THE MAGAZINE OF THE NATIONAL COUNCIL FOR US-CHINA TRADE MAR.-APR. 1977

The China Business Review

VOL. 4 NO. 2

NEW FROM THE NATIONAL COUNCIL

DIRECTORY

of Foreign Trade Exhibitions in the People's Republic of China (1971-1976)

China's Technology Preferences in the 1970s

- What is the real China market?
- What specific types of foreign technology are of interest to the People's Republic of China?
- What exact products and technology has your competition displayed in China in the past six years? And sold to China?
- How have China's foreign technology preferences changed during the 1970's and what opportunities do these represent for your firm?
- What happens at a foreign exhibition in Peking?

In providing the answers to these questions, the National Council's *Directory of Foreign Trade Exhibitions in China (1971-1976)* represents an essential market research tool for companies involved in doing business with the PRC, with cross-referenced details of over 10,000 models and products displayed—and, in most cases, sold—by over 2,200 foreign companies in China since 1970. As a tool for analysis of the present and future China market, this 500-plus page Directory is unique and vital for your PRC strategy.

About the Directory

There have been over forty industrial exhibitions in the People's Republic of China by foreign countries during the past six years. Twenty-six of these trade fairs were by western nations, including nearly all European countries and Japan. These exhibitions are showcases of the types of foreign technology China is interested in.

- The *Directory* is an essential reference guide to what other companies have displayed in the PRC
- the products and technologies exhibited in the PRC, 1971-1976, by model number and/or type
- how exhibitions are organized in China—and where China exhibits abroad · floorplans of major exhibits in the PRC · China's technology preferences, and how these preferences have changed · what happens at an exhibition in China
- what technical seminars in the PRC accomplish and how they work.

The *Directory* has been prepared by Molly Bruce Jacobs, a Chinese-speaking specialist in the subject of trade shows in China. The 500-plus page volume will be available in early 1977.

Countries included in the Directory are Australia, Austria, Belgium, Britain, Canada, Denmark, France, Germany, Italy, Japan, Mexico, Netherlands, Sweden and Switzerland.

The Directory costs $200.
Outside North America, add $7.00 for airmail postage.
Copies may be ordered from the National Council in Washington, D.C.

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The China Business Review

EDITOR: N. H. LUDLOW • ASSISTANT EDITOR: S. R. GREEN • EDITORIAL ASSISTANT: H. JACKSON

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Front Cover: A Talien-built 1974 "East Wind" (Dong Feng) locomotive ready to roll a train out of Canton station, en route to Lo Wu, a familiar sight to visitors to the PRC. For details of China's railroads, see p. 26.

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The National Council for United States-China Trade is grateful to His Excellency Huang Chen, Chief of the Liaison Office of The People's Republic of China in Washington, for the calligraphy on the front cover of the China Business Review.

(Formerly U.S.-China Business Review)

CHINA TRADE EVENTS

NATIONAL, March 14–End of April

A four-person delegation from the China National Native Produce and Animal By-Products Import and Export Corporation specializing in the export of essential oils is currently touring the United States at the invitation of the National Council. Its itinerary includes meetings with businessmen in Washington, D.C., New York City, and on the West Coast. For details contact Suzanne Reynolds, Coordinator of Import Activities, 202-331-0290.

NATIONAL, March 28–April 15

A four-person mission from the China National Textiles Import and Export Corporation is visiting this country hosted by the National Council. Concentrating on silk piece goods and greige goods, the group is going to Washington, D.C., New York City, San Francisco, and Los Angeles. For details contact Suzanne Reynolds, 202-331-0290.

CHINA, April 4–15

The Importers Steering Committee of the National Council has dispatched a delegation to meet with representatives of Chinese FTC's in Peking. The group is being escorted by Vice-President Melvin W. Searls, Jr.

KWANGCHOW, April 15–May 15

The 41st Chinese Export Commodities Fair will be held. Attending from the National Council will be Vice President Searls, Director of Business Advisory Services Eric Kalkhurst, Hong Kong representative John Kamm, and New York representative Arne de Keijzer. Irene Kamm will provide secretarial support.

SAVANNAH, GEORGIA, April 19–21

Nicholas H. Ludlow, Council Director of Publications and Research, will speak on "Trade with the PRC: Present and Future Prospects" at the Georgia Foreign Trade Conference, sponsored by the Georgia Port Authority.

MILWAUKEE, WISCONSIN, May 13–14

The Institute of World Affairs of the University of Wisconsin at Milwaukee and the China Council of the Asia Society are planning a "Wisconsin Conference on China," which will feature an afternoon roundtable on "Sino-US Trade: Prospects and Problems." Nicholas Ludlow, Director of Publications and Research at the National Council will speak on the status and realities of the US trade relationship with the PRC, followed by William Clarke, Director of the Division of PRC Affairs, US Department of Commerce, who will speak on the nuts-and-bolts of doing business with the PRC. A panel session will follow. This workshop will take place during the afternoon of May 14. For further details contact: write P.O. Box 413, Milwaukee, Wisconsin, 53201, or call (414) 963-4251.

FORT LAUDERDALE, FLORIDA, May 26

Speaking at the annual Governors' Conference will be Council President Christopher H. Phillips on the topic of Sino-US Trade in the Post-Mao Era.

SAN FRANCISCO, June 4

A conference on China and Global Issues will be held, co-sponsored by the World Affairs Council of Northern California, the Stanford US-China Relations Program, and the China Council of Asia Society. For information contact Douglas P. Murray, 415-497-3150.

Take Special Note

WASHINGTON, D.C., June 16

The Annual Meeting of the National Council will be held at the Madison Hotel, 15th and M Streets, N.W., beginning at 12:00 noon with a pre-luncheon reception and luncheon at which Senator Charles Percy will be the keynote speaker. The meeting will be in session from 2:00 to 5:00, and will conclude with an evening reception from 5:30 until 7:00. For details, contact Pat Caperones at the National Council, (202) 331-0290.

NATIONAL, September

The China Council for the Promotion of International Trade has accepted the invitation of the National Council to send its second official delegation to the U.S.

CHICAGO, November 17

The National Council will hold a conference on technology licensing and transfer to the PRC. For details contact Eric Kalkhurst, 202-331-0290.

YOUR MEN IN PEKING

When in Peking, US Commercial Staff at the US Liaison Office will be happy to assist you. Please feel free to call them if you are in China's capital.

Commercial Staff:	William W. Thomas, Jr. (Chief) Richard Mueller Frank P. Wardlaw
Agricultural Representative	Koy L. Neeley (FAS/USDA)
Telephone:	522033 Ext. 215 or 216
Address:	17 Guanghua Road Peking
Cables:	United States Liaison Office Peking
Telex:	None.

US-made seismic equipment approved for China by US export controls.

Export Controls, National Security and China

A Commentary and a Proposal

Donald Henry

The sale of high technology items to China and to other countries in the "East," including the Soviet Union and East European nations, has been a controversial subject. Peking's purchase of Rolls-Royce Spey engine technology from the UK in late 1975 and CDC Cyber 172 computer in 1976 has fueled this controversy. The Spey engine technology could be used for new tactical fighter aircraft and provide long-term commercial advantages to those firms that traditionally use Rolls engines in their commercial aircraft. What is the relationship of these kinds of technology sales to national security? Is the system for licensing such sales in the US fair, efficient, and realistic in terms of changing foreign technology developments? Don Henry argues that the US needs a new, more constructive procedure for administration of export controls. He proposes a new licensing structure that would allow for fairer, faster and more competitive operation. This article does not necessarily represent the views or policy of the National Council or its staff.*

Mr. Henry is a Washington-based consultant specializing in market development activities for industry. He has worked in Europe, South America, the Middle East and South Asia in the petroleum, aerospace and computer/electronics industries and sold the first US manufactured computer-based system to the Institute of Physics, Peking in 1973. He has made several trips to China as well as to Eastern Europe and Russia.

For over a quarter of a century, the US Government has attempted to curtail the sale of state-of-the-art products and systems to the "East." The justification for this policy was that it would hinder the East's ability to develop and deploy sophisticated weapon systems. The United States vigorously enforces this policy, at least as far as US business is concerned, through the Export Administration Act.

Yet, over the same period, trade of manufactured goods between the West and East, containing high levels of technology, has reached the $20 billion annual level. The US Department of Commerce estimates that the annual level of communist imports of manufactured goods will reach $45 billion during the first part of the 1980's. If present conditions prevail, the US will have less than four percent of this trade.

Russia, Eastern Europe and the People's Republic of China represent a real export market to US manufacturers. The domestic benefits that would be derived from expanding trade with the East are obvious. If the US obtained 30% of the market ($15 to $20 billion annually), it would mean thousands of new jobs and it would make a meaningful contribution to our international balance of payments.

Many factors contribute to the small American share of East-West trade, including the East's longer relationships with other countries, more attractive financial terms from other western nations, and, to some extent, the proximity of Europe and Japan to the Eastern bloc.

But the primary reason is that US manufacturers face considerably longer delays and more restrictions

* "East" and "Eastern nations" in this article refers to the communist nations of Eastern Europe, the Soviet Union and the PRC.

in their ability to export to the East than do their competitors in other countries.

The positions of the national security bureaucracy —the Departments of Defense and ERDA, the Central Intelligence Agency and National Security Council— are, it seems to this author, that "Nothing good can come from East-West trade, the East can never be trusted, and American companies conducting business with the East are working against the interests of the United States."

Relaxation of Export Controls

For those who advocate relaxation of export controls, there appears to be no hope for expanding trade with the East in high technological content products and systems unless the national security bureaucracy is removed from the first line of technical evaluation of proposed exports. Attempting to achieve rational technical export guidelines by working through government-controlled technical advisory committees is self-defeating.

The American electorate should be informed that relaxation of export controls does not automatically represent a national security risk.

Secondly, the United States is only internationally competitive in selected areas, primarily in agricultural products and industrial products, systems, and processes that have a high technological content. The competitive advantage the US enjoys in computers, electronics, communication systems, machine tools, and so forth, is not that immune from competition from Western Europe and Japan. The East has a source other than the US for many of its requirements: the alternative equipment may not be functionally equivalent to or price competitive with its American counterpart, but it can satisfy the basic need. (American business would lose its competitive advantage if it attempted to supply less than state-of-the-art products.)

Thirdly, if the East expects to acquire the products and systems from US industry it has indicated that it wants to purchase, it should consider changing its import procedures. Eastern bloc nations should discontinue their practice of secrecy in purchasing from abroad, allow open, competitive import bidding, and guarantee foreign nations a certain percentage of total annual imports. They cannot otherwise expect or anticipate that the US Government will allow the transfer of management and manufacturing "know-how" in state-of-the-art products and systems.

National Security Safeguards

Since 1945, the United States has based its national security on technical superiority. It was, still is, and will continue to be in American long-term interests to continue this policy. In order for it to be effective, the US has to demonstrate that its weapon systems vis-a-vis Russia and, to a lesser extent, China, are more sophisticated, achieve stated system performance and are reliable and maintainable in the field. Most reliable published weapon system comparisons continually rate Eastern systems inferior to those of the West.

It is less costly and generally advantageous to wage a public battle of weapon-system development and deployment rather than to have the East and West engage in actual combat. This adult version of "show and tell" has several facets: each side engages in strategic arms limitation negotiations, mutual and balanced reduction in force negotiations; each side participates in proxy wars, whereby its tactical weapon systems can be evaluated under actual combat condition and, of course, each side is involved in international competitive arms sales situations. The process enables each side to stay reasonably current with its adversary's latest developments and deployments.

The sudden collapse of South Vietnam and the resulting capture of $5 billion worth of intact tactical systems, state-of-the-art computers and other electronic systems would suggest that the East had gained a significant technical advantage. Yet, it has not caused the US security bureaucracy to raise any public alarm. The US has not had to scrap its tactical weapon systems; there has not been a request for a completely new weapon system inventory.

Why? Because it would make little sense for the Russians or Chinese to attempt to duplicate these systems. The problems associated with introducing new (foreign) systems into any established military inventory are monumental.

Time is always on the side of the original developer. Before the East could set up the required manufacturing base, modify an established logistic network, and deploy the systems, the United States could develop and deploy superior defensive systems.

If there are risks involved with relaxed export controls, they certainly cannot be any greater than those associated with the indiscriminate sale of weapon systems to the Middle East. The probability is quite high that one or more of our latest systems will fall into the hands of one of our adversaries. As in Vietnam, the real threat is that they may be able to develop an effective counter-measure.

The national security establishment justifies these sales as "petrodollar" off-sets. It alleges that it can control political destabilizing military adventures through selective control of logistical support. But Mid-East conflicts have proven to be short, intensive engagements characterized by a high weapon system attrition rate. The 1973 war cost each side approximately $2.5 billion in weapon systems and the United States had to deplete its prepositioned inventories, and in some instances divert on-going production, in order to make up these losses, a real national security risk.

Almost all Mid-East weapon system sales by the US are administered by the Department of Defense, which has to supply continuous logistical support in order

to keep the systems operational. The man-years lost in supporting these systems are a real danger.

The Defense Department does not have an unlimited supply of highly skilled managers, engineers and technicians, and its major expenditures for recruitment and training should support its own weapon systems. In addition, most of the American weapon systems procured by Mid-East countries are not identical to those in the US inventory. Keeping track of engineering change orders, modification kits, and so on is a time consuming task and a burden on logistical support.

What happens when there are more logistical demands than limited DOD personnel resources can handle? What happens when we have to dig into our prepositioned inventories again? What happens to regional and bi-lateral relationships when we are forced to support one side over the other?

The East has repeatedly demonstrated its capability to develop one-of-a-kind special purpose products/systems. No matter how many times they go through this process, it is unlikely that they will be able to establish a technically superior manufacturing base.

Special purpose products are designed and built to satisfy a special set of problems. They do not lend themselves to the development of a general purpose line of sophisticated systems, the keystone to modern weapon systems. Western European countries and Japan, with their access to the most advanced US technology in computer, electronics and machine tool fields have not "caught up" with the US and it is highly unlikely that the East will.

And, if it is not detrimental to the US national security interest to help the East develop their manufacturing capability through the sale of whole plants such as truck factories and ammonia plants and the transfer of "know-how," why is the sale of industrial products and systems considered such a threat?

"Personalized" Diplomacy

Until the 1970's, the majority of US business was willing to forego the "nonmarket" countries, to the benefit of the Western European companies. Not only did the United States underwrite R&D and weapon system production in high technology risk areas, but, by "cooperating," Western European nations enjoyed exclusive marketing rights in the East: Russia, Eastern Europe and the People's Republic of China became their protected preserve, an exclusivity guaranteed by the US national security bureaucracy.

Then came 1969. The "personalized" policies of Nixon/Kissinger encouraged US business to enter the market with the promise of access to its high technological content products. This concerned other COCOM members, who had spent years struggling through a difficult and costly market development effort in the Eastern bloc.

After eight years of "personalized" US diplomacy, what has been the result? Nothing of significance, certainly nothing in the area of export of high technological products and systems. Almost all potential sales to the East involving computers, electronics, machine tools, commercial jet aircrafts, and so on, have required White House intervention in order to prevent the national security bureaucracy from torpedoing the proposed transactions.

It is unlikely that any of the proposed sales, by themselves, or collectively, represented a national security risk in this author's opinion.

When shopping for high technology abroad, the East had decisions to make. Who were they going to do business with and in what areas? Would they really have continued access to high technology products and systems, and could they plan on it? Was trade with the US going to be substantive or only politically decorative? How much homework had the US Administration done? Was the bureaucracy in line, did it have Congressional support? After Nixon/Kissinger left office, what would happen?

To a large extent, trade between the East and the US has not developed to its fullest potential because the East failed to grasp the political opportunity that was presented. Eastern nations have elected to deal primarily with large and supposedly, politically-secure companies. The contacts and infrequent contracts have resulted from one-to-one relationships. The procurement practices of those nations have prevented open competitive bidding.

If the East continues to depend upon existing practices, it has to accept the fact that the US national security establishment will continue to prevent access to state-of-the-art products and systems. Elaborate and detailed "end-user statements" will not circumvent nor prevent US export licenses from being turned down. On occasion, as in the past, the East and some American firms will benefit from last minute White House intervention.

"Personalized" political considerations, however, can not be predicted or depended upon, nor are they or should they be the basis for establishing permanent and expanding trade. Dependency upon them can only lead to misunderstanding, overcommitment by some American firms, and to eventual distrust.

Time to "Go Public"

The East could do a lot to help itself. Communist countries could devise procedures that permit open competitive bidding. The use of "requests for proposals" would eliminate the cloud of secrecy now associated with Eastern nations' procurements. The issuance of specifications and requests for proposals to US industry would require a public response on the part of the security bureaucracy to justify a refusal of an export license. It would preempt a prejudicial appeal to the domestic political interests who advocate continuance of a "hard line" with the East.

What would be the benefits of "going public"? A good example is the recent contract between the People's Republic of China (PRC) and France for two seismic research facilities. The contract called for two Control Data Corporation (CDC) Cyber 172 computers as part of the equipment to be furnished. The battle within the US bureaucracy raged for many months over whether or not to grant the export license for the two computers. Secretary of State Kissinger finally intervened in favor of the export license.

The basis for the decision was apparently political, to do with PRC-US relations: Kissinger sided with those who advocated backing the conservative, pragmatic, elements within the PRC. It was decided neither on the technical merits of the case nor on the basis that the PRC had a legitimate requirement.

The public issuance of a request for a bid for the total system contract could have avoided the delays that the Chinese experienced. There are many companies in the United States that could have been permitted to bid on the systems contract, allowed because they are technically qualified, because they lead the world in state-of-the-art seismic data reduction and analysis techniques, and because they have developed the most advanced software programs.

There are several ways to configure a seismic research facility, for example. One important feature to be considered is the computer hardware and software. Not every seismic system house is tied to a CDC computer. There are several seismic system companies that prefer to use other computer systems because they are faster, and have more satisfactory operating systems and application programs. Their architecture, in the opinion of these firms, is more adaptable to the peculiar processing requirements of seismic data reduction and analysis. The acquisition cost of the mainframes are considerably less than that of a Cyber 172, the operating costs are lower, thus, the end-user experiences a lower total life cycle cost.

But the national security bureaucracy's attention appeared to be focused on preventing the issuance of an export license to CDC. It certainly was not focused on obtaining the total system contract for American business. The French firm selected by the PRC was technically committed to using the Cyber 172. It couldn't offer a viable technical alternative.

If there were a legitimate national security risk involved in permitting the PRC to acquire the Cyber 172s, the US Government certainly did not take advantage of the political, financial and technical opportunity that was presented. The government, in this writer's opinion, is supposed to represent US, not foreign business interests, and all US business interests, not just a favored few companies.

It would not have violated any law for the Government to suggest to the PRC that it consider letting US seismic system companies look at the requirement and submit competitive bids. It is more than likely that the Chinese would have received a pleasant surprise—bids that would have completely satisfied their technical requirements and saved them considerable foreign exchange.

Hypothetical Conditions

How else would the PRC have benefitted by "going public" on the seismic research facilities project? Let us assume, on a hypothetical basis, that the US State Department tied the sale of the CDC computers to the PRC's agreement to accepting three years of continuous on-site inspection. If it had had access to the American public, China could have turned this unreasonable condition to its own advantage.

One wonders about the US public reaction if the Chinese publically adopted these negotiating tactics:

(a) China agreed to the condition. However, since it was a US Government requirement, the US, not China, would have to cover the total cost for the surveillance. Assurances and guarantees would have to be made by both the seller and the US Government that no surveillance costs were buried in the selling price of the end item, spare and repair parts, periodic maintenance or other technical support.

(b) As a further condition to accepting continuous on-site surveillance, each surveillance team would have to be comprised of at least six members who possessed the highest technical credentials, thus, insuring that 24 hour coverage was maintained. The surveillance would have to be continued for at least five years at each installation. In order to minimize work disruptions through frequent change over of surveillance team personnel, members of each surveillance team could only be rotated once every 30 months.

(c) China only agreed to on-site surveillance of the seismic research facilities, if it applied to all computer purchases.

(d) China announced its intention of purchasing one hundred US computer systems over the next 12 months.

At a minimum, it would cost $150 to $200 million annually to support one hundred surveillance teams in China. The dollar amount is large enough to become politically significant; it would not take long before the US Congress became involved. The expenditure of millions of dollars for on-site surveillance would have to be politically justified to the American people. It would be extremely unlikely that highly qualified technicians would allow themselves to become technically obsolete or stagnate by just "observing" for 30 months. The Chinese would surely see the advantages of making the work environment conducive to voluntary participation.

Why not? They would be assured of greater utilization of the system, gain additional insight into the functional capability of the equipment, have additional software developed, and so on, all at US Government expense.

Proposal for New East-West Technology Agreements

Since "Detente" and the "Shanghai Communique" were unleashed, American business has spent considerable time, effort and money attempting to acquire a working knowledge and understanding of the Eastern markets. There have been more false starts than real accomplishments. No one has experienced the results anticipated. In this writer's opinion, there has to be a dramatic change in procedures before both American industry can make a substantial penetration of the market and the East can acquire the products and systems it needs.

Political realities have to be accepted. The mutual distrust between the East and West cannot be willed away. It would be irresponsible to propose complete abandonment of all export controls, but there has to be a change. American industry can help itself. Why not lobby for the new Administration to initiate negotiations with the East for a Trade Agreement covering high technological content products and systems? The agreement could include the following:

(a) The East guarantees minimum purchases of $50-75 billion (30% of the market) over a five years period.

(b) The East allows competitive bids. This could be accomplished through the following process. Specifications and end-use statements would be submitted by a country to the US Department of Commerce/National Bureau of Standards (NBS) for evaluation to determine whether a national security risk was involved. If not, an export license would be granted to American industry. The country's resident purchasing office would release requests for proposals, containing the approved specifications, to US industry. Those companies which so desire would submit proposals in response to the requests.

The purchasing country would then select the company it determines is the most responsive (price/performance competitive), or any other criteria it wants to use. Prior to the shipment of any equipment, the Department of Commerce would be empowered to verify that the equipment does not exceed the approved export specifications.

(c) In the event that there is any question that the originally issued specifications represent a national security risk, the NBS can hold public hearings. Both industry and the national security bureaucracy would be allowed to comment. If it is determined that an export license can not be granted, the US Government would be obliged to propose a technical alternative acceptable to the issuing country and would guarantee an export license to any company that could successfully bid to the alternate specifications.

The suggested Agreement provisions may appear to infringe upon a company's marketing rights, but the constraints are no greater than industry now experiences in doing business with any US Government agency. A commitment to a specific volume of imports over a five-year period would eliminate suspicions held by many that the East places small orders with US firms in order to establish an export license precedent. Quite a few companies suspect that, once a new technical guideline is created, the East places the bulk of its orders (with specifications falling short of the technical guidelines) with West European or Japanese companies.

The National Bureau of Standards is as professionally qualified as any other US Government agency to determine a technical risk. It has had little or no involvement in carrying out the national security policies of the past, and could be impartial in its rulings.

Benefits and Safeguards of the Proposal

The proposed changes in export control procedures would provide the following benefits and safeguards:

(a) The proposal would eliminate uncertainties and delays in obtaining export licenses. The entire export license procedure could be accomplished within 90 days of release of a specification/end-use statement, including public hearings and the issuance of alternate specifications when required.

(b) Both the seller and buyer could develop business plans with some assurance that they could be initiated and completed on a scheduled basis.

(c) It would eliminate the suspicion that export licenses are granted to "favored" companies; either because they enjoy political privilege, or because they are part of the national security establishment.

(d) It would facilitate the rational development of specification standards that would apply equally across the board. More importantly, they could be part of the public record; no one company or importing country could benefit from the "closed door" decisions associated with present practices.

(e) The technical burden of developing original technical specifications would be rightfully borne by the customer. There would be no necessity for any company to engage in extensive technical negotiations prior to the issuance of an export license.

(f) Unrealized product/system performance expectations could not be attributed to overly aggressive marketing efforts, unrealized in the sense that no assurances for obtaining an export license could be implied by the seller or assumed by the buyer.

(g) There are sufficient safeguards. The national security agencies would not be excluded from the process. However, their influence would only have weight equal to other Government considerations and priorities.

Would the East go along with such an Agreement? Who knows? Eastern countries claim they want access to our industrial products and systems. How badly do they want them or need them? One way to find out is to initiate such a negotiation. 完

NEW FROM THE NATIONAL COUNCIL

DIRECTORY

of Research Institutes in the People's Republic of China

The emphasis on China's scientific research is on "Uniting theory with practice", applying science to the needs of changing economic priorities. In the past seven years China's scientific and technical interaction with the world's scientific and industrial community has increased enormously. The need to know the state of China's scientific research has become important.

The *Directory of Research Institutes in the People's Republic of China* is an up-to-date reference that any organization or individual concerned with China's scientific development will find indispensable.

The *Directory* will be a standard reference for the following—

- Members of scientific and technical missions to the PRC.
- Companies giving technical presentations in China, and participating in exhibitions in China.
- Institutions and firms hosting scientific and technical delegations from China.
- Scientific and technical research institutes studying research in China, overall or in individual categories.
- Companies analyzing the market for scientific instruments and other laboratory equipment in the PRC.
- Companies analyzing China's scientific development in the short-to-long range as it relates to their own product area:
- Individuals interested in learning about the state of science in the PRC.

About the Directory

In 1977, the National Council is publishing a three-volume *Directory of Research Institutes in the People's Republic of China*. The 300-plus page volumes will describe research in the categories listed and will provide comprehensive information about the organization and work of all known industrial research institutes in China through 1976. The *Directory* has been prepared by Susan Swannack Nunn.

The *Directory* contains the following data where known · name and addresses of the institute, in English and Chinese · date of establishment · organization · staffing · research divisions · subsidiary facilities · affiliates · biographical information of staff · present and past research and publications · recent research and activities (including abstracts of work published) and known equipment installed.

The cost of the 3 volume *Directory* is $300. Individual volumes are $125 each. Airmail postage overseas is $20.00 per set or $7.00 per volume.

VOLUME I
Agriculture, Forestry, Fisheries
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SPECIAL DISCOUNT for Academic and Other Non-Profit Institutions

The *Directory of Research Institutes in the People's Republic of China* is available at a discount of 33 percent to academic and other non-profit institutions. The reduced price of $200 applies only to purchase of the set of 3 volumes. Postage overseas is additional.

China began 1977 with a splash of mini-fairs, six in all, three of them aimed at international markets. The National Council's Hong Kong representative, John Kamm, was invited to three—the Feathers and Down, Carpets, and Fur Garments Fairs—and found soaring demand, higher prices and plenty of business, except at the Furs fair. His report follows.

Down jackets on display at the Feather and Down Fair in Shanghai.

CHINA'S MINI-FAIRS - 1977

The Chinese use of mini-fairs is gradually becoming more refined, as each corporation experimenting with the technique assesses the usefulness, that is, the profitability of staging specialized export fairs.

The year opened with no fewer than six mini-fairs. Of this total, three were aimed at international markets: the Feather and Down Products Minor Export Fair, the Fur Products Minor Export Fair and the Chinese Carpets Fair. US firms were well represented at these events and the National Council for US-China Trade was invited to attend or visit each fair.

The Council was the only foreign observer body to enjoy this distinction, and its representative had fruitful discussions with numerous members of the host corporation—the China National Native Produce and Animal By-Products Import and Export Corporation (CHINATUHSU).

The remaining three fairs were "market-specific" events hosted by CHINATEX.

- The Woolen Knitwear Minor Fair was held in Kwangchow in early January (closing day: January 14) for Hong Kong/Macau, Overseas Chinese and Japanese buyers. For the first time in recent memory, Europeans were reported to have attended this event, but no Americans were present.
- The Garments Minor Export Fair, January 15-31, was also held in Kwangchow. The fair was apparently restricted to Hong Kong/Macau "compatriot" distributors and their Overseas Chinese counterparts. Attendance was high.
- A Woolen and Cashmere Sweater Minor Fair—exclusively for Japanese buyers—was reportedly underway in Shanghai during late January.

FEATHER AND DOWN PRODUCTS MINOR EXPORT FAIR—BOOSTING FINISHED GOODS

This event, held January 15-25 in Shanghai, was the third successive minor fair devoted exclusively to the sale of finished feather and down products. With the advent of the "natural look"—and especially the current popularity of "survival" and other outdoor gear in the American and European markets—sales of feather and down garments, comforters and other articles have soared recently. The host corporation hopes to capitalize on high worldwide demand and China's dominant position as a source of raw feathers and down to boost sales of finished goods in 1977. The Shanghai fair marked the kickoff of this effort.

The fair was held in the spacious East Wing of the gargantuan Shanghai Industrial Exhibition Hall—the first time in recent years that this complex has been utilized for an export fair. According to a leading member of the trade fair, this development is a direct consequence of the fall of the "Gang of Four" and their associates in Shanghai's Revolutionary Committee. With the removal of this group, foreign trade will receive more support from local authorities in terms of facilities—and presumably budgets—made available. Foreign buyers can look forward to future mini-fairs being sited in the Industrial Exhibition Hall—"in accordance with the general arrangements of the municipal authorities."

Attendance—More than One Hundred Guests

More than 100 guests from approximately ten countries and territories attended the fair. As with last year, Japanese buyers made up the bulk of attendees, but participation by US firms was high—much higher than

at the 1976 event. According to an estimate verified by trade authorities, 12 US companies showed up for the 10-day event, including Eddie Bauer (division of General Mills), China Products Northwest, Eastern Mountain Sports, Friendship Division of Sobin Chemicals, Purofied Down Products Co., Milbern Foam Products Co., Frank's Trading, James Ying Co., Pack-In Products, North Face, Wellman Inc. and Windsor Trading. In addition, a number of Hong Kong-based firms, including Jardine Matheson, made purchases for the US market.

Availability and Quality—"Remarkable" Improvements

As with the previous two-versions of the fair, the 1977 Feather and Down Products Mini-Fair was devoted entirely to sales of finished products. More than twenty products, including recreational and non-recreational winter wear, comforters and quilts, sleeping bags and embroidered cushions and pillows, were available.

Although a virtual freeze on sales of raw feathers and down was in force for two months prior to the fair, at least two US firms were able to procure quantities of this scarce commodity through direct negotiations with CHINATUHSU during and immediately after the fair. Both buyers were reluctant to give details on the amounts purchased, although one characterized his deal as "miniscule."

Prices reportedly jumped 19 percent since the previous quotes obtained at the Autumn CECF; taken together with other increases recorded during 1976, the price of Chinese feathers and down have soared by nearly 140 percent in the calendar year preceding the 1977 mini-fair. During the same period, the buyer's commission has progressively declined from 2.5 percent to the current rate of 1.5 percent.

The quality of the finished goods offered at the fair has registered a remarkable improvement during the past year, and buyers were unanimous in praising the styling and workmanship of the garments. Problems with securing desired materials and specifications, in evidence during the 1976 fair, have apparently been solved to the buyers' satisfaction. One firm reported difficulties with the stitching currently employed for winter gloves, but solution of this problem is expected to present few hurdles.

Firms submitting counter-samples were able to inspect returned goods within 2-3 days after submission. In at least one instance, the quality of the returned samples far surpassed the exacting standards of a leading firm engaged in feather and down garment manufacturing for decades.

Double the 1976 Price, Deliveries Causing Some Anguish

Prices of finished products offered at the fair were approximately 100 percent higher than prices for equivalent goods quoted at the 1976 mini-fair. While the rate of increase has slowed somewhat since the Autumn CECF, Chinese officials indicated during the fair that further price hikes could be expected in the near future.

The high prices unquestionably resulted in a much lower volume than could have been attained. Several US firms "walked away" from sizable deals, citing Chinese intransigence over price. Concern was widespread in the ranks of US traders that CHINATUHSU is pricing itself beyond the means of the average American. Consumer resistance will certainly emerge if more realistic structures are not formulated.

The corporation's reply to these complaints centered chiefly on the high tariffs to which their goods are subjected in the US market. According to CHINATUHSU market research, Chinese export prices are competitive, but the 60 percent US duty on feather and down garments makes the US wholesale price prohibitive. While this argument deserves serious attention, it fails to account for identical complaints over price from buyers representing markets in which China enjoys MFN treatment.

Another frequently-voiced complaint over commercial terms concerned China's consistent failure to meet delivery schedules. A number of buyers present voiced dismay and considerable anguish over late deliveries of goods contracted for during the Spring and Autumn CECFs. Moreover, the times quoted for delivery on current contracts left little room for increased confidence. Comforters, for instance, contracted for in the Spring were scheduled to arrive as late as September and October; with deliveries typically running three months late, buyers faced the grim prospect of accepting goods as their selling seasons waned.

CHINATUHSU's present stance on private labels is identical to that of the Textiles Corporation, e.g. buyers' labels are only permissable as double labels, and foreign brandnames are unacceptable. Contracts were denominated primarily in RMB yuan; buyers' commissions on finished goods were 5 percent.

Volume—Two or Three Times That of Last Year's Fair

A rough estimate of the total business transacted at this mini-fair is $20 million. Chinese officials were reluctant to release figures, but a leading member confirmed that volume (in terms of yuan-value) was up "two or three" times over last year's mini-fair. Considering the 100 percent price hike, real growth was modest.

The major transactions recorded at the fair—according to an official source—included a $600,000 order for pillows, an order of 60-70 thousand pieces of winter wear and a purchase of 20-30 thousand cushions. None of these deals was concluded with US firms.

American purchases were characterized as "not so large." The total value of feather and down products

destined for the US market from the fair probably amounted to less than US$1.5 million. The major deal concluded with a US firm involved a sale of $100,000 of comforters and $230,000 of jackets.

The US performance was disappointing in light of the volume of sales to the US achieved by CHINATUHSU at the preceding CECF. A brief survey of US customers present revealed that their aggregate purchases at the Autumn fair topped US$5 million. The failure of the mini-fair to approach this level was a major disappointment to CHINATUHSU.

Accordingly, the corporation is investigating the possibility of expanding the present fair to include other goods handled by the Animal By-Products Division. CHINATUHSU officials from the Head Office's Feather and Wool Department—the fair's leading body—indicated that next year's fair would probably be held, once again, during January in Shanghai.

"Bag Customers"

In answering complaints over late delivery, the Chinese corporation admitted that they were frequently at fault but that sometimes customers failed to open L/Cs on time and this caused unfortunate delays. "However, if both parties exert their efforts," asserted one cadre, "the problem of delayed shipments can certainly be solved."

As with CHINATEX, the corporation has had unfortunate experiences with some US customers in 1976. According to a senior official, one US firm booked more than 100,000 feather and down garments at the Autumn fair only to "disappear" and never be heard from again. "He is what you call a 'bag customer'—all he owns is the bag he carries. He boasted a lot about his outlets, but in reality he had none."

CHINA'S CARPET FAIR 1977—LOWER ATTENDANCE, MORE PURCHASES

CHINATUHSU is prepared to grant more exclusives and discounts as part of its effort to expand carpet exports to the US, according to corporation officials interviewed at the Chinese Carpet Fair. This fair, the third successive staging of the event, was held from January 20 to February 10 in the Peking Exhibition Hall, a mammoth, Soviet-style structure where foreign technical exhibitions are usually sited.

Use of the Peking facilities, another "first" for a mini-fair, was necessitated by severe damage inflicted on Tientsin by the North China earthquakes of July 28 and November 15. Peking unquestionably proved inferior to Tientsin as a venue for carpet fairs. The 1,200 square meters of exhibition space represented a drop from that available last year, and carpet stocks in Peking's only warehouse were depleted soon after opening day. (Truck convoys were used to ship extra stocks from Tientsin).

As opposed to last year's event, few (if any) technicians and designers from the factories were present; indeed, factory visits themselves were deemed impossible due to damage suffered by Peking's sole major carpet producer.

Attendance—Slightly lower

Total attendance was slightly lower than last year, according to one source, but more US firms showed up for the event than ever before. These included Baker Trading Company, Hakimian, Milbern Foam Company, IDC Marketing, International Corporation of America, Couristan, Rugby Company, Wellman Inc., Gertamamien Company and Pack-In Products.

CHINATUHSU officials stated that the corporation intends to be more selective in issuing invitations to US carpet buyers in the future. "We are reviewing our ties with US companies in order to assess their purchasing capacities and marketing abilities. We wish to expand our business with experienced, successful firms while reducing time and effort spent on the small buyers."

Availability and Quality—Rush of Purchases

As is usually the case, opening day witnessed a rush of purchases—largely from Japanese wholesalers and department store chains—of stocks on display. With the gradual depletion of these stocks, a process virtually completed by the third or fourth day, emphasis shifted to placing orders against specifications and designs.

A number of new patterns were displayed at the fair, but reaction among buyers was restrained. US firms have been concentrating on traditional designs in basic blues and whites in an effort to reintroduce Chinese carpets to a market which has yet to acquire the sophistication in demand which characterizes both the European and Japanese markets.

Damage to looms caused by the earthquake has resulted in the appearance of occasional flaws in handwoven carpets. One source reported that corporation inspectors had discovered flaws in one out of every ten carpets produced in Tientsin since the July earthquake. CHINATUHSU is doing all it can to eliminate this problem, and buyers who receive damaged goods have been assured that the branch concerned will make good the loss.

Price and Other Terms—No Indications of Price Hike

Prices of Chinese carpets have remained virtually stable over the last two years, and there are no indications of planned hikes in the immediate future.

Although discounts are no longer granted to US buyers to counteract high Column II rates, CHINATUHSU will offer carpets at reduced CIF prices to firms that undertake advertising and promotion in the US market. Size of these discounts is determined by negotiations between the corporation and the US firm.

At least one US firm—Transocean—has secured an

exclusive on importing low-priced hook rugs. CHINATUHSU will grant exclusives on both types *and* designs, and one US firm at the fair managed to secure "six or seven" exclusive designs of super-woolen carpets from a number of different branches.

Volume Topped Last Year's Total

Value of contracts concluded at the fair reportedly topped last year's total, but no figure was released by fair authorities. US purchases probably exceeded $2.0 million, a significant rise in comparison to last year's volume.

The largest deal with a US firm reported to this writer called for spot purchases in excess of ¥400,000 and deliveries of booked lots over a one year period amounting to well over ¥600,000.

CHINATUHSU concluded sales contracts worth $3-4 million with US carpet dealers in 1976, and corporation planners are apparently aiming to boost this figure to $10-12 million by 1980. The key to their success will be the extent to which they initiate and expand effective promotion in the US market.

As opposed to last year, CCPIT involvement with the Carpet Fair was marginal. Sole responsibility for organizing and staging the fair rests with the department concerned, in this case, CHINATUHSU's Carpet Department, of the head office.

FUR GARMENTS FAIR 1977—SMALLER THAN LAST YEAR

The Fur Garments Minor Export Fair was held in the Peking Export Commodities Hall from January 20 to January 30. This fair, the third successive staging of the event, was considerably smaller in scale and variety of products offered than last year's Fur Products Mini-Fair. Exhibition space was reduced by two-thirds and, most importantly, neither plates nor raw skins were offered.

The hall, formerly the Palace of the National Minorities, was converted to its present use in mid-1976 as part of the municipality's efforts to boost export earnings. All products on display are handled by municipal branches of the national FTCs. The first floor is used for mini-fairs and also contains permanent exhibits of foodstuffs, hardware, native produce and animal by-products. The second floor is given over to textiles. The third floor is used for arts and crafts. (Business hours of the PECH are 8:30-11:30 a.m. 2:30-6:00 p.m.)

More than 40 foreign firms attended, including three US companies: Evans Incorporated, Wellman Inc. and the Kaufmann Trading Corporation.

Total volume reportedly exceeded last year's, and US purchases, still very low due to the US embargo against Chinese furs imposed by 1951 legislation—were up. European buyers fretted that Chinese prices have failed to track world levels, which have fallen due to sliding demand. 完

A VISIT TO SHANGHAI WEI TUNG GARMENT FACTORY

The Wei Tung Garment Factory is one of four enterprises engaged in the sewing and tailoring of feather and down winter wear in Shanghai Municipality. The present factory is actually an amalgamation of five separate workshops, individually housed until last year when the present plant was constructed. The manager of the plant, Mr. Mu, apologized for the fact that the elevator had not yet been installed. "Last year we commenced capital construction, and the acquisition of equipment is not yet complete."

A five-story concrete edifice houses the factory; each floor contains a separate workshop. The fourth and fifth floors are given over to feather and down garments. Fur garments are sewn and tailored on the third floor, while ladies' blouses for the domestic market are manufactured on the second floor. The first floor houses administrative offices as well as the reception/exhibition room.

As the plant developed, the work force increased from an initial 300 to the present 1,000. The majority of workers are young; 50 percent are male. Each serves a period of apprenticeship under the tutelage of veteran workers. Only one shift is worked. Most veterans (e.g. over 35 years of age) are engaged in quality control work.

The two feather and down garments workshops are divided into various cutting, sewing and tailoring sub-sections. The cutting of the outerwear's nylon taffeta takes place on the fifth floor. All the nylon is imported from Japan in 112 cm by 92m skeins.

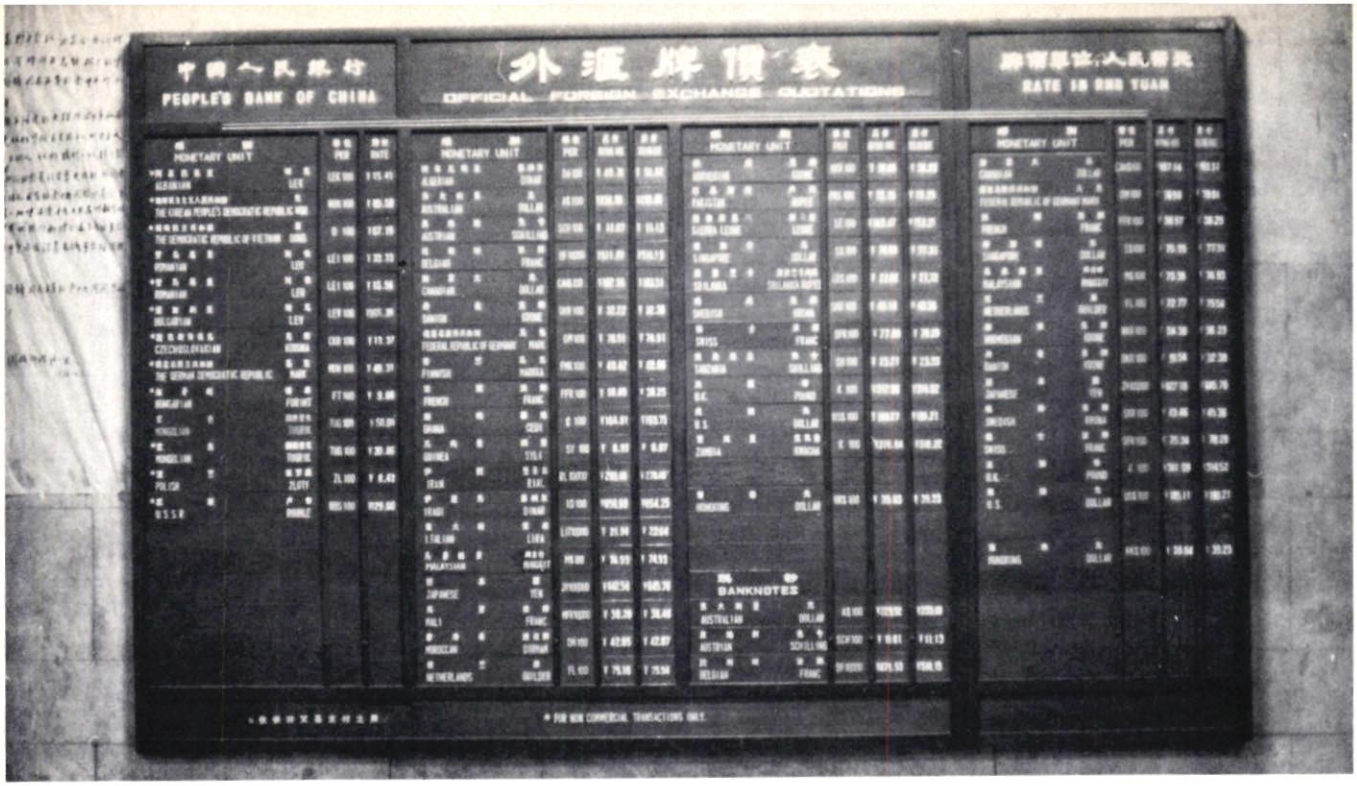
Upon completion of cutting, the fabric is taken to a workshop outside of the factory where the crucial value-adding activity of feather and down stuffing occurs. Mr. Mu told visitors that stuffing would eventually take place on premise. The bulk of the sewing takes place in two large rooms, each housing approximately 80-100 workers.

All of the industrial sewing machines are made in Shanghai, and the thread—100% silk—is procured from Wuhsi. It was apparent that the factory was still undergoing both capital and labor force acquisition, as nearly 25% of benchspace was unoccupied.

The factory's output of feather and down garments was approximately 1,000 jackets a day as of late 1976. Nearly all of this is exported. Swan-brand garments manufactured by the Wei Tung factory are now sold in 70 countries and regions. While the visit was in progress, a substantial order of red-and-white ski jackets for the US market was being fulfilled.

Because of rising world-wide demand for feather and down products, the factory has increased budgetary allocations for their production. An increase of 200-300 thousand jackets is planned for 1977.

The factory is under the direct supervision of the Shanghai Garments Corporation. The total output of feather and down garments is marketed by the Shanghai Animal By-Products Branch of CHINATUHSU.



China's exchange rates: foreign currency quotations at the People's Bank of China, Shanghai, November, 1976.

CHINA'S FOREIGN FINANCIAL LIABILITIES

David L. Denny and Frederic M. Surls

Two years ago, this magazine looked at the state of China's foreign financial obligations based on the PRC's known plant and grain purchases at that point. In the piece, David Denny stated it "may be difficult to keep [China's] repayments from exceeding 20 percent of exports." In the article that follows, China's foreign financial policies are reviewed and foreign obligations tabulated and extended through 1980. One of the conclusions of the piece is that the PRC's ratio of repayments to hard currency earnings reached 23 percent in 1976. But the outlook from here on is good: unless grain imports again rise sharply, repayment pressures through the rest of this decade will be significantly eased. The article also stresses the continuity of China's conservative financial policies during the 1970's. Nevertheless, with repayment pressures easing, Peking could resume a substantial complete plant import program even if it chooses not to liberalize financial policies.

David L. Denny is an International Trade Specialist, Bureau of East-West Trade, US Department of Commerce; Frederic M. Surls is an Economist, Economic Research Service, US Department of Agriculture.

The past year was the first year of China's Fifth Five Year Plan period (1976–80), but because of the death of three of the most prominent leaders of the Chinese revolution (Chairman Mao Tse-tung, Premier Chou En-lai, and Marshal Chu Teh), a devastating earthquake in North China, and internal political debates over economic policies, the most important aspects of the plan are apparently only now being finalized. A key question concerns the role foreign trade will play in the plan and how receptive Peking may be to accepting foreign financing for imports. This article examines the financing of trade during the Fourth Five Year Plan (1971–75), expanding and updating an earlier article on China's practices during the first part of the period.[1]

It is clear that the Fourth Five Year Plan saw an agressive expansion of China's international economic activities. By 1976, hard currency exports and imports (more than 80% of total trade in recent years) had risen to over three times the 1970 level (Table 1). Inflation accounted for a substantial proportion of the rise but even after discounting for higher prices, trade grew very substantially—by at least 10% per annum—for the period as a whole and at a much higher rate in the first few years of the period.

However, even before the midpoint of the Fourth

Table 1

PRC FOREIGN TRADE IN THE 1970's: KEY INDICATORS
(Millions of US Dollars)

Year	Hard Currency Exports	Hard Currency Imports	Balance	Cumulative Hard Currency Balance since 1971
1970	1,570	1,860	−290	—
1971	1,830	1,805	+25	+25
1972	2,345	2,300	+45	+70
1973	3,960	4,420	−460	−390
1974	5,140	6,375	−1,230	−1,620
1975	5,565	6,400	−835	−2,455
1976	5,750	5,750	0	−2,455

Source: 1970-75: Unclassified Central Intelligence Agency. *People's Republic of China: International Trade Handbook*, ER 76-10610, October 1976, p. 13.
1976: Preliminary U.S. Government estimates.

Note: Trade with non-Communist countries is used to approximate hard currency trade. However, some non-Communist trade is on a barter basis and some small amount of trade with Communist countries may be on a hard currency basis.

Five Year Plan period, the Chinese encountered two unexpected events which severely disrupted trade plans: a bad harvest in 1972 that was largely responsible for a sharp rise in agricultural imports in 1973 and 1974 and the combination of world recession and inflation that substantially reduced the market for Chinese products after 1974 and drove up prices of a broad range of imports. The negative impact of these two events was in part offset by the earnings from crude oil exports which began in 1973. But oil earnings were insufficient to prevent a series of hard currency trade deficits that reached a cumulative level of $2.5 billion by the end of the plan period.

Foreign economic activities during the Fourth Five Year Plan Period were not limited to accelerated exchanges of goods. Previous issues of this magazine have chronicled China's expansion of maritime activities and port facilities, enlarged exchanges of trade exhibits, and greatly accelerated exchanges of technical personnel. Thus, the increase in the volume of trade appears to reflect a significant long-run shift toward expanding foreign economic contact and higher levels of trade.

The single most dramatic symbol of the new policy was the decision to purchase a large number of complete "turnkey" plants from Japan, West European countries, and the United States. These purchases began in late 1972, reached a level of $1.2 billion in 1973, were maintained at a high rate for the first part of 1974, but then fell back strikingly after mid-1974 and have been continued at greatly reduced rates in 1975 and 1976. As described below, these purchases and the purchase of agricultural commodities required substantial commitments of China's future foreign exchange earnings. The question of the size of the plant import program involved both Peking's assessment of its future foreign trade levels and its willingness to accept foreign financing to pay for imports.

Peking's View of Foreign Debt

In an authoritative 1974 article in *China's Foreign Trade*, it was stated that: "Another important sign of the unprecedented excellence in China's financial and monetary affairs is that we are completely free of domestic and foreign debt. The loans from the Soviet Union extended to China when Stalin was in leadership were totally repaid early in 1965 ahead of schedule. The government bonds floated in the early days of New China were all repaid during the Great Proletarian Cultural Revolution. Our country has become a socialist country with neither external nor internal debts." [2]

The same theme was reiterated by the Chinese as recently as January of this year: "Our socialist country simply does not permit foreign capital to develop our country's resources; neither does it ever enter any joint enterprise with a foreign country nor solicit foreign loans. Our country has contracted no external or internal debts." [3]

As a general indication of China's extremely conservative financial policies, these statements are accurate. However, it should not be concluded that China has no foreign financial obligations according to Western definitions. China has committed a substantial share of its future foreign earnings for products for which the contracts have already been signed. It seems clear that such obligations have, indeed, influenced China's foreign trade behavior.

The key to this apparent contradiction is China's

own precise definition of "debt." Unfortunately, Peking's interpretation has never been spelled out. From their descriptions it is apparent that China's leaders are still opposed to accepting commercial bank or governmental credits for general purposes. This would seriously undermine the principle of relying on China's own resources. Moreover, China consistently maintains that such loans have been utilized in China in the past and in Third World countries at the present time in order to gain special privileges that go beyond financial repayments.

China's planners apparently consider short-term (here defined as up to 2 years) and medium-term (2–5 year) financial obligations that are directly paid to suppliers of equipment and agricultural products as normal commercial payment terms and thus not equivalent to "debt." Peking obtains such terms from its suppliers and not from banks, apparently making the arrangements more palatable. This is true even when the contract specifies explicit interest charges and when the Western suppliers obtain credits from commercial and government export support banks.

Similarly, mutual depositing of currencies with correspondent banks may be considered as normal aspects of a banking relationship. To a certain extent, the Bank of China will accept hard currency deposits from foreign nationals and foreign banks. These also may not be considered as "debt" since they are presumably made at the initiative of the other party and represent a service offered by the Bank of China. Nonetheless, they ultimately are Chinese liabilities.[4]

Whether it is called "debt" or by some other terminology, the central fact is that such contracts imply a stream of future financial payments that restrict trade policy to some degree and are a claim on future export earnings. In Western banking circles both the ratio of total debt to export earnings and the ratio of principal and interest repayments to export earnings are thought to be useful indicators of a country's creditworthiness. For the latter ratio, 25% is often regarded as a warning signal although a country with a rapidly growing economy might be judged creditworthy even though the repayment to export ratio was substantially higher.[5]

Direct information on the size of ratios that would begin to trouble Chinese policymakers is lacking. Former Vice-Premier Teng Hsiao-p'ing once stated that "We now also accept installment payment terms for machinery from abroad but only in the knowledge that we are capable of making regular payments."[6] The recent attacks on Teng's antagonists—the "gang of four"—have included the charge that they sabotaged oil exports in 1976 and "this harmed our country's international credibility and had negative effects both politically and economically."[7] In view of China's foreign exchange shortages and mounting financial obligations, it is likely that one aspect of credibility that the present planners had in mind was China's international reputation for a blue chip credit rating.

China's commentary on the plight of other developing countries also reflects a conservative financial bias: "(worsening terms of trade) . . . led to a sharp rise in trade deficits and foreign debts of most developing countries. The repayment of loans and payment of interest by these countries are estimated at $13 billion to $17 billion each year, which amounts to 15% of their export revenues;"[8] and

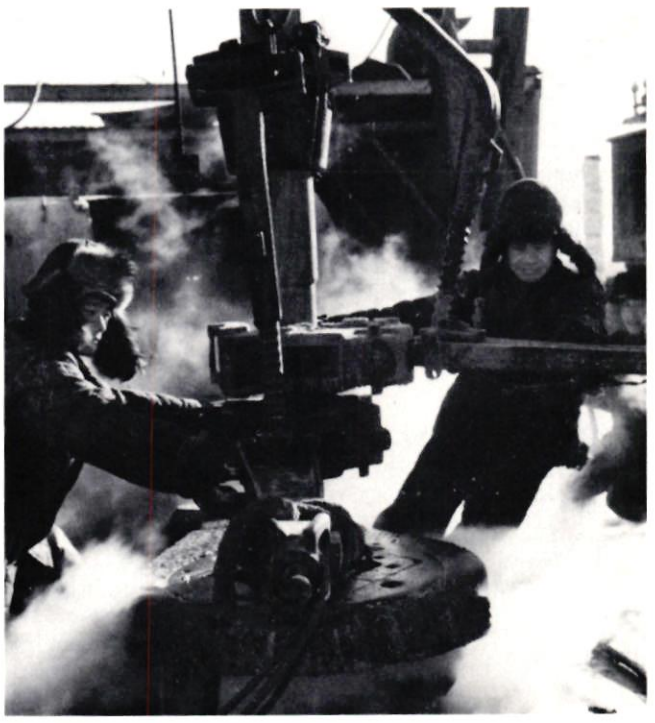
"The repayment of heavy external debts has drained the developing countries of a great part of their hard earned exchanges. Every year 86 countries have to give out 10%, 20% or even 30% of their foreign earnings as debt payment. Take Brazil for example. In 1975, it was in debt to the extent of about $22,000 million. And the sum it has to pay this year as principal and interest is estimated at $5,500 million, equivalent to 65% of that country's $8,500 million of income from foreign trade last year."[9]

These commentaries on the situation facing other countries tend to support the view that conventional standards (i.e., a 25% ratio of repayment obligations to hard currency exports—referred to below as the repayment service ratio) would be considered too risky on both political and economic grounds. Beyond that it is not possible to directly judge Chinese intentions from public statements.

Short-term Commercial Financing

The PRC has consistently used short-term commercial financing, mainly in connection with its purchases of grain from Canada and Australia but also occa-

Taching oil, an important source of foreign exchange for China. Here, drilling team at work in freezing temperatures.



Hsinhua

sionally for purchases of other products, e.g., Japanese steel. Grain purchases began on a regular basis in 1961 and most of the contracts concluded since then have been financed sales. Grain has consistently been a major import item, with imports during the 1960's varying between 3.2 and 6.8 million tons and between $212 and $534 million in value.

At the beginning of the Fourth Five Year Plan the quantity of grain imported was the lowest of any year since 1960. However, by the middle of the plan period a temporary slowdown in the growth of grain production has pushed the quantities imported to record levels. Moreover, rising world market prices had pushed unit values up sharply. Consequently the value of imports and of outstanding short-term commercial obligations rose sharply as the plan progressed.

Until 1973, Canada and Australia were China's principal grain suppliers. The Canadian sales, negotiated directly between the Canadian Wheat Board and the China National Cereals, Oils and Foodstuffs Export and Import Corporation (CEROILS), have consistently required a 25% downpayment on shipment with payment of the balance plus interest within 18 months. Terms on the Australian wheat sales, also directly contracted between the Australian Wheat Board and CEROILS, have varied. During the 1960's typical arrangements required a 10% downpayment with payment of the balance plus interest, 20 percent each at the end of 6 and 9 months and the remaining 50 percent at the end of twelve months. Precise schedules on more recent contracts are not available but completion of payment within 12 months has been required. Interest rates in these transactions have not been revealed.

US sales of grain and agricultural products to the PRC began in 1972 and the United States became China's leading supplier of grain in both 1973 and 1974. In addition to wheat and corn, the United States also supplied substantial quantities of other agricultural commodities, especially cotton and soybeans, in both of these years. Total US agricultural exports in 1973 and 1974 amounted to $626 million and $664 million, respectively. These sales clearly had a large effect on China's short-term obligations; unfortunately, little specific information on financial arrangements for these sales is available. However, it appears that commercial financing was arranged for a large part of the grain purchases, either through US or third-country banks.

For purposes of placing an upper limit on short term obligations it has been assumed that all purchases of US grain and soybeans shipped after June

Table 2

PRC GRAIN PURCHASES AND SHORT-TERM OBLIGATIONS

Year	Grain Imports		Financial Obligations	
			Absolute Level of Obligations at End of Year	Principal and Interest due the Following Year [1]
	Million tons		*— Million US dollars —*	
1970	4.6	$ 280	$226	$202
1971	3.0	205	181	121
1972	4.8	345	244	145
1973	7.7	840	744	601
1974	7.0	1,180	982	832
1975	3.3	680	996[2]	978
1976 [3]	2.0	300	279	217
1977 [3]	4.0	500	384	333
1978 [4]	4.0	500	365	300
1979 [4]	4.0	500	380	300
1980 [4]	4.0	500	380	300
1981 [4]	4.0	500	380	300

[1] On obligation contracted by the end of the year.
[2] Includes estimated obligation of $400 million for nonagricultural purchases.
[3] Preliminary estimates.
[4] Estimated. Three-fourths of purchases in these years are assumed to be financed.

Sources: Grain import data for 1970-75 from Central Intelligence Agency, unclassified. *People's Republic of China: International Trade Handbook*. ER-76-10610, October 1976. Estimates of financial obligations are based on shipment values reported in partner country trade statistics and on reported and assumed contract terms (see text). A 7 percent interest rate has been assumed.

Table 3

THE PRC's COMPLETE PLANT PURCHASES THROUGH 1976: PAYMENT TERMS
(Millions US dollars)

Type of Payment	1972	1973	1974	1975	1976	Total, 1972-1976
Progress payments	—	311	322	336	60	1,029
Deferred payments	50	890	509	35	140	1,624
Total [1]	50	1,209	831	371	200	2,661

[1] Includes plants purchased on cash payment basis.

Source: Complete plant data is taken from: Central Intelligence Agency. *People's Republic of China: International Trade Handbook.* ER 76-10610, Table 11; Hans Heyman, "Acquisition and Diffusion of Technology in China," Joint Economic Committee, *China: A Reassessment of the Economy*, July 10, 1975; and from various issues of *CBR*. $40 million for complete plant purchases in the second half of 1976 have been added to the list. $8 million of this represents known contracts and $32 million is an estimate based on incomplete information.

1973 were financed on 18 month terms and that no cotton was purchased on credit. Canadian and Australian repayment schedules can be calculated from known contract terms although there is some uncertainty on the precise timing of repayments due Australia. Table 2 gives the resulting short-term obligation (column 3) and an estimated repayment schedule (column 4) for PRC purchases of agricultural products from Australia, Canada, and the United States. In addition, $400 million of the obligations at the end of 1975 and of repayments due in 1976 is a rough estimate of temporary financing obtained in 1975 on nonagricultural purchases.

For purposes of analyzing probable future financial obligations it has been assumed that about four million tons of grain valued at about $500 million will be imported annually from 1978-81 and that three-fourths of this will be bought on terms.

Medium-Term Financial Obligations [10]

The most striking aspect of China's economic program in the early 1970's was the large scale importation of foreign complete (turnkey) plants and technology. Table 3 provides breakdown by the year of purchases and payment method used. The imported plants were located predominantly in a few sectors of the economy: petrochemicals, steel making, fertilizers, and electric power.

Importing complete plants and using financing to pay for them are not new in the PRC. In fact, during the 1950's, China's complete plant imports from the Soviet Union and East Europe were roughly one-third greater in total value than the 1970's program. On the other hand, the purchases in the early 1970's were much more concentrated in time and as a result annual delivery on the plants during the 1975-78 period will be considerably higher than during the earlier period.[11]

During the 1950's China used long term credits from the Soviet Union partly to finance complete plant purchases and partly to cover normal trade account deficits. It appears that China's largest debt at any one time was around $1.5 billion. Repayments of principal and interest probably took as much as 40% of China's foreign exchange earnings during a few years in the early 1960's.[12]

After the Sino-Soviet split and after the Soviet debt was repaid, a small number of plants were imported in 1964 and 1965. These were imported from Japan and West Europe and generally were paid for primarily in cash although terms were used in the case of at least one plant purchased from the United Kingdom.[13] One reason more financing was not used was that China's suppliers were reluctant to grant it for political reasons. In any event, the number of plants imported was extremely small because the onset of the Cultural Revolution in 1966 reduced China's international economic activity and abruptly ended complete plant imports.

Most of the payments for complete plant purchases in the 1970's have been arranged under two basic formulae: progress payments and deferred payments. The first—"progress payments"—is, as the name implies, a method of paying for the imported plant as the equipment is installed. Typically, the Chinese pay an immediate 20% downpayment at contract signing; 70% of the balance is paid as the equipment for the project is shipped; a final 10% is usually paid after one year of operation and is a form of guarantee that the plant will perform up to specification.

It should be noted that progress payments for turnkey plants are quite normal the world over.

Under such arrangements no debt is incurred (and no interest assessed) since the contractor for the plant is paid soon after completion. Nevertheless it is still true that in contracting for such plants, the Chinese incur a future financial obligation. Since this method has been used to procure nearly $1 billion (or over 33%) of China's total plant imports, its financial implications must be explored in relation to China's trade. There is a danger, however, in using data from this part of China's import program when comparing China's liabilities with those of other countries where such purchases would not be included in conventional measures of external obligations.

More than 60% of China's complete plant import program has been financed by "deferred payments" (Table 3). This figure was reduced somewhat by China's unwillingness to finance 1975 purchases at the higher interest rates agreed to at that time by many national Export-Import Banks. This impasse was apparently broken in 1976 and led to a renewed use of the Japanese Eximbank facilities at a probable interest rate of 7% (compared to 6% for the earlier transactions).

Typical terms for complete plant purchases financed by deferred payments call for a 10%downpayment at contract signing; another 10% is paid when final shipment is accomplished; the remainder (80%) is financed over a five-year period. The announced value of most plants does not appear to include interest charges, which are separately dealt with in the contract's payment clause. There appears to be no direct contractual relationship between the Chinese purchaser and the supporting export-import banks; the supplying firm arranges financing and the Chinese make all payments directly to their supplier. In the Chinese view, this is a normal commercial transaction and does not involve them in a debtor position vis-a-vis commercial or national banks. Under Western conventions, however, the Chinese have clearly utilized medium term (5-year) financing for 80% of the contract value when final shipment occurs.

If we examine the resulting financial implication of of the complete plant purchase program from the point of view of total outstanding "obligations" [14] we find that the schedule (table 4) rises to nearly $2 billion by the end of 1974. It remains in that range through 1976 and then falls rapidly to insignificant levels by the early 1980's. This, of course, simply reflects two basic facts: first, that the great bulk of China's purchases were concentrated in 1973 and 1974; and second, that China has chosen to pay for its purchases very rapidly.

If the same purchases are examined from the point of view of estimated annual payments (cash outflow), the striking fact is the very low level of payments between 1973 and 1975 (table 5). However, in 1977 and 1978 the very short repayment schedules force China to repay nearly one-half billion dollars annually. Thereafter, repayments decline rapidly but they remain fairly substantial until the early 1980's (table 5).

Table 4

CHINA'S COMPLETE PLANT PURCHASES THROUGH 1976: OUTSTANDING FINANCIAL OBLIGATIONS [1]
(Million US dollars)

Year	Outstanding Obligations from Deferred Payment Purchases	Outstanding Obligations from Progress Payment Purchases	Total Outstanding Financial Obligations from Complete Plant Purchases [2]
1973	$ 842	$248	$1,090
1974	1,300	490	1,790
1975	1,322	629	1,951
1976	1,349	434	1,783
1977	1,172	223	1,395
1978	927	108	1,035
1979	659	48	707
1980	392	12	404
1981	159	0	159
1982	23	0	23

[1] Obligations (principal) outstanding as of December 31 of the year given.
[2] Column (1) plus column (2).

Methodology: Yearly repayments of principal and interest were estimated for each plant (see table 3). Outstanding financial obligation was then determined as value of contract minus downpayment and repayments to date. Estimates were based on available information on financing terms and completion dates. Where terms were unavailable, they were assumed to approximate those described in the text.

Source: See Table 3 and also David L. Denny, "China's Foreign Financial Liabilities," *U.S. China Business Review*, v. 2 no. 1, p. 37.

Table 5

CHINA'S COMPLETE PLANT PURCHASES THROUGH 1976: ESTIMATED ANNUAL REPAYMENTS SCHEDULE
(Million US dollars)

Year	Repayments Arising from: Progress Payment Purchases	Repayments Arising from: Deferred Payment Purchases	Total Repayments
1973	—	—	—
1974	$ 33	—	$ 33
1975	137	$ 9	146
1976	241	81	322
1977	191	229	420
1978	115	306	421
1979	24	331	355
1980	36	312	348
1981	10	262	272

[1] Excludes downpayments.

Methodology and Sources: See table 4.

China's Financial Obligations and Foreign Trade Policy

Total repayment obligations from both short- and medium-term purchases are summarized in table 6. From this it is clear that total repayment obligations rose rapidly from inconsequential amounts in the early 1970's to about $3 billion in the last part of the Fourth Five Year Plan. Part of the reason for this large increase was clearly expected and part of the original plan. However, certainly a large part of the short term liability was unanticipated and forced on Chinese planners as a result of the poor 1972 harvest and the substantial inflation in world agricultural prices. As emphasized above, all of China's financial obligations should not be considered as "debt" but even if they were, the resulting maximum "debt" to hard currency export ratio of approximately 0.5 in both 1974 and 1975 would be small by most comparative standards.[15]

From the point of view of the annual flow of repayment obligations the most striking point is that if China had not been forced to greatly increase agricultural purchases in 1973 and 1974, repayments during the Fourth Five Year Plan period would have been very small. Most of these repayment obligations arising from the complete plant import program began to come due only in 1976, peaked in 1978, and then continued at high but declining levels throughout the rest of the Fifth Five Year Plan period. What in fact happened, however, was an immediate jump in payment obligations to 12% of hard currency export earnings in 1974. The repayment service ratio continued to rise until it reached 23% in 1976 when the first large scale repayments for plant purchases began. Despite the increase in repayments for plant purchases in 1977 and 1978, the ratio will drop sharply because of greatly reduced grain purchases in 1975 and 1976. This illustrates the basic point that one of the most volatile and unpredictable aspects of China's foreign trade plans—and of the national economic plan as a whole—remains the success of the annual agricultural harvest.

The second important influence on the repayment service ratio is the performance of Chinese exports. Given the rapid expansion of Chinese exports in the early 1970's and the expansion of trade supporting institutions and facilities, it is clear that the trade expansion was expected to continue. Thus, from the vantage point of 1972 and 1973 (when the negotiations for the complete plants began in earnest) the commitments that were made must have appeared prudent and modest in light of what appeared to be expanding export markets and improving terms of trade. For example, projecting a 10% export growth rate beyond 1973 would have been quite reasonable in view of the record of the preceding years. Under this assumption, the repayment commitment for complete plant purchases would never have exceeded 8% of total projected hard currency export earnings.

In fact, by mid-1974 the outlook had changed dramatically. By the second quarter of 1974 the sustained rise in Chinese exports that had started in mid-1971 had been halted by the world recession, by import restrictions on some Chinese products, by shortages of some Chinese products (such as soybeans) and by unfavorable price trends in some areas.

In retrospect, China's reaction to these unfavorable trends was, predictably, both strong and fast. Complete plant negotiations were generally broken off. The

Table 6

CHINA's TOTAL FINANCIAL OBLIGATIONS
(Million US dollars)

Year	Total Obligations Outstanding [1]			Repayments due During Year [2]			(7)	(8)	(9)
	(1) Short-term Liabilities	(2) Complete Plant Purchases	(3) Total	(4) Short-term Liabilities	(5) Complete Plant Purchases	(6) Total	Obligation As % Hard Currency Exports	Repayment Service Ratio %	Hard Currency Exports
1970	226	—	226				14.4		1,570
1971	181	—	181	202	—	202	9.9	11.0	1,830
1972	244	—	244	121	—	121	10.4	5.2	2,345
1973	744	1,090	1,834	145	—	145	46.3	3.7	3,960
1974	982	1,790	2,772	601	33	634	53.9	12.3	5,140
1975	996	1,951	2,947	832	147	979	52.9	17.6	5,565
1976	279	1,783	2,062	978	322	1,300	35.9	22.6	5,750
1977	384	1,395	1,779	217	420	637			
1978	367	1,035	1,402	333	422	755			
1979	380	707	1,087	300	355	655			
1980	380	404	784	300	348	648			
1981	380	159	539	300	272	572			

[1] At end of year.
[2] Principal and interest (where applicable) due on obligations outstanding at end of previous year.
Sources: Columns (1), (4)—Table 2.
Column (2) —Table 4.
Column (5) —Table 5.
Column (7) —Column (3) as percent of Column (9)
Column (8) —Column (6) as percent of Column (9)
Column (9) —Table 1.

few major contracts signed after the first six months of 1974 were related to the previous commitments to expand petrochemical facilities and to make major additions to the Wuhan Iron and Steel Works. A significant exception to this was the 1975 Spey engine deal (engines and manufacturing facilities) but the military and political implications of that contract were sufficient to protect it from the general economic retrenchment.

A final factor affecting both the immediate and longer term aspects of trade is the fact that the liberalized course of foreign trade followed since the early 1970's was never fully accepted by all elements of China's leadership. In particular, there were substantial differences of opinions both on the appropriate level of complete plant and technology imports and over export policy, particularly exports of petroleum and raw materials. Although these differences were submerged during much of the period, they surfaced in the media during the first part of 1974 and again much more openly and extensively during the campaign against Teng Hsiao-p'ing in 1976.

From the perspective of this article, the most interesting aspect of the campaign against Teng was the charge that he apparently considered long-term contracts with Western firms for technology, plant, and equipment for natural resource development. Part or all of repayment was to be in the form of raw material exports (product payback). It is not known how seriously the Chinese considered such proposals nor is it known whether recent political changes again make it possible to discuss such arrangements. Other attacks on foreign trade policy were publically refuted in late 1976, but the possibility of using "product payback" to finance complete plant imports has not reemerged.

Thus, while there is no evidence of a fundamental change, the fact that trade policy was controversial clearly had a depressing effect both on trade and more importantly on willingness to enter into further longer-term commitments. The unfavorable trade trends in the 1974-76 period must also have strengthened the hands of the opponents of more liberalized trade policies.

Conclusion

The events of the past few years have significant implications for the future course of trade and complete plant purchases. In the first place, despite the generally more liberalized trade policies followed since the early years of the Fourth Five Year Plan period, Peking's international financial policies remain highly conservative, an important element of continuity with

past practices. Although there was a greater willingness to enter into medium term financing arrangements in 1973 and 1974, the repayment ratios to which China committed itself were not high, given assumptions about export growth which were reasonable at that time. Once their financial position changed and repayment pressures increased in 1974-76, the response was consistent with their traditionally conservative outlook.

Moreover, China's conservative approach has probably been reinforced at least temporarily by the developments of 1974-76. One particularly important aspect of this must involve Peking's assessment of the future prospects for China's exports. The experiences of the mid-1970's must have increased the uncertainty that surrounds Peking's judgment about future export growth rates. Future agricultural import requirements and world market agricultural prices are a probable additional element of uncertainty. These uncertainties, growing in large part from experiences between 1973 and 1976, suggest a more cautious approach to future trade growth and financial commitments.

However, the stagnation of Chinese imports and the slow pace of new complete plant commitments observed from mid-1974 through 1976 cannot simply be projected ahead into the future. In the first place, since major new plant purchases during 1977 would not create significant repayment obligations until 1979 and later (although there would be an immediate 10 to 20% downpayment requirement), there would appear to be no significant immediate financial constraint on substantial complete plant purchases even if only modest rates export growth are projected for the Fifth Five Year Plan. Similarly, the declining pressures for meeting repayment obligations as the plan progresses will help ease the pressures to hold down imports.

By way of illustration, a modest 5% export growth rate during the Fifth Five Year Plan period would reduce the repayment service ratio on anticipated agricultural purchases and complete plants contracted through 1976 from an estimated 23% in 1976 to 12% in 1978 and 9% in 1980.

To date there has been only a modest acceleration in Peking's interest in new complete plant negotiations and only limited and incomplete indications of a resumption of rising import levels. However, Chinese officials and the Chinese press have recently stressed that the attacks of the "gang of four" on the more liberal trade policies of the Fourth Five Year Plan were not only wrong but were tantamount to economic sabotage. In particular, China's complete plant import program during the Fourth Five Year Plan has been vigorously defended, as has the oil export program.

Moreover, the Chinese press has printed several important articles indicating a continuing need for foreign equipment and technology (for example in coal mining).[16] In an important symbolic gesture, Li Hsien-nien hosted a New Year's reception for foreign engineers and technicians resident in China in connection with the complete plant program.[17] Finally, many foreign businessmen and officials have been assured by high-level Chinese officials that there will be a resumption of complete plant and technology imports during the Fifth Five Year Plan.

These statements and actions suggest that restrictions on imports and complete plant purchases can be expected to lessen somewhat in the future. However, the same officials have stressed that China continues to have foreign exchange problems, that trade should be balanced, and that a major resumption of plant and technology orders will not take place until 1978 or beyond.[18] These remarks are consistent with the major theme of this article: China's financial policies, although liberalized somewhat during the early 1970's, remain remarkably cautious and conservative. 完

FOOTNOTES

[1] *David L. Denny, "China's Foreign Financial Liabilities,"* US China Business Review, *Vol. 2, No. 1, January-February 1975, pp. 34-38.*

[2] *Tsai Cheng, "The Victory of Chairman Mao's Policy of Building the Country Through Self-Reliance, Diligence, and Thrift,"* China's Foreign Trade, *1974, #1, p. 6.*

[3] *"NCNA on 'Gang' Sabotage of Foreign Trade," NCNA Domestic Service in Chinese, Jan. 13, 1977 in FBIS, January 14, 1977, p. E1.*

[4] *The question of bank "credits" to the Bank of China has stimulated a great deal of speculation in the last few years. We will not attempt to estimate the size of these liabilities—available information is incomplete and inadequate. Thus our estimate of China's financial obligations may be too low. But we do not believe that including such estimates would greatly alter the conclusions of our discussion on short-term obligations.*

[5] *For a discussion of the issues involved in using such measures see Paul Marer, "Indebtedness, Credit Policies, and New Sources of Financing" in Carl McMillan (ed.).* Changing Perspectives in East-West Commerce. *Lexington Book, D.C. Heath and Company, Lexington, Mass. 1974, p. 130.*

[6] *October 2, 1974, remarks at reception for overseas Chinese. Quoted in UCBR, Vol. 2, No. 1, p. 34.*

[7] *See source in note 3, p. E-5.*

[8] *NCNA cites GATT Report on Trade Inequities, NCNA in English, Nov. 6, 1976, in FBIS, Nov. 9, 1976, p. A-3.*

[9] *"Debt Issues Seen as Critical at UNCTAD," Peking NCNA in English, May 24, 1976. in FBIS, May 25, 1976, p. A-1.*

[10] *This section is limited to medium-term obligations arising from the purchase of complete plants. In so doing we ignore other equipment and technology purchases in which medium-term repayments may have been involved. Little is known about specific terms of many of these purchases, but it is felt that their inclusion would not significantly alter the repayment picture presented here.*

[11] *Alexander Eckstein, "China's Trade Policy and Sino-American Relations,"* Foreign Affairs, *Vol. 54, No. 1, p. 140.*

[12] *Alexander Eckstein,* Communist China's Economic Growth and Foreign Trade, *McGraw-Hill, 1966, p. 161 and p. 298.*

[13] *Hans Heyman, "Acquisition and Diffusion of Technology in China,"* Joint Economic Committee, China: A Reassessment of the Economy, *July 10, 1975, p. 719.*

[14] *The word "obligation" has been chosen rather than "debt" because the financial requirement imposed by the plant purchase on "progress payments" are not, strictly speaking, analogous to debt—or paying for a product by borrowing money and repaying the credit at a later point. Nevertheless, they do impose specific financial obligations on China's planners that must be paid out in those years.*

[15] *For example, in 1975 the ratio of obligation to hard currency exports in selected countris was as follows: Bulgaria—4.5; Czchoslovakia—0.87; Poland—2.4; USSR—1.6; Brazil—2.5; Mexico—6.5; South Korea—1.5. Larry Theriot, "Communist Country Hard Currency Debt in Perspective" (mimeo). Department of Commerce, Bureau of East-West Trade, December 15, 1976.*

[16] *"Foreign Technology Needed in Coal Industry," Peking* Kwangming Daily *in Chinese, November 10, 1976, p. 3 in FBIS Nov 22, 1976, pp. E 11-13.*

[17] *"December 31, Peking Reception Honors Foreign Experts," Peking NCNA in English, December 31, 1976, in FBIS, Jan. 3, 1977, p. A-1.*

[18] *See, for example, "Ku Mu: Economic Recovery will Buoy Trade," in FBIS, Nov. 11, 1976, p. A-1.*

Disney Enterprises, which bought Chinese fireworks for last July 4, was host to Ambassador Huang Chen and his party.

COUNCIL ACTIVITIES

Spring has brought with it a new year of China trade activities that may surpass any yet. The Council escorted Ambassador Huang Chen on a second trip, to Georgia and Florida, held a well-attended conference on China's Mining and Construction Industries in Denver, received two import-oriented delegations for essential oils and textiles, and received positive word from the Chinese on a number of industry delegations to China.

On April 7 the first official US importers delegation to the PRC from the Council arrived in Peking, hosted by the CCPIT, for extensive talks. Representatives of the Importers' Steering Committee discussed foodstuffs, chemicals, minerals and metals and textiles. The Steering Committee also participated in a Pre-Canton Fair briefing in New York on April 1 attended by over sixty people.

And highlighting the year will be a top-level visit from the CCPIT hosted by the Council in September.

AMBASSADOR HUANG TRAVELS SOUTH WITH NATIONAL COUNCIL, VISITS PRESIDENT CARTER'S HOME STATE AND FLORIDA

His Excellency Ambassador Huang Chen, the ranking Chinese official at the People's Republic of China's Washington Liaison Office, toured Atlanta, Disney World and Miami during a private five-day visit in mid-March, arranged by the National Council.

In his second unofficial trip this year, Ambassador Huang and a party of five other Liaison Office officials saw the heart of America's vacation land—Disney World's Theme Park and Magic Kingdom, Miami's famous beaches, and Underground Atlanta.

Accompanying Ambassador Huang were his wife, Madame Chu Lin; the Counselor of Commercial Affairs, Chang Tsien-hua; the Second Secretary of Commercial Affairs, Hsu Shang-wei; and Mr. Hsu's wife, Madame Wang Hung-pao. Ambassador Christopher

H. Phillips, President of the National Council, his wife, and Council staffer Howell Jackson escorted the group during the trip.

MINING AND CONSTRUCTION CONFERENCE HELD IN DENVER

About 105 mining and construction companies and other interested parties from around the country attended the National Council's Conference on China's Mining and Construction Industries and Prospects for US Sales, held in Denver, Colorado, on March 22 and 23.

Philip C. Habib, Assistant Secretary of State for Political Affairs and the luncheon speaker, stressed the Carter administration's commitment to work toward full normalization and announced that Secretary of State Cyrus Vance expects to visit China soon. Habib also said that new efforts are being made to resolve the frozen assets/claims issue, and that government analysts foresee an increase in China's purchases of foreign products.

A 432-page workbook on China's Mining and Construction Industries, which was distributed at the conference, is available at a cost of $75 plus postage, with a $25 discount for Council members.

EXHIBITIONS DIRECTORY ISSUED— KEY REFERENCE FOR MEMBERS

The Council's first member project, the *Directory of Foreign Trade Exhibitions in the People's Republic of China* was published in March by the Council, in conjunction with the Council's Exhibitions Committee.

Saul Poliak, of Clapp and Poliak Inc., Chairman of the Committee, describes it "a first rate job and one that should be exceedingly useful to virtually every member of the Council, plus a lot of other people."

National Council staffer Molly Bruce Jacobs compiled the Council's *Directory of Foreign Trade Exhibitions in the People's Republic of China.*

The 540-page *Directory*, prepared by Molly Bruce Jacobs, features 54 foreign exhibitions held in the PRC during the past ten years, giving details of most of the foreign companies that have exhibited in China, and the over 10,000 products displayed, by type and model number where given.

Any company wanting to know what specific types of foreign technology have been of interest to China—and how China's preferences have changed, will want to have a copy of this volume, which includes an

FOR TRAVELERS— Spring in China April-May

CANTON

50′ above sea level; approximately the same latitude as Havana, Cuba. The weather will be warm and pleasant as the Spring fair opens in Canton, but the humidity averages a high 74%. As the fair closes, the tropical summer may set in. Shirt sleeves and casual clothes are suitable for most occasions, business and social.

PEKING

165′ above sea level; approximately same latitude as Philadelphia or Denver. Spring is mild in Peking and lasts into mid-May. Generally clear days bring out the capital's best foilage, but occasional light showers fall.

SHANGHAI

50′ above sea level; approximately same latitude as Jacksonville, Florida. Shanghai becomes very wet in the spring with more than half of the days rainy. Fast drying synthetic clothes will do well in this part of China during April and May.

April Temperatures

	Canton	Peking	Shanghai
Mean Daily Maximum Temperature	77°	69°	67°
Mean Daily Minimum Temperature	49°	43°	49°
Mean Number of Days with Precipitation	7	4	13
Mean Monthly Precipitation	0.9	0.7	3.6

95TH CONGRESS
1ST SESSION

H. R. 5714

IN THE HOUSE OF REPRESENTATIVES

MARCH 29, 1977

Mr. AUCOIN (for himself, Mr. PRICE, and Mr. REUSS) introduced the following bill; which was referred to the Committee on Banking, Finance and Urban Affairs

A BILL

To amend the Export-Import Bank Act of 1945 by eliminating the Presidential determination requirement in connection with trade with the Peoples Republic of China.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. Section 2(b)(2) of the Export-Import Bank Act of 1945 is amended—

(1) by inserting in subparagraph (A) immediately after "(as defined in section 620(f) of the Foreign Assistance Act of 1961" the following: ", but excluding the Peoples Republic of China"; and

I

Two bills introduced by Rep. AuCoin which would permit US companies selling to China to benefit from Eximbank credits.

95TH CONGRESS
1ST SESSION

H. R. 5715

IN THE HOUSE OF REPRESENTATIVES

MARCH 29, 1977

Mr. AUCOIN (for himself, Mr. PRICE, and Mr. REUSS) introduced the following bill; which was referred to the Committee on Ways and Means

A BILL

To amend the Trade Act of 1974 to permit the People's Republic of China to participate in programs of the United States which extend credits, credit guarantees, or investment guarantees.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

That subsection (a) of section 402 of the Trade Act of 1974 is amended by inserting after "treatment), such country" the following: "(other than the People's Republic of China)".

I

George Krieger, Vice-President, ACLI International, Chairman of the Council's Importers Steering Committee, led delegation to Peking in April for talks with CCPIT, SINOCHEM, CHINATUHSU, CEROILS, MINMETALS, CHINATEX.

index and cross-reference by product. The *Directory* costs $200 plus postage and is available from the National Council.

SINO-AMERICAN CHAMBER OF COMMERCE FORMED IN NEW YORK

More than one hundred and fifty people representing some eighty companies were present at the inaugural banquet of the Sino-American Chamber of Commerce on March 17, 1977 marking the largest and most successful attempt to organize American businessmen of Chinese descent interested in improving trade ties with the PRC.

The Sino-American Chamber of Commerce was organized to "bridge the friendship of two peoples and promote the development of two-way trade on the basis of mutual benefit," according to Mr. Lloyd Fong, Co-chairman of the newly formed group. Mr. Yeh Nan, the other Co-chairman, echoed this theme, stating in his welcoming remarks that the Chamber intended to "help create the favorable conditions for a normal trade relationship between the United States and the People's Republic of China."

On hand to help celebrate the founding of the Sino-American Chamber of Commerce were Christopher Phillips, President of the National Council for US-China Trade, Joe Erazzo, Special Assistant to the Mayor of New York City, as well as representatives of the US Food and Drug Administration, US Customs, and the New York banking community. Phillips hailed the founding of this new effort to promote better trade, and underlined the importance of improved trade ties in the overall development of US-China relations. He pledged the Council's support in the efforts of the Sino-American Chamber of Commerce, noting that the Council also makes a special effort to assist importers by hosting trade missions and through its Importers Steering Committee.

Mr. Erazzo, speaking on behalf of Mayor Beame, noted that the formation of the Sino-American Chamber of Commerce was reflective of the diversity of our society: "a Chinese group, meeting in the city founded by the Dutch, on a day for celebrating the Irish in all of us."

Among the activities planned by the Chamber are; discussions with Chinese trade officials, trade missions, the creation of a forum for the discussion and solution of common problems, and a concerted effort to help lower trade barriers and to promote the normalization of relations between the two countries.

ESSENTIAL OILS DELEGATION MARKETS IN AMERICA

Despite a driving rain, some seventy representatives of the US essential oils industry attended an afternoon reception for the Essential Oils Delegation from the China National Native Produce and Animal By-Products Corporation at the New York Hilton Hotel.

The delegation's visit, co-hosted by the National Council and the Essential Oils Association, marks the first for this particular Chinese group as well as the first selling mission from the People's Republic of China in 1977. The delegation travelled from New York to San Francisco to hold further talks before returning to China in mid-April.

In his welcoming remarks, Mr. Eric Bruell, First Vice President of the E.O.A., thanked the delegation for the warm hospitality which had been accorded many of its members on their visits to China. He noted that China has perhaps the largest output of any nation in the world in this product area, making the People's Republic of China "deserving of our closest collaboration and attention." He called it "vital that the membership share the information of trends in the market in China" to insure both the continuity of supply and stability in pricing.

Mr. Feng Kuan-shun, leader of the three-man delegation, publicly thanked the National Council and the Essential Oils Association for its warm hospitality, and expressed the hope that this visit would help them understand better "the needs of our American friends." Wu Wen-an, Chang Chan-hua, and Li Yun-chiu of CHINATUHSU were the other members of the Chinese delegation.

Representing the National Council's Importers' Steering Committee were David Cookson (Chairman of the Foodstuffs Subcommittee) and Lee Sobin (Chairman of the Light Industrial Committee). Arne J. de Keijzer, New York Representative of the National Council and Priscilla Rope, the delegation's escort, also attended.

COUNCIL HOSTS TEXTILES DELEGATION

A four-man delegation from the China National Textiles Import and Export Corporation hosted by the National Council arrived in the United States on March 20 to meet with US buyers of cotton and silk piece goods. Headed by Chi Yi-kuang with Tsung Wen-tse, Li Yu-Chou, and Wu Shu-tung, the delegation visited Washington, New York, San Francisco, and Los Angeles during its month-long visit to the United States. Suzanne Reynolds, the National Council's Coordinator of Import Activities, accompanied the group. A reception for the group, hosted by the Council's Importers' Steering Committee and Textiles Subcommittee was given on Tuesday, April 5 in New York. 完

For Your Diary

A CONFERENCE ON LICENSING TO THE PRC NOVEMBER 17, 1977

A conference on Licensing to the PRC will be held in Chicago, November 17, 1977, sponsored by the National Council. The all-day event will feature:

- An introduction to licensing to the PRC.
- The state of technology in China, technology transfer to and in the PRC, and China's attitude toward foreign technology.
- Typical licensing agreements and legal aspects of license contracts with the PRC.
- Negotiating licensing agreements with the Chinese, including case examples.
- The effect of US export controls on licensing to China.

There will be a specially produced volume prepared for this conference. Inquiries about the meeting should be addressed to Eric Kalkhurst at the National Council.

Essential oils delegation from China Native Produce and Animal By-Products Corporation at Council offices before starting tour of Washington, New York and the West Coast to meet with American importers.

CHINA'S RAILROADS 1977

SINGLE TRACK

DOUBLE TRACK

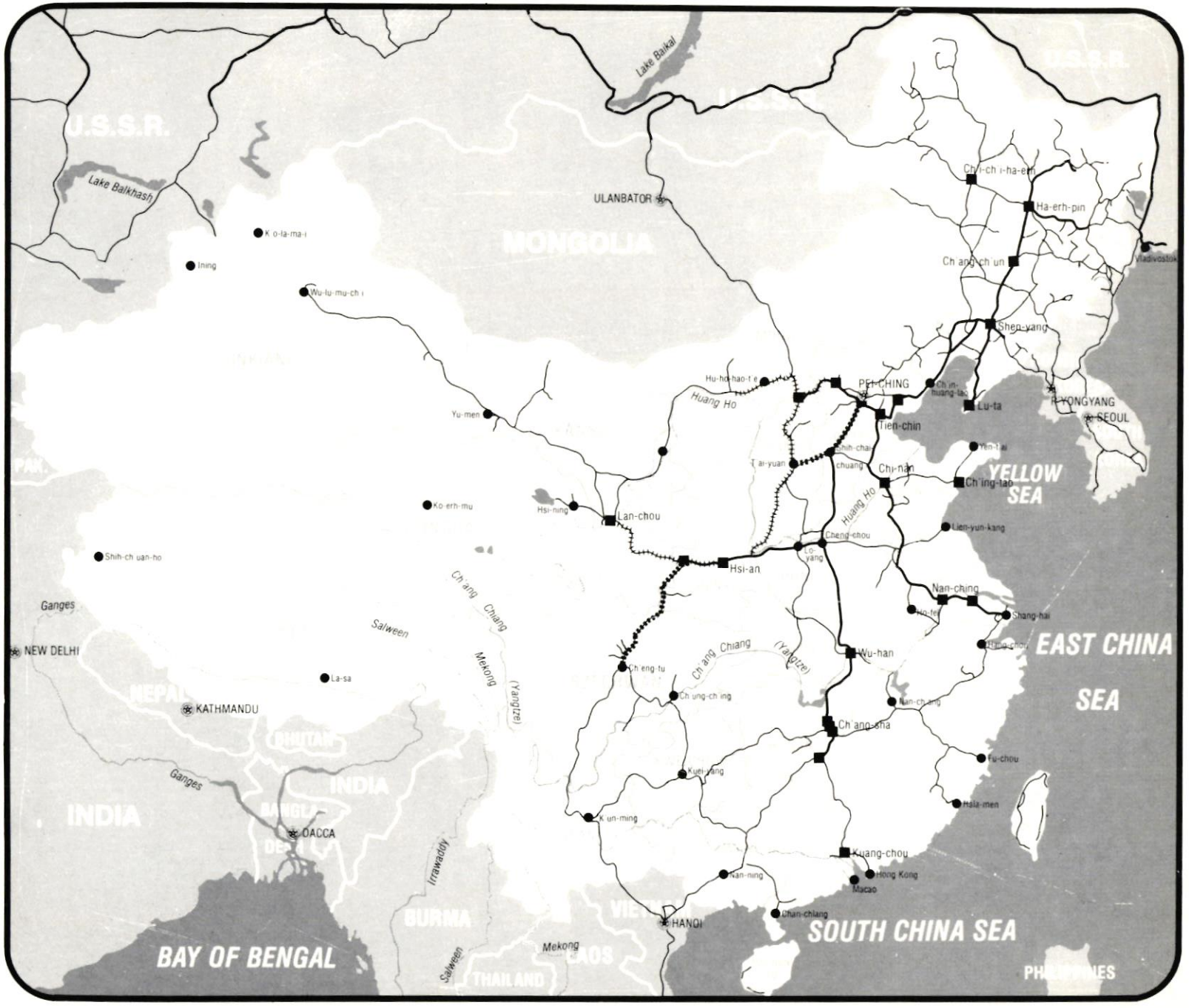
ELECTRIFIED

EXISTING

PROPOSED

■ MAJOR LOCOMOTIVE OR ROLLING STOCK PLANT

Note on romanization: the Wade-Giles system has been used for names on this map. Lu-ta is also known as Talien.



CHINA'S RAILROADS

Ralph W. Huenemann and Nicholas H. Ludlow

With the rapid expansion of China's economy and foreign trade in the last five years, the pressure on China's transportation network has increased substantially. Railroads are a major part of China's transportation capabilities, accounting for about 60% of the PRC's freight. More than half the freight carried on China's railways is coal, the mainstay of the PRC's energy supply. Thus railroads are a critical factor in the development of China's economy. But, during the past year or so, railways in the People's Republic have become, at Peking's own admission "a strikingly weak link in the national economy," and, probably as a response to this, a new Minister of Railways, Tuan Chun-yi, has been appointed. Recently China held a special conference to dramatize the "key link in running the country" and plan "rapid improvement in rail transport." The conference proposed "painstaking work . . . for three to five years," establishment of "scientific regulations and rules for successful management," and the transformation of railway workers into a "mighty semi-military industrial force." Protection of state property and improved security against sabotage were mentioned as important objectives. The article that follows explores the development of China's railways, examines China's manufacturing capabilities and purchases of railway equipment from abroad, and takes a look at the future of rail as the premier means of transportation in the People's Republic.

Ralph W. Huenemann, who teaches at the University of California at Santa Cruz, wrote his Ph.D thesis on China's railroads. Nicholas H. Ludlow is the editor of The China Business Review.

> Railways are . . . the main arteries of the national economy. When railways are running smoothly, they promote the overall development of the national economy. Therefore railway transportation must be smooth and safe. Trains must run on schedule, haul still more freight at faster speeds and play well the role of forerunners.
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> From an article in the *People's Daily,* February 21, 1977, entitled "Great Order Throughout the Land, Great Order in Railways."

In 1876 an English engineer named Gabriel James Morrison drove home the symbolic first spike of China's first railroad—the Shanghai-Woosung line. Those few miles of 2′ 6″ track were not destined to last very long. An angry Chinese government ordered the line dismantled two years later, and it was not rebuilt until 1898. Nevertheless, the Shanghai-Woosung marked the beginning of the railroad era in China.

Last year, on the centennial of this event, no commemorative speeches were reported. Nor were any nostalgic books published. The reason is not hard to understand. Railroads brought to China the social and economic disruption of the Industrial Revolution. More significantly, they came to be the most visible manifestation of imperialism's presence in the Middle Kingdom.

During the 1880's and early 1890's a few Chinese officials known as the "self-strengtheners" urged that railways should be built, but little was accomplished. Then, China's defeat by Japan in 1885 set in motion an undisguised scramble for quasi-colonial spheres of influence and an era of "conquest by railways."

In 1899 the German admiral Tirpitz wrote to the governor of the German colony at Tsingtao: "Our most essential interest is furthering the railroad construction from Tsingtao to Tsinan. . . . As the railroad grows we will be able to expand our influence outwards from it more and more widely and to gradually establish ourselves ever more firmly in the province (of Shantung)." The Russian official Witte gloated over the "extremely favorable" terms obtained in the negotiations over the Chinese Eastern Railway (in Manchuria).

Simultaneously, Leopold II of Belgium was making efforts to gain control of the trunk line from Peking to Canton. And in 1906 the Japanese Minister of Finance told a legislative hearing: "At this juncture, it is most urgent for us to . . . fully coordinate our railroads at home with those in Korea and Manchuria to our maximum advantage in our supreme effort to utilize the expanded sphere of influence, which we should bring under our complete control in the future."

By 1911, when it was announced that local railroad projects would be nationalized and that further foreign loans would be sought, the public outcry was enough to bring China's whole dynastic edifice tumbling to the ground. But the best-known figure in the Revolution of 1911, Sun Yat-sen, somewhat paradoxically held high hopes that his ambitious scheme of railroad building, financed with foreign loans, would bring political cohesiveness and economic modernization to his country.

Additional railways were built in the following decades, but the problems continued. The Nationalist government spent relatively little on new lines. Warlord disruptions were a continuing plague. Revenues fluctuated, coupon payments were missed, and in the London market Chinese railway bonds plummeted. Then came the bombings and destruction of World War II followed by Stalin's post-war attempt to strip Manchuria of its industrial assets.

Conditions in 1949—130 Different Types of Rail

By 1949 the entire network was still quite small. At 21,880 kilometers, it was about equal to that of the US in 1854. The lines were located primarily in the coastal areas and in Manchuria, while certain important regions such as the fertile Szechwan basin had no railways at all. The gauge was largely a uniform 4′ 8½″, although there were exceptions including some meter gauge in Shansi province and in the French zone of influence near Indo-China, and some remnants of Russian broad gauge in Manchuria.

However, there were more than 130 different types and weights of rail in the network, so that uniform axle loadings and the easy interchange of rolling stock were out of the question. There were also about a hundred different series of foreign-built locomotives in a total fleet of some 4,000 units, of which about one-third were out of commission.

Interestingly enough, many of these locomotives were American, despite the fact that the US had played a relatively inactive role during the scramble for concessions. At least 562 steam locomotives were exported from the United States to China during the three decades from 1915 to 1946, including 218 Baldwins, 288 Alcos, 45 Limas, nine Americans, and two Davenports. Recent visitors to China report that trains are still being coupled to these faithful old Baldwins and Alcos!

The Chinese railroads in 1949 were a network, albeit a small one, but they were not yet a well-integrated system.

Expanding the Network

For the first few years after 1949, the new government of China concentrated on restoring the existing network to a more serviceable condition, although the construction of new lines also began rather quickly. The remote but populous interior province of Szechwan saw its first railroad in 1952, when the Chengtu-Chungking was completed. The mid-1950's brought the completion of the Yingtan-Amoy on the coast opposite Taiwan, the mountainous Paoki-Chengtu, and the trans-Mongolian railway which shortened the train trip from Peking to Moscow by about 700 miles.

Also, 1956 saw the building of the first railway bridge across the Yangtze River, at Wuhan. In the late 1950's the desert line from Paotow to Lanchow was completed, and then carried in two directions to Sining and Urumchi. Another bridge across the Yangtze, at Chungking, was also built at the close of the decade.

During the 1960's, despite the severe economic difficulties of the early years, several additional lines were opened to traffic. Among these were the Chungking-Kweiyang (1965) and the Kweiyang-Kunming (1966). A third bridge across the Yangtze, at Nanking, was finished in 1968—its double tracks greatly expediting traffic between Shanghai and Peking. In 1976, officials indicated 120 trains used this bridge daily.

The 1970's have been a period of substantial further construction, beginning with the Chiaotso-Chihkiang and the Chengtu-Kunming lines in 1970. The Hunan-Kweichow was finished in 1972. And the Nenlin Railway through Manchuria's frigid Greater Khingan Mountains was opened to traffic in 1974.

Supplementing China's standard-gauge railroads is a system of lightweight, narrow-gauge lines. Information on this system is scanty, but the pattern in Honan province is revealing. In 1973 the Honan network was about 600 miles in length and reached into thirty counties. The gauge is described as half that of an ordinary railroad, and is therefore probably 750mm—a gauge that is also widely used in the Soviet Union

CHINA'S RAILROAD STATIONS

Top left, passengers inside Canton Railroad station; lower left, outside view of Canton Railroad Station; lower right, Peking Railroad Station.

for specialized auxiliary purposes, particularly logging.

Traction is partly by steam and partly by small diesels of 160 and 400 hp. The 400-hp model reportedly pulls trains of up to 300 tons. Similar use of light railroads is also reported from Shansi, Anhwei, Szechwan, Fukien and Kwangtung provinces, and they are almost certainly used in Manchuria as well for logging operations.

Engineering Feats

Some of China's new lines were incredibly difficult to build. The Chengtu-Kunming, with 250 miles of bridges and tunnels along its 675-mile route, may well have been the worst. One American government study has characterized the Chengtu-Kunming as "one of the great engineering feats of the modern world."

But other lines were also quite troublesome. The Kweichow section of the Hunan-Kweichow required 57 miles of bridges and tunnels in 171 miles of track. And the Paoki-Chengtu lines crosses the same kind of difficult mountainous terrain, with 57 percent of the mileage on the northern slope of the Tsinling range confined to tunnels. As if to offer the railroad builders variety in their headaches, the Paotow-Lanchow line was plagued by shifting sand dunes. And, most recently, the Nenlin Railway in Manchuria had to traverse a region in which the annual mean temperature is below freezing and the lowest recorded temperature has been a numbing −58° F.

One July 1976, NCNA report summarized the construction of a 291.5-kilometer supplementary Shanghai-Nanking railway line: "The entire project was very difficult and complex because it required the expansion and building of 41 railway stations, the laying of

Rolling stock: Sleeping car on Chinese-produced train, 1976.

more than 300 kilometers of Chinese-manufactured rails on the mainline and more than 270 kilometers of underground communications and signal cables and the building of 300 tunnels and ditches . . . Comrades on the rail-laying teams strove to speed their work by using manual labor to lay the 2500-catty (1.25 metric ton), 20-meter rails on the ties because they were short of machines."

The Organization of China's Railways

In 1949 the new government established a Ministry of Railways under the auspices of the Economic and Financial Commission of China's highest administrative organization, the State Council. In 1954 the Ministry was placed under the 6th office of the State Council; later, in 1959, under the Office of Industry and Communications. Following the Cultural Revolution, the Ministry of Railways was absorbed by the Ministry of Communications in 1970, reemerging as a separate entity again in January 1975.

According to a French account in 1975, the Ministry has seventeen different departments. These include four general departments concerned with overall transportation, line construction, administration of plants' manufacturing equipment, and maintenance and distribution of regional administrative personnel; and eight specialized departments concerned with signaling, planning, accounts, statistics, international transportation, wages, and security. Two committees oversee scientific and budgeting matters and other bureaus are concerned with "culture and education," health and medical services, business and "politics."

The Ministry of Railways presently administers twenty railway bureaus and 16 sub-bureaus throughout China, as well as most of China's 33 locomotive and rolling stock factories via its Locomotives and Rolling Stock Factories Department. (The First Ministry of Machine Building's Bureau No. 5 produces industrial and mining railway equipment of various kinds.)

The Ministry also runs the Railway Science Academy which has a locodrome near Peking, and which is staffed by 2,000 personnel, 900 of whom are university graduates. The Academy sponsors six research institutes, one of which assisted in Tangshan reconstruction. Research focuses on testing of locomotives, engines and rolling stock, signaling and safety.

Rapid Ton-Mile Increase

Because of the ongoing construction work of the past quarter century, the length of the Chinese railroad network at 46,500 kms in 1975 is now more than double what it was in 1949. About 1,000 kms of new rail have been added, on average, to China's network every year. (In 1970 more than 2,700 kms were added.) But the economic usefulness of the system as measured, for example, by the ton-miles of freight hauled, has increased at a much faster rate. The reasons for this are fairly clear, although the relative importance of the different factors is less certain.

First the roadbed itself has been significantly improved. Brittle old rails and rotted sleepers were replaced as rapidly as possible. The magnitude of the job is suggested by the more than 5,700,000 sleepers replaced in 1950 alone, while at the end of 1958 it was reported that nearly ten percent of the network still consisted of rails rolled prior to 1920. The standard rails installed during much of this period were only 12.5 and 25 meters long, although recently the Chinese have been moving to the use of continuous-welded rail.

In 1976, it was reported that "heavy duty steel rails" accounted for over 60% of China's track. By last year, over 40% of China's track was suitable for 90 km/hr travel.

Second, a considerable amount of double-tracking has been done. Recent examples include the 800-mile trunk line from Tientsin to Shanghai. China now has double-tracking from north Harbin in Heilungkiang to south of Changsha in Hunan. Other techniques, which to some degree can substitute for double-tracking, such as modern block methods and two-way radio use, have also been reported.

Third, the full electrification of the 420-mile Paoki-Chengtu, completed in 1975, represents another method of expanding capacity. Of course, electrification—in this case, a 27,500-volt, single-phase AC system—has a variety of advantages on a line with steep gradients, numerous tunnels, and relatively easy access to hydroelectricity. But it also provides a significant increase

in carrying capacity. The Chinese expect that electrification of this line will double its freight volume, but at only one-tenth of the cost of laying additional track. The Paoki-Chengtu is not double-tracked. Parenthetically, it should now be easier to move Szechwan's grain harvest to north China.

Fourth, and by no means least important, is the modernizing of China's fleet of locomotives and rolling stock.

Regional Dispersion

One of the features of the PRC's expanding rail network is that it now covers the map of China much more uniformly and reaches into many frontier areas where the population density is still quite low. This pattern is partially explained by military and diplomatic consideration. For example, John Foster Dulles undoubtedly had some influence on the decision to build the Yingtan-Amoy in the 1950's. And certainly the rail connections across Mongolia and down to Vietnam have strategic implications.

But the logic of the pattern is more complex than this. Part of the explanation lies in the need to seek natural resources where they can be found. In particular, the search for petroleum has led to railroad-building efforts in the deserts of Sinkiang and the frozen wastes of nothern Manchuria. Logging and mining have also contributed to this pattern.

The Sinkiang line was also intended to link up with the Russian rail network near Alma-Ata, thereby easing some of the freight burden on the Trans-Siberian, although this connection was never completed. In addition, the special needs of the nuclear sector—heavy construction materials and an isolated location—probably influenced the decision to build a line into Sinkiang.

Another notable characteristic of these new lines is that almost all of them reach areas inhabited by various minority nationalities such as the Yi people on the Chengtu-Kunming; the Yao, Hui, Miao and other groups on the Hunan-Kweichow; the Hui nationality on the Paotow-Lanchow; and the Uighur and Kazakh people of Sinkiang. Thus a domestic political goal, the guest for greater national cohesiveness, has probably also affected the geographical location of the new lines.

Finally, it is worth noting that any serious effort to reduce regional income disparities virtually requires a policy of building modern transport of some sort into these less accessible and less developed regions.

CHINA'S MODERN TRANSPORT PERFORMANCE

Mil Metric Tons Originated

	Total	Rail-roads	High-ways	Inland and Coastal Waterways
1949	67	56	6	5
1950	114	100	7	7
1951	134	111	13	10
1952	167	132	21	14
1953	211	161	30	20
1954	266	193	44	29
1955	280	194	50	36
1956	372	246	79	47
1957	429	274	101	54
1958	633	381	176	76
1959	864	520	230	114
1960	842	510	220	112
1961	565	340	150	75
1962	582	350	155	77
1963	634	380	170	84
1964	668	400	180	88
1965	737	440	200	97
1966	823	490	225	108
1967	690	410	190	90
1968	730	430	205	95
1969	872	510	250	112
1970	1,050	615	300	135
1971	1,229	725	344	160
1972	1,295	770	356	169
1973	1,398	830	385	183
1974	1,459	865	404	190
1975	1,598	945	445	208

Source: People's Republic of China: Handbook of Economic Indicators, CIA, August 1976.

Economic Importance of the Railroads

The American economy, with the Penn-Central bankrupt and continuing pressure to close down insolvent lines, can perhaps be said to have moved into a post-railroad era. The situation in China is quite different.

If we consider the total ton-mileage hauled, the greater part of the transport work in the Chinese economy is probably still done by the pre-modern sector. This was certainly the case in 1959, when Li Fu-ch'un reported that only about 36 percent of the aggregate volume of freight was carried by the modern means of transportation. This pattern is changing, but nonetheless the traditional modes probably remain predominant.

By the end of the First Five Year Plan (1953-1957), the railroads accounted for 63% of all freight hauled, 77.8% of the ton-kilometers, and 73% of the passenger-kilometers in the modern sector. Because diversification has occurred since then, railways now carry a slightly lesser proportion than before: in 1975, they hauled an estimated 59% of total freight.

In 1958, according to the last available official figures, the average daily run per freight locomotive was 391.0 km; the average gross weight hauled per

freight locomotives was 1,704 tons; the average daily efficiency per freight locomotive was 600 thousand ton-km; the coal consumption per freight locomotive per thousand ton-km was 14.8 kg; the average turn-round distance per goods wagon was 703.6 km; the average daily run per goods wagon was 255.6 km; the average stopping time per goods wagon per run was 10.4 hours; the average speed per freight train, including stops, was 25.7 km/hrs; the average load per goods wagon was 37.6 tons; and the average daily efficiency per goods wagon was 6,596.0 ton-km. The efficiency of the Chinese rail system has almost certainly improved steadily since then.

Railroads are unquestionably still the dominant mode of transportation in China. Even a light-traffic frontier line like the Kweiyang-Kunming carries an annual traffic density of more than 3 million ton-miles per route-mile. On such key lines as the Peking-Shenyang and the Peking-Wuhan, traffic densities have reportedly exceeded 25 million ton-miles per route-mile. (The average figure for American railroads in 1972 was a bit over 3 million ton-miles per route-mile.)

The future of China's rail and road haulage will definitely include containers. Containerization of China's railroads has been discussed in the Chinese press since at least 1974, when an article was published extolling the virtues of the fast turn-round of containers at transshipment points, including railway-road points. In 1977 turn-round time, for freight cars was given as 3.4 days. In 1975, the publication of a series of five Chinese booklets giving full details of truck containers and their use indicated that this mode of transport is probably soon destined for China rails and roads.

China's railways are critical links for passenger transportation between major cities. For example, unless they can take a plane, travelers from Shanghai to Peking must go by rail because there are no long distance buses in the PRC, except to neighboring provinces. A national passenger timetable issued in Peking in September 1975 listed 40 trunk-route expresses, as well as five international trains.

The first class compartments of China's expresses are, incidentally, impeccably maintained, and have an excellent cuisine available in dining cars.

The volume of passengers handled by China's railroad system is immense. Even in 1958, the last year for which official data is available, some 346 million Chinese, or over half the Chinese population, paid to travel the rails. During the 1950's, from 1949 to 1958, the number of rail passengers increased by 236 percent. Today the railways in China, if they are transporting the same relative number, are carrying some 450-500 million people.

Russian Help, Then Imports From Europe

Russian exports of railway equipment to China did not become significant until 1956, but then increased rapidly in 1958 and 1959. There was an abrupt cessation of these exports during 1960, when the Russians suddenly packed up and went home. When measured against the amounts that China was spending for railroad construction at the time, these Russian shipments are quite modest. Even the peak year figure of about $75 million for 1959 is only about 10 to 15 percent of

CHINA'S ESTIMATED RAILROAD EQUIPMENT, RAIL AND HIGHWAY NETWORKS AND FREIGHT TURNOVER (1952-1975)

	Inventory		Railroads		Highways	
	Mainline Locomotives (Th Units)	Freight Cars (Th Units)	Length (Th Km)	Turnover (Bil Metric Ton-Km)	Length (Th Km)	Turnover (Bil Metric Ton-Km)
1952	3.3	58	24.5	60.2	127	0.8
1957	3.7	86	29.9	134.6	255	3.9
1965	5.4	143	35.9	213	550	7.0
1970	6.4	175	40.0	298	640	10.5
1971	6.7	185	41.5	352	670	12.0
1972	7.1	197	43.5	373	700	12.5
1973	7.5	209	44.5	403	N.A.	13.5
1974	7.9	222	47.5	420	N.A.	14.1
1975	8.3	237	46.5	458	840	15.6

Source: People's Republic of China: Handbook of Economic Indicators, CIA, August 1976.

Yangtze River Railroad Bridge at Nanking.

the annual amounts budgeted for railroad work by the Chinese in those years.

Almost all of these Russian shipments were locomotives. Like the United States, Russia abandoned steam traction in the 1950's. Plans were made to sell China about 2,000 of Russia's used FD 2-10-2 class, although only about half of these units were actually shipped before the break in relations occurred. Because China's domestic production of locomotives was still quite limited in the late 1950's these relatively new and powerful units represented a considerable upgrading of China's fleet of aging pre-war Consolidations, Mikados and so on. They were converted to Chinese gauge at Changchun and dubbed the "Friendship" class.

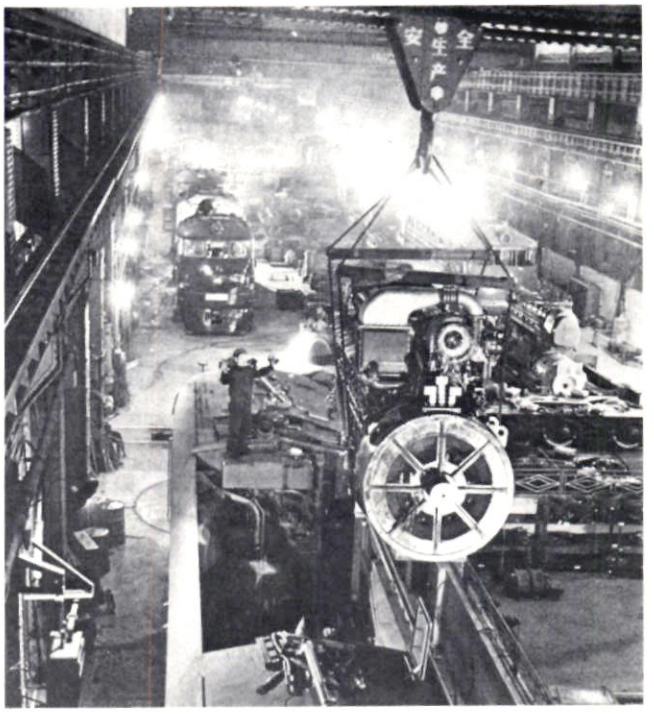
Also, visiting Soviet specialists helped the Chinese tool up to build the Heping ("Peace") steam locomotive, a more powerful 2-10-2 very similar to the Russian LV 1-5-1, which was just going out of production in the Soviet Union. The first prototype was assembled at Talien in 1956, and the Heping was in serial production by 1959 or earlier.

Russian design influence was also quite evident in the early Chinese diesels, prototype models of which appeared in the late 1950's, shortly before the Sino-Soviet rift.

The Chinese shifted their purchases of railroad equipment to European and Japanese suppliers after 1960. In value terms, these imports have remained a modest part of the Chinese railroad picture. But these imported locomotives were undoubtedly studied carefully for the technologies involved, since China was building her own prototypes of these machines in that period. (For details see table.)

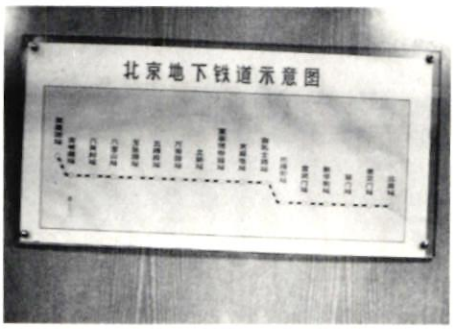
Apart from rolling stock, Chinese imports of railway items have been quite limited. Although China buys a significant variety and quantity of finished steel products, rails have not been important. In 1973, for example, rails and rail accessories amounted to only US $1.1 million, or less than one-fifth of one percent

4,000-h.p. diesel-electric locomotives in production at Talien.



PEKING'S SUBWAY

Begun in July 1965, opened October 1969, Peking's subway is now 24 km long with 17 stations. It carried 70-80,000 passengers daily as of end-1976, at Y0.10 a ride. Trains move 720 passengers each in four 19 m cars, at 60-80 km/hr at 8 min intervals during rush hours, 10 min the rest of the day. Open 6 am-9 pm, the subway works off a 750 volt DC system, under the supervision of 1,000 plus workers of the Peking Underground Railways Division of the Peking Municipal Revolutionary Committee. Top: subway entrance at Military Museum; center left, waiting for a train at subway terminus; center right, in subway car; lower left, Peking subway car; lower right, route map.



of that year's imports of steel. (See *US-China Business Review*, July-August 1975, p. 38.)

Chinese Production of Locomotives and Rolling Stock

Although the Chinese have imported a considerable number of foreign locomotives over the past quarter century, they have also made remarkable progress in the development of a domestic supply. The first Chinese locomotive was a 2-8-2 built at Tsingtao in 1952. A 4-6-2 for passenger service and the Heping 2-10-2 for freight followed within a few years. Thus China began to build steam just when most of the world was shifting to diesel. Given the Chinese circumstances of the 1950's—plentiful coal, scarce petroleum, and little experience with precision machining—this was an eminently sensible policy to follow.

In the late 1950's and early 1960's, a few prototypes of electric, diesel-electric, and diesel-hydraulic designs were built. They appear to have been rather unsatisfactory, but must have contributed to the valuable process of "learning by doing." Even with the abrupt Russian withdrawal, the Chinese were able to begin sustained production of diesel-electrics, first the "Giant Dragon" and then the "East Wind" series, by the mid-1960's.

The continuing Chinese interest in large diesel-hydraulic locomotives, both the imported German units and the 6,000-hp model produced domestically, remains something of a mystery. An executive at Canadian Pacific put the question this way: "What can one of those big units do that a pair of medium-horsepower diesel-electrics can't do just as well—and with fewer maintenance problems?"

CHINA: ESTIMATED PRODUCTION OF LOCOMOTIVES AND FREIGHT CARS 1949-1975

	Mainline Locomotives (Units)				Freight Cars (Units)
	Total	Steam	Diesel	Electric	
1949	—	—	—	—	3,155
1950	—	—	—	—	696
1951	—	—	—	—	2,882
1952	20	20	—	—	5,792
1953	10	10	—	—	4,501
1954	52	52	—	—	5,446
1955	98	98	—	—	9,258
1956	184	184	—	—	7,122
1957	167	167	—	—	7,300
1958	350	346	2	2	11,000
1959	533	530	3	—	17,000
1960	602	600	—	2	23,000
1961	100	100	—	—	3,000
1962	25	25	—	—	4,000
1963	27	25	—	2	5,900
1964	27	25	2	—	5,700
1965	50	20	30	—	6,600
1966	220	150	70	—	7,500
1967	300	200	100	—	6,900
1968	340	200	140	—	8,700
1969	391	230	160	1	11,000
1970	435	250	180	5	12,000
1971	455	250	200	5	14,000
1972	475	250	220	5	15,000
1973	495	250	240	5	16,000
1974	505	250	250	5	16,800
1975	530	250	275	5	18,500

Source: People's Republic of China: Handbook of Economic Indicators, CIA, August 1976.

By 1975 it is thought China was producing about 530 locomotives a year, about 275 of which were diesel and 250 steam. Inventory was about 8,300 units. Production of locomotives increased about 16% during the Fourth Five-Year Plan (1971-1975) while rail-freight turnover rose by 30% to 458 billion ton-kms. At the same rate, the PRC's production will be about 610-620 units by 1980, when steam output should be minimal, and turnover will be about 595 billion ton-kms.

Output of freight cars rose from 14,000 in 1971 to 18,500 in 1975, according to US Government estimates, a rise of 32% Inventory in 1975 was about 237,000 units. By 1980 annual production should be about 24,000 units.

During the 1971-75 plan China's laid track increased by 12% to 52,280 km; at the same rate China's total track should reach 58,000 km by 1980.

The Tan-Zam Railway—China Exports Rail Technology

An important diplomatic payoff to China's rapid development of locomotive-building skills occurred in the mid-1960's. When the World Bank showed little enthusiasm for a proposed railway linking Tanzania and Zambia, Peking was able to step in and offer to do the job. A formal agreement was signed in 1967, work commenced in 1970, and the line was formally opened to traffic last year. The commonly-quoted cost was RMB 988 million, or about $400 million. The agreement provides for a long-term, interest-free loan, repayable over thirty years beginning in 1983.

In view of China's own pressing need to improve rail transport at home in the 1960's, the diversion of 102 locomotives, 2,100 freight cars, 100 passenger cars, the steel for 1,156 miles of track, and significant amounts of skilled labor represented a very substantial sacrifice. Interestingly enough, all 102 locomotives are diesel-hydraulics, some of them 1,000 hp and some 2,000 hp.

Considering how little experience the Chinese had had with diesels at the time of the negotiations, and considering the need to redesign the equipment somewhat for the Tan-Zam's narrower 3'6" gauge, the whole venture was a rather daring gamble. Perhaps it represents a first step toward exports of locomotives to other, less sheltered markets.

Prospects for Foreign Exports to the PRC

For the moment, however, China seems likely to remain a net importer. It is true that in recent years the Chinese newspapers have contained many attacks on those who "worship foreign things," and Mao Tse-tung's injunction to "rely mainly on our own efforts" has been widely quoted.

But China's recent mood seems more receptive to utilizing foreign technology. In this new atmosphere, it may be somewhat easier for Chinese officials to consider the importing of railroad equipment as a way to "serve the people." Certainly, foreign producers ought to explore the possibilities with vigor.

The potential for foreign companies to supply the PRC with railway and track equipment and know-how clearly exists. French and Japanese companies have been involved in the electrification and modernization of various parts of China's rail network including the Kwangchow-Peking route and the Paoki-Chengtu section. A number of foreign companies have exhibited railway-related equipment at trade shows in Peking.

The visit of a Chinese Railways Standard Inspection Mission to Japan, in November 1976, has been an indication that a major program to improve the PRC's railroad infrastructure involving foreign purchases may be underway. The Chinese delegation visited and studied the electrical machinery and rolling stock plants of Mitsubishi Electric Machinery, Hitachi Ltd., and Kawasaki Industries, and reportedly implied that China may be importing rolling stock on a large scale, and marshalling yard technology.

China's recent national conference on railways calling for "rapid improvement in rail transport" as part of China's plan to modernize its economy completely by the end of the century suggests that foreign technology may surely have a part to play in the future development of China's railroads. Indeed, rapid expansion of this "artery of the economy" may hold the key to China's ability to modernize. 完

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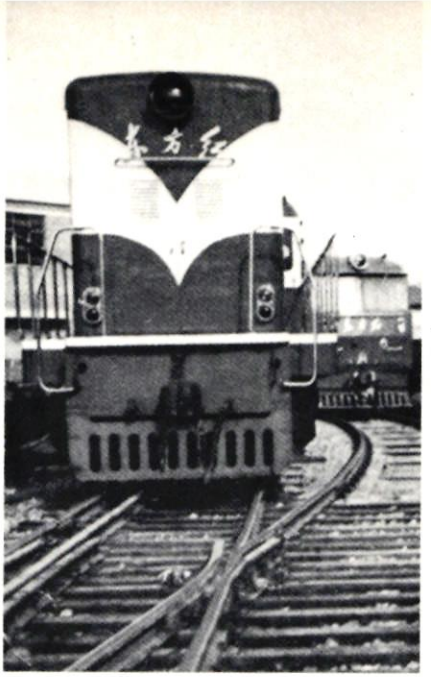
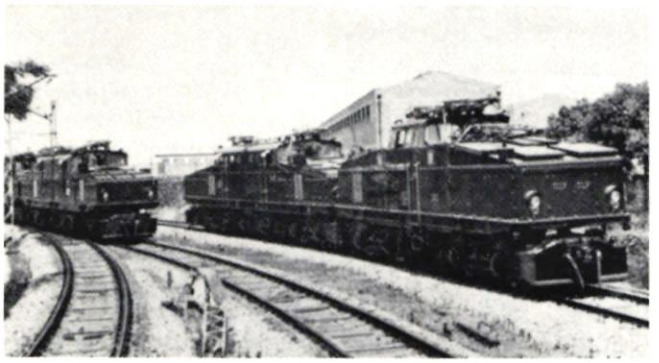
SALES OF FOREIGN LOCOMOTIVES TO THE PRC (1949-1976)

1958-1960	USSR	1050 used Felix Dzherzhinskys (FDs) 2-10-2 steam locos, 12-wheel tenders, spoked "drivers," built 1931-41, valued at about $85.6 million.
1960	Alsthom—MTE, France	25 Co-Co, 139 ton, 6,000 hp electric locos for 4,400 kw DC op. with ignition rectifiers and energy recovery brakes; max speed 100 km/hr; hauling capacity exceeding 32 tons at 47 km/hr; energy recovery when braking of 3,500 kw for two units, 3,600 kw for 38; in multiple units could haul 1,500 tons up to 0.3 grade at 50 km/hr. Numbered 6-Y-2 by Chinese; to work freight at −40° to +40° C.
1965	Japan	31 small electric locos
1966	Sweden	17 small electric locos
1966-67	Henschel (Rheinstahl), Germany	4 diesel hydraulic CC, 180-ton, 4,000-hp locos; max speed 160 km/hr; with Voith L830rU turbo-transmission; for freight and passenger hauling; each with two MB839B6 Maybach-Mercedes-Benz 16-cyl engines; dev. 2,000 bhp. at 1500 rpm; designed to operate from −40° C to +40° C; Behr cooling equipment. Khorr airbrakes; gauge 1,435 mm; NY5 class.
1968-1972	Henschel	30 diesel-hydraulic CC 138 ton locos; max speed 120 km/hr; length 23,610 mm; width 3,120 mm; height 4,570 mm; tractive effort (starting) 45,500 kg; Voith L820 hydro-dynamic drives; gauge 1,435 mm; comprise ten NY6 4,600 hp (UIC), site rating 4,300 hp; with two MB16V652 diesel engines by MTU, and twenty NY7 5,400 hp. (UIC), site rating 5,000 hp, with two MA 12V 956 engines by MTU; bodies and cabs acoustically and thermally insulated, plus comprehensive heating system with Henschel WK200 boiler to keep engine, transmission oils and fuels warm; Behr cooling systems; tank capacity 10,000 litres for 2,000 km range due to limited fueling points.
1970-73	Alsthom—MTE	40 Co-Co, 7,300 hp electric locos for 5,400 km DC op. with silicon semi-conductors; for 25 kv/50hz system; hauling capacity exceeding 36 tons at 4.5 km/hr; energy recovery when braking 4,300 kw; numbered 6G 51-90; 138 tons; max speed 112 km/hr; rated tractive effort of 353 KN at 55 km/hr continuous; provision for multiple working on very heavy freight trains; gauge 1,435 mm.
1971-1974	Alsthom—MTE	50 Co-Co, 4,000 hp diesel-electric 138 ton locos with single-C motor trucks; 3-phase continuous AC/DC transmission; max speed 100 km/hr single; AGO V-16 ESHR motor by SACM; supplying 3,650 hp at 30°C, towing at 1,350 rpm; withstand −40°C without anti-freeze; able to maintain traction performance at 30 km/hr with two engines coupled in multiple units tracking in one-way 5-km tunnels; freight use; numbered ND 4 1-50 by Chinese; tractive effort (starting) 48,000 kg; 23,020 mm long; width 3,290 mm; height 4,500 mm; gauge 1,435 mm; separate heating system; fuel capacity of 10,000 litres gives range of 2,000 km, two days normal use; large resistance banks provide dynamic braking at 4,000 hp; designed, when double-headed, to haul 5,000 ton freight train at 80 km/hr on level, maintain 24 km/hr hp and 25 km/hr down 1.0% gradient; also to haul 2,000 tons up 2.5% grade and maintain 30-40 km/hr down 2.5% incline.
Early 70s	East Germany	Heavy industrial electric locos 150 ton EL-1, 1,500 V DC overhead line op; 100-ton EL-2, with alternative 1200-2400 V DC rating; used in opencast mines, number unknown.
1973	Henschel	36 diesel locos, 5,500 hp, valued at $8 million.
1974	Nippon Sheryo Seizo Kaisha, Japan	Six 24 ton diesel locos valued at about $500,000; deal arranged via Nichimen.
1975	Electropuntere, Romania	20 diesel-electric locos, 2,100 hp.

CHINA'S LOCOMOTIVES

Clockwise from top, diesel locomotive manufactured by Tsingtao Szefang Rolling Stock Plant, labelled "new" in late 1975 by the Chinese; "Dongfanghong" (East is Red) locomotive being serviced in Tanzania; electric locomotives on the Paoki-Chengtu Railroad; lower right, "Dong Feng" (East Wind) diesel engine on display at the Canton Fair, Spring, 1974; "Dong Feng" 4,000-h.p. diesel electric loco in action; electric mine locomotives built at Hsiangtan; side view of Dong Feng "East Wind" diesel locomotive built in 1974 at Talien Locomotive and Rolling Stock Factory, shown here at Canton Station, 1976.





CHINA'S LOCOMOTIVE AND ROLLING STOCK PLANTS

CANTON MOTIVE-POWER MACHINERY WORKS, Kwangtung. Mainly makes steam locomotives. Trial produced 380-hp internal comubstion narrow-gauge locomotive as of March 1975, with two others in production, for local province work.

CENTRAL CHINA LOCOMOTIVE AND ROLLING STOCK PLANT, Changsha, Hunan. Reported in April 1969 by NCNA to be producing China's first high-power loco with electric transmission using semi-conductors.

CHANGCHOU DIESEL LOCOMOTIVE PLANT, Kiangsu. In August 1968, NCNA reported this plant was trial-producing China's first diesel-hydraulic locos for mine and factory use. The 80,120, and 180-hp versions were designed and made through the joint efforts of this plant, Dairen (Talien) Industrial Vehicle Plant, and the Shihkiachwang Motive Power Machinery Plant. In 1965, this plant was producing a new type of small diesel loco of 60 and 120-hp, with compressed air controls, for factory use.

CHANGCHUN LOCOMOTIVE WORKS, Kirin. Products: "Peace" (Heping) freight locomotive produced May 1959, 80 km/hr and 150-m radius curvature; 21 km/hr on 0.6% gradient; max 3,154 hp. "Rocket" small steam locomotive, 234-hp, built 1960 for rural and mine transportation, can pull 300 tons on 0.6% gradient; dwt 30 tons; runs 105 km on single watering. Self-propelled "Peking" subway cars and rolling stock, first operational October 1969; 19m long cars designed to go at 60-80 km/hr (80 km max), accommodate 186 passengers, 60-seated, use 750-V DC power. "YM-22" 3rd class sleeping cars first manufactured September 1959, with eight bed compartments, electricity, ventilation, water and heat; max speed 120 km.

CHANGCHUN PASSENGER CAR WORKS, Kirin. Est. 1957. Products: Lightweight passenger car for high speed (160 km/hr) trains. Deluxe class built in 1950's 3rd class sleeping car, built 1963, dwt 41 tons, 160 km speeds, double decker. Lightweight passenger car built 1965 of aluminum alloy, pressed-plastic board interior, 120 to 140-km speeds. In 1964 was building sleeping coaches with improved suspension and independent heating systems ready for change from steam to electric locos. In early 1966 NCNA reported passenger coaches were being fitted with AC systems for lights, ventilation etc. Workshops include iron casting, carpentry, tools, precision casting and machine repair. Has 100-m automatic mould-carrying loop line. Expanded since Cultural Revolution.

CHENGTU ROLLING STOCK WORKS, Szechwan. Late in 1968, China's news agency reported this repair works had been converted to repair diesels as well as steam locos.

CHICHIHAERH RAILWAY CAR PLANT, Heilungkiang. Produced 370-ton flat car for transport of complete machines and heavy equipment, as of July 1974; car has double-connection feature.

CHIANGAN ROLLING STOCK PLANT, Wuhan, Hupei. One of this plant's technicians is a deputy to China's National People's Congress: Fan Chung-chih. The plant began following a strike on February 7, 1923.

CHISHUYEN ROLLING STOCK PLANT, Changchou, Kiangsu. Produced 2,000-hp loco with electric transmission in 1958. 5,000-hp diesel locomotive with hydraulic transmission, "Dongfanghong 4," which completed loaded test-run of 100,000 km, in NE China, Shanghai-Nanking and Shanghai-Hangchow lines during late 1976 after five years development. Engine, when fully loaded, runs at 1,500 rpm.

CHUCHOU ROLLING STOCK WORKS, Hunan. Gondolas and other freight cars. 150-ton "lightweight" goods wagon trial produced in 1969. Works with Chuchou Electric Locomotive Research Institute.

FUCHIN ROLLING STOCK WORKS, Nanking, Kiangsu. Originally locomotive repair yard. Products include passenger coaches, freight cars, chilled cast car-wheels, shaft boxes, brake cylinders, gate valves and 110 other parts. Facilities: nine shops including locomotive boiler, instruments, coach, casting, forging, power, machining and materials. Reforms include electrostatic spray painting.

HARBIN ROLLING STOCK PLANT, Heilungkiang. NCNA reported in 1967 that this plant was producing a new type of automatic-dumping wagon with capacity of 100 tons.

HENGYANG RAILWAY MACHINERY MANUFACTURING AND REPAIR PLANT, Hunan. Products include China's first laser aligned hydraulic rail lifting and lining machine built in 1976 in cooperation with the Scientific Research Institute of Ministry of Railways. Machine is operated by one person and can lift a 60-meter long section of rails with sleepers, and straighten the rails with laser alignment device.

HSIANGTAN ELECTRIC GENERATOR PLANT, Hunan. Produced China's first electric CC locos, in the 1950s, 4,900-hp, based on Russian N-60s, numbered 6-Y-1. 150-ton electric locomotives for mining applications.

HSUANHUA VEHICLE WHEELS FACTORY, Hopeh. Est. 1960. Built to outfit 100,000 freight cars annually.

LANCHOW LOCOMOTIVE PLANT, Kansu. Est. 1960. Produces internal combustion locos which can run in desert areas. Facilities overhaul 300 locomotives a year.

LANCHOW ROLLING STOCK PLANT, Kansu. Run by Lanchow Railway Bureau. Makes rail vehicle wheels. Mentioned by NCNA in 1967.

NANKOU ROLLING STOCK PLANT, Peking. Mentioned by NCNA in 1971.

PAOKI ROLLING STOCK PLANT, Paoki, Shensi. Reported by NCNA in 1969 to have built 300-ton oil hydraulic-press to assemble train wheels and axles. Administered by Ministry of Railways.

PEKING "FEBRUARY 7th" LOCOMOTIVE & ROLLING STOCK WORKS, Peking. Founded in 1901 as a repair facility, this plant was originally called the Changhsintien Railroad Factory. Derives name from a famous strike by railway workers on February 7, 1923. Products: "Construction" locomotive, based on MK-1 Japanese Mikado, 600-hp, built June 15, 1958, (recent version has 2,270 hp), 90% made at plant, 60 tons, 85 km per hour. "Peking" diesel

CHINESE MADE LOCOMOTIVES

Name, factory where built	Specifications
Aiming to the Sun, (Shang Yan) (SY), Tangshan Construction, (Jian She) (JS), Tsingtao/Peking 2-7	2-8-2 steam loco, trip and branch line work. 1952, 1958 steam 2-8-2 2,270-hp; 56,175 lbs TE; 54″ WD; 54 mph; Cyls: 22.8″ x 28″; BP: 220 psi; wgt: 201,317 lbs.; TW: 70,600*.
East is Red, Dong Fang Hong (DFH), Tsingtao (Dong Fang Hong 4), Chishuyen	1968, 2,000-hp diesel hydraulic. 1976, 3,000-hp diesel hydraulic. 102 1,000-hp and 2,000-hp diesels shipped to Tanzania/Zambia.
East Wind, (Dong Feng W), Talien	1,800-hp diesel loco remodeled in "design of a foreign diesel locomotive," used in Chengchow south locomotive section. According to NCNA "most diesel locos used on major railways are of the 'Dongfeng W' type for passenger services." In 1966, 2,000, 3,000 and 4,000-hp diesel electric versions noted.
(Dong Feng 4), Talien	Spring 1974, model at Canton Fair, with AC/DC electric transmission; 4,000-hp, 1 hr. rating of diesel; 3,600-hp continuous rating.
Forward, (Qian Jin) (QJ), Tatung	1965(?), 2-10-2, 2,980-hp; 73,405 lbs TE; 59″ WD; 50 mph; Cyls: 25.6″ x 31.5″; BP: 220 psi; wgt: 262,400 lbs; TW: 65,000.
Giant Dragon, (Ju Lung) (JL), Talien	1963, series production 1965, 278,000 lbs, CC unit. Two 2,000-hp opposed piston diesel engines operate 1,350-kw DC generator. Traction capacity said to be 3,500 mt at 100 kw/hr.
Liberation, (Jie Fang) (JF), ?	2-8-2, 1,545-hp, 52,985 lbs TE; 54″ WD; 54 mph; Cyls: 22.8″ x 28″; BP: 206 psi; wgt: 207,500 lbs; TW: 63,900.
Mao Tse-tung, Tsingtao	2-8-0 or 2-8-2. Single steam loco rebuilt from foreign loco in 1946, had done 3 million miles by 1976.
Peace, (Heping) (HP), Changchun, Talien	1956, 2-10-2 prototype 2,780-hp. 1959, max. 3,154-hp, 80 km/hr. Total prod: 100 p.a. thru 1971. "Chinese designers borrowed heavily from the blueprints of the Soviet L-class 2-10-2 and threw in the best features of locomotives from other countries. The cylinder cocks were an American design; the blower was adapted from a Belgian design; and the self-adjusting wedges were Japanese. The Heping was given a mechanical stoker and lubricator, pneumatic rocking grates, and any other modern labor-saving device the Chinese could design. Crew comfort was a primary consideration. Inside the all-weather cabs are a

* TE: Tractive Effort; WD: Wheel Diameter; Speed: Rated Speed; BP: Boiler Pressure; TW: Tender Weight.

locomotive first built 1958. Trial produced 3,000-hp and 6,000-hp diesel hydraulic locomotives in 1969. Four "Peking" 3,000-hp diesels produced by May 1976 with 160-mm cardan shaft, in serial production by 1975. First batch production of 6,000-hp diesels began in 1975. 'Supercharged' 3,000-hp diesel engine produced in 1969. Wheel bearings trial manufactured in 1968. Facilities: The largest locomotive works for Peking-Hankow Railway, although, according to an NCNA account in April 1976, until 1975 it did "only repairs on steam locomotives." Overhauled 215 engines in 1971. Has eight production lines; 120,000 sq. m casting shop; internal combustion shop; locomotive factory; freight car factory; assembling shop; parts shop; boiler shop; tools shop; sawmill. Facilities include automatically controlled electric furnace, 100-ton broaching machine, numerically controlled lathes, hydraulic copying lathes, two 30-ton overhead cranes, photoelectric tracking cutter, plasma welding torches, electric furnace. Has a transmission gear workshop with adjustable hydraulic double-headed drill. Has a housewives factory that makes links and chains from scrap metal. 7,000 employees (1968), 9,000 (1971), 9,000 (1974) and almost 10,000 (May 1976). Population of factory area 40,000 (1971). Had a trade union in 1975.

SHENYANG LOCOMOTIVE AND ROLLING STOCK PLANT, Liaoning. Products: Internal combustion locomotive. Other products include pounding machines for track maintenance and heavy duty drilling machines for tunnelling. Automatic sleeper-tamping tool, first produced in Sep-

CHINESE MADE LOCOMOTIVES—continued

Name, factory where built	Specifications
Peace, (Heping) Changchun, Talien—continued	small stove for tea and snacks, small changing room with a mirror and even a heater for keeping the engineer's feet warm. The Heping allegedly can haul 80% more than the Construction 2-8-2 on an 0.4% grade at 25 mph, while burning 12% less coal. No thought was given to making the Heping an oil burner because China had massive coal deposits. (Sizable petroleum reserves were not discovered and exploited until fairly recently.) The Heping is estimated to weigh between 330,000 and 485,000 lbs." (Trains 11.72).
Peking (Beijing) (BJ), Peking	1958, steam loco. Also 3,000-hp diesels trial produced 1969.
Peking (Subway), (Beijing), Changchun	1969, electric 750-V DC, 19 m cars; max speed: 80 km/hr.
People, (Renmin) (RM), ?	Pre-1956, 4-6-2 steam loco, 1,900-hp, 39,800 lbs TE; 70″ WD; 68 mph; Cyls: 22.4″ x 26″; BP: 220 psi; wgt: 198,000 lbs; TW: 70,600 lbs.
Red Flag (Hungqi) (HQ), Talien	1958, steam, freight.
Rocket, Changchun	1960, small steam loco, 234-hp, wgt 54,426 lbs; rural and small mine use.
Satellite, (Wei Xing) (WX), Tsingtao	1959, 1960, 1,000-hp diesel hydraulic, 2,000-hp version, wgt; 188,000 lbs; BB, speed to 85 mph.
Shaoshan, (Shaoshan) (SS), Tienhsin	1969, 5,200-hp electric for 25,000-V 50 cycle, single-phase A.C. system.
Victory, (Shengli) (SL), ?	4-6-2 steam passenger loco, 1600-hp, 37,220 lbs TE; 70″ WB; 68 mph; Cyls: 22.4″ x 26″; BP: 206 psi; wgt: 195,600 lbs; TW: 61,500 lbs.
	OTHERS
NA, Canton	1975, 380-hp steam loco, narrow-gauge.
NA, Tsingtao	1959, 2,000-hp hydraulic transmission internal combustion loco.
T-6, Tsingtao	1960, 1,500-hp steam passenger loco.
288, Tsingtao	Steam loco.
NA, Chuchou	Electric locos.
NA, Hsiangtan	150-ton electric locos.
NA, Peking Feb. 7	3,000 and 6,000-hp diesel hydraulic locos.
"2-8-2", Talien	1956, 1,544-hp steam freight loco.
NA, Talien	1959, 4,000-hp freight diesel; 2,000-hp diesel electric with electric transmission.
NA, Tatung	Gas turbine loco.
NA, Tientsin	Internal Combustion loco.
NA, Shenyang	Internal Combustion loco.

tember 1969, allowing 10-12 ties to be tampered per minute. Workshops include tool, lumbering, crane, forging, metallurgical and transportation. Has ten "sledgehammers" in forging and metallurgical plant. Recycles heat and waste oil.

SIAN ROLLING STOCK PLANT, Shensi. NCNA reported in February 1975 that this plant produced 173 oil tank cars in 1974. Plant also maunfactures and repairs passenger and freight cars.

TALIEN INDUSTRIAL AND MINING ROLLING STOCK PLANT, Liaoning. NCNA reported, June 1967, that this plant was making a new narrow-gauge internal combustion loco with 240 hp engine and, apparently, fluid drive with automatic gear changing. Also designed and manufactured 80, 120, and 180-hp diesel hydraulics as of 1968.

TALIEN LOCOMOTIVE AND ROLLING STOCK WORKS, Lushun, Talien, Liaoning. Est. 1905. Began manufacturing in 1954. Extensively expanded with Soviet aid in July 1956; in October 1956 first Chinese made steam locos came off production line. In 1959 was producing about 40% of PRC locos. 2-10-2 Heping ("Peace"), 2,780-hp, built in 1956; China's first large freight locomotive, this model is capable of pulling a pay load of 2,800 tons at 29 km/hr on a 0.4% gradient, with a maximum speed of 80 km on a level ground; other equipment includes a mechanical stoker, mechanical lubricator, and pneumatic boiler shaker etc. In 1957, successfully trial produced "Construction"

CHINESE LOCOMOTIVE WEIGHTS AND LENGTHS

Locomotive Type	Total Weight of Locomotive With Coal and Water Cars (Tons)	Length of Locomotive With Coal and Water Cars (Meters)
XK_2	48	11.0
$MG_{4, 5, 6}$	66	17.6
DB_1	66	14.3
JF_8	69	19.8
KD_5	71	18.7
$ET_{1, 8}$	74	14.3
DB_2	78	14.3
Dong-Fang-Hong (East is Red)	82	17.6
$PL_{2, 9}$	86	20.9
$KD_{6, 9}$	89	20.9
SL_9	95	22.0
KD_2	98	23.1
$JF_{3, 5, 7, 12}$	99	22.0
$JF_{6, 9, 10, 11, 13}$	102	23.1
DK_1	102	23.1
SL_3	104	23.1
DK_2	105	23.1
Dong-Feng$_2$ (East Wind)	106	16.5
$SL_{12, 13, 14, 15}$	109	24.2
KD_7	111	22.0
Dong-Feng (DF) (East Wind)	118	16.5
Sheng-Li (SL) (Victory)	120	25.3
Ren-Min (RM) (People's)	122	24.2
SL_5	123	25.3
Jien-She (JS) (Construction)	126	24.2
Jie-Fang (JF) (Liberation)	127	24.2
Shao-Shan*	138	17.6
$6Y_2$	138	23.1
$SL_{7, 8}$	140	27.2
$JF_{2, 4}$	140	25.3
KF_1	144	30.8
Qian-Jin (QJ) (Forward)	154	29.7
FD	178	29.7

Source: Table in *Railroad Yards*, Prepared by the North China College of Communications, Transportation Division; Published by the People's Communications Press, Peking, September 1973. 18,000 copies known printed in two separate printings. Second in October 1974.

* Chairman Mao's birthplace, Hunan.

locomotive, which has haulage capacity of 3,500 tons, 22% higher than the type "commonly produced in China". "Red Flag 150" steam locomotive, designed in 1958 for use with freight trains said to operate with 7% more traction, 12% more speed but 28.3% less metal and 30% less hours to build the "Peace" type; 50 built in first quarter of 1959. "2-8-2" steam locomotive (1956), 1,544-hp, for use with freight trains. Internal combustion locomotive equipped with electric transmission was trial produced in 1956. In 1965, 600, 1,200, and 2,000-hp diesel locos were reportedly in production and steam loco production reportedly ended. Julung "Giant Dragon" CC 2,000-hp diesel locomotive, designed in 1958 for use with freight trains, trial produced 1961, "mass" production 1962; began serial production in 1966; 23-m long, with two sections each housing 2,000-hp diesel engine for the operation of a 1,350-kw DC generator; when both engines are put to work, traction capacity is 3,500 tons at 100 kilometers per hour; subsequently increased rating to 3,000-hp plus; operational temperature range is from 40° C to −45° C; capable of 800 kilometer non-stop run. Diesel electric locomotive, electric transmission, 2,000 hp. In April 1969, the works trial-produced 4,000-hp freight diesel "Dong-feng 4" (East Wind) with AC/DC electric transmission using semi-conductor devices; had vibration problems at high speed; in 1972 this was in serial production; in June 1974 produced in "large numbers," (over 150 had been produced by 1974); cruises at 120 km/hr pulling passenger train; full consumption and weight per hp reduced by 10 and 40% compared to 2,000-hp loco; crankshaft of engine is made of "special alloy", (modular cast iron); has 500-amp, 1,200-kv air cooled silicon elements in rectifier; particularly suited for mountainous, high elevation or tunnel areas. Oil tank car (1966); built with the cooperation of the Petroleum Industry Ministry's Peking Design Institute and the Railways Ministry's Rolling Stock Research Institute, this was a new type with the largest oil loading capacity in China in 1966, featuring a center-beamless structure, and low-alloy steel; tank forms slopes from both ends toward the center; draining device permits fast emptying; special anti-corrosion spray keeps oils from corroding the inner surface and reduces cleansing work. Light-oil tank car (1966). Gondolas, hoppers, tanks, flat cars. Facilities: planned capacity, 270 locomotives and 2,500 freight cars a year (1970). During 1969-72, 30,000-sq m of new workshops were added and 59 "automatic production lines" installed. Twenty-four workshops in 1976 including metal structure, locomotives, casting, heat treatment, forging and machinery shops. It has a 150-meter long production line for processing timber, a 1,000-ton automatic press to process oil tank car ends. Over 1,500 machines, including planers. In 1973 produced 500 and 1000-amp air-cooled silicon elements for diesel rectifiers. In 1975, designed and produced large 20-meter long N/C machine tool to speed production of Model V (9895) diesel engines required to power 4,000-hp internal combustion locomotive first produced in 1969. Also in March 1974 produced with ten+ other plants, a 25-m long digital computer controlled unit machine to facilitate automatic mass production of diesel engines. This 200+ ton machine, in the No. 2 machinery shop, has more than 20,000 parts, with 32 working positions, 23 power heads; and 217 main shafts on the sides digitally programmed to work as separate but coordinated units will drill 578 holes

as one process. Does drilling, boring, and threading of several hundred holes in engine body. 8,000 workers (1972), 8,700 (1976).

TANGSHAN LOCOMOTIVE AND ROLLING STOCK WORKS, Hopeh. Est. 1884, expanded 1912. Modernization began 1966. "Aiming High" smaller steam locomotive 2-8-2; over 1,000 produced by 1976 when still in production as of June, used for trip and branchline work. Produced 165 steam locos in 1974, with output scheduled to produce 170 in 1975. In 1976 began converting to diesel production, reducing steam loco output to 140, scheduled to phase out steam by 1980. Also makes passenger cars. Over 7,000 workers in 1974, over 7,500 in 1975.

TATUNG LOCOMOTIVE PLANT, Shansi. Designed to build the Peace (Heping) 2-10-2, this plant was only partially complete when the Russians pulled out in 1960. It was completed in 1965. Produces steam locos. Experimental work with gas-turbine locomotives, as of 1970, with trial production of 3,000-hp "Chang-cheng." Forward "Qian Jin" heavy (300 ton) freight steam locomotive, 2-10-2 still in production in 1975; 2,980-hp, traction effort 73,405 lbs. 59" wheel diameter; 50 mph rated speed; wgt. 262,400 lbs, tender weight: 65,000 lbs.

TIENHSIN LOCOMOTIVE AND ROLLING STOCK PLANT, Chuchou, Hunan. A major locomotive works was planned for this site in the 1930's, the buildings were constructed in 1937 but were destroyed again almost immediately. Rebuilt sometime after 1949, it first produced steam locomotives. Since 1969, it has been producing the 5,200-hp electric "Shaoshan No. 1" model, used on the Paoki-Chengtu line trunk routes; first designed in 1958, it has a shaft power of 4,200 kw, uses ignition transistor rectifiers, rheostat braking. Electric machinery in diesel locomotives. Developed semi-conductor commutation equipment in place of igniter communication, in cooperation with Chuchou Electric Locomotive Research Institue (1975). Shops include machine shop that produces on-load switches. Maintains steam locomotives of Canton, Nanchang, Shanghai, Wuhan and Liuchou RR bureaus.

TIENTSIN LOCOMOTIVE AND ROLLING STOCK WORKS, Tientsin. Product: internal combustion locomotive. Facilities include a semi-automatic heavy hot spring-winding machine, produced serially at end of 1969. The machine can be operated by 6 to 9 workers and is capable of shaping springs in a single operation. Facilities also include a medium speed pressurer, manufactured in 1969, which provided the basis for development of large horse power diesel locomotives.

TSINAN LOCOMOTIVE PLANT, Shantung. Mentioned by NCNA in late 1975.

TSINGTAO SZUFANG LOCOMOTIVE & ROLLING STOCK WORKS, Tsingtao, Shantung. Est. pre-1949, China's second largest loco plant. Products: "Mao Tse-tung" steam locomotive originally rebuilt in 1946 from foreign body; hauled 1.16 million tons by September 1976 and ran for 3 million miles. This plant built the first "Construction" 2-8-2, similar to the Japanese MK-1 Mikado, in 1952. Trial produced China's first 2,000-hp diesel hydraulic loco and began serial production in 1959. In September 1969, NCNA reported the plant produced China's first 5,000-hp diesel-hydraulic locomotive "Dongfanghong"; in September 1975 the Chinese reported that these were in serial production,

CHINESE IMPORTS OF RAILWAY VEHICLES FROM OECD COUNTRIES 1952-1975 (In US $000's)

Year	Value	Year	Value
1952	17	1964	24
1953	0	1965	793
1954	0	1966	3,467
1955	61	1967	997
1956	60	1968	1,959
1957	130	1969	4,928
1958	150	1970	9,588
1959	1,952	1971	2,715
1960	10,928	1972	44,022
1961	3,545	1973	30,736
1962	14	1974	31,448
1963	6	1975	8,620

Source: Official OECD Statistics.

and suggested that an electric loco, also named "Dongfanghong", was being manufactured at the plant. "East is Red" (Dongfanghong) diesel locomotive, 2,000 hp, hydraulic transmission built 1968. "Satellite" diesel locomotive, 1,000-hp hydraulic transmission began production in 1960. "T-6" steam, 1,500-hp passenger loco, began production in 1960. "288" steam locomotive. "Worker-Peasant-Militia" convertible coach capacity 120 people. Double decker convertible coach (1957). Two-story coach built 1961, accommodates 118 persons; max speed 140 km/m; has telephone booth, bathroom, storage room, electric water boiler, mechanical ventilation, lighting controls, etc. (Output of these cars in 1961 was 12.) Sleeping car, built in 1970 with cooperation of Szufang Rolling Stock Research Institute and the Shanghai Railway Bureau. High-speed passenger coach 75.5-m long, using alloys and plastic for light weight, hard seats. Original annual capacity: 25 locomotives, 50 passenger coaches, 900 freight cars. Workshops include boiler; lumber; cast steel; moulding; forging and alloy machines; 3-ton sledgehammer; automatic saddles.

TSITSIHAR ROLLING STOCK WORKS, Heilungkiang. Est. 1958. Products: flat freight car, 4 axle, low alloy steel, electrically welded, built March 1966. Box freight car produced since 1958. Gondolas. 100-ton capacity diesel hydraulic railway crane. Facilities include No. 1 and No. 2 freight car shops, crane, tools, cast steel, machine parts, spares, and other shops totalling 25. No. 1 freight car workshop is equipped with two large turnover machines; the tool workshop produces fine angular drills; spares workshop has built a roller-molding press, supplementing a hydraulic press, and a production line.

WUCHANG ROLLING STOCK PLANT, Wuhan, Hopei. Stock cars, ventilated cars, refrigerator cars.

WUHAN RIVERBANK ROLLING STOCK WORKS, Hupei. Est. 1910 as repair facility, began manufacture in 1958. Products: Freight cars, 600 produced in 1959. Facilities include forging, casting and power workshops, passenger car and freight car factories and a locomotive/machine shop. 完

EXPORTER'S NOTES

Briefly

- **China in "best buying mood in years."**
- **US exports to PRC in 1977 may reach $150 million, prospects for 1978 better.**
- **China's purchases of wheat, soybeans, cotton all up, but not from US—yet.**
- **Petrochemical license sold by US to PRC.**
- **China buys American trucks and oilfield equipment.**

CHINESE IN "BEST BUYING MOOD IN YEARS"

Although 1977 began slowly for American exporters to China, the general feelings of US China traders were good to excellent. The Chinese have been in the best buying mood in years, according to one frequent visitor to Peking's FTCs. The consensus of first hand observers is that after months of preliminary planning, Chinese FTC officials seem to have completed their final "study groups" in late February and are now, armed with new budget appropriations, prepared to sign contracts. One leading American negotiator reported he had signed three contracts by the middle of March with several additional sales pending. Other leading China traders are known to be shuttling back and forth between Peking and various corporate headquarters. US exports to China during January totaled $3.4 million but rose to $14.6 million in February. Most observers agree that 1977's year-end exports to China should range between $125 and $150 million. The important variable is how much equipment Chinese buyers will order in the next nine months for delivery over the coming five years.

GRAIN, COTTON AND SOYBEANS —CHINA BUYING

China scours world grain reserves. In the first six months of the People's Republic's twenty-seventh year, Chinese officials bought grain on the international market at an unprecedented rate. Following modest PRC grain purchases of 2 million metric tons in 1976, Peking traders signed contracts with their major suppliers in late 1976 to ship some 1.5 million metric tons of wheat to the PRC during the first half of 1977. Foreign analysts reasoned that this continued low level of wheat purchases refuted rumors of a poor 1976 harvest. Suddenly, however, three additional contracts appeared in the first three months of 1977, and once again serious questions were being raised as to China's ability to feed its 950 million citizens. The sales themselves, totalling 5.1 million metric tons,, have been made with the Australian Wheat Board (2.50 million tons) the Canadian Wheat Board (2.26 million tons), and the Argentinian National Grain Board with Nidera Argentina (0.3 million tons). Since 250,000 tons of Australia's wheat will arrive in China after January 1, 1978, Canada is currently slated to be the PRC's leading source of grain for 1977. Argentina, though presently a distant third, is thought to be in the process of negotiating further contracts with China. The latest round of purchases combine with previous commitments to give China 4.8 million metric tons of wheat imports in 1977, more than double the amount bought in 1976; the total bill will be roughly $564 million (fob). Although the Canadian and Australian governments' financial support of their own wheat boards make those countries more attractive suppliers for China, America's failure to find a market for US grain in Peking is largely due to political considerations. TCK, a cold-weather smut found in past American wheat shipment to China, has also hampered recent efforts to sell Peking Kansas crops. American officials, however, are cautiously optimistic that with Canadian and Australian surpluses depleted, especially reserves in Canada's western regions, America will once again emerge as the supplier of last resort. Even if China insists on buying from non-American sources, US firms can hope to approach other world grain buyers who had previously planned to buy from either Canada's or Australia's now diminished stockpiles.

China will purchase 390,000 tons of soybeans during 1977, according to a report released by the USDA's Office of General Sales Management on March 31, 1977. Arranged through two separate contracts during the week of March 21-27, the Chinese purchases will almost certainly return China to the position of net soybean importer for the first time since 1974. According to current soybean prices, the beans will cost China over $100 million, an expensive dent in the nation's total import budget. The first contract, due in crop year 1976-1977, is for 200,000 tons of produce which is to be delivered in 50,000-ton monthly shipments from May to August of this year. The second shipment, for crop year 1977-78, is for 190,000 tons, to be moved to China between September and November of 1977. **Since the soybean may be from optional origin, according to the terms of the contract, it is possible that some American beans will be included in the shipment.** If so, it will be the first time since 1975, that significant amounts of American agricultural goods have been sold to the PRC. The majority of the contracted beans will probably come from Brazilian fields, which supplied all of China's soybean imports in 1975 (25,000 tons) and 1976 (36,000 tons). China's large purchases this year are thought to be attributable to the country's poor soybean harvest in 1976, which fell to or below 10 million metric tons. China's own soybean exports, largely to Japan, have been contracting in recent years. In 1975, Chinese FTCs sent some 350,000 tons of soybeans abroad, but in 1976, only 200-250,000 tons were marketed outside of the PRC.

Chinese cotton purchases also noted: After relatively restrained cotton purchases in 1975 and 1976, the China National Textiles Import and Export Corporation has embarked upon a comparatively large buying binge. One international cotton seller revealed 100,000 bales of medium grade cotton were sold to China in a series of contracts signed during the first three months of 1977. Informed sources estimate total Chinese cotton purchases for marketing year 1977 to be between 250,000 and 300,000 bales, but add that the potential exists for total PRC purchases to surpass 600,000 bales by the end of the year. China imported 700,000 bales of cotton dur-

GRAIN SALES TO THE PRC 1976-1977

Country (company)	Date of Contract	Volume (metric tons)	Value (US $ 000s)	Price ($/ton)	Delivery
1976					
Australia	Nov. 1976	500,000	$ 54,500	$109	Feb.-June 1977
Canada	Dec. 7, 1976	762,000	$ 95,500	$125	Feb.-June 1977
Argentina	Late 1976	200,000	$ 18,000	$ 90 (fob)	Feb.-June 1977
1977					
Canada	Jan. 28, 1977	1,500,000	$166,700	$111	March-Dec., 1977
Argentina (Nidera Argentina)	Feb. 1977	100,000	$ 9,000 (?)	$ 90 (?)	—
Australia	March 1977	2,000,000	$220,000	$110	June, 1977-Jan., 1978
TOTAL	**Dec. 1976-March 1977**	**5,062,000**	**$563,700**	**$111**	**Feb., 1977-Jan. 1978**

ing marketing year 1976, according to USDA figures. While central American fields have been providing China with large amounts of cotton, **African crops have also been negotiated for delivery.** At an early March 1977 auction in Tanzania, Chinese agents successfully bid on 10,000 bales, and at a Sudanese auction, a similar quantity of cotton was bought for the PRC. Chinese cotton purchases reflect a disappointing 1976 harvest, which itself came on the heels of output declines in 1975 and 1974. There are, however, other explanations for expanded PRC cotton purchases. For instance, China's capacity to export textile fabrics and piece goods has been growing since the early 1970's. To accumulate foreign exchange, China has begun importing the raw material, cotton, and exporting the processed goods, textiles. In this sense, continued cotton imports to China are building the countries exchange coffers rather than breaking them. In addition, the international cotton market is becoming increasingly tight. Since many of China's purchases are for future deliveries—some as late as February-March 1978—Chinese traders are hedging against any possible price inflation. **Will there be any American sales?** Since 1975, Chinese FTCs have assiduously avoided US cotton, in one case reportedly rejecting non-American crops because they had been warehoused on US soil. Some link the Chinese boycott on US agricultural goods to the America's failure in conferring MFN status on the PRC; others, however, insist the reasons are strictly financial. Recent cotton sales to China from central American suppliers have ranged between 73.5¢ and 75.5¢ per pound, FOB stored, for cotton roughly comparable to Californian or Arizonan crops. Some experts speculate that several hundred thousand bales of Chinese purchases in the US would drive up domestic prices to over one dollar per pound, unacceptably high for the Chinese. Nevertheless, smaller US shipments are possible in coming months; at least they would seem to be from the actions of US suppliers. A minimum of two companies with previous Chinese sales already have been to Peking this year. One company recently ironed out a long-standing disagreement with CHINATEX, and another firm is trying to resolve a similar misunderstanding through "amicable negotiations." All major US cotton trading houses are thought to have sent some quotations to Chinese officials in recent months. Whether China will actually act upon any of these offers is probably dependent on the duration of the drought currently baking the North China plain where much of the PRC's own cotton crop is usually sown.

INTERNATIONAL TRADE

As Peking's policitical tempers rose in 1976, foreign trade seems to have fallen, although not as far as some anticipated. Being caught on the cusp of the Fourth and Fifth Five Year Plans, China's FTC buyers were unable to obtain permission to continue purchases of western hardware and technology during 1976; but the export branches seem to have maintained the flow of Chinese goods to foreign markets. Of the twenty-three OECD member countries, eighteen increased their imports in 1976 over 1975. The total volume of Chinese sales to OECD nations remained constant during the two years, at $2.8 billion, only because of a $200 million dollar reduction in China's exports to Japan. The Chinese promotional campaign apparently has not been restricted to the United States. Conversely, Chinese imports from OECD countries fell to $3.8 billion in 1976 from $5.0 billion in 1975, down nearly 24%. Only six OECD countries increased their exports to China in 1976, and only three—West Germany, Denmark, and Yugoslavia—enjoyed significant growth. Due to the decline in OECD sales, China's total trade with the group fell by 15% to roughly $6.6 billion. China's balance of trade, however, improved substantially during the period, as a 1975 PRC deficit of $2.1 billion was reduced precipitously to slightly under $950 million. One of the most interesting aspects of the 1976 Chinese trade figures is the relationship of PRC trade with Yugoslavia to its trade with the Western European nations. Not only did Yugoslavian exports to China more than double over the previous year, but the growth took place entirely within the second half of the year. During the last two quarters of 1976, all of China's

OECD COUNTRIES' TRADE WITH CHINA
1975 and 1976
(US $000's; Exports, FOB; Imports, CIF)

Country	1975 Imports	1976 Imports	1975 Exports	1976 Exports	1975 Total Trade	1976 Total Trade	Change 1976/1975 Total Trade
US	158,400	201,600	303,600	135,600	462,000	337,200	−27%
Canada[1]	55,440	86,385	370,560	207,270	426,000	293,655	−31%
Japan[1]	1,531,080	1,330,755	2,258,640	1,604,730	3,789,720	2,935,485	−23%
Australia[1]	86,040	96,240	326,280	321,435	412,320	417,675	+ 1%
Austria[1]	13,440	18,015	29,520	15,540	42,960	33,555	−22%
Bel-lux[1]	44,640	50,580	46,800	38,355	91,440	88,935	− 3%
Denmark[1]	21,600	26,640	9,360	22,320	30,960	48,960	+58%
Finland	23,520	11,640	15,360	26,160	38,880	37,800	− 3%
France[1]	173,520	195,045	374,040	358,095	547,560	553,140	+ 1%
West Germany	224,400	270,840	522,840	622,560	747,240	893,400	+20%
Greece[2]	1,488	2,502	2,148	2,778	3,636	5,280	+45%
Iceland	72	108	11,184	—	11,256	108	−99%
Ireland[1]	2,772	4,746	120	51	2,892	4,797	+66%
Italy	128,880	147,810	144,720	123,000	273,600	270,810	− 1%
Netherlands[1]	81,000	87,330	133,800	37,200	214,800	124,530	−42%
Norway[1]	8,160	8,325	108,000	18,525	116,160	26,850	−77%
Portugal[1]	9,840	2,850	432	438	10,272	3,288	−68%
Spain	33,960	47,640	23,280	17,400	57,240	65,040	+14%
Sweden[1]	47,040	50,685	41,520	32,175	88,560	82,860	−6%
Switzerland	30,960	36,240	56,520	51,840	87,480	88,080	+ 1%
Turkey[1]	21,960	1,148	1,572	2,295	23,532	3,443	−85%
UK	131,880	156,000	178,200	125,400	310,080	281,400	− 9%
Yugoslavia[1]	18,480	12,975	12,360	28,650	30,840	41,625	+35%
TOTAL	2,848,572	2,846,099	4,970,856	3,791,817	7,819,428	6,638,916	−15%

[1] Extrapolated from Jan-Nov 1976 trade statistics
[2] Extrapolated from Jan-June 1976 trade statistics

major western trading partners (Japan, American, Australia, West Germany, and France) experienced sharp reductions in their exports to the PRC. Compared with its Western competition, the United States made a respectable showing in 1976. US imports from China, up nearly 27% in 1976, considerably outshone the stagnation in OECD's total imports from China. America's 55% drop in sales to China during 1976, however, was substantially larger than the 24% decline experienced by the combined OECD nations. Due to the shrinkage in US exports, total Sino-American trade fell 12 percentage points more than total Sino-OECD trade did.

TECHNOLOGY—US KNOW-HOW TO PRC

American ethylene glycol know-how about to start up in China. More than three years after the deal was signed, New York City's Scientific Design Company revealed it has sold China's TECHIMPORT a license to produce the polyester feedstock ethylene glycol. In late winter 1973, three company officials travelled to the PRC with representatives from Japan's Nisso Engineering to submit a bid on a petrochemical facility. Other contractors were also asked to prepare quotations, but by March 1974, the Nisso-Scientific Design delegation had contracted to supply the Chinese with a 50,000-ton-per-year ethylene oxide facility, valued at over $10 million. According to the terms of the agreement, Scientific Design has provided the process license, the basic engineering, and the silver catalyst while the Nisso Engineering Company has supplied the detailed engineering, heavy equipment, and construction supervision. **The plant itself, which is scheduled for completion in the summer of 1977, is located in a Chinese Petrochemical Works, which at least three Scientific Design technicians have visited to assist Chinese engineers in plant construction and start-up.** Scientific Design tried to approach Chinese buyers with information on its industrial processes several years ago. After feelers extended through both West and East European intermediaries proved fruitless, the American firm received an indirect response: TECHIMPORT requested a quotation on an ethylene glycol facility from Nisso Petrochemical, a sister company of Nisso Engineering, at the time manufacturing ethylene gycol with a Scientific Design license. In response to that inquiry, Nisso Engineering and Scientific Design prepared a bid which they then defended during a technical seminar in Peking. Before the contract was signed, Scientific Design sought and received export approval from the US Department of Commerce; similar ethylene glycol plants have been sold

by the firm to East Germany, the Soviet Union, Romania and Bulgaria. Technically, Scientific Design sold the license to Nisso Engineering, who then re-exported it to the Chinese.

US EQUIPMENT SALES

China buys thirty-two American trucks; pays $8.9 million. Recently published US Census Bureau figures have revealed that China imported $8.9 million worth of American trucks and associated equipment during the month of February alone. With an average price of roughly $278,125 apiece, the equipment is not all part of a single sale. Dowell-Schlumerger's eight truck-mounted oil field fracturing units shipped in February 1977 (See CBR IV: 1, page 37), certainly contributed to the large amount of February's US truck exports, but another major sale was involved. **Stewart and Stevenson Services Inc. reveals major oil field equipment sale.** This Houston-based company announced to the *China Business Review* that it had made a $5.8 million sale to China's TECHIMPORT with two contracts signed in February and May, 1976. The sale, including oil well servicing equipment mounted on twenty International Harvester trucks, was contracted to be sent to China's Szechwan province in a series of three shipments, the first of which was loaded onto Chinese chartered vessels in September, 1976, followed by a second shipment in February 1977 and a final shipment expected to be loaded in April or May 1977. Originally approached by the Chinese in late 1975, the Stewart and Stevenson management, after consultations with officials at the Washington People's Republic of China Liaison Office, sent a three-man delegation into Peking for negotiations. The contract for the basic hardware was signed in February 1976 for $5.1 million of equipment and a second contract, primarily for spare parts valued at $700,000, was finalized on May 14, 1976. The package reportedly includes twelve Detroit Diesel Allison powered pumping units, each rated 1200-bhp imput, three diesel powered blending units, and five Stewart and Stevenson designed and built manifold - monitoring - recording units. All of the units are mounted on International Harvester Detroit Diesel powered COF-4000 trucks. The pumps, blenders and control systems were designed and built by Stewart and Stevenson with power supplied by Detroit Diesel 12V-149TI, 1200-bhp engines on the pumpers, 6-71 models on blenders and Stewart and Stevenson "Pow-R-Quik" air starters on each engine. The trucks have 13-speed RT 913 Eaton transmissions and high-ambiance radiators. The Stewart and Stevenson designed pumping units utilize Allison DP 8961 transmissions connected to Gist pumps with capacities up to 15,000 p.s.i. The blender units utilize power provided by Detroit Diesel 6-71N engines, and the manifold trucks carry 5-ton Stanco swivel cranes with Stewart and Stevenson designed digital control and monitoring equipment. In order to familiarize themselves with the highly sophisticated equipment, TECHIMPORT sent seven technical representatives from a Szechwan province petroleum company to Houston for six weeks this winter. The group inspected the last group of equipment as it was prepared for shipment to China later this spring. In order to facilitate start-up of the trucks in China, Stewart and Stevenson sent three company technicians to Chungking, Szechwan to oversee the unloading of the equipment which a Chinese vessel recently moved from Shanghai up the Yangtze River to a Chungking pier. The Chinese paid for the equipment in three separate installments made by irrevocable letter of credit due following each of the three shipments. *A footnote:* One of the components in the Stewart and Stevenson sales, a densometer, contains a certain radioactive isotope; company officials are having some difficulty getting this unstable substance past US export controllers. **At least one other American company has sold trucks to China.** A third US firm, who asked that its name not be published, has sold trucks equipped with sophisticated electronic hardware to the China's MACHIMPEX for use in the Chinese petroleum industry. Valued at some $1.5 million dollars, the sale comprises three systems, each mounted on an American-made truck filled with a variety of seismic monitoring equipment. The systems collect and interpret data fed into the central control equipment aboard the trucks from a series of cables, up to a mile long, with sets of geological recording devices, which register seismic waves generated by man-made shocks. Initiated by a spring 1976 technical presentation made after a Chinese proposal request, the sale was finalized after a four-man team spent three weeks inside China in December of last year. 完

TEN LEADING US EXPORTS TO THE PRC 1976

Category	Value	Percent of All Exports
Aluminum and aluminum alloys, unwrought, except extrusion, ingot, and billet	$25,641,310	12.8
Steam engines and turbines incorporating boilers and parts, nec.	7,850,479	3.9
Polyester staple, not carded or combed, or not otherwise prepared for spinning	7,482,673	3.7
Machines and parts, nec, for treating materials by temperature changing, condensing unit parts, nec, and heat exchange parts, nec	6,492,033	3.2
Gas compressors, centrifugal and axial	5,600,032	2.8
Gas turbines, nec, and parts, nec, for mechanical drives	4,815,418	2.4
Power boilers, steam engines, nec	3,293,546	1.6
No. 1 heavy steel scrap, except stainless	3,205,659	1.6
Special-purpose non-military vehicles, nec, new	3,066,174	1.5
Air compressors, stationary, over 100 hp	3,041,068	1.5
TOP TEN TOTAL US EXPORTS	**$70,488,392**	**52.1**

CHINA ECONOMIC NOTES

From Chinese Media Reports

Briefly:

- **Drought and industrial difficulties threaten Chinese economy in first quarter of 1977.**
- **Chinese leadership encourages more intense efforts to counter drought; aims for 70% mechanization of agriculture by 1980.**
- **Chinese steel output drops substantially in 1976; oil and natural gas output increase.**
- **Chinese conservation conference stresses fuel economy.**

GENERAL

Chinese economy slumps through 1976: "China's industry is going through a difficult period," according to a March 11 NCNA press account. Plagued by consistently unfavorable weather conditions, Chinese leaders are faced with drought in the countryside on top of disappointing industrial production in the cities. As the country entered the second year of the postponed Fifth Five-Year Plan (1976-1980), inadequate harvests in grain and cotton fields have been matched by a sharp decline in Chinese steel production during 1976 and further exacerbated by labor demands for better working conditions and higher wages. Under the leadership of Chairman Hua, Peking planners have revamped the Five-Year Plan and called a series of conferences to elicit criticisms from the masses and seek support for administration policies and priorities. Indications are that central government expenditures on military programs will be streamlined in order to finance the development of the economic base, especially in steel and other primary production, and to increase the quantity of goods available to the average Chinese worker. While the Chinese press has, over the last few months, carefully educated the Chinese masses as to the benefits to be derived from importing foreign technology and complete plants, recent Chinese imports of cotton, grain, and soybeans during the next twelve months will reduce the foreign exchange available to finance heavy equipment price tags. Initially, it seems Chinese leaders will focus on pushing annual steel production back over 25 million tons while trying to increase coal, mineral, and metal production in PRC mines. Expanded production of Chinese light industrial goods for export should also be seen in coming months to improve balance of payments difficulties.

AGRICULTURE

Drought in China: Famine or Farce? With the important winter wheat crop more than half way toward its June harvest, Chinese papers have begun to report "the most serious spring drought since the founding of new China (1949)." To combat the natural disaster, Chinese officials have exhorted Chinese peasants and cadres to overcome this new threat to the foundation of the Chinese economy. Some foreign observers, however, note that such droughts are common in China and suggest that **the current lack of rainfall is being used by Peking leaders to encourage redoubled efforts from the Chinese countryside.** Once the crops are in next fall, the same officials will be able to point to another bumper harvest in spite of unprecedented natural calamities. The large number of cadres sent down to the countryside this year—some 1.4 million—may be there to insure the proper percent of rural output is handed over to the state rather than just to help with production itself, according to one US government official. When questioned as to the possibility of Chinese grain output declining in 1977, a Chinese official admitted that there was little chance the total harvest would not exceed last year's crop, estimated at 270 million metric tons. **Insufficient water supplies are, nevertheless, undoubtedly a problem for Chinese farmers.** In Shantung province alone, some 61,888 machine-operated wells were newly sunk in 1976, of which 60,124 were equipped, according to a March 14 NCNA account. Whether caused by poor harvests or unequal distribution of crops, shortages in Chinese port cities will be balanced by grain and soybean imports in the next nine months (see Exporter's Notes.)

Cotton production especially is thought to be faltering in the PRC. Not only has China continued to purchase foreign cotton, but Chinese papers have run stories encouraging domestic production. A February 18 account reminded readers that "Chairman Mao taught us: 'we must pay close attention to grain, cotton, and cotton cloth.'" Party organs at all levels were encouraged to promote cotton production to "meet the requirement of the state plan."

FARM MECHANIZATION

The Second National Conference on Learning From Tachai in Agriculture put goal of mechanizing at "more than 70% of the major operations in farming, forestry, animal husbandry, fishery, and side-line occupations" by 1980 rather than "in the main" mechanization as proposed previously. Hunan has been cited as a good example of a province moving towards mechanization. According to a February 23 article, the province currently has 32,000 tractors in use; since 1973, the province has organized 150 units to support the construction of tractors and now has an annual production capacity for 5,000 large tractors and 15,000 small units. Produced by 100 machinery plants of various sizes, some 90 small nitrogenous fertilizers plants are in use in the province, compared with 30 plants in 1970. **New grain drying unit designed:** The Shanghai Technology and Physics Research Institute has developed a grain dryer capable of drying 500 kilograms of grain per hour with 14 kilowatt-hours of electricity. The dryer, which employs infra-red rays and reduces bacteria during the process, is to be used in Kiangsu, Shantung, Chekiang, Kiangsi, Fukien, and Heilungkiang. **Chinese rainmaking equipment** has been under development in the Heilungkiang Petrochemical Research Institute since 1973, according to a January 21 provincial report. Using some undisclosed catalyst, the "all-season rain source" is being produced at the Anta Experimental Chemical Plant. Although first launched from aircraft, the chemical is now being implanted by rocket.

STEEL

China's steel output fell to 21 million metric tons in 1976, according to one diplomatic source. Other experts, in the US Government, place the figure higher, at 23-24 million tons. If true, these reports suggest that political disturbances combined with natural disasters shaved between 8% and 19% off the country's crude steel production, which reached a record 26 million metric tons in 1975. Some experts speculate that the 21 million ton figure might not include all of the steel production in small-scale steel furnaces spread throughout the Chinese countryside. The consensus is, however, that last July's earthquake sufficiently hampered coal coke production and railroad networks to reduce significantly China's steel output. Wall posters in Canton have critically compared the PRC steel industry's development to that of Japan, suggesting perhaps the Chinese mills should adopt some Western technical and managerial procedures. **New Chinese steel technology:** The Shenyang Metallurgical Machinery Repair Works has developed a technique to convert iron and steel chips into high-grade carbon steel and alloy steel. Since 1972, when the technique was first tested, the factory has used 16,300 tons of pig iron chips and 16,700 tons of steel chips to produce the new alloys. Raw materials worth $1.5 million plus 500,000 kilowatts of electricity were saved in the process, compared with traditional steel production methods.

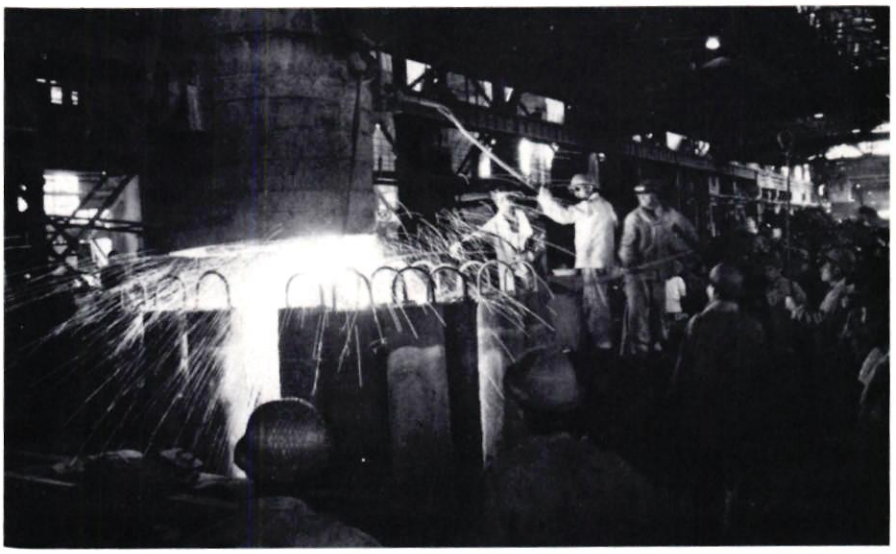
ENERGY

China's oil production increased in 1976 by 13%, according to a January NCNA report. Based on US government estimates, China's actual crude output in 1976 must have been between 83.4 and 84.2 million metric tons. In light of the generally unsatisfactory performance of the Chinese economy during 1976, oil production would appear to be a bright note, but its rate of growth (13%) was substantially beneath the average annual growth during the previous decade, roughly 21%. LNG output meanwhile increased by 11% in 1976. **Petrochemical facilities come on line.** In early January of 1977, the Chinese press praised two developments in China's petrochemical industry. First, a general petrochemical works at Shengli was announced in production on January 12. Consisting of a refinery, two chemical fertilizer plants, a catalyst plant and a synthetic rubber plant, the complex can produce gasoline, kerosene, diesel oil, pitch, chemical fertilizer, acrylonitrile, benzene, and other products. In the already massive Peking Petrochemical Works, Chinese papers announced a 300,000-ton ethylene unit had been brought on line. The addition, which will also produce high pressure polyethylene, polypropylene, and divinyl, was reportedly approved by Chairman Mao before his death. **China is perhaps planning to build the largest LNG plant in the world,** according to the March 1977 New Supplement of *Petroleum News Southeast Asia*. To be built in the vicinity of Canton and Hong Kong, the rumored facility would be larger than the Brunei Shell Petroleum plant, according to sources mentioned in the article. Kawasaki, Bridgestone, IHI, Mitsui, and C. Itoh have been reportedly contacted concerning the project. A more substantive report, from a February 8 NCNA account, indicated that the 3252 drilling team of Shengli oilfield has set **a national record by drilling a 2,777.69-meter deep well with one single diamond drag bit** in a net drilling time of 151 hours and 40 minutes, thus averaging 18.3 meters per hour. On the other front of China's battle to produce energy, Chinese coal miners were encouraged by a well-publicized January conference on the coal industry. Press reports shortly announced that **January's coal production had exceeded state requirements by 6.7%.** The situation, however, is still serious. Foreign visitors travelling between Peking and Wuhan late in 1976 noted Chinese workers scavenging railroad beds for stray pieces of coal. Not until China's coal production has increased and its transportation network has improved will the energy crunch be resolved.

CONSERVATION

A national campaign to save gas, coal and fuel is apparently underway in China. Highlighted by a conference convened by the State Planning Commission in Canton during early January 1977, the new campaign has praised the frugal spirit of the Chinese worker. According to a January 1977 press report, last year about 800,000 tons of oil, 10 million tons of coal, and 5 billion kilowatt-hours were saved by Chinese transportation and industrial workers, who "improved boilers, utilized waste heat, and made better use of anthracite, stone coal, oil shale, and other fuel resources." **Automobile fuel economy is also stressed.** During a meeting attended by officials from the Ministries of Commerce, Communications and Machine Building plus representatives of the PLA General Logistics Department and the Chinese Academy of Sciences, the Tatung Communications Bureau held a conference in early March to promote gas conservation in gas consumption. In 1976, the Tatung bueau trimmed 226,000 liters from its official gas allotment. The whole campaign is, according to some western experts, part of a **con-**

China's steel production was down in 1976: here, Tangshan smelters cast ingots with first heat of molten steel turned out after July earthquake.



Hsinhua

Hsinhua

Energy producers: women electricians at the Tankiangkou hydro-power station in north Hupeh.

certed drive to increase the amount of Chinese crude available to Japanese and other buyers. Recent Chinese wall posters have blamed the "gang of four" for encouraging wasteful domestic consumption of oil products to limit the level of Chinese exports.

TECHNICAL INNOVATION

Normally attuned to more applied sciences, on February 25 the NCNA reported the work of two Chinese mathematicians, Yang Lo and Chang Kuang-hou. Working out of the CAS's Institute of Mathematics, the pair established a relation between deficient value and singular direction, "two principal concepts of value distribution in the theory of functions" according to the press account. A day earlier, on February 24, another NCNA article praised, posthumously, the work on geomechanics theory advanced by geologist Li Ssu-kuang. With his work done in the 1950's, Dr. Li contributed to the discoveries of oil at Taching, Takang, and Shengli oilfields, by the press account. **These two articles may signal a move towards more theoretical scientific studies inside the PRC.** Improvement in China's telecommunications, a priority among Chinese planners in recent years, was furthered by a recent development of a **Chinese-made 960-channel microwave telecommunications system.** Described as up to advanced international standards, the equipment was announced in a February 14 NCNA report. As part of the continued Chinese program to improve domestic communications, Hupeh province's Itu county has set up "an intracounty single-channel facsimile communications network for official work," according to a January 30 report. In six minutes, the network can transmit a "160 MO size document." Developed by the Hupeh Postal and Telecommunications Department and its research unit, the system is now in serial production. **Chinese bottling** has been advanced by the successful trial-production of the country's first liquid insecticide bottling machinery which can bottle between 1.4 and 4 tons of liquids in one hour under the supervision of a single man. **A set of optical transfer function measuring equipment** has also been developed by China's industry, according to a February 12 report. Up to international standards, the machine "gives an accurate, objective and all-round image assessment of various optical systems and electron-optical imagain devices." **A double-turret color isotope scanning device** has also been devised by Chinese researchers to detect tumors. The instrument, produced through the joint efforts of Harbin Medical University Personnel and Mutanchiang Electronic Instrument Works technicians, the all-Chinese-made instrument has been in development since 1974. **The longest highway bridge in China** is now the 3,428.9-meter long Loyang Yellow River bridge, which opened to a large ceremony attended by a vice minister of Communications on January 2, 1977.

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RMB: DOLLAR RATES AS OF FEBRUARY 1977

Date		RMB/US$	US¢/RMB	RMB/US$ % Change
		1976		
November 5	Bid	1.9098	52.3615	
	Offer	1.9002	52.6260	
	Median	1.9050	52.4932	+0.50
December 21	Bid	1.8926	52.8374	
	Median	1.8832	53.1011	
	Offer	1.8879	52.9689	−0.90
December 30	Bid	1.8850	53.0504	
	Offer	1.8756	53.3163	
	Median	1.8803	53.1830	−0.40
		1977		
January 11	Bid	1.8944	52.7872	
	Offer	1.8850	53.0504	
	Median	1.8897	52.9185	+0.50
January 14	Bid	1.9020	52.5762	
	Offer	1.8926	52.8374	
	Median	1.8973	52.7065	+0.40
January 15	Bid	1.9097	52.3642	
	Offer	1.9001	52.6288	
	Median	1.9048	52.4965	+0.40
January 27	Bid	1.9211	52.0535	
	Offer	1.9115	52.3149	
	Median	1.9163	52.1839	+0.60
February 12	Bid	1.9154	52.2084	
	Offer	1.9058	52.4714	
	Median	1.9106	52.3396	−0.30
February 16	Bid	1.9097	52.3642	
	Offer	1.9001	52.6288	
	Median	1.9049	52.4962	−0.30
March 17	Bid	1.9020	52.5762	
	Offer	1.8926	52.8374	
	Median	1.8973	52.7065	−0.40

Source: Standard Chartered Bank, Ltd.

IMPORTER'S NOTES

Briefly

- **PRC cotton textile imports to US drop, but cashmere goes through roof.**
- **Life of spices from China problematic: ginger is cancelled by Chinese without explanation.**
- **Essential oils has continuity problem.**
- **New ski-wear requirements from US customs.**
- **Can do? Flexibility of containers asked for.**

TEXTILES

US imports of Chinese cotton textiles have begun a drop in the last few months. According to newly-released Commerce Department figures, the import total for January 1977 (5.3 m. SYE) was lower than during any months in 1976, and showed a substantial decrease for the third consecutive month. (November 1976, registered 12.4 m. SYE and December 1976 dropped to 9.4 SYE.) If imports continue at this lower level during 1977, totals for the year will be far below the record years of 1975, with 139.3 million SYE imported, and 1976, with 148.6 million SYE imported. **However, there have been sudden increases in Chinese sales of non-knit cotton headwear** (TSUSA category 7021220, including cotton and flax.) Imports skyrocketed from a zero dollar value in 1975 to over $1 million last year. This rise was the catalyst, according to some sources, for a February 23 notice from the International Trade Commission announcing investigation of headwear in four different categories to determine whether the increased import quantities are causing serious injury to the domestic industry. Hearings begin in New York on May 17 and in St. Louis on May 26. The petition was filed by the Empire State Cloth Hat and Manufacturers Association and the United Hatters Cap and Millinery Workers International Union. Several companies reportedly have suffered financial setbacks because of the Chinese imports. **The shortage of cashmere supplies, which was severe in the fall, appears to have eased slightly.** One major importer, who formerly could not get any orders filled, reports that the PRC has agreed to supply him with a small quantity of cashmere, although much below the amount requested. Another has also gotten promises for some supplies and is off to Peking. In 1975, US importers purchased only $55,000 worth of cashmere goods in two major TSUSA categories, but last year that figure zoomed to approximately $2.5 million. China appeared last autumn to have severely overextended itself; CHINATEX informed one company that no more cashmere would be available from Peking or Shanghai until 1978. **Carpet imports from China have also registered phenomenal increases,** going from about $860,000 in 1975 to almost $3.7 million in 1976.

COMMUNICATIONS

New cable addresses and telex numbers have gone into effect for a number of Chinese foreign trade corporations. They are as follows:

Light Industry Cable Addresses

Tientsin Arts and Crafts Branches

ARTS	TIENTSIN
PORCELAIN	TIENTSIN
STRAW	TIENTSIN
WILLOW	TIENTSIN
RUSH	TIENTSIN
TMAC	TIENTSIN

Hunan Branch Kwangchow Office

HNARTS	KWANGCHOW

Fukien Branch Amoy Office

3964	AMOY

Textiles Cable Addresses

Kiangsu Branch Nanking Office

CHINATEX	NANKING

Swatow Drawn Works, Swatow

DRAWN	SWATOW

China Resources (Hong Kong) Telex Number

HX 3277

Reports are that since the fall of the 'gang of four'—Mao's wife Chiang Ch'ing and her three radical cohorts from Shanghai — **communications have improved** with various of the FTC's, and letters have been responded to more promptly.

Please Take Note—Head Office/ Branch Office Chinese trade officials have recently stressed the following. Please deal with head office of the FTC before the contract is signed and for signing the contract. After signing the contract, contact the FTC branch office for all matters relating to production, shipping, delivery etc, with a copy to the head office. And when you want to go to China—write to the head office, not to China Travel Service. Write to the head office of the main corporation with which you'll do business—they'll arrange visits to other FTCs. Allow three months for it to be processed.

EXCLUSIVES
Pricing Themselves out of the Market?

Philstone Nails, which obtained an exclusive for nails from the MINMETALS corporation in November, 1975, did not get the agreement renewed for the current year. "I think the Chinese have the potential to be a viable competitor in the nail industry," comments Philip Stone, president of the Canton, Mass.-based company, "but they have priced themselves out of the market." The underlying problem, according to Stone, is that the Chinese lack a basic understanding of the US nail market and how it operates. This has been coupled, he feels, with a lack of communication and continuity, mostly on their part. "The Chinese must decide several things. They must decide if they are genuinely interested in the US market, and they must decide if they want to be competitive on our terms. This essentially means that the only way for them to break into the market here is to price their commodity lower than the already-established sellers." The PRC price is substantially higher than those of Japan and of Canada, the latter of which has recently become a strong force in the nail market. Stone first attended the Canton Fair in the spring of 1974. He was invited to Peking in late 1975, at which time the exclusive agreement with the Chinese was reached. It was valid only for states east of the Mississippi River, although Philstone concluded one major contract with an Oregon firm. Since the exclusive was agreed to, Philstone Nails has purchased several million pounds of Chinese nails. The company has been happy with their quality and with their specifications, and hopes that in the future it may re-establish an exclusive agreement with the PRC.

Raising cultured pearls, Chouhu Commune, Kiangsu Province.

NATIVE PRODUCE
More Information Needed

Spice importers report that purchases from China are generally quite satisfactory. Quality control is excellent, comments one, and several say that packaging problems are nonexistent. "We have been particularly impressed by the fact that ginger and celery seed were packed in jute bags with innerpolyethylene liners" praises another. But complaints have been lodged about a number of problems: 1) **Some shipments have arrived without the requisite markings,** as needed under US Customs laws, clearly spelling out the country of origin. When this occurs, re-labelling under Customs supervision is required. It would be advantageous both legally and publicity-wise for the Chinese to mark all bags "Product of the People's Republic of China." 2) **Shipments of chillies have contained bamboo slivers,** which are potential health hazards because they act like slivers of glass. 3) A third problem involves maximum moisture content for chillies. Contracts specify a maximum of 14%, but **many chillies have arrived moldy,** thus facing FDA detention. ASTA specifications only allow a maximum 5% mold, and the FDA a 3% mold. 4) Finally, **shortages of ginger have rocked the spice market,** causing the Chinese to cancel 50% of all contracts for Shanghai Flakes. Importers would like an accounting as to why this occurred, and hope that it may be avoided in the future. **Importers of essential oils and aromatics would also like to see some problems cleared up.** The major difficulty is in **continuity of supply.** Buyers are often reluctant to use new and unfamiliar oils for fear that the supply, once it has been incorporated into usage, will not be available on a continuing basis. This problem is heightened by the fact that the quality of Chinese essential oils is quite different from many other sources of supply, meaning that there is no adequate replacement when a break in supply occurs. In relation to this problem, **importers would appreciate receiving more information about Chinese production of essential oils,** including quantities of different types of oils available for export sales and an advisory of peak production seasons for individual oils. They would also appreciate receiving **specific information about the methods used to obtain oils and aromatics.** For example, notes one, if there is a solvent used, it should be noted on the inspection certificate that a certain percentage of the solvent remains as a trace. The certificate should also list only other residues. In addition, he comments, it would be helpful to know what the Chinese mean by "natural" when they used the word on an inspection certificate. One Native Produce importer suggests that CHINATUHSU consider a **program of education to world buyers** of essential oils on its products, growing seasons, potential production, specifications and other factors. In another area of native produce, **feathers** have been so scarce that the market has been disrupted by speculators hoarding and driving the price up. In addition, the lack of supply has forced many manufacturers to turn to synthetics to keep their factories in production. Companies must make sure that, **for feather and down jackets, gloves, and sleeping bags, the special invoice form lists the cost of all components,** including zippers, lining, labor for sewing, and others. This new requirement stems from a decision by US Customs that it prefers to make its own determination of the cost of these items, rather than simply allowing the importer to declare the "chief value component" as previously required. Reasoning behind the decision is that, because there is no set duty rate for those products, Customs now requires the information to determine an accurate tariff. All importers buying these feather and down products for the US market are subject to the new regulation. In the **tea business,** at least one buyer has expressed dissatisfaction concerning palletization of tea shipments, noting that the tea industry has very specific requirements for palletization. Several lots have entered the US with substantial damage to the chests. The same importer expressed some concern about Chinese **labelling practices.** Praising the Chinese for their generally cooperative attitudes about labelling of native produce items, he nevertheless wondered why some divisions will not make even small re-labelling changes when requested to in order to comply with FDA regulations. Regarding **can packaging,** US buyers would appreciate more flexibility from the PRC about can sizes, especially packaging of more goods in larger cans. **China currently accounts for about 60% of the world's production of bristles.** Since the early 1970's imports of bristles have steadily increased, especially in the past six months when the PRC slashed its prices for hog bristles as much as 50%.

TRAVEL
More Americans to China

Since 1971, over 12,000 Americans have visited China using Hong Kong as their exiting point. Hong Kong Immigration authorities report the breakdown for the number of U.S. citizens crossing *from* China into Hong Kong as follows:

1971	211
1972	1,661
1973	2,779
1974	2,031
1975	2,620
1976	3,005
Total	**12,307**

This does not take into account the increasing numbers exiting China from Shanghai and Peking on CAAC, Japan Air Lines and other carriers in the past few years.

LIGHT INDUSTRY

American light industrial products importers, currently at the Canton Fair, are discussing labelling, exclusive representation, US safety

regulations, styling, toys, rubber and canvas shoes, and purchase of US technology. The Chinese are particularly concerned about proposed restrictions on shoe imports which have been recommended by the International Trade Commission. **Bamboo products from the PRC** are featured in the 1977 catalog from Boxer & Ashfield of New York. Boxes, baskets, briefcases, planters, pots, trays, containers shaped as apples or pineapples, and more, are available through this unique book. The company believes it is the only US firm which puts out a catalog featuring 100% bamboo products from the PRC. The products are mainly from the Shanghai and Foochow branches of the Light Industrial Products Corporation. For further information, contact Robert Tsai, Boxer and Ashfield, 1115 Broadway, New York, N.Y. 10010, 212-243-9100. 完

In negotiating with the Chinese, there's no magic formula

Words from a China Hand

David Cookson

The following note, excerpted from a recent speech, sums up the experience of one China trader in selling to the PRC. British-born David Cookson is Manager of China Trade for ICD in New York.

I personally have been doing business with China since 1962 and while there have been some upheavals in China during that time, I think there are some constants which can help in developing trade with the PRC. However, it should be said catgorically, there is no magic formula for doing business with China.

Firstly, one should never assume anything: the Chinese will certainly not. But they will expect the highest degree of professionalism in the people with whom they deal. In any introductory approach, which by necessity will be by correspondence, clearly state the background and capabilities of your company and send plenty of literature to Peking as well as to the branch offices of the particular corporation handling your products. Set up a regular mailing program to follow up and try and give a different slant to each of the selling approaches you make by mail.

Hopefully one will eventually receive a response. It is not uncommon for the keenest and most persistent exporter to be completely ignored, but then suddenly find that, out of the blue, he is asked for a detailed offer, in short order invited to Peking, and is then very quickly signing a contract.

Undoubtedly one of the biggest frustrations exporters face in doing business with China is that of getting an invitation to actually physically visit the market and thus do some real hard face-to-face selling. Again, there is no set formula for getting an invitation to China. But one thing is certain: if they determine that you have a product of interest, they will make it very clear.

The real problems begin when serious negotiations start, as there is no question that the Chinese rank among the toughest negotiators in the world. They are generally very well-informed on market prices and will be very determined in their pricing requirements.

It is generally possible to reach a compromise although I have heard many complaints from exporters that this has resulted in the business being for prestige purposes rather than for profit. Certainly many companies have sacrificed profits on the basis of establishing a foothold and then recouping in the long run.

Unless one has overriding excess capacity to dispose of, I do not recommend a prolonged period subsidizing the business: in China, more than anywhere else, one can easily be misled into believing that you are developing an actual physical need, only to find that the orders dry up when a more advantageous pricing policy is introduced. It must be remembered that for other than the most sophisticated technology, China has a ready seller right on her very doorstep in the form of Japan where, even with her present inflation, prices are still very competitive

Offers in their Laps

Expect to be confronted with negotiators who have copies of competitor's offers conspicuously on their laps, as they discuss the transaction with you. From their expressions, one is frequently led to believe that your product is overpriced, over-rated and utterly devoid of merit. After a few days of tactics like this, which will be interspersed with changes of negotiators who one day speak no English yet the next day are word-perfect translators, one is likely to start questioning the strength of one's own arguments.

If one can show "sincerity" by trying to concede to at least some of the buyers' requests, it is usual that they will likewise respond. In other words, try and start with a negotiating position which is flexible and thus give the Chinese negotiators the opportunity to demonstrate to their superiors that they have done a good job. Once agreed, one can assume that the contract will be meticulously adhered to even to the exclusion of anything being "read into" contracts which might be assumed in other markets.

CHINA INTERNATIONAL NOTES

BUYING REPORTS

According to a November 1976 source, **New Zealand Forest Products Ltd.** will increase its sales of **pulp and paper** to the PRC. The new contract, which lasts from January 1977 to December 1978, provides for the New Zealand company to export bleached pulp to China. The previous contract included only unbleached pulp and kraft linerboard. **Toyo Engineering Co. Ltd.** has won a Chinese order for an **electric dust collector** which will be installed in the Wuhan Iron and Steel Plant. The collector is capable of processing 186,000 normal cubic meters of heated gas from a steel mill. It is expected to commence operation during June this year. **Sri Lanka** will exchange **49,200 tons of sheet rubber** for **200,000 tons of Chinese rice** under a barter agreement signed last month. According to the *Japan Economic Journal*, **Maruichi Steel Tube Works, Ltd.,** Japan's top structural pipe maker, has contracted to export **35,000 tons of products** to China for water supply purposes in January-March, 1977. China wants to purchase 5,000 tons more. Following US reports that Cuba is unable to fulfill its contracts to China, **Australia** hopes to increase its exports of **sugar** to China to record levels this year. Already, the the PRC has placed orders for some 200,000 tons of Australian sugar to be delivered this year. A second report states that China has bought over **200,000 tons of raw sugar** since early December from dealers in **Singapore, Hong Kong, Britain and France.** The purchases were all for 1977 shipment at a fixed price, which is normal in Chinese transactions on the open market. The PRC has received two **West German Messerschmitt Boelkow Blohm Bo105 multipurpose helicopters** destined for supply work on oil platforms off the North China coast, complete with load hooks for assembly and transport work as well as winches for rescue operations. The contract was signed last summer. Delivery of more helicopters is under negotiation. In December, a contract was announced for a sale of **750,000 tons of Canadian wheat;** in January, a further contract for 1.5 million tons. The PRC will also import **200,000 tons of Argentine wheat,** worth $18 million. Shipment of 40,000 tons monthly from Argentina began in February and will end in June 1977. In addition, imports of **500,000 tons of Australian wheat** will be shipped to the PRC between February and June, 1977. Terms provide for payment within twelve months of the date of shipment. A February report indicates that China has bought synthetic rubber from Japan for the first time in two years. **Japanese Zeon Co., Japan Synthetic Rubber and Mitsubishi Chemical Industries** will export nearly **6,000 tons of styrene-butadiene rubber** to China in the first half of this year. The PRC has reportedly accepted a Japanese demand for a substantial raise in the export price of the synthetic rubber. China has now appeared on the market as a major purchaser of **Mexican coffee.** Reports from Mexico City say that 1,000 tons were sold to the PRC in mid-February for $5.05 million ($2.29 per lb.). China has ordered **four Quantimet 720 image analyzers** worth over $631,000 from Britain's **Cambridge Instruments.** Three of the four instruments will be used in China's steel industry for quality control and research. The fourth, a computerized image analyzer will be used in a Shanghai research institute. **Three hundred tons of steel cable** for anchoring oil drilling rigs are being shipped from **K. Teufelelsberger, Austria.** The cables are 84 mm in diameter, 1,000 m in length and have a theoretical breaking strength of 381 tons. The PRC has contracted to import **3,000 tons of low-density polyethylene from Japan.** Two of the Japanese firms involved are **Toyo Soda Manufacturing Co.** and **Mitsui Polychemicals.** According to January reports, China bought **5,000 tons of Malaysian crude palm oil** from the Federal Land Development Authority (FELDA) for about $5.8 million. The consignment arrived in Shanghai on February 3. According to February reports, the PRC purchased **leather goods** worth 20,000,000 rupees **from Pakistan.** Officials of **New Zealand Aerospace Industries Ltd.,** manufacturers of the **Fletcher FU-24 agricultural aircraft,** are in consultation with PRC representatives regarding the possible purchase by China of a number of these aircraft. The PRC is reportedly looking for an aircraft to replace its veteran Antonov An-11s. **Hawker De Havilland Australia** announced in March that it contracted to supply jet engines and spare parts to China. The firm signed an agreement for an initial order of **two Allison 250 gas turbine engines and spare parts worth $318,000.** The engines, which will power helicopters employed in oil rig work off China's coast, were scheduled for delivery at the end of March. Options are held for a further 16 aircraft. Chinese authorities are also considering a proposal that Hawker De Havilland install an Allison engine overhaul facility in Peking. **Hino Motors Ltd.** and **Mitsubishi Motor Co. Ltd.** have received Chinese orders for **13 five-ton trucks and one trailer head,** respectively, according to the Japan *East West Trade Report* (March 3, 1977). The PRC is expected to order about 300-400 trucks at the coming spring Canton fair.

SELLING REPORTS

China will probably sell Japan **1,000,000 tons of coal** annually over a ten-year period from 1980 as planned, according to Yoshihiko Morozumi, President of the Japanese Electrical Power Development Co. A February trade report indicates that Chinese exports of **medicinal herbs** to Japan have decreased sharply at a time when fresh light is being cast on Chinese herb medicine which is free from ill effects. Approximately 10,000 tons, or 70%, of Japan's total annual herb imports come from the PRC. Chinese authorities in Hong Kong have agreed to sell Malaysia **50,000 tons of rice from Kwangtung province** in 1977, according to the March 1977 issue of *China Trade Report*. The price has reportedly been set at between $320-$326 per long ton, with deliveries scheduled throughout the year. Statistics published by the U.K. customs show that in December the PRC shipped 80,797 kilograms of **gold to London valued at $350 million.** Bullion sources believe fifteen tons are still unsold, although the Chinese want all sold eventually. This was the only bullion shipment from China to the U.K. last year. London dealers believe

the delivery was an exceptional one and do not expect such shipments to continue. In order to win a bigger share of Southeast Asia's diesel engine market, China has reportedly decided to add a **condensor-type diesel engine,** commonly used by Asian farmers, to its production line. On January 14, 1977, the PRC predicted that it will increase exports of **oil and minerals** to improve the country's trade picture. Malaysia will import 50,000 tons of Chinese rice this year. It will be delivered before June 1977.

DELEGATIONS TO CHINA

ALBANIA, 1/30/77, **Government trade** delegation led by Minister of Foreign Trade Nedin Hoxha arrived in Peking.

ALGERIA, 12/16/76, Delegation of Algerian Ministry of **Public Health and Population** led by Professor Toumi Mohamed.

ARGENTINA, 12/10/76, **Government trade** delegation led by Jorge Horacio Zorrequieta, Under Secretary of State for Agriculture, arrived in Peking.

AUSTRIA, 1/16/77, **Austria China Research Institute** delegation, led by Christian Broda, concluded visit to Peking, Shanghai, Nanning, Kweilin and Kwangchow.

AUSTRIA, 2/24/77, **Scientific** delegation led by Erich Schmid, Vice President of the Austrian Academy of Sciences arrived in Peking.

BULGARIA, 3/13/77, **Government trade** delegation led by K. Kozmov, Vice Minister of Foreign Trade, arrived in Peking.

CEYLON, 2/12/77, Delegation of **Ceylon Tourist Board** of Sri Lanka led by its Chairman Dharmasiri Senanayake arrived in Peking.

CUBA, 2/4/77, **Government trade** delegation discussed 1977 trade between the two countries.

ETHIOPIA, 1/6/77, **Mass media** delegation led by Lt. Colonel Asrat Desta arrived in Peking.

GREAT BRITAIN, 12/29/76, **Conservative Party** delegation led by Baroness Elles arrived in Peking.

IRAN, 11/14/76, **Journalists** delegation led by Kazem Zarnegar arrived in Peking.

ITALY, 3/11/77, It was reported that a sales and technical delegation of the **Allis-Chalmers and Fiat Earthmover group,** Fiat Allis, negotiated contracts in several major sectors.

JAPAN, 12/27/76, Goodwill delegation of **researchers on China** arrived.

JAPAN, 1/7/77, Delegation of **educationists for recovering Northern Territory** led by Yuzo Komine arrived in Peking.

JAPAN, 1/20-2/2/77, **China-Japan Friendship** delegation led by the Association's President, Takamaru Morita, discussed the promotion of bilateral trade.

JAPAN, 1/22/77, Delegation of the **Federation of Independent Unions** of Japan led by Toshio Ichikawa, Vice President of the Federation, met with Tan Chen-lin.

JAPAN, 1/24-31/77, Delegation of the Japan Council for Importing Chinese **Petroleum.**

JAPAN, 2/2/77, **Journalists** delegation led by Isao Hirano, Managing Editor of the Mainichi Shimbun.

JAPAN, 2/4/77, **Ice hockey** delegation.

JAPAN, 2/6/77, **Japan-China Association on Economy and Trade** twenty-member delegation led by Yoshihiro Inayama, Chairman of the Association, returned home.

JAPAN, 2/11/77 **Molecular crystal** delegation led by Hiroo Inokuchi arrived in Peking.

JAPAN, 2/21/77, Japanese sources predicted that a **measuring equipment** delegation will visit China for market research between June and October 1977.

JAPAN, 3/77, **Trade** delegation of representatives from Toyko Seiko and other wirerope makers.

KUWAIT, 1/23/77, **Trade** delegation led by Muhammad Mishari al-Badr arrived in China.

LIBERIA, 1/15/77, **Goodwill** delegation led by Adolphus Benedict Tolbert, Chairman of the Foreign Relations Committee of the House of Representatives of Liberia ended visit to the PRC.

MALI, 3/10/77, **Trade** delegation led by Omar Coulibai, technical counsellor of the Ministry of Finance and Commerce, arrived.

NORTH KOREA, 1/2-13/77, Three-man **railway** delegation led by Kim Chin-ho, Bureau Director in the Ministry of Railways.

NORTH KOREA, 1/4/77, Delegation of Ministry of **Building Material** Industry led by Li Jong Chil, Director of the General Bureau of Forestry.

PAKISTAN, 1/44/77, **Broadcasting and TV** delegation led by S. Ijlal Hyder Zaidi, Director General of the Pakistan Broadcasting Corporation left Peking.

VIETNAM, 2/4/77, **Economic** delegation led by Nguyen Chank, Vice Minister of Foreign Trade.

WEST GERMANY, 3/11/77, **Economic** delegation met with Chai Shulan, Chinese Vice Minister of Foreign Trade.

WEST SAMOA, 3/14/77, **Parliament** delegation arrived.

YEMEN, 2/77, **Government** delegation led by Muhammad Salih Muti.

ZAIRE, 12/22/76, **Trade** delegation led by Kamany, Councillor of the Department of Commerce, arrived in Peking.

DELEGATIONS FROM CHINA

AUSTRALIA, 1/11/77, **Journalists** delegation led by Ting Hsi-ling, editor-in-chief of the South China Daily.

BURMA, 2/5/77, **Government** delegation led by Teng Ying-chao, Vice Chairwoman of the Standing Committee of the National People's Congress, left Peking.

CANADA, 3/15/77, **Government trade** delegation led by Sun So-chang, deputy departmental director of the Ministry of Foreign Trade, left Peking.

GREAT BRITAIN, 2/77, **Vertebrate palaeontology** 5-member study group from Academy of Sciences led by Sun Ai-ling, leading member of the laboratory of Lower Vertebrate Zoology of the Institute of Vertebrate Palaeontology and Palaeoanthropology of the Academy.

JAPAN, 3/77, Thirteen-member delegation of **China National Metals Export-import Corporation** held negotiations with Nippon Steel Corporation and other steel makers on the purchase of **steel products** for loading in the first half of 1977.

JAPAN, 7/77, The PRC will send a **high level trade mission to Japan in July,** according to the Japan Association for the Promotion of International Trade. The Association indicated that Peking wishes to increase purchases of Japanese fertilizer, steel and chemical products in return for stepped-up Chinese sales of energy-related products.

MEXICO, 12/9/76, **Scientific and technological** delegation led by Hsiao Peng, Vice Minister of Agriculture and Forestry, returned to Peking after attending a meeting on scientific

Taching oil price to Japan up. Here a view of petrochemical works at Taching Oilfield.

and technological co-operation.

NORTH KOREA, 12/23/76, Delegation led by Li Hsi-ming, Chinese member of the **Council of the Sino-Korean Yalu River Hydroelectric Power Corporation** and Vice Minister of Water Conservancy and Power, left Peking for Pyongyang to attend the 29th council meeting.

PAKISTAN, 1/10/77, **Journalists** delegation led by Fan Fa-yuan, Editor-in-Chief of the Hsinhua Daily, left Peking. They will also visit Bangladesh and Burma.

PAKISTAN, 2/7/77, **Government scientific and technical co-operation** delegation led by Shih Lin, Vice Minister of Economic Relations with Foreign Countries, returned to Peking after attending the first conference on Sino-Pakistani scientific and technical co-operation.

ROMANIA, 12/21/77, **Government trade** delegation led by Li Chiang left Yugoslavia for Belgrade.

SWITZERLAND, 3/4/77, Delegation to the **UN** conference on common fund for integrated commodity program left for Geneva.

YUGOSLAVIA, 1/14/77, **Government trade** delegation led by Li Chiang, Minister of Foreign Trade, discussed the prospects of a trade increase between the two countries. Yugoslavia is interested in buying Chinese oil, rice, soybeans and coal and wishes to export ships and ship engines, tools, equipment and transport vehicles.

ZAIRE, 2/4/77, **Scientific** delegation discussed scientific cooperation, particularly the installation of an **electron microscope** presented by the PRC.

EXHIBITIONS

ALGERIA, 2/23/77, Reports that Algerian **economic advancements** exhibition will open soon in Peking.

AUSTRALIA, 1/27/77, Chinese **archaeological** exhibition which visited Melbourne, Adelaide, Canberra and Sydney closed.

BAHRAIN, 12/16/76, PRC **economic and trade** exhibition closed in Manama. The event attracted over 80,000 Bahraini visitors.

BURMA, 1/13/77, Chinese **handicraft and fine arts** exhibition opened in Rangoon. Over 200 people from Burmese cultural and arts circles attended the opening ceremony. Over 200 items were displayed, including embroidered silk, sculptures, multicolored enamel-embossed brassware, earthenware, and rattan and bamboo products.

GAMBIA, 1/25/77, Chinese **economic and trade** exhibition group left Peking for Gambia.

GREAT BRITAIN, 12/23/76, Chinese exhibition of **peasant painting** from Huhsien County closed after receiving over 15,000 spectators since its opening on November 18.

NIGER, 12/8/76, PRC **construction photo and publications** exhibition closed, having been seen by 110,000 people.

PEKING, 1/20/77, **Chinese carpet fair** opened. It was sponsored by the China National Native Produce and Animal By-Products Import and Export Corporation.

SENEGAL, 12/14/76, Chinese **photo exhibition** opened in Dakar and marked the fifth anniversary of the establishment of diplomatic relations between the PRC and Senegal.

TUNISIA, 1/16/77, Chinese **paper-cut** exhibition in Tunis closed. Over 8,000 people attended the display of 50 sets of paper-cut works.

UGANDA, 1/3/77, Chinese **photo exhibition** jointly sponsored by the Ugandan Ministry of Culture and Community Development and the Chinese embassy in Uganda closed. Visitors numbered over 15,000.

VENEZUELA, 1/7/77, Chinese **arts and crafts exhibition** opened in Caracas.

WEST GERMANY, 1/14/77, Chinese **contemporary graphic art** exhibition opened at Parliament Hall, Bremen.

FOREIGN AID

AFGHANISTAN, 12/30/76, Official inauguration of the **trunk canals** of PRC-aided construction of the Parwan **irrigation project.**

AFGHANISTAN, 2/12/77, Chinese technical team left for home after completing technical assistance to the **Bagrami textile mill.**

BANGLADESH, 12/15/76, Eight-member Chinese technical survey team headed by Li Yi-wei, head of the Kiangsi provincial hydroelectric and water conservancy projects bureau, arrived in Dacca to explore the possibility of **small irrigation projects** in Bangladesh.

GUINEA, 34/77, Inauguration of a **radio station,** "The Revolutionary Voice of the National United Workers' Party," built with Chinese assistance.

GUYANA, 12/16/76, Signing ceremony for the handing over to Guyana of the Bel-lu **claybrick factory** built with Chinese assistance.

LAOS, 1/22/77, Official inauguration of Lao-Chinese friendship **printing house** built with the aid of Chinese experts.

LAOS, 2/77, Reports of completion of a **water works system** begun early in 1976 in Phong Saly provincial town, built by Chinese specialists and workers.

MALI, 2/77, An informed source reports the handing over of an **agricultural machine repair shop,** located in the Third Region capital, Sikasso. This workshop was constructed by China in accordance with the agreement signed between the Chinese Ministry of Economic Relations with Foreign Countries and the UN Organization for Industrial Development. The equipment for the workshop was financed from Chinese contributions to the latter.

MALI, 2/4/77, The minutes of the meeting on China's assistance to Mali in building **four water conservancy projects** were signed. The projects are: the Markala dam overhauling project, the principal canal clearing project, a drainage project and the principal and secondary canals clearing project.

MOZAMBIQUE, 3/77, Red Cross Society of China donated 5,000 tons of **food grains** and 5 tons of **medicine** to aid **flood victims.**

NEPAL, 12/26/76, Agreement on technical aspects of PRC-aided **construction** of Gorkha-Narayanghat **highway.** A team of forty Chinese technicians recently arrived in Kathmandu to undertake a detail survey of the highway. Construction is expected to begin in February 1978 and will be completed within three years.

NEPAL, 2/1/77, It was reported that Chinese technicians who provided as-

sistance in the building of a Kathmandu-Bhaktapur **trolley bus line** began leaving for home. The bus line carries some 7,000 passengers a day.

PAKISTAN, 1/77. Informed sources revealed that the Chinese assisted **Heavy Mechanical Complex** project at Taxila will begin producing **Bedford bus and trucks chassis** during 1977-1978 financial year. For this purpose, a 3,000-ton hydraulic press supplied by the PRC has been installed at the HMC.

PAKISTAN, 2/77. Informed sources report that China is helping Pakistan build **two sugar plants** for approximately US $52 million. The PRC will provide financial and technical aid. When completed in 1979, the mills will each have an annual **production capacity of 30,000 tons.**

PAKISTAN, 2/23/77. PRC-aided heavy **foundry and forge** plant opened.

RWANDA, 12/16/76. Ceremony for handing over of the Chinese-aided expansion project of the Rwandan **sugar refinery.**

SIERRA LEONE, 1/29/77. Handing over ceremony of three **rice-growing technical stations** in Lambyama, Kabala and Newton which were built with Chinese aid.

SOMALIA, 3/8/77. Opening of the Benadir gynecology, obstetrics, and pediatrics **hospital** built with Chinese assistance.

SUDAN, 1/25/77. Chinese experts assisted Sudanese doctors in successfully performing a **heart operation** of mitral commissurotomy with acupuncture anaesthesia on a Sudanese girl.

SUDAN, 3/5/77. The Wad Madani-Jadarif **road** and the Wad Madani Blue Nile **Bridge,** jointly built by Chinese and Sudanese workers and technicians, were open to traffic.

UGANDA, 12/20/76. It was reported that Chinese technicians have spent three years on the Kibimba **rice farm** in East Uganda. They have held technological courses on water control, rice cultivation, farm machinery expertise and maintenance.

VIETNAM, 12/30/76. Official inauguration of a **medical glass-tubing factory** in Hai Hung province which was built with the assistance of Chinese technicians.

AGREEMENTS

ALBANIA, 1/13/77. **Scientific co-operation** agreement signed in Peking between representatives of the Chinese Academy of Sciences and the Academy of Sciences of the Socialist People's Republic of Albania.

ARGENTINA, 2/2/77. Agreement to **increase bilateral trade and technology transfers** between the PRC and Argentina signed in Buenos Aires. The agreement provides for **MFN treatment** for tariffs and convertible currency payment or transfer. It also calls for a joint trade mission which is to meet alternatively in Buenos Aires and Peking to oversee the implementation of the agreement.

BANGLADESH, 1/4/77. **Economic and technical co-operation** agreement and a **trade and payment** agreement between the PRC and Bangladesh were signed in Peking.

BULGARIA, 3/15/77. **Goods exchange and payment** agreement for 1977 signed in Peking.

CAMBODIA, 12/25/76. **Protocol on the supply of complete sets of equipment** by the PRC to Cambodia and an agreement on **co-operation in science and technology** between the two countries signed in Phnompenh.

CANADA, 1/77. It was reported that the PRC agreed in December 1976 to purchase 27.9 million bushels of Canadian **wheat.** The contract worth about $95.5 million was signed in Kwangchow and was the final one to be negotiated under a three-year contract which expired at the end of 1976 and under which China bought a total of 179.1 million bushels. Discussions for new agreements are tentatively set for late Spring, according to the Canadian Wheat Board.

FINLAND, 12/21/76. Sino-Finnish **trade** agreement for 1977 signed in Helsinki anticipates the year's trade at 220,000 Finnish marks, which represents no increase on 1976.

FINLAND, 1/28/77. **Maritime transport** agreement signed in Helsinki.

JAPAN, 2/77. Agreement on a modest **6.9% price increase** in the price of **Taching crude oil exports** to Japan. In accepting a smaller price increase, Chinese officials rejected Japanese requests for larger shipments during 1977.

LOW COUNTRIES, 1/22/77. Agreement on **reciprocal registration of trademarks** reached between China and Belgium, the Netherlands and Luxembourg on April 10, 1975 went into effect.

NORTH KOREA, 12/19/76. **Scientific co-operation** plan for 1977-1978 signed in Peking between the Chinese Academy of Sciences and the Academy of Sciences of the Democratic People's Republic of Korea.

NORTH KOREA, 2/5/77. Protocol of the 17th meeting of the **scientific and technical co-operation** committee between the PRC and the DPRK signed in Peking.

NORTH KOREA, 2/8/77. Protocol of the 29th meeting of the board of directors of the **China-Korea Yalu River Hydro Power Company** signed in Pyongyang.

PAKISTAN, 1/29/77. **Scientific and technical co-operation** protocol signed in Islamabad.

PHILIPPINES, 1/77. Agreement to sell a total of **450,000 tons of sugar** to the PRC at **"friendship price"** of 12¢ a pound (representing production costs although the world market price was below that amount).

RUMANIA, 1/27/77. Protocol on **goods exchange and payments** calling for an increase in trade during 1977 was reported.

SUDAN, 2/77. **Trade protocol** for 1977.

SUDAN, 3/2/77. **Trade protocol** for 1977 signed in Khartoum.

THAILAND, 1/18/77. Agreement on the **reciprocal registration of trademarks.** The agreement stipulates that the juristic persons and natural persons of either country may apply for trademark registration and acquire the right to exclusive use of registered trademarks in the other country in accordance with its laws, rules and regulations.

VIETNAM, 3/1/77. Annual executive plan of the **medical and health co-operation** agreement between the PRC and Vietnam. 完

Corrections

In *CBR* 4, 1; p. 9, capital increased from RMB 19,800,000 to RMB 400,000,000, not from RMB 19,800 to RMB 400,000; On p. 10, PRC retained deposits were HK $15 billion not US $15 billion; On page 13, the heading under liabilities in the right-most column should read 1975/74; On p. 38, Digital Resources is a subsidiary of Applied Devices of Hauppauge, New York; and on p. 48, in the box on Chinese Trademarks, Narcissus mushrooms, Reg. #1012349, 2/24/76, should appear as Pending, on Ng Fung Hong's application.

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