their type in the world. How well they perform remains to be seen. Data on the trial operation of two units over several months suggests a relatively low rate of utilization.

There is obvious interest in foreign technology for bulb-type Kaplan turbines, which operate at extremely low heads of 5-10 meters. Three such units, rated at about 19 mw each, were purchased from Voith AG, Austria, in 1979, for the Majitang Station on the Zishui River in Hunan.

In addition, Allis-Chalmers of the US, one of the premier hydroturbine manufacturers in the world, has reached a cooperation agreement with the Ministry of Machine Building involving "hydropower equipment and related technologies." This is not believed to involve a full-fledged licensing program, but rather an agreement to cooperate on jobs in China and around the world. Factories in China would participate in the manufacturing with Allis-Chalmers' assistance when orders are received.

Transmission. Many of China's good potential hydro sites—including those in the Hongshui valley—are located in the south and west, more than 1,000 km from major load centers. Hence, high-voltage transmission lines are necessary to prevent unacceptable line loss. China is in the process of installing several 500-kilovolt (kv) transmission lines, including one from Gezhouba to Wuhan. (The others are from thermal plants.)

But the question is: How willing are the Chinese to use foreign equipment for key components such as transformers and substations? The first 500-kv line, completed last year and running from Pingdingshan to Wuhan, used transformers, protective relays, and inductance devices from France and Sweden. There is probably growing pressure now to procure such equipment from Chinese factories licensing Alsthom Atlantique, and ASEA equipment, though many observers feel the quality standards of Chinese factories are still too poor.

In the future, a substantial technical leap to high voltage direct current transmission will be required if domestic equipment is to be used to transmit power from some of the more remote dams—including the colossal Three Gorges project—that are under study.

HYDROPOWER

Foreign Engineering Assistance

China finally has begun paying for some of the consulting services of foreign firms. Much of the money, however, still comes from abroad.

The question of foreign engineering involvement in Chinese hydropower construction is a very sensitive one. The Chinese are still not accustomed to the idea of paying for consulting services. They are justifiably proud of the expertise they have accumulated in dam construction, and the self-reliance philosophy is believed to be especially strong in the Water Conservancy and Electric Power Ministry.

Almost every Chinese press release about Gezhouba takes pains to mention that the Chinese have built the project by themselves. Some foreigners suspect that Minister Qian, Gezhouba's main sponsor, believes in a more literal interpretation of self-reliance than officials in the old MEP.

Under these circumstances, it is unlikely that foreign engineering companies will obtain projects in China that give them primary design, equipment procurement, or construction management responsibilities. But this does not mean that the Chinese are uninterested in the expertise the firms have to offer.

The Chinese received considerable free advice from a number of firms in the 1978-80 period. Since then, they have gotten free help from the US Army Corps of Engineers and Bureau of Reclamation, and on occasion have asked American firms to troubleshoot at specific projects under construction, again without pay. The Chinese have been interested both in outside opinions on specific engineering problems and in the technical and economic methods of analysis used by foreign companies.

In the last year companies began to be paid for conducting preinvestment studies of Chinese dam sites for the World Bank and other international lending agencies. The consulting firms are Snowy Mountain of Australia (Lubuge); the American giant International Engineering Company, a subsidiary of Morrisson-Knudsen (Shuikou, a second possible World Bank project); and a consortium of three Canadian firms—Le Group SNC, Shawinigan, and Acres International. The latter study is for a 200-mw project at Zhaoping on the Gui River in Guangxi, which provincial authorities hope to submit to the bank. The client is the Guangxi Provincial Electric Power Bureau, not the water power ministry.

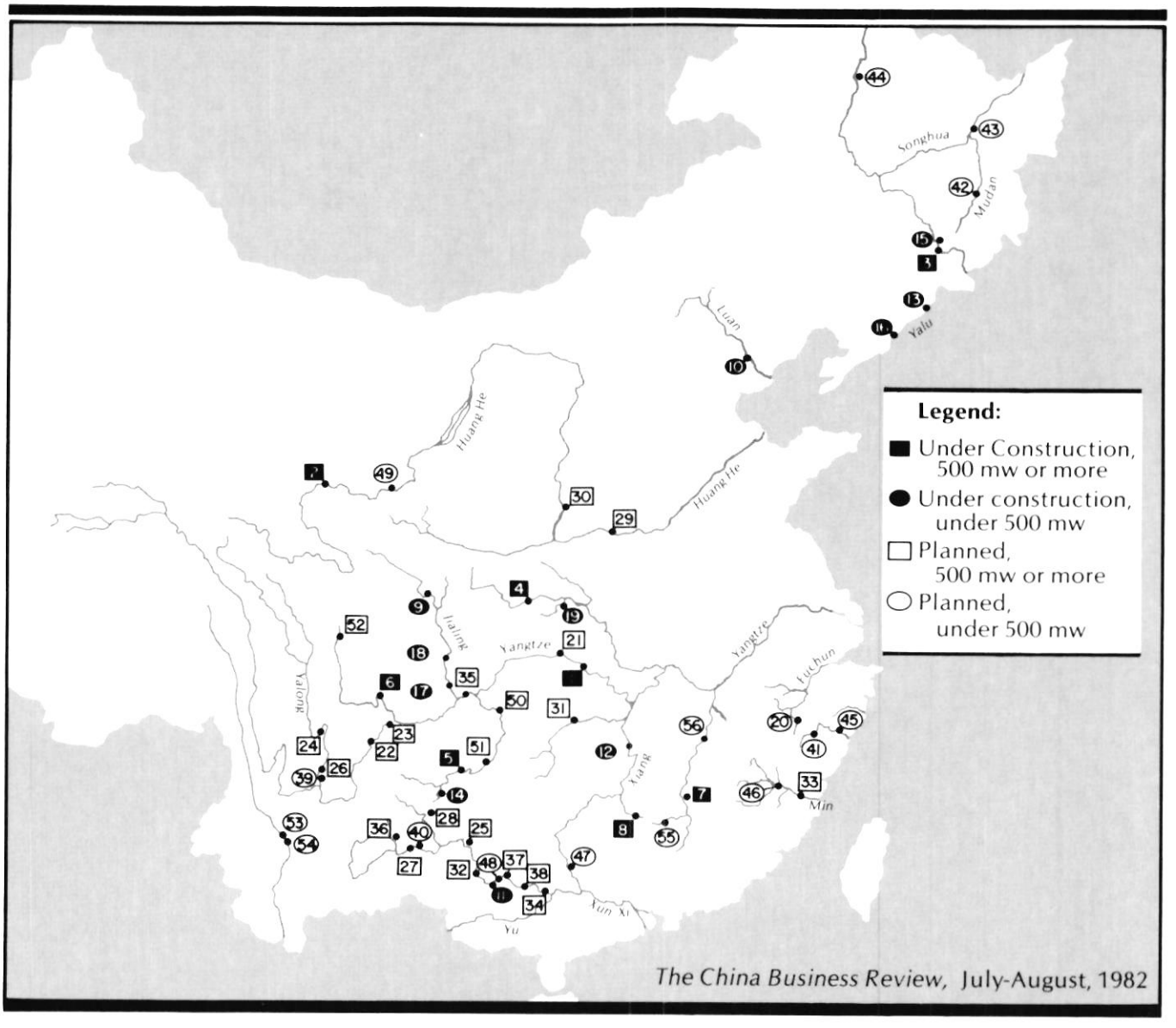
These contracts share several features. They basically involve reviewing plans the Chinese already have developed. The main contribution from the companies is advice on scheduling and managing construction using equipment with which the Chinese are unfamiliar, and on preparing bidding documents. In each case, the money for the studies comes from outside China: from the UNDP for International Engineering Company (IECO), and from the Australian and Canadian governments for the others.

Most feasibility studies are still funded by the UN or foreign governments.

The Japanese government is offering funds to Japanese firms through the Japan International Cooperation Agency for the 300-mw Tankang and 250-mw Huangpu dams on Zhejiang's Ou River. The foreign parties seem to be playing a more extensive role here. They will help determine the type of dam to be built at Tankang and are engaging in cartographic, soil, and geological surveys, according to the *Mainichi Daily News*. The surveys, which will include cost estimates, are likely to last three years. The Chinese hope to obtain Japanese government assistance for construction.

The Brazilian firms Themag and Mendes Junior are discussing the 240-mw Shaxikou project in Fujian, but whether or when the Brazilian government will fund a formal survey is unclear. European engineering firms also are discussing the possibility of conducting government-funded studies with the Chinese and their home governments. The US government already has gotten into the act by funding a private survey of Tianshengqiao (*see* page 24).

The willingness of foreign governments to fund these studies reduces the chance that China will spend its own money on feasibility studies anytime soon. The big question is what will happen when construction begins. IECO, for one, believes that as the Chinese gain experience working with foreign firms, the scope of cooperation—and compensation—will gradually expand.



1 Gezhouba, Hubei. 2,700 mw (2 x 170, 19 x 125); 70 m high; concrete-gravity; storage 1.6 bln m^3; power output 13.8 mln kwh; low-head 18.6 m run-of-the-river plant; three units in operation by 1982, completion targeted 1987. Originally intended as reregulating dam for Three Gorges.

2 Longyang, Qinghai. 1,280 mw (4 x 320); 178 m (highest in China); 890 m long; concrete-gravity arch dam; storage 24.7 bln m^3; output 6 bln kwh; first generator installation in 1985; completion target 1987. Delays caused by discovery of faults at site. Electricity to supply North China, probably via 500-kv lines.

3 Baishan, Jilin. 900 mw (3 x 300); 150 m; 667 m long; concrete-gravity arch dam; storage 6.2 bln m^3; construction began 1975. Due to major delays first generator to be installed 1983.

4 Ankang, Shaanxi. 800 mw (4 x 200); under construction since 1978.

5 Wujiangdu, Guizhou. 630 (3 x 210) mw; 165 m; concrete-gravity arch dam; 2 units installed by 1982. One of first dams in country built in karst-limestone area.

6 Tongjiezi, Dadu River, Sichuan. 600-mw; to begin construction second half 1982; probably to be coordinated with nearby 700-mw Gongzu dam.

7 Wanan, Gan River, Jiangxi. 500 mw; under construction since 1978.

8 Dongjiang, Leishui River, Hunan. 500 mw (4 x 125); 157 m; concrete; under construction since 1978; storage 8.1 bln m^3.

9 Bailongjiang River, Gansu. About 500 mw, probably addition to existing facility at Bikou.

10 Luanhe River, Hebei. 450 mw (1 x 150-mw turbine, 3 x 100 pump-storage units); 107.5 m; 1,040 m long; storage 2.9 bln m^3; electricity output 520 mln kwh; one generator commissioned 1981. Major political battles concerning diversion to Tianjin.

11 Dahua, Guangxi. 400 mw (4 x 100, 600 mw after Longtan completed); 79 m; concrete; targeted for completion 1983; storage 354 mln m^3; locks to accommodate 200-ton ships.

12 Linfen, Hunan. 400 mw.

13 Weiyuan, Jilin. 390 mw; under construction jointly with North Korea; power to be shared.

14 Maotiaohe, Guizhou. Expansion of cascade system from 240 mw to 500 mw under way.

15 Hongshi, Jilin. 200 mw; will use Baishan tail water; construction began 1981.

⑯ Taipingwan, Liaoning. 190 mw; under construction jointly with North Korea; power to be shared; completion target 1985.

⑰ Yuzixi River, Sichuan. 160 mw.

⑱ Nanya River, Sichuan. 120 mw; began construction 1982; part of cascade series.

⑲ Huanglongtan, Duhe River, Hubei. Possibly 100 mw to be added to existing 150 mw. High construction priority for the 1980s.

⑳ Hunanzhen, Wuxi River, Zhejiang. 80 mw addition, to 170; 128 m.

Hydroelectric Projects under Construction or Planned

㉑ Three Gorges, Hubei-Sichuan. Proposed as 25,000 mw; 200 m; concrete; storage 70 bln m^3. Exact site not selected. Project controversial, but now believed to be on construction agenda for late 1980s. Inundation/displacement problems may change plan to 6,000 mw low-head dam.

㉒ Baihetan, Sichuan-Yunnan. Proposed 10,000 mw; 270 mw; concrete. Postponed indefinitely.

㉓ Xiangjia, Sichuan-Yunnan. Proposed 4,000–6,000 mw; 130 m; earth-rock. Most accessible of Jinsha River sites, but still postponed indefinitely.

㉔ Jinping, Sichuan. Proposed 4,500 mw; involving 16-km pressure tunnels to create 300-m head. Probably lower priority than Ertan.

㉕ Longtan, Guangxi. Proposed 4,000 mw; 225-m; storage 27.4 bln m^3. No plans to build before late 1980s, due to cost. Flood control interests arguing for 265-m dam. Key to regulating the Hongshui.

㉖ Ertan, Sichuan. Proposed 3,000 mw (6 x 500, or 5 x 600); 245 m; concrete-gravity arch. Postponed for immediate future, due to lower projected power demand in Dukou area.

㉗ Tianshengqiao, Guangxi-Guizhou. Porposed 2,340 mw; first priority on Hongshui system. 880-mw, 58-m, concrete Basuo low dam to be built starting 1983-84, followed by 1,080-mw, 180-m Bapan rockfill high dam, then expansion of Basuo to 1,240 mw. 11-km pressure tunnels part of plan. World Bank financing sought; US government funding private sector engineering studies.

㉘ Huangguoshu, Dabang River, Guizhou. Proposed dam possibly 2,000 mw, one of highest construction priorities in 1980s.

㉙ Xiaolongdi, Henan. Proposed 1,600 mw (4 x 400); 151 m. Postponed due to silting problem.

㉚ Longmen, Shanxi-Shaanxi. Proposed 1,500 mw (5 x 300); 200 m. Postponed indefinitely due to silting problems, high cost.

㉛ Wuqiangxi, Yuan River, Hunan. Proposed 1,500 mw; 100 m. Funded with cheap Japanese government loans, but blocked for time being by opposition to inundation of 13,000 hectares.

㉜ Yantan, Guangxi. Proposed 1,400 mw; 108 m; storage 2.4 bln m^3.

㉝ Shuikou, Min River, Fujian. Proposed 1,400 mw (7 x 200); 95 m; storage 2.3 bln m^3; power generation 5 bln kwh. World Bank Funding sought for second half of 1980s, engineering study by International Engineering. Inundation of 54,000 hectares major problem.

㉞ Datengxia, Guangxi. Proposed 1,200 mw; 79 m. Storage volume under debate, possibly 1.46 bln m^3. Transport capacity also an issue.

㉟ Baozhusi, Sichuan. 640 mw; planning advanced, but held up by inundation problem. Still hope to construct in 1980s.

㊱ Lubuge, Huangni River, Yunnan. Proposed 600 mw (4 x 150); 100 m; rockfill; 9.4-km pressure tunnel to create 310-m head. Highest priority hydro project for World Bank in China. Construction under way briefly 1979, may resume 1983-84. Engineering survey by Snowy Mountain (Australia). Power for Yunnan.

㊲ Etan, Guangxi. 500 mw to be added to 60 mw; 60 m; run-of-river dam. Construction to begin after completion of Longtan.

㊳ Qiaogong, Guangxi. Proposed 500 mw; 55 m; run-of-river dam; to be built after Longtan.

㊴ Tongziling, Sichuan. 400 mw; low-head dam. Now has higher construction priority in 1980s than Ertan; eventually would be reregulating dam for Ertan. Sedimentation poses problems.

㊵ Pingban, Guangxi. 360 mw; run-of-river dam. Will not be built if larger Longtan size chosen.

㊶ Tankang, Oujiang River, Zhejiang. 300 mw. Japanese government conducting engineering survey, considering financial assistance in late 1980s.

㊷ Lianhuapao, Mudanjiang River, Heilongjiang. 250–500 mw.

㊸ Changjiatun, Mudanjiang River, Heilongjiang. 250–500 mw.

㊹ Buxi, Nenjiang River, Heilongjiang. 250–500 mw.

㊺ Huangpu, Oujiang River, Zhejiang. 250 mw; rockfill dam. Japanese government conducting engineering survey, considering financial assistance in late 1980s.

㊻ Shaxikou, Min River, Fujian. 240 mw. Negotiating investment with Brazil. High provincial priority in 1980s.

㊼ Zhaoping, Guangxi. 200 mw (3 x 66); 80 m; concrete-gravity, run-of-river dam. Part of 4-dam cascade; of which one already built. Engineering survey by Canadian firms. Foreign investment may be used.

㊽ Bailongtan, Guangxi. 180 mw; 22 m; run-of-river dam to be built in conjunction with Longtan.

㊾ Yanguoxia, Gansu. Several hundred mw to be added to existing dam to take advantage of water from Longyang Reservoir. High construction priority for 1980s.

㊿ Pengshui, Sichuan. Design advanced, high construction priority for 1980s.

(51) Dongfeng, Guizhou. Design advanced, high construction priority for 1980s.

(52) Dadu River, Sichuan. Cascade System planned for stretch 160-240 km from Chengdu.

(53) Manwan, Yunnan. Highest priority among Lancang River cascades; construction planned for 1980s.

(54) Xiaowan, Yunnan. Second-highest priority among Lancang cascades.

(55) Guting, Shangyou River, Jiangxi. "Medium-sized" station proposed for construction before 1990.

(56) Xiashan, Jiangxi. "Key project" for Gan River Basin development. Inundation and relocation pose problems.

—Martin Weil

HYDROPOWER

Private Sector Potential

A $400,000 grant for a hydropower study in China gives US firms the chance they have been waiting for.

Richard E. Gillespie

The US-China Hydropower Protocol, one of 17 such science and technology protocols signed for information exchange since 1979, may soon begin generating business for US engineering companies and equipment suppliers. A $400,000 Trade Development Program (TDP) grant will fund an engineering study by a US firm for the proposed Tianshengqiao ("Bridge of Heaven") dam on the Hongshui River along the Guangxi-Guizhou border. TDP funds are given by the State Department to promote trade opportunities for American business.

This grant grows out of a new government approach toward the Hydropower Protocol—to concentrate US resources on just one top-priority China hydropower project. The Hongshui River emerged as the priority after the State Council's approval last fall of the 10-dam plan for the development of the Hongshui.

A US Army Corps of Engineers team that examined the Hongshui in October–November 1981 recommended immediate construction of upstream power plants at two sites near Tianshengqiao, where the river's greatest grade differentials occur.

The two new coordinators of the Hydropower Protocol, Deputy Assistant Secretary of Commerce Eugene Lawson and the Ministry of Water Resources and Electric Power's Zhou Jingde, originally discussed commiting TDP funds to the Shuikou project in Fujian. But after the Chinese decided to use UNDP money for Shuikou, the two sides agreed that the money should go to Tianshengqiao.

Tianshengqiao eventually will encompass an installed capacity of 2,800 mw—1,240 mw at Basuo's low diversion (concrete gravity) dam, and 1,080 mw at the Bapan high rockfill dam and powerhouse. Two penstock tunnels, each 9 meters in diameter and 11 kilometers long, will serve the Basuo power facility initially. A third is planned for construction when the Bapan dam is completed.

The US government recognizes that Tianshengqiao offers one of the best opportunities for the private sector in China, as it is one of the projects under serious consideration for funding from the World Bank. Bank funding would generate international bidding in areas where the US is highly competitive, including exploration drill equipment, high-speed earth-moving equipment, computers, and turbine generators, as well as engineering and perhaps construction management services.

The June grant will pay for these US engineering services: preparation of a technical-alternatives study for the Basuo tunnels, guidance for Chinese tender document preparation on Basuo to meet World Bank standards, and preliminary conceptual design studies on selected aspects of the Bapan dam.

If planning continues on schedule, applications from companies should be solicited via the *Commerce Business Daily* in late September. Interested companies will then be allowed 45 days in which to submit prequalification packages, from which the normal "short list" will be developed. The Corps of Engineers will be prepared to assist the Ministry of Water Conservancy and Electric Power in selecting the US engineering company. A decision is expected before the year's end.

If the Basuo grant proves successful, TDP will consider making a second grant from its fiscal year 1983 and 1984 budgets to the Chinese for engineering work on Bapan.

Including the Private Sector

The decision to fund a private firm rather than a US government agency removes a thorn from the side of the private sector. After Vice-President Mondale signed the Hydropower Protocol in China in September 1979, the private sector has complained that the agreement promotes government-to-government cooperation at the expense of private-sector initiatives.

Annex I to the protocol, signed on March 15, 1981, set forth the areas of cooperation to be pursued in 1980–81, and called for engineering assistance on several major hydroelectric projects—principally Longtan and development of the Hongshui Basin, Three Gorges (Sanxia), Ertan on the Yalong River, and construction on the Yangzi River Estuary. But, even though US engineering firms had earlier discussed Longtan and Ertan with the Chinese, the Annex only provided for exchanges with the US Army Corps of Engineers (for Longtan, the Hongshui, and the Yangzi Estuary), and with the Bureau of Reclamation (on Ertan and Three Gorges). Training of Chinese specialists in water resources management and power grid engineering was to be carried out by the Tennessee Valley Authority and the Bonneville Power Administration. The private sector was

excluded, even though the exchanges of delegations eventually were funded by $475,000 worth of TDP grants—money that is supposedly earmarked to help the private sector.

US government agencies answered the critics by explaining that it was the Chinese, not they, who had turned to the public sector for support. Due to its lack of experience in dealing with foreign business, the argument went, the ministries of Water Conservancy and Electric Power clearly felt more comfortable working with US government agencies. Ambassador Holsey Handyside, the former US hydropower coordinator, claims that the government stepped in primarily to keep the door open for subsequent private sector involvement.

Pressure from business nevertheless produced a gradual shift in the government policy. Particularly active in developing a business-government dialogue on the subject was the National Council for US–China Trade (in particular its Engineering, Design, and Construction Services Committee), along with the American Consulting Engineers Council. Private-sector engineers representing both organizations participated in three 1981 delegations to China under the protocol.

The change became more marked toward the end of 1981, as Chinese and US negotiators began to discuss the 1982–84 program to be developed under Annex II. Hard bargaining was needed to increase the role of private firms. The Chinese, though eager for US engineering assistance, were not willing to pay for it. They had been conditioned to free engineering support from other foreign countries.

Meanwhile, US government funding for the completion of Annex I had been reduced to a trickle by late 1981, causing an indefinite delay in the visit by PRC power transmission engineers to the Bonneville Power Administration, and a decision to delay training programs for Chinese engineers and technicians.

Future of the Protocol

Before Annex II is formally signed, perhaps this summer, both sides will probably have to reach some cooperation agreement for Longtan, Ertan, and Three Gorges. There is also unfinished business from Annex I, including practical training within the American engineering community (some 60 engineers under two programs would be trained for periods ranging up to 12 months), and the long-delayed power grid technology delegation under sponsorship of the Bonneville Power Administration.

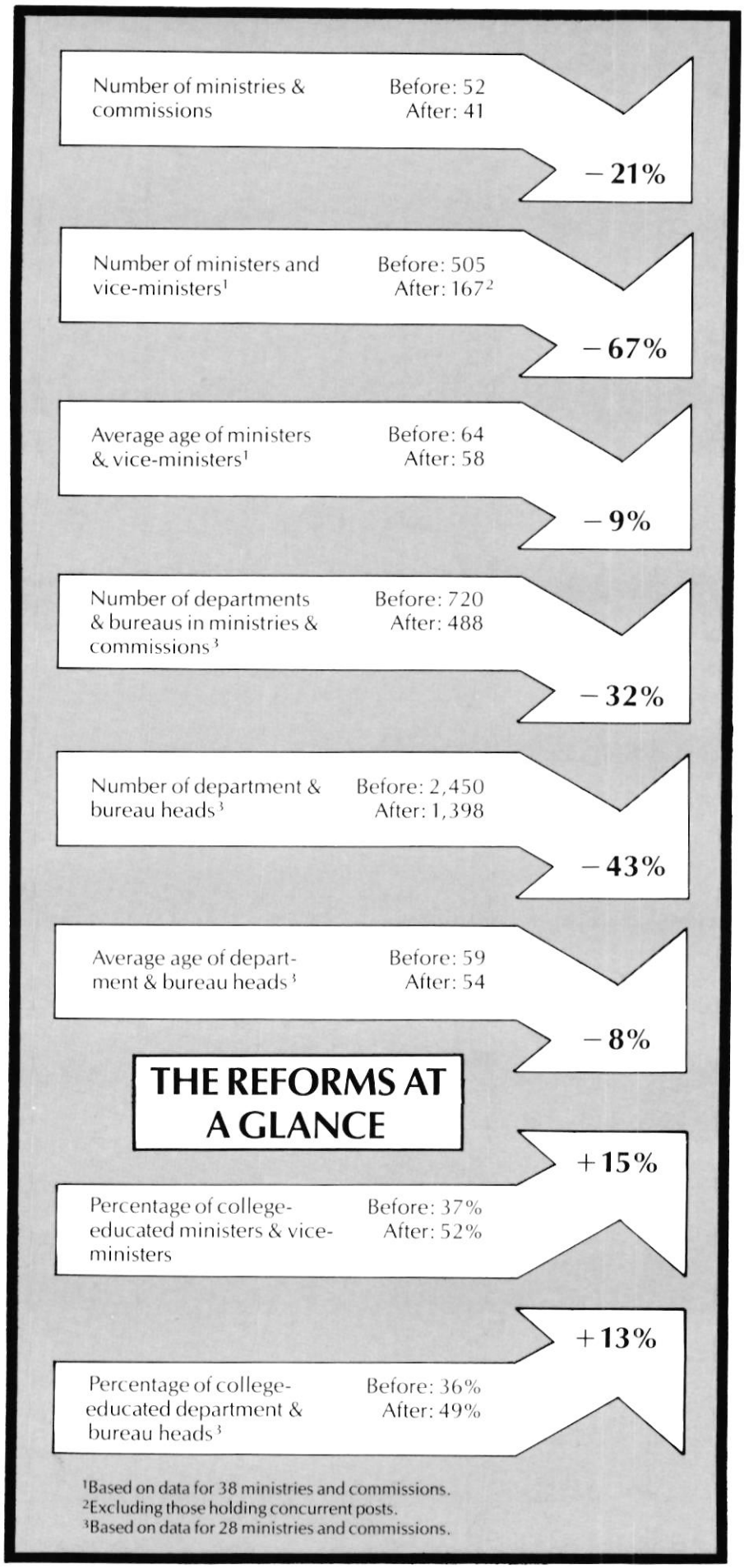
Funding for protocol activities will remain a problem. It is doubtful that US engineering firms will either provide services, or accept PRC engineers for training, without charging fees.

American firms still hope that some additional government funds may be found for Annex II. However, TDP funding beyond the $500,000 already committed will require congressional approval, which is unlikely in the current atmosphere of austerity. Little feasibility study money is available from the Overseas Private Investment Corporation, and the US Eximbank emphasizes goods and equipment, rather than services.

In all, there is a strong feeling among US businesses that the Hydropower Protocol can open the door for the private sector. For maximum cooperation to take place, however, the Chinese must come to understand why American engineers must charge for their work, and recognize that China stands to gain the most if foreign consultants can help them shorten construction periods and lower overall costs. Business leaders hope that the US government will convey this message to China while implementing the Hydropower Protocol.

The decision to fund a private firm rather than use a government agency removes a thorn from the side of the private sector.

Richard Gillespie is assistant director of the Council's Business Advisory Services Department. He has accompanied five delegations to China since joining the Council in 1979.



China is in the midst of a "revolution in administrative structure," in the words of Communist Party Vice-Chairman Deng Xiaoping. The development that has been most widely publicized in the West has been the two-staged streamlining of the State Council between March and May 1982. But the leadership's administrative reform program is even more far-reaching, extending into at least six areas.

For openers, China has begun a large-scale transition of power from the Deng Xiaoping–Chen Yun generation to their successors. No leader of a one-party state in the past has effected such a transition during his life. This time the prospects for success are reasonably good. Under the guidance of Deng and Chen, Communist Party Chairman Hu Yaobang and Premier Zhao Ziyang are beginning to cement their positions and install their "teams" in the Party and state apparatus.

Because so much of Chinese politics hinges on the personalities, background, and activities of second-level Chinese politicians (*see The CBR*, May-June 1982, pp. 22-28), it is very important to examine who is on the second team and what they think. Many "unknowns" were promoted as ministers and vice-ministers between March and May. Some of these individuals will be the political leaders of the next generation.

Constitutional Reform

On April 27, the Standing Committee of the National People's Congress released a draft of a new state constitution. This will be sent to the full NPC to be ratified as the fourth state constitution since 1949. The draft makes several important changes in state structure and in the relationship of the government to the Communist Party.

Defining roles. The new constitution goes a long way toward further separating and defining the roles of Party and state. The most conspicuous example of this is the establishment of a Central Military Council "to lead the armed forces" of the PRC, with the Council chairman serving as military commander-in-chief. By law, the chairman of the Party now commands the PLA. However, when Deng Xiaoping engineered the demotion of Hua Guofeng from the Party chairmanship, he did not entrust this military role to Hua's replacement, Hu Yaobang. Instead, he himself assumed *de facto* command of the army by accepting reappointment

China's Organizational Revolution

Christopher M. Clarke

as chairman of the Party's Military Affairs Commission. The new constitution will do away with this uncomfortable and anomalous situation, but will create two problems of its own.

First, a chairman will have to be appointed for the Central Military Council. Undoubtedly this will be a topic of intense political debate over the next months. The military will be pushing for a career PLA officer. Civilian government and Party officials will be worried that the appointment of someone with a "purely military" viewpoint will weaken—perhaps destroy—the chances for civilian control over the military, especially in times of crisis.

Secondly, there is the danger that the position will be used as a personal power base. No one in China has forgotten how Lin Biao used his control over the PLA during the Cultural Revolution to position himself next to Chairman Mao.

The draft constitution also calls for the reestablishment of the position of chairman and vice-chairman of the PRC, with the chairman being titular head of state and the premier remaining head of government.

The state chairmanship, which existed before the Cultural Revolution, would be a largely ceremonial position. The chairman would receive foreign visitors, accept diplomatic credentials, dispatch Chinese diplomats and envoys to foreign assignments, and formally announce NPC decisions such as declarations of war, promulgation of laws and treaties, and appointments of top state officials. The chairman also grants pardons, declares martial law, orders mobilization, and nominates the premier. Thus, in the same way that the chairmanship of the Central Military Council represents a potential "independent kingdom," so too does the PRC chairmanship.

The immediate problem with the position is whom to appoint. Deng, the obvious candidate, reportedly has declined. The Chinese could instead choose an old-line Party member with high prestige and visibility like Chen Yun, Li Xiannian, or Peng Zhen. Or, they could opt for a highly respected and internationally known revolutionary veteran not so closely associated with Party politics, like Liao Chengzhi.

Another possibility would be to select a Party cadre of the second rank. Hong Kong sources have mentioned the names of Xi Zhongxun and Song Renqiong—both veteran Party functionaries and close associates of Deng. A fourth option would be to choose a token minority member like NPC Standing Committee Vice-Chairman Ulanhu, a Mongol. Elevating one of the top "new generation" leaders like Zhao Ziyang or Wan Li would be an outside possibility.

Each of these decisions has its costs. To select someone too closely associated with Party operations would defeat the purpose of trying to separate Party and state. Similarly, to pick someone in his 70s or 80s would undermine the leadership's program of infusing important positions with new blood. Selecting someone without great prestige, however, would reduce the effect of reestablishing the position. The selection of state chairman undoubtedly will be another issue of intense political debate over the next year or so.

While the constitution establishes new military and state chairmanships, it also takes a major step toward abolishing the current system of lifetime tenure. Limitations are placed on all top posts, allowing for a maximum of two five-year terms for the PRC chairman and vice-chairman, Central Military Council chairman, premier, vice-premiers, and state councilors. Similarly, NPC Standing Committee members are barred from holding government or judicial posts while serving.

State Council Reorganization

On May 4, China announced the second—and presumably final—set of changes in the structure of the State Council. Although many past "reorganizations" have resulted only in the renaming, downgrading, or reshuffling of organizations and personnel, this time real cutbacks appear to be taking place.

The bloated bureaucracy. By late 1981, government employees were said to exceed half a million; the State Council itself contained over 1,000 ministers and vice-ministers and some 5,000 bureau chiefs. Paradoxically, Deng Xiaoping himself created this situation, by helping to rehabilitate hundreds, perhaps thousands, of fellow purge victims following the Cultural Revolution. This resulted in a dramatic increase in State Council staff, many of whom were technically incompetent, incapacitated by age, or cowed into indifference, indecision, and inactivity by years of abuse.

Meanwhile, State Council agencies were proliferating, under the guidance of a group of powerful political officials associated with energy and heavy in-

dustries. In 1975, the State Council had only 29 ministries and commissions. By 1981 it had 58.

As the Deng–Chen coalition embarked on its program of decentralization, it became clear that the bloated bureaucracy was part of the problem. The first corrective step came with the establishment of several functional commissions. These were designed to break down the barriers existing between agencies working in the same economic sectors. But in time, they became avenues for delaying decisions and passing the buck. Having accomplished what they could in the areas of energy, agriculture, foreign investment, and machinery production, the commissions were dissolved in March, and their functions were returned to the State Planning and Economic commissions.

Major cutbacks. By the end of the second round of State Council cuts in May, only 41 ministry-level agencies were left. The number of ministers and vice-ministers was reduced by about two-thirds, and the average age lowered half a dozen years, to 58. Departmental directors and their deputies suffered a 43 percent cut, while the number of State Council bureaus was reduced from about 46 to about 19.

This large-scale turnover has brought about the appearance of many new faces and the disappearance of many familiar ones. Of the 176 new vice-ministers (including those holding more than one position), only 72 retained their posts or took on a position roughly equivalent to the one they held before. Many others were apparently promoted from lower level posts in their agencies.

More individuals with technical and professional competence appear to have been promoted during this period. More than half of the ministers and vice-ministers now have college educations, compared with about one-third before; almost half of the departmental directors and deputies are college-educated.

The government is instituting a rule that the number of ministers and vice-ministers in each ministry will be kept between three and five. Likewise, only two or three departmental and bureau directors and deputies will be allowed in each bureau. Mandatory retirement ages have been set "under normal conditions" for ministers (65), and for vice-ministers, departmental directors, deputies, and bureau directors (60).

At the top. Another major innovation of the May reforms was the reduction in the number of vice-premiers from 13 to 2, and the establishment of the position of State Councilor. Now a formally designated standing committee of the State Council will hold weekly meetings to deal with major policy questions and to hammer out thorny interbureau problems. The standing committee will consist of the premier, vice-premiers, state councilors, and the secretary general of the State Council.

This time real cutbacks appear to be taking place, whereas in the past "reorganizations" generally had resulted only in the renaming, downgrading, or reshuffling of organizations and personnel.

That Wan Li and Yao Yilin were appointed vice-premiers shows the solidification of the Deng–Chen coalition and policy program. Wan, a close associate of Deng, has served as troubleshooter and has functioned as executive vice-premier for almost two years. Yao, a long-time associate of Chen, is the chairman of the State Planning Commission. He, like Chen, favors the primacy of central planning, relegating free markets to a distinctly subordinate role.

The new state councilors have protocol status equivalent to that of a vice-premier. They serve as general advisors to the premier. Several councilors also hold concurrent portfolios on the State Council. In fact, four of the six highest ranking state agencies are headed by a councilor. (The other two are headed by Premier Zhao and Vice-Premier Yao.)

The only other agency headed by a councilor is the Ministry of Foreign Economic Relations and Trade, under Party politburo alternate and former vice-premier Chen Muhua. The selection of high-ranking Chen to head this ministry demonstrates the importance the Chinese attach to the role of foreign investment and trade in economic development.

Several recognized opponents of the Deng–Chen line survived the reorganization, though with further restraints on their power. Yu Qiuli, Gu Mu, and Kang Shien have proved too powerful to oust altogether. Their long experience in dealing with the Chinese bureaucracy will be utilized in their new positions as state councilors. From there they will be able to influence policy while keeping their perquisites and most of their prestige intact. But now it will be more difficult for them to obstruct the implementation of policy. Yu and Kang may play some role in energy development, and Gu Mu will continue to be active in attracting foreign investment and building up the special economic zones. In fact, Gu Mu was recently appointed vice-chairman and executive director of a new Special Economic Zones Office under the State Council. Zhao Ziyang is the office's chairman.

The May 4 appointment of the 10 state councilors contained several surprises. First, it was widely expected that Kang Shien, criticized for his role in the cover-up of the November 1979 Bohai oil rig disaster and only recently appointed minister of petroleum, would be removed altogether. Not only was he appointed a state councilor, but he was listed in fifth place, ahead of his political superior, Chen Muhua. Party Secretariat member Gu Mu was listed fourth, even though he too is outranked by Chen. This continued strength of those associated with the energy and heavy industry sectors explains the compromises apparent in the reorganization of some agencies discussed below.

Surprisingly, the only former vice-premier to disappear from the State Council was the military's only professional representative, Zhang Aiping. Zhang reportedly remains in charge of defense research, development, and production. It is possible, although too early to be certain, that his removal from the State Council represents an intention to pull back military equipment production activities from the public eye.

Ministerial Changes

Some significant changes also took place below the vice-premier and state councilor level:

Planning. Both the State Planning and State Economic commissions were strengthened. The SPC will concentrate its efforts on long-term planning. The SEC, according to Premier Zhao, will be

responsible for "supervising and checking how the national economic plan is implemented in each fiscal year, and for organizing and coordinating all economic and technical activities in a particular year for the various departments of agriculture, industry, capital construction, railway transportation, finance, and domestic and foreign trade."

To perform these expanded functions, the SPC and SEC absorbed the agriculture, machine building, and energy commissions. The SPC dropped eight of its old vice-chairmen, but picked up four new ones, leaving it with more vice-chairmen than any other agency. Two of the new men were dynamic and influential vice-chairmen of disbanded commissions: He Kang from SAC and Lu Kebai from SCCC.

The SPC and SEC will assume much of the responsibility of the State Science and Technology Commission. The pared-down SSTC will serve as the implementing agency for policy determined by the premier and the two planning commissions. Zhao Dongwan, one of the two SSTC vice-chairmen, will also be a vice-chairman of the SPC.

Only one of the 11 vice-chairmen at the SEC was retained—Ma Yi, whose specialty seems to be machinery. More surprising was the demotion of Yuan Baohua from the chairmanship to the second-ranked vice-chairmanship. A career official with ties to many leaders, Yuan has been completely free of any taint of scandal or incompetence. His relatively low political rank appears to be the reason that Anhui Provincial Party First Secretary and former Minister of Finance Zhang Jingfu was brought in to take over the SEC. Zhang is a protege of Deng Xiaoping and an associate of Vice-Premier Wan Li.

Most of Wan's associates from the disbanded State Agriculture Commission assumed positions of importance. He Kang became a vice-chairman of the SPC, and Li Ruishan took a similar position at the SEC. In addition, Du Runsheng took over the Party's agricultural policy think-tank, the Rural Policy Research Center of the Central Committee.

The SEC's first vice-chairman will be Lu Dong, a bureaucrat with long experience in heavy industry and the machine building apparatus. Surprisingly, Wang Lei, severely criticized last year when he was Minister of Commerce for dining out without paying his bills, was also made a vice-chairman of the State Economic Commission.

Wang's appointment demonstrates the leadership's resolve in improving the supply of goods in the Chinese marketplace. During the first round of reorganization in March, a new Ministry of Commerce absorbed the ministries of Food and Commerce, as well as the economic functions of the All-China Federation of Supply and Marketing Cooperatives. This ministry will now be responsible for the procurement, distribution, and sale of all agricultural inputs and consumer goods. Increasing the supply of consumer goods in the rural areas will be a major task of the new commerce ministry. Wang, one of China's most experienced administrators in the circulation of commodities, will supervise this process as vice-chairman of the SPC.

Problems of unemployment and inefficiency in the labor market caused the leadership to create a new Ministry of Labor and Personnel. The new minister, Zhao Shouyi, appears to be a protege of Wan Li and is a former Anhui subordinate of SEC Chairman Zhang Jingfu, with whom he will now work closely.

Finally, a State Commission for the Restructuring of the Economic System will be headed by Premier Zhao. One of the five vice-chairmen—State Council Secretary General Du Xingyuan—is Zhao's administrative right-hand man. The other vice-chairmen all have successfully supervised or assisted in restructuring their sectors. Bo Yibo, the commission's first vice-chairman, ramrodded the reorganization of the machinery industry, while An Zhiwen supervised the transformation of the Sixth Ministry of Machine Building into a corporation (*see* below).

Zhou Taihe, also a former SMBIC vice-chairman, apparently had special responsibility for the transformation of much of the military's industrial capacity to civilian production, while Tong Dalin was a vice-chairman of the SSTC when both it and its sister organization, the Chinese Academy of Sciences, underwent restructuring between 1979 and 1982.

Foreign Affairs. Substantial changes took place at the Ministry of Foreign Affairs. Only two of 10 vice-ministers retained their posts. A newcomer to the ministry, Wu Xueqian, was appointed ranking vice-minister. An old associate of Hu Yaobang, Wu comes to the position with experience in relations with foreign communist parties rather than state diplomatic relations.

All but two of the remaining vice-ministers are African or Middle Eastern experts. This fits well with other indications that China is attempting to reassert its position as head of the Third World, and to take a more balanced position between the US and the USSR.

Two vice-ministers are American specialists: Zhang Wenjin, who was retained, and Han Xu, former deputy chief of the liaison office in Washington, and recently director of the American and Oceanian Affairs Department of the ministry. Both Zhang and Han have been closely associated with US-China normalization over the past decade—perhaps a good sign for the future.

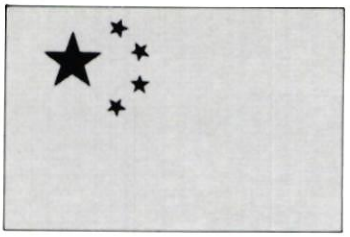
Energy. The energy sector went through a major reorganization between March and May, with the Energy Commission being dissolved, and the ministries of Electric Power and Water Conservancy merged. (Given the past disagreements between these two agencies, this must have been a difficult merger.)

Those associated with hydro-electric power more than held their own. Qian Zhengying, widely respected for her administrative and technical expertise, took over the combined ministry, bringing with her Li Boning as vice-minister. Minister of Electric Power Li Peng became first vice-minister. His colleague Li Daigeng also came along as vice-minister.

The Ministry of Coal Industry underwent an internal reorganization in March. Minister Gao Yangwen was retained, as was recently appointed vice-minister Li Hui. Three new vice ministers were appointed—all young, dynamic, and professionally trained.

In May, the leadership tackled the sensitive problem of reorganizing the petroleum ministry. Vice-Premier and Minister of Petroleum Kang Shien was "kicked upstairs" as a State Councilor, and replaced by controversial Minister of Metallurgy Tang Ke.

Tang's appointment as minister of petroleum shows both domestic political compromise and China's sensitivity to the concerns of foreign oil companies. The Ministry of Petroleum has been a trouble spot for several years. In August 1980, Minister Song Zhenming was fired for covering up the November 1979 Bohai oil rig disaster. A replacement was not found until March 1981, when Kang Shien was forced to give up the chairmanship of the SEC to become minister of petroleum. The ministry



CHINA STATE COUNCIL

Standing Committee
Premier: Zhao Ziyang
Vice Premiers: Wan Li, Yao Yilin
State Councilors: Bo Yibo, Chen Muhua (f), Fang Yi, Geng Biao, Gu Mu, Huang Hua, Ji Pengfei, Kang Shien, Yu Qiuli, Zhang Jingfu
Secretary General: Du Xingyuan

Commissions (7)

State Planning Commission
Chairman: Yao Yilin
Vice Chairmen: Chen Xian, Fang Weizhong, Gan Ziyu, Gu Xiulian (f), He Kang, Huang Yicheng, Jin Xiying, Lu Kebai, Song Ping, Zhao Dongwan

State Economic Commission
Chairman: Zhang Jingfu
Vice Chairmen: Li Ruishan, Lu Dong, Ma Yi, Peng Min, Wang Lei, Yuan Baohua

State Family Planning Commission
Chairman: Qian Xinzhong
Vice Chairmen: Wang Wei, Zhou Boping

State Nationalities Affairs Commission
Chairman: Yang Jingren
Vice Chairmen: (not announced)

State Physical Culture and Sports Commission
Chairman: Li Menghua
Vice Chairmen: Chen Xian, Lu Jindong, Xu Cai, Xu Yinsheng

State Commission for Restructuring the Economic System
Chairman: Zhao Ziyang
Vice Chairmen: An Zhiwen, Bo Yibo, Du Xingyuan, Tong Dalin, Zhou Taihe

State Science and Technology Commission
Chairman: Fang Yi
Vice Chairmen: Yang Jun, Zhao Dongwan

People's Bank of China
President: Lu Peijian
Vice Presidents: Chen Li, Li Fei, Liu Hongru, Qiu Qing (f), Zhu Tianshun

Ministries (33)

Ministry of Agriculture, Animal Husbandry, and Fisheries
Minister: Lin Hujia
Vice Ministers: He Kang, Xiao Peng, Zhu Rong

Ministry of Aviation Industry
Minister: Mo Wenxiang
Vice Ministers: Cui Guangwei, Gao Zhenning, He Wenzhi, Wang Qigong

Ministry of Chemical Industry
Minister: Qin Zhongda
Vice Ministers: Feng Bohua, Jia Qingli, Lin Yincai, Yang Guangqi

Ministry of Civil Affairs
Minister: Cui Naifu
Vice Ministers: Yang Chen (f), Zou Entong

Ministry of Coal Industry
Minister: Gao Yangwen
Vice Ministers: Hu Fuguo, Lin Hui, Ye Qing, Yu Hongen

Ministry of Commerce
Minister: Liu Yi
Vice Ministers: Jin Ming, Jiang Xi, Pan Yan, Song Keren

Ministry of Communications
Minister: Li Qing
Vice Ministers: Qian Yongchang, Wang Zhanyi, Zi Gang

Ministry of Culture
Minister: Zhu Muzhi
Vice Ministers: Ding Qiao, Lu Zhixian, Zhou Weizhi

Ministry of Education
Minister: He Dongchang
Vice Ministers: Huang Xinbai, Peng Peiyun, Zhang Wensong

Ministry of Electronics Industry
Minister: Zhang Ting
Vice Ministers: Jiang Zemin, Wei Mingyi, Zhang Xuedong

Ministry of Finance
Minister: Wang Bingqian
Vice Ministers: Chen Rulong, Chi Haibin, Li Peng, Tian Yinong

Ministry of Foreign Affairs
Minister: Huang Hua
Vice Ministers: Gong Dafei, Han Xu, Qian Qichen, Wen Yezhan, Wu Xueqian, Zhang Wenjin

Ministry of Foreign Economic Relations and Trade
Minister: Chen Muhua (f)
Vice Ministers: Jia Shi, Lu Xuejian, Wei Yuming, Zheng Tuobin

Ministry of Forestry
Minister: Yang Zhong
Vice Ministers: Dong Zhiyong, Liu Kun, Wang Dianwen

Ministry of Geology and Minerals
Minister: Sun Daguang
Vice Ministers: Xia Guozhi, Zhang Tongyu, Zhu Xun

Ministry of Justice
Minister: Liu Fuzhi
Vice Ministers: Zheng Xiwen, Zhu Jianming, Zou You

Ministry of Labor and Personnel
Minister: Zhao Shouyi
Vice Ministers: Jiao Shanmin, Li Yunchuan, Yan Zhongqin

Ministry of Light Industry
Minister: Yang Bo
Vice Ministers: He Zhihua, Ji Long, Wang Wenzhe

Ministry of Machine Building Industry
Minister: Zhou Jiannan
Vice Ministers: He Guangyuan, Shen Liechu, Yang Keng, Zhao Mingsheng

Ministry of Metallurgical Industry
Minister: Li Dongye
Vice Ministers: Li Ming, Lin Hua, Qi Yuanjing, Zhou Chuandian

Ministry of National Defense
Minister: Geng Biao
Vice Ministers: (not announced)

Ministry of Nuclear Industry
Minister: Zhang Chen (f)
Vice Ministers: Jiang Xinxiong, Liu Shulin, Zhao Hong

Ministry of Ordnance Industry
Minister: Yu Yi
Vice Ministers: Lai Jinlie, Li Liqing, Pang Tianyi, Tang Zhongwen

Ministry of Petroleum Industry
Minister: Tang Ke
Vice Ministers: Li Jing, Li Tianxiang

Ministry of Posts and Telecommunications
Minister: Wen Minsheng
Vice Ministers: Cheng Anyu, Li Yukui, Yang Taifang, Zhu Gaofeng

Ministry of Public Health
Minister: Cui Yueli
Vice Ministers: Guo Ziheng, Tan Yunhe, Wang Wei

Ministry of Public Security
Minister: Zhao Cangbi
Vice Ministers: (not announced)

Ministry of Radio and Television
Minister: Wu Lengxi
Vice Ministers: Hao Pingnan, Ma Qingxiong, Xu Chonghua

Ministry of Railways
Minister: Chen Puru
Vice Ministers: Li Kefei, Li Senmao, Li Xuan

Ministry of Space Industry
Minister: Zhang Jun
Vice Ministers: Li Xue, Rui Xingwen, Song Jian, Zheng Lianchang

Ministry of Textile Industry
Minister: Hao Jianxiu (f)
Vice Ministers: He Zhengzhang, Wang Ruiting

Ministry of Urban and Rural Construction and Environmental Protection
Minister: Li Ximing
Vice Ministers: Dai Nianci, Xiao Tong, Xie Beiyi

Ministry of Water Conservancy and Electric Power
Minister: Qian Zhengying (f)
Vice Ministers: Li Boning, Li Daigeng, Li Peng

Bureaus of the State Council (19)*

Agricultural Bank of China
President: Fang Gao

Central Meteorological Bureau
Director: Xue Weimin

General Administration of Civil Aviation
Director: Shen Tu

General Administration of Industry and Commerce
Director: Ren Zhonglin

General Administration of Travel and Tourism
Director: Han Kehua

People's Construction Bank of China
President: Wu Boshan

State Council Foreign Experts Bureau
Director: Wu Fanwu

State Council Government Offices Bureau
Director: Li Mengfu

State Council Overseas Chinese Affairs Office
Director: Liao Chengzhi

State Council Religious Affairs Bureau
Director: Qiao Hansheng

State Council Special Economic Zones Office
Director: Zhao Ziyang
Deputy Director: Gu Mu

State Commodity Prices General Bureau
Director: Cheng Zhiping

China's Organizational Structure

Christopher M. Clarke

State Customs General Administration
Director: Wang Runsheng

State General Administration of Foreign Exchange Control
Director: Bu Ming

State Oceanography Bureau
Director: Shen Zhendong

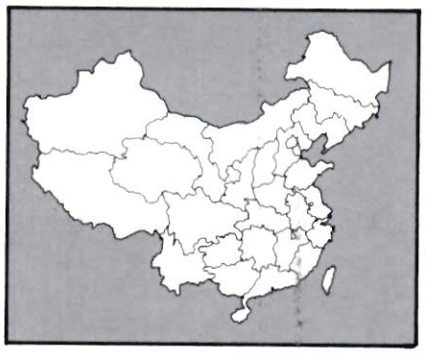
State Seismology Bureau
Director: Zou Yu

State Statistical Bureau
Director: Li Chengrui

State Supplies General Bureau
Director: Li Kaixin

Xinhua (New China) News Agency
Director: Mu Qing

*Reorganization of the State Council's bureaus is not yet complete. This list has been compiled from information supplied by the National Council's Beijing Office and from the organizational files of the Council's Washington headquarters.



LOCAL GOVERNMENT

Provincial-level Municipalities (3)

Beijing
Party First Secretary: Duan Junyi
Mayor: Jiao Ruoyu

Shanghai
Party First Secretary: Chen Guodong
Mayor: Wang Daohan

Tianjin
Party First Secretary: Chen Weida
Mayor: Li Ruihan

Provinces (21)

Anhui
Party First Secretary: Zhou Zijian (acting)
Governor: Zhou Zijian

Fujian
Party First Secretary: Xiang Nan
Governor: Ma Xingyuan

Gansu
Party First Secretary: Feng Jixin
Governor: Li Dengying

Guangdong
Party First Secretary: Ren Zhongyi
Governor: Liu Tianfu

Guizhou
Party First Secretary: Chi Biqing
Governor: Su Gang

Hebei
Party First Secretary: Gao Yang
Governor: Li Erzhong

Heilongjiang
Party First Secretary: Yang Yichen
Governor: Chen Lei

Henan
Party First Secretary: Liu Jie
Governor: Dai Suli

Hubei
Party First Secretary: Chen Pixian
Governor: Han Ningfu

Hunan
Party First Secretary: Mao Zhiyong
Governor: Sun Guozhi

Jiangsu
Party First Secretary: Xu Jiatun
Governor: Hui Yuyu

Jiangxi
Party First Secretary: Jiang Weiqing
Governor: Bai Dongcai

Jilin
Party First Secretary: Qiang Xiaochu
Governor: Zhang Gensheng

Liaoning
Party First Secretary: Guo Feng
Governor: Chen Baichen

Qinghai
Party First Secretary: Liang Buting
Governor: Zhang Guosheng

Shaanxi
Party First Secretary: Ma Wenrui
Governor: Yu Mingtao

Shandong
Party First Secretary: Bai Rubing
Governor: Su Yiran

Shanxi
Party First Secretary: Huo Shilian
Governor: Luo Guibo

Sichuan
Party First Secretary: Tan Qilong
Governor: Lu Dadong

Yunnan
Party First Secretary: An Pingsheng
Governor: Liu Minghui

Zhejiang
Party First Secretary: Tie Ying
Governor: Li Fengping

Autonomous Regions (5)

Guangxi Zhuang
Party First Secretary: Qiao Xiaoguang
Chairman: Qin Yingji

Nei Monggol
Party First Secretary: Zhou Hui
Chairman: Kong Fei

Ningxia Hui
Party First Secretary: Li Xuezhi
Chairman: Ma Xin

Xizang
Party First Secretary: Yin Fatang
Chairman: Ngapo Ngawang Jigme

Xinjiang
Party First Secretary: Wang Enmao
Chairman: Ismail Amat

PEOPLE'S LIBERATION ARMY

Military Affairs Commission of the Chinese Communist Party Central Committee
Chairman: Deng Xiaoping
Vice Chairmen: Liu Bocheng, Nie Rongzhen, Xu Xiangqian, Ye Jianying

Staff Departments

General Staff Headquarters
Chief of Staff: Yang Dezhi

General Political Department
Director: Wei Guoqing

General Logistics Department
Director: Hong Xuezhi

National Defense Science and Technology Commission/National Defense Industries Office
Director: Zhang Aiping**

Service Branches

Air Force
Commander: Zhang Tingfa

Armored Corps
Commander: Huang Xinting

Artillery Corps
Commander: Song Chengzhi

Capital Construction Engineering Corps
Commander: Li Renlin

Engineering Corps
Commander: Tan Shanhe

Navy
Commander: Ye Fei

Railway Engineering Corps
Commander: Chen Zaidao

Second Artillery Corps
Commander: Li Shuiqing

**Unconfirmed

COMMUNIST PARTY STRUCTURE

Chairman: Hu Yaobang
Vice Chairmen (6): Ye Jianying, Deng Xiaoping, Zhao Ziyang, Li Xiannian, Chen Yun, Hua Guofeng

Politburo
Standing Committee Members (7): Chen Yun, Deng Xiaoping, Hu Yaobang, Hua Guofeng, Li Xiannian, Ye Jianying, Zhao Ziyang
Members (23): Chen Yun, Deng Xiaoping, Deng Yingchao (f), Fang Yi, Geng Biao, Hu Yaobang, Hua Guofeng, Li Desheng, Li Xiannian, Liu Bocheng, Ni Zhifu, Nie Rongzhen, Peng Chong, Peng Zhen, Ulanhu, Wang Zhen, Wei Guoqing, Xu Shiyou, Xu Xiangqian, Ye Jianying, Yu Qiuli, Zhang Tingfa, Zhao Ziyang
Alternates: Chen Muhua (f), Saifudin

Secretariat
General Secretary: Hu Yaobang
Members (11): Fang Yi, Gu Mu, Hu Qiaomu, Peng Chong, Song Renqiong, Wan Li, Wang Renzhong, Xi Zhongxun, Yang Dezhi, Yao Yilin, Yu Qiuli

Discipline Inspection Commission
First Secretary: Chen Yun
Second Secretary: Deng Yingchao (f)

General Office
Director: Hu Qili
Deputies: Gao Dengbang, Kang Yimin, Yang Dezhong

Organization Department
Director: Song Renqiong
Deputies: (not available)

Propaganda Department
Director: Deng Liqun
Deputies: He Jingzhi, Wang Huide, Yu Wen

United Front Work Department
Director: Yang Jingren
Deputies: Jiang Ping, Li Ding, Li Gui

International Liaison Department
Director: Qiao Shi
Deputies: Li Shuzheng (f), Qian Liren, Zhu Liang

Central Party School
President: Wang Zhen
Vice President: Feng Wenbin

Research Center of the Secretariat
Director: Deng Liqun

Rural Policy Research Center
Director: Du Runsheng

Party Literature Research Center
Director: Li Qi

Party History Research Center
Director: Hu Sheng

Commission for Collecting Party Historical Data
Chairman: Feng Wenbin

People's Daily
Director: Hu Jiwei
Chief Editor: Qin Chuan

Red Flag
Chief Editor: Xiong Fu

has been under close scrutiny ever since. Tang, whose impending purge has been rumored for almost two years, may be politically weak enough that his superiors feel he will be firmly under their control.

At the same time, Tang, having served as vice-minister of fuels and chemicals in the 1970s, is a charter member of the "energy clique." This makes him familiar and acceptable to the powerful bureaucracy he now heads. He also is a dynamic leader and strong advocate of involving foreigners in China's resource development. Thus, his appointment, combined with Kang's elevation to the status of advisor, seems at least partly designed to assuage the fears of foreign oil executives as they begin to bid for offshore blocks.

The fact that the Ministry of Petroleum got no new vice-ministers reflects the difficulties of reorganization. It retained only two: Li Jing and Li Tianxiang, both veteran oil administrators. Gone are the familiar faces of Zhang Wenbin and Qin Wencai, who will apparently become fulltime "businessmen" heading up the Petroleum Corporation and the newly established China National Offshore Oil Corporation, respectively.

Some analysts expected that the Ministry of Geology would be dissolved or downgraded. But its functions were actually expanded. As the new Ministry of Geology and Minerals, it will be responsible for the "protection, efficient exploitation, and multipurpose utilization of mineral resources." Apparently it will continue to play a role in the development of some reserved offshore oil blocks.

Finance. The People's Bank of China got an almost total face lift. Li Baohua was replaced by a relatively unknown former Vice-Minister of Finance, Lu Peijian. Bu Ming (president of the Bank of China) and Fang Gao (president of the Agricultural Bank) were dropped as vice-presidents of the PBOC. However, cutbacks and reorganization appear to have affected the banks minimally. The BOC expects no major reorganization and actually anticipates continued growth.

The new constitution calls for the appointment of a chief auditor to the State Council. His office will supervise and audit finances, revenues, and expenditures at all governmental levels and in enterprises and other institutions. This potentially very powerful office will have the authority to scrutinize the books of any state agency on demand.

Controlling expenditures on construction has been one of China's thorniest problems. Vice-Premier Gu Mu lost his job as chairman of the State Capital Construction Commission in 1981 over this issue. Now the commission itself has been abolished. Long-range planning will be the job of Lu Kebai at the SPC. Implementation will fall under the new Ministry of Urban and Rural Construction and Environmental Protection.

Agriculture. The agricultural commission may have been dissolved, but the responsibilities of the Ministry of Agriculture were actually expanded, as reflected in its new name: Ministry of Agriculture, Animal Husbandry, and Fisheries. Headed by Lin Hujia, the new ministry absorbed the old State General Bureau of Aquatic Products and the Ministry of State Farms and Land Reclamation. He Kang and Zhu Rong were retained as vice-ministers, and Aquatic Products Bureau director Xiao Peng was made the third vice-minister.

The current campaign of afforestation gave new life to the Ministry of Forestry. Its new head is the youngest minister promoted in the reorganization—Yang Zhong (50). He came to Beijing from the forestry center of Sichuan, where he served as deputy governor. Sichuan, power base of Zhao Ziyang and Deng Xiaoping, is a model for innovation in agriculture.

Machine Building. The two-year-old State Machine Building Industry Commission was dissolved. This, however, in no way represents a slight to its chairman Bo Yibo, or dissatisfaction with his performance. As described above, Bo and many of his SMBIC subordinates wound up in influential posts.

Machine building ministries two through seven were renamed. Each is now identified by function: nuclear, aviation, electronics, ordnance, and space industries. Turnover of personnel in these agencies was substantial. Only electronics retained its minister, while in the Ministry of Nuclear Industry the entire leadership retired and a bureau director was promoted to minister.

The former First Ministry was renamed the Ministry of Machine Building Industry. It absorbs the old Ministry of Agricultural Machinery, the State Bureau of Instruments and Meters Industry, and the National Bureau of Equipment for Complete Industrial Plants. The new minister, Zhou Jiannan, was a vice-minister of the first ministry from 1961 to 1979, when he became vice-chairman of the Import-Export and Foreign Investment commissions. Under his influence the ministry is likely to pursue an aggressive export program, which may entail purchasing advanced technology to modernize China's machinery industry.

China's cautious reform of the Petroleum Ministry shows its sensitivity to the concerns of foreign oil companies.

The final major change was the abolition of the Sixth Ministry. Taking its place is a new nationally integrated corporation, the China State Shipbuilding Corporation.

"Corporatization"

The third area of institutional reform supports the continuing trend toward a Corporate China. The China National Offshore Oil Corporation, established early in 1982, will now have complete responsibility for all phases of offshore oil development, according to the petroleum regulations. Operating under the Ministry of Petroleum, CNOOC is headed by former Vice-Minister Qin Wencai (*see The CBR*, May-June 1982, p. 17).

Two major corporations were established in May. The China State Shipbuilding Corporation, set up on May 4, took over all facilities, negotiations, contracts, and agreements of the Sixth Ministry of Machine Building and its subordinate organs, including the China Corporation of Shipbuilding Industry. It also took control of some departments, factories, and shipyards of the Ministry of Communications. CSSC's 20 shipyards and 100 factories will produce and sell various kinds of offshore oil drilling equipment, ships, pleasure craft, and shipboard equipment.

Shipbuilding heavyweights head the corporation. The chairman of the board, Chai Shufan, has served as vice-chairman of the State Planning, Eco-

nomic, and Capital Construction commissions; he also has been vice-minister of foreign trade, chief Chinese delegate to the Law of the Sea Conference, and minister of the Sixth Ministry. Feng Zhi, the corporate general manager, is a former Sixth Ministry vice-minister.

Three days after the establishment of CSSC, the China Automotive Industry Corporation was set up. This company integrates the major elements of the Chinese automotive industry—including some 73 vehicle plants, more than 2,000 parts factories, and in excess of 700,000 workers. The new board chairman, Rao Bin, left his post as minister of the first Ministry of Machine Building to take over CAIC. He apparently pushed to have the corporation made a ministry-level agency, independent of the Ministry of Machine Building Industry. The effort reportedly failed, and the corporation will continue to report to MMBI. Nevertheless, CAIC will integrate research, production, and domestic sales of motor vehicles, engines, special-purpose vehicles, motorcycles, and parts and accessories. CAIC supposedly is hammering out with MMBI how it will split up imports and exports with MMBI's foreign trade arm, EQUIMPEX.

A number of transdepartmental corporations also have recently been set up. Three in the petrochemical sector—the Fushun General Petroleum Industry Corporation, the Jinling General Petrochemical Corporation, and the Shanghai Gaoqiao General Petrochemical Corporation—have all combined factories and research institutes from various agencies and locales in order to rationalize production and sales.

Party Restructuring

At the same time that the Western press has been focusing on China's state and constitutional reforms, the Chinese leadership has been setting the groundwork for a more far-reaching and potentially more divisive administrative revolution—the reform of the Communist Party apparatus.

On May 15, the Party announced a reorganization of the Central Committee's administrative organs. Staff was cut by 17 percent, and the average age of department leaders lowered from 64 to 60 years. Many of the old department heads were replaced.

It is clear from the appointments that Hu Yaobang is beginning to put his own team into place. His people will supervise the reorganization of the Party at all levels, and reassess the political reliability of Party members, more than half of whom joined the CCP during or since the Cultural Revolution. For example, the new head of the Central Committee's very important General Office is Hu Qili, former mayor of Tianjin. Before the Cultural Revolution, Hu worked in the Communist Youth League under Hu Yaobang; during it, he and Hu were sent to the same "reform school."

Hua Guofeng was formally removed as head of the Higher Party School, the training ground for promising Party leaders. Heading it now will be Politburo member Wang Zhen. Wang was rehabilitated by Deng, and is a no-nonsense, pragmatic Long March leader with high prestige.

Deng Liqun was appointed head of the very influential Party propaganda department. A long-time supporter of Chen Yun, Deng Liqun is known as an advocate of close control over cultural "blooming and contending." His appointment, along with other appointments in both the Party and state cultural spheres, cannot be a welcome signal to China's intellectual community.

Senior Party officials have announced their intention to hold the Party's Twelfth National Congress later in 1982. Such a schedule must mean that Deng Xiaoping and Hu Yaobang are rather confident that they can carry out the restructuring of the Party so soon after reorganizing the state apparatus.

Military Streamlining

Apparently Deng's ambitions extend to the imminent reorganization of the People's Liberation Army. He has been trying for more than two years to persuade senior commanders and commissars to step down in favor of younger leaders. Since February, China's senior soldier, Ye Jianying, has been making noises that raise suspicions of his impending retirement.

To smooth the way for military reorganization, Deng has made some concessions. First, China's defense budget for 1982 has been raised marginally reversing a two-year trend of budget cutting. The PLA will receive an increase of about $1 billion this year.

Second, the removal of Zhang Aiping from the State Council, and the "demystification" of the machine building ministries may signify the pullback of military industrial activities from public view.

At the same time, however, the foreign trade role of corporations associated with the military—like NORINCO and the Great Wall Corporation—appear to have been substantially strengthened. Observers at the spring Guangzhou trade fair reported that the product lines and trading independence of these corporations have been bolstered. It seems that the PLA will retain a mechanism for raising its own foreign exchange, and for insuring continued employment of labor and industrial capacity in a time of economic readjustment.

The incentives for old soldiers to fade away have been made rather attractive. Retirees will apparently be paid their full salary, with an adjustment for length of service. Thus, a "grade 10" commander with 50 years service will receive his monthly ¥218 plus a monthly bonus of ¥50. Retiring PLA leaders will also be entitled to a house-building subsidy to get them settled, and will continue to have access to documents, meetings, and files from their old jobs.

The success of this program depends largely on convincing Ye Jianying and other old commanders to go along, and on finding a number of young PLA veterans with good experience and high prestige to take over top posts. Neither of these tasks will be easy.

Local Reorganization

The final, and in some ways most problematic, task of reorganization is persuading local leaders to go along with Beijing's rather drastic spring cleaning. The past four or five years have shown a clear trend of appointing capable younger leaders to positions in the central government where their talents and reliability can be observed. Then they are sent to top provincial posts. Between March and May, however, the center has been relying to some extent on calling in successful leaders from the provinces to help run the national government.

This reverse process may make local reorganization more difficult. China's provinces are large, diverse, and complex entities with well-entrenched bureaucracies and interest groups. It will require strong executives without local ties or allegiances to supervise reorganization at this level.

The Deng–Chen leadership has set itself the goal of extending reorganization to the provinces by 1983. Whether the reforms survive at the grass-roots level will depend largely on how well they take root in Beijing.

Tough Terms for Offshore Oil

Foreign firms at last have the crucial model contract in hand. Now the real talks begin.

Chris Brown

The process of hammering out contract terms for the most ambitious commercial enterprise ever undertaken by China in cooperation with foreign entities is about to begin. As the August 17 deadline for offshore bids approaches, 40 companies, including 21 from the US, are feverishly studying documents and figures to determine what their negotiating positions will be.

Interested foreign companies already have their bidding packages in hand, and have begun to discuss terms with the Chinese. Included in those packages is the crucial model contract—the starting point for negotiations. Several US companies have been invited to China to discuss lists of questions about the model contract submitted to the China National Offshore Oil Corporation (CNOOC) on June 15. The real horse trading, however, will not begin until sometime this fall, after the Chinese have had time to scrutinize the bids.

This round of bidding is the first step in opening China's continental shelf—the largest area of untapped offshore oil reserves in the world. Reserves could range anywhere from 30 billion to 100 billion barrels. Opened for bidding are 43 unified blocks totaling 150,000 sq. km.

Foreign companies were invited to bid on this area in two stages. The first stage covered the northern part of the South Yellow Sea, and one-third of the total area of four geophysical survey areas in the Pearl River Basin. The second stage was comprised of the entire geophysical survey area in the southern part of the South China Sea, and one-third of the area surveyed in the southern part of the Beibu Gulf (Gulf of Tonkin). Of the 46 companies that participated in the geophysical survey and were invited to bid, only six expressed no interest. Two of these, Tesoro Petroleum Corp. and Kerr–McGee Corp., were from the US.

China's Dilemma

The stakes for both sides are high. In the face of declining onshore production and a growing economy in need of fuel, swift development offshore will mean the difference between China increasing hard currency exports, or becoming a net importer of oil in the next decade. Onshore production reached a plateau in 1979, declining slightly from 1979 to 1980; the drop from 1980 to 1981 was nearly 5 percent. Chinese officials, casting aside earlier ambitious plans, are now hoping for little more than steady production over the next few years, at the current rate of about 2.02 million barrels per day.

Even in this unfavorable scenario, the Chinese plan to maintain exports at current levels of about 300,000 barrels per day (which earned them $4 billion in 1981). This means that domestic consumption of oil would have to remain at present levels, even though the GNP is projected to grow at an annual rate of about 4–5 percent. Despite the country's success in cutting consumption by some 5 percent in 1981, sustaining industrial expansion at the projected rate without increasing fuel consumption would be a near impossibility over a period of several years.

The PRC has three choices as it enters the 1990s: cut oil exports in order to fuel its growing domestic industries, impede industrial expansion while maintaining hard currency earnings through oil exports, or develop its offshore oil resources.

In view of this situation, China is under pressure to come to terms with foreign companies to get the projects rolling as quickly as possible. Chinese projections point to commercial production beginning in the areas now being tendered as early as 1987. But to achieve that goal, exploration must begin shortly and proceed on schedule.

Still, by issuing its model contract China has shown that it is not so desperate as to proceed without a great deal of wariness and a solid commitment to crucial points of principle. Its legal framework is admittedly nascent, and the country's experience is limited in this risky contractual area. Ideally, the Chinese would like to reach a contract that is comprehensive, without being too specific on issues where conditions could change to their detriment.

The terms of the model agreement underscore China's determination to be in control of the undertaking, and to use that control to ensure that rather than building a dependence upon foreign technology to exploit its resources, China will expand its own capabilities to conduct future offshore operations. Industry observers believe that China envisions using the first phase of exploitation as a base for its own train-

ing and development. Foreign involvement in the second round would decrease, and continue to do so until exploitation of the last third of the surveyed area would proceed without any foreign participation.

US companies are nonetheless eager to get a share of what may be one of the richest areas of offshore oil left in the world. To assess its potential, foreign companies already have sunk a total of some $200 million into seismic surveys.

These companies, like their Chinese counterparts, are approaching the terms of the agreement warily. Contributing to their caution is the present glut on the world crude oil market. This situation of course is not a reliable indicator of the profits that could stem from agreements stretching perhaps 30 years into the future. But companies' exploration budgets are at a low point and executives must choose carefully in targeting expenditures.

Further concern comes from the fact that the foreign firms must bear entirely the exploration expenses and risks. The total cost of exploration for the areas of the first round is expected to be some $2–$3 billion.) Companies consequently want to make certain that if good commercial reserves are found, the contract will assure them adequate maneuvering room, as well as a fair profit.

50%
COST OIL

Half of total output will go to cost recovery: to cover operating expenses, exploration costs, and finally development costs, in that order. As exploration and development costs are recovered, surplus cost oil will be added to allocable profit oil, which is split 51–49 between the CNOOC and the foreign party.

Contract Terms

The general opinion among US oil executives is that the model contract, while tough, will be workable—provided certain provisions are negotiated satisfactorily. The 80-page contract combines elements of a joint venture and of a production-sharing arrangement. It apparently was conceived on the basis of previous agreements for cooperation in offshore exploitation in countries such as Indonesia and Norway.

The contract is open for bidding on three points: *the work program*, which will include the foreign company's schedule for exploration and development and number of wells, *a factor bid* by the foreign company that will determine the percentage of production it will receive as profit, and a bid of *other contributions* the foreign company is willing to make to China's offshore oil program or to other sectors of the Chinese economy. (Larger oil companies may offer financing as their contribution.) These three variables will by no means be the only areas of negotiation. Some industry observers expect a full third of the model contract's provisions to come under negotiation.

The stakes to China are high: Rapid development of the country's offshore resources will mean the difference between increasing hard currency exports or becoming a net importer of oil in the next decade.

The contract, as expected, calls for the foreign partner to put up all capital and bear all risks in the exploration phase. CNOOC and the foreign party would jointly participate in the development and production phases, with China contributing its share of capital for expenses. When an area goes into commercial production, output is to be divided according to a rather complex formula for a term of 15 years, extendable to 30 years.

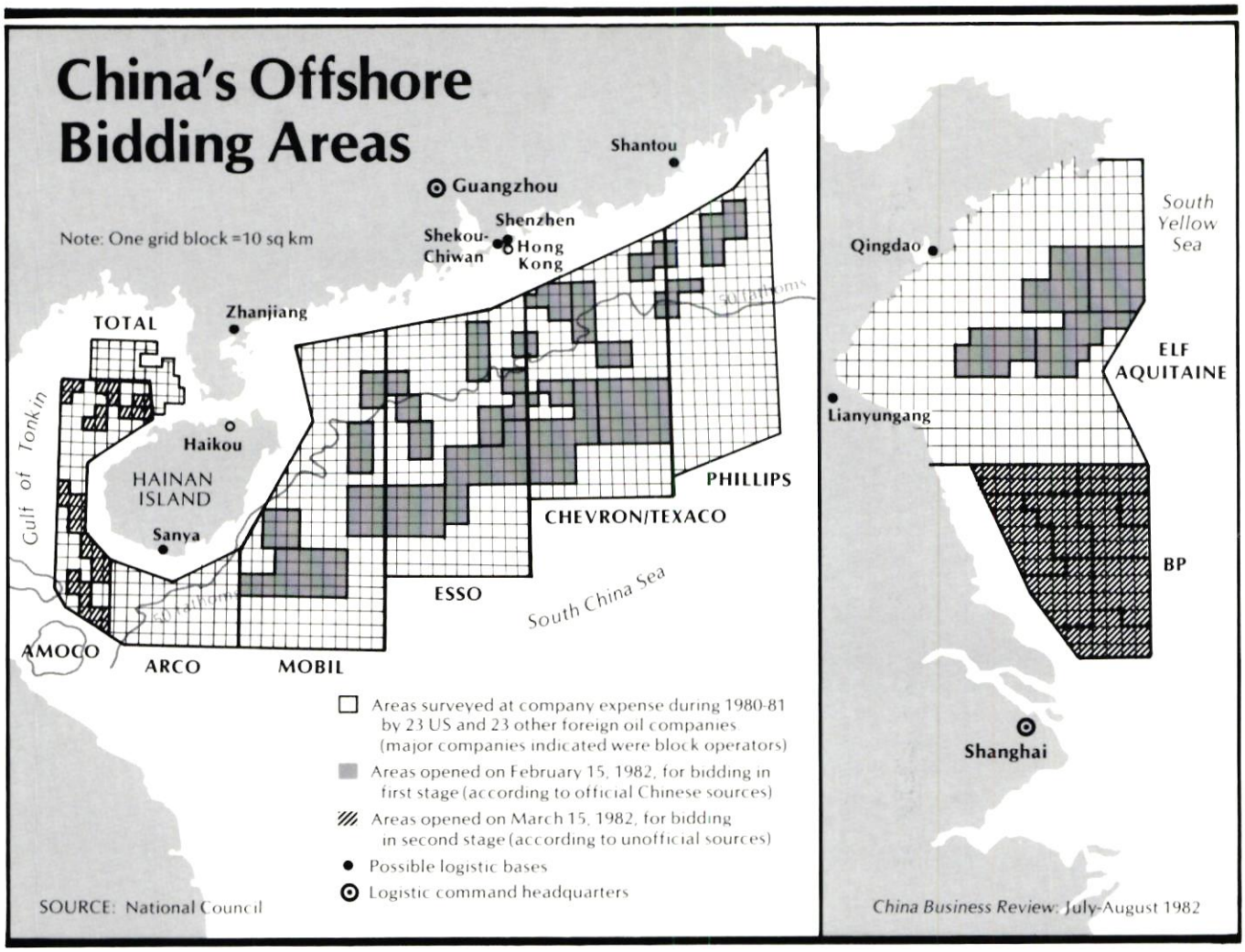
A company that has been awarded a contract has a set term in which to explore the area. For an area of less than 2,000 sq. km., the term is five years; for an area equal to or larger than 2,000 sq. km., seven years. The exploration term is separated into stages. Under the seven-year term, for instance, there are three stages of three years, two years, and two years. After each of the first two stages, the company must relinquish 25 percent of the contracted area.

This arrangement has two purposes. First, it functions as a sort of performance guaranty. The exploration team must act quickly to assess which areas it will relinquish, and which it will reserve for further exploration. Second, after each stage is completed, the foreign company has the right to withdraw from the agreement. If a company is disappointed by the findings of its exploration or decides that operating conditions are untenable, it can withdraw and sustain a loss only in the amount of exploration expenses already incurred.

After an area has been explored and targeted for development, CNOOC has 90 days in which to contact the foreign company in writing if it chooses not to participate, or if its participation will be less than 51 percent. If no such notification is received, CNOOC and the foreign company will jointly develop the area, with CNOOC bearing 51 percent of the cost and the foreign party putting up the remainder.

The 15-year production period begins when a cumulative total of 100,000 tons of oil or 100 million cu. mt. of natural gas are extracted from the area and delivered according to standard procedures. At this point a rather elaborate production-sharing formula is used to divide the output: 17.5 percent of output off the top goes to China in the form of a 12.5 percent royalty, along with a 5 percent Industrial Consolidated and Commercial Tax—or "turnover tax." Another 50 percent of production is "cost oil," which goes first to recover operating costs, second to exploration costs, and finally to development expenditures. The remaining 32.5 percent is divided into "share oil" and "allocable profit oil" according to an x factor bid by the foreign company. The share oil goes directly to the Chinese. The allocable profit oil is split 51/49 between the Chinese and the foreign company.

This x factor is bid on each of seven tiers of annual output: 500,000 to 1 million metric tons; 1 to 2 million tons; 2 to 3 million tons; 3 to 5 million tons; 5 to 7.5 million tons; 7.5 to 10 million tons; and over 10 million tons. In this way, the



percentage of allocable profit oil is in inverse proportion to output level: The more oil produced, the less goes to profit oil.

US oil companies have asked the Chinese for clarification concerning how the x factor would be applied in practice, but the prevalent interpretation is that it would apply incrementally. That is, in a single year, the percentage split for the first 1 million tons would be determined by the x factor for the first tier, the second million tons would be split according to the second tier factor, and so forth. The foreign company is free to repatriate and sell its portion of oil on foreign markets, with CNOOC reserving the right to limit the destination.

Finally, the foreign company's revenues from its sale of the crude will be taxed at approximately 50 percent under the Foreign Enterprise Income Tax Law enacted in China last December. A recent ruling by the US Internal Revenue Service determined that this tax would be creditable in the US, thus abolishing industry fears of double taxation.

As exploration and development costs are recouped, surpluses in the cost oil portion revert to the allocable profit oil to be split between the Chinese and foreign partners. CNOOC has the right to take over operations by unilateral decision only after exploration and development costs are recovered. Before that point, CNOOC can take over only with mutual agreement.

Since the foreign company's exploration costs are to be financed with its own capital, interest for capital in that phase is not deductible either in cost oil or from Chinese income tax. Interest on money borrowed for the development phase, however, can be deducted. There is a lid of 9 percent on this deduction for cost recovery, but no lid for interest deduction for income tax. In other words, if a company borrows money at 15 percent to finance development costs, it may recover no more than 9 percent of the interest in oil. But it can list the entire 15 percent as an income tax deduction.

Areas for Negotiation

Foreign companies have no problems with this formula per se. It would allow a foreign participant a fair share provided a reasonable bid is accepted. Most industry fears stem from other conditions in the contract, and from peculiarities of China's legal framework that they feel could escalate costs, hamper operations, or prevent the company from cashing in on its share of oil.

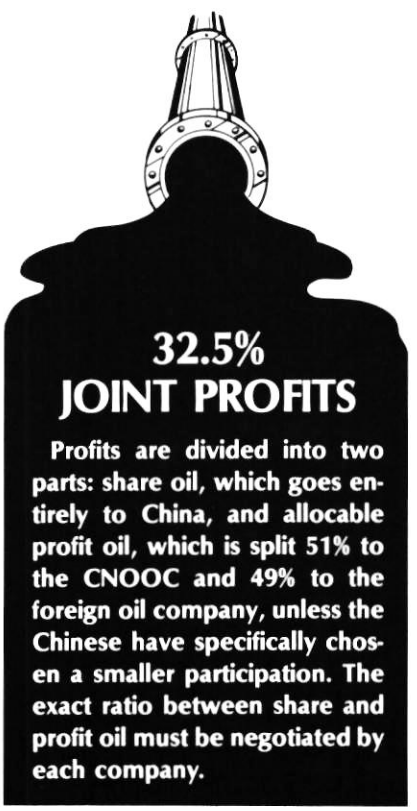
Control is one issue many companies will want to negotiate. The model contract calls for the formation of a Joint Management Commission (JMC), composed of representatives from CNOOC and the foreign company and chaired by a CNOOC representative. As interpreted by some companies, this committee would have control over everyday operational decisions as well as broader budgeting and planning decisions.

Some companies fear that, without clarification of the committee's mandate, such control could hinder operations and create unpredictable costs.

Another concern of many companies is the obligation to use Chinese personnel (at international wage rates) in all phases of exploration and development, and to give preference to Chinese equipment, materials, and services provided that price and quality are competitive. Some executives fear that this stipulation could lead to long delays if the Chinese supply and service companies prove to be unreliable, or because every purchase and subcontract must be approved by the JMC and other Chinese organizations. Any delays could put the foreign company in violation of its contract. The cost of training Chinese personnel also could become a devastating factor.

One contract term that seems to be a sticking point for virtually all US oil firms is the one pertaining to technology transfer. According to one clause, the foreign company must transfer all technology—including design, software, and data gathered in exploration—to the Chinese *without* charging royalties. As interpreted by some industry observers, this clause would obligate the US firm to release technology that belongs to the company but is not used in its China operations. Even designs that are patented or copyrighted by other companies could come into play.

The general opinion among US oil executives is that the model contract is workable, provided that certain provisions are negotiated satisfactorily. Significantly, the document combines elements of a joint venture and production-sharing arrangement, and bears marked similarity to offshore exploration contracts in countries such as Indonesia and Norway.



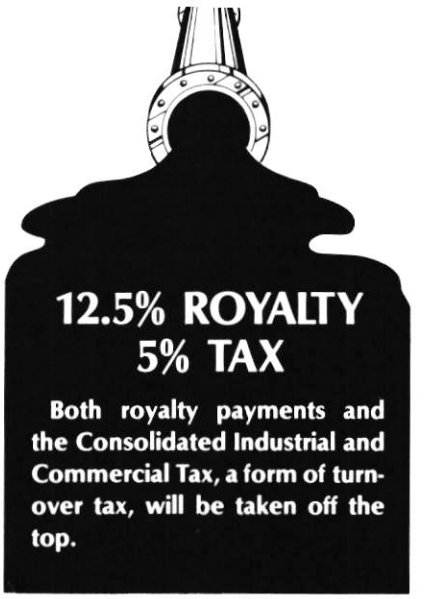
32.5% JOINT PROFITS

Profits are divided into two parts: share oil, which goes entirely to China, and allocable profit oil, which is split 51% to the CNOOC and 49% to the foreign oil company, unless the Chinese have specifically chosen a smaller participation. The exact ratio between share and profit oil must be negotiated by each company.

Several US companies also are concerned with a particular matter of timing in the model contract. The contract gives CNOOC 90 days after a contract area is determined to be commercial to make known the degree of its participation. However, the contract also calls for the foreign company to submit an overall development plan within 90 days of the same determination. This would mean that the foreign company would have to arrange financing for the development stage before knowing the degree of its own participation.

Finally, an important question in the minds of many bidders concerns repatration of profits. The model contract makes it clear that foreign companies will be able to repatriate the oil taken as cost recovery or profit, and to sell that oil on world markets. According to Chinese currency regulations, however, it is unclear whether US firms would have to remit earnings from their oil to the Bank of China, which then could determine exchange rates and possibly the amount of earnings that could be repatriated. Similar questions arise concerning the method of payment in the event that China exercises its option to purchase part or all of the foreign company's profit oil.

The matter of repatriation of profits, which had been a major concern of oil companies, recently has been cleared up. On June 23, the State General Administration for Foreign Exchange determined that foreign companies may retain or dispose of their oil profits abroad without remitting them to the Bank of China. Although the model contract states that the foreign companies' share of oil could be repatriated and sold overseas, previous to the administration's decision there had been fears that profits from the oil would have to go through the Bank of China. This would have given the BOC the power to set exchange rates and, possibly, to limit the amount of hard currency that could be repatriated.



12.5% ROYALTY 5% TAX

Both royalty payments and the Consolidated Industrial and Commercial Tax, a form of turnover tax, will be taken off the top.

In addition to these issues concerning particular terms, there is a more fundamental question in the minds of many executives. This involves the mandate of CNOOC. Although Ministry of Petroleum officials have stated more than once that CNOOC has the full power to sign contracts and to fulfill obligations under the contracts, some oil companies are uneasy with the absence of an official statute that defines CNOOC's authority. Executives have reportedly expressed the view that they would consider a contract with the Chinese Government more secure.

With these and other matters still unclear or unresolved, some industry observers predict long and hard negotiations before final contracts are signed. According to CNOOC's schedule, negotiations will begin in one to three months after bids are received and will continue for two to three months. After examining the model contract, however, few US bidders believe that this schedule is realistic. Final contracts, which CNOOC officials believe will be signed by the end of the year, are likely to remain under negotiation well into 1983.

Exhibitions '82

More than 500 US firms exhibited a strong interest in four US-sponsored trade shows that took place this year. They also have registered many of the familiar complaints.

Carol S. Goldsmith

This year is the big one for American exhibitions in China—at least when compared to previous years. More than 500 US companies straightened their shoulders, took a deep breath, and marched into four large-scale US trade shows between January and May, demonstrating for the first time in a long time a serious interest in China shows.

The Department of Commerce led off the year in much the same way that it had ended 1980—by staging a broad US national exhibition in Beijing. This one came under the banner of light industry. The Society of Petroleum Engineers was next in line with its timely petroleum equipment and technology show. The March conference opened in Beijing just as the Chinese began notifying foreign oil firms of the start of second-stage bidding for offshore exploration rights. The Cahners Exposition Group took electronics and semiconductor firms into China the following month for a two-week international show. After that, Clapp & Poliak boldly ventured where no exhibition manager had gone before with CHINABUILD '82, billed as the PRC's First International Construction and Mining Equipment Exhibition.

US companies—both those who are trying to sell the equipment and those who are trying to sell the shows—have been anxiously watching these events unfold. More than one trader has referred to them as a "litmus test" of the short-term potential for China shows.

The success or failure of each one varies, of course, with the particular industry. Regardless of the sales that exhibitors have racked up as a result of the Cahners semiconductors show, the results didn't convince food processing and manufacturing firms to rush *en masse* to Cahner's recent Guangzhou exhibition. Clapp & Poliak may have gotten pretty high marks as manager of CHINABUILD, as well as of the electronics show it did back in 1980. But telecommunications and related firms are quite naturally gauging the market, much more than the manager, before deciding whether to sign up for the long-awaited CHINACOMM '82 exhibition.

Rating a show's commercial success is at best an iffy business. Most exhibitors agree that it takes six to nine months before attendees in China begin to respond. Even then, it may not be possible to trace the contacts directly to the show, particularly if it represents but one part of a company's marketing effort.

Still, many people try. And rightly or wrongly, the immediate reactions to a trade show do have some psychological effect on the whole exhibitions scene, in much the same way that headlines about China's retrenchment in heavy industry two years ago upset traders in virtually every business line.

Light Industry

The Department of Commerce could be called the head cheerleader for China exhibitions. In November 1980 it tried to kick things off for American equipment manufacturers by staging the first US National Economic Trade Exhibition in Beijing. The broad-based, heavy industry show took 254 manufacturers and $10 million worth of equipment (petroleum, transportation, power, agriculture, textile, and consumer goods production) over for the 12-day stay. Immediate sales figures were good. Exhibitors generated some $11.6 million worth of business during the show, Commerce reported, and concluded $15 million worth of pre-negotiated sales on top of that (*see The CBR*, Jan.–Feb. 1981, p. 30).

Sales *prospects*, however, turned out worse than anyone could have imagined. Shortly after the exhibition closed, so did a good part of the market. By the end of the year China had postponed a number of major metallurgical and chemical projects, and had begun rethinking its whole attitude about heavy industry. Suddenly the companies and associations that had castigated Commerce for edging its national exhibit ahead of theirs were grateful that their shows hadn't been caught in a revolving door.

This year's strategy at Commerce—to promote light industry in another national show—attracted 61 US exhibitors in 86 product categories. DOC's exhibitions staff smile at the $4.6 million sales figure generated from the floor. Remarked Nancy Rinehart, international trade specialist supervisor, "That's exactly what we expected."

Maybe so. But a number of exhibitors say their expectations weren't fully met. Two comments immediately spring to mind: The overall exposure was very good, but the show was overly broad.

John Carlson of Carlson Machine Tools Company described it as "pretty soup to nuts." Though in the end the show was heavily tilted toward computers and instrumentation, Carlson said, "You had everything from opticals to lasers to instruments to printing machinery to paneling machinery. The one common thing among the companies is that they all thought there's something [of a market] in China."

Walter J. Keifer, sales manager for Schmutz Manufacturing, thinks companies could have made better use of the show had they been aware of its scope. "If we would have known [how broad it was], we would have had more types of equipment there."

Approximately 80,000 Chinese attended—a far cry from the 200,000 drawn to the first national exhibit, but still far more than most companies wanted. Exhibitors complained of being constantly surrounded by sightseers, students, and compulsive collectors of product samples. John Cheng, Far East regional manager for Gould, Inc., said the booths tended to be so crowded with onlookers that "the person who should be there couldn't get in."

Such complaints have consistently haunted China shows. Companies point out that the Chinese have always insisted on extending the invitations to the organizations and factories, making it difficult for the foreigners to know who is coming. Certain exhibition managers have made some strides. Clapp & Poliak, for instance, sends direct mail materials to the CCPIT (China Council for the Promotion of International Trade), for distribution to the desired audience. May Lee International, also through a China mailing, even managed to sign on an American exhibitor for its September show on renewable energy and environmental protection. President Phil Jacobis said that at first the US company turned down May Lee's offer. Shortly thereafter it changed its mind and decided to participate, when an official from a Chinese trading corporation wrote to say he looked forward to seeing the company at the show.

Commerce has taken to heart companies' complaints about scope, and narrowed its next China show to cover only instrumentation. (Cahners' Asia manager—and former Commerce official—Steve Sind—thinks that's still overly broad.) Ideally it would be yet another national exhibition; remarked Nancy Reinhart, "The industry seems particularly interested in preserving its identity." The way things now stand, however, it looks as though the exhibition will be merged with an international instrumentation show set for early next year, because of Beijing's crowded calendar.

To say that foreign firms have been more active exhibitors than Americans is to understate the case. Only one US company attempted a fair-size China show last year (in automotives). And as it turned out, only foreign firms participated.

The Japanese and British are the trade show leaders in China. They, say exhibition managers, have taken the "long-term view" of the market, realizing they must establish a presence if they hope to cash in on the future.

The firms don't necessarily like it. Derek Lyons, China exhibitions manager for the British giant ITE International, reports that British companies have become "disenchanted" with China shows. Apart from the high cost and often marginal short-term sales, scheduling conflicts arouse some ire. "In some cases little attention is paid to the existing world calendar" of major events, said Lyons. "The situation is caused in part by the greater autonomy now afforded to the provinces . . . and exacerbated by the relatively late approval of exhibition proposals, affording inadequate selling and preparation time."

Neither is the point lost that China is in the *business* of exhibitions. More than one person has remarked that in some cases a show matters less to the Chinese than the foreign exchange it generates.

Still, the "long term" is a convincing rationale for Europeans and Japanese to take their exhibitions to China. It is also the most popular reason that Americans keep theirs out.

Organizers have the most difficulty selling particular shows where the market has not fully materialized. May Lee International, for instance, has been engaged in an "uphill grind" convincing firms to join its September environmental protection show. Phil Jacobis says the firm discovered some business opportunities while doing research on China's new environmental protection law. But among companies in the field, "There are mixed emotions about whether China is really a market."

Cahners had the same problem luring companies into its July food processing show. Thirty-two booths had been contracted for as of early June; Cahners had hoped for 60. The Food Packaging Equipment Association, which had been trying to generate interest in a China show for some time, has put off plans indefinitely. Both groups feel the industry is on the cutting edge of opportunity. The industry, however, prefers to sit out the shows till opportunity actually knocks.

Electronics/Semiconductors

Where Cahners succeeded in China this year is where many companies hope to—in electronics and semiconductors. By most accounts the Beijing exhibition paid off. Approximately 145 exhibitors from 12 countries (led by the United Kingdom, Japan, and the US) rung up floor sales of $3.55 million—90 percent of what was on display. Cahners projects sales upwards of $33 million. (*See The CBR*, May-June 1982, p. 47.)

Nearly all the exhibitors took over equipment, according to Cahners' Steve Sind—automatic insertion, electronic testing, and semiconductor processing equipment, etc. Argus Trading Company felt the show gave its clients "the right exposure in both the technical and commercial" areas. The "far-reaching attendance" from China's main industrial centers also impressed the firm. Bear Stearns reported selling three models of noncontact wafer-measuring instruments for one of its clients, ADE Corporation. George Koo, managing director of Bear Stearns' China Trade Advisors, said the company had more buyers than it had machines.

INTERNEPCON was not completely problem-free. Sind described his job of selling the show as "worse than arm-twisting. It was bone-breaking." Aggravating firms' natural hesitance about China shows was the whole export licensing question; firms remain uncertain over what they will be permitted to sell to China, and when. Expense was also a factor. One company representative who has participated in several China exhibits thought that the cost of the booth was too high, since he had to rent additional furniture and lighting, and contract the services of an interpreter. Cahners counters that it minimized the options in order to keep down the basic package price.

That same firm expressed outrage that a serious bureaucratic snafu had not come to light until the show's end. Reportedly the China Electronics Import-Export Corporation (CEIEC), with factory orders in hand, came in toward the end of the show to make its buys. Only then was it learned that the corpo-

ration had not been authorized to do business there, the exhibitor said. Few seemed aware of the problem, and no one offered an explanation. But the US trader has a theory. In his view INSTRIMPEX, which has its own stake in the electronics trade, convinced CCPIT to keep the rival organization out. Other China hands think this is quite possible, since CCPIT and INSTRIMPEX maintain close ties to the Ministry of Foreign Economic Relations and Trade, while CEIEC comes under the Ministry of Electronics.

Problems aside, the questionnaire Cahners sent out after the show indicated that 90 percent of the exhibitors would go again. They will soon get their chance. Cahners had scheduled a near-identical show for April 1984—same time, same place, with expanded space.

Petroleum

It should surprise no one that the hottest topic of the year made for one of the hottest shows. Three hundred companies from nine nations participated in the SPE International Petroleum Equipment and Technology Exhibition, sponsored by the Society of Petroleum Engineers. Approximately 60 percent of the exhibitors were US firms, split down the middle between first-timers and China hands.

The timing could not have been better—thanks, in the view of SPE General Manager Doug Ducate—to special efforts made by the Chinese. Day one of the show coincided with the official announcement of the areas opened in the second stage of the first round of bidding. On the second day, China announced formation of CNOOC, the China National Offshore Oil Corporation. Exhibitors were doubly pleased, said Ducate, that the CNOOC chairman—Petroleum Vice-Minister Min Yu—happened to be cochairing their show.

Day five saw two important visitors make their way into the Beijing Exhibition Hall. At six o'clock in the evening, an hour after the crowds had been cleared, vice-premiers Yu Qiulu and Kang Shien paid what the Chinese regarded as a highly symbolic courtesy call. Exhibitors were told that this marked the first time a vice-premier had ever attended an exhibition sponsored by the private sector.

During regular hours, at least 160,000 Chinese swarmed into the eight-day event. "Obviously there aren't 160,000 decisionmakers in China's oil industry," Ducate replied, when asked about the quality of attendance. "But the 10,000 who are, were there."

SPE, much to its credit, was able to identify at least 3,000 of the attendees—by name, title, and technical area. Taking place across the hall from the exhibit was an SPE technical symposium; exhibitors and Chinese petroleum experts presented a total of 85 papers on operations, technology, and development plans. The Chinese attending wore name badges that were color-coded according to positions and technical levels. Those badges enabled exhibitors scanning the crowds to single out some of their contacts.

While all this went on, attendees took part in 47 product seminars. These day and a half-long events allowed each exhibitor to discuss practical topics in which the Chinese had expressed a special interest. SPE half-heartedly backed the idea. Too often the Chinese who attend these types of detailed, product-specific seminars turn out to be manufacturers of competitive products, Ducate remarked.

This was at once the most, and the least, commercial of shows. SPE's stated reason for staging it was "technology transfer." Said Ducate, "We're not in the business of staging an exhibit to make money, like a Clapp & Poliak." Indeed, Ducate said it took the Chinese Petroleum Society two years of invitations and negotations before it convinced SPE to bring in the show.

"We stood fast" on two main conditions, said Ducate—that a high-technology conference be linked to the exhibition, and that the show be international. "Not only do the Chinese prefer [national exhibits]," he explained, "they insist on it."

Exhibitors went over to "wave the flag," as one trader put it, and to learn more about development plans. Immediate sales were a small concern. Cutaway and operating models made up the bulk of displays; many of the compressors, generators, drill bits, and packers on hand stopped by the show en route to delivery points throughout Southeast Asia. SPE had warned its members about China's penchant for price dickering.

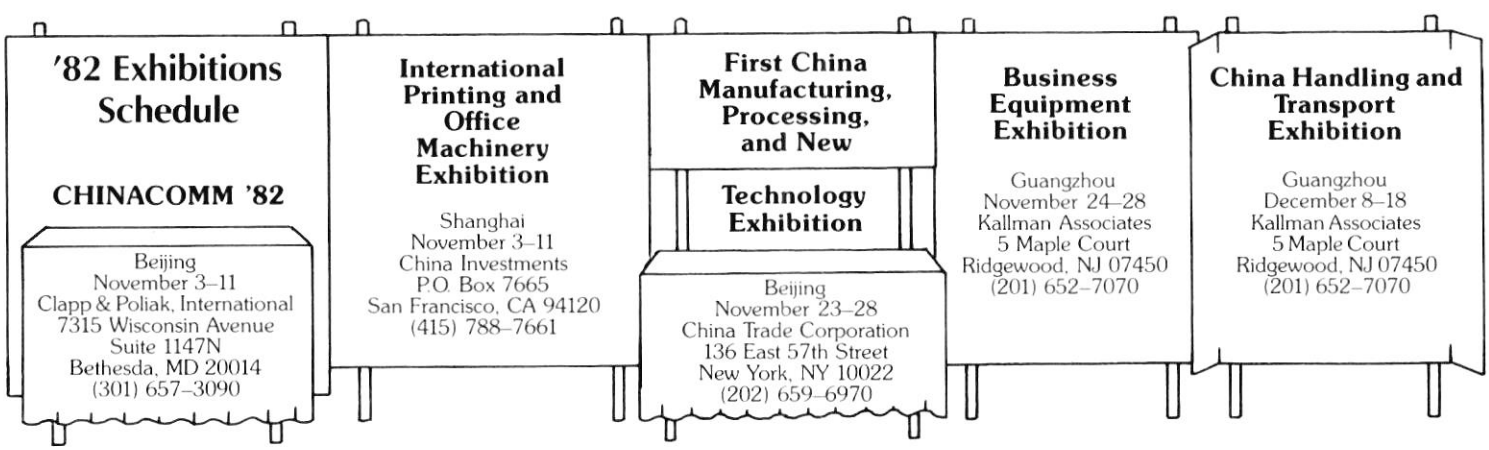
US exhibitors are taking a "wait-and-see attitude" about the show's market potential. Still, optimism seems to prevail. A detailed survey sent out by SPE, and answered by 148 of the exhibitors, showed that 73 percent rated their sales prospects as "good" or "excellent." Roughly 27 percent were able to sell their products or services during the show; another 21 percent contracted for future delivery.

Based on the survey, Ducate has concluded that 48 percent of the exhibitors either have sold, or will sell, to China as a direct result of the show.

CHINACOMM/CHINABUILD

Few would argue that the timing of a China show is as difficult as it is important. Organizers generally spend a minimum of 18 months trying to launch their shows. In the meantime, a market can virtually disappear.

Nowhere are the ups and downs of exhibitions planning better illustrated



than in the long and circuitous history of CHINACOMM '82. The Electronics Industry Association first approached the Chinese about a telecommunications show in 1973. Serious talks began about four years later. Then in mid-1980, EIA and the National Council submitted a joint proposal for the show. EIA Vice-President John Sodolski said that all systems seemed go, right up until China made the startling announcement that plans to purchase a US satellite communications system would be moved back "several years" (*see The CBR*, Mar.–Apr. 1981, p. 30).

Remarked Sodolski, "The initial interest [in the exhibition] was high. But it didn't take many months after retrenchment to make that evaporate."

The situation began to change last year. Clapp & Poliak, which had been asked to organize the original show, conducted an industry poll that indicated a renewed interest in participation. Believing that the show must go on, Clapp & Poliak took over sponsorship of what has now become CHINACOMM '82. EIA is cosponsoring the exhibition; the National Council and DOC are endorsing it.

After an almost painfully slow start, CHINACOMM is heading into the home stretch with head held high. More than 60 firms—"a blue-ribbon list of the US industry," according to the organizer—will participate in the November 3-11 event. Exhibitors include Rockwell, Honeywell, IBM, ATTI, Hewlett-Packard, Scientific Atlanta, and Burroughs. The scope of the show has been expanded from strictly telecommunications to cover military, defense hardware, computers, and avionics.

Clapp & Poliak had a much easier time—though by no means an easy one—selling CHINABUILD '82. Promotion began more than a year and a half before the April event. Ned Krause, director of Clapp & Poliak's international exhibitions, says the response at a given time could be gauged just by looking back over the headlines. Exhibition planners everywhere were being forced to postpone plans as China began cancelling projects. Even today, he says, the waiting line of foreign exhibition managers that "used to stretch to Tiananmen Square," includes only a handful of organizers who are serious about China shows.

In the end, CHINABUILD boasted participation by 60 exhibitors (half from the US), with $3.5 million worth of displays. More than 30,000 Chinese attended. While that may not seem significant compared to the gigantic crowds drawn by the two DOC shows, Clapp and Poliak says this is precisely the audience it wanted. The firm was permitted to draw up an attendee list and submit it to CCPIT Tianjin, which then extended invitations. Such flexibility is not granted by the Beijing CCPIT, says Krause. In fact, "I don't think this has ever been done in China."

Companies nevertheless felt that too many of the wrong people got into the show. "Practicing English" was a big passtime, as it is with most exhibitions. A number of firms complained that the Chinese had come in to do "window shopping" rather than to place actual orders.

Many Americans left their equipment home, owing to the colossal expense of transporting heavy machinery to China, and possibly back again. European and Japanese firms, consequently, garnered most of the floor sales. Krause says that nearly 95 percent of the equipment that was sent, was sold.

Opinions vary on the overall wisdom of displaying equipment. Some people feel that having equipment on hand gives a company a real edge on the competition. Said one trade show promoter: "Once you sell some equipment, it can lead to future sales. You've already got your foot in the door." Another businessman, who would have spent $75,000 transporting one machine to and from a DOC show, sees it as too costly an investment. "The Chinese expect you to sell your equipment at 50 percent off," he remarked.

More than one trader has complained of walking into a particular show thinking his display equipment had been "presold" to China, only to learn that he either had to cut the price or lose the sale.

Clapp & Poliak, by most accounts, did a good job organizing CHINABUILD. Nine months before the event, it released a detailed survey of China's product requirements (conducted in the PRC by China Consultants International). Krause says that mailings and phone calls kept firms abreast of the exhibitor list. Also, he remarks, the National Council spent a significant amount of time gathering and providing information to exhibitors on show size and displays.

Some firms still complained that they had to decide whether to go and what to take without sufficient market and display information. But at least part of that seems to be their own fault. Several major manufacturers—veterans of a number of China shows—admitted having joined exhibitions they did not want to attend. One reason: subtle pressure from the Chinese. Another, perhaps more important one, is concern over what the competition would do.

Exhibitors like to play their cards close to their vests. By keeping their plans and displays a secret, many reason that they can thwart the competition. A few traders, however, have begun to see this line of reasoning turn into a vicious circle. The companies, they say, are really only hurting themselves.

Immediately after CHINABUILD, several of the major equipment manufacturers reportedly met for dinner to discuss their involvement in recent China shows. A consensus wasn't hard to reach, according to two participants. "We all agreed that before we decide to get involved in another China exhibition," said one, "we will sit down and talk it over."

Exhibitions are not inexpensive creatures. A firm that participated in either of the Commerce shows had to spend $5,000 for a 3x4 meter booth, and pay for travel, hotels, food, shipping, translation, and other services on top of that. (The 1980 booth price included translation services. The booth price for the light industry show did not.)

Stephen Mulder, manager of China marketing for Cummins Engine, said it probably cost his company $10,000 "to get us in the door" at CHINABUILD. Having three Cummins people there may have added another $10,000 to the bill, he said.

Trade show proponents point out that the cost isn't so outrageous compared to the expense a firm might have incurred by going to China on its own. Argus Trading Company's Kathleen O'Donnell says she always leaves a show thinking, "I could have done it for half the price." But for the "kind of coordination" she said Cahners demonstrated in the semiconductors show, "you probably couldn't have done it."

Still, the price tag may be out of the question for smaller firms. And it may not be a wise buy for larger companies just trying to assess the market. For them, there is always the option of videocassette and catalogue shows.

CTPS, China Translation and Printing Services, USA, started selling the catalogue concept last year. In December the San Francisco firm put on ELEC-

TRO LIT '81, a three-city catalogue exhibition of materials from 61 US firms. (All the CTPS shows are strictly US.) AGROLIT EXPO followed in June. Now final arrangements are being made for TRANSENERGY LIT in September (covering transportation and energy), and the US Machinery Equipment Literature Exhibition scheduled for mid-November.

CTPS General Manager Russell Lowe sells the shows as an economical means of doing market research and gaining exposure. For $750, CTPS will display a firm's literature and provide feedback from the Chinese. Small firms with limited budgets may find this the only feasible way of introducing themselves to China. Even some of the industrial heavyweights who could well afford a full-scale exhibition opt for a catalogue show. Lowe says that Diamond Shamrock, Lockwood, Perkins-Elmer, and Monsanto participated in AGROLIT.

CTPS states up front that catalogue shows are not a substitute for exhibitions. "We tell people that the first thing they ought to do [in China] is a catalogue show," said Lowe. Then if the response looks positive, "definitely an exhibition."

A trade show is something that should be tried at least once, in the view of many China hands. Dick Gillespie, the National Council's exhibitions expert, believes trade shows offer "the best possible exposure companies can get for the price. I think they're an excellent way to introduce goods and services."

How many people will take that advice is anybody's guess; show types and trends are particularly difficult to predict right now. But if strong opinions among traders have any bearing, as DOC Exhibits Manager Kerry Gumas puts it, three changes will take place: "Smaller exhibitions, more specialized, and fewer in number."

Some shows already are heading in that direction—particularly those being organized by trade associations. The Tanners Council of America recently sponsored an exhibition in Guangzhou for its member companies. The Machine Tool Builders Association has a members-only exhibition slated for early next year. One of the year's more highly rated US shows was actually one of the smallest. Roughly 1,500 Chinese came to see and discuss scientific instruments and lab equipment on display at Qinghua University, in a trade show/conference organized by American consultant Don Lin. The equipment ties into Phase II projects stemming from the World Bank educational loan.

Only one large American exhibition—CHINACOMM—has yet to take place this year. The eventual success of that show, and of all the other US-staged exhibitions, will be largely determined by what the Americans do next. Follow-up is all-important. Bear Stearns credits much of its success at the semiconductors show to meetings and sales presentations made later in its Beijing office. Carlson Machine Tools doubts that its meetings at the light industry show would have been worthwhile without the groundwork laid by National Council member China Consultants Northwest.

Too often traders sit back and expect the exhibition to do all the selling for them. DOC's Nancy Reinhart says that after a national show, she's more apt to hear from the Chinese than from the American firms. Sometimes three months will go by and then "the Chinese will come back and say they now have the money to buy something," remarked Reinhart. The problem is, "the company the Chinese were interested in never went back."

Telecommunications

Recent business deals are big topics on the telecommunications circuit. The hope is that 1982 will signal the start of real opportunities for foreign firms.

Chris Brown

After a long lull in US sales of telecommunications equipment to China, the climate seems to be changing. Contracts, though still few and small, *are* increasing, and signs have appeared that indicate China may get serious about certain communications plans in the coming year. Some promising budgetary decisions have been made, including decisions to increase satellite communications. Also, the first exhibition of US telecommunications products in China is scheduled to take place this fall. As one US executive put it, "The activity level is building up. There's more contact and more dialogue."

For companies that have watched this sort of activity build and dissipate in the past, the question is whether or not the Chinese are willing to make the hard decisions to allocate money to modernize communications. Looking at the 1982 budget, there is less reason for jubilation than for restrained optimism. The Chinese press reports that the 1982 capital construction total for the Ministry of Posts and Telecommunications (MPT) is ¥250 million. That represents a 1.2 percent share of the national capital construction budget, up from a 0.8 percent average over the years since 1950. This may not constitute an actual rise in the MPT budget for 1982, since the total capital construction budget for the nation was down 11.2 percent from 1981. But at least the sector has escaped the severe cuts suffered by other industries in the second stage of readjustment.

A far more promising budget development came from the decision that the MPT, as well as other local posts and telecommunications bureaus, will from this year on be allowed to retain 90 percent of their profits and foreign exchange income, mainly for upgrading equipment. In the past, they were allowed to keep 80 percent of their profits and only 60 percent of their foreign exchange. The preponderance of local deals of late makes this a particularly significant change.

The fact remains, however, that little foreign exchange has been allocated for telecommunications development, and China looks overwhelmingly to domestic production to upgrade its primitive infrastructure. The work of expanding and renovating networks, although acknowledged as a priority, has proceeded slowly. Domestic telephone capacity is expanding at a rate of 5 percent annually, with international telecommunications developing at a rate of some 30 percent per year, mainly in satellite communications.

This slow but steady development is apparent in 1982 MPT capital construction plans. As announced in the Chinese press, the emphasis for this year is to expand international telecommunications in major cities where foreign companies do business—Beijing, Shanghai, Guangzhou, and Dalian. Plans are to add about 1,000 long-distance telephone circuits throughout the country, with most of them serving major coastal cities and special economic zones. In addition, 170,000 telephones should be installed, mainly in the cities of Beijing, Tianjin, Shanghai, and Guangzhou.

Roughly one telephone is available for every 250 people in China today. And as any visitor there will note, it is easier to make a connection between a hotel phone in Shanghai and a party in the US, than it is to call an office across town. Considering the recent upsurge in production and consumption of electronic consumer goods such as television sets and radios, the casual observer might wonder why there is not an explosion in the PRC's telephone market.

Chinese planners are not concerned with telephone communication as a consumer service; rather, they view it as a vital part of China's industrial and administrative infrastructure. As such, there remains a great need for renovation and expansion. Even by the admission of Chinese officials, the communications networks are a primitive patchwork in need of overhaul. But expenditures for modernization in this sector are not commensurate with announced priority. The reasons: imports are needed to enable China to man-

ufacture its own modern telecommunications equipment, and domestic communications do not directly earn hard currency. The fact that international communications *do* result in hard currency earnings explains their relatively fast growth.

Thus far, Japanese, Hong Kong, and European companies have held the lion's share in sales of telecommunications equipment to China. PRC officials have made no secret of their opinion that US technology in this field is the most sophisticated in the world. However, US prices are not competitive, in their view, and export controls pose major problems. Favorable financing, better foreign exchange rates, and lower transportation costs from other countries do not help America's competitive position.

The Satellite Connection

There is still no word on China's previous plans to purchase a $200 million US satellite broadcast and communication system, plans which were postponed indefinitely in December of 1980 (*see The CBR*, Mar.–Apr. 1981, p. 30; Nov.-Dec. 1981, p. 58). Yet China has started to move on other cooperative activities with the US in satellite telecommunications.

In April, the Ministry of Posts and Telecommunications issued a formal request to lease one and one quarter transponders for domestic communications on the Intelsat IV-A satellite, for an annual fee of $1 million. That lease will provide nationwide broadcasts from two color TV stations through one transponder, and 200 channels for intercity telephone communication through the other one-fourth. Shortly after the formal request was submitted to Intelsat, a delegation from the MPT came to the US and visited a number of ground station equipment manufacturers. Those companies included Varian/Beverly, Scientific Atlanta, Harris Inc., Hughes Aircraft, Radiation Systems, and MACOM/Linkabit.

It is estimated that some 40 groundstations will be required to make use of the transponders. China reportedly plans to put 17 of these in operation in the first year of the lease. Ten ground stations in Beijing, Shanghai, Nanjing, Shijiazhuang, and other sites are now being used in an experiment to test domestic communication and TV transmission through the Intelsat IV A. According to Chinese press reports, China plans to build ground stations in Beijing, Chengdu, Hohot, and Urumqi sometime after the tests are completed in August.

The prospects for foreign participation in the construction of future ground stations for Intelsat are not clear. China is able to produce 10-meter antennas and some terminals at vanguard facilities. Much of the sophisticated equipment, such as low-noise amplifiers and receivers, multiplexing devices, and measuring and testing equipment, will probably be imported. Depending on the arrangement that China and Intelsat arrive at for technical assistance, there may also be an opportunity for a US firm to assist in engineering and design.

The lease of Intelsat transponders may act as a catalyst for the Chinese to expand and renovate domestic long-distance networks. As one industry observer commented, "Once a country obtains satellite capabilities, it puts tremendous pressure on them to make decisions."

A second promising development in satellite telecommunications comes from China's $10 million order for a Landsat ground station from Land Resources Management Corp. of the US. China had agreed, in the Sino-US Understanding on Cooperation in Space Technology signed in 1979, that this station would be purchased from a US firm. But in 1981 there was some fear that China would go to a foreign company with more competitive prices.

Since the contract was signed, LRM has reportedly been beset by internal and legal problems that many observers believe will cause a cancellation of the China deal. Other US companies have already approached the Chinese to pick up the pieces if the present arrangement falls apart.

When a ground station is finally constructed, the Chinese will be able to apply the remote sensing and thematic mapping capabilities of Landsat D to estimate harvests, predict droughts and flooding, identify crop disease and infestation, and conduct geological exploration for mineral deposits. The ground station ordered would be located near Beijing and would receive Landsat information for the areas of the north China plain reaching as far west as Shanxi and Gansu, and areas spanning south into Guangdong. After the system becomes operational, more equipment may be purchased to enhance analysis capabilities. China also has expressed interest in constructing two additional ground stations to cover areas in the west and south.

There may be additional opportunities in satellite communication coming from the Ministry of Electric Power. Scientific Atlanta is now installing three ground stations for the ministry. They will be used to transmit data from remote generating stations to central stations. Reports from the coal sector indicate that a ground station may be needed for communications at the Pingshuo project.

Plans have already been made to lease an additional one-fourth to one-half Intelsat transponder as part of an overall project to develop telecommunications for offshore oil exploration and development. That project, according to one US government official, is projected to cost between $100 million and $150 million. It is expected to resemble the telecommunications network set up by the Norwegian company Statoil, for use in the exploitation of North Sea reserves.

The authority to manufacture and procure equipment for the offshore system is vested in the Telecommunications, Broadcasting, and Television Administration (formerly State Bureau of Broadcasting and Television Industry), under the newly formed Ministry of Electronics Industry. Long-term plans call for the equipment to be manufactured domestically. But for the short term, the China National Offshore Oil Corporation (CNOOC) is authorized to purchase foreign equipment with TBTVA approval. TBTVA has already approached several US firms seeking ground station and shipboard communication equipment.

International Communication

US carrier services report that the growth of circuits between the US and China continues; expansion, they say, is limited only by the ability of the Chinese network to absorb further traffic. ITT, for instance, is now in the process of doubling its circuits for telex, telegraph, and lease channel services to the PRC by replacing its Frequency Division multiplexing equipment (FDM) with Time division multiplexing equipment (TDM). This equipment will subdivide the 24 50-baud telegraph channel circuits now operated by ITT into 46 circuits.

To handle increasing international traffic, a 16-story gateway switching center is planned for construction in Shanghai. Though a site has already been selected, responsibility for the project is apparently still under discus-

sion. A major expansion of the international switching center in Beijing is also planned.

Domestic Network

China has now linked 23 provincial centers with long-distance automatic and semiautomatic dialing. Microwave circuits are employed in service to 15 of these cities. Although China's land-line circuits—still the backbone of its overall network—are generally overloaded, the new microwave circuits have not been used to capacity. Chinese press reports say that only 28 percent of the microwave communications circuits are now in use, and even those that are in commission have been underutilized.

Last year an agreement was signed to construct a major microwave system to link Guangzhou with Hong Kong. The $5 million project is being undertaken by a joint venture between Cable and Wireless Ltd. (Hong Kong) and the Guangdong Posts and Telecommunications Administrative Bureau. Equipment for the project is being purchased from Japanese companies, with deliveries scheduled to be completed by September.

Switching in Chinese networks is done through semiautomatic and automatic crossbar systems, with manual step-by-step exchanges still in use in rural areas. MPT officials have said that replacing urban crossbar switching with Stored Program Control (SPC) systems is a priority, and there have been discussions with US companies about more sophisticated digital equipment. Imports in this area have generally come from Europe and Japan, although US companies such as AT&T and GTE have sold PABX switching packages for hotels.

China's cable factories are able to produce telephone transmission lines, including coaxial and multiconductor cables. Much of the output, however, is not technically sophisticated; some factories are able to produce only steel and iron wire, and most standard telephone cable is manufactured with paper insulation and lead sheathing.

The Essex Group, a subsidiary of United Technologies Corporation, has been negotiating an agreement with MPT and MACHIMPEX to produce modern telephone cable in Chengdu, Sichuan. The agreement, as originally envisaged, would call for Essex to provide licensing, know-how, and equipment procurement services for a facility that would produce 8 billion conductor feet of jelly insulated plastic-sheathed telephone cable per year. Essex would then be responsible for marketing 50 to 60 percent of production over the 6-year term of the agreement. The cable would be used in China to connect central offices within cities and for local communication in rural areas.

As one industry observer commented, "Once a country obtains satellite capabilities, it puts tremendous pressure on them to make decisions."

However, prospects for a final agreement are now in question, and the US company may end up providing a license in a straight sale arrangement.

Another US company, Storage Technology Corp. of Louisville, Colorado, has begun to sell multiplexing equipment to the Chinese to increase capacity on overloaded major telephone lines. Last year, the company signed a contract worth over $600,000 to install four of its COM2 voice concentrator/multiplexer telephone systems, to train Chinese technicians in maintenance and to supply spare parts. These are the first time-assigned speech interpretation multiplexing systems to be imported by China and are expected to be used to double capacity on long-distance circuits linking the coastal cities of Guangzhou, Shanghai, Beijing, and to connect the Nei Monggol capital of Hohot with Beijing. According to a company source, Chinese officials have described the installation of these systems as a pilot project, with as many as 50 more installations to follow in the next five years if the pilot proves successful.

In the area of telex equipment, formerly a Japanese stronghold in the market, Extel Corp. of Northbrook, Illinois, has recently made important advances. With a recent sale of $700,000 worth of terminals for use throughout the provinces, Extel's total sales of teleprinter units since 1978 is up to more than 2,000. The company also supplied the Xinhua news agency with terminal equipment to edit and prepare texts and to disseminate news throughout the provinces.

CHINACOMM '82

With these developments pointing to opportunities for US companies in the China telecommunications market, the US industry is eagerly awaiting the CHINACOMM '82 exhibition this fall. The first show of US telecommunications equipment in China, CHINACOMM has been organized by Clapp and Poliak with the cosponorship of the Electronic Industry Association and endorsement from the National Council for US-China Trade and the US Department of Commerce. More than 40 companies already have registered to take part in the exhibition, scheduled for November 3 through 11 at the Beijing Exhibition Hall (*see* p. 40).

The general shopping list issued by the Ministry of Posts and Telecommunications and other Chinese organizations for the exhibition covers a full range of equipment. Included are SPC switching systems and PABX systems, mobile telephone switching systems, and auxiliary equipment for central switching centers; transmission facilities systems including coaxial cable, PCM multiplex transmission equipment, digital microwave transmission systems, and optical fiber transmission systems; high-speed and low-speed digital transmission equipment, digital switching equipment and terminal equipment; telegraph switching systems and terminals; facsimile transmission equipment; satellite communications systems; cables including coaxial and jelly-filled plastic insulated cable, and photoconductive fiber cable, computer applications in communications; testing instruments; and specialized components for communication equipment, including large scale, linear, and mixed integrated circuits, microwave devices, optical devices, and plug adapters..

Unfortunately, much of the equipment that interests China most—integrated circuits for manufacturing sophisticated communication devices, and advanced computer-associated equipment the Chinese are unable to produce—is guarded carefully under US export controls. Representatives of the US telecommunications industry have been meeting with government officials to arrive at guidelines for CHINACOMM exhibitors. In this sense, the exhibition will not only determine what the Chinese are willing to buy, but may indicate what the US is able to sell.

Behind the Scenes Mainland-Taiwan Trade

Helen Kauder

One of the most popular brands of black and white TVs on the market in Fujian Province last year came from Taiwan. The 525 scanning lines on Taiwanese sets make it possible for viewers to catch Taiwan broadcasts.

Meanwhile, in Taiwan, retailers did a brisk business selling mainland silk apparel, herbs, medicines, and teas, all of which are believed to be of better quality than the local brands.

While official trade between Taiwan and the mainland of China does not exist and is considered illegal by Taiwan authorities, a survey by the Hong Kong Census and Statistics Bureau of local trading companies involved in reexporting revealed that two-way semiofficial trade in 1981 reached US$462 million.

Typically, goods that are shipped to these trading companies from China are relabeled and repacked with goods from other countries before they are sent to Taiwan. Products from Taiwan are often repackaged and then sold to China Resources Company, the Hong Kong purchasing agent of the Chinese government, or sold directly to PRC import-export corporations.

Manufactured goods make up over 70 percent of Taiwan's exports, consisting mainly of textile yarns and man-made fabrics. The figure for textile yarns jumped from $60 million in 1980, to $114 million last year. Sales of sewing machines and other textile and leather-fabricating machinery rose from $2 million in 1980 to $17.2 million in 1981.

Repackers in Hong Kong are likely to receive fewer Taiwan goods in 1982 now that Beijing has imposed restrictions on some Taiwan imports. In addition, an official at China Resources Company said in June that if Taiwan-made goods are repacked in Hong Kong, they can no longer enter the mainland of China duty free. Indeed, Taiwan-to-mainland reexports from January to April 1982 showed a 28 percent decrease in volume, as compared with the same period in 1981.

Restrictions are coming from the other side, as well. When Sempol, a major electronics company in Taiwan, took out an advertisement in the *Ta Kung Pao*, a Hong Kong-based Communist newspaper, it was severely reprimanded by the Taiwan authorities. Taiwanese fishermen now face the risk of stiffer jail sentences for trading across the Taiwan Straits. Previously, some fishing vessels had exchanged watches, eyeglasses, and radios for gold.

Demand in Taiwan for mainland products continues to increase in spite of these changes. One reason is the growing familiarity in Taiwan of mainland products, as local residents traveling to Hong Kong bring home items purchased in PRC emporiums. A store in Taipei is meeting the demand by using a third party in Hong Kong to buy traditional Chinese silk dresses sold in the Beijing Friendship Store. They are resold in Taiwan with new labels that do not indicate place of origin.

Teapots from Yixing, in Jiangsu Province, are particularly sought after. Famed all over the world for their durability and distinctive glaze, the tea pots are now fired with labels written in unsimplified Chinese characters. The Taiwan authorities have been willing to assume that the goods were made prior to 1949.

Taiwan businesspeople have, as with many other imported items, made their own cheaper imitations of the pottery. Aware of the hazards of selling a PRC product but eager to capitalize on its status, they have chosen a carefully ambiguous label that under no circumstances would make them guilty of false advertising. In English, it is simply "Made in China."

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Mainland-Taiwan Trade
(Million US dollars)

Taiwan's exports to the mainland through Hong Kong	1980	1981
Food and live animals (mainly cereal preparations)	0.27	0.32
Crude materials (mainly synthetic fibers)	13.45	7.39
Chemicals	2.70	5.02
Manufactures (mainly textile yarn, man-made fabrics, containers)	156.11	277.75
Machinery (mainly TVs, sewing machines, typewriters)	61.36	83.84
Misc. manufactures (mainly watches, womens' skirts, optical goods, umbrellas)	7.68	11.95
Total	**241.53**	**386.21**
Percent of Taiwan's total export through Hong Kong	26.0	27.1

Taiwan's imports from the mainland through Hong Kong		
Food and live animals (mainly fish, fruits and nuts)	7.33	7.02
Crude materials (mainly animal hair, plants, seeds, clay, concentrates of base metals)	64.95	60.81
Chemicals (mainly antibiotics, nitro-function compounds)	3.61	5.38
Manufactures (mainly woven cotton fabrics)	1.80	1.24
Machinery (mainly electrical machinery)	0.24	0.66
Misc. manufactures	0.30	0.33
Mineral fuels	0.03	0.06
Total	**78.28**	**75.49**
Percent of PRC total exports through Hong Kong	17.1	17.5

SOURCE: Hong Kong Census and Statistics Bureau, June 1982.

Marianna Graham
Librarian

NEW REFERENCE BOOKS

The China Directory of Industry and Commerce and Economic Annual, compiled and edited by Xinhua Publishing House. Boston: Science Books International; Beijing: Xinhua; Washington: Chinatrans, 1982. Directory, 1,377 pp.; Economic Annual, 378 pp. $395 until October 15, 1982, $495 thereafter.

A unique, major reference work for China traders, the volume contains a directory of nearly 10,000 Chinese manufacturing and commercial enterprises and a review of the Chinese economy through 1980. Enterprises are listed according to 17 industrial and commercial categories, each with its own table of contents. Included are an enterprise's address, director, telephone number(s), cable address, number of employees, and major products or commodities handled. A mailing label in Chinese is provided for photocopying. An alphabetical index to the directory listings is included.

The *Economic Annual* contains information on trading with China; the national economy, including reports on industrial and commercial sectors; provincial reports; texts of economic laws and regulations; major economic statements in 1980; and an economic chronicle, 1949–1980.

This reference book is an important Chinese contribution to the available resources on China and will be essential to research libraries and to corporations with a major commitment to trading or investment in China.

China: International Trade Annual Statistical Supplement. National Foreign Assessment Center, February 1982. Distributed by the National Technical Information Service, NTIS #PB82-928202. 101 pp. $13.50.

This very useful report is a listing, by SITC numbers, of China's total commodity trade for the years 1970 and 1975–1980 in US$ value. Using primarily the statistical reports of China's trading partners, the NFAC staff was able to account for 97-98 percent of Chinese imports and exports (the balance was distributed among appropriate categories). The import and export listings present 1, 2, 3, and 4–5 digit SITC numbers. This supplement complements NFAC's series, *China: International Trade Quarterly Review,* which provides statistics on China's trade with the countries and regions of the world.

US–China Trade Statistics 1981. Washington: The National Council for US–China Trade, 1982. 110 pp. $40; free to National Council members.

The National Council's annual compilation of trade statistics lists US exports to China by 7-digit Schedule B and E numbers and US imports from China by TSUSA and Schedule A numbers. Listings are in cumulative rank order and in numerical order. New features in this edition include information on China's total world trade and trade with selected countries, analyses of US exports and imports 1978–1981 in a simplified format, and US textile imports by major category.

Chinese Petroleum: An Annotated Bibliography, by Raymond Chang. Boston: G.K. Hall & Co., 1982. 214 pp. $35.

An excellent new resource on China's petroleum industry, this annotated bibliography is a welcome tool for research on the history and development of the industry to 1980. Some entries on the petrochemical industry and alternative energy sources are included. The volume is not comprehensive; for example, English-language monitoring services' reports are not included. The 860 entries, from primarily English-language sources, have been selected on the basis of significance, usefulness, and availability. The bibliography contains sections for reference works, books, articles, and Chinese and Japanese books and articles. Entries are chronologically arranged within sections. The volume includes an appendix on research libraries and subject, author, and title indexes.

Research Guide to the People's Daily Editorials, 1949–1979, by Michel Oksenberg and Gail Henderson. Ann Arbor: Center for Chinese Studies, the University of Michigan, 1982. 194 pp. $7.50.

Providing access to the only continuous source of high-level Chinese policy statements, this guide is a day-by-day chronological listing of editorials in the *People's Daily* from 1949–1979. An extensive subject index cites the editorials by topic, by region in China, and by country.

Americans in China, 1971–1980: A Guide to the University of Michigan National Archive on Sino-American Relations. Ann Arbor: Center for Chinese Studies, the University of Michigan, 1981. 313 pp. $15.

The archive is a historical collection of diaries, reports, memoranda, and oral history tapes and transcripts documenting informal relations between the United States and China. This guide lists the contents of the archive by subject. An introduction to the volume summarizes the American experience in China as reflected in the collection.

Council Expands Business Services

In July the Council merged the Importer and Exporter Services departments to form a new Business Advisory Services Department, headed by Carolyn Brehm. The move expands and consolidates all import, export, and countertrade functions to improve the quality of membership services.

The department's three assistant directors will each take responsibility for several industrial sectors, and handle all contacts with member firms, committee work, and delegation activities in their areas. Likewise, the Council's committees will combine importer and exporter interests in the same industrial areas, where appropriate.

The new team: Richard Gillespie (front left), Carolyn Brehm, and Andrew Heyden. **Standing:** Sally Wile (left), Susan Baugh, Gerri Lee, and Marie Richards.

Council Officers Form New Company

Norman Getsinger, the former director of Exporter Services, and Harold Champeau, deputy director, are leaving the Council this summer to form their own consulting firm, China Business Services. Before joining the Council over three years ago, both officers had lengthy government service careers, mainly in the China area. In the Council, they administered industrial committees and escorted delegations to and from China. Pending establishment of a Washington office, China Business Services can be reached at 2924 Richmond Lane, Alexandria, VA, 22305, or by calling (703) 683–4847. The Council's staff wish Norm and Harold every success in their new enterprise.

Harold Champeau and Norman Getsinger

Rosanne Drummond Joins Beijing Office

Rosanne Drummond will assume the post of deputy representative for the National Council on August 1. She will be succeeding Stephen Markscheid, who has served in this position since March of 1981.

Prior to joining the Council, Drummond worked as an account executive with Altman, Inc., an international trading company and Council member. In this capacity, she formulated and carried out new marketing strategies, negotiated contracts on behalf of US companies, and coordinated documentation and shipping arrangements.

Drummond received her B.A. in East Asian Studies from Columbia University and is proficient in spoken and written Mandarin Chinese. Her other professional experience includes banking, retailing, and fund raising.

Lori Starrs Joins *The New Republic*

In July *The CBR*'s production assistant took over production responsibilities at Washington's weekly magazine, *The New Republic*. Lori Starrs joined the Council in 1980, and has copyedited and assisted with the production of virtually all Council publications since then. *The CBR* staff wishes her the best of luck in her new job.

Lori Starrs

THE NATIONAL COUNCIL FOR US–CHINA TRADE

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Jennifer Little
Assistant Librarian

The following tables contain recent press reports of business arrangements 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 (202-828-8376) 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 Jennifer Little.

中外貿易

EXPORTS TO CHINA: SALES AND NEGOTATIONS THROUGH JUNE 15

Company/Country	Product/Value/Date
Agricultural Commodities	
(Brazil)	3,000–4,000 tons of tobacco. Reported 2/5/82.
(US)	30,000 tons of soybeans and 7,000 tons of corn. Reported 2/23/82.
(Malaysia)	Timber. $1.7 million (4 million ringgit). Reported 2/24/82.
(Ecuador)	10,000 tons of bananas. Reported 2/25/82.
(Brazil)	30,500 tons of soybean oil shipped in 1981. Reported 3/16/82.
(Canada)	Gift of a shipment of wheat for drought and flood relief. $1.6 million (C$2 million). Reported 3/25/82.
(Chile)	77,500 tons of unbleached kraft pulp during 1981. Reported 4/82.
World Food Programme (United Nations)	Gratis aid in the form of grain. $51.6 million. Reported 4/3/82.
Nissho Iwai Corp. (Japan)	83,000 cubic meters of American lumber. $12 million. Reported 4/13/82.
(Burma)	130,000 tons of rice. Announced 4/18/81.
(Argentina)	Agreement to supply cotton to China from 1982-1984. Signed 4/23/82.
(Canada)	3.5–4.2 million tons of wheat during the next 3 years beginning August 1, 1982. $2.25 billion. Agreement announced 5/6/82.
(Thailand)	60,000 mt of rice. $12.2 million. (280 million baht). Reported 5/6/82.
Agricultural Technology	
Agrodev Canada Inc. (Canada)	Will act as project manager of the first phase of the Northern Livestock Project in Nei Monggol under a contract awarded by the General Bureau of Animal Husbandry. $833,000 (C$1 million). Reported 4/82.
(Australia)	Equipment and technical aid to increase the productivity of the citrus orchards at the Lingling State Farm, Hunan. $1.46 million (Aus$1.34 million). Reported 5/5/82.
Chemicals and Chemical Plants	
Dunlop Holdings Ltd. (UK)	Cooperation to help modernize the Guangzhou Rubber Bureau's rubber manufacturing facilities. Protocol reported 3/22/82.
(Japan)	380,000 tons of urea between 9/81–1/82. Reported 3/30/82.
Coal	
Fluor Corp. (US)	Contract to modernize and expand the Fushun West open-pit mine in Liaoning Province. Approx. $50 million. Reported 4/27/82.
Romania Bucharest Co. for Mining and Geological Cooperation (Romania)	Will design a coking coal mine and preparation plant at Huoxian, Shanxi, for the China National Technical Import Corp. Reported 5/12/82.

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

Minequip (France)	French government loan of coal mining equipment for the 4-million-tons-per-year Dongtan mine at the Yanzhou field in Shandong. $45.8 million (Fr 275 million). Reported 5/24/82.
Technotrade (Italy)	Preliminary agreement with China Southwest Development Corp. to provide engineering and technical advice for coal mines in southwest China and to design and oversee construction of a 250-km rail network. Proposed payment: 8–10 million mt of steam coal over a 5-year period. Reported 5/28/82.
ACEC, Brugeoise & Nivelles, and Electrobel (Belgium)	May receive orders for the Guizhou coal mining project. Could total $340 million (Fr 15 billion). Reported 5/31/82.

Construction Materials and Planning

Shin Ho Cheng Development Ltd. (Hong Kong)	Will double its investment in a new hotel complex in Guangzhou, a cooperative project between Shin Ho and the Yancheng Service Development Corp. $100 million. Reported 4/16/82.
Hitachi Ltd. and Kanematsu-Gosho Ltd. (Japan)	Elevator manufacturing equipment and technology for a plant in Guangzhou. ¥500 million ($2.1 million). Reported 4/19/82.
Asland, Ateinsa, and Focoex (Spain)	Letter of intent for construction of a 1.2-mt-per-year cement plant in Guangzhou on a compensation trade basis. $200 million. Reported 4/21/82.

Consumer Goods

East Asiatic Co. (Denmark)	Cooperation in construction of a beer factory in Guangzhou, probably in conjunction with Carlsberg. Reported 4/19/82.
Seikosha (Japan)	Technology for cold pressing watch cases and other equipment at the Xian Hongqi Watch Factory. $384,000. Reported 5/3/82.

Electronics

Kayex-Hamco (US)	Crystal growing furnaces to supply raw materials for integrated circuits in Wuxi. $1 million. Reported 3/82.
Nippon Electric Glass Co. and Nissho Iwai Corp. (Japan)	1.2 million screen tube bulbs for black and white TV sets ordered by the Shanghai Municipal Light Industrial Corp. in 1982; $7.6 million. 1 million bulbs ordered for 1983; $6.3 million. Reported 3/13/82.
Nippon Electric Co. (Japan)	A television tuner production line for the Dandong TV Parts Factory, Liaoning. Reported 4/82.
Okaya Electric (Japan)	Plant to produce film capacitors. $858,000 (¥200 million); half of the value to be paid in products over a 2-year period. Reported 4/82.
Control Data Corp. (US)	A Cyber 170-730 computer for oil and gas exploration. COCM approval. Reported 4/7/82.
International Imaging Systems (US)	Computerized image processing system. $1.2 million. Reported 4/12/82.
David Jamison Carlyle Corp. (US)	Lear Siegler video display terminals and electronic printers ordered by the Ministry of Electronics Industry. $100,000. Reported 4/12/82.
Koa Denko Co. (Japan)	2 plants for making carbon-film resistors to be supplied to the Shanghai Electronics Components Industries. Approx. $642,000 (Approx. ¥150 million). Reported 4/13/82.
Philips (Hong Kong)	Will supply two-way radios to Kee Kwan Motors, which holds the exclusive China bus tour franchise for Macao. Reported 5/82.
Andro Korea Electronics Co. (S. Korea)	50,000 units of monaural cassettes via Hong Kong. Reported 5/82.
Datamax Pty. Ltd. (Australia)	30 single-board microcomputers and an agreement signed with the Metallurgical Research Institute to market and eventually manufacture the Datamax 8000. $180,000. Reported 5/82.
Thermo Electron Inc. (US)	Instruments and calibration equipment for an air monitoring network for Beijing. $1 million+. Reported 5/13/82.

Food Processing

Danish Turnkey Dairies Ltd. (Denmark)	Complete set of equipment for a milk powder factory in Heilongjiang. $9 million, financed by Danish government loan. (70 million kroner). Reported 4/19/82.
Austral Insulation Pty. (Australia)	Will design and construct a 6,000 sq. m. cold storage complex. $3.3 million (Aus$3 million). Reported 5/82.

Machinery

Ebara Corp. (Japan)	Agreement with China Machine Building International Corp. to provide pump manufacturing and casting skills to a plant in Shenyang. Announced 4/27/82.
Flymo Ltd. (UK)	Six petrol engine GT-4 air cushion lawn mowers. Reported 5/82.
Rockwell International (US)	A Webb offset printing press for the New China News Agency. Announced 5/27/82.

Metals, Mining, and Processing

Comalco Aluminum (Australia)	5,000 tons of aluminum. Reported 4/8/82.
Nippon Light Metal Co. (Japan)	10,000 mt of alumina for a new Guiyang smelter. Reported 5/11/82.
General Electric Co. (US)	A continuous casting system for the Harbin Cable Factory to produce copper wire. Signed December 1981.
Ajax Magnethermic Corp. (US)	Electric furnace to melt copper at the Harbin Cable Factory. $1 million. Reported 5/14/82.
Showa Electric Wire and Cable Co. (Japan)	Equipment for a copper dip forming system for the Harbin Cable Factory. $1.2 million. Reported 6/11/82.

Petroleum

Irish Bridge (Ireland)	Equiment and technology for oil exploration in the Yellow Sea. $18 million. Reported 4/16/82.
Japan National Oil Corp. (Japan)	Will jointly explore for oil and gas in the northern part of the Ordos Basin in Nei Monggol with China's Ministry of Geology and Minerals. Agreement signed 5/19/82.

Power

General Electric Co. (US)	Advanced solid-state relaying and signaling equipment for a 500-kv transmission line in north China. Reported 4/82.
Snowy Mountain Engineering Corp. (Australia)	Review of feasibility study for the proposed Lubuge hydroelectric project in Yunnan. $440,000 (Aus$405,000). Reported 5/5/82.

Shipping

(Pakistan)	4,500-ton bulk carrier. Reported 2/28/82.

Telecommunications

Storage Technology Corp. (US)	Five COMZ voice concentrator/multiplexer telephone systems. $600,000. Reported 4/5/82.
Standard Telephones & Cables Ltd. (UK)	Negotiating the System X digital public telephone exchange for Guangdong. Reported 4/20/82.

Textile Plants and Equipment

Toyobo Co. and Sumitomo Corp. (Japan)	A 30,000-ton-per-year polyester staple spinning plant to be constructed outside Nanjing. $13.3 million (¥3.2 billion). Announced 4/16/82.

Transportation

Daihatsu Motor Co. (Japan)	150 small trucks for Guangdong. Reported 3/18/82.
National Bicycle Corp. (India)	Bicycles. $1.08 million (Rs 10 million). Reported 3/31/82.
Eaton Corp. (US)	An air traffic control system to serve the Guangzhou airport. Reported 4/82.
Hino Motors Ltd. (Japan)	393 sightseeing buses. $17 million (¥4 billion). Reported 4/13/82.
Fuji Heavy Industries, Ltd. (Japan)	Technology and sample parts for 35-seat buses to an Aviation Ministry plant in Beijing. Reported 4/13/82.
Perkins Engines Group Ltd. (UK)	500 diesel engines and transmissions to be installed in "Overlander" jeeps made for export in Beijing. Reported 4/23/82.
NA (US)	3 fire trucks. Reported 5/15/82.

Miscellaneous

Toko Tokuma (Japan)	Joint production with the Beijing Film Studio of the film *An Unfinished Chess Game*. Reported 3/18/82.
(Philippines)	Cooperation with the Bureau of Cinema in producing the film *The King of Sulu and the Emperor of China*. Reported 3/29/82.
(Japan)	Grant to the Beijing Institute of Physical Education and the Chinese Judo Association for equipment for research. $2 million (¥50 million). Reported 3/29/82.
(Sweden)	Bilateral agreement on the mutual protection of investments. Signed 3/29/82.
(Japan)	Is cooperating with China to edit a two-volume book entitled *Contemporary Chinese and Japanese Economies*. Reported 5/3/82.
Mitsubishi Bank (Japan)	Is seeking agreements on business cooperation and promotion with the Beijing Economic Development Corp. and the Shanghai Investment and Trust Corp. Reported 5/11/82.
NBC and Children's Television Workshop (US)	Are cooperating with China's Central Television Station to produce a 90-minute special program featuring Sesame Street characters. Reported 5/13/82.

中外贸易 CHINA'S EXPORTS: SALES AND NEGOTIATIONS THROUGH JUNE 15

Company/Country	Product/Value/Date

Agricultural Products

(Hong Kong) and (Southeast Asia)	1,400 live yaks. Reported 3/22/82.
(Sri Lanka)	120,000 tons of rice. Reported 3/24/82.
Atlantic Warehousing and Distribution (US)	1,143 bags of coffee beans. Reported 4/82.
(Japan)	600 tons of rapeseed. Reported 4/1/82.

Chemicals

Pestcon Systems Inc. (US)	Will market China's aluminum phosphide agricultural fumigant in the US under an exclusive agreement. Reported 4/20/82.

Construction

(Hong Kong)	Pipe-laying contract won by the Guangdong Water Conservancy and Hydropower Engineering Development Co. $37.5 million (HK$220 million). Reported 4/82.
(Somalia)	The Chinese Complete Plant Export Corp. will undertake a drilling project in northwest Somalia. Reported 4/7/82.

Foreign Aid

(Solomon Islands)	Donation by China Red Cross Society to rebuild homes. $10,000. Reported 4/10/82.
(Pakistan)	Medicine and medical instruments and Afghan refugees in Pakistan. Presented 4/19/82.

Machinery

H. Ernut-Soniva (France)	80 lathes, model Cholet 550, sold by the Gansu Provincial Machinery and Equipment Import and Export Corp. Reported 4/26/82.
Boston Metals Co. and CDI Imports (US)	Diesel engines. $1,695 each. Reported 5/82.
Asoma Funding Corp. (US)	50 tons of high-pressure container tubes. Reported 5/24/82.
(Philippines)	2,300 tons of seamless tubes from the Chengdu Seamless Steel Tubing Mill. Reported 5/24/82.
General Electric Co. (UK)	Diesel engine parts. $2 million. Reported 6/4/82.

Metals and Minerals

Du Pont (US)	Samples of minerals and ores, including fluorspar. $10 million. Reported 3/17/82.
Shell Developments (Hong Kong)	Less than 50,000 tons of steam coal from the Datong mine in Shanxi sold by China National Metals and Minerals Import and Export Corp. $55–$60 per ton. Reported 4/28/82.

Petroleum

Petrobras (Brazil)	1 million tons of petroleum. Less than $30 per barrel. Announced by Brazilian media 3/31/82.

Shipping

AS Edesvik (Norway)	Export credit extended by the Bank of China for four supply ships from the China Corp. of Shipbuilding Industry. Total contract is $30 million, BOC financing is $6 million. Reported 5/13/82.
Uljanik Shipyard (Yugoslavia)	The Shanghai Shipbuilding Technology Research Institute will transfer its integrated, computerized system for marine pipe design, fabrication, installation, and management. China will still reserve copyright for the software and technical documents. Reported 6/7/82.

Textiles

(Hong Kong)	The Xian No. 1 Silk Mill will process 240,000 yards of silk/cotton blended plain fabrics. $744,000. Reported 5/3/82.

Tourism

Travman Travel Service (Australia)	Has chartered a Chinese cruiser from the Yangtzi branch of the China International Travel Service. $4,868/day (¥8,800/day). Reported 5/24/82.

Trade Agreements

(Mongolia)	Protocol for mutual exchange of goods. Signed 2/26/82.
(Bulgaria)	Barter and payments agreement. Reported 2/27/82.
(Egypt)	Trade protocol under which Egypt will supply linen, furniture, and dyestuffs in addition to traditional exports in exchange for Chinese textiles, machinery, and chemicals. Reported 3/31/82.
(Pakistan)	Trade protocol signed. $36 million. 4/15/82.
(Philippines)	Trade protocol signed. Reported 4/19/82.
(USSR)	Goods exchange and payments agreement; trade volume will increase by 45 percent, and border trade will resume. $320 million (SwFr600 million). Reported 4/28/82.
(Argentina)	Signed an agreement to supply cotton between 1982 and 1984 and signed contracts for the export of tannin extract and linseed oil and for the import of peanut oil, ginseng liquor, and pencils. Reported 5/10/82.

Transportation

(Pakistan)	130 3-wheeled motorcycles. Reported 5/8/82.

Miscellaneous

Takawa Prince Hotel and the Jingue Corp. (Japan)	Nine chefs from Beijing's Quanjude Roast Duck Restaurant will work at the Japanese hotel. Contract signed with the Beijing Friendship Commercial Service Co. $214,000 (¥50 million). Reported 5/3/82.

JOINT VENTURES: PRESS REPORTS THROUGH JUNE 15

Foreign Party/ Chinese Party	Technology/Terms/Value/Status
Lloyds Bank International (UK)/China Corp. of Shipbuilding Industry and China International Trust and Investment Corp.	Are discussing formation of a joint finance company in Hong Kong to provide export credits to shipowners who intend to purchase Chinese-built ships. Reported 4/14/82.
Gillette Co. (US)/Shenyang Daily Use Metals Industrial Corp.	Have formed a joint company called Shenmei Daily Use Products Ltd. Co. located in Shenyang to make razor blades, plastic razors, and uncoated blades for industrial use. Reported 4/16/82.
Wheeling-Pittsburgh Steel Corp. (US)/Minmetals (a unit of China National Metal and Mineral Import and Export Corp.)	Have formed a 50/50 joint venture called Wheeling-Minmetals International Inc. located in Pittsburgh to trade in metal and mineral products. Reported 4/30/82.
E-S Pacific Development and Construction Co. (US)/Shaanxi Provincial Bureau of Travel and Tourism	Cooperation in building and operating the Xijing Hotel in Xian. Reported 5/3/82.

OTHER ARRANGEMENTS: PRESS REPORTS THROUGH JUNE 15

Foreign Party/ Chinese Party	Technology/Terms/Value/Status
Voest-Alpine (Austria)/NA	Compensation trade negotiation: supply of a coal liquefaction plant to Yunnan in exchange for Chinese methanol. $395 million. Reported 10/81.
(Yugoslavia)/Jialing Machinery Plant, Sichuan	Barter: Yugoslavia will exchange motorcycle engines for Chinese motorcycle parts. Reported 2/11/82.
Societé de Construction de Machines-Outils (France)/NA	Licensing: manufacture of lathes and boring machines to be sold under the SOCOMO trademark. Reported 2/25/82.
Hughes Tool Co. (US)/Jianghan Rock Bits Factory, Hubei	Licensing: switched from Chengdu to existing Hubei plant. Reported 3/20/82.

Chasko Inc. (US)/China National Import and Export Service Corp. for Light Industry and Beijing Audio Industrial Co.	Licensing: exclusive manufacturing rights for a 2-speed cassette tape recorder for sale within China only. 4 percent royalty. Reported 3/22/82.
Wang Laboratories (US)/ NA	Licensing: is negotiating the manufacture of computers. Reported 4/82.
Showa Leasing Co. Ltd. (Japan)/Dalian International Trust and Consultant Corp.	Agreement to promote their cooperation in leasing business and in particular, to lease equipment to produce ceramic condensers. Reported 4/19/82.
Otsuka Pharmaceutical Co. (Japan)/State Pharmaceutical Administrative Bureau	Will cooperate to develop drugs from Chinese herbs. Reported 4/20/82.
Matsushita Electric Industrial Co. Ltd. (Japan)/ China National Import and Export Service Corp. and Yingkou Washing Machine Factory, Liaoning	Cooperative production of double-drum washing machines. Reported 4/26/82.
Bruel and Kjaer Co. (Denmark)/China National Instruments Import and Export Corp., Shanghai Branch	Have set up the B&K Service Station to maintain and repair Bruel and Kjaer Co. instruments. Reported 4/26/82.
Battenfeld Maschinen Fabriken (W. Germany)/ Zhejiang Plastics Machinery Factory and Wuxi Machine Building Factory	Licensing: Technical data and training for the production of plastics injection molding machines. Reported 5/82.
Hitachi Construction Machinery Co. Ltd. (Japan)/ China Railway Engineering Corp.	Have opened the China Railway Engineering-Hitachi Construction Machinery Service Center to service Hitachi products in China. Reported 5/3/82.
Wanneroo High School (Australia)/Boarding, Hebei	Licensing: technology for the BMX off-road racing bicycle. $1.09 each. (Aus$1/each). Reported 5/3/82.
Tai On Co. (Hong Kong)/No. 2 Garment Factory, Xian	Coproduction of 18,600 pairs of double knit trousers every month. Reported 5/3/82.
Singer Co. (US)/Shaanxi Province	Compensation trade: technology for industrial sewing machines in exchange for finished product. Reported 5/3/82.
CANAC Consultants Ltd. (Canada)/China Civil Engineering Construction Corp.	Will cooperate in joint railway construction projects worldwide. Reported 5/17/82.
Eastman Kodak Co. (US)/ Shanghai Movie and Photo Industrial Corp.	Will supply slide projector parts for assembly and sale in China. Reported 5/21/82.

CHINA DATA

中國數據

KEY INDICATORS

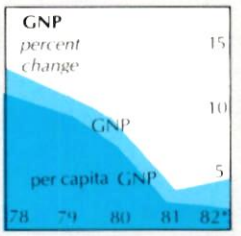
	1977	1978	1979	1980	1981	Percent change	1982 target	Percent change
GNP (billion yuan, current prices)	¥307.4	¥349.8	¥391.4	¥424.1	¥443.2	4.5	¥460.9	4.0
	$165.5	$207.8	$251.7	$283.0	$259.9	-8.2	$251.9	-3.1
Population (year end, million)	945.2	958.09	970.92	982.55	994.0	1.2	—	—
GNP per capita	¥325	¥365	¥403	¥432	¥445.9	3.2	—	—
	$175	$217	$259	$288	$261.5	-9.2	—	—
National income (billion yuan, 1980 prices)	¥266.6	¥303.5	¥337.8	¥366.0	¥388.0	6.0	—	—
	$142.3	$178.8	$215.4	$244.3	$227.6	-6.8	—	—
Total gross industrial and agricultural output value (billion yuan, 1980 prices)	¥553.1	¥616.1	¥668.6	¥716.7	¥749.0	4.5	¥779.0	4.0
	$299.0	$365.9	$430.0	$478.4	$439.3	-8.2	$425.7	-3.1
Gross value of industrial output (billion yuan, 1980 prices)	¥372.9	¥419.9	¥455.6	¥497.4	¥517.8	4.1	¥538.5	4:0
	$201.6	$249.3	$293.0	$332.0	$303.7	-8.5	$294.3	—
Of which:								
Heavy industry	—	¥240.1	¥258.5	¥263.9	¥251.5	-4.7	—	—
	—	$142.6	$166.2	$176.2	$147.5	-16.3	—	—
Light industry	—	¥179.8	¥197.1	¥233.4	¥266.3	14.1	—	—
	—	$106.8	$126.8	$155.8	¥156.2	0.3	—	—
Gross value of agricultural output (billion yuan, 1980 prices)	¥180.2	¥196.2	¥213.0	¥218.7	¥231.2	5.7	¥240.4	4.0
	$97.4	$116.5	$137.0	$146.0	$135.6	-7.1	$131.4	-3.1
Average monthly industrial wage	¥47.1	¥49.9	¥54.1	¥61.7	¥62.5	1.3	—	—
	$25.4	$29.6	$34.8	$41.2	$36.6	-11.2	—	—
Of which:								
Workers in state-owned enterprises	¥49.3	¥52.5	¥57.4	¥65.3	¥65.7	0.6	—	—
	$26.6	$31.2	$36.9	$43.6	$38.5	-11.7	—	—
Workers in collective enterprises	¥38.7	¥40.7	¥42.9	¥49.8	¥51.9	4.2	—	—
	$20.9	$24.2	$27.6	$33.2	$30.5	-8.1	—	—

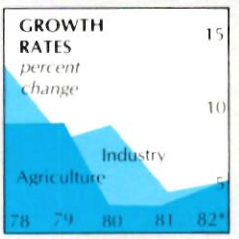
DOMESTIC FINANCE

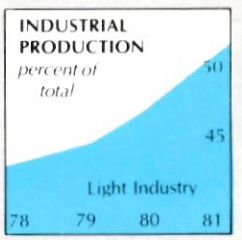
(Billion current yuan unless otherwise indicated)

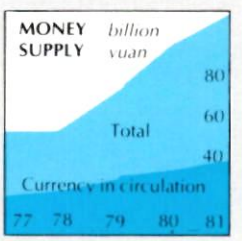
	1977	1978	1979	1980	1981	Percent change	1982 target	Percent change
State budget revenues	¥87.45	¥112.11	¥110.33	¥108.52	¥105.86	-2.5	¥110.45	4.3
	$47.07	$66.59	$70.95	$72.42	$64.16	-11.4	$60.36	-5.9
State budget expenditures	¥84.35	¥111.09	¥127.39	¥121.27	¥108.58	-10.5	¥113.45	4.5
	$45.40	$65.98	$81.92	$80.93	$65.81	-18.7	$61.99	-5.8
Of which:								
Investment	¥29.48	¥39.50	¥36.00	¥53.90	¥25.06	-53.5	¥29.73	10.6
	$15.87	$23.46	$23.15	$35.97	$15.19	-57.8	$16.25	—
Defense	¥14.91	¥16.78	¥20.23	—	¥16.87	—	—	—
	$8.03	$9.97	$13.01	—	$10.22	—	—	—
Administrative expenses	¥4.33	¥4.91	—	—	¥7.24	—	—	—
	$2.33	$2.92	—	—	$4.39	—	—	—
State budget deficit (-) or surplus (+)	¥3.10	¥1.02	-¥17.06	-¥12.75	-¥2.72	—	-¥3.0	—
	$1.67	$0.61	-$10.97	-$8.51	-$1.65	—	-$1.6	—
Money supply (end of period, bilion yuan)	¥58.01	¥58.04	¥73.66	¥91.93	¥109.8	19.4	—	—
	$31.23	$34.47	$43.75	$54.60	$64.4	17.9	—	—
Of which:								
Currency in circulation	¥19.54	¥21.20	¥26.77	¥34.62	¥39.63	14.5	—	—
	$10.52	$12.59	$15.90	$20.56	$23.2	12.8	—	—
Official price index (1975 = 100.00)								
Of which:								
Consumer goods	103.0	103.7	105.7	113.6	—	—	—	—
Agricultural goods*	100.2	104.2	127.2	136.3	144.3	5.9	—	—

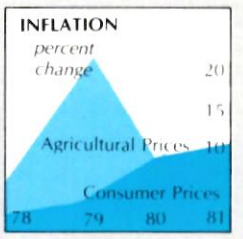
*Based on state purchase prices of agricultural and byproducts, which excludes free market prices.









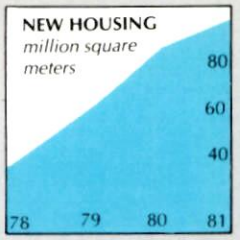


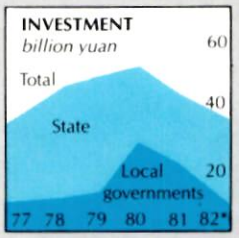
CAPITAL CONSTRUCTION

(Billion yuan unless otherwise indicated)

	1978	1979	1980	Percent change	1981	Percent change	1982 target	Percent change
Total investment	¥47.90 $28.45	¥50.00 $32.15	¥53.9 $36.0	7.8 12.0	¥42.8 $25.1	-20.6 -30.3	¥38.0 $20.8	-8.9 -17.1
Of which:								
National budget	¥39.50 $23.46	¥39.50 $25.40	¥28.1 $18.8	-28.9 -26.0	¥20.8 $12.2	-26.0 -35.1	¥29.73 $16.25	42.9 33.2
Budgets of provinces, prefectures, and counties	¥8.40 $4.99	¥10.50 $6.75	¥25.8 $17.2	145.7 $154.8	¥20.0 $12.9	-14.7 -25.0	¥8.3 $4.5	-62.3 -65.1
Residential building* (million square meters)	90.2	120.0	145.0	20.8	—	—	—	—
Of which: Housing for industrial workers and staff	37.69	62.56	91.9	46.9	97.0	5.5	—	—

*Including public facilities such as parks, hospitals, and housing.

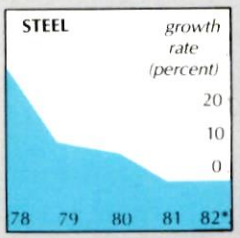


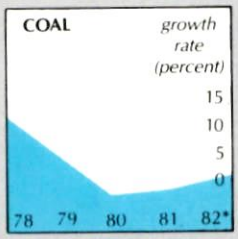


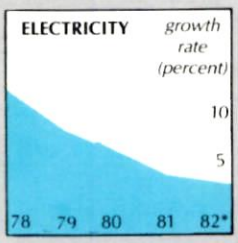
INDUSTRIAL OUTPUT

(Million metric tons unless otherwise indicated)

	1978	1979	1980	Percent change	1981	Percent change	1982 target	Percent change
Steel	31.78	34.48	34.2	7.7	35.6	-4.1	34.0	-4.4
Rolled steel	22.08	24.97	27.16	8.8	26.7	-1.7	—	—
Pig iron	34.79	36.73	38.02	3.5	31.17	-10.1	—	—
Coal	618.0	635.0	620.0	-2.4	620.0	0.0	625.0	1.3
Crude oil	104.05	106.15	105.95	-0.2	101.22	-4.5	100.0	-1.2
Natural gas (billion cubic meters)	13.73	14.51	14.27	-1.7	12.74	-10.7	—	—
Electricity (billion kilowatt-hours)	256.55	281.95	300.6	6.6	309.3	2.9	313.0	2.6
Cement	65.24	73.9	79.86	8.8	84.0	5.2	—	—
Sulfuric acid	6.61	7.0	7.64	9.1	7.81	2.2	—	—
Chemical pharmaceuticals (thousand metric tons)	40.7	41.7	40.1	-3.8	37.3	-7.0	—	—
Chemical fibers (thousand metric tons)	285.0	326.0	450.0	38.0	524.0	16.3	—	—
Cotton yarn	2.38	2.63	2.93	11.4	3.17	8.2	—	—
Machine-made paper and paperboard	4.39	4.93	5.35	8.5	5.4	0.9	—	—
Chemical fertilizers (based on 100 percent effectiveness)	8.693	10.654	12.32	15.7	12.39	0.6	—	—
Of which: Nitrogenous	7.637	8.821	9.99	13.3	9.86	-1.3	—	—
Phosphate	1.033	1.817	2.31	26.9	2.51	8.7	—	—
Potash (thousand metric tons)	21.0	16.0	20.0	25.0	20.0	0.0	—	—
Chemical insecticides (thousand metric tons)	533.0	537.0	537.0	0.0	484.0	-9.9	—	—



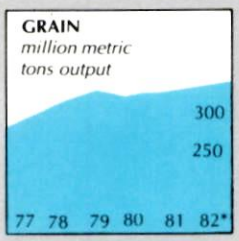


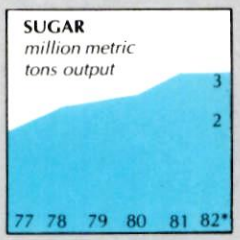


AGRICULTURAL OUTPUT

(Million metric tons unless otherwise indicated)

	1977	1978	1979	1980	Percent change	1981	Percent change	1982 target	Percent change
Grain	282.75	304.75	332.115	320.52	-4.2	325.02	1.4	335.5	2.6
Cotton	2.049	2.167	2.207	2.707	22.7	2.968	-9.6	—	—
Silkworm cocoons (thousand metric tons)	216.0	228.0	271.0	326.0	20.3	311.0	-4.6	—	—
Processed sugar	1.816	2.27	2.5	2.57	2.8	3.166	23.2	3.2	6.7
Oil-bearing crops	4.015	5.218	6.435	7.691	19.5	10.205	32.7	—	—
Tea (thousand metric tons)	252.0	268.0	277.0	304.0	9.7	343.0	12.8	—	—
Hogs slaughtered (million head)	—	—	187.72	198.607	5.8	194.95	-1.8	—	—
Timber (million cubic meters)	49.7	51.62	54.39	53.59	-1.5	49.42	-7.8	—	—

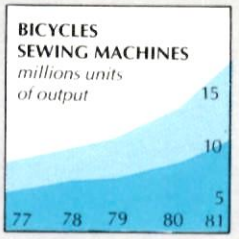


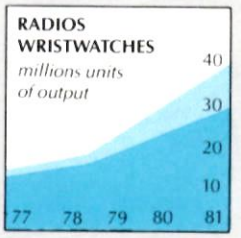


CONSUMER GOODS OUTPUT

(Million units unless otherwise indicated)

	1978	Percent change	1979	Percent change	1980	Percent change	1981	Percent change
Bicycles	8.54	14.9	10.09	18.1	13.02	29.0	17.54	34.7
Sewing machines	4.86	14.6	5.87	20.8	7.68	30.8	10.39	35.3
Wristwatches	13.51	22.4	17.07	26.4	22.16	29.8	28.72	29.6
TV sets (thousand units)	517.0	—	1,329.0	157.1	2.492	87.5	5.394	120.0
Radio sets	11.68	—	13.81	18.2	30.04	117.5	40.57	35.1
Cameras (thousand units)	178.95	—	238.0	33.0	373.0	56.7	623.0	67.0
Light bulbs	760.3	—	850.0	11.8	950.0	11.8	970.0	2.1
Cotton cloth (billion square meters)	10.286	8.6	11.43	11.1	12.80	12.0	13.4	5.0
Woolen piece goods (million meters)	88.84	—	90.17	1.5	101.0	12.2	113.0	11.9
Silk textiles (million meters)	610.35	—	663.45	8.7	759.0	14.5	835.0	10.0



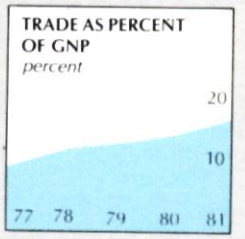


CHINA'S FOREIGN TRADE

(Billion current yuan unless otherwise indicated)

	1977	1978	1979	Percent change	1980	Percent change	1981	Percent change
Exports (fob)	¥13.97	¥16.79	¥21.20	26.3	¥27.2	28.3	¥36.8	35.5
	$7.52	$9.97	$13.63	36.7	$18.2	33.5	$21.6	18.5
Imports (cif)	¥13.28	¥18.75	¥24.30	29.6	¥29.1	19.8	¥36.8	23.1
	$7.15	$11.74	$15.63	40.3	$19.4	24.1	$21.6	11.2
Total trade (fob/cif)	¥27.25	¥35.54	¥45.50	28.0	¥56.3	23.7	¥73.5	29.0
	$14.67	$21.11	$29.26	38.6	$37.6	28.5	$43.1	14.7
Total reserves (period end, million US dollars)	$2,889	$2,141	$2,744	28.2	$3,116	13.6	$5,564	78.6
Of which:								
Foreign exchange	$2,345	$1,557	$2,154	38.3	$2,262	18.2	$4,773	111.0
Gold*	$544	$584	$590	1.0	$571	-3.22	$516	-9.6
Gold reserves (trillion fine troy ounces)	12.8	12.8	12.8	0.0	12.8	0.00	12.7	-0.8

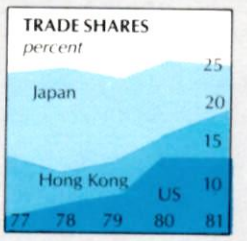
*Valued at SDR 35 per fine troy ounce and converted into US dollars at end-of-period dollar/SDR exchange rate.



FOREIGN TRADE WITH SELECTED COUNTRIES

(Million US dollars)

	1977	1978	1979	1980	Percent change	1981	Percent change
Japan							
Exports (fas)	1,955	3,074	3,674	5,109	39.1	5,075	-0.7
Imports (cif)	1,560	2,045	2,933	4,346	48.2	5,283	21.6
Total	3,515	5,119	6,607	9,455	43.1	10,358	9.6
Share of China's total two-way trade	24.0	24.2	22.6	25.1	—	24.0	—
Hong Kong							
Exports (fob)	44	63	82	1,249	227.0	1,964	57.2
Imports (cif)	1,735	2,249	3,021	4,401	45.7	5,271	19.8
Total	1,779	2,312	3,403	5,650	66.0	7,235	28.1
Share of China's total two-way trade	12.1	10.9	11.6	15.1	—	16.8	—
W. Germany							
Exports (fob)	501	995	1,493	1,145	-23.3	1,017	-11.2
Imports (cif)	288	367	534	808	51.3	770	-4.7
Total	789	1,362	2,027	1,953	-3.7	1,787	-8.5
Share of China's total two-way trade	5.4	6.4	6.9	5.2	—	4.1	—
Canada							
Exports (fob)	347	442	507	742	46.4	777	4.7
Imports (cif)	77	83	143	132	-7.7	325	146.2
Total	424	525	650	874	34.5	1,102	26.1
Share of China's total two-way trade	2.9	2.5	2.2	2.3	—	2.6	—



US–CHINA TRADE
(Million US dollars)

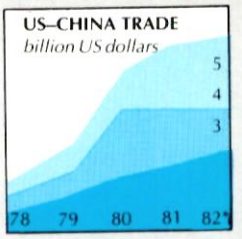
US exports (fas, schedule E)	1978	1979	1980	1981	1982 Q1	1982 Projection*
Food and live animals	362.3	488.3	1,264.7	1,332.5	314.8	1,259.3
Beverages and tobacco	0.0	0.1	0.3	1.1	0.1	0.4
Crude materials, inedible except fuels	223.9	531.8	1,183.3	1,102.9	274.4	1,097.7
Mineral fuels, lubricants, and related products	1.8	0.7	1.8	3.1	Negl.	Negl.
Animal and vegetable oils and fats	37.8	42.0	73.4	21.8	1.7	7.0
Chemicals	60.5	125.2	385.6	405.3	165.8	663.1
Manufactured goods by chief materials	25.3	243.9	423.6	446.9	79.7	318.7
Machinery and transport equipment	93.0	228.7	358.4	211.8	48.9	195.5
Misc. manufactured articles not classified elsewhere	13.7	55.2	55.8	70.7	18.5	73.9
Items and transactions not classified	Negl.	0.6	2.1	2.5	0.6	2.6
Statistical error	5.3	7.5	5.4	—	—	—
Total	823.6	1,724.0	3,754.4	3,598.6	904.5	3,618.2
US IMPORTS (Customs value, schedule A)						
Food and live animals	26.0	51.4	57.3	96.3	31.8	127.2
Beverages and tobacco	0.6	0.8	1.4	2.3	1.8	7.3
Crude materials, inedible, except fuels	58.0	66.0	126.5	332.9	42.0	168.1
Of which: Minerals and metals	35.5	60.4	158.9	208.5	—	—
Mineral fuels, lubricants, and related products	Negl.	96.4	134.7	293.5	114.3	457.1
Animal and vegetable oils and fats	3.3	3.4	2.0	0.3	0.1	0.5
Chemicals	34.2	59.8	110.4	125.5	35.0	140.0
Manufactured goods by chief materials	95.1	93.4	235.3	377.0	123.6	494.2
Of which: Textile manufactures	63.4	150.8	247.0	418.6	—	—
Machinery and transport equipment	0.5	1.1	5.7	39.6	14.4	57.8
Misc. manufactured articles not classified elsewhere	105.4	215.5	381.8	621.9	192.4	769.7
Items and transactions not classified	0.9	4.4	3.3	6.1	1.2	4.6
Statistical error	0.1	0.1	-4.8	-0.1	—	—
Total	324.1	592.3	1,053.6	1,895.3	556.6	2,226.5
Total two-way trade	1,147.7	2,316.3	4,808.0	5,493.9	1,461.1	5,844.7
US trade surplus	499.5	1,131.7	2,700.8	1,703.3	347.9	1,391.7

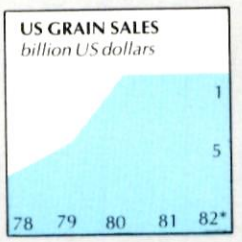
*1982 first quarter trade results times four.

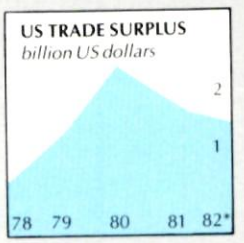
EXCHANGE RATES
(Period Averages)

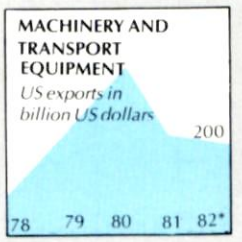
	1979	1980	1981	1982 J	F	M	A	M	J
Yuan per US dollar	1.555	1.498	1.705	1.77	1.82	1.84	1.85	1.80	1.89
US cents per yuan	64.3	66.7	58.7	56.6	55.0	54.5	53.9	55.4	52.9
Japanese yen per yuan	140.9	151.3	129.3	127.1	129.4	135.0	131.6	131.2	134.7
Hong Kong dollar per yuan	3.201	3.329	3.315	3.281	3.246	3.161	3.14	3.17	3.14
Pound sterling per yuan	0.303	0.287	0.289	0.300	0.298	0.300	0.305	0.310	0.304
W. German marks per yuan	1.179	1.213	1.326	1.297	1.302	1.308	1.29	1.28	1.30

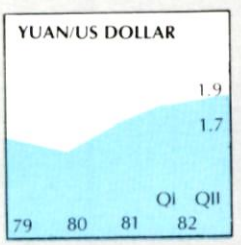
SOURCES: State Statistical Bureau, Ministry of Finance, Bank of China, General Customs Administration, *International Financial Statistics* (IMF), *Direction of Trade Statistics* (IMF), and *US Commerce Department*.

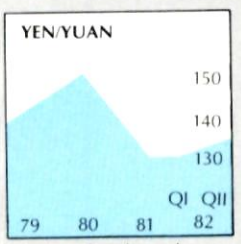












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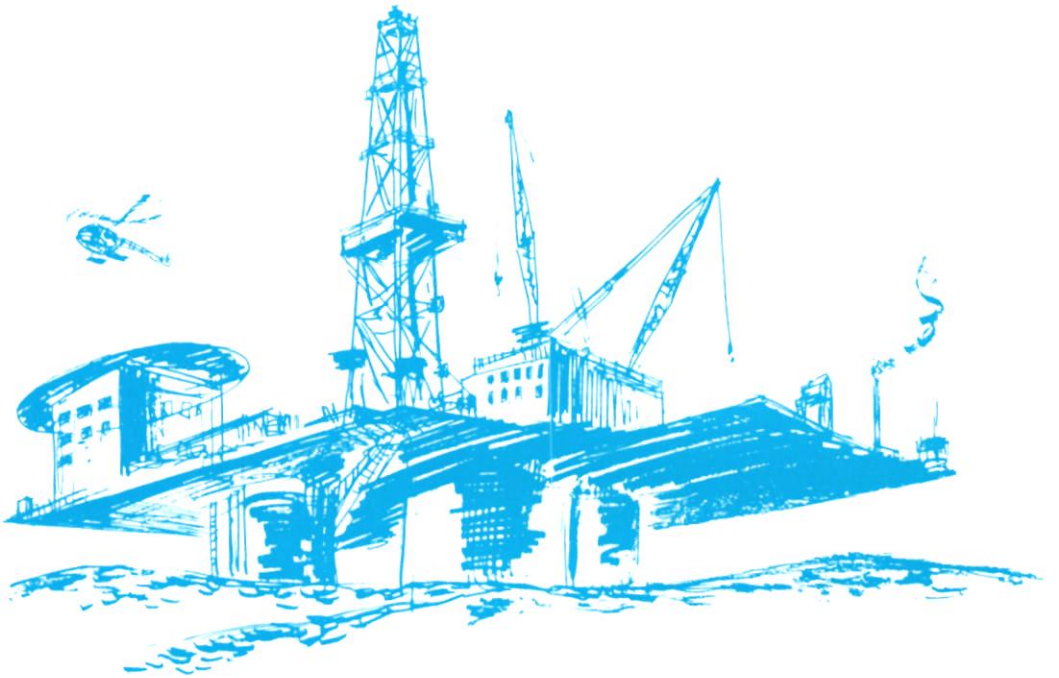

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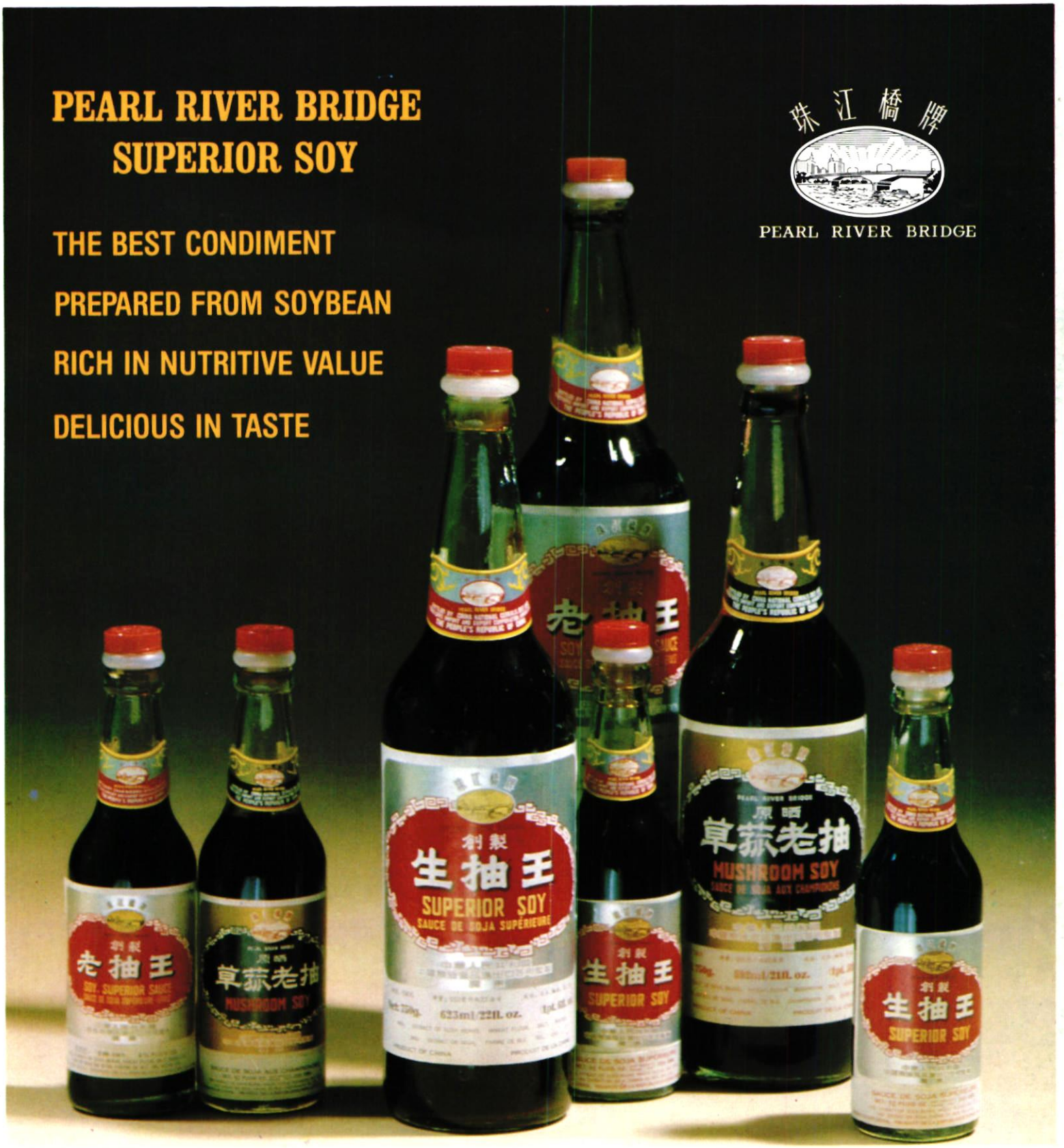

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