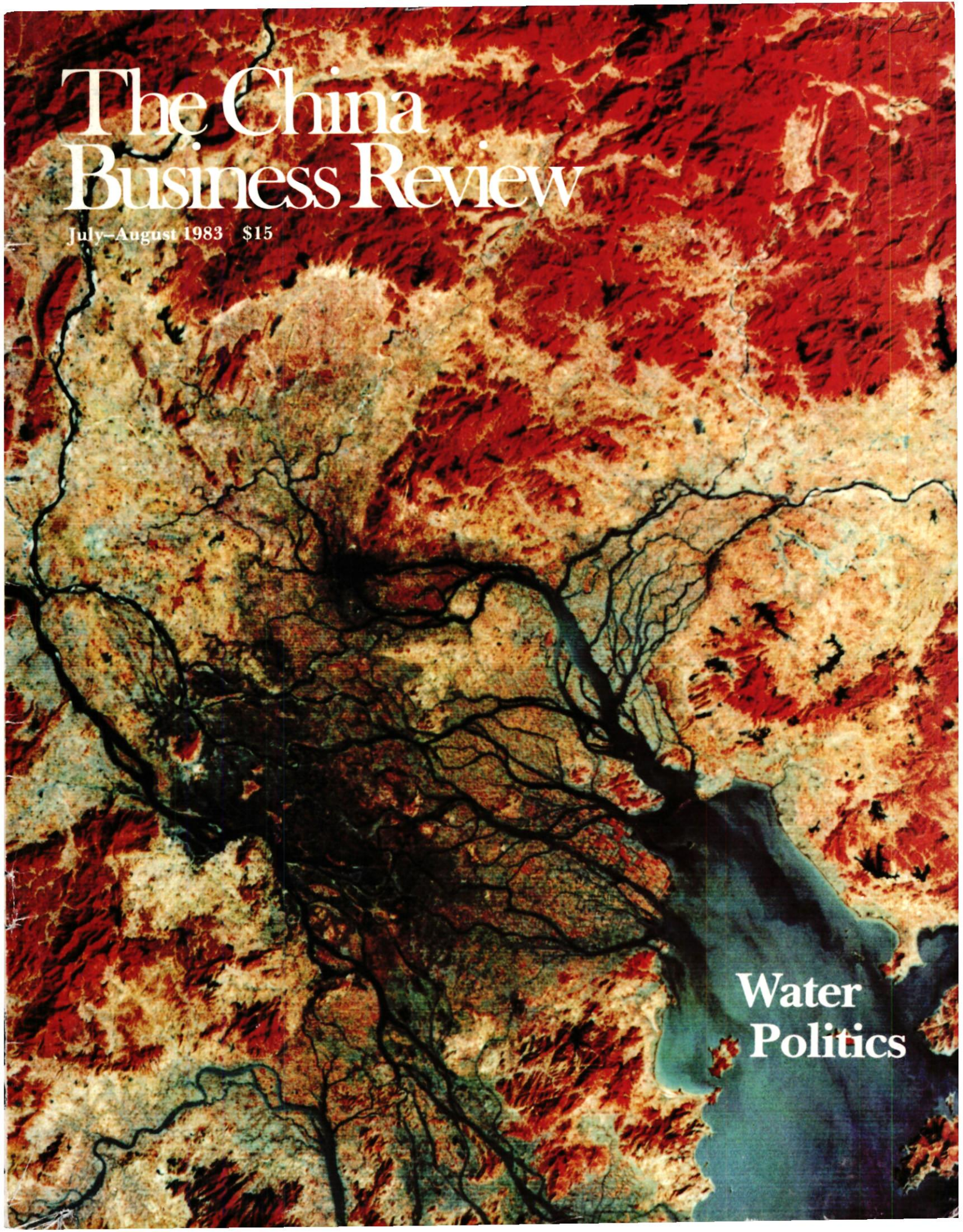
The China Business Review

July–August 1983 $15



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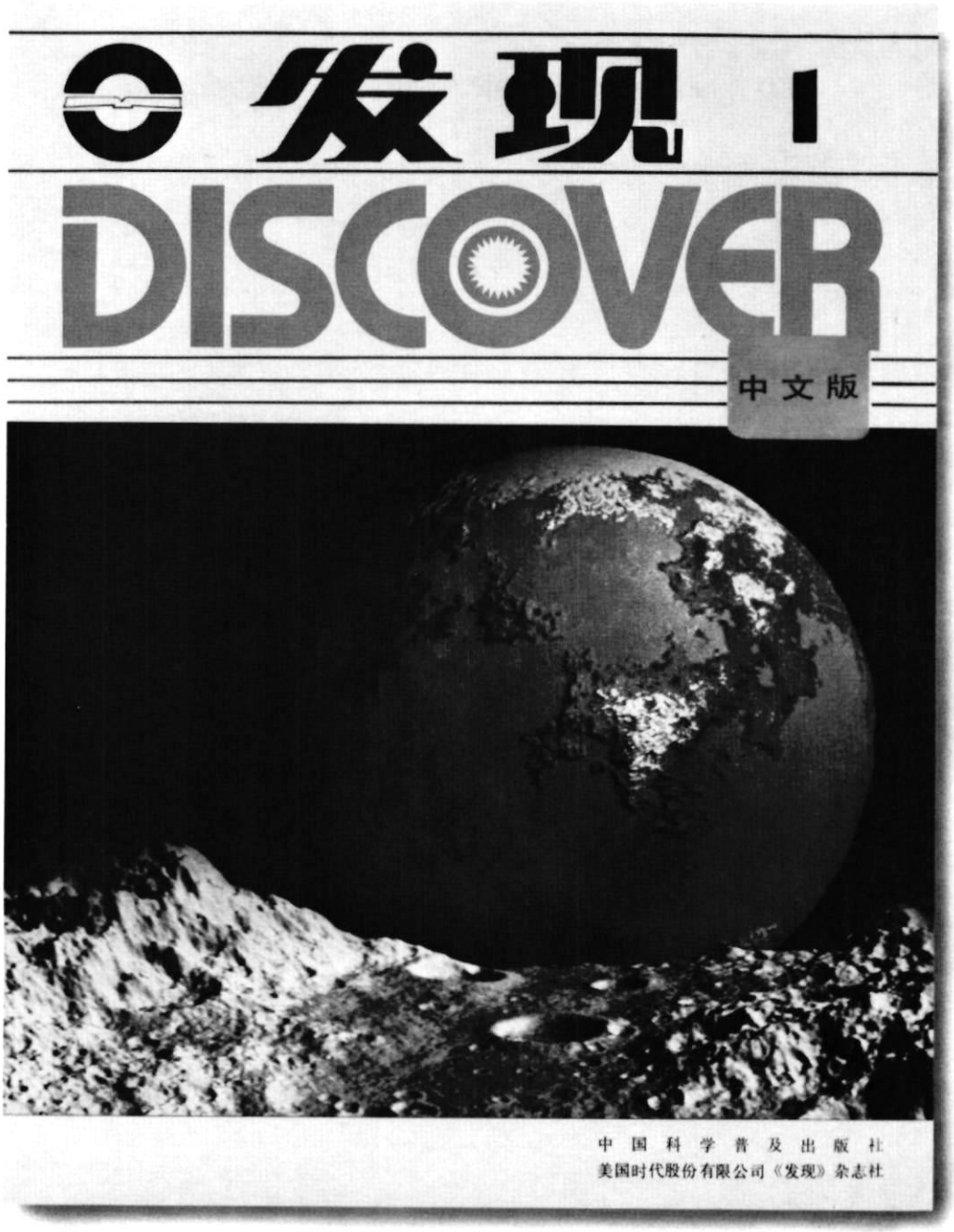

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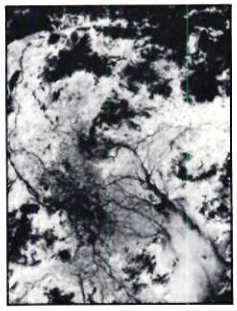
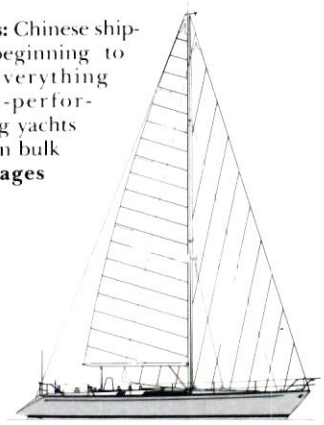
The China Business Review

The magazine of the National Council for US–China Trade

July–August 1983 Volume 10, Number 4



Cover: China's millenia-old struggle against droughts and floods is far from over. In fact, major water conservancy projects are urgently needed to keep such disasters from re-occurring. **Page 10.** *Photo of Pearl River Delta by Landsat I courtesy of NASA.*



Ship exports: Chinese shipyards are beginning to turn out everything from high-performance sailing yachts to 60,000-ton bulk carriers. **Pages 32 and 35.**

Tourism: New tours, PR ploys, and a string of high-rise hotels signal a radical change in China's tourism philosophy. **Page 40.**

摘要

BUSINESS PICKS UP

Although the era of "readjustment" has not been officially closed, the steam has gone out of the austerity policies that slowed business in 1981 and 1982.

A sign of the times is the number of long-delayed deals that have been signed recently, including the $51 million American Motors joint venture to produce jeeps in Beijing; McDonnell Douglas' approximately $50 million sale of its first two jets to China, on top of Boeing's sale of 10 planes in December; Honeywell's more than $15 million computer sale under the World Bank education loan; Scientific Design's $10 million deal for the design of an ethylene glycol plant (in cooperation with Toyo Engineering of Japan); and Fluor's and Bechtel's agreements to conduct feasibility studies and design work for two major coal mines.

The upturn has been dramatic in the area of modernization of existing enterprises in basic heavy industries. US firms have signed contracts or are in the process of negotiating investment or licensing agreements for petroleum drilling parts and electrical controls, mining shovels, special-purpose power generators, passenger aircraft, and coal gasification techniques for fertilizer plants, to name a few. And, as individual plants gain access to modest sums of foreign exchange, US firms are increasing their sales of individual pieces of equipment, such as testing machinery, quality control instrumentation, and industrial computers. Even US machine tool manufacturers are making their most significant sales in five years. —MW

LONG-TERM PROSPECTS ALSO IMPROVE

China's current economic expansion looks promising precisely because it is being held in check. In the past, efforts to "fine tune" the economy generally failed. All too often, there were convulsive surges and equally dramatic leaps backward. In 1981 and 1982, for example, central leaders found that to cut back certain sectors like steel and chemicals, it was politically necessary to cut back almost everything, the good with the bad, high-priority and marginal projects alike.

Today the Chinese are concentrating on priority areas, and emphasizing technical renovation rather than new plant construction.

Other promising signs that growth in the economy and in trade will be sustained this time, include the following:

▶ The 12th Communist Party Congress in September 1982 seems to have ushered in a period of greater political stability that may have triggered the new economic activity. More than was appreciated at the time, the congress achieved a consensus favoring faster growth, more internal economic reforms, and a more liberal attitude toward foreign business in general.

▶ Soon after the party congress, the Sixth Five-Year Plan was issued together with increased (central government) investment figures for the last three years of the plan, 1983–1985. A key reason for the suspension of projects in 1981–82 was the absence of an operative long-range plan, as only such a plan authorizes the initiation of large-scale projects. A seventh five-year plan is currently in the initial drafting stage which, by all available indications, will call for more rapid expansion than the sixth. The threat of cut-backs seems directed only at runaway spending on smaller projects at the local level.

▶ More money is available. China's total reserves have risen $6 billion in the last 2 years to $16 billion. Imports are rising (by an anticipated 20 percent or more in 1983 and 1984), but no buying spree like that of 1978 seems in the offing. The Chinese are buying key pieces of equipment rather than complete plants, and emphasizing the transfer of manufacturing technology. While this does not always make the foreigners' negotiating job easy, it significantly reduces the likelihood of another backlash.

▶ The key energy and transport sectors have the most foreign exchange. One source told *The CBR* that the Coal Ministry has $500 million for 1983–85, and the Rail Ministry is making purchase inquiries for up to 200 high-horsepower diesel locomotives.

▶ Recognition is growing that, as a recent *People's Daily* editorial noted, "Capital in the international markets always goes after profits. It will not come if it has no prospects of gain, or will gain a lower profit than the international average." Foreign investors are being offered stronger financial incentives: a reduction in interest and royalty taxes from 20 to 10 percent, an extension of the joint venture tax holiday from 2 to 3 profit-making years, and the elimination of equipment import duties for joint equity ventures. Moreover, the government has relaxed its rigid rule that each individual enterprise must balance its own foreign exchange account, probably the strongest disincentive to foreign investment. Although waivers must still be granted on a case-by-case basis, the evidence so far is that cooperative ventures will find it easier to sell to China's domestic market.

▶ The greater availability of cash has diminished the importance of compensation trade. The unyielding insistence on payment in goods doomed last June's UNIDO-sponsored investment conference in Guangzhou, which failed to result in even one solid contract. This may have prompted the Chinese to relent somewhat on countertrade demands. Of course China still wants foreigners to accept payment in goods where conditions permit. McDonnell Douglas, for example, was reportedly persuaded to make a good-faith commitment to take airplane parts worth

about 10–20 percent of the price of its two jets.

▶ Greater foreign trade authority has been granted the important trade centers of Shanghai and Tianjin. Chinese sources report that there is no longer a limit on the size of deals Shanghai can negotiate on its own without central government approval ($5 million was the previous limit), provided that Shanghai does not take action that disrupts the state plan. Also, Shanghai reportedly is permitted to retain a larger share of the foreign exchange earned from its exports. —MW and JBS

US-CHINA TRADE IS DOWN

Despite the general upturn in the China trade, total US–China trade is expected to fall to $4.6 billion in 1983, a 12 percent drop from 1982.

Our nonagricultural exports to China have increased during the first four months of 1983 by a healthy 15 percent, and may achieve $1,270 million by year-end. But this favorable trend cannot offset the larger decline in US exports of wheat, cotton, and soybeans. Overall, agricultural exports are expected to fall by more than 50 percent, or from $1,800 million in 1982 to $800 million this year.

The trend concerns US Agricultural Department officials who negotiated the October 1980 US–PRC grain agreement, under which China agreed "to purchase for shipment for each 12-month period" a minimum of 6 million tons of grain. So far China has purchased only 2.6 million tons (1.2 of wheat and 1.4 of corn). Not only must China place orders totaling another 3.4 million tons to meet the terms of the agreement, but it must do so no later than September if shipments are to occur this calendar year.

Despite unilateral US quotas on some product categories, our textile imports from China grew in excess of 10 percent in the first four months. This buying surge is likely to fall off as imports approach quota ceilings, probably leaving total US textile imports for 1983 at around $972 million. The small 10 percent increase is well below the average annual growth rate of PRC textile and apparel imports achieved during the previous four years.

Our non-textile imports from China—mainly gasoline ($101 million during January–April), crude oil (just $10 million), tin, fireworks, wool rugs, baskets, and other light manufactures—are expected to increase by 10 percent, or by about half the rate of last year's increase. —JBS

WHY THE DOWNTURN?

The decline in overall US–China trade largely reflects China's retaliation for perceived US intransigence during the last seven rounds of textile negotiations that began in August 1982. Textiles constituted a 39 percent share of China's exports to the US last year, and in normal years provide a major source of revenue that helps China pay for even larger imports (though not this year) of US cotton, fiber, and textile machinery.

The dispute provides a revealing lesson on how the Chinese mix politics and trade. When Beijing announced on January 19 that no new contracts would be signed for American cotton, soybeans, and synthetic fibers—three items that were declining anyway—it carefully avoided an across-the-board cutback in favor of a selective response. US–China trade took a nose dive when that response included buying wheat in countries other than the US.

Individual deals in other sectors were not affected. Indeed, some advanced technology sales may have gone through faster as Beijing moved to reassure foreigners that its "open door" policies had not changed. In short, China limited its action to lower-priority, easily substituted commodities that did not jeopardize its access to foreign technology.

Many observers believe that the current impasse can be resolved if the textile talks achieve a breakthrough this summer, and President Reagan's offer to liberalize export controls, which may have caught the pro-US faction in the Chinese government by surprise, begins to produce a more positive attitude in Beijing toward our bilateral commercial relations. —JBS

USING "GUANXI"

The National Council staff is often asked for advice about "contact brokers." Can a firm do business in China without such people, or should a company hire someone who claims to have high-level contacts in the Chinese government?

The short answer seems to be: "Contacts are indeed important—but watch out."

People with good contacts are said to have *guanxi*, meaning strong personal ties that might or might not be useful in certain business situations. According to Nike Vice-President David Chang, "Everyone has heard of guanxi, but its value is overstated. A company in the embryonic state of its relations with China probably needs assistance to avoid spinning wheels for six months. But once contacts have been made, a firm should work on its own. Guanxi has been of little substantive value to us," he said.

"For a company new to the field," adds Randall Chang, vice-president of Union Bank in Los Angeles, "someone with good contacts can provide a valuable escort service through the Chinese bureaucracy. Making the right appointments is an important first step in doing business in China."

"Let's face it, only a few people make the decisions in any area, and it is important to reach them," says Walter Keats, president of Middle West Consultants, Ltd. in Chicago. "But any bona fide company with something solid to offer should have no problem reaching the right people. It is much easier getting your message through today than five years ago because there are so many new avenues for doing business. Also, more technically oriented Chinese have been promoted to positions of responsibility, and that makes it easier to sell your product on its merits," Keats said.

On the other hand, a go-between could set back a company's chances in China, one New York executive argued. "Take just one example—suppose you hire someone whose friends in China happen to be in an organization that is a rival of the bureau or ministry you want to do business with. It's easy to imagine a situation in which you are spending lots of money in consulting fees and only hurting your efforts." —JBS

CHINA BEATS THE ODDS

The World Bank predicted more than two years ago that China's energy shortage would limit future economic growth to less than 6 percent per year. Under the best scenario, the World Bank argued, the growth rate of energy production would be about 2 percent per year, and the rate of energy conservation (the rate of decrease in the number of kilograms of energy required to fuel

each ¥1,000 of real GNP per year) would fall by no more than 2.2 percent.

But in the last two years the Chinese have far surpassed both "best case" scenarios. Energy production increased at an average annual rate of 4.3 percent in 1981 and 1982, while during the same two-year period the annual rate of energy savings achieved 3.5 percent, according to data released by China's State Statistical Bureau on April 29. Moreover, real GNP grew by 3 percent in 1981, by more than 6 percent in 1982, and is headed for about 6 percent again in 1983.

Of course the World Bank was projecting energy trends through 1985 and 1990. It did not rule out the possibility that in any given year, or short space of two or three years, China might do better than was predicted for the long term. In fact, the World Bank's June 1, 1981 report argued that substantial energy conservation was not only possible, but represented China's best hope in the near term. The reason: China's per capita consumption of commercial energy "is about 3.5 times the average of other low-income developing countries." In short, China wastes energy. However, in the last two years, at least, China seems to have made a real effort to correct its profligate energy habits. —JBS

FAST-TRACK FOREIGN HOTEL

As part of China's sudden drive to add at least 1,350 hotel rooms by 1985, the historic city of Xi'an has offered one US developer some unusually attractive terms.

Kowin Development Corporation of California recently signed a HK$280 million ($40 million) deal to construct the first Western-style hotel in Xi'an. The joint cooperative contract with the Xi'an Tourist Service Company gives Kowin full management responsibility for the first 15 years, plus the majority share of the profit. Kowin Vice-President Dorothy Ko revealed the split as 90 percent Kowin, 10 percent Xi'an.

The Jinhua (Golden Flower) Hotel is the first Xi'an project involving foreign capital, according to Ko. Kowin is the sole financer.

Even though this is the real estate company's first China project, Kowin needed only 12 working days in three trips to conclude the deal. Plans call for Kowin to design the eight-story modern hotel, and Xi'an to supply the labor. Phase I of the 600-room project should be completed by 1985. —CSG

QUALITY CONTROL IS KEY

Sourcing consumer goods in China for export to discerning Western consumers has proved difficult for many American companies, but National Council member Fuqua World Trade of Secaucus, New Jersey, has chalked up a dazzling array of successes. In five and a half years, Fuqua has manufactured in China items such as: knock-down wooden furniture, camping lanterns, gun racks, sports garments, garden tools, and plastic garbage bags.

According to Michael De Clercq, vice-president for China operations, Fuqua's key to success is its Western, Mandarin-speaking staff in Beijing, which works closely with Chinese factories to produce high-quality products according to buyers' specifications and samples. The Fuqua staff regularly visits suppliers to make inspections and ensure quality control.

Fuqua's tenacity in the China market has enabled it to overcome problems that other firms might have considered insurmountable. Producing a sports garment made of cotton, leather, and rubber once seemed impossible, as the raw materials had to be supplied in a coordinated manner by three separate state trading corporations, SINOCHEM, CHINATUHSU, and CHINATEX. The job was finally accomplished when INDUSTRY agreed to oversee production and exportation of the garments in coordination with CHINATEX, which furnished the export visas. Early this year, Fuqua initiated agent and consultancy services for companies outside the Fuqua conglomerate. —CLB

NEW FACES AT THE NPC

Among Deng Xiaoping's most remarkable achievements since his return to power in July 1977 has been bringing in younger, more technically competent leaders. The average age of China's State Council leadership at the time of the Fifth National People's Congress in February 1978 was 66, and its members included many "reds" along with a few "experts." With each yearly session of the Fifth NPC in June 1979, August 1980, November 1981, and November 1982, Deng and his followers recruited younger leaders, in the process weeding out most of those without technical qualifications. By the first session of the Sixth NPC in June 1983, the average age of China's four vice-premiers had fallen to 61, while the average age of China's 34 ministers had dropped to 62. Today at least four ministers are younger than 58-year-old Finance Minister Wang Bingqian (hailed as the country's youngest minister when appointed two years ago). Well over half of China's ministers and vice-ministers are college educated. As recently as early 1982 only 37 percent were college trained. —CMC

BUT NO MAJOR POLICY CHANGES

As expected, the Sixth NPC made a number of personnel changes during its June 6–21 meetings which seem designed to continue and strengthen current economic policies. Veteran economic planner, Li Xiannian, was named president of the PRC. The 78-year-old member of the Party's Politburo Standing Committee has opposed many of Deng's reforms, though his new ceremonial post is not expected to increase his ability to obstruct further reforms. The new vice-president was to have been Liao Chengzhi, who died just 10 days before his prearranged nomination. His replacement was 77-year-old Ulanhu, a Chinese of Mongol descent, who has been a Party member for more than half a century and a member of the Politburo since 1977.

Ignoring his own promises to retire, Deng Xiaoping chose to become the chairman of the new Central Military Commission, a largely honorific entity.

A new Ministry of State Security was created to "ensure China's security and strengthen the struggle against espionage," according to the official Chinese announcement. Ling Yun, the new minister, had been a vice-minister of public security for at least two decades. Upon his appointment, he expressed concern that the "open door" policy has led to greater espionage activity in China.

Rather unexpected was Premier Zhao's announcement of a cabinet reshuffle. Two new vice-premiers were named: 55-year-old Li Peng and 54-year-old Tian Jiyun. Li is an electric power expert who served briefly as minister of electric power

in 1981–82, before stepping down to become vice-minister in the expanded Ministery of Water Conservancy and Electric Power. Tian Jiyun served as a financial and economic expert in Guizhou and Sichuan, and later as the State Council's deputy secretary general. He will hold the dual appointment of vice-premier and State Council secretary general. The appointment of two new vice-premiers will take the load off the State Council's current vice-premiers, Wan Li and Yao Yilin, both fully 10 years older than their new colleagues. —CMC

WHO'S WHO AS OF JULY 1983

President of the PRC†: Li Xiannian* (Age: 78)
Vice President of the PRC†: Ulanhu* (77)
Chairman of the NPC Standing Committee: Peng Zhen* (81)
Supreme Court Chief Justice: Zheng Tianxiang* (69)
Chief Procurator of the Supreme People's Procuratorate: Yang Yichen* (69)

State Council

Premier: Zhao Ziyang (64)
Vice-Premiers (4): Wan Li (67), Yao Yilin (66), Li Peng* (55), Tian Jiyun* (54)
State Councilors (10): Fang Yi (67), Gu Mu (69), Kang Shien (68), Chen Muhua (f) (62), Ji Pengfei (72), Zhang Jingfu (69), Zhang Aiping (72), Wu Xueqian* (62), Wang Bingqian* (58), Song Ping* (66)

Commissions (8) and Ministries (34)

State Planning Commission: Song Ping* (66)
State Economic Commission: Zhang Jingfu (69)
State Family Planning Commission: Qian Xinzhong (72)
State National Defense, Science, Technology and Industry Commission: Chen Bin (NA)
State Nationalities Affairs Commission: Yang Jingren (65)
State Physical Culture and Sports Commission: Li Menghua (61)
State Commission for Restructuring the Economic System: Zhao Ziyang (64)
State Science and Technology Commission: Fang Yi (67)
People's Bank of China: Lu Peijian (55)
State Auditing Administration†: Yu Mingtao* (NA)
Ministry of Agriculture, Animal Husbandry, and Fisheries: He Kang* (60)
Ministry of Aviation Industry: Mo Wenxiang (60)
Ministry of Chemical Industry: Qin Zhongda (59)
Ministry of Civil Affairs: Cui Naifu (54)
Ministry of Coal Industry: Gao Yangwen (66)
Ministry of Commerce: Liu Yi (52)
Ministry of Communications: Li Qing (63)
Ministry of Culture: Zhu Muzhi (67)
Ministry of Education: He Dongchang (60)
Ministry of Electronics Industry: Jiang Zemin (NA)
Ministry of Finance: Wang Bingqian (58)
Ministry of Foreign Affairs: Wu Xueqian (62)
Ministry of Foreign Economic Relations and Trade: Chen Muhua (f)(62)
Ministry of Forestry: Yang Zhong (51)
Ministry of Geology and Minerals: Sun Daguang (66)
Ministry of Justice: Zou Yu* (NA)
Ministry of Labor and Personnel: Zhao Shouyi (66)
Ministry of Light Industry: Yang Bo (62)
Ministry of Machine Building: Zhou Jiannan (66)
Ministry of Metallurgical Industry: Li Dongye (65)
Ministry of National Defense: Zhang Aiping (72)
Ministry of Nuclear Industry: Jiang Xinxiong* (52)
Ministry of Ordnance Industry: Yu Yi (58)
Ministry of Petroleum Industry: Tang Ke (65)
Ministry of Posts and Telecommunications: Wen Minsheng (67)
Ministry of Public Health: Cui Yueli (63)
Ministry of Public Security: Liu Fuzhi* (66)
Ministry of Radio and Television: Wu Lengxi (63)
Ministry of Railroads: Chen Puru (65)
Ministry of Space Industry: Zhang Jun (64)
Ministry of State Security†: Ling Yun*
Ministry of Textile Industry: Wu Wenying (f)(50)
Ministry of Urban and Rural Construction and Environmental Protection: Li Ximing (57)
Ministry of Water Conservancy and Electric Power: Qian Zhenying (f)(61)

* New appointment
† New position
f Female —CMC

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The China Business Review is published bimonthly by the National Council for US–China Trade, a nonprofit organization incorporated under the laws of the District of Columbia. Controlled circulation postage is paid in Washington, DC. Articles in *The CBR* do not reflect Council policy, unless indicated. The Council is grateful to His Excellency Huang Zhen, former minister of culture, for the calligraphy on the front cover, and to I-Chuan Chen of the National Council for the calligraphy used for the magazine's departments.

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EXPORT CONTROLS

The meaning behind China's new status as a "friendly" but non-allied country.

Chris Brown

President Reagan's recent decision to change China's status under Export Administration Regulations could be the most important move in America's policy toward China since the opening of diplomatic relations in 1979. Not only does the policy take the definitive step in treating China as a friendly country, but it should also remove one of the greatest constraints on trade in a number of key sectors.

Based on recent experience, observers question whether the spirit of the policy will survive the process of drafting guidelines. This time, however, indications are that the president means business and that decision-making procedures have been engineered for results. "We have a clear presidential directive, and the people working on it want it to work," said one high-level administration source, "It's going to be a major step."

The recently announced administrative change culminates an evolution that began with Nixon's open door policy in 1972 and spans four administrations. "The move from Country Group P to Group V" says the June 21 Commerce Department release, "is intended to emphasize that sales to China should take place on a similar basis as to most other friendly countries."

China has been classified in Country Group P since the spring of 1980 when the Carter administration removed it from Group Y, which contains the USSR and its East-Bloc allies. As the sole member of Group P, China was designated a "non-enemy" but not a friend. Under this classification, interagency differences of opinion resulted in a failure to implement new, more liberal guidelines.

The present policy change places China among a group of countries that includes our Nato allies as well as other countries such as India, Egypt, and Yugoslavia. But there is an important qualification to China's status as a V group country. After explaining that China should be treated roughly as other friendly nations, the Commerce Department announcement states: "However, the change will allow for restrictions on certain products and technologies which present a national security concern to the United States." Furthermore, "Export license applications for China will continue to be reviewed under national security procedures."

Here, the prospects for the policy become conditional. The administrative move could be a decisive step to improve relations with China *if* "national security concerns to the United States" are not defined under the rules for China as they would be for a potential enemy. Some observers fear that this condition will allow the Defense Department to maintain restrictions even on current technologies needed for commercial applications in China.

Suspense over whether or not the new regs will follow the spirit of the president's policy should end with the summer if the government's plan proceeds according to schedule. An interagency Export Control Steering Committee, composed of representatives from the National Security Council and the State, Commerce, and Defense departments, is laying the groundwork now for the policy's implementation. Once criteria are established defining risks to US national security, interagency technical working groups will draft guidelines for specific product areas.

Cynics contend that the intent of the policy is likely to dissipate in the steering committee as Defense stakes out its claim. The makeup of the committee, however, supports a more optimistic view. The committee is reportedly chaired by a member of the National Security Council who will work in concert with the office of the White House Science Advisor. This would suggest that Defense representatives will not be able to dictate policy by applying their own definitions of "national security concerns." Instead, they will bear the burden of proof in recommending restrictions before a committee that includes technically competent members charged with seeing that the regulations embody the spirit of the president's policy.

The question remains, however, of how the committee will define US security concerns vis-a-vis China. One criterion, which was recommended in a paper prepared by the Export Controls Working Group of the National Council for US–China Trade, would be to base export control decisions on a comparison of the relative risk of exporting to China against the risk of making the same sale to other friendly countries. In other words, exports would only be restricted for China if they clearly posed a greater risk to our national security in the hands of the Chinese than in the possession of other Group V countries. By this criterion, risk of diversion to East Bloc destinations would not be an acceptable argument for restrictions, since the equipment is more likely to be diverted to the East Bloc from, say, France or India. Similarly, the argument that an export is likely to be used for military applications would not be an acceptable basis for restricting its sale unless it could be demonstrated that it was likely to be used to significantly enhance China's capability in the area of strategic weaponry.

The commercial effects of the policy change are impossible to gauge until final regulations are released. The projections cited by Commerce Department officials of $1 billion to $2 billion in annual exports are conjectural and highly optimistic. But if the policy is to be "evolutionary" with restrictions reviewed each year, as high-level officials have suggested, and if the criteria for imposing restrictions resemble those suggested by the National Council, the Commerce figures may not be unrealistic in the coming years.

China's worsening water crisis is forcing different ministries and administrative units to do what they most abhor—to work together.

WATER POLITICS

David M. Lampton

Some Chinese already are arguing that the "water crisis" is bigger than the country's widely acknowledged energy and transport problems. The North China Plain, a semi-arid region in the best of times, is facing alarming water shortages. The flow on the Yellow River has been cut eight times in the last 10 years, in one case for nearly 20 days. In some areas "dry" factories have had to buy water from other enterprises at prices as much as 30 times above the official price. Soil erosion is clogging rivers in both north and south China with accumulations of silt that pose a growing menace in times of flood. My archival research and extensive interviews and field work in China in 1982 convinced me that the crisis is real—and growing.

Behind these difficulties lies a curious combination of bureaucratic inertia and some truly outstanding achievements in the area of water management. To mention a few of the successes: There have been no dike breaches along the Yellow River since 1949 (though there have been a few intentional diversions). The damage caused by the Yangzi River (Changjiang) floods of 1954 and 1981 was reduced by the many diversions, storage, and drainage projects that have been constructed. (It remains to be seen if the current flooding at Wuhan can be as easily controlled.) Across the country water-logged land has been significantly reduced since 1949, and irrigated acreage now embraces about 48 percent of all cultivated land. Between 1949 and 1980, more than 86,000 small, medium, and large reservoirs, and 160,000 kilometers of dikes, embankments, and seawalls, have been built or renovated, according to a recent issue of the authoritative *China Water Conservancy*.

The Chinese have reason to be proud of these gains. But the country's water problems today are in some respects graver. What is worse, the bureaucratic consensus needed to deal with them has yet to materialize. Given the long lead times necessary for critical water projects, the failure to act will postpone their completion to the turn of the century. The forces of nature might not hold off that long.

FLOOD CONTROL

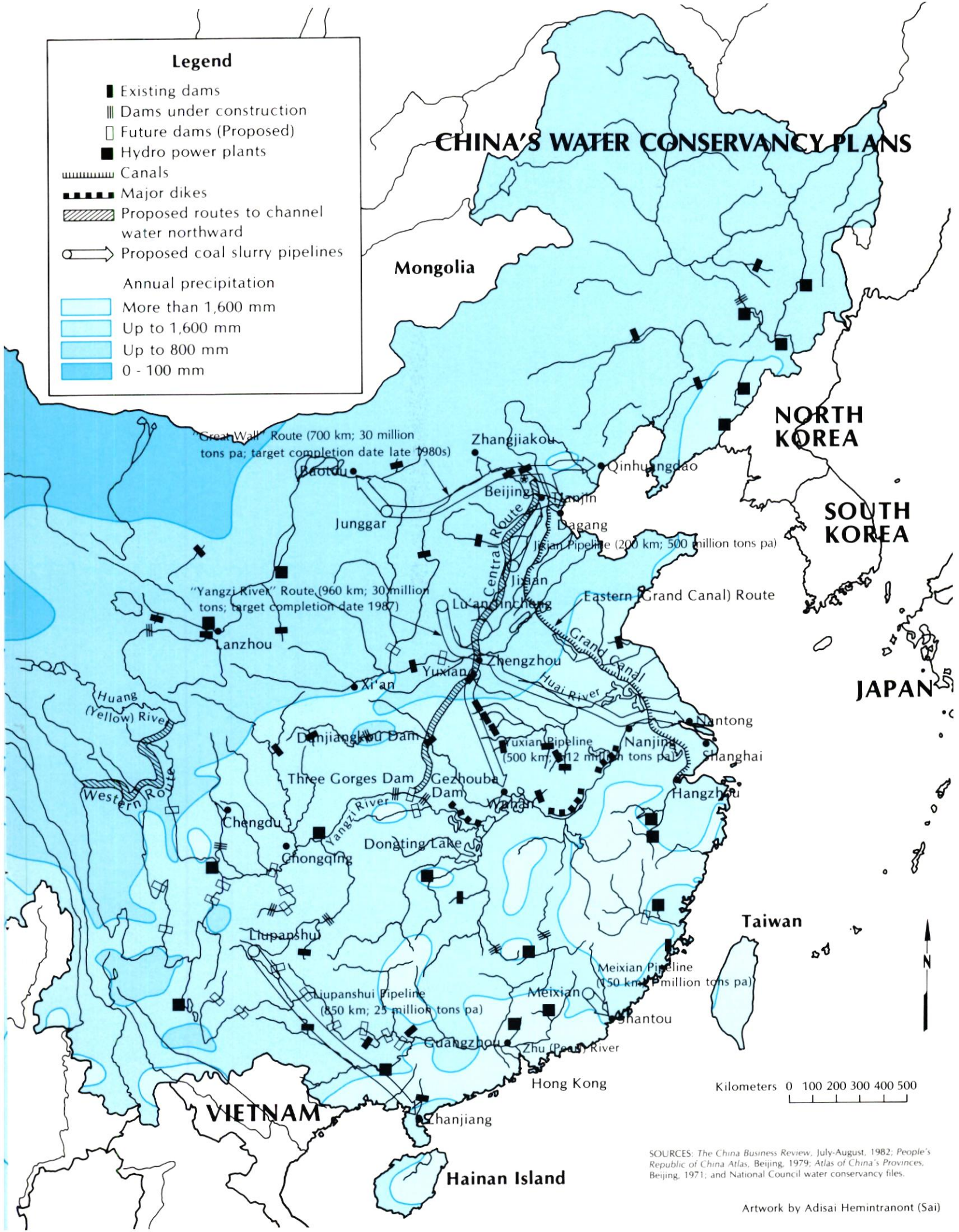
The river beds keep rising

The 1981 Yangzi flood reminded both outside observers and Chinese officials what the peasant who lives along major rivers never forgets: Floods can inflict staggering losses. Ironically, flood control efforts are partly responsible for these losses. As rivers become "safer" people build houses and factories in more exposed areas, and the potential for flood damage increases. Land-use rules must accompany flood control development and, as we shall see, they have not. The floods of the future could inflict economic losses far in excess of those of the past.

Moreover, the flood control standard along China's main inland water system, the Yangzi, is still comparatively low. Most stretches can withstand floods of only a 10–20 year frequency, *China Water Conservancy* reports. If a flood such as that of 1954 were to hit the Yangzi Basin today, Chinese planners estimate that as many as 7 million persons could be displaced, and economic losses could reach ¥20 billion. The much smaller and regionally localized 1981 Yangzi flood, according to Chinese figures, caused ¥2 billion in direct economic losses, left 1.13 million persons homeless, 2,600 factories destroyed, 98,000 hectares of farmland covered with debris, and 22,678 hectares of reclaimed land washed out.

Along the Yellow River, the situation is equally worrisome. Interminable and costly dike-raising projects are required just to keep up with the rising river bed. During the 1950–78 period, accumulations of silt raised the streambed about two meters in the river's lower reaches. The river will continue to rise until upstream water and soil conservation projects are completed. Chinese hydrologists even now predict that a flood like that of 1958 would create "a grave situation." China's other principal rivers also present problems. Major floods have occurred along the Song and Liao rivers in 1960, the Hai in 1963, and the Huai in 1954 and 1975. Bluntly, the meteorological clock is ticking, while the potential remedies are enormously costly and require long lead times to complete.

Many of China's flood control planners argue that the most cost-effective way to control the Yangzi Basin is to build a high storage dam at the lower reaches of the famous Three Gorges, located in western Hubei Province. This would back up water to Sichuan's major city of Chongqing, a project so grand that it even caught Mao Zedong's poetic sense in 1956, when he wrote the poem "Swimming." Cost estimates by different Chinese authorities vary wildly, ranging from a high estimate of between ¥40 and ¥50 billion down to a low of ¥12.5 billion, including population displacement costs. Officials admitted to me that the high estimates are produced by organizations opposing the project. No matter what the figure, it would constitute a very large chunk of China's capital construction budget. To



SOURCES: *The China Business Review*, July-August, 1982; *People's Republic of China Atlas*, Beijing, 1979; *Atlas of China's Provinces*, Beijing, 1971; and National Council water conservancy files.

Artwork by Adisai Hemintranont (Sai)

provide some perspective, planned budgetary allocations for capital construction in the draft 1983 national budget are ¥36.18 billion. Every day that the Three Gorges project is delayed, its costs and population displacement presumably grow.

Because of the monumental sums involved, some people in the State Planning Commission's Office of Agriculture, Forestry, and Water Conservancy argue that instead of the Three Gorges project, emphasis should be placed on dikes. They assert that dikes would be cheaper, would occupy less agricultural land, and would employ China's abundant labor power. The view is shared by officials in a number of ministries, who fear such a large project might take away money from their priority projects.

The Yangzi River Valley Planning Office, on the other hand, vigorously disputes this viewpoint. Its planners point to the increasing danger of ever higher dikes, the mammoth quantities of earth and stone that would have to be moved in order to appreciably enhance flood control standards, and the structural weakness of the foundations of some of the basin's most strategic dikes. Sichuan Province prefers a third approach, arguing that it would be better to build a series of smaller storage dams upstream rather than one gigantic project at its eastern border that would inundate large tracts of the province's most valuable real estate.

Information I have indicates that Beijing recently decided to launch the Three Gorges project, three years from now, despite the fact that major design and financial details still have not been resolved. It remains to be seen if the project is launched. If it is, the dam's 15-year construction schedule is not likely to be even approximated. China's experience of long construction times at other big projects suggests that a 15-year plan is exceedingly optimistic.

THE PROBLEM OF LANDFILL

Lakes and waterways are disappearing

Land is arguably China's most precious resource. An expanding population, increasing industrial and urban sprawl, a housing boom in the countryside, erosion and desertification, and the inundation of large tracts of farmland by reservoir projects all have produced a decline in China's net stock of agricultural land. Though some outside observers assert that peasants are "hiding" land from the authorities, as peasants have done for eons, the government genuinely is alarmed. An article in the July 19, 1982 *Beijing Review* noted:

> *China's farmland covered 111.33 million hectares in 1957, but it dropped to 99.33 hectares in 1977. However, this figure includes 17 million hectares of farmland reclaimed from wasteland during this period, so the country actually lost 29 million hectares of farmland during those 20 years, an area equal to the total area of farmland of Shandong, Hebei, Henan, and Heilongjiang provinces in 1979.*

Now that incomes are more directly linked to individual entrepreneurship, peasants are trying to secure land wherever, and however, possible. Rising peasant incomes have set off a housing boom that requires land. In river valleys and lake areas, this land hunger takes the form of filling, or otherwise encroaching upon, lakes, ponds, and rivers, as well as building on dikes and in diversion areas. Factories and enterprises, anxious to expand, have built in areas that are vulnerable to flash floods and inundation. Construction on exposed sites such as islands and shoals has been cited as an illustration of the problem. This obviously escalates potential flood losses.

In the central Yangzi River Basin, the surface area of Hunan's Dongting Lake has declined from 4,350 to 2,740 square kilometers during the last three decades, *China Water Conservancy* reported last year. While admittedly not all of this is due to peasant encroachment (siltation from upstream erosion also is very important), this decline is indeed serious. It reduces aquatic production, further constricts inland navigation and, most importantly, it diminishes the capacity of the middle reaches of the Yangzi River to safely store flood waters. This critical equalizing function of the middle reaches lakes has been recognized at least since the Ming Dynasty. As the surface area of the Chinese lakes diminishes, more diversion or storage capacity must be built simply to replace what nature initially provided. Responding to this problem, the State Council recently declared that it is necessary to "protect lakes in order to regulate surface runoffs and achieve an ecological balance. . . . No unit is allowed to seize land or water surface area . . ." Clearly, though, this policy is working against the combined momentum of an expanding rural population and new economic incentives that are motivating peasants to increase production.

Effective zoning is almost nonexistent. One Hubei expert related how local peasants had filled in about 70 percent of their ponds to expand farm land after the state built a new reservoir, thinking that they could now depend on the state reservoir for water.

A similar perverse process is endangering commercial waterways. Though Chinese planners tend to believe that inland waterway transport is the best way to move bulk freight, the government has conceded that the total length of China's navigable waterways dropped from 170,000 kilometers in 1961 to 108,000 kilometers in 1982—a 37 percent decline. As a result, "the share of freight volume carried on inland waters dropped from 14 percent in 1957 to 7 percent in 1981," a January 1983 report said. Another government study revealed that in central China's Hubei Province, which straddles the Yangzi River and some of its largest tributaries, the length of navigable waterways has declined annually, while water-borne freight volume dropped from 56 percent of the province's total road and water freight volume in 1957, to 37 percent in 1979.

Why is this occurring? My interviews and field research point to the following factors: Dam construction has paid insufficient attention to the needs of navigation; new factories have frequently obstructed smaller rivers; erosion has silted up streambeds; and insufficient funds have been provided for channel maintenance, much less improvement.

Railroads have received a much larger share of capital construction investment than has inland river development, despite the fact that investment per unit of water-borne freight capacity is less than one-half that needed to create equivalent rail capacity. Moreover, railroads occupy extensive tracts of farmland. In short, a process of river deterioration is underway, in no small part due to

poor land-use policies, weak enforcement of what guidelines there are, and suboptimal investment patterns. These problems are political in origin, and the politics of water management must shape their solution.

SOIL EROSION

Agricultural output takes precedence

The current drive to accelerate economic growth has created tremendous pressure on China's forests and water quality. Present policies that increase household incentives to produce new sources of income have created additional pressures described in the June 21, 1982 *Beijing Review* as the "wanton felling of forests and destruction of other natural resources." China's former minister of forestry, Yong Wentao, made the surprising admission in 1981 that "The degree of destruction [of forests in the upper reaches of the Yangzi Basin] became more serious since the founding of new China." In 1979, by its own account, China ranked 120th in the world in the percentage of its land covered by forests. Immediately after 1949, approximately 19 percent of Sichuan's land area was forested; by 1982 this figure had declined to 13.3 percent.

A case in point: Sichuan's Wusheng County, hard hit by the 1981 floods, had 10,000 hectares of forested area in the 1950s; this was reduced to just 56 hectares by 1976. Situated upstream, these problems in Sichuan inevitably will affect the entire Yangzi River Basin.

Today the river's heavy silt load (there is some debate about whether or not the silt load is increasing) reduces lake surface areas, obstructs inland navigation, shortens the useful life of hydraulic projects, and further diminishes the absorptive capacity of upstream areas. Topsoil is being washed from where it is needed to where it is a problem. Against this background, Sichuan's then first Party secretary, Tan Qilong, stated flatly in the January 1983 issue of the Party's theoretical journal *Red Flag* that: "the 1981 Sichuan flood, which caused disastrous damage to vast areas of the province, was brought about by the drastic reduction of forest land in northern Sichuan." (Sichuan Province and the Ministry of Forestry attributed the damage to deforestation, while the Ministry of Water Conservancy and Electric Power blamed the lack of storage and water conservation.) To seriously tackle the erosion problem, Beijing must increase its forestry budget, import more lumber, and take steps to ensure that forests are, in the words of Tan Qilong, closed off for a few years to give them a respite from cutting.

Though equally serious, less is known about China's pollution problem. According to the Ministry of Water Conservancy and Electric Power, the country discharged 40 million tons of polluted water daily in the early 1970s; by 1979, that daily discharge rate had exceeded 72 million tons, an 80 percent increase. Industrial waste accounted for about four-fifths of the 1979 discharge. A recent scientific gathering on the subject of Lake Tai (located 90 kilometers west of Shanghai) concluded that: "The irrational distribution of industry, . . . has resulted in environmental pollution and damage to its aquatic resources." In talking about Hubei's Lake Hong, a recent survey showed it to be "one of the few unpolluted large inland lakes on the middle and lower reaches of the Changjiang [Yangzi] River." Ground water purity also has become a problem, with the Chinese acknowledging that ground water in some urban areas already is being contaminated, in some cases severely so.

Effective zoning in China is almost nonexistent. In one perverse case some peasants in Hubei Province filled in most of their ponds to increase farm land after the state built a new reservoir. They obviously thought they could depend on the state reservoir for water.

In China as in other countries, including the US, one set of policy objectives frequently conflicts with another. The drive to increase coal and other industrial output, for instance, has led to mining and refining practices that poison the water. This is how the people of Yuxian County, Shanxi, described the effects of a nearby ore-dressing plant on their reservoir:

It discharges 70–80 tons of tailings a day and contaminates the mountain spring flowing into the reservoir. In the past few years, over two-thirds of the storage capacity has been filled with silt. Further, the 200,000 fish we stocked the reservoir with all died because of pollution.

Another recent Chinese press report had this complaint: "for the sake of temporary or local benefit, the people would not hesitate to build obstructions in rivers and streams, disrupt the water system, reclaim land from rivers to build farms, [and] indiscriminately discharge mining waste . . ." These practices can only be reversed if the political system allocates the capital and, what is harder, enforces the necessary controls.

MOVING WATER NORTH

Three routes are under study

China's northern and northwestern provinces receive less than 500 millimeters of rain annually on the average, well below the mean annual precipitation of 1,100 millimeters that falls on the Yangzi River Basin. Stated differently, the water available per capita in the Yangzi valley is more than four times greater than that available per capita to residents of the Yellow River Basin. A 1982 issue of *China Water Conservancy* also shows that each *mu* of cultivated land in the Yangzi Basin has more than nine times as much water available to it as does each mu of cultivated land along the Yellow River valley (one mu equals .0667 hectares). Moreover, a much greater percentage of the Yellow River's runoff is diverted to large and medium reservoirs (84 percent) than is the case in the Yangzi Basin, where only 9.1 percent of the runoff is captured. At times so much water is removed from the Yellow River that it reportedly runs dry.

Available ground water estimates, though imprecise, nevertheless suggest that north China's Huai, Yellow, and Hai river basins only have about 10 percent of China's total primary reserves of ground water. The water table is dropping throughout north China and more wells frequently do not produce more water. During the repeated droughts of the 1970s and early 1980s some northern factories had to operate well below capacity for lack of water. Irrigated acreage is

below planned levels in many areas. And yet, despite these present shortages, the government is counting on north and west China's economic muscle to help meet the country's ambitious production targets for the year 2000.

There has been, and continues to be, some debate as to whether there is really a water shortage in north China. Some geologists argue that more ground water may be available than estimates indicate. Some agriculturalists assert that new irrigation techniques would save a great deal of water. Both foreign and domestic experts agree that more water could be recycled. Nonetheless, in light of the basic meteorological facts of life in the north, experts in the Ministry of Water Conservancy and Electric Power believe that the only long-term solution to the north–south imbalance in water supplies is to move water northward from the Yangzi Basin. Officials in some other ministries think they hear an echo of the Three Gorges, and oppose siphoning off money to such a scheme.

But if additional water is not injected into the arid north and northwest, intraregional conflict between the upstream and the heavily industrialized downstream areas of the Yellow River Basin will increase. Areas in the west, such as Gansu Province, desperately need to pump more water from the Yellow River system, while growing areas downstream (Tianjin is already dependent to some degree on Yellow River water) want to minimize the upstream "take" so that they have as much left for themselves as possible. Even in 1958, the "contradiction" was clear to the old Ministry of Water Conservancy, which attempted to mediate between a growing upstream west and a growing downstream east, because the water take of each lessened the growth possibilities of the other. Today, the problems of China's west are serious, but not widely recognized abroad. Areas of Gansu are trapped in a vicious cycle of drought, leading to overcultivation and progressive desertification. In one county, the average annual per capita water supply was 1,360 cubic meters during 1951–55. That figure fell to 238 cubic meters per capita during 1971–75, *China Water Conservancy* reported in 1981.

Water, like grain and housing, is sold at prices below its cost of production. China's entire economic system is a web of subsidies that give large segments of the population a perceived self-interest in perpetuating the inefficiencies of the present system.

Beijing has been considering two possible routes to move Yangzi water northward (*see* page 11). A third route, the "Western Route" along the Yalong River, is a less likely choice. The proposed "Central Route" would run from the Danjiangkou Reservoir in northwest Hubei Province (and ultimately the Three Gorges if the high dam is built) past Zhengzhou, across the Yellow River, and up to the vicinity of Beijing. As envisioned, this project would be entirely gravity flow, with no pumping required. Substantial tunneling would be needed, however. The proposed "Eastern Route" would run from the Yangzi River near Yangzhou up through portions of the Grand Canal to Jining, in Shandong Province, and up to Tianjin when phase two is completed. The authorities recently settled on the Grand Canal route, though the matter is probably still being hotly debated.

The Yangzi River Valley Planning Office believes that the Central Route is preferable because long-term operating costs would be lower, and the route fits in with its plans (or hopes) to raise the height of the Danjiangkou Dam and build the Three Gorges Project. In this case water would flow northward into the enlarged Danjiangkou Reservoir and ultimately to the North China Plain. Provinces along the way support the Planning Office's proposed Central Route, since it will boost their irrigated acreage.

However, Eastern Route advocates have a case that even the Yangzi River Valley Planning Office cannot shake. Its initial cost would be about one-third less than for a Central Route, it would be somewhat faster to build, move more water, and occupy less agricultural land. Moreover, the powerful Ministry of Communications (responsible for shipping) prefers the Eastern Route, as do the provinces along the Grand Canal. On the minus side, however, the Eastern Route would require extensive pumping and would, therefore, consume a large quantity of electricity, producing permanently higher operating costs, a fact the Yangzi River Planning Office readily brought to my attention.

Some localities along the Eastern Route are also concerned that the transmission of water-borne parasites (schistosomiasis) could occur as it did in Egypt with the Aswan Dam. The Ministry of Water Conservancy experts with whom I spoke, dismissed this as an unjustified fear.

SUBSIDIZING WASTE

The price of water is set too low

The one cheering note in China's water difficulties is that since waste is substantial, conservation could make a real difference. Water, whether it be for agricultural, industrial, or household use, is underpriced. Like grain, housing, and urban medical care, water is sold at prices below its cost of production. China's entire economic system is a web of subsidies and multitiered prices that gives large sectors of the populace a perceived self-interest in perpetuating the inefficiencies of the present system. Agricultural water is priced lowest, industrial water is in the middle, and household water is priced dearest. Many consumers still do not have metered service; it is not even known how much water they use. Underpricing water, like underpricing any commodity, encourages utilization that would not occur if the prices were higher. For instance, a 1982 *People's Daily* report asserts that Chinese industry reuses only 10 percent of its water, while the comparative figure for industries in the developed countries is 70 percent. Beijing's Municipal Water Bureau estimates that it received two *li* (one li equals 1/1000th yuan) per cubic meter of water during the period of 1966–81, when the true cost of production was 21 li per cubic meter. In turn, since water revenues have been low, the maintenance of pipes, water treatment facilities, and reservoirs has

been neglected. Major maintenance projects require separate capital construction appropriations that may, or may not, be forthcoming. Given the slowness and Byzantine complexity of the budgetary process, such appropriations almost certainly are not made in a timely fashion.

But waste and low water rates are likely to continue as long as enterprises are under pressure to make larger profits and pay higher taxes to the state—while not raising their prices. Until the prices of goods can be changed, factories and other enterprises do not want higher costs. Moreover, water departments already have serious difficulty collecting bills from delinquent enterprises. If one enterprise were permitted to pass along its costs by raising prices, all might want to. Changing the price of any commodity, including water, would set off a chain reaction throughout the economy. Once again, policies designed to accelerate economic growth (by encouraging enterprise profitability) clash with the objectives and needs of a sound water price policy.

Waste is also evident in foregone opportunities due to mismanagement. For instance, annual fish production in one large-scale reservoir I visited was 2,721 *jin* (1 jin equals one-half kilogram) per square kilometer of lake surface. In another smaller county-run reservoir that I visited in southern Hubei Province, annual fish production was about 20,000 jin for each square kilometer. The reasons for this wide disparity in productivity are many. Larger reservoirs with hydroelectric plants lose fish through escape, and security tends to be poor. Illegal fishing, "bombing," "shooting," and "poisoning" are problems repeatedly mentioned in both ministry publications and conversations with reservoir managers. However, another important reason for the low productivity in big reservoirs is that they tend to straddle a multitude of local jurisdictions. Each jurisdiction is reluctant to stock fish that another jurisdiction might take. When I suggested to interviewees that unified management of these large reservoirs might be a way to deal with this "free rider" problem, they thought it would be very hard to reach a workable and enforceable agreement. Consequently, a large potential resource remains underutilized because of the lack of investment incentive, the inability to secure cooperation among competing local jurisdictions, and difficulties in enforcement.

China's total surface water runoff of 2,614 cubic kilometers per year is 5.5 percent of the world's total, or less than that of Brazil, the USSR, Canada, and the US.

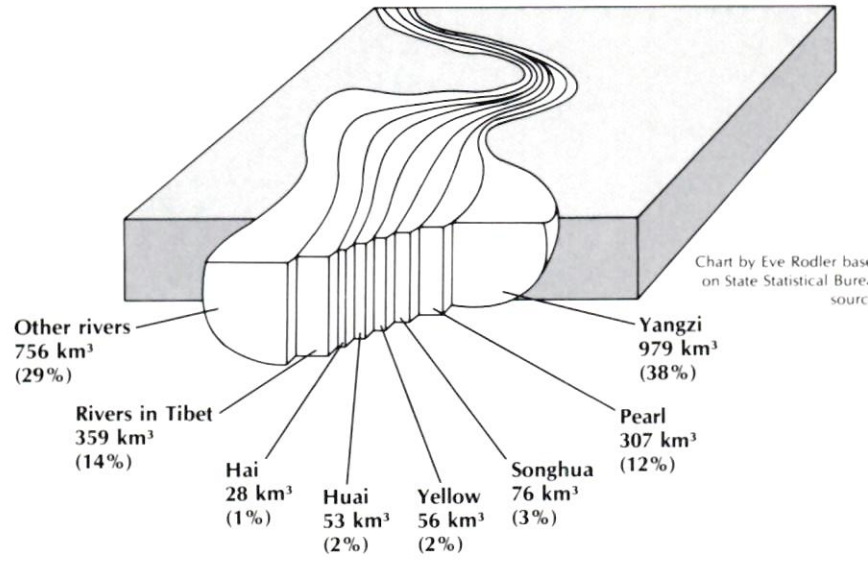


Chart by Eve Rodler based on State Statistical Bureau sources.

FINDING A SOLUTION

Can the bureaucracy meet the challenge?

The politics of water is not only the "source" of some of China's water problems, but is also the mechanism from which a "solution" must be fashioned. A number of fundamental attributes of the political system are working against the rapid development and effective implementation of long-range water (and other) policies. First, the political process, with respect to these types of issues, relies on consensus building. Images of a "centralized" China notwithstanding, the process is *not* one in which the top leaders unilaterally impose their will on the bureaucracy and territorial units. Instead, there is an elaborate process of consultation and negotiation among bureaucratic and territorial units and between administrative levels. This process can last for decades, literally. Those at the top frequently lack sufficient information to make decisions, hence they request input from below. The various bureaucracies respond with what Mao Zedong called "washouts," or deluges of information, multiplying the options to such an extent that the country's leadership is immobilized. Even when a decision is made, Beijing knows that a consensus is required to carry it out, hence subordinates may be called upon to achieve a consensus among themselves.

Consensus politics seems to have produced the expectation at all levels that each territorial and bureaucratic unit should receive a share of the budgetary pie roughly the same as it received previously. The absolute monetary amount may change with economic and budgetary circumstances, but as one official explained to me, there is a baseline expectation that relative shares of the budget should not change dramatically. Each superior unit allocates budget shares to subordinate units on a predetermined and apparently stable formula. There is an ethic of budgetary "live and let live" that makes it hard to change priorities. While some changes in budgetary priorities have occurred (as between heavy and light industry), these exceptions to the rule require the expenditure of enormous political capital. Most budgetary fighting occurs at the margin under the assumption that basic expenditure categories will remain in a rather stable relationship to one another. Assuming that this is an accurate reflection of how resources are divided, it suggests that any significant reorientation of the budget in favor of water conservancy will be most difficult to achieve, even *if* water problems assume more importance on the government's agenda.

The Chinese system is a complex hierarchy of territorial units. Each

unit is understandably reluctant to impose severe costs on its subordinate levels. Consequently, in water policy, where the effect of *any* decision to take, divert, impound, or allocate water inevitably affects many units, the decisionmaking process easily gets bogged down in an effort to build a consensus. In the case of the large-scale Three Gorges or Danjiangkou Reservoir projects, for instance, these consensus-building efforts become protracted negotiations over how many displaced persons each unit takes, how much water, electrical power, and flood protection each receives, and how net beneficiaries are to compensate net losers. Generally, the larger the project, the more complicated the negotiation process. The proposed Three Gorges Dam, if built to the 200 meter level, would partially inundate about 22 counties.

Field work on water management provides a healthy antidote to any exaggerated sense one might have regarding Beijing's authority. Exasperated water planners and project managers often recounted instances of projects that had been stalled owing to the opposition of this or that county, special district, or province. And as negotiations lengthened so did a project's bill, making it even harder to achieve a consensus on cost and the displacement of people. Mao Zedong's impatience with the process was well-founded and that is why several of China's biggest water projects were launched as a result of the chairman's circumvention of the bureaucracy.

What one finds in China, I believe, is a system in which every territorial unit, bureaucratic organization, and individual has inadequate resources to accomplish assigned tasks. Consequently, it simply is not seen as "just" or "fair" to take resources away from already impoverished entities. You could call this the budgetary "iron rice bowl" ethic.

In the end, achieving a consensus seems to rely on two noncoercive mechanisms: money and crises. As Lester Ross recently pointed out in his cogent analysis of the 1981 Yangzi flood, that crisis brought forestry and soil conservation work to Beijing's attention in a way that mere entreaties could not. Disaster in China, as elsewhere, commands the government's attention. However, to assert that problems must be grave before they elicit a response is not entirely reassuring, considering that the response time is measured in decades.

Artwork by Susan S. Lampton

Too many hands on the spigot.

Money may be even scarcer than crises. Those ministries and enterprises that generate large profits for the state treasury generally receive comparatively more investment than do ministries and enterprises that generate fewer revenues and have a lower rate of "capital circulation." The result has been that water projects tend to be less favored by central planners, despite their contributions to the economy. It remains to be seen whether or not the 1982 merger of the former Ministry of Water Conservancy with the big revenue-producing Ministry of Electric Power will enhance the attractiveness of investment in this area.

THE PLANNING PROCESS

Institutional loyalties come first

An important element in the political system is the planning apparatus. Water planners in the Ministry of Water Conservancy and Electric Power, and in organs such as the Yangzi River Valley Planning Office, frequently are viewed as flood control advocates by other ministries and, indeed, by the electric power interests within the ministry itself. Although water planners claim to represent the general social interest, they are distrusted by the Ministry of Communications and electrical power interests, particularly those committed to thermal power. These other organizations believe that their work is continually subordinated to the priorities of the flood-control people. This leads to protracted discussions between the Ministry of Water Conservancy and Electric Power and other agencies and territorial units about what priorities ought to be and, indeed, even what standards of comparison should be employed in establishing project priorities.

Each organization and unit has its own ideology, sense of mission, and priorities that are sacred to it. Each believes that its objectives truly embody the general welfare. Each organization is afraid that it will not be adequately consulted and that its interests will be ignored. In this situation, my sense is that it would be more effective to have an interministerial water planning agency, with representatives of all affected organs, reporting directly to the State Planning Commission. Something along these lines occurs each time Beijing tries to overcome bureaucratic log jams and creates ad hoc interministerial groups to forge compromises. Such organs were established to build Gezhouba Dam, and to study the proposals for diverting the Yangzi River water northward.

Poor planning practices, such as *san bian*, or "simultaneous surveying, designing, and construction," have resulted in abandoned or suspended projects. This, in turn, has resulted in protracted construction times, cost overruns, and projects which, once finished, are not up to initial specifications. For instance, the Danjiangkou Dam in northwest Hubei Province originally was designed to reach a height of 175 meters; in fact, it was built only to a height of 162 meters because of higher-than-expected costs, local opposition, and uncertainties about construction quality. The lower dam cost more than the higher dam was initially expected to cost, and now, almost 10 years after the 162-meter dam was completed, the Yangzi River Valley Planning Office wants to raise the dam to its initially designed height at considerable expense. Similar problems have been encountered at the Gezhouba Dam on the Yangzi near Yichang. Both Gezhouba and Danjiangkou had to be halted (in each case for two years) once construction had been started because of inadequate planning, insufficient preparation, and unforeseen problems. This, one sup-

poses, makes Beijing leery of quickly approving large-scale projects.

The planning process is defective in other respects. Capital still is not seen as just another commodity. Planners, therefore, are reluctant to calculate the "interest cost" of investment. The Ministry of Water Conservancy and Electric Power is perhaps reluctant to calculate interest because the capital requirements of its projects are large and because construction times tend to be extremely long. Gezhouba will have taken about 20 years to build when it is completed, for instance. The result of not attaching a price to capital is waste. Moreover, water planners tend to be construction-oriented engineers. There has been less concern with financial planning than design planning. The ministry itself acknowledges that the engineers' mentality and the absence of social science and managerial experts has been a problem. Simply put, few persons in the planning process have been trained to ask: How can we extract maximum financial return from every project that we design and build? Comprehensive cost-benefit analysis is seldom employed. Skewed domestic prices for such basic commodities as coal make balanced cost-benefit analysis difficult. For example, how does one compare the "cost" of thermal and hydroelectric power plants if the principal fuel for thermal plants, coal, is selling way below the world price? (Only at the Yangzi River Valley Planning Office was I told that *economic* analysis is based on *international prices*.) The Chinese I interviewed were very reluctant to even attempt to assess broader "social costs," such as coal emissions and mining accidents, as part of a comprehensive cost-benefit analysis process. Moreover, wood, steel, concrete, and other basic construction materials are usually allocated to projects according to set ratios, so that a fixed quantity of each material accompanies each increment of investment. Obviously, this creates shortages and surpluses since different projects may need quite different proportions of materials.

Such questionable planning practices inevitably lead to bureaucratic wrangling, with each unit advancing partial arguments consistent with its preferred policy. This makes it hard for the government to choose between investment options.

SUBSIDIES
They hold the status quo together

The web of subsidies and differential prices creates constituencies that seem to resist any change of the status quo detrimental to their interests. The Chinese are just beginning to reveal the enormity of the subsidy system that they have created. A significant portion of China's budgetary expenditure is being consumed by these subsidies. The grain and cooking oil subsidy (¥28.8 billion during 1979–81 alone) is just the best-known example. Recently, Vice-Premier Yao Yilin announced that in order to compensate for increases in cotton textile prices, "subsidies of ¥100 million will be granted to China's poorest areas in an effort to balance the adverse effects scheduled increases for cotton textiles might produce on living standards."

And so it is with water, which is selling far below its cost of production, as noted earlier. Consequently, existing water systems decay, water is wasted amidst a shortage in the north, and capital is not accumulated to meet future repair and expansion needs. Yet, to raise the price to industry and agriculture would set off a domino effect of price changes throughout the economy.

Electricity subsidies are just as complex. In Gansu Province, for instance, some particularly arid regions at high elevations use large quantities of electricity to drive their irrigation pumps. These areas purchase power at a highly subsidized price—electricity costs per mu constitute about 5 percent of the farmer's per-mu output value. If the price were raised to a nonsubsidized level, electricity costs per mu would jump to about 30 percent of the output value per mu. The price of electricity is a critical matter for these areas which, predictably, resist efforts to change it. Similarly, small hydroelectric plants have received political guarantees that the power grids will purchase their excess electricity at comparatively high prices, even when the grid does not need the power. The result has been that the grids (particularly in the south) have had to occasionally curtail production at larger and more efficient generating plants so that they can purchase the output from the smaller, less efficient generators. These electricity revenues provide resources the localities can control. They fight to keep these funds because they offer a small degree of autonomy, and the capability to accomplish their own objectives.

Such widespread subsidization means, first, leaders who are trying to improve economic efficiency are treading on a political minefield. To change the subsidy patterns would be to redistribute the benefits of society. Second, it means that gradual change will be difficult to carry out because changing the price of one commodity will cause a reverberation throughout the economy. Moreover, price changes will produce both wage demands and budgetary demands.

Water politics in China basically centers on the twin issues of who receives and who is denied water and its derivative resources when there is not enough to go around. As elsewhere, the crises of the present tend to divert attention from the needs of the future. Moreover, because it crosses administrative boundaries, water forces different organizations and administrative units to do what they most abhor—to deal with each other. In the end, though, only through closer cooperation can China remove some of the political barriers that hinder the development of its water resources. ₹

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Dangerously high levels of industrial waste including cyanide, arsenic, and mercury pollute almost all of China's major rivers.

Rivers of Waste

Vaclav Smil

Nothing describes the state of Chinese urban wastewater treatment better than these facts: in 1980, in a country of some 200 million city dwellers, there were only 35 small municipal treatment plants, and over 90 percent of China's urban wastewater is discharged untreated.

It is not surprising that China has water pollution problems. Even rich industrialized countries have serious pollution problems despite decades of investment in treatment facilities and the enactment of stringent anti-pollution laws. Nevertheless, the statistics are awesome: China discharged 77.8 million cubic meters of polluted water daily, or 28.4 billion cubic meters per year, according to an official 1979 survey. Thus, for every 14 cubic meters of natural water available to China, one cubic meter was untreated wastewater. The annual economic loss caused by such massive pollution was put at about ¥5 billion ($2.5 billion at today's exchange rate). The study found that of 78 rivers monitored, 54 were polluted: 14 of these were classed as seriously polluted, including all major rivers in the country.

China's first big wastewater treatment facility was put into operation in Beijing's eastern suburb only in the fall of 1980. In the same year a new secondary treatment plant was completed near the capital's international airport, with a daily capacity of 15,000 tons and the effluent destined for irrigation. But these measures are mere beginnings. Beijing's sewage flow rose from 66,000 tons a day in 1954 to 1.8 million tons by 1980. The city's sewers, though extended to 1,270 kilometers, cannot keep pace with the inflow.

Shanghai's situation appears even more critical. The daily discharge of polluted water now surpasses 5 million tons, but only 200,000 are treated. The city is worse off today than in the mid-1970s because new sources of polluted water have nearly doubled—far in excess of new wastewater treatment capacity. Four million cubic meters of unprocessed sewage is dumped daily into the Huangpu River and its branches, making the river one of the world's largest sewers. Yet it is Shanghai's principal water source. Raw sewer outlets are interspersed among the city's eight water pumping plants. One intake, for the Zhabei ward, is a mere 40 meters downstream from a large sewer opening.

A similar situation can be found in most large Chinese cities. Tianjin reportedly dumps 1.26 million tons of untreated waste into the Hai River daily, which contains not only the usual urban and industrial wastes but also sea water flowing upstream, especially during dry years when the Hai He's volume is so low that inter-basin transfers are necessary to provide the city's water. Tianjin's drinking water also contains excessive concentrations of heavy metals, arsenic, and phenol, as do the underground aquifers of most Chinese cities.

A recent environmental study shows that 41 out of the 44 major Chinese cities relying heavily on underground water drawn on contaminated supplies. In nine cases (Beijing, Xi'an, Shenyang, Taiyuan, Baotou, Jinzhen, Baoding, Changchun, and Jilin) the level of pollution is serious. The danger of groundwater pollution is greater in shallow, sandy, or pebbly aquifers where percolation is easy; unfortunately Beijing, Shenyang, and Baotou have precisely this type of water-bearing strata.

The most frequent pollutants endangering both underground and surface water supplies are oil products, phenolic compounds, cyanide, arsenic, heavy metals (lead, chromium, cadmium, mercury), chlorinated hydrocarbons, nitrates, and sulfates. The heaviest concentration of industrial water pollutants is, of course, in large cities, and especially in the highly industrialized cities of the North and Northeast. However, as the sad example of Guilin shows, industrial water pollution is now worrisome in just about any large stream, save the remote rivers of Tibet.

Guilin possesses the most famous picturesque landscape in China. To many Chinese, and to an increasing number of foreigners who fly in, this northern corner of Guangxi Province is the most beautiful scenery the country can offer: wondrously shaped hills carved by water and wind in the karst region of the Li River, known for the surprising shapes and colors of vertical rocks protruding from lush paddy fields and meandering streams. It is a badly flawed fairy tale, though few tourists seem to notice anything awry.

The first public disclosures came in February 1979, telling about the Li River being so heavily polluted by phenol, arsenic, chlorides, and cyanide that three factories had to be closed down and operation of another suspended. But these measures came too late for most of the cormorants traditionally used for fishing on the river. In the past, these remarkable diving birds could catch over five kilos of fish a day, and a fishing team could bring in 50 kilos. Now three out of four fishing teams in a small town near Guilin have had to take up other occupations as their cormorants have died, a sad but inevitable result of accumulated toxic materials moving up the food chain.

Another tourist attraction marred by water pollution is the ancient Grand Canal. For example, in Jiangsu's Wujin County an oil refinery, some chemical factories, a paper mill, and a print and dyeing plant discharge all their wastes without treatment. Quantities of kerosene and, above all, phenol, became so high that local fishermen had to abandon the canal. Desperate, they "marched collectively on the factories to protest and to demand food," according to one report. The

plants were subsequently fined, and began to compensate the fishermen for a part of their lost earnings. But they continued dumping wastes into the canal.

Perhaps the most dramatic illustration of water blight occurred in Beijing. Several factories in the capital's Chaoyang ward were dumping huge amounts of untreated oil waste into the Ba River where it accumulated in a several-centimeters-thick layer. On December 16, 1979, some peasants working in a field on the southern bank of the river near Louzizhuang Bridge were warming themselves at a small fire when one of them tossed a smoldering piece of wood into the Ba River. The oil wastes immediately ignited, and in 30 minutes the fire destroyed the nearby high voltage lines, burned five steel sluice gates out of shape, separated the surface cement layer of the bridge, and lowered its load capacity by a third, for a total loss of more than ¥80,000.

Some invisible and tasteless pollutants produce less spectacular results, but are just as dangerous to human health. Uncontrolled releases of heavy metals have been responsible for some astonishingly high cadmium and mercury concentrations in rivers and underground waters. At the entrance of Tianjin's largest water treatment plant the Hai River reportedly carries 17 times the allowed mercury content; at the main outlet of Xi'an's Lijiahao reservoir the mercury concentration is 440 times the allowed standard; and along a 20 kilometer stretch of the Songhua River downstream from Jilin City, organic mercury concentrations reach 2–20 milligrams per liter —roughly five times higher than those recorded in the Minamata Bay in Japan, the location of the world's most famous chronic mercury poisoning epidemic. (International mercury standards for drinking water specify no more than 0.001 milligram per liter.)

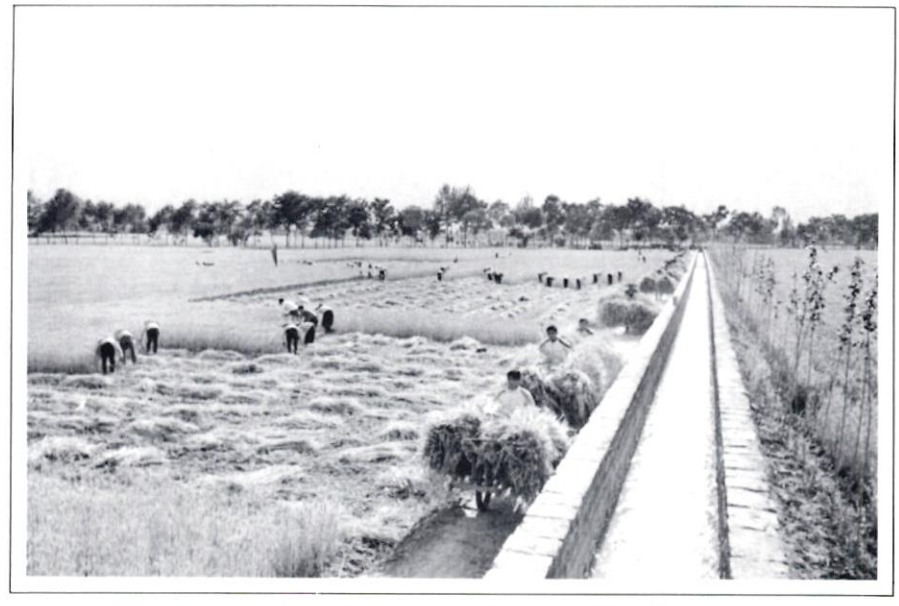
Vegetables irrigated with polluted underground water pose a real health threat to the inhabitants of northern cities. In the suburbs of Shenyang, for example, vegetables irrigated with polluted water were found on "numerous occasions" to contain chromium concentrations reaching up to 5.2 milligrams per kilo of cabbage, and 6 milligrams per kilo of spinach. International as well as US standards prescribe rejection of water as unfit when chromium exceeds 0.05 milligrams per liter, or one-hundredth of the Shenyang values. Polluted well water is blamed for rice harvested in Shenyang's suburbs that contained more than one milligram of cadmium per kilo. The international standard for cadmium is a mere 0.01 milligram per kilo.

Industrial and urban wastes are eventually carried out to the ocean, of course. But in the case of the shallow, semienclosed Bohai Bay, which enjoys little circulation, the pollution from surrounding ports, rivers, and oilfields has accumulated noticeably. In alarm, the State Council issued a directive in 1977 to improve the situation speedily. The Shengli and Dagang oilfields eventually began treating most of their wastewater, and heavy metal discharges reportedly are somewhat lower today. However, Bohai Bay is the arena of relatively large-scale offshore drilling, and this will certainly add to the sea's pollution.

Since 1978 Beijing has occasionally taken strong stands, issued strict orders, set aside special funds, and published innumerable exhortations. Any literate Chinese is by now aware of the magnitude and acuteness of the problem. Even functionaries inclined to read just the party daily can no longer plead ignorance. And yet, relatively little has been accomplished. Some new primary wastewater treatment plants were completed in big cities (the largest in Beijing and Jilin); various industrial enterprises have installed recovery systems to cut down pollution; and a few grossly offensive factories have been closed. But on the whole, the quality of China's surface and underground water has kept on slipping. Why?

Certainly not because of the lack of a legal or regulatory framework. China's Environmental Protection Law is explicit in its injunctions against pollution. Numerous local regulations based on the law can specify in detail any offense and the penalty. For example, stern antipollution regulations were recently promulgated for the port of Shanghai, where every day over 1,000 tons of sewage and 350 tons of garbage used to be dumped into the Huangpu River by more than 4,000 ships. The 18-point regulation forbids such practices as the uncontrolled discharge of waste oils, refined oil products, toxic pollutants, rinsing of ship decks into the river, redischarge of dredged bottom mud, and the use of chemical removers.

Nor does the lack of money seem to be the chief culprit. In some instances the allocated funds were relatively generous, but bore disappointing results. Again, Guilin affords an apt example. After the State Council issued guidelines for the area's pollution control in January 1979, it provided a special fund of ¥5.915 million. The regional government added ¥43,000, the unspent portion of its 1978 pollution control budget of ¥1.5 million. Local factories provided ¥190,000. The total of ¥6.1



Xinhua News Agency photo

Grains and vegetables irrigated with polluted water pose a real health threat in China.

million was far from an inconsiderable sum. Yet only ¥2.077 million was actually spent, just a bit over one quarter of the available sum—as if the improvements were not urgently needed. Just one more of many similar examples: A mill in South China released tons of wastewater that reportedly turned a local river into a "huge polluted ditch with purplish-black water over which floats yellow froth and under which lies heavily polluted sediments." Some 10,000 people living along this smelly stretch had to close their doors and windows in the summer, and eat vegetables irrigated by the water. Beginning in 1973, pressure to control the mill's effluents led to a state grant to the mill of ¥190,000, in addition to 23 tons of steel, 20 tons of cement, and 36 cubic meters of wood—expressly to establish a waste treatment facility. The plant's technicians were also sent to other provinces to study the installation and operation of pollution controls. Still, these measures have been without result.

The problem, according to some Chinese authorities, goes right to the heart of China's management structure. Writes one PRC official: "There are some plants which are not evaluated as Daqing-style [model] enterprises because of noncompletion of one of the eight economic indicators . . . while there are some enterprises which have polluted whole rivers and endangered the health of millions of people, yet this has not affected their placing as a Daqing-style unit."

Anything that does not contribute to higher production and early plan fulfillment (hence to special bonuses) apparently is neglected. Upper echelons of the bureaucracy reportedly cover up the mistakes of their subordinates to maintain the aura of successful supervisors. Understandably, such practices do not generate much fear of the new laws and regulations and may engender an attitude of arrogant nonchalance. When a fishing village at the entrance of the Hangzhou Bay complained in a letter to *Guangming Ribao* that yellow croakers had disappeared, that shark catches were down by 60 percent, and that in just four years jellyfish landings declined by 80 percent, Shanghai's main petrochemical plant, one of the principal polluters of the bay, extended in a letter "profound sympathy" to the fishermen. That is where the matter rests.

Because pollution control is largely neglected despite strong official support, successful examples are few. Unfortunately, one of the greatest water pollution "successes" of the recent past is a cruel fake. A shallow lake about 60 kilometers east of Wuhan was once one of Hubei's major fishery areas, and the source of drinking and irrigation water for 300,000 people living on its shores. Untreated discharges of three chemical plants built on the lake in 1959 led to heavy pollution, particularly the high accumulation of organic phosphates. The lake's fish and shrimps died out, and the water became unfit for drinking and irrigation. After 1976 four oxidation ponds were set up and, according to Xinhua News Agency, "pipes were installed to drain the effluent . . . thus avoiding the use of water-control channels."

The whole project cost ¥6.53 million, and 6 million work units of "volunteer" labor. A model of the installment even toured science and technology exhibits around the country. In 1978 broadcasts and articles began portraying the lake as pristine again, with fish catches surpassing the previous record levels. One news item claimed that the "physical health of the masses around the lake has been assured." Then a *People's Daily* correspondent visited the region in the summer of 1980, and came away with a shocking twist to the success story.

He heard "peasants incessantly beseeching high heaven: Hurry and save us! Save our children and grandchildren!" All sewage from the three large factories, the correspondent discovered, no longer went through pipes. Apparently one month after work was completed the pipes that were supposed to carry sewage nine kilometers from the plants to oxidation ponds ceased to function. Instead the untreated sewage flowed through an open canal along the pipes, a canal that was the only source of drinking and irrigation water for several tens of thousands of peasants. All food and water for these peasants was thus contaminated and the *People's Daily* correspondent did not see any solution in sight.

China's water pollution controls, both quantitatively and qualitatively, are akin to those of rich Western countries of several generations ago. Progress to date represents just the start of a long effort that is far from being completed even in the United States, France, or West Germany. The costs are, without exaggeration, enormous. Some exacting technologies and good management are called for. The rewards are many, and more so in China than in a typical rich Western country for a number of reasons.

In the Chinese countryside, hundreds of millions of peasants draw their drinking and cooking water directly from rivers, lakes, and ponds. Boiling this water kills bacteria, but does not affect the concentrations of heavy metals and numerous other toxic substances. Proper wastewater treatment before release would contribute immensely to rural health.

If China's wastewater were properly treated, more could be used for irrigation. Some 270,000 hectares of farmland is now irrigated by sewage in China, and the area is expanding. However, the potential for using treated sewage for irrigation is large. Calculations indicate that if all municipal wastes would be so used about 80 percent of all water consumed by cities could be reused in farming, at considerable savings. Of course, treated sewage is not particularly high in essential nutrients and hence very large volumes must be applied if it is the only, or prinicipal, fertilizer. Technically, this is not an insurmountable problem if the liquid can be used within a short distance of the treatment plant. Finally, by recycling more water, China could go a long way toward overcoming water shortages in China's capital and throughout North China. ₹

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China is about to become a pioneer in a technology developed in the USA.

Coal Slurry in China

Martin Weil

China is eagerly embracing a new technology that is still the subject of controversy in the US—the transportation of coal by pipeline. In response to the nation's transport bottlenecks, and emboldened by the prospect of increased funding, the Ministry of Coal Industry has put forth a preliminary outline for the construction of seven "coal slurry" pipelines (which pump a mixture of water and pulverized coal) by the turn of the century.

The proposed pipeline would link major coal-producing areas in Shanxi, Inner Mongolia, and Henan with major consumption centers in east and central China. Other lines would be located in the south and southwest.

Two lines, according to the ministry, have already received State Council approval. The first is a 700 kilometer line capable of carrying 30 million tons of coal per year from the proposed Junggar open-pit mining area in Inner Mongolia to the Hebei port of Qinhuangdao, for which Bechtel is participating in the feasibility study. The second is a 15 or 30 million ton line connecting the already developed and expanding mines in southeast Shanxi to the port of Nantong near the mouth of the Yangzi River. Both of these lines would have greater length and capacity than any other slurry line in the world.

The 440 kilometer, 4.4 million ton Black Mesa line in northern Arizona is the world's only operating coal slurry pipeline. Attempts by US coal companies and utilities to build up to nine additional lines around the US have been thwarted by local governments concerned about their water supply, by environmentalists, and above all, by the railroads, which have refused to sell their right-of-way to such formidable potential competitors.

The Chinese Coal Ministry argues that in socialist China such administrative difficulties will not arise. But in reality, few major projects in China escape opposition from those who are hurt, or simply feel they are not adequately helped, by proposed projects. Moreover, the roughly 80 million cubic meters per year of water needed by the lines in north China could strain the water resources of the region.

Cost is another formidable problem. It is not immediately obvious, even with the Coal Ministry's enlarged budget for 1983–85 under the remainder of the Sixth Five-Year Plan, how China will come up with the billions needed to build its first two slurry lines.

Nonetheless, coal slurry has acquired such bureaucratic momentum in the last nine months that pipelines might be operational by the late 1980s—the Coal Ministry's current target—which would make China a pioneer in this technology.

The US Experience

Slurry technology has developed over a 50 year period, first as a means to move waste tailings short distances, and later to transport concentrates longer distances where rail transport was uneconomical. Today there are 13 long-distance, non-coal slurry pipelines in operation throughout the non-Communist world, according to the Bechtel Corporation: 7 for iron concentrates, 3 for copper, 2 for limestone, and 1 for phosphates.

Coal slurry is essentially the same technology, but did not develop until the 1950s, when US power plants began to burn fine coal, and most important, rail freight rates started climbing. In 1957 Consolidation Coal built a 440 kilometer mine-to-power plant line in Ohio with a 1.2 million tons-per-year coal throughput, but it closed down six years later when the railroad cut its rates by 47 percent. Proponents of slurry credit the pipeline with pushing the railroad industry into the age of the efficient unit-train, a coal-only hauling system with substantially higher capacity.

Interest in coal slurry rebounded with the Western coal boom of the 1970s, which increased the demand for large volumes of mountain states' coal in the distant Midwest and South. Slurry seemed the logical answer, since it is more economical the longer the distance. US experts believe that in the continental US, moving roughly 10 million tons over 800 kilometers is coal slurry's break-even point. The efficiency of a slurry pipeline further improves if it serves just a few large customers, such as power plants.

Since 1970 at least 10 pipelines have been proposed, but only the Black Mesa line, completed in 1970, ever entered service. And only one other is in the advanced planning stage: the giant 2,200 kilometer, 27 million tons-per-year line (known as "ETSI," for Energy Transportation Systems, Inc.) from Wyoming's Powder River Basin to Arkansas. None of these schemes, however, is likely to be built until some way is found around the opposition of railroads, water interests, and other coal slurry foes.

The Chinese Rationale

Bureaucratic realities largely explain coal slurry's current popularity in China. Railway service is unpredictable, loading times excessive, and local railway bureaus tend to behave like mini-empires, according to Chinese official sources. As a *People's Daily* commentator put it in 1982: "Some railway and mining units do not have sufficient understanding of the importance of cooperating among themselves." It is hard to escape the conclusion that the alacrity with which the Coal Ministry has adopted the coal slurry idea is related to its documented history of trouble with the railroads.

Cost does not seem to be a factor. The Railroad Ministry levies a rate of about ¥.01 per ton kilometer to transport coal, which at current ex-

change rates is only roughly one-quarter of rates.

But even if service were better, it might not help the situation in Shanxi, China's largest coal-producing province, where 10–20 million tons of coal sits unmoved each year due to the lack of rail capacity. Foreign visitors often see piles of coal at railway sidings throughout the province, mainly from the mines under local government control that are given lower priority by the railroads. Other interior provinces—Shaanxi, Henan, and Guizhou—also suffer from lack of capacity. Although the government is stepping up investment in coal-carrying railroads (capacity out of Shanxi is expected to rise from about 72 million tons in 1980 to 120 million by 1985), the situation will take time to remedy.

It is hard to escape the conclusion that part of coal slurry's appeal to the Coal Ministry is that it represents an alternative to the poor service offered by the Railroad Ministry.

The introduction of special unit trains could ease this problem. But the Railroad Ministry has resisted unit trains, preferring general use cars that can carry a variety of cargo and run on any line. Ministry officials have explained that the rails, sidings, and radii of curvature on most Chinese lines are unsuitable to unit trains. However, the central government reportedly has decided to import as many as 200 high-horsepower diesel locomotives for unit trains, and to begin constructing a special line for unit trains from northern Shanxi to the coast within a few years.

Though coal slurry's primary appeal seems to be that it represents an alternative to the railroads, this does not mean that there are no economic arguments for slurry in China. Its advocates point to the anticipated increases in coal shipments out of key producing areas—mainly Shanxi—which rail will be hard-pressed to handle. This will exacerbate the already severe situation of rail cars returning to Shanxi empty. Moreover, coal slurry uses less land and frees up rail cars for other commodities, to mention a few of the pro arguments. Even a researcher at the Railroad Ministry admitted in the June 1982 issue of *Journal of Energy* that slurry could be an alternative to rail in certain cases. Many experts, both in China and out, see a case to be made for selected long-distance slurry lines as a complement to a rail system, though railroads would still carry most of China's coal.

Still missing, however, is a systematic study of the slurry–rail trade-off. What disturbs many foreign observers is that China may be jumping into slurry without carefully evaluating its merits against other transport options. In China's each-ministry-for-itself environment, such multisector feasibility studies are seldom carried out. Some proposed slurry lines, for example, run parallel to existing rail lines and, in one case, to a line that is in the process of being double-tracked and expanded. One would expect this to prompt some hard thinking about the suitability of slurry. Meanwhile, there are relatively inexpensive ways rail transport could be improved, such as by washing more coal and transporting less waste, upgrading load-out and unloading facilities, using larger cars (30–50 tons cars seem to be the norm, though China makes 60-ton cars, and the US uses 100-ton cars), and by running more unit trains.

SLURRY PLANNING

The Chinese reportedly first gave serious consideration to coal slurry in 1979, when several US engineering firms made presentations in China. Later in the year, a Chinese delegation traveled for a firsthand look at the US experience. The two key organs involved were the Coal Ministry's Central Design Institute and the former Electric Power Ministry, which has an obvious interest in obtaining a reliable coal supply.

Momentum for slurry generated quickly. By September 1980, it was being taken seriously enough for the official Communist Party newspaper *People's Daily* to publish an educational article in its favor, drawing heavily on information and arguments from the Black Mesa line.

As the article made clear, Coal Ministry planners were immediately attracted to the idea of a 700 kilometer line to the coast capable of transporting coal from the massive Junggar deposit in Inner Mongolia, which the Coal Ministry plans to turn into a 30 million ton open-pit complex by 1990. The plan bears remarkable similarity to the proposed ETSI line in the US, both in its capacity and flow design, which involves siphoning coal off for a number of large power plants en route. The parallels do not end there. The scheme to build an open-pit mining base at Pingshuo and Junggar in the dry highlands of Shanxi and Inner Mongolia bears a strong resemblance to the actual development of the Wyoming–Montana coal region, where the ETSI line would originate.

Slurry's grand plans were temporarily cut short by fiscal retrenchment in 1981, when virtually all large-scale capital investments were put on hold. But the Coal Ministry pushed steadily ahead with its slurry R&D work. Attention shifted to a proposed 150 kilometer, 1 million tons-per-year line from Meixian to Shantou in Guangdong Province, a project enthusiastically promoted by provincial authorities for an area without a railroad. This line would not require a large investment, and would provide experience for the larger lines later on. Test work for the line was carried out during 1981–82 by a research institute under the Coal Ministry in Tangshan. The third loop, which is reported to have operated satisfactorily, was over one mile long.

The promulgation of the Sixth Five-Year Plan in late 1982 created another abrupt change, and coal came out the undisputed winner. The Coal Ministry quickly revived its major slurry plans and began looking for support at the top. Sometime in 1982, an interagency coal slurry planning office was formed in the State Council headed by the Ministry of Coal Industry, the State Planning Commission, and the State Science and Technology Commission. (The Ministry of Railroads is conspicuously absent from this group.) Later,

the Chinese Academy of Sciences, under the Science and Technology Commission, became actively involved in slurry R&D, a sign of how accepted coal slurry has become in top planning circles.

A new interagency delegation traveled to the US in the fall of 1982. Upon its return, reports began to filter out about China's seven proposed slurry projects. They are:

▶ ***"Great Wall" line.*** Extending 700 kilometers from Junggar in north central China to the Bohai port of Qinhuangdao, this line is designed to carry 30 million tons of steaming coal annually (*see* page 11). The line would pass near the site of the proposed Pingshuo coal complex, and might transport coal from some planned mines in the area, though plans do not include transporting coal from the Antaibao mine under discussion with Occidental Petroleum. Most of the coal would be delivered to power plants in Hebei Province en route, with a portion shipped to other parts of China from Qinhuangdao.

▶ ***"Yangzi River" route.*** Beginning in Lu'an and Jincheng, two mining areas in southeast Shanxi that are separated by about 120 kilometers, this line would transport 15 million tons of coal annually, ending at the port of Nantong near the mouth of the Yangzi River. Later, the 964 kilometer line might be expanded to carry 30 million tons. At least initially, most of the anthracite and bituminous coal transported is expected to come from mines under local control. Coal would be siphoned off at locations along the Yangzi River for power plants and other local uses, with a portion shipped to Shanghai and Zhejiang from Nantong. Because the users are scattered over a wide area, considerable handling and shipping of the coal will be required after the slurry is dewatered. This would not be considered economically sound in the US.

▶ ***Yuxian–Wuhan.*** The 8–12 million-ton-capacity line would extend 500 kilometers from Henan Province to central Hubei Province.

▶ ***Luipanshui–Zhanjiang.*** The 850 kilometer line from Guizhou Province to the coast would transport 25 million tons per year.

▶ ***Meixian–Shantou.*** The smallest proposed line, this would transport 1 million tons 150 kilometers to the Guangdong port of Shantou. In mid-1983 interest in the line was eclipsed by the growing attention focused on the Great Wall and Yangzi River lines.

▶ ***Junggar–Baotou.*** This 100 kilometer line would run uphill, requiring large pumping facilities.

▶ ***Jixian County, Hebei–Tianjin.*** As with six out of seven proposed lines, this 200 kilometer, 5 million ton line terminates at a major port.

Most pipelines are in the conceptual phase, although the Great Wall and Yangzi River lines have the highest priority and have received State Council approval, the Coal Ministry claims. Planning on the Great Wall line is further advanced, probably because it has been under consideration for a longer time. In April 1983 a contract was signed with Bechtel to participate in a feasibility study of the pipeline, washing plant, and associated coal mines. (Perhaps not coincidentally, Bechtel has led the design work on the ETSI line.)

The Yangzi River line faces more uncertainties. Even its route is not completely settled. Some thought is still being given to running the line to Shandong, and then shipping the coal down the Grand Canal, an option that does not seem to be favored by Coal Ministry planners. Exactly who will use the coal has not been determined either. Despite these uncertainties, the Ministry of Coal wants to build the Yangzi River line before the Great Wall line because there already is surplus coal production in Lu'an and Jincheng that cannot be shipped. Both pipelines are targeted to be completed by the late 1980s.

SLURRY'S THIRST FOR WATER

China's slurry pipelines will use about 1 ton of water for each ton of pulverized coal. In other words, the arid North China Plain will lose about 80 million cubic meters of water annually if the 5 proposed lines for north China are built. This represents an amount of water equal to one-eighth of Beijing's total annual water supply.

In Shanxi Province, the source of most of the coal, the average annual rainfall is only about 600 millimeters. Ground water acquifers are about 450–500 meters below the surface, and surface water is not abundant. The provincial government recently promulgated "Regulations on the Management of Water Resources in Shanxi" in order to control water use. Although the full content of these regulations is not known, they are believed to prohibit the drilling of deep wells without provincial government permission. Informed sources indicate that any pipeline project in Shanxi will need to obtain some sort of water-use permit from the provincial Water Conservancy Bureau. The Ministry of Coal already claims to have received informal approval to use a reservoir near the Lu'an mines, and a small river (with a 7–10 cubic meters-per-second average flowrate) near Jincheng for the Yangzi River line.

The Great Wall line will rely on the Yellow River about 50 kilometers from Junggar. The approximately 1 meter-per-second flow required for the line is less than 0.1 percent of the Yellow River's annual average flow. But water disputes with downstream areas could occur during the very dry years.

LAND RIGHTS

Although the Ministry of Railroads cannot prevent the pipelines from obtaining the right-of-way to cross rail lines, as in the US, local agricultural interests could make it difficult for the Coal Ministry to obtain the land to build its lines. Local governments in China have been known to demand route changes, extort high rates of compensation, delay construction, or even force the cancellation of construction projects over the issue of land. A Coal Ministry official recently said that it often takes three years just to acquire land for a new mine.

The State Council issued national regulations on land acquisition in mid-1982, to bring some order to the situation. Among other things, these set standards for monetary compensation (not exceeding 16 times the average annual output value of the cultivated land), and seem to give provincial-level authorities the power to approve land purchases, even land requisitioned by central government ministries in Beijing. In view of this stipulation, it is not surprising that the regulations have not completely solved the problem. As recently as May, Premier Zhao publicly denounced a county in Shanxi for making extortionate demands on the government for land needed by

an aluminum plant.

Fortunately for the slurry pipeline interests, the amount of land to be requisitioned is small, as pipelines can be buried underground where land is tilled. Under the 1982 land-use regulations, farming units must be compensated only for what would have been produced during pipeline construction. All construction work could be done in the slack season anyway, US experts believe. Only the slurry preparation plants, the pumping stations, and the dewatering plants will remove land from cultivation.

FINANCING

Both the Great Wall and the Yangzi River pipelines would cost well over $1 billion if built in the US. Given China's high machinery and steel prices, the total bill in Chinese yuan could be just as big. The foreign exchange expenditure for mainline items such as pumps, valves, and dewatering centrifuges could easily run into the hundreds of millions of dollars for each project. As the Coal Ministry's annual construction budget is probably only about ¥4–¥5 billion at present, and its rumored exchange allocation about $500 million between now and 1985, it is obvious that financing will be a problem.

Chinese planners probably have not come to grips with the true dimensions of the cost. A Chinese pro-slurry magazine article, for example, mentioned the $39 million cost of the Black Mesa line in the late 1960s without adding that the cost for such a line would be higher now by several orders of magnitude.

Apart from central government grants, the Coal Ministry hopes to tap the budget surpluses, and extra-budgetary funds of areas and units that would benefit from the pipelines. There is more than ¥50 billion in extrabudgetary funds in China—funds outside the control of the state budget—that ministries have increasingly relied on for major projects: lenders and investors are normally repaid in the form of output from the project.

Finally, there is the possibility of foreign loans or direct foreign investments. This was discussed over a long period with Bechtel for the Great Wall line. What the Chinese have failed to do so far, however, is indicate a willingness to make the venture attractive to foreign investors.

BUCKING THE OPPOSITION

As is usual with large Chinese construction projects, the pipelines involve a coalition of entities with sometimes different interests: the Coal Ministry itself, the Ministry of Water Conservancy and Electric Power, the Ministry of Petroleum Industry (which will actually build the lines because of its oil pipeline experience), the Ministry of Communications (responsible for shipping of dewatered slurry coal), and the various provinces en route, which are fighting for larger shares of the coal. One obvious example of the pushes and pulls within the group is the uncertainty over the route of the Yangzi River pipeline. The number and location of dewatering plants is another issue that seems to divide the coalition. These kinds of disagreements stand to delay the Coal Ministry's ambitious construction schedule.

These are just the differences among friends that must be resolved. The Coal Ministry's differences with the Ministry of Railroads are far more serious. There is also opposition from Inner Mongolia, which believes that a new railroad would provide greater benefit to the province's economy. Shanxi's attitude is not known, but Coal Ministry officials claim that the desire to move stockpiled coal from locally controlled mines will lead to provincial support for the Yangzi River line.

The politicization of coal slurry is one of the most striking similarities between the Chinese and US experiences to date. If in the end the Chinese succeed in building large coal slurry pipelines before the US does, one of the main reasons will undoubtedly be a more accommodating political environment.

The author participated in a National Council delegation to China which investigated the possibilities for US business involvement in the proposed Yangzi River pipeline project on behalf of the US government's Trade and Development Program. Participating Council member companies included Bechtel, Dravo, Fluor, Morrisson-Knudson, Pickands Mather, and Texas Eastern. The author takes sole responsibility for this article's contents.

SLURRY'S BUSINESS PROSPECTS

Millions of dollars of business are riding on the Coal Ministry's gamble to court Western companies.

The Coal Ministry considers foreign assistance crucial to the success of its first two slurry pipelines. Its equipment shopping list consists mainly of critical pieces of machinery never made before in China: large pumping-station pumps, pipeline valves, and large centrifuges for dewatering plants at the termination of the lines. The value of the equipment for these two priority slurry projects could run into the hundreds of millions of dollars. Most other equipment would be made domestically, including the pipe, although the steel for pipe-rolling might be imported. The ministry hints that equipment for its five other proposed pipelines would be made in China under license.

More far-reaching than the equipment import lists, at least on paper, is the ministry's request for "all-around" assistance from abroad in conceptual engineering, coal sample testing, construction management, personnel training, and pipeline startup and operation.

China is turning first to the US, as the US has by far the most experience in slurry design and operation. After many years of discussion, Bechtel signed a contract in April to participate in the Great Wall line feasibility study, and at the same time, the US government's Trade and Development Program was asked to fund a feasibility study of the Yangzi line by a US firm.

Paradoxically, the Coal Ministry may have to adopt a tough bargaining position precisely because it wants to work so closely with foreign firms. Coal slurry is already a controversial program, and as the Baoshan Steel Mill experience shows, controversial projects that also are perceived as overly dependent on foreigners are in double jeopardy. The future of coal slurry in China could be riding on the ministry's skill in pacifying the critics while at the same time offering something of value to the foreigners.

RETHINKING R&D

The Chinese apparently have decided that new ideas can best be encouraged through profit incentives.

Denis Fred Simon

By the year 2000 China hopes to be at the same level technologically as Japan and the West were in the 1970s and early 1980s. This announcement appeared at the same time that Beijing called for a fourfold increase in the country's gross value of industrial and agricultural output by the end of the century. Both goals are impossible without rapid technological progress, which raises an interesting question: Does China have the research and development capability to conceive, coordinate, and implement such a stupendous achievement in just 17 years?

China's top leadership seems aware of what such an effort will cost, and has voiced its support, in both financial and political terms, for the expansion of the country's R&D establishment. An important expression of this support came in October 1982 at the National Science Awards meeting, where Premier Zhao Ziyang emphasized the role of technology in development, and criticized those who continued to pay lip service to the reform of China's research sector.

The announcement of the Sixth Five-Year Plan last December marked a further expression of the high-level attention being given to science and technology. According to provisions of the plan, 15.9 percent of state expenditures (reaching 16.8 percent in 1985) will be allocated for science, technology, and education—an appreciably larger percentage than the 11 percent that had been allocated during the previous five-year plan. Thirty-eight fields, and 100 key projects were identified. Moreover, a special fund of ¥130 billion was allocated for the "technical transformation" of China's more than 400,000 enterprises, in an effort to give first priority to the modernization of existing enterprises.

The culmination of Beijing's concerns about the need for more rapid technological progress was the formation, in January 1983, of a special supraministerial "leading group" directly under the State Council. The group, which is headed by Premier Zhao, contains representatives from all the leading economic, education, research, and defense R&D sectors. Its major function is to oversee national technology development programs. The decision to establish such a high-level body has added the authoritative stamp of the premier's office to lower-level restructuring in ministries and provinces.

Important changes are also evident on the foreign trade front. China has decided to forgo its prior effort to import only the latest, state-of-the-art technologies. As in the case of many developing nations, China has found that the successful assimilation of foreign technology depends on the existence of an indigenous R&D base, a realization that dovetails with the leadership's still-strong ideological preference for self-reliance. As a result, Beijing has been de-emphasizing the importation of whole plants, and is placing an ever-increasing stress on the acquisition of technology and managerial know-how. According to one report, over 8 million patent documents have been secured from overseas during the last several years.

In the belief that little actual "technology transfer" took place in the past when the emphasis was on whole plant purchases, China's leaders now want to make sure that their own R&D institutions reap the benefits of all foreign acquisitions. This has led to the creation of new "special groups," commissions, and other bodies to screen technology purchases and pass judgment on what may or may not be imported. Meanwhile, pressure has mounted to disseminate foreign technology among research institutes and factories as soon as it enters China. This will undoubtedly heighten the wariness of some high-tech foreign vendors.

These and other goals are set forth in a 15-year technology development plan that replaces the plan announced in March 1978. The plan specifies agriculture, energy, transportation and communication, computers and electronics, and medicine and health as major target areas. Six objectives are outlined, which focus on improving the research system and procedures for managing R&D personnel. The plan also advocates the formation of "technical service centers" throughout the country to consolidate local R&D resources. In addition, the plan emphasizes four types of transfers: laboratory to production, military to civilian and military, coast to interior, and from foreign nations to China. Most importantly, the plan sets in motion policies designed to increase the rewards for technical innovation, and to improve the evaluation of such innovations.

China's R&D System

China's research and development system is composed of five major elements: the Chinese Academy of Sciences and its affiliated institutes; the institutes under the direction of the Ministry of Education; the institutes under the control of the various ministries; the national defense research units; and the local research sector. All together, as of 1982, there were close to 8,000 research units throughout China, with approximately 4,600 of these above the

county level. The rest, many of which are involved in agricultural work, are below the county level. The situation in Shanghai reflects the complexity of the system. Shanghai claims 561 research institutes; of these, 14 are under the Chinese Academy of Sciences, 79 are run by ministries, 49 by municipal bureaus, 55 belong to enterprises, and 22 are under the jurisdiction of county governments.

According to the State Statistical Bureau, China had 5.7 million scientists and technicians in 1981. Of this total, 338,000 were engaged in research, while 2.07 million were involved in "engineering and technical" jobs. Only 10 percent of those engaged in research are described as "senior scientists," or scientists with advanced degrees and training equivalent to their counterparts in the West.

The major funding for research in science and technology comes from three sources: central or local governments, special project funds, and enterprises. In 1981, China allocated ¥6.6 billion for R&D, or 1.5 percent of GNP. Special funds are dispersed by either the State Science and Technology Commission, or its subordinate organizations at the provincial level. Each year, the SSTC has 500 or so national priority projects that it funds either jointly or independently. Enterprise funds come from the operating budgets, or retained earnings, of individual firms. In recent months, new sources and types of funding have become available from enterprise profits, tax credits, more rapid depreciation, and bank loans.

State Science and Technology Commission

Prior to the formation of the "leading group" for science and technology in January, the primary organization for managing and overseeing research activities in China was the State Science and Technology Commission, headed by Fang Yi. The SSTC still has a policymaking role, though it is most active in implementing policy. Some of the SSTC's policy and planning functions are now shared with both the State Planning Commission (in charge of long-range planning), and the State Economic Commission (in charge of annual plans). The change reflects the desire to more closely link research and production. In 1982, a new office within the State Planning Commission was established to facilitate close cooperation and improved planning with the SSTC. Zhao Dongwan, who holds a vice-ministerial appointment in both SSTC and SPC, serves as the executive secretary for the new office.

The counterpart to the SSTC on the military side is the National Defense Science, Technology, and Industry Commission, headed by Chen Bin. The Defense Commission was established in 1982 as part of Beijing's massive bureaucratic reorganization effort. It is composed of the former National Defense S&T Commission and the National Defense Industries Office. The purpose of setting up a unified body was to stabilize the previously erratic relationship between research and manufacturing units in the defense sector.

Western analysts know little about the actual size and capabilities of China's defense sector, since few have been allowed to visit defense-related laboratories or research institutes. A Ministry of Ordinance Industry report recently revealed, however, that the defense sector has three advantages over the civilian R&D sector: the quality and number of its scientific and technical personnel is appreciably higher; it has more and better equipment, especially sophisticated instrumentation and testing equipment; and it enjoys greater financial and political support, which has contributed to China's successes in the development of nuclear weapons and missiles. In addition, strong political muscle has come to the aid of large-scale defense projects requiring the mobilization and orchestration of units that otherwise would not cooperate.

Because of the past and present advantages it has enjoyed, the defense sector is now being called upon to provide technical assistance to the civilian R&D effort. Ever since China began to emphasize light industry in 1979, for example, military research institutes have supported the expansion of consumer goods production. The proctoscope and microscope industry in Jiangsu Province has benefited from military optics know-how, and military experts reportedly helped an artificial rain-making factory in Sichuan design better aerial explosives, to cite just two cases. Of course, the movement of technology and assistance from the military to the civilian sector can also move in the other direction, particularly in "dual-use" fields such as electronics and computers.

Along with the SSTC and the Defense Commission, the State Council has set up a think tank called the Center for Techno-Economic Research, headed by Ma Hong, the current president of the prestigious Chinese Academy of Social Sciences. The purpose of the center is to assess the feasibility of new policies and projects that involve a significant commitment of national financial and technical resources. Social scientists, as well as natural scientists and engineers, will participate in these assessment efforts. Recently, experts from the fields of coal science, transportation, environmental science, electric power, and economics were brought together to conduct a project appraisal of a Shanxi coal project.

Chinese Academy of Sciences

The CAS is the most prestigious, and as far as one can tell, most productive research organization in China. It is obstensibly the focal point for all basic research. As a result of the recent shift away from basic research, however, it is not uncommon to find CAS institutes or researchers engaged in cooperative projects with universities, the defense sector, or industrial ministries. For example, more than 10 CAS institutes recently signed an agreement with the Ministry of Petroleum Industry to conduct research on new technology for sea-bed exploration. The CAS also may serve in a review capacity, helping other units evaluate their research programs. In the summer of 1982, the CAS's mathematics and physics departments assessed the work of the Sonar Research Institute at Donghai, and contributed to the development of a multiple beam sonar for fishing, and instrumentation for preparing topographic profiles in underwater strata.

The CAS supports 117 institutes and nearly 80,000 employees, of whom approximately one-third are engaged in research work. Most of the Chinese scientists trained in the West prior to the Communist takeover in 1949 work at CAS facilities. The CAS also has several branch

academies in such cities as Shanghai and Guangzhou. These local branches administer, independently or jointly, their own research institutes. The Chinese University of Science and Technology in Hefei also is administered by the CAS. The current president of the CAS is a Western-trained chemist, Dr. Lu Jiaxi, who is supported by a "scientific council" composed of 400 members of China's scientific community.

Ministry of Education

For the most part, the research system within China's higher education sector remains undeveloped. This is due, in large part, to China's decision in the early 1950s to adopt the Soviet R&D model and make universities the center of teaching, not research. Since 1978, a major effort has been underway to strengthen the research capabilities within many of China's 715 colleges and universities. The World Bank's November 1981 loan to China for $200 million, the bank's first credit to the PRC, was for instruments, computer equipment, and training at 26 key Chinese universities.

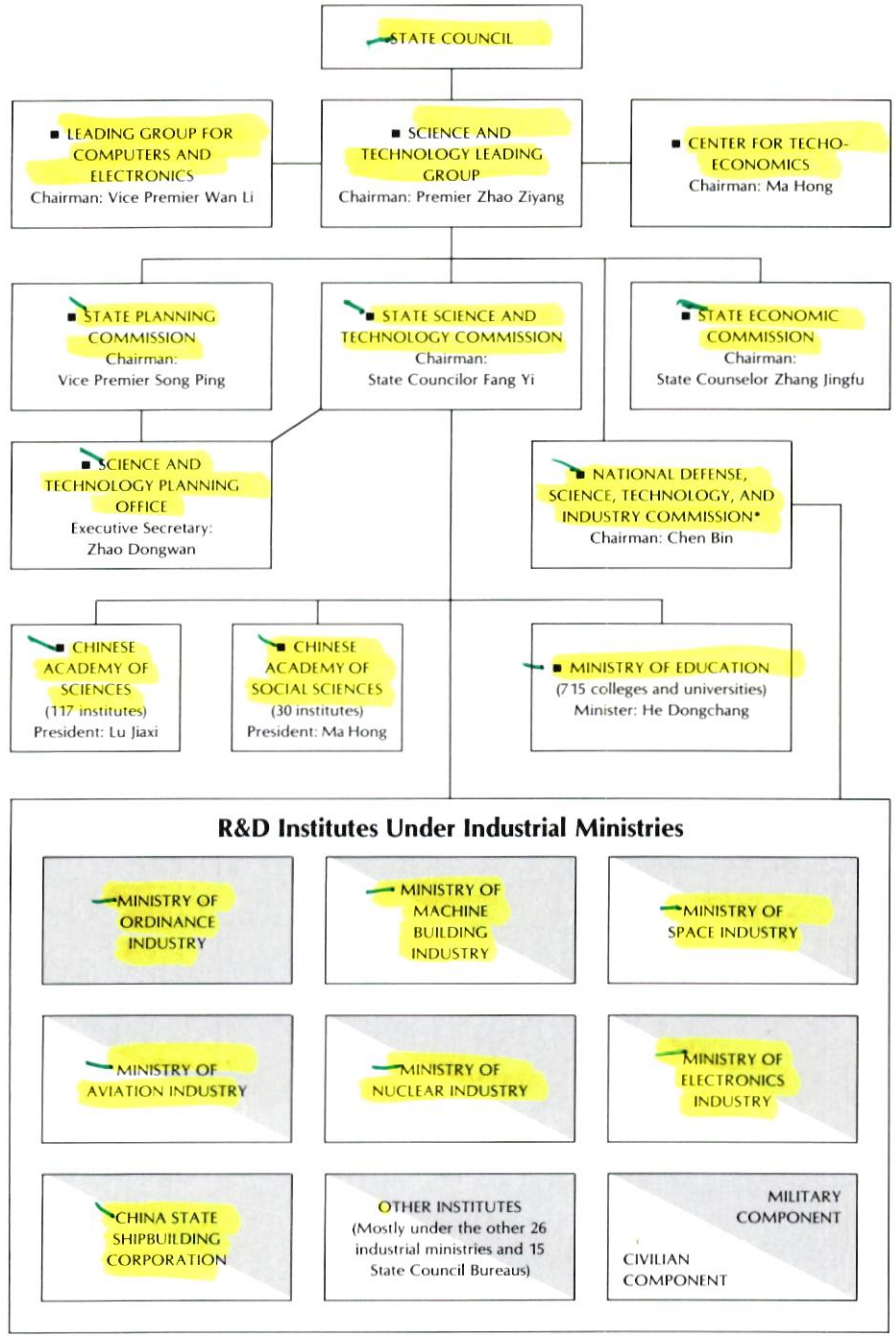
Funds for university research will continue to be in short supply, even with Beijing's increased allocations under the Sixth Five-Year Plan. In the meantime, some of China's more entrepreneurial universities have set up consulting relationships with local enterprises or government offices. Jiaotong University in Shanghai, for example, earned over ¥1.5 million in 1982 from consulting through its Department of Technical Services.

Ministry Research Institutes

Every ministry in China maintains institutes and research support staffs. These institutes tend to engage in applied research, and are administered either directly by a ministry's headquarters in Beijing, or by the ministry's local bureau at the provincial or municipal level. In some cases, such as the Ministry of Chemical Industry, there exists a large and well-defined research structure composed of engineering and design institutes, colleges, and technical schools. According to the Chemical Ministry's Research Office, these include 180 chemical research institutes, of which 23 are run by the ministry, and 8 by state-owned chemical complexes. The remainder, for the most

CHINA'S R&D ESTABLISHMENT

About 1.5 percent of China's GNP is allocated to R&D. This supports 338,000 research scientists at 3,400 local, and 4,600 provincial or central government research institutes.



CHINA ASSOCIATION FOR SCIENCE AND TECHNOLOGY — Chairman: Zhou Peiyuan

CAST oversees 105 professional societies, mostly devoted to R&D. Through its conferences, projects, and other activities, CAST brings together scientists and researchers from all of the above organizations who might otherwise lack professional channels of communication. CAST is a "mass organization" under the State Science and Technology Commission and the Central Committee of the Chinese Communist Party.

CHINA SCIENCE AND TECHNOLOGY CONSULTATIVE SERVICE CENTER — President: Lin Bomin

Composed of around 500 separate consulting organizations, CSTCSC was established by, and draws upon, CAST member organizations and personnel to carry out multidisciplinary studies on a fee basis.

*Established in August 1982 combining former National Defense Science and Technology Commission and National Defense Industries Office

Sources: Chinese press reports, National Council files, and Christopher M. Clarke (ed.) *China Business Manual 1982 Supplement*, National Council for US-China Trade, July, 1982.

A Question of Confidentiality

Stanley B. Lubman

Foreign firms frequently ask how they can protect themselves against unauthorized transfer or use of technology by Chinese domestic entities.

The problem of protecting proprietary information in China is a legitimate concern for any company considering transactions involving technology transfer, as in a license or as part of a joint venture, co-production, or compensation trade arrangement.

Q: How can foreign firms protect their technical know-how in China?

A: Know the limits of your Chinese partner's authority. But don't forget to insist on the right contract clauses.

A confidentiality clause frequently used by the China National Technical Import Corporation, or TECHIMPORT, the state trading agency handling the bulk of China's turnkey imports, provides that "within the validity time of the contract the Buyer shall not disclose or publish in any form to any third party *outside* China the contents of the know-how supplied by the Seller to the Buyer." Getting TECHIMPORT to accept non-disclosure to entities *inside* China may be somewhat more difficult.

Curiously, when foreign negotiators have tried to limit disclosure within China to the end-user with whom negotiations have been carried out, some TECHIMPORT negotiators have been willing to state (in private) that any Chinese organization other than TECHIMPORT or the end-user would constitute a "third party" to whom disclosure would be unauthorized. Yet some of these same TECHIMPORT negotiators have also been unwilling to express this interpretation in the contract. In one recent negotiation, the TECHIMPORT representative agreed to add language preventing disclosure by the Buyer "to any person without connections with the present contract," which is still not completely satisfactory. Fortunately, other importing organizations and end-users in China are increasingly willing to limit disclosure or use of the licensed know-how to a named manufacturing facility, a hopeful sign that the need for more explicit protection is gaining wider recognition in the PRC.

A brief perusal of a typical Chinese contract helps explain why US technology sold to China may need protection. The standard TECHIMPORT contract, for example, states that the Seller (the foreign licensor in this case) must guarantee that the technology "shall be the latest technical achievement possessed by the Seller." It may further stipulate that the Buyer be supplied with "all relevant technical documentation including design, calculations and research reports, quality control, product drawings, manufacturing technology, inspection, installation, operation, and maintenance" of the product. References to "assembly drawings," "process instructions," "equipment operation instructions," "tool drawings," and "parts and material specifications" are also common.

Assuming that the Chinese end-user agrees to treat other Chinese entities as third parties, the foreign company still has the difficult task of figuring out what is a "third party" in China's labyrinthian bureaucracy. The lines of jurisdiction between organizations are often unclear, and a stable equilibrium between centralization and decentralization has yet to be found. Moreover, the number of Chinese agencies authorized to negotiate technology transfer agreements has increased dramatically in the last four years. No longer are TECHIMPORT and the other central government trading corporations the only entities authorized to sign such agreements. Most ministries have launched their own competing agencies. Even individual enterprises are sometimes authorized to sign foreign trade contracts. The picture is even more confused when one includes the Special Economic Zones in Guangdong and Fujian, and the cities of Shanghai and Tianjin, all of which have gained greater autonomy.

Given the blurred lines of authority that exist, a foreign firm may have to discount assurances of Chinese organizations that claim to possess authority not only to enter into tech-

nology transfer agreements, but to protect the foreign firm in certain necessary ways. Consider, for example, a promise to a US firm by a provincial bureau of chemical industry that factories in other provinces will not export to the US. Does the provincial bureau really have the means to prevent its parent body, the Ministry of Chemical Industry, from transferring the necessary know-how to subordinate plants in other provinces, or to prevent their provincial bureaus from negotiating with competing licensors? The US company would do well to be skeptical. Suppose, too, that the bureau cautions the foreigner not to go elsewhere, such as Beijing, for assurances. If the foreign company is confronted with a choice between accepting a local organization's assurances at face value, or seeming to be impolite or mistrustful, I would advise trying to obtain fuller assurances and support at the central level, taking care to tell the local Chinese organization that such action is being taken. It behooves the foreigner to risk embarrassment in order to avoid some momentous problems.

Finally, what happens when a company suspects or discovers that its technology has been improperly disclosed? What remedies are available?

China's draft patent law provides for damages for infringement, though the law is not expected to be promulgated for some time. This increases the importance of the contract, which Chinese legal specialists consistently assure foreigners will always be honored. It is important that foreign companies obtain clear contractual expression of the obligations of the Chinese partner not to disclose or duplicate licensed technology or other proprietary information without the licensor's consent. In licensing, and almost any other trade or investment agreement I can conceive of, a satisfactory third-country arbitration clause should be included, as well.

The need for stronger guarantees has led some to ask whether Chinese courts can enforce contractual stipulations prohibiting technology transfer. In practice, Chinese courts still operate outside the purview of the state bureaucracy, and judicial review of administrative acts does not yet exist. (But recent legislation has made Chinese courts the appropriate forums in tax and labor disputes involving foreigners.)

Foreigners would be well advised to look first to extrajudicial remedies. They should first contact the Chinese party to the contract that they suspect is committing violations. Restrained, tactful, nevertheless unambiguous expressions of concern that duplication of the company's technology would violate a prior agreement (perhaps in the context of technical seminars and an offer to enter into discussions about additional license agreements) should carry the company's message convincingly. If such discussions do not succeed, the company should bring the violations to the attention of a high-level agency, such as a ministry, whose authority runs *vertically* downward to the organization that has violated the contract or is duplicating the technology. Other routes would be to seek out other organizations, but of equal or greater political clout, that can approach the bureaucratic hierarchy involved *horizontally*. These choices are not mutually exclusive. For example, if a licensor believes that a provincial chemical enterprise is wrongfully duplicating its technology, not only should a licensor complain to the enterprise's superiors, such as the provincial chemical industry bureau and the ministry itself, but also to the local government (the horizontal route), and to the Ministry of Foreign Economic Relations and Trade.

Regardless of how much progress is made toward regularizing Chinese law, the settlement of disputes involving foreigners, in the near future at least, is more likely to be through negotiations than any form of third-party adjudication. Foreigners who encounter problems arising out of alleged contract violations should take the system as it is—highly incomplete—and try to gain access to, and seek the assistance of, nonjudicial Chinese agencies that have a big stake in China's commercial credibility abroad. ₹

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part, are run by large, collectively owned enterprises. Of the 17 major chemical engineering and design units in China, 13 belong to the ministry. Provinces and cities with large chemical enterprises usually fund and operate their own R&D units. There are 40 chemical colleges and colleges with chemical specialization. Similar research networks exist in the metallurgical sector (with 66 research units and 61 colleges), and in the textile industry (which boasts 83 research units and 14 textile colleges).

Contrary to the "application-oriented" image of China's research units, most lack close ties with enterprises and, for the most part, have failed to tackle practical production problems. Moreover, research personnel are badly scattered and there are simply too many research institutes, according to China's top R&D administrator, Fang Yi. Many of these problems can be traced to the introduction of Soviet-style planning in the 1950s, when factory managers were told to pay attention to output quotas above all else. With few, if any, rewards for technical innovation, factory managers had little incentive to develop close ties with research units. Those links that did develop were usually conducted through "back-door" methods, and were aimed at maintaining the existing level of production rather than developing new products or more efficient manufacturing methods.

Research for Profit: The Time Has Come

In recent years, several changes have been introduced to provide stronger incentives for both the research units and the enterprise manager to establish closer and more sustained working relations. One is the newly instituted "production responsibility system," which places enterprises more on a profit-and-loss basis. This has opened the door to mutual profit-making opportunities for both the enterprise and laboratory. Another change has been the emphasis on "intensive" rather than "extensive" development, which refers to upgrading existing enterprises instead of building or importing new ones. These factors have spurred the development of several new organizational forms called "alliances," "brain-trusts," "research-production unions," and "coalitions." In Liao-

ning Province, for example, 31 research and design institutes, 6 universities, 76 enterprises, and 20 units outside the province have been involved in numerous "research-production" unions since 1979. These engage in joint planning, product development, and production-related research. They have reportedly helped exploit untapped resources, develop new products, and upgrade equipment design.

In cases where formal and sustained ties are impossible or not desirable, enterprises have simply paid research units for their services. Three forms of contracts appear to predominate: The institute sells its rights to a new technology directly to the factory and receives a fee; the institute signs a contract with a factory to provide technical assistance, and after the product is marketed, the institute receives a percentage of the profit at an annually decreasing rate, such as 20 percent the first year, 10 percent the second year, and so on; or an institute provides technology to a factory and receives a percentage of the sales as compensation, once again at a decreasing rate, such as 5 percent during the first year and 3 percent during the second year. An example of the first case is provided by the Chongqing Nonferrous Metals Research Institute and the Jiangbei Electronics Equipment Plant, which signed a contract in 1981 to jointly test several new products. Under the agreement, the institute developed and supplied components that the factory assembled. As a fee for its services, the institute received 45 percent of the production value of the units sold. The factory received 50 percent, and 5 percent was alloted for administrative overhead. In the same city the Chongqing Machinery Research Institute, Chongqing Spark Plugs Factory, and Chongqing Low-pressure Container Factory agreed to jointly design an automatic welding machine for spark plug production. Under their three-way agreement, 4 percent of the sales value of each unit went to the research institute until 100 units were sold.

Closer cooperation between research and production units is by no means geographically confined. Shanghai plants, for example, have received requests for technical assistance from all parts of China. According to Wang Daohan, Shanghai's mayor, the city received 105 technical delegations in 1982. Today 17 of China's provinces have some form of technical cooperation with research or production units in Shanghai. Last year the city earned more than ¥20 million through such activities.

The value of these activities to the respective production units is quite clear, but one should not overlook their contribution to a healthy research climate in China. By injecting more money into the R&D sector, enterprises have increased the demand for new technology and technical assistance. Under China's pre-1978 economic system, "technology" as a commodity had little or no value. Without adequate compensation, research institutes had no real motivation to help enterprises. Today, as research units and their managers attempt to upgrade facilities and purchase new equipment, they see new earning opportunities that were unavailable in the past. One Tianjin organization has launched the newspaper, *Technology News*, that carries the ads of local research units publicizing their services and most recent technological feats.

This so-called "commercialization" of research, however, has had some undesirable consequences. Some firms have been accused of establishing "technological blockades" and refusing to share newly developed or acquired information. Contributing to this problem is the lack of any laws in China to protect proprietary information. As technology develops an economic value, some units have felt threatened by requests from above and below to share their know-how with other units.

The research-for-hire concept has other problems, too. In Shanghai a researcher was recently accused of "accepting a bribe" and arrested. The controversy involved an engineer at the Shanghai Rubber Products Research Institute, who worked in his spare time to help the Qinqiao Rubber Factory develop a better sealant. His assistance greatly benefited the factory, which was happy to pay his ¥88 per month consulting fee. Though eventually acquitted of "bribery," his example could make other researchers think twice before charging for technical assistance.

Locally Controlled Research Units

The number of research units under the control of local government authorities and collectively owned enterprises has proliferated in recent years. In some cases, as in the major municipalities, these units possess some highly trained individuals and a respectable level of technical competence. Others can be quite small, have less than 10 staff members, and represent no more than paper organizations.

Provincially controlled research units are generally coordinated through provincial science and technology commissions, the local representatives of the State Science and Technology Commission in Beijing. Overall, the local S&T commissions perform three functions. They help coordinate national projects, make sure that national priorities and policies are followed, and support pilot or experimental projects. In practice, however, projects and institutes in China generally come under so many overlapping lines of authority that the local S&T commissions frequently manage activities jointly with other organizations. There also is a lack of clarity with respect to funding channels and control over personnel. As a result, the vertical chain of command is often unclear, leaving the local S&T commission in a rather ambiguous position.

Chinese Association for Science and Technology

In theory, CAST is a nongovernmental organization directly under Party control. Nevertheless it plays a vital role in bringing people and institutions together that otherwise might never meet. CAST is principally an administrative body that oversees 105 professional societies, both national and local, the majority of which are concerned with R&D matters. These societies are composed of the leading administrators, scientists, and researchers in any given sector. As is so often the case, these individuals work in isolation from their peers in other units that fall under different chains of command. The societies bring them together on projects, conferences, and on other occasions that greatly promote the cross-fertilization of ideas and information.

But CAST is more than an aca-

demic association. In recent years, it has assumed an important role in developing a network of technical advisory groups and consultative bodies supporting factory managers, and even China's top policymakers. In early 1983, CAST played a major role in the formation of the China Science and Technology Consultative Service Center in Beijing. The center, composed of more than 500 separate consulting organizations, serves as a vehicle for bringing together multidisciplinary teams of experts to advise on economic and technical matters. Where appropriate, advice reportedly will be rendered on a fee basis. The appearance of this body reflects the government's increasing efforts to marshal technical talent and put it to work on feasibility studies and project appraisals to avoid the wasteful mistakes of the past.

China's top leaders seem more aware than before that it is not just the shortage of R&D personnel, but the failure to use their skills that has hampered the country's development. Now the government is endeavoring to cure "technology indigestion" by speeding up the flow of information among factories, domestic R&D units, and foreign vendors of advanced technology. Japanese firms already have had some modest success in linking up with these efforts by reorienting their business strategy to support technology transfer. This basically involves improving plant management and plant layout—two forms of "soft" technology that are badly needed in China. It is through similar basic technical assistance to enterprises that China's own R&D institutions are being called upon to help modernize Chinese industry by the year 2000. ₹

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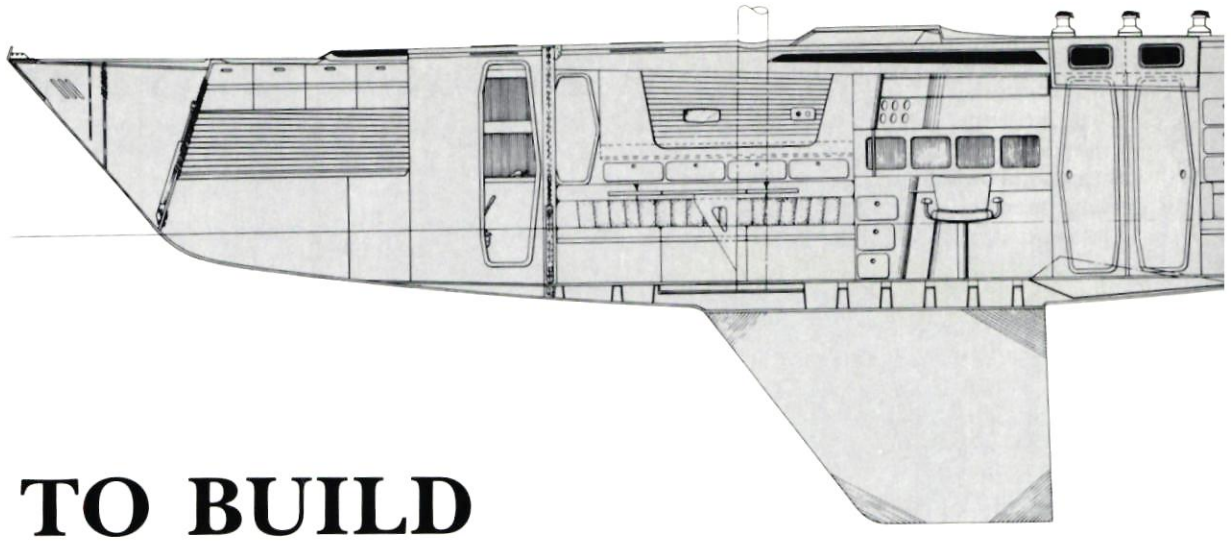


HOW TO BUILD A YACHT IN CHINA

Steven Hendryx

A modern, high-performance yacht is at once a complicated, sophisticated piece of machinery and a work of art. It is essentially a rich man's plaything. And rich men, we know, can be very particular about their toys.

Taiwan is presently the world's foremost producer of large (over 35 foot) fiberglass sailing yachts. Officials across the strait in Guangzhou couldn't fail to note the foreign exchange potential of this labor-intensive industry. A single yacht can sell for as much as half a million dollars.

So last year they decided to enter the yacht business. In March 1982 a McLean, Virginia company, Dynasty World Yachts, signed an exclusive contract with the China State Shipbuilding Corporation, Guangzhou branch, to produce luxury sailing yachts. CSSC's subsidiary, the Nanhai Yacht Company, was especially set up to make yachts to Dynasty's specifications, and Dynasty agreed to market them worldwide.

I managed the start-up of the operation, first in the US and then in China, as work got underway there last August. Today we are working on the prototype yacht, which should be completed before the end of the year. Plans are to ship the yachts to the US, where the mast and rigging will be added. If orders meet expectations, we should be building 20 yachts in Guangzhou by 1984. In every respect the venture has been an incredible challenge, as we had to tackle most of the problems that companies commonly face in establishing a manufacturing operation in China.

MANAGEMENT
Quality control at the top

For tax and customs duty reasons, we structured the venture as a processing arrangement (*lailiaojiagong*, literally, "bring materials, add labor"). Dynasty agreed to provide the designs, import virtually 100 percent of the materials and components, and provide the on-site technical assistance of half a dozen American yacht-building experts. The factory remains completely Chinese-owned. Upon completion of the yacht and acceptance by Dynasty, a pre-established fee is paid to the Nanhai Yacht Company and the yacht becomes Dynasty's property.

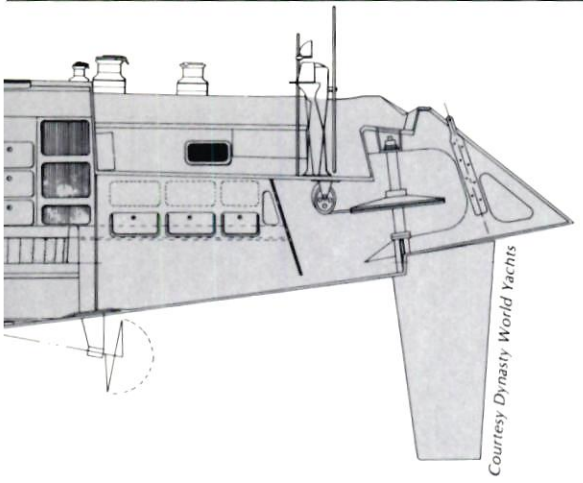
Fortunately for us, the Chinese demonstrated a real willingness to learn. While the contract made it clear that we were "advisors" rather than partners, it gave us wide latitude in structuring the organization of the factory. In one of our first organizational meetings, the Chinese factory manager asked me to write out job descriptions and duties for his management staff. He said in effect, "You say how you want it done and we'll do it."

The contract took only six months to negotiate. Structuring the deal was the easy part. The real difficulties began to surface when we discussed the topic of quality—what it is and how to control it.

Consider this problem: Not one of the 100 Chinese workers and managers had ever seen a yacht. Their jobs at the shipyard had been building steel coal barges. The Chinese word for yacht—*you ting*—further confused the image, since it can also refer to the little rowboats used in public parks.

So as our first task, we set about acquainting the Chinese with our product and its place in the market. There being no yachts in China, we brought along photographs of racing yachts and arranged to take several of the key managers and workers to Hong Kong to see some yachts in action. We tried to convey some sense of our customers' lifestyles and expectations by showing slides of Beverly Hills mansions, interiors from *Architectural Digest*, magazine ads for expensive cars, and pictures of the shops on Rodeo Drive.

We then began organizing a number of small work groups that would take responsibility for the quality of their work. The groups, or "quality circles," would meet on a regular basis to address such questions as: Where did we go wrong? Where did we do especially good work? Why? We saw this as a natural development



Courtesy Dynasty World Yachts

Starboard inboard profile of Dynasty's 48' high performance sloop under construction in Guangzhou

among Chinese workers who had grown up with "criticism and self-criticism" meetings. The Chinese, in typical fashion, wanted each group to follow a fairly elaborate system of procedures, with inspections, forms, and signatures. The Chinese wanted to ensure that if anything of substandard quality passed through the system, they would at least know who was responsible. (They even suggested that losses due to carelessness be charged against the worker's salary.)

Still, the key question remained unanswered: Were the Chinese really able to evaluate their work in terms of Western criteria?

The arrival of Mr. Chen, the quality control department manager, illustrated the problem. Chen decided immediately to involve himself in quality control throughout the plant. He specified the rigorous inspection system each department would follow. But having never so much as seen a yacht, he was by his own admission unprepared to pass judgment on the quality of the work produced.

During negotiations, we insisted on and won the right to veto any part —or even the whole yacht—that didn't meet our quality standards. The Chinese wanted us to develop written, quantifiable criteria that could be objectively verified. This might work with the critical dimensions of a shaft or a gear, we reasoned, but how does one write standards to judge the finish of a piece of wood, the neatness of a fiberglass lay up, or the lack of ripple in the surface of the hull? Our technicians were not used to thinking in such terms, since there are no published industry standards.

The only answer was to learn by doing. So we had our technicians use the prototype yacht, still under construction, to show the Chinese the quality our technicians required for each part. These will be the standards adhered to for future yachts.

Poor quality in the US is frequently caused by worker carelessness. In our experience in China, it was more often caused by a lack of understanding of the quality level required. Once a worker was shown the standard, he usually met it.

We have done our best to instill a sense of pride and responsibility in the workers. The factory must be kept neat and clean at all times—cleaner than similar shops in the US. Someone works full time just sweeping the floors of the woodworking shop, for example. The workers and managers wear uniforms of their own choosing: a business suit for the managers, sports jacket and tie or jacket and skirt for the staff, and a work uniform for the rest. We also have outlined a worker incentive plan in the guise of an "over-fulfillment of quota" bonus, for which there is ample precedent in China. It rewards quality by counting only the production that strictly meets the quality standards.

In the final analysis, the responsibility for the quality of the prototype—which sets the standard for the entire project—rests with the US technical experts. The fact that they are considered only "advisors" is but one unusual aspect of our unique *lailiaojiagong.*

ORGANIZATION
Shared responsibilites

We had 100 non-English speaking workers, 6 non-Chinese speaking Americans, and 30,000 man-hours of work that had to be divided among them for the production of one yacht. How would we start?

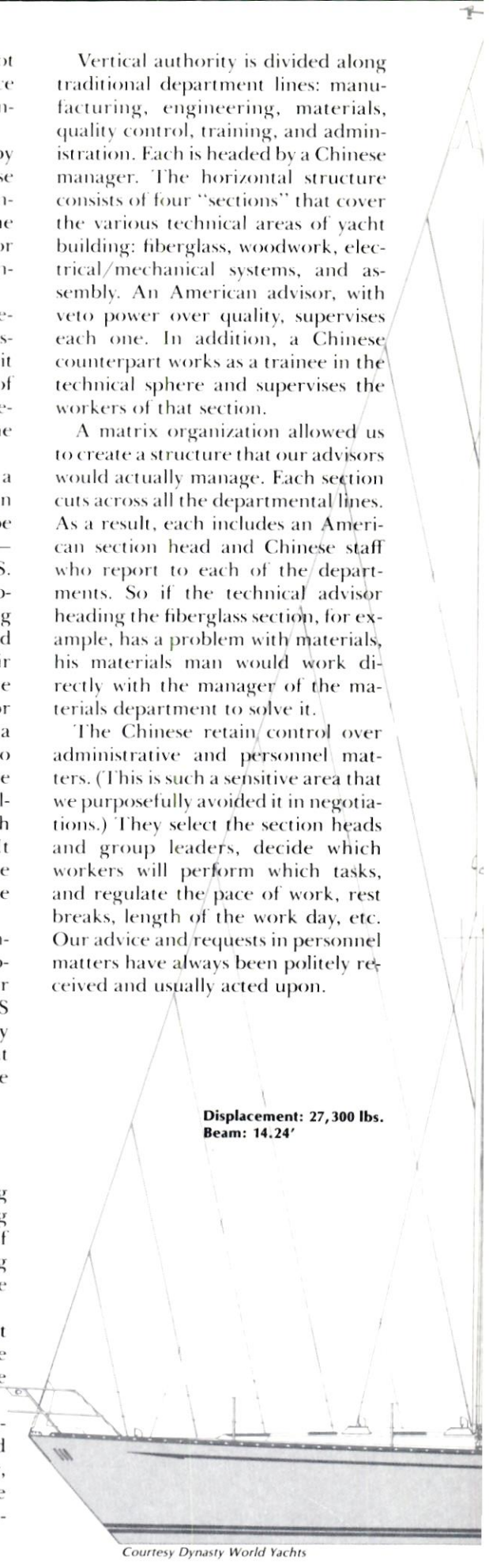
We wanted to devise a system that would give us the broadest possible authority without overstepping the bounds of our "advisory" position.

Our solution was developing a matrix organization with "vertical" and "horizontal" lines of authority, which brought everyone under the joint supervision of the Chinese managers and American advisors.

Vertical authority is divided along traditional department lines: manufacturing, engineering, materials, quality control, training, and administration. Each is headed by a Chinese manager. The horizontal structure consists of four "sections" that cover the various technical areas of yacht building: fiberglass, woodwork, electrical/mechanical systems, and assembly. An American advisor, with veto power over quality, supervises each one. In addition, a Chinese counterpart works as a trainee in the technical sphere and supervises the workers of that section.

A matrix organization allowed us to create a structure that our advisors would actually manage. Each section cuts across all the departmental lines. As a result, each includes an American section head and Chinese staff who report to each of the departments. So if the technical advisor heading the fiberglass section, for example, has a problem with materials, his materials man would work directly with the manager of the materials department to solve it.

The Chinese retain control over administrative and personnel matters. (This is such a sensitive area that we purposefully avoided it in negotiations.) They select the section heads and group leaders, decide which workers will perform which tasks, and regulate the pace of work, rest breaks, length of the work day, etc. Our advice and requests in personnel matters have always been politely received and usually acted upon.



Displacement: 27,300 lbs.
Beam: 14.24'

Courtesy Dynasty World Yachts

MATERIALS MANAGEMENT
Overseeing the imports

Our next pressing concern was the management and control of the hundreds of thousands of US dollars worth of raw materials and components we took to China.

We were fortunate that the Chinese insisted on practicing a tightly controlled stockkeeping system—kept under lock and key—whereby every part must be checked out with a stock request voucher. Each part number is later recorded on an inventory card, and placed in a ledger showing all the parts used in each yacht.

The major problem was the Chinese's lack of familiarity with many of the 2,500 different components and materials used in the yacht. Anticipating this, we brought along a trunkful of catalogues from the vendors who supplied the materials. Then we teamed up a Chinese worker trained at a heavy machinery factory with a Chinese-speaking French woman, to tackle the translating job.

Working with our computerized bill of materials (which included the vendor name and the vendor part number), they looked up each part in the catalogues, made a copy of the accompanying picture, and did the best translation they could. Then they affixed a copy of the picture to the back of each stock card, printed a master list of all the part numbers, added the Chinese translation and, using copy labels from Hong Kong, ran off several copies of self-adhesive labels with the part name in both Chinese and English along with the part number. These were affixed to the front of the stock cards and to the stockroom shelves where the part was to be stored. In addition, we attached the bilingual labels to extra copies of all the pictures and filed them in a binder, in part number sequence, to provide a ready reference guide.

The same translated list was used to make the pre-import application as well as the actual customs declaration when the goods arrived. This two-step process speeds up clearance of goods through customs. Our contract has several addenda that spell out all the products needed for the job; the Chinese do not charge duty since the imports are for *lailiao-jiagong*. Whenever a container would arrive at port, we would take the application down to the dock, and there file the customs declaration and have the sealed container delivered to the factory. The container was opened and the customs examinations done at the factory rather than the pier—a great advantage in controlling the goods.

Our goal is to have the Chinese staff take responsibility for materials requirement planning and place the orders directly with our US-based materials department. To do so they must understand the timing of their use in the construction process. Consequently the bill of materials has been organized by task, and the production tasks for each yacht are scheduled by the planning and manufacturing departments. This will be a major focus of our management training in the coming year.

PRODUCTION
Transferring technology and flow charts

From there we turned our attention to one of the bigger challenges in this venture: scheduling and describing the tasks involved in building a yacht from scratch.

L.O.A.: 48.49′
L.W.L.: 39.37′

Courtesy Dynasty World Yachts

Photo by Hendryx

Nanhai Yacht Co. workers studying "crisis English" taught by Dynasty staff. The vocabulary lesson included "stop!", "OK!", and "watchout!"

The job involved the breakdown of the yacht-building process into some 400 discreet tasks, the development of a Critical Path Network and associated Gantt charts (horizontal bar charts that show when each task starts and stops), and the writing of one-page task sheets that describe the sequence of steps, critical quality control issues, and the special tools required. These sheets were prepared by the responsible US technicians and translated by five Chinese.

Each week the Chinese planning and manufacturing managers would meet with our production manager to map out the work schedule by week and by month. This schedule would refer to the translated task sheets and to the bill of materials, which also is organized by task. The package enables the manufacturing department manager and shop supervisors to determine at a glance what task must be done, its basic content, and what materials are needed.

Each technician then works with his Chinese counterpart to schedule the factory work in his section. This system frees the technician from the overwhelming task of organizing the work flow, and allows him to spend more time demonstrating his technical skills.

Another critical area of technology transfer is engineering drawings. The yacht industry is somewhat peculiar in that detailed shop drawings are frequently dispensed with, at least in the US. This is particularly

true in the early stages of development. The naval architect usually supplies a set of from 30 to 50 basic drawings showing the hull shape, structure, installation of the critical machinery, and the general arrangement plan. The manufacturer finalizes many of the designs. More often than not, the workmen rely on their own knowledge and experience to determine the construction details of a drawer or door frame.

However, the Chinese have no such familiarity with this newly imported industry, and so they cannot provide the missing construction details as they begin their part of the job. According to what appears to be general industrial practice, the workers are taught to adhere strictly to the drawings. The drawings are also a key link in the Chinese quality control system (as they are in most US industries).

We therefore anticipated the need for a large number of detailed drawings. These were laboriously produced in the factory's engineering department. The American technical expert had to produce a very detailed sketch and then closely monitor the Chinese draftsman as he produced the final drawing.

Despite the difficulties, the arrangement has yielded large dividends. The engineering department is now in the forefront of technical training in the plant. The draftsmen frequently provide the communication link between the English-speaking technical expert and the Chinese shop worker. On balance, though, I think we would have been wiser to have brought complete shop drawings from the United States for the model yacht.

The experience has been a hard one for us all. Each side brings a very different set of expectations to the workplace; the barriers to communicating and understanding one another only begin with the language. The rewards, however, are correspondingly great—and they only begin with the business returns. ▼

Steven Hendryx, former executive vice-president of Dynasty World Yachts received his degree at MIT and Harvard, earned his MBA from Stanford University, and learned his fluent Chinese in Taiwan. His business experience includes five years in corporate strategy consulting and five in management.

About half of all major ships made in China go to foreign buyers.

SHIP EXPORTS

Charles Dragonette

When the Chinese announced their ambitious goals in 1980 to boost the export of ships, it was reasonable to greet their declarations with substantial skepticism. They had little experience in winning orders open to free competition. At that time they had delivered only one small cargo ship of 3,700 deadweight tons (or dwt) to Malaysia, and had won an order from a Hong Kong firm for a multipurpose cargoship of 17,000 tons. Without a track record, and with a reputation for inefficient management, outdated yards and equipment, and inconsistent economic policy, it took an unusually optimistic point of view to predict success. Their inexperience was further hampered by a reputation for inefficient management, outdated yards and equipment, and inconsistent economic policies.

Today, at the end of three years, China's experience in this area is far from complete. Nonetheless, its ship exporting effort can already be seen as one of the most noteworthy successes of China's export drive. As of early 1983, China had logged orders for more than 1 million tons of merchant shipping, and had a 900,000-ton order backlog of ships yet to be delivered. Chai Shufan, chairman of the China State Shipbuilding Corporation, is quoted as saying that China plans to begin constructing ships of 60,000 and 80,000 tons. Chinese builders hope to upgrade their capacity soon to include ships of 100,000 to 150,000 tons. Their projections call for the production of 1 million tons per year by 1985, including vessels sold domestically. (In 1982, Japan, the world's shipbuilding leader, produced 14.8 million tons of ships; South Korea placed a distant second with a total of just under 2.3 million tons.)

Achieving the 1985 goal would clearly place the Chinese among the world's top-ranked shipbuilders. Yet China's yards may have to strain to produce this tonnage, which appears in excess of their current total capacity. Both Japan and South Korea, not to mention most other shipbuilding nations, have been forced by the world recession to work well below their maximum capacity. A further worldwide decline in orders could dampen China's enthusiasm to undertake the capital-intensive expansion of shipyards that will be required to increase its market share.

Interestingly, China's export order backlog of 900,000 tons for delivery by 1985 represents about half of the country's total capacity for the construction of major ships. Recent figures place Chinese shipyard output in 1982 at 1,025,000 tons, up 120,000 tons from 1981, but still a relatively flat production performance. China claims that it will soon construct ships of 150,000 tons or more. So far orders for two 60,000-ton bulk carriers have been placed by Sir Y. K. Pao. The ambitious task of building larger vessels could only be undertaken at the new Dalian Shipyard, which is fully occupied with building relatively more complex and profitable offshore oil rigs (*see* page 38). Given the priority accorded offshore oil work, it is unlikely that less remunerative shipbuilding efforts would be allowed to interfere.

The probable maximum capacity of the remodeled facilities at older yards, such as Shanghai's Jiangnan and Hudong shipyards, may well be 60,000 tons. Grain and coal ships are among the few types of vessels doing well in the current business slump, and Chinese yards are likely to ex-

CHINA'S EXPORT ORDER BOOK

(As of 1 June, 1983)

China has logged orders for 1,192,000 million tons of merchant shipping for delivery during 1983–85, which represents about half of the country's total capacity for the construction of major ships.

Shipyard	Number and type vessel	Deadweight tonnage per vessel	Unit price (Million US $)	Delivery date	Remarks
Dalian Shipyard	8 Bulk carriers	27,000	$11.5	First unit June 1982; last due end 1983	REGENT TAMPOPO class design probably of Japanese origin; fitted for service to US Great Lakes, and built to Lloyd's Register class; for Hong Kong owners incuding Y. K. Pao, Wheelock Marden, Green Island Cement.
	6 Roll-on/Roll-off cargo ships	7,000	$14.0	First unit due end 1984	For Parley Augustsson, Norway, who probably supplied design; only hulls to be built in China; all machinery to be imported; order may be for 4 units, with 2 on option.
Jiangnan Shipyard, Shanghai	6 Bulk carriers	27,000	$11.5	First delivered Aug. 1982; last due end 1983	REGENT TAMPOPO class vessel for Hong Kong owners.
	2 Bulk carriers	60,000	NA	Probably late 1983 through early 1984	Order by Y. K. Pao unconfirmed. If true, these would be largest ships built in China to date.
	2 Container ships	18,000	$40.0	Due March 1984, August 1984	For Neptune Orient Lines, Singapore; option for 2 others with Shanghai Shipyard.
Hudong Shipyard, Shanghai	10 Bulk carriers	36,200	NA	First quarter 1983 through end 1984	Design probably of Japanese origin; built to Lloyd's Register class. STAR ORIENT is lead ship. Some accounts suggest 5 of 10 may be on option.
	9 Offshore tug/supply ships	1,200	$4.5	All due by end 1983	For Singapore firm Sentinel Offshore, which supplied plans through joint company, China Offshore Oil company.
Zhonghua Shipyard, Shanghai	10 Container feeder ships	4,400	$5.5-8.0	First delivered March 1983	For West German owner.
	2 Container ships	8,200	NA	Due Sept. 1983, March 1984	For Express Ship Management, Hong Kong.
Shanghai Shipyard	4 Combination cargo/container ships	12,300	$10.0	All due by end 1983	For West German owners, who probably supplied plans.
	2 Container ships	18,000	$40.0	Option	2 sister ships on order at Jiangnan.
	2 Offshore tug/supply ships	NA	NA	NA	Order by Norwegian owner.
Guangdong Marine Co., Guangzhou	2 Container ships	11,000	NA	Due by end 1983	For Plymouth Shipping, US.
	4 Offshore tug/supply ships	2,800	$7.5	Due by end 1983	Order by Norwegian owner may be increased to 8 vessels.
	3 Cargo ships	18,000	NA	NA	For Panamanian owner.
Wuchang Shipyard, Wuhan	6 Offshore tug/supply ships	1,300	NA	First unit due first quarter 1984; last due end 1985	Norwegian UT-714 design; for Parley Augustsson, Norway; includes option for additional 6 units.

NOTES: 1) List excludes orders for similar ships placed by domestic owners, orders for non-self-propelled craft, and orders by China-Poland Shipbrokers. 2) Chinese references to the tonnage of ships built or on order generally mean deadweight tons (dwt), that is, the ship's capacity when loaded. The usage is adopted here and in the article. 3) It means many things when a ship is "built" in China, depending on the entity quoted. Design units sometimes consider a vessel "done" when their work is completed: business offices often consider a ship built when the terms of delivery are completed; the actual construction force may use either the launch date or the date sea trials commence. The reader may find authoritative dates that differ from those used here, due to these confusing practices. Similarly, some contracts for ships prove later to be letters of intent, and are never acted upon.

pand production if they can increase their rate of delivery of 27,000-ton and 36,000-ton bulk carriers. But to sustain a long-term place in the forefront of world shipbuilding, China will need new shipyards to replace the cramped older yards, which are predominantly located near urban centers such as those along the Huangpu River in Shanghai.

The moving force behind China's shipbuilding drive is the China State Shipbuilding Corporation. The CSSC was set up by the State Council in May 1982 to replace the former Sixth Ministry of Machine Building and its subsidiary, the China Corporation of Shipbuilding Industry (CCSI). It was the CCSI, founded in 1977, that had won China's first export orders.

The CSSC represents China's first ministerial-level corporation, and combines former shipyards and plants of the Sixth Ministry with facilities of the Ministry of Communications. The MOC had been the Sixth Ministry's largest customer, though it operated a number of shipbuilding and repair yards of its own. These facilities competed directly with those under the Sixth Ministry and CCSI, prompting State Councillor Bo Yibo to remark that "The vast number of systems has given rise to too many leaders, too many departments, and . . . irrational duplication in production, import of technology, construction, and scientific research."

The new corporation assumes control of 26 shipyards and 66 associated factories that specialize in the construction of marine engines, navigational equipment, communications gear, and other marine equipment. It is reported that the shipbuilding facilities alone employ 300,000 workers. The CSSC also oversees ship design research and development, and runs schools for the training of shipbuilders and designers. These turn out roughly 3,000 students per year. The vague manner in which this number is stated probably indicates that many of these graduates have received only the barest technical training, and basically join the labor force as skilled laborers, rather than as naval architects or marine engineers.

One of CSSC's most important functions is to process customer requests for imported machinery and other equipment installed in domestically built hulls. Although China has been producing main propulsion diesel engines and other gear for a number of years, most is still built under foreign license. The bulk of propulsion machinery aboard ships for export appears to be imported in its entirety. While this must, of necessity, cut deeply into the CSSC's profits from exports, the Chinese benefit by becoming familiar with advanced foreign technology.

As in most every other area of its economy, China's goal in the shipbuilding sector is to produce domestically most of the equipment and engines it now imports. CSSC Chairman Chai Shufan recently announced that by 1985 China will supply 80 percent of the materials and equipment used in the ships it produces for export. The author Liu Kezeng, writing in last October's issue of the Chinese journal *Ship World*, advised foreigners to enter into joint production agreements early in order to preserve a market position when the day comes that China is nearly self-sufficient. Whatever the validity of these projections, it is clear that the production of propulsion machinery and auxiliary equipment is seen by the Chinese as lagging behind the rest of the shipbuilding industry.

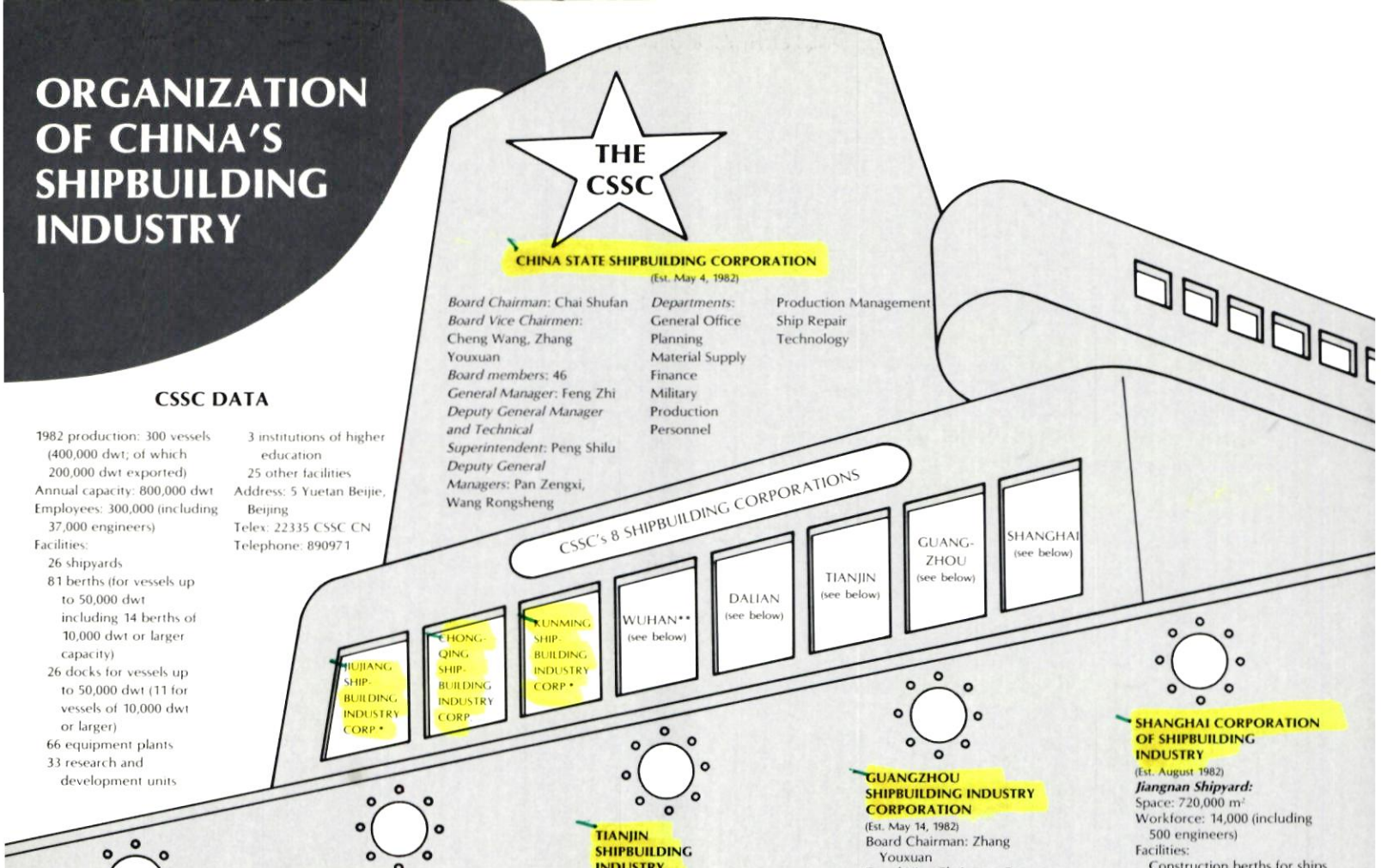
CSSC has apparently continued CCSI's policy in reducing the myriad ship designs formerly built for domestic use and, initially, offered for export. Recent CSSC catalogues continue to describe ships built for Chinese owners that have never been ordered abroad, though their number is small. For example, CSSC still offers the Chinese-designed and built *Chang Zheng* class passenger ship, of which at least 11 have been built for Chinese service. It is unlikely that this design, which makes so much sense for Chinese trade, could be equally successful in countries not still so dependent upon water transport of passengers.

Other CSSC offerings include the familiar 27,000-ton and 36,000-ton bulk carriers, which are probably imported designs of Japanese origin. Orders for offshore oil rig support ships, container ships, and roll-on/roll-off vessels appear to rely completely on imported plans. This does not mean that CSSC, which maintains numerous design institutes, has failed in its responsibility; to the contrary, it speaks well of the industry's realistic approach to the market. The April

The launching of China's first 36,000 toner, the bulk cargo ship *Dongxing*, now registered in Panama under Sir Y.K. Pao's Worldwide Shipping Group. The *Dongxing* was built at Shanghai's Hudong Shipyard and is powered by a 12,000 hp Burmeister & Wain diesel engine built in Japan under license. Most large Chinese export vessels contain B&W engines.

Photo by Liu Zhongyang, New China Pictures Co.

ORGANIZATION OF CHINA'S SHIPBUILDING INDUSTRY



CSSC DATA

1982 production: 300 vessels (400,000 dwt; of which 200,000 dwt exported)
Annual capacity: 800,000 dwt
Employees: 300,000 (including 37,000 engineers)
Facilities:
- 26 shipyards
- 81 berths (for vessels up to 50,000 dwt including 14 berths of 10,000 dwt or larger capacity)
- 26 docks for vessels up to 50,000 dwt (11 for vessels of 10,000 dwt or larger)
- 66 equipment plants
- 33 research and development units
- 3 institutions of higher education
- 25 other facilities

Address: 5 Yuetan Beijie, Beijing
Telex: 22335 CSSC CN
Telephone: 890971

CHINA STATE SHIPBUILDING CORPORATION
(Est. May 4, 1982)

Board Chairman: Chai Shufan
Board Vice Chairmen: Cheng Wang, Zhang Youxuan
Board members: 46
General Manager: Feng Zhi
Deputy General Manager and Technical Superintendent: Peng Shilu
Deputy General Managers: Pan Zengxi, Wang Rongsheng

Departments:
- General Office
- Planning
- Material Supply
- Finance
- Military
- Production
- Personnel
- Production Management
- Ship Repair
- Technology

CSSC's 2 functional corporations:

CHINA OFFSHORE PLATFORM ENGINEERING CORPORATION
(Est. September 1982)
General Manager: Huang Dexing
Functions: Design, manufacture, and repair off-shore oil drilling rigs, production platforms, single-point mooring oil supply facilities, and oil field auxiliary ships.
Address: 10 Yuetan Bei Xiaojie, Beijing
Subsidiary: China Offshore Platform Engineering Design Corporation

CHINA SHIPBUILDING TRADING CO. LTD.
CSSC's foreign and domestic trading arm, with branches in Chongqing, Dalian, Guangzhou, Jiujiang, Kunming, Shanghai, Tianjin, and Wuhan.

CHINA UNITED (HUA LIAN) CORPORATION
(CSSC's Hong Kong agent)

*Main facility Jiangxin Shipyard
**Main facilities Wuchang Shipyard and 12 factories and plants

DALIAN SHIPBUILDING INDUSTRY CORPORATION
Space: 500,000 m² at 7 major shipyards
Workforce: 10,000 (including 600 engineers)
Facilities:
- 4 berths for ships up to 100,000 dwt
- 3 docks for ships up to 100,000 dwt

Specialties: Oil tankers, cargo and bulk cargo carriers, ocean-going salvage tugs, and oil rigs. Two jack-ups built for Baker Marine Corporation
Address: 1 Dalianyanhai Jie, Dalian

Two provincial shipbuilding corporations:

FUJIAN PROVINCIAL SHIPBUILDING CORPORATION
Independent, non-CSSC corporation with 5 shipyards, 5,500 workers (including 300 technicians and engineers) capable of building and repairing ships up to 5,000 dwt. Specializes in engineering ships, auxiliary vessels, tourist boats, pleasure craft, and fishing boats.

GUANGDONG PROVINCIAL SHIPBUILDING INDUSTRY CORPORATION
Independent, non-CSSC corporation established January 1980, with 20,000 workers (including 1,000 technicians) capable of building up to 1,000 dwt ships. Shipyards at Xinhua, Yuezhong, Xijiang, Zhujiang, Shantou, Zhanjiang, Hainan, and Xinhui.

TIANJIN SHIPBUILDING INDUSTRY CORPORATION
Space: CSSC's smallest complex, with shipyards at Xingang, Xinhe, and Dagu
Workforce: Xingang 6,500; Xinhe 4,300
Facilities:
- 2 berths at Xingang for 5,000 dwt and 30,000 dwt ships
- 2 docks for 3,000 dwt and 25,000 dwt ships

Production: 4 ships in 5,000-7,000 dwt range, and 10 smaller vessels per year
Specialties: cargo carriers, oil tankers, ice breakers, floating cranes, salvage boats, harbor vessels, pile drivers, water carriers, passenger ships, and hovercraft.

WUHAN SHIPBUILDING INDUSTRY CORPORATION
Workforce: 8,700 at Wuchang Shipyard
Facilities: Wuchang Shipyard and 12 factories and plants
Specialties: diesel submarines, mine-sweepers, cargo and passenger ships, and oil rigs

GUANGZHOU SHIPBUILDING INDUSTRY CORPORATION
(Est. May 14, 1982)
Board Chairman: Zhang Youxuan
Board Vice Chairmen: Bo Hanqiu, Wang Shengjie
General Manager: Wei Ji
Managers: Yan Ming, Zhang Liankui, Zhao Tingxian, Zheng Jianmin
Staff: 30,000
Address: No. 1 Duli, Dongfeng Bei Lu, Guangzhou

Guangzhou Shipyard:
Space: 700,000 m²
Workforce: 8,300 (including 500 technicians and engineers)
Facilities:
- 3 construction berths for vessels up to 20,000 dwt
- 2 drydock for 10,000 dwt and 1 for 5,000 dwt ships
- Factory building
- CTI containers

Specialties: cargo, container, passenger, and oceanographic research ships, oil tankers, and specialty vessels

Huangpu Shipyard:
Space: 1,000,000 m²
Workforce: 3,700
Facilities: construction docks for ships up to 3,000 dwt
Specialities: tug boats, cargo and passenger ships, container barges, ferries, submarines, warships, specialty ships, and jack-up rigs for Wah Chang International and Bethlehem Steel

Wenchong Shipyard:
Staff: 7,000
Facilities:
- 10 workshops
- 2 drydocks for ships up to 25,000 dwt

Construction docks for ships up to 15,000 dwt

SHANGHAI CORPORATION OF SHIPBUILDING INDUSTRY
(Est. August 1982)

Jiangnan Shipyard:
Space: 720,000 m²
Workforce: 14,000 (including 500 engineers)
Facilities:
- Construction berths for ships up to 60,000 dwt
- 4 drydocks for ships up to 60,000 dwt
- 6 repair berths for ships up to 60,000 dwt

Specialties: freighters, cargo, coal, and ore carriers, and specialty vessels. Contract with Baker Marine for 1 semisubmersible oil rig

Shanghai Shipyard:
Space: 600,000 m²
Workforce: 10,000 (including 1,000 technicians)
Facilities:
- 2 construction berths for ships up to 35,000 dwt
- 2 drydocks
- 1 floating repair dock
- Container division with 60,000 m² space near Baoshan

Specialties: tugs, freighters, passenger, cargo, and container ships. Built Kantan III semisubmersible oil rig

Hudong Shipyard:
Space: 670,000 m²
Workforce: 11,000
Production: about 25 ships per year
Facilities:
- 10 construction berths for ships up to 40,000 dwt

Specialties: oil tankers, oil drilling ships, passenger, cargo, and oceanographic research vessels

Shanghai's other shipyards:
Zhonghua
Qiuxing
Hongqi
Dongfanghong
(at least 10 other shipyards)

Other facilities:
13 factories and 5 research units in Shanghai, Jiangsu, Zhejiang, Anhui, and Shandong

SOURCES: National Council files; Christopher M. Clarke (ed.) *China Business Manual 1982 Supplement*, National Council for US–China Trade, July 1982; *China Trader*, December 1982; and *Business China*, November 10, 1982 through April 27, 1983. Chart prepared by Christopher M. Clarke and Erin McGuire Endean.

Photo by Huang Jianqiu, New China Pictures Co.

The 8,000 dwt container ship *Papua*, now registered in the Cayman Islands, was ordered by the Plymouth Shipping Co. Ltd. of the US.

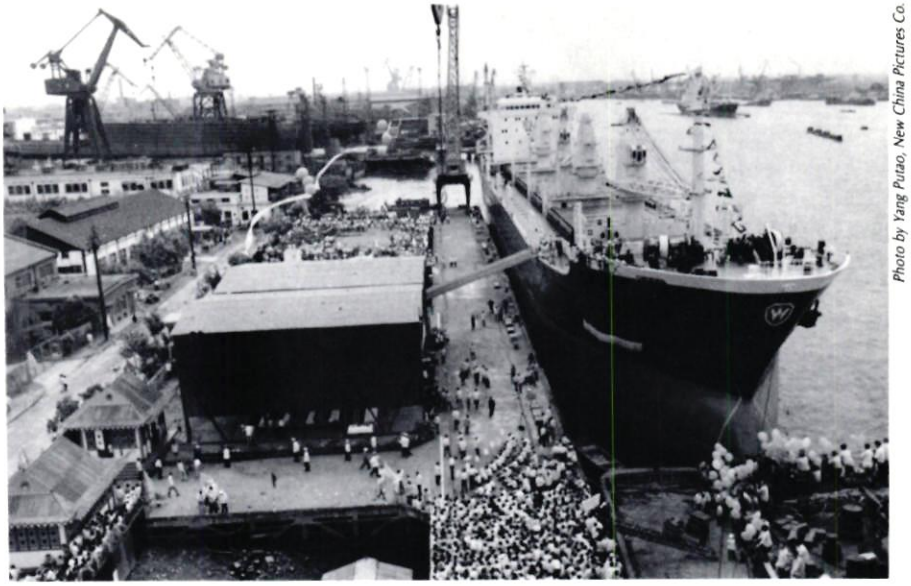


Photo by Yang Putao, New China Pictures Co.

The delivery ceremony for the 28,136 dwt *Shihu*, a bulk carrier built at Shanghai's Jiangnan Shipyard that carriers four 25-ton cranes and is especially strengthened for heavy cargoes.

1982 issue of the Chinese journal *Shipbuilding Know How* pointed to the success of China's 27,000-ton bulk carrier, explaining that the design was specifically adapted to the maximum allowable dimensions for transit to the US and Canadian Great Lakes. Indeed, these ships are classed by Lloyd's Register of Shipping as "Lakes Fitted," reflecting the provision of equipment required by the locking operations along the St. Lawrence Seaway.

The most sophisticated ships on order are undoubtedly the offshore oil rig support ships and roll-on/roll-off freighters. In the latter case it has been announced that all equipment, apart from the ship hulls, will be imported from Europe. The ships will cost $14 million each, including the equipment. That figure is reportedly one-third less than a comparable vessel from a European yard.

Of course, a cheaper ship must still be a quality product in order to sell. That is why the Chinese attach such importance to having their designs and workmanship approved by internationally recognized classification societies. In 1982 the Chinese relented on their refusal to permit on-site inspection of ships under construction, and since then ships have been built to the class of Lloyd's Register, the American Bureau of Shipping, Norske Veritas, and Germanischer Lloyd. Chairman Chai Shufan reported that fully 90 percent of the ships built in China for export were classed by Lloyd's Register, which had stationed surveyors at Dalian, Shanghai, and Guangzhou.

Low-interest financing has added to the attractiveness of Chinese-built ships. Beginning in early 1983, foreign buyers were given the option of paying 40 percent on delivery, and the rest over a six-year term at an annual interest rate of 9 percent. In some cases, the Bank of China has offered credit up to 80 percent of contract value Previously, all ship sales had involved cash payments, beginning with 10 percent paid at contract signing and the final sum paid upon delivery.

In the future, China's continuing drive for greater self-sufficiency in production will enlarge the country's ship research and design capability, which must be regarded, still, as the industry's weakest link. The flagging world demand for ships will inevitably affect new orders, as China competes with the troubled shipbuilding industries of Japan and South Korea, which are seeking major subsidies from their own governments to keep yards and people employed. China's large domestic requirements for additional tonnage could overtax available building capacity, and reduce CSSC's hard currency earnings from export contracts. Finally, China will soon butt up against its production ceiling unless major steps are taken to enlarge the shipbuilding infrastructure and build new yards.

This ceiling may already have been reached. The Shanghai Shipbuilding Industry Corporation's marketing manager, Li Hangchu, recently announced that Shanghai will not accept orders for delivery before 1985. This restriction implies that there is very little slack capacity elsewhere in China, since Shanghai accounts for two-thirds of the foreign orders placed with Chinese yards. Any new orders therefore will have to be for delivery in 1986 and beyond.

China has succeeded admirably in launching its export drive. Maintaining it on course through the end of the five-year plan in 1985 will take skill and consistency. Positive results will be reflected in new orders for delivery in 1985 and beyond, and it is safe to say that many established and fledgling shipbuilding nations will be watching China's performance with great interest. ₹

Charles Dragonette is a Washington-based merchant marine analyst, and has followed the development of the Chinese merchant fleet for over a decade. His articles on merchant shipping have appeared in Sea Power *and the US Naval Institute* Proceedings. *Currently, Dragonette is working to catalogue the patterns of crockery and silverware used by various shipping companies, and to compile a social history of dining at sea.*

Tourism Development: FITs and Starts

China may have decided to "take the Chinese road toward developing tourism," as its top tourism official has advised. But for now, at least, that road is being paved with Western ideas. Individual tourists may visit select parts of the country on their own. Several cities now offer rooms in modern high-rise hotels, complete with swimming pools and some with private saunas. Even hotel management and service are beginning to improve, with a little help from some foreign friends.

Carol S. Goldsmith

Individual Travelers

According to the tourism calendar, this is the Year of the FIT—the foreign individual traveler. China announced last fall that it would begin allowing individuals to visit certain parts of the country on their own, rather than as part of a tour group. These latter-day Marco Polos, as FITs have been called, can also visit 29 "open" cities without a special travel permit.*

This marks a radical change in China's tourism philosophy. Foreign tourists, in the past, were things to be grouped and guided; of the 2.5 million who traveled in China between 1978 and 1982 (not including overseas Chinese), nearly all were part of tour groups. The shortage of hotel rooms and of trained guides, as well as China's inexperience with tourism, made this a near necessity. Today, however, China believes it can turn FITs into a staple of its tourism program. Han Kehua, director of the National Tourism Administration, predicts that individuals will account for perhaps 20 to 30 percent of China's tourists by 1990.

Madame Xie Shouzhen, the China International Travel Service (CITS) official in charge of FITs, recently explained how the program works.

A tour operator should propose an itinerary to the CITS head office in Beijing two months before an individual's departure. (Operators have been known to push through a FIT in as little as two weeks, but this is always risky.) If the itinerary permits, CITS will then book the tourist in a "small-group FIT"—two to nine persons visiting the same areas, but not necessarily touring together. Otherwise the FIT tourist will pay a somewhat higher price to go it alone.

For an individual visiting a major city like Beijing, the operator pays CITS ¥120 per day for pick-up and send-off services by the local CITS office, and ¥65 per day for a hotel room and breakfast. The charges for "small-group" members are ¥80 and ¥35, respectively. Separate arrangements may be made for an escort or for a complete meal package.

On average, a FIT costs a traveler about $25 more per day than a regular group tour, according to Helen Wong, manager of Kuo Feng Tours in New York. The most popular itineraries are almost identical to the standard group tours. Ironically, she says, "everybody still wants to spend the most time in Beijing, then go to Xi'an, Shanghai, and Guilin."

China obviously was testing its FIT program on some of the delegates to its March tourism conference. Participants had the opportunity to sign up for one of seven special travel programs that commenced immediately after the conference. The price was about half that of a regular tour. Hundreds of people signed up to visit such favorites as Kunming, Guilin, and Suzhou. Nonetheless, all of them were treated as FITs—with their own cars, drivers, and national and local guides. The service was excellent, but the situation bordered on the absurd. At a special performance of Tang Dynasty dances in Xi'an, perhaps 100 foreigners were accompanied by 300 drivers and guides.

China has not yet announced an FIT quota for 1983 or 1984; officials first wish to see how many individuals they can handle without straining the group tour system. Most tour operators doubt the country could handle a significant number of individual tourists immediately anyway, even if the demand existed.

The president of Pacific Bestours, which just began publicizing its FIT program, does not believe that "FITs will make an appreciable difference in China travel." As Peter Yeung points out, CITS strongly discourages individual itineraries in the peak tourist season. Furthermore, operators claim that China does not give a significant enough off-season discount to encourage travel in the winter and mid-summer months.

The real significance of FITs, says Yeung, lies in giving business people added flexibility in their China trips, and in encouraging travelers who are planning an Orient tour to include China on their itineraries.

Even the Chinese recognize that FITs will take time to develop. Tourism officials still joke about the reaction of one overzealous US operator to the FIT announcement. During the tourism conference he rushed up to officials and exclaimed, "We can give you 3,000 FITs this year." Replied the CITS official, "Make it 300 and we will talk about it."

*Beijing, Tianjin, Shanghai, Qinhuangdao, Taiyuan, Shenyang, Changchun, Harbin, Nanjing, Suzhou, Wuxi, Hangzhou, Jinan, Qingdao, Zhengzhou, Kaifeng, Luoyang, Wuhan, Changsha, Guangzhou, Foshan, Zhaoqing, Nanning, Guilin, Xi'an, Chengdu, Chongqing, Kunming, and Lunan.

Sales and Promotion

There was a time, not long ago, when the only travel brochures about China came from outside of China. But times are starting to change. Operators attending the tourism conference were amazed to find an entire exhibition devoted to tourism, with literally hundreds of booklets, maps, slides, and assorted souvenirs from every tourist office in China. Little of it could be labeled "promotional" material in the Western sense of the word; the brochures were geared toward servicing tourists already in China, rather than attracting them from abroad. Nonetheless, it marked the first time China had produced tourism materials on any kind of scale.

China has just started to realize that the endless stream of tourists isn't endless after all. Last year's growth rate turned out to be the lowest in the history of China tourism. CITS reports that it handled 300,000 foreign tourists, an increase of slightly more than 10 percent over 1981. Growth rates during the first three years of China travel had averaged 29 percent. (See *The CBR*, November-December 1982, p. 36.)

No one—either in China or abroad—wanted to see that disastrously high rate continue. Neither did they wish for a drastic downturn. Foreign firms have been trying to convince China for some time to undertake an international tourism promotion campaign, but to no avail. The first indication that China saw any role for itself in promotion came at the recent conference. Han Kehua met with a delegation from the National Council's Travel and Tourism Committee and made this remark: "The American market knows about China to a certain extent, and you have done your job well in promoting travel. But of course the real responsibility is ours."

The exhibition, despite its domestic bent, made a tremendous impression on the delegates. Display booths with huge color posters of the main tourist spots covered the entire first floor of the Cultural Palace of the Minorities. Officials and guides from every tourism office were on hand to deliver their sales pitch and coax delegates to visit their areas. A young, colorfully clad woman from the Mongolian travel office handed out her brochures, along with samples of goat's cheese, from inside a yurt.

A number of operators think it would be good PR to bring this exhibition to the States. The Chinese think so too—provided the Americans pay.

The New Look of Chinese Hotels

Perhaps it's the blonde tables and the lumpy red chairs, decorated with off-white antimacassars, that give the rooms that Chinese look. Or maybe it's the colorless carpet, the pale green fleur-de-lis wallpaper, or the scenic watercolor pictures that hang almost face down from the walls. Whatever the reason, Chinese-style hotels have the uncanny ability to look 30 years old the day they open their doors.

On the other hand, China's prefabricated Western hotels—like those the Australians set up around the country a year or so ago—don't look a day over 15.

A "modern" hotel, in Chinese parlance, used to mean the bathrooms had hand-held showers and the cooks could scramble eggs. Now, however, that image is slowly being updated. Foreigners have introduced a third style of hotel that is changing China's thinking about architecture: the tall, lean, glassy look of a modern high-rise hotel.

E-S Pacific Development and Construction Company, a California-based firm, pioneered this type of project in China. Everyone by now has probably read about the mammoth Great Wall Hotel, the three-tiered, 22-story building that towers over all of Beijing. (See *The CBR*, September-October 1982, p. 6.) When construction began in late 1980, few could imagine that a modern skyscraper would really make its way into China. But by the time the Great Wall opens next year, at least three other high rises will be serving foreign guests.

Traders attending this spring's Guangzhou Trade Fair had two main hotel options: the ever-changing, always kitschy Dong Fang, or the

HOTEL PROJECTS

1983–1985

At least 58 new or expanded hotels will open in China between now and 1985. Meanwhile, another 16 projects are being discussed with foreign firms, according to research by The CBR *and China Features in Beijing. If all 58 hotels open as scheduled, China by 1985 will have added 22,891 beds to the number it now offers foreign tourists—for a grand total of nearly 111,000 beds.*

Hotel	Investors Chinese party/foreign party	Number of Rooms	Scheduled Completion
BEIJING			
Guoji	China International Travel Service/Shing Kwan Ltd. (Singapore)	1300	1985
Kunlun	Xinhua Enterprising Corp./Sin Gang Co. Ltd. (Hong Kong)	1006	1985
Xiyuan	First Bureau of Service Trade/Esquel Enterprises (Hong Kong)	756	1985
Zhaolong	China International Travel Service	300	1985
Jianhua	Beijing Travel Corp. and CITS Beijing branch/Noble Chong Assn. of Toronto, Canada (construction pending financing)	650	1984
Yanchun	Beijing Travel Corp.	400	1984
Minzu (east wing)	Beijing Travel Corp./Esquel Enterprises	200	1983
Zhaopang	Beijing Travel Corp./Y.K. Pao (Hong Kong)	250	Mid-1983
Changcheng (Great Wall)	Beijing Travel Corp./E-S Pacific Development and Construction Co. (US)	1007	Late 1983
Lidu	Beijing Travel Corp./financed by Yick Ho Associates (Hong Kong), and controlled by Robin Lok (Singapore)	1000	Late 1983
Chang'an	Ongoing negotiations with Intercontinental Hotels and 1st Chicago	N/A	N/A
Hotel Project	AGA Kilan Foundation (interest expressed 6/82)	N/A	N/A
FUJIAN PROVINCE			
Xiamen *(Xiamen)*	Fujian Development and Construction Corp., Xiamen branch/Singapore firm; agreement signed 7/81	N/A	N/A
Fuzhou *(Fuzhou)*	Local government/Kato Bussau (Japan)	365	1983
Quanzhou *(Quanzhou)*	Local government	250	1983
Jinjiang *(Jinjiang)*	Local government	86	1985
GANSU PROVINCE			
Dunhuang *(Dunhuang)*	Local government	100	1984
Lanzhou *(Lanzhou)*	Local government	150	1984–85
GUANGDONG PROVINCE			
Yixianhu *(Zhongshan County)*	Zhongshan County/Yixianhu Tourist Enterprise Co., Ltd. (Hong Kong)	100	1983–85
Cuiheng *(Zhongshan County)*	Zhongshan County/Julifa Co., Ltd. (Hong Kong)	100	1983
Shuiku *(Zhongshan County)*	Zhongshan County/Sanlin Shengjie Investment Co., Ltd. (Hong Kong)	150	1983
Zhongshan *(Zhongshan County)*	Zhongshan County/Mitsubishi Co. (Japan) and Transport Engineering Co. (Hong Kong)	N/A	first stage 7/82
Hotel Project *(Shenzhen)*	Local capital	75	1983
Hotel Project *(Shenzhen)*	Local government/Holiday Inn (US); agreement signed 7/81	500	N/A
Hotel Project *(Shenzhen)*	Local government/Bihag Brander, Ltd. (Switzerland); agreement signed 2/81	N/A	N/A
Hotel Project *(Shenzhen)*	Local government/Chung To Co. (Hong Kong); agreement signed 2/82	N/A	N/A
Dameisha *(east Shenzhen)*	Club Med (negotiations reported 2/82)	N/A	N/A
Bamboo Garden *(Shenzhen)*	Local government/Millies Industrial Development and Service Group (Hong Kong); agreement announced 1/81	N/A	N/A
Wenkong *(Shenzhen)*	Local government/Pak Lee Co. (Hong Kong); agreement signed 2/82	200	N/A
Hotel Resort Project *(Shenzhen)*	Shenzhen Forestry and Park Bureau/Goodyear Estate, Ltd. (Hong Kong); contract announced 7/81	N/A	N/A
Marine Resort Project *(Shenzhen)*	Shenzhen Tourism Dept./Goodyear Estate, Ltd. (Hong Kong); project announced 7/81	N/A	N/A
Huaqiao *(Shantou)*	Shantou office of China Travel Service	300	1983
Huaqiao *(Donggun County)*	Donggun County office of China Travel Service/Jianian Enterprising Co. Ltd. (Hong Kong)	100	1983
GUANGXI ZHUANG AUTONOMOUS REGION			
Rongcheng *(Guilin)*	Local government	250	1983
Yongzhou *(Guilin)*	Local government	250	1983
Ronghu *(Guilin)*	Guilin Tourism Corp./Kaiyuan Co., Ltd. (Hong Kong)	150	1983
Guihu *(Liuzhou)*	Local government	150	1983

GUANGZHOU			
Garden	Guangdong Tourism Corp./Garden Hotel Investment Co., Ltd. (Hong Kong)	2000	1984
Zhongguo	Guangdong Tourism Corp./Shin Ho Cheng Development Co., Ltd.	1032	1984
Huaqiao	Guangdong office of China Travel Service	300	1983
Meihuayuan	A district of Guangzhou/Hong Kong capital	150	1983
International Grand Hotel	Yangcheng Service Development Corp./Philippine–China Friendship Corp.; agreement signed 1983	N/A	N/A
GUIZHOU PROVINCE			
Guizhou *(Guiyang)*	AGA Kilan foundation (interest expressed 6/82)	N/A	N/A
HEILONGJIANG PROVINCE			
Swan *(Harbin)*	Provincial tourist bureau	250	1984
HENAN PROVINCE			
Friendship (addition) *(Luoyang)*	Local government	150	1984
HUBEI PROVINCE			
Qingchuan *(Wuhan)*	Local government	250	1983
Yichang *(Yichang)*	Local government	250	1985
HUNAN PROVINCE			
Furong *(Changsha)*	Local government	250	1984–85
INNER MONGOLIA			
Hohhot *(Hohhot)*	Regional tourist bureau	250	1984
JIANGSU PROVINCE			
Meilin *(Yangzhou)*	Provincial tourist bureau	150	1983
Nanlin *(Suzhou)*	Provincial tourist bureau	200	1984–85
Jinling *(Nanjing)*	Provincial tourist bureau/foreign capital	804	1983
LIAONING PROVINCE			
Hotel Project *(Shenyang)*	Provincial tourist bureau	250	1984
SHANDONG PROVINCE			
Qilu *(Jinan)*	Provincial tourist bureau	250	1984
Qufu *(Qufu)*	Provincial tourist bureau	150	1985
SHANGHAI			
Jinjiang (addition)	Shanghai Municipal Administrative Affairs Bureau/US capital	700	1985–86
Hongqiao	Shanghai Tourism Corp./Shanghai Travel and Tourism Administration	600	1985
Huating	Shanghai Tourism Corp./US capital	1000	1985
Shanghai	Shanghai Tourism Corp.	600	1983
SHANXI PROVINCE			
Yungang *(Datong)*	Datong tourist bureau	150	1984
TIBET AUTONOMOUS REGION			
Lhasa *(Lhasa)*	Local government	50	1985
XI'AN, SHAANXI PROVINCE			
Huashan	Local government	400	1984–85
Jinhua	China International Travel Service, Xi'an branch/Kowin Development Corp. (US)	600	1985
Ligong	Local government	100	1984–85
Tangcheng	Local government	400	1984–85
Zhonglou	Local government	350	1983
Xijing	Shaanxi Bureau of Travel & Tourism/E–S Pacific Development & Construction Co.; agreement announced 9/82	N/A	N/A
Xi'an	AGA Kilan foundation; interest expressed 6/82	N/A	N/A
YUNNAN PROVINCE			
Friendship (addition) *(Kunming)*	Local government	250	1983
ZHEJIANG PROVINCE			
Huagang (addition) *(Hangzhou)*	Provincial tourist bureau	75	1983
Huajiashan *(Hangzhou)*	Provincial tourist bureau	135	1983–84
Wanghu *(Hangzhou)*	Provincial tourist bureau	350	1983
Hotel Project *(Ningbo)*	Local government	150	1984–85
Xihu *(Hangzhou)*	Local government/Showa Concrete Industry Co. (Japan)	130–150	N/A

SOURCES: The National Council library, China Features, and reports from the National Tourism Administration and China International Travel Service. Compiled by Carol S. Goldsmith.

brand new White Swan Hotel, a modern miracle on Shamian Island.

A project of the Guangdong Tourism Corporation, the White Swan's white concrete and glass frame stretches 34 stories above the Pearl River. Hong Kong developer Henry Fok supervised the design of this hotel, a contractual joint venture between GTC, Fok, and Goodyear Investments of Hong Kong. The entryway opens into a magnificent marble lobby, its three-story atrium alive with tropical plants. Traditional gardens, a pagoda, and waterfall extend the full length of the lobby; a floor-to-ceiling picture window provides a dramatic view. Features of this 1,000-room hotel include a swimming pool, shopping arcade, Chinese and Western restaurants, conference facilities, and a business center. An American consultant on the project says that a 1,000-seat "floating" marble restaurant will be anchored alongside the hotel.

In Nanjing, meanwhile, the modern Jinling Hotel continues its steady journey skyward. The 34-story, glass-faced structure, designed and financed by Singapore investor Tao Xing Bo, will add 804 international-standard rooms to the city. Tourists should be dining in its revolving rooftop restaurant sometime this year.

The 30-story Kunlun, now underway in Beijing, also will sport a rotating rooftop restaurant when it opens in 1985. The $60 million hotel is a joint venture between Sin Gang Company, Ltd. of Hong Kong and the newly formed Xinhua Enterprise Corporation of Beijing. Management responsibilities will reside with Xinhua; Sing Gang will receive free use of 500 rooms for 11 years.

"We are going to put up a five-star hotel, the first of its kind in Beijing," claims Qiao Zeng, director of the Kunlun's construction office. Conveniences will include a sauna, closed-circuit TV, piped-in music, and two indoor swimming pools.

Not to be outdone, Shanghai has produced a wonder of its own—all on its own. This spring officials finally opened the first section of the Shanghai Guest House after more than four years of unsteady progress. The 29-story hotel, situated next door to the venerable Jing An Guest House, provides a marked contrast between China's old and new ideas about lodgings. Shanghai not only constructed and financed this hotel itself, but designed its impressive interior.

The expansive, well-appointed lobby is done in shades of off-white, gold, and brown. A wide marble staircase in the center of the room leads to the second-floor banquet area, where a fabulous, cylindrical crystal chandelier plummets nine meters down to the lobby. The hotel features 600 guest rooms, several conference areas, and will eventually have 19 restaurants, according to the Chinese managers.

Already, three stylish restaurants on the 23rd floor specialize in French, Japanese, and Chinese dishes. The "Western" dining room affords a spectacular view of the city. Full-length picture windows alternate with mirrors to give this long, wood-paneled dining room the feel of a European banquet hall. No foreign designers were involved in this project. Artists and engineers from the Shanghai Civil Design Institute took care of every detail—even the painting of an impressionistic bullfighting scene taken from a Spanish oil painting.

For all of its plusses, however, the Shanghai Guest House has some serious flaws. Only 4 elevators service its 600 rooms, which average just 16 square meters in size. First-time visitors to Shanghai may be impressed with the hotel's neatly appointed quarters, which look a bit like Ramada Inn rooms of 10 years past. But when compared with the Old World elegance of Shanghai's other guest houses, these rooms seem less than impressive.

China has not yet decided just what it wants a modern hotel to be. Clement Chen, Jr., the architect-partner of Beijing's highly touted Jianguo Hotel, had some difficulty convincing the Chinese to accept a transplanted version of his elegant, but low-rise, Palo Alto Holiday Inn.

"The Chinese are preoccupied with grandeur," says he. "Anything that's tall will receive approval." Chen says he had to revise the Jianguo drawing plans five times before the Chinese approved; the final plan included a tower.

To many minds, only the new Fragrant Hills Hotel outside Beijing truly "follows the Chinese road." The Chinese asked world-renowned architect I.M. Pei to design their project. Pei not only was given the freedom to choose the location, far from town in the rolling hills near the Summer Palace, but also the artistic license to develop the hotel's personality himself. Everyone praises the classic yet contemporary styling, which blends Western practicality with Oriental grace.

The workmanship, though, is another matter. Visitors walking through the new hotel have already noticed torn and weathered carpets, leaky faucets, paint stains on the concrete floors, and restroom doors that either don't close or won't stay on their hinges.

"It's a beautiful place," remarked one visitor, "but I don't think the Chinese can maintain it. The bottom line for a hotel, regardless of its style, still comes down to service and workmanship."

It is a lesson China is only beginning to learn.

Tourism Training

Everyone who has visited China has a favorite horror story, courtesy of the service sector. In fact, tourists probably would feel shortchanged if they didn't encounter at least one guide who could barely speak English, a floorboy who barged in at an embarrassing moment, or a pilot who delayed the flight two hours in order to have his lunch.

One delegate to the tourism conference, however, had a different tale to tell. She was dining at the new Chinese-style Huadu Hotel, which is notorious for its food, when she decided to swallow her manners and tell the waiter just what she thought of the meal. That night at about 11:00 the hotel chef came by her room to discuss her complaints. The next evening he prepared a private dinner that the woman described as "magnificent."

"That just proves the Chinese can do better if they really want to," she says. "But they seem to think that tourists don't know the difference between good service and bad."

Slowly, tourism officials are coming to recognize the seriousness of the "service problem." A wide cultural gap still exists between Chinese hosts and their foreign guests. Service personnel, most of whom have never been out of their province,

know little of standard international practice. The very notion of serving anyone but the motherland is new to this nation of comrades.

Five Chinese colleges are trying their best to change that, by offering the only management-level training programs for tourism and hotel officials. The Beijing Foreign Language Institute No. 2, formerly a language training center for guides, recently added a department of Tourism Economic Management and achieved university status.

Officials are also encouraging education abroad. Five CITS managers have returned home from the US with masters degrees in tourism administration. These graduates of the New School for Social Research in New York are believed to be the first Chinese to study tourism and hotel management outside of the PRC.

China's various tourism programs, such as those at the Shanghai Tourism College, Northwest University at Xi'an, and universities in Hangzhou, Nanjing, and Tianjin, have several things in common. They typically offer either a three- or four-year program for middle school graduates; emphasize courses in language, geography, history, tourism economics, and management; and employ a staff of Chinese teachers who, understandably, have little if any practical experience in the tourism field.

The Shanghai Tourism College—China's first—could well be the most comprehensive. Li Kuoqing, the school's dean, has established a small but self-sufficient facility about an hour and a half from the city, complete with student and faculty libraries, a model hotel room, training kitchen, and gardens patterned after typical hotel grounds.

Degrees are offered in hotel administration, hotel finance and accounting, and tourism administration. The 80 instructors write their own teaching materials for the 300 students. Their papers are then typeset and produced in the school's printing house.

Few visitors could fail to be impressed with the school's enthusiasm or troubled by its inexperience. Students in this three-year program spend less than two months in an internship at either a hotel or travel bureau. The rest of the time they study their instructors' materials on tourism economics, international money exchange, interior design, and hotel maintenance. No books on Western tourism management are in evidence.

Ironically, both the Shanghai and Northwestern faculty, who know little of each other's programs, claim to offer a course on "tourism psychology." This seemed the most innovative, and yet one of the most important, subjects on the 30-course curriculum.

Both faculty were asked what this course entailed, and both gave exactly the same answer. After mumbling amongst themselves for awhile, a spokesperson finally looked up and said, "Well, we haven't really *started* to teach that class yet."

Some of the best service personnel in China work at the Jianguo Hotel. And workers of an equally high, if not superior caliber, are expected to staff the Great Wall next year.

This is neither the result of luck nor of shrewd hiring by the joint venture partners. Both firms put a great deal of time and money into training their hotel personnel—some of them abroad—to help China set a higher service standard.

Clement Chen, Jr., an overseas Chinese himself, saw little problem at first in training his Chinese management staff. More than a year before the Jianguo's April 1982 opening, he brought 10 Chinese to work in his California Holiday Inn. The facilities and operation would be practically the same as the Jianguo's.

Of those trainees, however, Chen could only use six. "They spoke hardly any English," says he, "and had no hotel experience. Some didn't want to work; they just wanted a trip to the United States." Chen then decided he needed an outside management group to take over the job. So he offered the name of the Peninsula Group, owner of Hong Kong's venerable Peninsula Hotel and others throughout Southeast Asia, to his Chinese partners.

"I begged, pleaded, and coerced them to agree," he says. "but the Chinese didn't want to do it. They're not used to spending hundreds of thousands of dollars for management and training that they don't think is needed anyway."

Finally, 10 months before the opening, the Peninsula sent 27 people to Beijing to begin the training program. More than 550 workers have since emerged—everyone from the two Chinese deputy managers to the cleaning personnel—to the general plaudit of Jianguo guests. Chen, however, expresses dissatisfaction.

Photo by Gao Meijin, New China Pictures Co.

The luxury 804-room Jinling Hotel, jointly developed by the Nanjing branch of China International Travel Service and a Singapore firm, will feature a revolving restaurant on its 37th floor.

"The hotel has been a huge financial success, and the results have far exceeded our expectations," he remarks. "But the frustration [is] that we could do so much better." Chen claims that his staff has "not been given enough authority and freedom to run this hotel. Our partners should trust us more. Theoretically, we are to make the decisions and they are supposed to carry them out. But they don't always carry them out the way we want, if at all."

Chen realizes, of course, that earning the Chinese's confidence takes time—and a proven track record. Since its opening the Jianguo has maintained a fulfillment rate well above 90 percent, and Chen feels that China's hotel officials are suitably impressed. In February the Beijing Municipal Service Bureau asked him to take 50 Chinese into his training program to prepare them for work in other hotels. Chen only hopes these trainees will be working

BEIJING'S HOTELS

(12) HEPING (PEACE) HOTEL
3 Jinyo Hutong, off Wangfujing Street
Rooms: 128
¥55-85 ($28-43) Double/ ¥100 ($50) Suite

(13) HUAQIAO (OVERSEAS CHINESE) MANSION
2 Wangfujing Street
Rooms: 186
¥28 ($14) Double/ ¥50 ($25) Suite

(14) YANXIANG GUEST HOUSE
2 Jiangtai Road, Chaoyang District
Rooms: 144
¥40 ($20) Double

(15) YOUYI (FRIENDSHIP) HOTEL
Baishiqiao Road
Rooms: 1400
¥40 ($20) Double/ ¥70-90 ($35-45) Suite

(16) LUSONG YUAN (PINE GARDEN) GUESTHOUSE
Bingmasi, Kuanjie Street
Rooms: 30
¥23 ($12) Double/ ¥28 ($14) Suite

(17) WANNIANQING GUEST HOUSE
Zizhuyuan Street
Rooms: 140
¥25 ($13) Double

(18) ZHUYUAN (BAMBOO GARDEN) HOTEL
24 Xiaoshiqiao, Gulou Street
Rooms: 19 (15 Double; 4 Suites)
¥40 ($20) Double/ ¥160 ($80) Suite

(19) XIYUAN HOTEL
Haidian District, 5 Sanlihe Street, Erligou
Rooms: 170
¥30 ($15) Single/ ¥55 ($28) Double
¥65-75 ($33-38) Suite

(20) NEW XIYUAN HOTEL
Adjacent to the Xiyuan Hotel
Rooms: 437/Still under construction

(21) CHONGWENMEN HOTEL
(Formerly Xiangyang No. 1 Hostel)
2 Qianmen Dong Blvd.
Rooms: 30 (Mainly for foreign offices)
¥40 ($20) Single/ ¥63 ($32) Double

(22) CHANGCHENG (GREAT WALL) HOTEL
Donghuan Bei Road
Rooms: 1007/To open December 1983

(23) JIANHUA HOTEL
Jianguomen Wai Blvd.
Rooms: 695/To be completed late 1983 or 1984

(24) WANSHOU HOTEL
12A Wanshou Road
Rooms: 94 (59 double; 8 suites; 3 villas with 1 suite and 8 rooms each)
¥40 ($20) Double/ ¥60-80 ($30-40) Suite

(25) BEIWEI HOTEL
13 Xijing Road
Rooms: 176
¥22-27 ($11-14) Double/ ¥50 ($25) Suite

(26) LIDU HOTEL
Liangmahe, Chaoyang District
Rooms: 1000/To be completed 1983

(27) KUNLUN HOTEL
Liangmahe, Chaoyang District
Rooms: 1000/To be completed 1985

(28) ZHAOLONG HOTEL
Donghuan Bei Road
Rooms: 300/To be completed 1985

(29) GUOJI (INTERNATIONAL) HOTEL
Jianguomen Wai Blvd.
Rooms: 1100
Construction scheduled to begin 1984

(30) YANCHUN HOTEL
Jiangtai Road, Jiuxianqiao
Rooms: 360/To be completed 1985

(1) MINZU (NATIONALITIES) HOTEL
51 Fuxingmen Nei Blvd.
Rooms: 431
¥40 ($20) Double
¥80 ($40) Suite

(11) XIANGSHAN (FRAGRANT HILLS) HOTEL
Xiangshan (West of the Summer Palace)
Rooms: 322
¥90-130 ($45-65) Double

(10) DIAOYUTAI GUEST HOUSE
Sanlihe Street
Rooms: 260
¥150 ($75) Double
¥300 ($152) Presidential suite

(9) YANJING HOTEL
Fuxingmen Wai Blvd.
Rooms: 508
¥49-60 ($25-30) Double
¥90-115 ($45-58) Suite

(8) XUANWUMEN HOTEL
Chongwenmen Blvd.
Rooms: 324 (For overseas Chinese)
¥50-80 ($25-40) Double
¥90-100 ($45-50) Suite

To Ming Tombs and Great Wall

Qinghua University

Beijing University

② **BEIJING HOTEL**
East Chang'an Street
Rooms: 900
¥55-70 ($28-35) Double
¥100-180 ($51-91) Suite

③ **JIANGUO HOTEL**
Jianguomen Wai Blvd.
Rooms: 529
¥110-130 ($56-66) Double
¥260 ($131) Suite

④ **HUADU HOTEL**
8 Xingyuan Nan Road
Rooms: 522
¥55-80 ($28-40) Double
¥110 ($56) Suite

Capital Airport Road

Ring Road

⑤ **HUAQIAO (OVERSEAS CHINESE) HOTEL**
5 Santiao Beixinqiao
Rooms: 134
¥18-25 ($9-13) Double

Beihai

Palace Museum

Zhongnanhai

Wangfujing Blvd.

East Chang'an Street

Railway Station

Jianguomen Wai Blvd.

Temple of Heaven

⑦ **QIANMEN HOTEL**
1 Yongan Road
Rooms: 387
¥30-40 ($15-20) Double
¥70-80 ($35-40) Suite

⑥ **XINQIAO HOTEL**
2 Dongjiao Minxiang, Chongwenmen
Rooms: 387 (Mainly for foreign offices)
Telephone: 55.7731

31 US Embassy
32 Friendship Store
33 International Club
34 Minzu Palace
35 State Planning Commission, State Economic Commission, People's Bank of China, Agricultural Bank of China, China Investment Bank, Construction Bank of China, and Ministry of Finance
36 Bank of China
37 Ministry of Foreign Economic Relations and Trade
38 Ministry of Foreign Affairs
39 Ministry of Petroleum Industry
40 Ministry of Geology and Minerals
41 Ministry of Light Industry
42 Ministry of Machine Building Industry
43 Ministry of Chemical Industry
44 Ministry of Electronics Industry
45 Ministry of Coal Industry
46 Ministry of Communications
47 Ministry of Water Conservancy and Electric Power
48 Ministry of Ordnance Industry
49 Ministry of Space Industry
50 Ministry of Nuclear Industry
51 Ministry of Aviation Industry
52 Ministry of Metallurgical Industry
53 Ministry of Railroads
54 Ministry of Textiles Industry
55 Ministry of Posts and Telecommunications
56 Ministry of Agriculture, Animal Husbandry, and Fisheries
57 Ministry of Forestry
58 Ministry of Commerce
59 Ministry of Urban and Rural Construction and Environmental Protection
60 Ministry of National Defense

Liangshui River

SOURCES: National Council map file; Christopher Clarke and Kathryn Dewenter, *China Business Manual 1981*; and China Features, Beijing.

for government-run hotels rather than for rival joint ventures.

The Great Wall boasts a training program almost as ambitious as the building itself. At least 1,300 employees will work in the 1,007-room hotel. All of them must go through a rigorous on-the-job and classroom training program, and all should understand something of Western hotel management before beginning their jobs.

Peter Sun, E-S Pacific's vice-president for hotel operations and the Great Wall's general manager, administers the master plan.

"We considered it impractical to bring in a full complement of professionals to manage the hotel," he explains, "because of the living conditions, cost, and difficulty in replacing them. Also, I was not too sure how the coordination would be between the local people and the foreign professionals. Often in these situations there is no real participation by the Chinese; they just respond to the foreigners' actions."

So Sun hired 14 expatriate professionals and made the daring decision to train the rest. For the past year they've been compiling an operations manual for the Great Wall, designing the computer software, and developing job descriptions according to Sun's organizational chart.

In March the real training work began. The Chinese deputy department heads arrived in Hong Kong to begin their three-month internship at the Mandarin and Excelsior hotels. "From day one they will be treated as employees of these hotels," says Sun. Meanwhile the expatriate staff will begin explaining the various department management systems.

August marks the arrival of the expatriates and the newly trained department heads in Beijing, where they will begin the three-month training of the hotel supervisors. The first lesson involves the organizational chart.

"We want to give them a firm sense of who is above and below them," explains Sun, "to establish a seniority system right then, and give them a sense of responsibility." Sun deliberately scheduled the training of the department heads and supervisors in stages, to help reinforce the hotel hierarchy.

Next come the 1,000 "line workers"—the maintenance people, waiters, cooks, etc. Their training involves two to four months of learning the routine of their jobs and gaining some foreign language skills. "We want them to learn simple but polite manners," says Sun. "If they can say 'Hello' or 'How are you?' as well, the guests flip."

Sun has proposed a six-month probation period for the hotel staff, including three months of their training period. The Chinese prefer a three-month probation. In any event, Sun feels fairly confident the staff will be ready for the hotel's December 10 "soft" opening. The Chinese interviewed some 8,000 candidates before the partners arrived at this staff.

"This project is important to the Chinese," says Sun, "and I keep putting more pressure on them to realize just how important it is. I tell them, 'This is your hotel, after all: you are the ones who will have to run it. We're just here to serve as teachers.' " ₹

Reservations

Three hotels in China now accept reservations by telex, cable, telephone, and letter. The Great Wall in Beijing also will accept reservations when it officially opens next year.

Jianguo Hotel (Beijing)
Telex: 22439 JGHBJ CN
Cable: 6677 Beijing
Tel: 595261

Dong Fang Hotel (Guangzhou)
Telex: 44139 GZDFH CN
Cable: 4221
Tel: 69900

White Swan Hotel (Shamian Island, Guangzhou)
Telex: 44149 WSH CN
Cable: 8888
Tel: 86968

Managing Editor Carol S. Goldsmith accompanied a delegation from the National Council's Travel and Tourism Committee to China's first International Tourism Conference in Beijing.

中外貿易

Jennifer Little
Research Assistant

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

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

中外貿易

CHINA'S IMPORTS THROUGH MAY 11

Foreign Party/ Chinese Party	Product/Value/ Date Reported
Agricultural Commodities	
(USSR)	1 million m³ timber in 1983 believed purchased as part of bilateral trade pact. 3/6/83.
(Denmark)/China National Animal Breeding Stock Import & Export Corp.	Dairy cattle. 3/7/83.
(Hungary)/China National Animal Breeding Stock Import & Export Corp.	420 Duroc breeding hogs. 3/7/83.
(Guyana)	Timber. $660,000. 4/17/83.
(Malaysia)	2,500 tons of rubber. 4/17/83.
(Ecuador)	20,000 tons of bananas and 2,000 tons of cocoa beans for 1983. 4/18/83.
Agricultural Technology	
(New Zealand)	Construction of 3 model farms for livestock breeding and a forage grass seed farm. 3/28/83.
(Australia)	Technology to upgrade 2 livestock projects. $5.8 million (A$6 million) contribution. 4/3/83.
Chemicals	
(Japan)	3,000 tons of polyester staple. 3/15/83.
NL Treating Chemicals (US)/China National Oil & Gas Exploration & Development Co.	410 drums of corrosion inhibitors and biocides for use in produced and injection water systems. $250,000. 3/21/83.
Chemical and Petrochemical Plants and Equipment	
(Philippines)	Signed letter of intent to construct a petrochemical plant in Shenzhen. 4/83.
(Yugoslavia)	Technology for renovating a paint factory in Shenyang. 4/18/83.
Woodward & Dickinson (US)/Huangpu Port	Cooperating on a fertilizer bagging venture. 4/28/83.
Coal	
Magco Ltd., subsidiary of Babcock (UK)	2 rotating screens for separating coal. $200,000. 2/83.
Anderson Strathclyde (UK)	Longwall mining equipment mainly for Datong mines, Shanxi. $3.45 million (£2.25 million). 3/11/83.
Mitsui Mining Co. Ltd. (Japan)	Joint feasibility study on development of Sitaigou No. 2 Coal Mine, Datong area, Shanxi. 4/7/83.
Fluor Corp. (US)/China National Coal Development Corp.	Signed protocol for cooperation on a coal slurry pipeline project. 4/11/83.
Occidental Petroleum Corp. (US)/China National Coal Development Corp.	Signed interim agreement for development of the Pingshuo coal mine, Shanxi. 4/13/83.
(Yugoslavia)	Is negotiating cooperation in mining Chinese coking coal and copper. 4/18/83.
Bechtel International Services Inc. (US)/China National Coal Development Corp.	Signed contract for a feasibility study of a surface mine at Jungar, Nei Monggol, including a coal washing plant and coal slurry pipeline. 4/30/83.
Construction Materials	
Caricor (Hong Kong) Ltd.	Air conditioners for 3 hotels. $725,000 (HK$5 million). 2/25/83.
Stramit International (UK)	Straw conversion process technology for building material panels made of rice and wheat straw for 2 plants near Beijing. $3.8 million (£2.5 million). 3/25/83.
Consumer Goods	
Johnson & Son Inc. (US)/ Beijing Municipal Government	Technology, equipment, and training for commercial and consumer products. 3/83.
Minolta Camera Co. (Japan)	Opened the Guangzhou Enterprise and Service Corporation Minolta Service Center in Guangzhou. 3/7/83.
Shiseido Co. (Japan)/No. 1 Light Industry Bureau	Signed technical assistance contract to aid in the production of liquid hair care products. 3/22/83.
Save Ways (US)	Are producing Pro Air hair care appliances (no location given). 3/24/83.
Electronics	
Trondheim University Computer Center and Norsk Data A/S (Norway)	Have begun establishing a software technology center in Beijing under a UN aid project. 1/24/83.
Terak (US)/Ninth Design & Research Institute	Computer systems. $500,000. 2/83.
(Australia)	Prime 750 computer; software supplied by Australian Associated Resources for offshore oil exploration. 2/27/83.

NA = Not Available

NOTES: Contracts denominated in foreign currencies are converted into US dollars at the most recent monthly average rate quoted in *International Financial Statistics (IMF)*. Contracts concluded over two months ago are also included if they were not reported in the last issue of *The CBR*.

(Romania)/Chinese Academy of Agricultural Sciences	Computer system for China's Agriculture Computing Center. 3/83.
Far East Computers (Singapore)	12 Abacus Eleven minicomputers to analyze census data. $800,000. 3/11/83.
Tokyo Pigeon Co., Ltd. (Japan)/Weifang Recorder Plant, Shandong	Technology for cassette recorder cores. $800,000. 3/21/83.
Chori Co., Ltd. (Japan)	Contract signed for 30 sets of equipment and molds for recorder core production. $1.9 million. 3/21/83.
Honeywell, Inc. (US)	14 DPS8 mainframes and 40 DPS6 systems. $20 million. 4/83.
Dataprep (Hong Kong)/ China (Guangzhou) Hotel	Computer system for hotel use. $362,000 (HK$2.5 million). 4/10/83.
Rediffusion (Hong Kong)/ Guangdong Guest House	Contract for hotel movie system, public address system, and other audio systems. 4/10/83.
(Yugoslavia)/Sichuan	Have agreed to coproduce electronic products. 4/18/83.
(Yugoslavia)/Chengdu	Have agreed to coproduce multilayer ceramic capacitors. 4/18/83.
Sumitomo Corp. and Nippon Electric Glass Co. Ltd. (Japan)/ TECHIMPORT	Order for a glass bulb plant for television picture tubes in Tianjin. $23 million. 5/9/83.

Food Processing

(Yugoslavia)	Has agreed to renovate a beer production line. 4/18/83.

Machine Tools

(Yugoslavia)	Has agreed to coproduce automatic digital-control systems for machine tools in Beijing. 4/18/83.

Medical Equipment

Ridat Engineering (UK)/ SINOCHEM	A manual thermoformer for radiotherapy. 2/83.
MEL (UK)/SINOCHEM	2 additional medical linear accelerators for the Cancer Research Institute of the Chinese Academy of Medical Sciences. $1.3 million (£850,000). 2/23/83.
Cyclotron Corp. (US)	A radiotherapy cyclotron. $1.2 million. 3/13/83.

Metals and Minerals

(Japan)	7,602 tons of zinc in 1982. 3/15/83.
(Japan)	8,700 tons of copper cathode. 3/22/83.
Research Institute for Metals (Japan)/Beijing University of Iron & Steel Technology	Began joint research project to extract columbium from Chinese iron ore. 3/29/83.
(Australia)	Signed scientific and technical cooperation agreement in geological sciences. 4/19/83.

Packaging

Hutchison China Trade Holding (Hong Kong)/ and Officine Cevolani S.P.A. (Italy)/Anhui	Contract for supply and installation of automatic can production lines. $1 million. 2/26/83.

Petroleum

British Petroleum, Petrobras, Broken Hill Proprietary Co. Ltd., Petro-Canada Exploration Inc., and Ranger Oil Limited/China National Offshore Oil Corp.	Have been awarded contracts to drill for offshore oil. 5/11/83.
(Australia)	Will provide $483,500 (A$500,000) to help China purchase offshore oil drilling equipment. 3/83.
Hydro Products Inc. (US)/ MACHIMPEX	Wellhead inspection television system to be installed on the Kantan III semisubmersible rig. 3/14/83.
(Nigeria)	China agreed in principle to import an unspecified volume of oil. 3/16/83.
Jardine, Matheson & Co. (Hong Kong)/China National Offshore Joint Service Corp.	Is negotiating to provide language training, oilfield orientation and secretarial training to Chinese oilfield liaison personnel. 4/15/83.
Baker Marine Corp./ China Offshore Petroleum Platform Engineering Corp. and the Jiangnan Shipyard, Shanghai	Contract to build a semisubmersible drilling rig. 4/25/83.

Pharmaceuticals & Equipment

Autopack Ltd. (UK)	32 automatic vial filling, feeding, rubber bunging, and cap spinning machines. 1/83.

Power

Froude Engineering Ltd. (UK)/China State Shipbuilding Corp.	An HS 790 high-speed hydraulic dynamometer. 12/82.
Harza Engineering Co. (US)/Ministry of Water Resources and Electric Power	Contract to advise on the design for the Tianshengqiao hydroelectric project in southwest China. $400,000. 4/7/83.
(Italy)	Will aid in the survey and exploitation of geothermal resources in Beijing, Tianjin, and Xizang under a UNDP project. 4/18/83.
(France)	Agreed in principle to provide 4 nuclear reactors for 2 planned power stations. 5/6/83.

Scientific Instruments

Seismic Engineering (US)	A sixth marine seismic system. 3/25/83.

Shipping

Transacme (Japan) Ltd./ Guangzhou Harbor Transportation & Trust Co.	Launched an intermodal container forwarding service between Japan and China via Hong Kong. 2/15/83.
Kawasaki Heavy Industries Ltd. (Japan)/China Ocean Shipping Co.	Won an order for 2 42,000 dwt bulk carriers. 3/4/83.
Hong Kong and Yaumati Ferry Co./Changjiang Shipping Administration Bureau of Wuhan	2 84-seater hoverferries. 3/6/83.
MAN (W. Germany)/ Xinzhong Power Machine Plant, Shanghai	Components for diesel ship engines. $1.65 million (Dm4 million). 3/10/83.
(W. Germany)	The motorship, Contract Carrier, 6340 dwt. 3/18/83.

Steel

NA (New Zealand)	Contract signed for several thousand tons of rolled steel. 3/28/83.
Nippon Steel Corp., Sumitomo Metal Industries Ltd., Nippon Kokan Kaisha, and Kawasaki Steel Corp. (Japan)	200,000 tons of seamless steel pipe for July-Dec. delivery which brings total 1983 purchases to 500,000 tons. 4/26/83.

Telecommunications

(Italy)	Has agreed to permit China to use the satellite, Sirio 1, for telecommunications experiments. 4/2/83.
McMartin Industry (US)	Order for a broadcast transmitter. 4/4/83.
International Telephone & Telegraph Corp. (Belgium)	Signed a protocol to provide Shanghai with computerized telephone switching equipment and know-how. 3/31/83.
CIT-Alcatel (France)	Is negotiating to provide telephone equipment technology. 4/11/83.

Textile Plants & Equipment

(New Zealand)/Nantong, No. 2 Textile Mill, Jiangsu	Equipment and raw materials to improve the Nantong wool mill yarn shop. 3/28/83.

Tourism

Miramar Hotel (Hong Kong)/Dongfang Hotel (Guangzhou) and Hainan Island	Will cooperate to invest in a resort-hotel project on Hainan. $5.1 million (RMB10 million). 4/17/83.
Seibu Group (Japan)/ Great Wall Hotel, Beijing	Furniture, lighting equipment, interior decoration, and other products. 5/3/83.

中外贸易 CHINA'S EXPORTS THROUGH MAY 11

Foreign Party/ Chinese Party	Product/Value/ Date Reported
Agriculture	
(Barbados)	Will cooperate with China to set up a vegetable cultivation center in Barbados. 3/11/83.
(Poland)	China will supply pork in the form of a long-term, interest free loan, as well as commodity credit. 3/25/83.
(Japan)	200,000 tons of soybeans. 3/29/83.
Construction	
(Algeria)/China Construction Engineering Corp.	Contract to construct 14 reinforced concrete apartment houses in Rouiba. $11 million (50.25 million dinar). 3/14/83.
(Kenya)	Signed agreement to build sports stadium in Nairobi. 4/1/83.
Foreign Aid	
Victoria (Australia)/China Red Cross Society	Aid for fire victims. $30,000. 2/27/83.
Machinery and Machine Tools	
(Portugal)	250 machine tools, including lathes, drills, grinders, borers, and spark-erosion machines. $2 million. 2/27/83.
OCI (US)	A Taishan 50S tractor made in Weifang. 4/83.
Minerals and Metals	
(Japan)	13,330 tons of silicon metal and 219.5 tons of antimony metal. 3/1/83.
(Japan)	2 Mt of coal in imports planned 1983. 4/8/83. Prices remain to be decided.
Military Equipment	
(Pakistan)	40 A5 fighters. 4/7/83.
Petroleum	
(Japan)/SINOCHEM	8 million tons of Daqing crude during 1983. $28.70/barrel. 3/24/83.
Power	
(Pakistan)/China Machine Building International Corp.	Contract to supply and install a 210 mw steam turbine set for the Guddu thermal power station. $56 million. 2/83.
(Sri Lanka)	China will assist in the construction of the Nelambe Oya hydropower project. 2/25/83.
Shipping	
Parley Augustsson (Norway)/China State Shipbuilding Corp.	6 7,000-dwt roll-on/roll-off vessels. $85 million. 2/27/83.
Trade Agreements	
(Pakistan), (Poland), (Seychelles), and (USSR)	Signed trade and economic agreements during March and April 1983.
Transporation	
Globe Auto Imports (US)	Will import the Beijing Tiger automobile line. 3/17/83.

中外贸易 DIRECT INVESTMENT/PROCESSING/ COUNTERTRADE THROUGH MAY 11

Foreign Party/ Chinese Party	Arrangement/Value/ Date Reported
Joint Ventures	
Yuet Shun Shipping (jointly owned by Guangdong Enterprises, Thoresen Solstad Offshore Services, and Shu Kong Shipping-Hong Kong) and Offshore Services (Hong Kong)/China National Offshore Joint Service Corp.	Formed the 50-50 Zhongxing Offshore Marine Service Co. Ltd. to provide supply vessel services for oil companies. 3/7/83.
NA (Australia)/NA	Are implementing the initial stages of a citrus fruit production venture located in Hunan. 3/7/83.
Cattle International Ltd. (US)/Nei Monggol General Corp. for United Business	Preliminary agreement for 15-year cooperation in cattle farming and beef cattle export. Total investment $100 million and RMB60 million. 3/14/83. Profit split 40 percent US; 60 percent China.
Baker Marine Corp. (US)/China National Offshore Oil Corp.	Formed a 50–50 equity venture China Nanhai–Baker Drilling Corp. Ltd. to build a semisubmersible drilling rig, rent and lease drilling rigs, and undertake drilling operations. Registered capital $20 million. 3/16/83.
Occidental Petroleum Corp. (US)/China National Coal Development Corp.	Signed an interim agreement for the construction of the open-cut Antaibao coal mine. 3/22/83.
General Electric Co. (UK)	Signed a memorandum of understanding for cooperating in the construction of a nuclear power plant in Guangdong. 3/26/83.
Kai Hoi (Hong Kong) and Offshore Supply Association (W. Germany)/China National Offshore Joint Service Corp.	Signed contract to form the Zhongji Offshore Marine Service Co. to offer shipping services to oil companies. 3/30/83.
Hwa Jian United Enterprise Ltd. (Hong Kong)/ Shanghai Furniture Co.	Established the Shanghai Upholstered Furniture Co. Ltd. located in Shekou to manufacture mattresses, sofas, chair cushions, stools, and other furniture. Investment: $435,000 (HK$3 million). 4/11/83.
R.J. Reynolds Tobacco International Inc. (US)/ Xiamen Cigarette Factory	Are negotiating a contract to produce a new cigarette to be sold in China and on international markets. $12 million. 4/15/83.
MacMillan Bloedel (Canada)/CITIC	Are discussing a pulp production venture. 4/17/83.
Pilkington Brothers PLC (UK) and U.D.I. Ltd. (Hong Kong)/Shanghai Yaohua General Glass Works	Signed contract for establishing and operating a float glass works plant. Total investment $102 million (RMB200 million). 4/18/83.
Fung Ping Fan Consultants Ltd. (Hong Kong)/ Guangzhou External Economic Information & Consultancy Servicing Corp.	Formed Sui Fung Consultants Ltd. based in Guangzhou to advise clients on trade and investment in China. 5/2/83.
American Motors Corp. (US)/Beijing Automotive Works	Signed contract to form the Beijing Jeep Corp., Ltd. to produce 4-wheel drive utility vehicles and trucks. $51 million. Equity: US-31.3%; PRC-68.7%. 5/5/83.
Compensation Trade	
Européen de Peausserie Co. and Jean Marc Soussan Co. (France)/Kaifeng Tannery, Henan	Tanning equipment in exchange for processed Chinese goatskins. 3/7/83.
NA (Hong Kong)/Jinxian, Dalian	Will cooperate on the production of prawns. 4/17/83.
Licensing	
Flakt AB (Sweden)	Technology to manufacture electrostatic precipitators used for cleaning emissions from coal-fired power stations. 3/20/83.

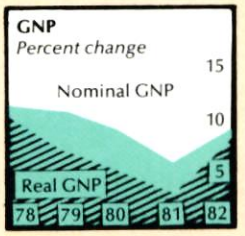
CHINA DATA

中国数据

KEY INDICATORS

	1977	1978	1979	1980	1981	1982	% change 1982/81	% change J-A '83/ J-A '82
Exchange rate* (yuan per US $)	1.8578	1.6836	1.5550	1.4984	1.7050	1.8887	—	—
GNP (bil. ¥, current prices)	314.4	350.2	389.1	425.4	450.4	488.7	8.5	—
(bil. $, current prices)	169.2	208.0	250.2	283.9	264.2	258.7	−2.1	—
GNP deflator (1976=100.0)	99.1	100.5	104.5	108.7	111.9	114.2	2.0	—
Population (year-end, million)	945.2	958.1	970.9	982.6	996.2	1,008.2	1.2	—
GNP per capita	179.0	217.1	257.7	288.9	265.2	256.6	−3.2	—
Gross value of industrial output (bil. ¥, current prices)	360.6	412.4	449.4	497.4	517.8	550.6	7.7	7.6
Of which:								
Heavy industry	209.1	236.3	255.7	263.9	251.5	274.0	9.9	11.7
Light industry	151.5	176.1	193.7	233.5	266.3	276.6	5.7	3.7
Gross value of agricultural output (bil. ¥, current prices)	142.2	156.6	195.1	218.7	244.8	278.5	11.0	—
Official price index (annual % change)	0.2	0.7	2.0	6.0	2.4	2.0	—	—
State budget revenues (bil. ¥)	87.5	112.2	110.3	108.5	109.0	112.4	3.1	—
State budget expenditures (bil. ¥)	84.4	111.1	127.4	121.7	111.5	115.3	3.4	—

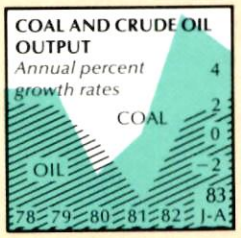
*Period average yuan-dollar exchange rate 1.9528 in first quarter 1983, and 1.9840 in second quarter 1983.

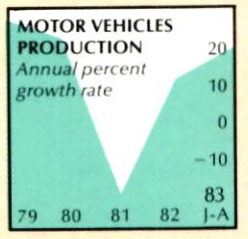


INDUSTRIAL PRODUCTION

(million metric tons unless otherwise indicated)

	1978	1979	1980	1981	% change	1982	% change 1982/81	% change J-A '83/ J-A '82
Steel	31.78	34.48	34.2	35.6	−4.1	37.16	4.4	9.3
Rolled steel	22.08	24.97	27.16	26.7	−1.7	29.02	8.7	6.7
Coal	618.0	635.0	620.0	620.0	0.0	666.0	7.1	4.9
Crude oil	104.05	106.15	105.95	101.22	−4.5	102.12	0.9	2.3
Natural gas (billion cubic meters)	13.73	14.51	14.27	12.74	−10.7	11.93	−6.4	4.0
Electricity (billion kilowatt hours)	256.55	281.95	300.6	309.3	2.9	327.7	5.9	6.0
Cement	65.24	73.9	79.86	84.0	5.2	95.2	14.8	14.8
Machine-made paper and paperboard	4.39	4.93	5.35	5.4	0.9	5.89	9.1	—
Chemical fertilizer	8.693	10.654	12.32	12.39	0.6	12.781	3.2	6.1
Chemical insecticides (thousand metric tons)	533.0	537.0	537.0	484.0	−9.9	457.0	−5.6	−15.5
Motor vehicles (thou. units)	149.1	185.7	222.3	175.6	−21.0	196.0	11.4	19.9
Medium and large tractors (thou. units)	113.5	125.6	97.7	52.8	−46.0	40.0	−24.5	−29.0
Walking tractors (thou. units)	324.2	317.5	217.9	198.9	−8.7	298.0	49.7	41.5
Locomotives (units)	—	573	512	398	−22.3	486	22.1	29.4

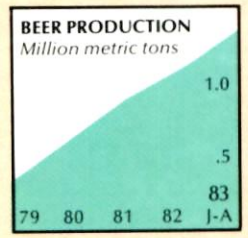




CONSUMER GOODS PRODUCTION

(million units unless otherwise indicated)

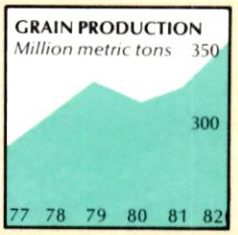
	1978	1979	1980	1981	% change	1982	% change	% change J-A '83/ J-A '82
Bicycles	8.54	10.09	13.02	17.54	34.7	24.2	38.0	22.8
Sewing machines	4.86	5.87	7.68	10.39	35.3	12.86	23.8	−6.2
Wristwatches	13.51	17.07	22.16	28.72	29.6	33.01	14.9	20.0
TV sets	.517	1.329	2.492	5.394	120.0	5.92	9.8	6.4
Radio sets	11.68	13.81	30.04	40.57	35.1	17.24	−57.5	−22.0
Cameras (thou. units)	178.95	238.0	373.0	623.0	67.0	742.0	19.1	4.1
Light bulbs	760.3	850.0	950.0	970.0	2.1	1,070.0	10.3	21.0
Cotton cloth (billion square meters)	10.286	11.43	12.80	13.4	5.0	14.92	9.4	1.5
Silk textiles (million meters)	610.35	663.45	759.0	835.0	10.0	910.0	9.5	0.7
Beer (thou. tons)	—	—	688.0	910.0	32.3	1,170.0	28.6	32.7
Cassette recorders (thou. units)	—	—	743.0	1,546.0	108.1	3,471.0	124.5	—
Household washing machines (thou. units)	—	—	245.0	1,281.0	422.9	2,533	97.7	51.4
Household refrigerators (thou. units)	—	—	49.0	55.6	13.5	99.9	79.7	66.5

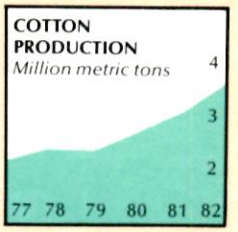


AGRICULTURAL PRODUCTION

(million metric tons unless otherwise indicated)

	1977	1978	1979	1980	1981	% change	1982	% change 1982/81
Grain	282.75	304.75	332.115	320.52	325.02	1.4	353.43	8.7
Cotton	2.049	2.167	2.207	2.207	2.968	−9.6	3.598	21.3
Silkworm cocoons (thou. tons)	216.0	228.0	271.0	326.0	311.0	−4.6	314.0	1.0
Processed sugar	1.816	2.27	2.5	2.57	3.166	23.2	3.384	6.9
Sugar cane	—	21.12	21.51	22.81	29.67	30.1	36.88	24.3
Oil-bearing crops	4.015	5.218	6.435	7.691	10.205	32.7	11.817	15.8
Tea (thou. metric tons)	252.0	268.0	277.0	304.0	343.0	12.8	397.0	16.0
Hogs slaughtered (million heads)	—	—	187.72	198.607	194.95	−1.8	200.63	2.9
Timber (million cubic meters)	49.7	51.62	54.39	53.59	49.42	−7.8	50.41	2.0





CHINA'S FOREIGN TRADE

	1977	1978	1979	1980	1981	% change	1982	% change 1982/81
Exports (bil. ¥, fob)	13.97	16.79	21.17	27.12	36.76	35.5	41.43	12.7
(bil. $, fob)	7.52	9.97	13.61	18.10	21.56	18.5	21.94	1.8
Imports (bil. ¥, cif)	13.28	18.75	24.39	29.88	36.77	23.1	35.77	−2.7
(bil. $, cif)	7.15	11.74	15.69	19.94	21.57	11.2	18.94	−12.2
Total trade (fob/cif)	27.25	35.54	45.56	57.00	73.53	29.0	77.20	5.0
	14.67	21.11	29.30	38.04	43.13	14.7	40.88	−5.2
Total reserves (period end, bil. $)	4.85	4.03	6.08	10.04	10.61	78.6	15.90	49.9
Of Which:								
Foreign exchange	2.35	1.56	2.15	2.26	4.77	111.0	11.13	133.3
Gold (bil. $*)	2.50	2.47	3.93	7.78	5.84	−9.6	4.77	−18.3
Gold reserves (million fine troy ounces)	12.8	12.8	12.8	12.8	12.7	−0.8	12.7	0.0

*Gold valued at current market prices based on IMF period average commodity price indices.

FOREIGN TRADE WITH SELECTED COUNTRIES

(million US dollars)

	1977	1978	1979	1980	1981	1982	% change	% change J-A '83/ J-A '82
United States								
Exports (fas)	171.3	823.6	1,716.5	3,749.0	3,598.6	2,904.5	−19.3	−32.7
Agricultural	(40.0)	(565.0)	(492.1)	(2,279.4)	(2,112.4)	(1,707.8)	−19.2	−57.0 est.
Nonagricultural	(131.3)	(258.6)	(724.4)	(1,469.6)	(1,486.2)	(1,196.7)	−19.5	−5.0 est.
Imports (customs value)	202.7	324.1	592.3	1,058.3	1,895.3	2,283.7	20.5	−1.8
Total	374.0	1,147.7	2,308.8	4,807.3	5,493.9	5,188.2	−5.6	−21.2
Share of China's total two-way trade	2.5	5.4	7.9	12.8	12.7	12.7	—	—
Japan								
Exports (fob)	1,955	3,074	3,674	5,109	5,075	3,500	−31.0	1.0
Imports (cif)	1,560	2,045	2,933	4,346	5,283	5,338	1.0	−12.8
Total	3,515	5,119	6,607	9,455	10,358	8,838	−14.7	−7.6
Share of China's total two-way trade	24.0	24.2	22.6	25.1	24.0	21.6	—	—
Hong Kong								
Exports (fob)	44	63	82	1,249	1,964	1,939	−1.3	−19.7
Imports (cif)	1,735	2,249	3,021	4,401	5,271	5,397	2.4	−3.8
Total	1,779	2,312	3,403	5,650	7,235	7,376	1.4	−8.5
Share of China's total two-way trade	12.1	10.9	11.6	15.1	16.8	17.9	—	—
W. Germany								
Exports (fob)	501	995	1,493	1,145	1,017	853	−16.1	−20.1
Imports (cif)	288	367	534	808	770	1,404	82.3	47.5
Total	789	1,362	2,027	1,953	1,787	2,257	26.3	18.9
Canada								
Exports (fob)	347	442	507	742	777	1,005	29.3	92.9
Imports (fob)	77	83	143	132	325	165	−49.2	13.3
Total	424	525	650	874	1,102	1,170	6.2	74.4

SOURCES: State Statistical Bureau, Beijing; IMF, *International Financial Statistics*; IMF, *Direction of Trade Statistics*; and National Council for US-China Trade.

书刊介绍

Joint Venture Agreements in the People's Republic of China, by Pompiliu Verzariu and Daniel D. Stein. Washington, DC: International Trade Administration, US Department of Commerce, November 1982. 124 pp. $5. Available from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

An excellent resource on joint ventures in China, the handbook contains chapters on the legal and institutional framework of US–China trade, the structure of joint ventures, joint venture legislation, and the practical aspects of organizing and operating joint ventures in China. Appendices include the texts of laws and regulations on joint ventures, special economic zones, and related topics. The texts of two joint venture contracts are included.

Countertrade Business Practices for Today's World Market, by Leo G. B. Welt. New York: American Management Associations, 1982. 72 pp. AMA members, $7.50; nonmembers, $10. Order from AMA Membership Publications Division, 135 West 50th Street, NY, NY 10020

A part of the AMA's Management Briefing Series, this book explains countertrade terms, forms of countertrade, the reasons for its use, and negotiating and contract considerations, and discusses a variety of ways to organize for countertrade. One chapter looks at countertrade with Eastern Europe, the Soviet Union, China, and the Third World. References and a short bibliography are appended.

China's Trade Law: Code of the Foreign Trade Law of the People's Republic of China, by Francois de Bauw and Bernard Dewit. Brussels: Bruylant; Deventer: Kluwer, 1982. 572 pp. $68. Order from Kluwer Academic Publishers, 190 Old Derby Street, Hingham, MA 02043

This one-volume compilation of China's trade law contains the English-language texts of 29 major trade laws and regulations, promulgated through January 30, 1982. It also contains the general conditions of insurance, statutes of the China International Trust and Investment Corporation, articles of association of the Bank of China, legislation establishing the arbitration commissions, and texts of several trade agreements. Included is legislation on joint ventures, SEZs, resident offices, income tax, customs, exchange control, maritime transport, commodity inspection, insurance, trademarks, inventions, petroleum contracts, arbitration, economic contracts, and lawyers.

This hardbound book is convenient and easy to use, but it is somewhat out of date and its format does not allow for updating. For example, the trademark law included in the book has been replaced by a new law that became effective March 1, 1983; and there were many new trade laws passed in 1982 and 1983.

The New York Beijing Directory. New York: The New York/Beijing Friendship City Committee, 1983. 109 pp. $20. Order from the Committee, 52 Chambers Street, Room 214, NY, NY 10007.

The past few years have witnessed a rapid growth in all types of exchange programs with China. This directory lists New York City firms and institutions that maintain active relationships with Beijing in the areas of business and commerce, communications, culture, and education. Directory entries provide the organization's name, address, telephone and telex number, cable address, name of primary contact, and a brief description of the organization's China activities. Offices in China of New York firms are listed, as are Chinese agency offices located in New York City.

The Chinese Agricultural Economy, edited by Randolph Barker and Raha Sinha with Beth Rose. Boulder, CO: Westview Press, 1982. 266 pp. $27.50 hardbound, $12.95 paperback.

This collection of 12 essays is designed to fill the information gap since the 1960s, when the last comprehensive works on Chinese agriculture appeared. Unfortunately, this book ignores recent policy changes and concentrates on the pre-1980 period. The first four chapters provide the historical, social, and geographic background. Later chapters analyze changes in agricultural policy and in the rural economy. Each chapter contains a suggested reading list. The book contains an index, appendices on agricultural statistics, and a list of additional sources of information.

New CIA Publications

China: International Trade Annual Statistical Supplement. NTIS #PB83-928204. March 1983. $13.50. The 1983 edition of this annual publication carries the commodity trade statistics, by SITC number, for China's worldwide imports and exports in the years 1970, 1975, and 1977–81.

Major Foreign Trade Organizations of the People's Republic of China. Wall chart. NTIS #PB82-928215. December 1982. $7.50

Chinese Communist Party Organizations. Wall chart. NTIS #PB83-928201. February 1983. $7.50.

These publications can be ordered prepaid from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, or phone (703) 487-4650. The NTIS number must accompany orders.

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

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