THE MAGAZINE OF THE NATIONAL COUNCIL FOR US-CHINA TRADE MAY-JUN 1978

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The China Business Review

VOL. 5 NO. 3

NEW FROM NATIONAL COUNCIL FOR US-CHINA TRADE
1050 17th Street, N.W.,
Suite 350
Washington, DC 20036 USA

DIRECTORY
of Scientific 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 significantly.

The *Directory of Scientific 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* is a standard reference for the following—

- Members of scientific and technical missions to the PRC.
- University science libraries.
- Companies giving technical presentations 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 areas.
- Individuals interested in learning about the state of science in the PRC.

About the Directory

In 1977-78 the National Council published the three-volume *Directory of Scientific Research Institutes in the People's Republic of China*. The 400-plus-page volumes describe research in the categories listed and provide comprehensive information about the organization and work of all known research institutes in China through 1977-78. The 1,400-page *Directory* has been prepared by Susan Swannack Nunn.

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

The cost of the three-volume *Directory* is $300. Individual volumes are $125 each. Postage and handling are additional.

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Crops
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The *Directory of Scientific Research Institutes in the People's Republic of China* is available at a reduced price of $200 to academic and other non profit institutions. The discount applies to the purchase of the set of three volumes only. Postage and handling are additional.

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The China Business Review

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Design
Louise Levine

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The CHINA BUSINESS REVIEW is published bimonthly by the National Council for US-China Trade, 1050 17th Street, N.W., Suite 350, Washington, D.C. 20036 USA. The National Council is a non-profit organization incorporated under the laws of the District of Columbia. The CHINA BUSINESS REVIEW is published principally for members of the National Council. Application to mail at controlled circulation rates is pending at Washington, D.C. The magazine is available for subscription in the US and Canada at $60 per year; elsewhere at $75 a year including airmail postage.

The National Council for United States-China Trade is grateful to His Excellency Huang Chen, formerly 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.

China Trade Events

HOT SPRINGS, VIRGINIA, June 8 to June 9, 1978
The Chase World Information Corporation presented a weekend seminar on "Training Strategies for Third-World Countries," at The Homestead, Hot Springs. There was a segment on training programs in the PRC. Contact Dr. Alice Haemmerli (212) 552-3238.

PHILADELPHIA, June 12, 1978
The International Business Forum, Inc., held a day-long seminar on "Approaching the China Market," beginning with a keynote address by Ambassador Thomas Gates, former chief of the US Liaison Office in Peking, on "Why China? A Summary of Sino-American Trade Relations." Other talks were given by William W. Clarke, Director, PRC Affairs, Bureau of East-West Trade, Department of Commerce; and J. Ray Pace, President, Baker World Trade. Henry Wendt, president of Smithkline Corporation, served as chairman of the seminar, and Stanley Young, vice president of the National Council, was moderator. For details, contact International Business Forum (215) 568-2710.

WASHINGTON, DC, June 14, 1978
The National Council for US-China Trade held its fifth annual meeting at the Mayflower Hotel. Secretary of Commerce Juanita Kreps gave a luncheon speech, and afternoon presentations were made by Professor A. Doak Barnett, Brookings Institution; Walter S. Surrey, Surrey, Karasik and Morse; Arthur Ashbrook, Central Intelligence Agency; George Krieger, ACLI International; Charles Rostov, Trans Ocean Import Company; and J. Ray Pace, Baker World Trade. For further details, contact Pat Caperones of the National Council staff (202) 331-0290.

NEWARK, NEW JERSEY, June 22, 1978
The Department of Commerce Industry and Trade Administration District Office in Newark, New Jersey, in cooperation with the New Jersey Business and Industry Association, the Somerset Valley Chamber of Commerce, and Somerset County College, will hold a seminar on "Doing Business with China." Included in the list of speakers is Nicholas H. Ludlow, director of the National Council's Research and Publications Department. For details, contact Stephan Wasylko, Trade Specialist, Department of Commerce (201) 645-6214.

WASHINGTON, June, 1978
The National Council for US-China Trade will host a delegation from the China National Metals and Minerals Import and Export Corporation. The delegation, expected to arrive in late June, will meet with companies across the United States to discuss the development of PRC hardware, metals, and minerals exports. For details, contact Carolyn Brehm (202) 331-0290.

HONOLULU, HAWAII, July 30 to August 1, 1978
The second Circum-Pacific Energy and Mineral Resources Conference will be held at the Mid-Pacific Conference Center at the Hilton Hawaiian Village. Among papers on national and international policy and regional development will be a paper by A. A. Meyerhoff on "The Petroleum Geology of the People's Republic of China." For complete information please write 1978 Circum-Pacific Conference, c/o AAPG, PO Box 979, Tulsa, Oklahoma, USA 74101.

UNITED STATES, Summer, 1978
The Committee on Scholarly Communication with the People's Republic of China will be hosting three Chinese technical delegations this summer: a plasma physics delegation in June and July (contact: Pierre Perrolle), an animal feeds delegation in July and August (contact: Halsey Beemer), and a light construction delegation. For more details, telephone (202) 389-6136.

CHICAGO, September 20–22, 1978
The Capital Equipment Industry Service will hold its annual Construction Machinery Conference this year at the Marriott Lincolnshire Resort, north of O'Hare Airport. Stanley Young, vice president of the National Council, will make a presentation on construction equipment business opportunities in China. For details, contact Charles Yengst (415) 854-7400.

YOUR MEN IN PEKING

The US Liaison Office staff in Peking will be happy to assist you; please feel free to call them when you are in China's capital.

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Chinese nuclear physicists invited for study at Illinois' Fermi National Accelerator Laboratory pose for photo at the Institute of High Energy Physics, Peking.

CHINA'S NEW PRIORITIES FOR TECHNOLOGY DEVELOPMENT

Fang I Outlines Plan

In a major speech on March 18, 1978, at China's National Science Conference, Fang I, vice premier of the PRC's State Council, minister in charge of the State Scientific and Technology Commission, and de facto head of the Chinese Academy of Sciences, outlined China's plan for the development of science and technology in the next eight years. The vice premier provided graphic details of the PRC's technological priorities, each of which, presumably, has been given an appropriate budget.

Among the chief aims of the plan: an increase in the number of China's top professional research workers, from the present 200,000 to 800,000 in 1985, and development of 27 specific types of technology with 108 particular items as key projects.

The planned programs for action include:

- agricultural technology
- energy—nuclear power, solar energy, etc.
- natural resources—iron ore, copper, aluminum, nickel, cobalt, titanium, vanadium . . .
- computer sciences—giant computers, computer networks, and serial production
- laser technology and physics
- aerospace technology—satellites, skylabs, and space probes
- high energy physics—proton accelerator development
- genetic engineering—molecular genetics and biology
- anti-pollution technology

Fang I also emphasized the need to introduce foreign technology, develop a technology research system and able personnel, produce scientific equipment, and establish data networks. A case example of how decision making in one of China's research priorities has developed in practice accompanies this article.

General

• By the end of this century, all departments and localities in China that can use machines must be fully mechanized, electrification must be realized in both urban and rural areas, the production processes in major industrial departments automated, advanced techniques extensively applied, labor productivity raised by big margins, and a radical change brought about in industrial and agricultural production.

• We must equip our armed forces with the latest achievements in science and technology and greatly enhance our national defense capabilities.

• We must build a vast army of working-class scientists and technicians who are both red and expert, and we must have our own experts in science and technology who are first rate by world standards. We must also acquire the most sophisticated equipment for scientific experimentation so that we can approach advanced world levels of that time in most branches of science and technology, catch up with them in some other branches, and take the lead in certain branches.

• Our plan should be aimed at helping the realization of the four modernizations. The key to this lies in the modernization of science and technology.

• Compared with advanced world levels in science and technology, our country is now lagging 15 to 20 years behind in many branches and more still in some others.

• A National Conference for Planning Natural Science Disciplines was held in September and October last year, and a National Conference for Planning the Development of Science and Technology took place in December last year and January this year. Through repeated discussions and revisions an "Outline National Plan for the Development of Science and Technology 1978–1985 (Draft)" took shape. The outline plan (draft) sets forth the following goals to be striven for in the next eight years: (1) Approach or reach the advanced world levels of the 1970's in a number of important branches of science and technology. (2) Increase the number of professional research workers to 800,000. (3) Build a number of up-to-date centers for scientific experiment. (4) Complete a nationwide system of scientific and technological research.

• The eight-year outline plan (draft) makes all-round dispositions for the tasks of research in 27 spheres, including natural resources, agriculture, industry, national defense, transport and communication, oceanography, environmental protection, medicine, finance and trade, culture and education, in addition to the two major departments of basic and technical sciences. Of these, 108 items have been chosen as key projects in the nationwide endeavor for scientific and technological research.

• The eight-year outline plan (draft) gives prominence to the eight comprehensive scientific and technical spheres, important new technologies and pacesetting disciplines that have a bearing on the overall situation; namely, agriculture, energy resources, materials, electronic computers, lasers, space science and technology, high energy physics, and genetic engineering.

Agricultural Technology

• Science and technology in agriculture: Agriculture is the foundation of the national economy. In accordance with the principle of "taking grain as the key link and insuring an all-round development," we will in the next three to five years actively carry out comprehensive surveys of our resources in agriculture, forestry, animal husbandry, sideline production and fisheries; study the rational exploitation and utilization of the resources and the protection of the ecological system; and study the rational arrangement of these undertakings so as to provide a scientific basis for the all-round development of our country's large-scale socialist agriculture.

• We should implement in its entirety the Eight-Point Charter for Agriculture (soil, fertilizer, water conservancy, seeds, close planting, plant protection, field management and improved farm tools) and raise our level of scientific farming so as to bring about a big increase in agricultural output. We should study and evolve a farming system and cultivating techniques that will carry forward our tradition of intensive farming and at the same time suit mechanization, and manufacture farm machines and tools of high quality and efficiency. We will study science and technology for improving soil, controlling water, drastically changing the conditions of our farmland, and turning it into crop fields that give stable and high yields. In order to improve as quickly as possible the low-yielding farmland that accounts for about one third or more of the country's total, we must make major progress in improving alkaline, lateritic, clay, and other kinds of poor soil; in preventing soil erosion; and in combating sandstorms and drought. We will study projects for diverting water from the south to the north and relevant scientific and technical problems; study and develop new compound fertilizers and biological nitrogen fixation, methods of applying fertilizer scientifically and techniques for drainage and irrigation; cultivate new seed strains; develop new techniques in seed cultivation; and improve the fine crop varieties in an all-round way so that they will give still higher yields, produce seeds of better quality and better resist natural adversities. We should quickly find out new insecticides that are highly effective and are harmless to the environment, and develop techniques for simultaneous prevention and treatment of different kinds of plant diseases and pests.

• We need to step up scientific and technological research in forestry, animal husbandry, sideline production, and fisheries and promote an all-round develop-

ment of these branches. We should provide new tree seeds and techniques that will make the woods grow fast and yield more and better timber; develop multipurpose utilization of forest resources and study techniques and measures for preventing and extinguishing forest fires; step up research on building pasturelands, improving breeds of animals and poultry, mechanizing the process of animal husbandry, increasing water life production, fish breeding, marine fishing and processing so as to make our contribution to improving the ingredients of the people's diet.

• We will set up up-to-date centers for scientific experiments in agriculture, forestry, animal husbandry and fisheries, and organize all departments and branches of science to tackle key problems by coordinated efforts, and accumulate experience.

Energy Technology

• Science and technology of energy: Energy resources are an important material basis for developing agriculture, industry, national defense, and science and technology, and for improving the people's livelihood. We should study the rules and characteristics of the genesis and distribution of the oil and gas in the principal sedimentary regions, develop the theories of petroleum geology, and extend oil and gas exploration to wider areas; study new processes, techniques and equipment for exploration and exploitation and raise the standards of well drilling and the rate of oil and gas recovery; and actively develop crude oil processing techniques, use the resources rationally and contribute to the building of some ten more oil fields, each as big as Taching.

• China has extremely rich resources of coal, which will remain our chief source of energy for a fairly long time to come. In the next eight years, we should basically mechanize the key coal mines, achieve complex mechanization in some of them, and proceed to automation. The small and medium-sized coal mines should also raise their level of mechanization. Scientific and technical work in the coal industry should center around this task, with active research in basic theory, mining technology, technical equipment and safety measures. At the same time research should be carried out in the gasification, liquefaction and multipurpose utilization of coal and new ways explored for the exploitation, transportation, and utilization of different kinds of coal.

• We must push up the power industry as a pressing task. We should take as our chief research subjects the key technical problems in building large hydroelectric power stations and thermal power stations at pit mouths, large power grids and super high-voltage power transmission lines. China has a great abundance of water power resources. We must concentrate our efforts on comprehensive research in the techniques involved in building huge dams and giant power generating units and in geology, hydrology, meteorology, reservoir-induced earthquakes (sic), and engineering protection which are closely linked with large-scale hydroelectric power projects.

• Atomic power generation is developing rapidly in the world, and we should accelerate our scientific and technical research in this field and speed up the building of atomic power plants. We should also step up research in solar energy, geothermal energy, wind power, tide energy and controlled thermonuclear fusion, pay close attention to low-calorie fuels, such

INTRODUCING TECHNOLOGY FROM ABROAD

Fang I on the Common Treasure of Mankind

In his March 18 speech Fang I stressed the need to introduce science and technology from abroad, calling science and technology the "common treasure of mankind." Missing from these proposals, however, is the spirit of reciprocity.

Science and technology are the common treasure of mankind. All countries and nations have their own merits and characteristics, and exchanges can help them assimilate each other's strong points and blaze new trails. An important way to develop science and technology at high speed is to utilize fully the latest achievements in the world in science and technology and absorb their quintessence.

We should introduce selected advanced technologies that play a key and pace-setting role in line with the needs for modernizing our country. We should take effective steps to master the technologies introduced. Special teams should be organized to learn and study major scientific and technological projects and completed sets of equipment that have been introduced. We should know the how and endeavor to know the why of the technologies introduced so as to create our own.

We should study earnestly and conscientiously and grasp and understand the subject matter before trying to improve on it. We must not lightly criticize and discard anything before we know it inside out.

We must strengthen scientific and technical cooperation and academic exchanges with other countries and keep abreast of the results, trends, policies, and measures of their scientific and technological research, as well as their experience in organization and management.

We should actively and systematically enlarge the scope of sending scientific and technical personnel, students, and postgraduates abroad to study, receive advanced training, make study tours, and take part in international academic conferences and other academic activities.

At the same time, we will also invite foreign scientific, engineering, and technical experts to China to give lectures, serve as advisers, or join us in scientific research.

as bone coal, gangue, and oil shale, and marsh gas resources in the rural areas, and make full use of them where possible.

• The techniques for the rational utilization and saving of energy present an important question that must be solved. People in all professions and trades should study this question, make full use of surplus heat, study and manufacture fine and efficient equipment for this purpose, try their best to lower energy consumption and particularly coke consumption in iron smelting, coal consumption in power generation, and energy consumption in the chemical and metallurgical industries.

Raw Materials Technology

• Science and technology concerning materials: Steel must be taken as the key link in industry. Great efforts must be made to grasp metallurgical science and technology. It is imperative to make a breakthrough in the new technology of intensified mining and solve the scientific and technological problems of beneficiating hematite so as to provide the iron and steel industry with large quantities of raw materials.

• We should speed up research work on the paragenetic deposits at Panchihhua, Paotou, and Chinchuan where many closely associated metals have been formed, solve the major technical problems in multipurpose utilization, intensify research on the exploitation of copper and aluminum resources, make China one of the biggest producers of titanium and vanadium in the world, and approach or reach advanced world levels in the techniques of refining copper, aluminum, nickel, cobalt, and rare-earth metals.

• We should master modern metallurgical technology quickly, increase varieties and improve quality; study and grasp the rules governing the formation of high-grade iron ore deposits and the methods of locating them; establish a system of ferrous and nonferrous materials and extend it in the light of the characteristics of our resources.

Chinese scientists study foreign-made integrated circuit.

• We should make full use of our rich natural resources and industrial waste and increase at high speed the production of cement and new types of building materials which are light and of high strength and serve a variety of purposes; step up research in the technology of mining and dressing nonmetal ores and in the processing techniques; lay stress on research in the technique of organic synthesis with petroleum, natural gas, and coal as the chief raw materials; step up our studies of catalysts and develop the technology of direct synthesis; renovate the techniques of making plastics, synthetic rubber, and synthetic fiber and raise the level of equipment and automation in the petrochemical industry.

Computer Science

• Electronic computer science technology: Electronic computers have been used ever more extensively with far-reaching effects in scientific research, industry, agriculture, national defense, and social life. At present the electronic computer is developing in the following directions: giant computers, microcomputers, computer networks, and intelligence simulation. The scientific and technical level, scope of production, and extent of application of computers has become a conspicuous hallmark of the level of modernization of a country.

• China must make a big new advance in computer science and technology. In the next three years we should rapidly develop basic research on computer science and related disciplines, lose no time in solving the scientific and technical problems in the industrial production of large-scale integrated circuits, and make a breakthrough in the technology of ultra large-scale integrated circuits.

• We should turn out giant computers, put a whole range of computers into serial production, step up study on peripheral equipment and software of computers and on applied mathematics, and energetically extend the application of computers. We aim to acquire by 1985 a comparatively advanced force in research in computer science and build a fair-sized modern computer industry.

• Microcomputers will be popularized and giant ultra high-speed computers put into operation. We will also establish a number of computer networks and data bases. A number of key enterprises will use computers to control the major processes of production and management.

Laser Technology

• Laser science and technology: This is one of the most active branches of science and technology, which began to develop in the 1960's. Its emergence, which marked a new stage in man's control and utilization of light waves, has effectively promoted the development of physics, chemistry, and biology. The laser has been widely used in material processing, precision

measurement, remote ranging, holography, telecommunications, medical treatment, and seed breeding. It has broad prospects in isotope separation, catalysis, and information processing. Laser fusion is an important approach in exploring controlled thermonuclear reaction.

• We will study and develop laser physics, laser spectroscopy and nonlinear optics in the next three years. We should solve a series of scientific and technical problems in optical communications, raise the level of routine lasers quickly, and intensify our studies of detectors. We expect to make discoveries and creations in the next eight years in exploring new types of laser devices, developing new wave-lengths of lasers, and studying new mechanisms of laser generation, making contributions in the application of lasers to studying the structure of matter. We plan to build experimental lines of optical communications and achieve big progress in studying such important projects of laser applications as separation of isotopes and laser-induced nuclear fusion.

Space Technology

• Space science and technology: Space science and technology has been used in many aspects of the military, the national economy, and scientific research so that man is beginning to extend his activities to the boundless universe. The development of space science and technology is bringing about tremendous changes in earth science, astronomy, and other disciplines. Space technology has raised such work as meteorological observation, survey of resources, environment monitoring, and cartographic survey to the level of concentrated automation. This not only saves large amounts of manpower and time, but makes possible a timely collection of a greater wealth of data. As an information transmission center, the man-made earth satellite can send messages directly to different places, thus causing radical changes in the technical system of communications, television, and radio broadcasting.

• We should attach importance to the study of space science, remote sensing techniques, and the application of satellites; build modern centers for space research and systems for the application of satellites; step up the development of the vehicle series, and study, manufacture, and launch a variety of scientific and applied satellites; actively carry out research in the launching of skylabs and space probes; and conduct extensive research in the basic theory of space science and the application of space technology.

High-Energy Physics

• High-energy physics: High-energy physics is a branch of science that studies the structure of elementary particles and the sublevel structure of matter and the laws governing their interaction. At present, new particles and new phenomena are being discovered

Magnavox, Litton units capture attention of visiting scientist.

and theoretical research is deepening, bringing about new changes in high-energy physics every day and making it one of the most active frontline branches of study in the development of natural science of our time.

• We expect to build a modern high-energy physics experimental base in ten years, completing a proton accelerator with a capacity of 30,000 million to 50,000 million electron volts in the first five years. Completion of this base will greatly narrow the gap between our high energy accelerators and advanced world levels and will stimulate the development of many branches of science and industrial technology.

• We should from now on set about the task in real earnest and make full preparations for experiments in high-energy physics, with particular stress on studying and manufacturing detectors and training laboratory workers. We should step up research in the theory of high-energy physics and cosmic rays, consciously promote the interpenetration of high-energy physics and the neighboring disciplines, actively carry out research in the application of accelerator technology to industry, agriculture, medicine, and other spheres, and pay attention to the exploration of subjects which promise important prospects of application.

Genetic Engineering

• Genetic engineering: It is possible for genetic engineering, an outgrowth of molecular biology, to splice and transfer genetic substance at the molecular level and create new biological species to meet the needs of humanity. Genetic engineering provides an effective means of experiment for such basic studies concerning higher organisms as cell differentiation, growth and development, and formation of tumors. It is likely to open new vistas for momentous changes in agriculture, industry, medicine, and certain other fields of production. We must in the next three years strengthen organization and coordination and step up the tempo

of building and improving the related laboratories and conduct basic studies in genetic engineering. In the next eight years, we should combine them with the studies in molecular biology, molecular genetics, and cell biology and achieve fairly big progress. We should study the use of the new technology of genetic engineering in the pharmaceutical industry and explore new feasible ways to treat certain difficult and baffling diseases and evolve new high-yield crop varieties capable of fixing nitrogen.

Anti-Pollution Measures

• Chairman Hua has given this instruction: "We must attach importance to multipurpose utilization which makes full use of natural resources and alleviates pollution of the environment. The three industrial wastes (liquids, gases and dregs) will bring harm if they are discarded but will become treasures if they are turned to good account." People working in all professions and trades should go in for multipurpose utilization, and the departments concerned should be organized to concentrate their forces on tackling major scientific and technical problems.

Development of Technology Research

• In the next eight years, we must create a nationwide scientific and technological research system that covers all branches of study, which should complement each other and be rationally distributed and developed in coordination, and that integrates professionals with the masses and military research efforts with those undertaken in the civilian sector. The Chinese Academy of Sciences, the various departments under the State Council, and the key universities and colleges must concentrate their efforts on restoring, strengthening and building a number of key scientific research institutions. If it is at all possible, branches of the Chinese Academy of Sciences or local academies of sciences are to be established where they are needed.
• We must lose no time in consolidating the existing scientific research institutions, particularly the key ones. We must first of all consolidate their leading bodies. The fundamental task of scientific research institutions is to produce research results and able people.
• The provinces, municipalities, and autonomous regions must establish and strengthen research institutions that suit the needs of economic development and their natural conditions and resources. All large industrial and mining enterprises should take active steps to establish and strengthen research institutions. Small and medium-sized factories and mines may establish research institutions independently or jointly.
• Big efforts should be made to strengthen research institutions in agronomy and farm machinery and tools at the county level and, with these as the nucleus, consolidate and expand the network of agroscience institutions and agrotechnical stations at county, commune, production brigade, and production team levels.
• We must firmly establish the moral code under which it is correct to work hard to improve professional competence . . . [and] praiseworthy to produce good results in scientific research. . . Moral encouragement should be the main form [of reward], but there should also be proper material rewards.
• Technical titles should be restored, the system of individual responsibility established for all technical posts, and the testing and promotion of scientific and technical personnel undertaken at regular intervals, in general every two or three years.
• The National Scientific and Technical Association and the societies of natural sciences should broaden their academic activities.
• In the next eight years we should build a number of modern experimental installations and centers. We should give a high priority to refitting the existing laboratories so as to modernize them as quickly as possible.

Production of Scientific Instruments, Establishment of Data Systems

• Emergency measures must be taken to push forward the designing and production of instruments and equipment. Efforts must be made to expand, renovate, and build a number of factories specializing in scientific instruments and chemical reagents. Scientific research institutions, universities, and colleges should pay great attention to new principles, new techniques, and new products in their research on instruments and equipment and where necessary expand the capacity for processing, trial-manufacturing, and production.
• It is essential to strengthen the management of the designing, production, distribution, and use of scientific instruments and bring them under an overall national plan. Costly large precision instruments should be used jointly by the units requiring them so that they are fully utilized.
• We should improve and strengthen our scientific and technical information institutions, and take effective steps to form scientific and technical information networks, each covering a region or a trade. We should collect foreign scientific and technical information and data extensively through diverse channels. We should register and organize exchanges of the research topics and scientific and technical results of our research institutions.
• It is essential to modernize scientific and technical information work and equip information institutions with modern facilities in the shortest possible time. In the next eight years we will set up a number of documentation retrieval centers and data bases and build a preliminary nationwide computer network of scientific and technical information and documentation retrieval centers. We should also strengthen the publication of scientific and technological material. 完

Chinese oceanographic survey vessel team at Woods Hole.

MAKING A DECISION ON PURCHASE OF FOREIGN TECHNOLOGY

The following illustration of the decision-making process in the PRC involves the purchasing of an oceanographic survey vessel for the Tsingtao Institute of Oceanology in Shantung. The development of oceanographic research and the acquisition of a large multidisciplinary research vessel is reportedly among the top twenty-five of the 108 major scientific projects mentioned in Fang I's speech at the March National Science Conference. As this story indicates, similar processes are afoot in many of China's scientific circles.

The Chinese decision to build a major oceanographic vessel began in the early months of 1977 when the Tsingtao Institute of Oceanology first contemplated the construction of a 300-foot, 4,000–5,000-dwt vessel. The Institute found its research efforts restricted by the relatively small size of the three vessels in its fleet, all converted in the 1950's from merchant marine vessels—1,000-dwt tons or less.

With roughly 500 scientific personnel, the Tsingtao Institute of Oceanology is the premier oceanographic research center in China. (The South China Oceanographic Institute, the only other important institute in this field in the PRC, was founded in the 1950's as a branch of the Tsingtao Institute, but later became independent.) Institute officials regard the acquisition of a sophisticated oceanographic vessel as essential for the development of oceanographic research in China up to advanced international standards. Moreover, such a vessel would contribute greatly to China's participation in the activities of the 1982 International Geophysical Year.

To gain support for the proposed research vessel, the Tsingtao Institute turned to its parent organization, the Chinese Academy of Sciences (CAS). With ministerial rank, the CAS is the most prestigious scientific organization in China. After reviewing the Tsingtao proposal, the Peking-based Academy granted its approval in May, 1977.

Confident of the value of acquiring a large research vessel, the Institute of Oceanology, along with the CAS, turned to the State Council to authorize a multimillion dollar budget for the research vessel. Approval came from the highest ranking administrative organ in China by December, 1977, less than a year after the project's conception.

With official authorization and, presumably, budgetary guidelines in hand, the Tsingtao Institute then set about investigating the best path for obtaining the vessel. This process included detailing exactly what the ship's specifications should be, where the vessel should be constructed, and what equipment should be placed on board.

As a result of their preliminary investigations, the Tsingtao study team made a complete list of require-

PRC oceanographic team at Scripps.

ments for the vessel (see below). The philosophy behind the decision was that China needed a flagship for its scientific fleet large enough to accommodate one hundred personnel: fifty scientists and fifty crew. The ship would have to be capable of working in all ocean environments, including arctic and antarctic, with sufficient workspace for a wide range of academic disciplines—biology, chemistry, geophysics, marine physics, and others.

One of the findings of the preliminary study was that many of the ship's scientific instruments would have to be purchased abroad in order to bring the ship's capabilities up to state-of-the-art levels. Also, it was concluded that in order to meet the Institute's construction schedule (launching one year from the signing of the shipbuilding contract), building the ship overseas might be required.

According to their information, the Chinese concluded that either US or Japanese shipyards would be the most appropriate for the construction of their vessel. Chinese yards, while capable of constructing such a ship, were backlogged with domestic orders; members of the PRC scientific community estimated that construction of such a vessel in their own country would take between two and three years.

By the early months of 1978, the Chinese oceanographic research vessel study team decided that a survey of foreign shipyards and equipment suppliers would be necessary to make their final selection. So, in March, an eleven-man team left Peking for Japan and the US. Their itinerary in April–May, 1978, included twenty days in America sandwiched between two nine-day stops in Japan.

The American leg of the trip was centered around equipment suppliers: Raytheon, Alcoa, Benthos, Sperry, Litton Resources, Geometrics-EG&G, Inter Ocean Systems, and Magnavox. Additionally, the Chinese requested printed information on another twenty-five key US manufacturers. In almost every facet of oceanographic research, the Chinese focused on the most advanced types of US products, especially those employing microprocessors and minicomputers.

Particular interest was expressed in an integrated navigation system including satellite positioning, doppler sonar, inertial navigation equipment, and gyrocompasses; advanced seismic equipment such as 24-section hydrophone streamers, air guns, side-scan sonar, and gravitometers; advanced propulsion units including cyclometers and controlled pitch units; and various other oceanographic units ranging from plankton nets to currentmeters to underwater cameras.

As part of their trip, the Chinese spent seven full working days with major American research institutes. During these visits, the PRC oceanographers were taken aboard some of the key US oceanographic research vessels, including the *Oceanus* and *Alcoa Sea Probe* at the Woods Hole Oceanographic Institute, the *Researcher* of the National Oceanographic and Atmospheric Administration, the *Thomas Washington* and the *Alpha Helix* at the Scripps Institution of Oceanography, and the *Kana Keoki* of the University of Hawaii. They also saw a slide presentation on Lamont-Doherty's research ships.

At each institute, the Chinese delegation solicited the opinions of American scientists as to the best possible design and construction of research vessels. At the Scripps Institution, the delegation met with the Scripps New Ship Committee, an ad hoc team of scientists responsible for overseeing the planning and construction of the institution's latest vessel, the *New Horizon*. During a morning session, the Chinese learned about an American institute's approach to acquiring a new vessel, including the details of opening the project to competitive bidding from the international shipbuilding industry.

To round out its tour of the American shipbuilding industry, the Chinese toured the Burton Shipyard in Port Arthur, Texas, through arrangements made by the American Offshore Company, and the Dillingham ship repair yard in Honolulu. Also in Hawaii, the delegates were given a complete tour of Pearl Harbor, where the nuclear aircraft carrier *Enterprise* as well as much of the US Navy's Pacific fleet was at berth.

Besides being favorably impressed by the sophistication and quality of American oceanographic equipment, the Chinese were influenced by many of the opinions expressed by American companies and scientists. In certain instances, the delegation's preconceived notions of what should be included on a modern oceanographic vessel were affected by information gained during their stay in the United States.

For instance, the Chinese had planned originally to include a large, centralized computer on board their new vessel; all of the experimental stations

would, in their plans, process their data through this central unit. Through the advice of various Americans, however, the delegates learned that a series of microprocessors and mini-computers in each of the laboratories would provide a more flexible and productive data processing system for their vessel.

In some cases, nevertheless, the Chinese chose to disregard the conventional wisdom of American oceanographers. Regarding the size of an oceanographic vessel, most Americans suggested that a smaller ship, perhaps 150–200 feet, would be more efficient than a 300-foot vessel. According to the Chinese, however, in China where scientific research is conducted in a more centralized fashion, the larger ship is a more rational selection.

The Chinese oceanographic research vessel delegation returned to Peking during the first ten days of May, 1978, after nearly six weeks abroad. Following a short rest, the study group was scheduled to reconvene in Peking to make the final decisions on what sort of vessel and equipment would be needed and where it should be acquired.

Final approval of their plans must be given by the CAS, which will then pass on purchase requests to the Ministry of Foreign Trade and, eventually, to the China National Machinery Import and Export Corporation (MACHIMPEX). By late summer, 1978, potential builders of the vessel are to be contacted by MACHIMPEX for quotations or bids, and later on in the year, or early in 1979, the equipment suppliers should receive similar requests.

The May meeting in Peking of the oceanographic study group will be one of a great many similar meetings going on in May and June in Peking. Members of the Chinese scientific community and manufacturing facilities will be holding conferences in China's capital to discuss what Chinese equipment will be produced for which Chinese institutes in 1979 and beyond, according to informed PRC sources.—HJ 完

PRELIMINARY PLANS FOR CHINESE OCEANOGRAPHIC RESEARCH VESSEL

(The following specifications were set by the Chinese oceanographic research vessel study group as preliminary design and functional requirements for the vessel.)

Accommodations: The ship shall be designed for 100, including fifty scientific personnel and fifty crew.

Berths: There should be 16 single staterooms, 20 double staterooms, and 16 four-man bunkrooms.

Computing Center: The vessel should contain a large computer center for processing data.

Crane: The vessel should have a crane with a 15-ton lifting capacity.

Crew: The crew will include a captain, a first mate, a second mate, a third mate, a fourth mate, and six crew members. In addition, there will be one chief engineer, a first engineer, a second engineer, a third engineer, and six boiler room personnel. The remaining crew slots will be filled by trainees. Each crew member will have fifty-two days of shore leave per year.

Dimensions: The vessel should be approximately 100 meters in length and 4,000–5,000 dwt in weight.

Geophysical Equipment: The vessel should include a complete geophysical system including a 12- or 24-part streamer with air gun, gravitometer, magnetometer, and side-scan sonar.

Ice Class: The vessel should be ice class A-1-A.

Laboratories: The vessel should include laboratories for marine biology, marine chemistry, meteorology, water service observation, high sky observation, meteorological transmission, and geology. Laboratories will include nets and sampling equipment as required for acquisition, analysis, and storage of data.

Navigation: The vessel should include an advanced integrated navigation system, including satellite positioning instruments, doppler sonar, inertial navigation, and gyrocompasses.

Special Rooms: The vessel should include a research library, a twenty- to thirty-person conference room, and a galley with gas appliances.

Speed: The vessel should have a maximum speed of 16 knots, with stable speed capabilities between one and eight knots.

Stability: The vessel should have very stable operating charecteristics with minimum possible roving angle and minimal vibration. It should be equipped with a stabilization system, dynamic positioning independent of anchors, deep sea anchors and stern and bow thrusters.

Underwater Cameras: The vessel should be equipped with underwater cameras capable of operating in depths up to 6,000 meters, as well as still photographic equipment.

Ventilation System: The vessel should include heating and air conditioning equipment suitable for tropical and arctic conditions. The engine room should have its own ventilation system, and throughout the ship there will be several laboratories with stabilized temperature and humidity.

Winches: The vessel should have an oceanographic depth of 15,000 meters, supplied by a deepwater winch (12,000-meter working depth), a medium water winch (6,000 meters), and a shallow water winch (3,000 meters), all with special cables.

Chemical fiber delegation poses at Du Pont, Wilmington; vice ministers Wang Jui-ting and Ku Hsiu-lien at front left.

Council Activities

The Council's second importer delegation to China visited Peking and other Chinese cities in April. The 11-person mission, concerned with consumer goods and handicrafts, spent two weeks in the PRC at the invitation of the CCPIT, and found a new readiness on the part of the Chinese to accept designs, materials and equipment from foreign firms for manufacturing of specific orders. A 20-person delegation from the newly formed China Chemical Fibre Corporation headed by the president of that corporation, a vice minister of textiles, and a 6-person textiles marketing mission from CHINATEX were sponsored by the National Council during April and May, 1978. The oceanographic survey vessel delegation from the Tsingtao Institute of Oceanology hosted by the Council departed for home from Hawaii on April 26, and on May 19, the Council's first agricultural mechanization delegation to the PRC arrived in Peking.

CONSUMER GOODS, HANDICRAFTS MISSION FINDS CHINESE READY TO ACCEPT DESIGNS, MATERIALS, EQUIPMENT FOR EXPORT ORDERS

The Council's consumer goods and handicrafts mission to the PRC, tagged the light industry delegation, visited the PRC for two weeks in April.

The 11-person delegation was in China to acquaint Chinese trade officials more fully with US requirements for footwear, straw products, toys, dinnerware, glassware, carpets, rugs, and personal accessories.

The mission, in China at the invitation of the CCPIT, gave presentations on various consumer goods to the China National Arts and Crafts Import and Export Corporation, the China National Native Produce and Animal By-Products Import and Export Corporation, the China National Export Commodities Packaging Corporation, the Chinese Inspection Bureau, and the Chinese National Chartering Corporation.

While in Peking, the delegation also met Ambassador Leonard Woodcock, chief of the US Liaison Office in Peking, and members of his staff.

The reports and presentations of the group were well received by the Chinese, as they covered those products which China indicated it is most interested in improving for export. Aside from industrial products, a presentation on packaging and packing of consumer goods was of special interest to the Chinese. This presentation was prepared in conjunction with a project carried out by Pratt Institute of New York on redesigning Chinese packages.

The delegation, after leaving Peking, visited Shanghai and Canton. As well as visiting factories and warehouses, the group was able to meet with representatives of the Peking, Tientsin, and Shanghai branches of the corporation concerned with consumer products.

According to the delegation, US importers are now encouraged to provide the Chinese with specific designs, some materials, molds and even equipment for manufacturing consumer goods to specific orders, be-

cause of shortages of certain raw materials in the PRC. The Chinese, while expressing their desire to cooperate with American importers, noted that certain planned improvements in supply arrangements will take time for China to accomplish. (Another importers' delegation from the UK's 48 Group was told the same things, in even more detail—see Importer's Notes.)

The members of the delegation were: Charles Rostov, Trans-Ocean Import Company, and Lee Sobin, Friendship International Corporation, cochairmen; Robert Eisenberg, Clipper Industries; Joseph Orshan, Mikasa; Louis Shanks, WJS, Inc.; Peter Siris, Sirco International Corporation; Beulah Sung, Wing On Company; Sydney Rich, Sidney Rich (Shoes) and Associates; and Melvin Nadel, Nadel & Sons Toy Corporation. Stanley Young, vice president of the National Council, accompanied the group.

CHEMICAL FIBER DELEGATION SEES US COAST TO COAST

The Chemical Fiber Technical Survey delegation from the People's Republic of China hosted by the Council arrived in Washington, DC, on May 7 for a three-week tour of the United States.

The 20-person delegation was led by Wang Jui-ting, president of the China National Chemical Fibre Corporation and vice minister of textiles. Chief adviser to the delegation was Madame Ku Hsiu-lien, vice minister of China's State Planning Commission. This was the first visit to the US by representatives of China's chemical fiber industry.

The primary interest of the mission was in chemical fiber technology. It toured American petrochemical plants, fiber production facilities, and research centers. Among the delegation's interests were hydrocracking, catalytic reforming, nylon 66 monomer and spinning, chemical intermediates, and synthetic fiber knitting.

The delegation visited Washington; Wilmington, Del.; Philadelphia; Richmond; Kinston and Wilmington, N.C.; Darlington; Atlanta; Huntsville; Charleston; New Orleans; Pascagoula; Pensacola; Chicago; Los Angeles; San Francisco; and Seattle.

Besides Mr. Wang and Mme. Ku, the members of the delegation were: Deputy Leader, Yu Li-ting, Vice-President, China National Chemical Fibre Corporation; Chien Tsien, Vice-President, China National Chemical Fibre Corporation; Chi Kuo-piao, Chief Engineer, China National Chemical Fibre Corporation; Kung Chao-yuan, General Manager, Shanghai Petrochemical Complex; Hsu Te-en, Manager, Fourth Department of China National Technical Import Corporation; Chu Hsiang-kun, Process Engineer, China National Chemical Fibre Corporation; Tung Yen-tseng, Mechanical Engineer, China National Chemical Fibre Corporation and Interpreter of Delegation; Chang Tsung-yi, Mechanical Engineer, China National Chemical Fibre Corporation; Tung Chuan, Process Engineer, Shanghai Petrochemical Complex; Sun Te-sheng, Mechanical Engineer, Shanghai Petrochemical Complex; Chao Shu-ying, Technician, China National Chemical Fibre Corporation; Chu Yen-tsao, Interpreter of Delegation, Staff Member, Fourth Department of China National Technical Import Corporation; Chen Li-hua, Interpreter, China National Chemical Fibre Corporation; Li Ching-tao, Process Engineer, China National Chemical Fibre Corporation; Chao Yuan-lu, Civil Engineer, China National Chemical Fibre Corporation; Chiang Shih-cheng, Process Engineer, China National Chemical Fibre Corporation; Teng Pei-hsin, Process Engineer, Shanghai Petrochemical Complex; Hung Chao-hsiang, Instrument Engineer, Shanghai Petrochemical Complex.

The group was accompanied by Christopher H. Phillips, president of the Council; Stanley Young, vice president; Suzanne Reynolds-Bennison; Richard Glover; Chen I-chuan; and Richard Chen. Peng Chin-po, commercial counsellor, and Jen Chih-chieh of the Liaison Office of the PRC also traveled with the mission.

Prior to the visit the group spent ten days in Germany and a week in England; they also visited Japan after leaving the US.

NATIONAL COUNCIL HOSTS OCEANOGRAPHIC DELEGATION IN US

An oceanographic research vessel study group from the People's Republic of China spent three weeks touring American oceanographic institutes and equipment suppliers during April under the sponsorship of the National Council. The eleven-member delegation from the Chinese Academy of Sciences Institute of Oceanology in Tsingtao, Shantung, came to the United States to investigate the construction of a complete multidisciplinary oceanographic research vessel, including an advanced oceanographic equipment system.

Led by Tseng Cheng-kuei, deputy director of the Institute of Oceanology and leading member of the Chinese scientific community, the group included specialists in a wide range of marine disciplines such as marine biology, navigation instruments, zoology, marine chemistry, geophysics, ship design, acoustical engineering, and marine physics.

In the course of its twenty-day stay in the United States, the Chinese delegation visited seven major American oceanographic equipment suppliers, two shipyards, and one shipbuilder. Through arrangements made by the Committee on Scholarly Communication with the People's Republic of China, the group also visited four of the leading oceanographic research centers in the United States as well as the

National Oceanographic and Atmospheric Administration (NOAA) in Washington, DC. The delegation went aboard thirteen oceanographic and seismic vessels while in America, including seven research ships, three specialty research vessels, two petroleum industry ships, and one equipment testing vessel.

The primary purpose of the Institute's mission was to assess the American industrial capability to build and outfit a large oceanographic vessel for worldwide research. The delegation also had several opportunities to discuss the design and operation of such a vessel with leading American scientists and industrial experts. In addition, members of the delegation held discussions with American oceanographers and marine specialists on their current research efforts.

Tseng Cheng-kuei, the leader of the delegation, received his doctorate from the University of Michigan in the 1930's and conducted research at the Scripps Institution of Oceanography in San Diego during the 1940's. On several occasions during the trip, Dr. Tseng was able to rekindle old friendships with his former colleagues in the American oceanographic community.

In addition to Dr. Tseng, the delegation to the US included Chang Tsung-hsun, chief engineer, Tientsin Navigation Instruments Factory; Yu Hsi-chun, captain of oceanological research ship, Institute of Oceanology (IO); Tai Li-jen, captain of oceanological research ship, IO; Liu Jui-yu, associate research fellow of IO and leading official of the Invertebrate Zoology Lab, CAS; Ku Hung-kan, assistant research fellow, IO; Chin Hsiang-lung, assistant research fellow, IO; Sun Sung-ho, engineer, Shanghai Ship Designing Institute; Ke Yi-hsing, engineer, IO; Chang Yu-lin, scientific research worker, IO; and Chang Chao-hsing, official of the Foreign Affairs Bureau of CAS.

The delegation was escorted throughout its stay in the United States by Howell Jackson of the National Council staff. Halsey Beemer of the CSCPRC accompanied the group to Lamont-Doherty and Woods Hole Laboratories. Nicholas Ludlow and Stephanie Green of the National Council also traveled with the delegation, and Ailsa Fenton provided administrative support.

COUNCIL HOSTS DINNER FOR TWO OIL GROUPS

The National Council's Petroleum Industry Committee hosted two different missions from the China Oil and Natural Gas Exploration and Development Corporation at a dinner in Houston May 17. Nine PRC engineers led by the corporation's managing director were here at the invitation of Otis Engineering Company to visit the Offshore Technology Conference as well as several additional geophysical exploration firms. Another six technicians attended who are spending three months in training at National Supply to learn how to operate the two drilling rigs purchased from the company last December.

Eighty-seven persons from 30 member companies of the Petroleum Industry Committee attended the banquet, at which Committee Chairman Robert W. Scott, Editor, *World Oil,* presented the OTC group with a set of newly published Composite Catalogs. The National Council thanks Scott for organizing the banquet.

Chinese attendees from the OTC group included: Lin Yun-ken, Managing Director, Oil and Natural Gas Corporation; Lu Pang-kan, Deputy Chief, Geophysical Department; and engineers Chao Chiu-chang, Kuang Shao-jung, Liu Sung-wei, Li Ching-chung, Yu Hsuan-li, Hua Feng-shan, and Liu Wan-kuo. Lo Kai-fu of the Chinese Liaison Office in Washington, DC, accompanied the delegation. The National Supply Platform Group included Wei Pu-jen, Deputy Chief, Department of Marine Development; and engineers Chao Chih-chiang, Chang Hou-wu, Hsu Chih-kang, Kung Chih-ming, and Chu Chung-wen. 完

COUNCIL HAS NEW OFFICER FOR EXPORTER SERVICES

Mr. Norman W. Getsinger joined the Council as Director of Exporter Services on June 1, 1978. Mr. Getsinger, 57, a senior Foreign Service Officer specializing in commercial and economic affairs, has served a total of ten years in Asia. His assignments with the State Department have included posts in Taiwan, Korea, and Hong Kong, as well as in Turkey and Italy.

Mr. Getsinger, who speaks fluent Chinese, has prepared and directed a number of commercial programs, exhibitions, and trade investment missions while posted abroad. In all of his assignments, he has worked closely with American businessmen and business organizations. At his overseas posts, Mr. Getsinger has worked to improve the climate for US business activity and coordinated the US mission departments to support the commercial objectives of the United States.

Mr. Getsinger was at one time the Watch Section Chief of the State Department's Operations Center providing 24-hour crisis management for the Secretary of State and the White House. He was also special assistant to a White House Department for six months.

His most recent post abroad was as Deputy Consul General in Hong Kong, 1974 through 1976, acting as executive director of America's largest Consulate General. Recently Mr. Getsinger has developed projects involving technology transfer in the private sector.

Mr. Getsinger received his B.A. degree from Harvard University and a Master's degree in International Relations from George Washington University. He is married and has four sons.

CHINA'S TRADE WITH NONMARKET NATIONS

Bohdan O. Szuprowicz

Foreign companies assessing the China market often fail to study a key part of the competition—that of the nonmarket nations, responsible for about a fifth of all China's foreign trade. Indeed, Romania and the Soviet Union are usually among China's top trading partners. Sino-Soviet trade has increased tenfold since 1970; Sino-Yugoslav trade is slated to expand to twenty times its 1976 level by 1985; and Romania has just signed a 10- to 15-year technology cooperation agreement with the PRC. Nonmarket nations are top suppliers to the PRC of aircraft, power-generating equipment, mining machinery, railroad equipment, agricultural machinery, machine tools, and trucks. Moreover, China's machinery imports from CMEA nations are rising steadily. This article describes the PRC's nonmarket trade and provides some fascinating insights into a number of facets of that trade, including China's chromium supplies from Albania and sugar from Cuba.

Bohdan O. Szuprowicz is president of 21st Century Research, an international market research firm specializing in high technology. He is coauthor with his wife Maria of Doing Business with the People's Republic of China, *published in May, 1978, by John Wiley and Sons. He contributed a major article on electronics in China to an earlier issue of this magazine.*

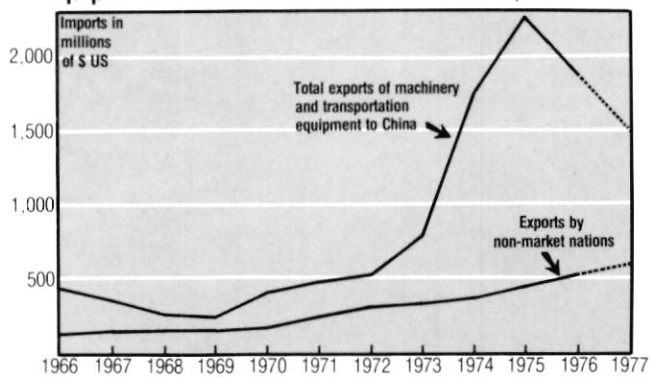
While total Chinese foreign trade has declined in recent years from its $14.6 billion peak in 1975, China's trade with nonmarket nations has continued the steady if unspectacular growth that resumed in 1970.

CMEA, which stands for Council for Mutual Economic Assistance (also abbreviated as COMECON), is an economic grouping of nonmarket nations that includes the Soviet Union, Poland, East Germany, Czechoslovakia, Romania, Hungary, Bulgaria, Cuba, and Mongolia. Albania has not been active in CMEA since 1961, while Yugoslavia has observer status but participates in some CMEA programs. Angola, Laos, North Korea, and Vietnam normally send observers to the annual CMEA meetings.

Trade with nonmarket nations presently represents about 18% of the PRC's total. This trade reached $2.35 billion in 1976, which is comparable to its previous all-time high of $2.98 billion in 1959 when it represented 69% of all the Chinese foreign trade.

The Soviet Union and Eastern European countries continue to be important suppliers of machinery and transportation equipment to China, contrary to a widespread belief that China shifted most of this trade towards Japan and developed capitalist countries in the West. While two-way Sino-CMEA trade accounts for only 12% of Chinese foreign trade, imports of critical machinery and transportation equipment from member nations made up 27% of all such imports in 1976 and may have reached 40% in 1977.

Growth in Exports of machinery and transportation equipment from non-market nations to China, 1966-1977



Source: Developed by 21st Century Research based on data from several U.S. Government Publications

Industrialized nonmarket countries are the leading suppliers to the PRC of aircraft, electric power generating equipment, coal mining machinery and land-based oil drilling rigs. Albania provides most of China's chromium supply, and Cuba supplies almost half of Chinese sugar imports. Centrally planned nations are also among the PRC's top suppliers of agricultural machinery, construction equipment, internal combustion engines, machine tools, trucks, ships, and locomotives.

China's imports of machinery and transportation equipment from nonmarket countries remained level during the Cultural Revolution while comparable imports from Japan and capitalist countries declined. In 1968 and 1969 China's imports of machinery and transportation equipment from communist countries accounted for over 50% of all such imports, and even in 1972 they constituted 54% of this total.

CMEA Equipment Exports to China Rising

When massive purchases of turnkey plants in Japan, Western Europe, and the United States resulted in a large upsurge of machinery imports by China from those areas, the CMEA share of these imports declined rapidly to a low of 19% in 1974 and 1975, but the volume of CMEA shipments to China continued to increase. By 1976 China's imports of machinery and transportation equipment from nonmarket, nations reached $522 million.

During the last two years Chinese imports of machinery and transportation equipment from communist countries have continued to rise and may have reached $580 million in 1977, while imports from Japan and Western Europe of such products dropped from a high of about $1.9 billion in 1975 down to an estimated $920 million in 1977. This suggests that, now that shipments of equipment for construction of the turnkey plants have been received, China has decided to reestablish its previous balance in imports of machinery and transportation equipment. This balance consists of three approximately equal supplier groups; namely, the nonmarket nations, Japan, and the industrial countries of Western Europe and North America.

Because there is a relatively low demand for Chinese products and even Chinese oil among the non-communist developed countries, trade with communist nations offers considerable benefits to China. It is conducted by means of annual commodity exchange agreements that do not necessitate much expenditure of hard currencies. Such trade is attractive to countries in Eastern Europe that are also short of hard currencies.

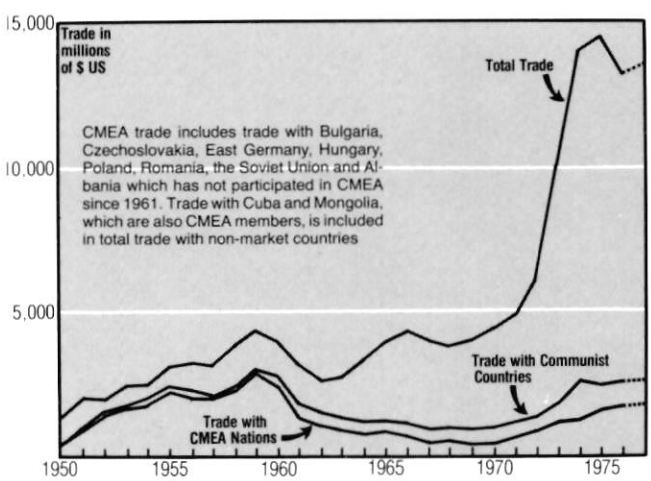
This trade is likely to gain in importance as Soviet oil production slows down in the early 1980's and the price of Soviet oil to East European countries increases to world levels by 1980. Several CMEA members are already looking for alternative sources of oil in the Arab world, Iran, and even Angola, which already enjoys observer status in the CMEA community.

It is now questionable whether China will have enough oil for export to supply a major portion of the demand of East European countries, which already import 68 million tons of crude annually, while Chinese production is probably only approaching 100 million tons per year and domestic demand is growing rapidly. On the other hand, East European countries, with an increasing output of machinery that is hard to sell in the West, may welcome an opportunity to reduce their dependence on Soviet oil supplies without the need to spend hard currencies.

Nuclear Power Tactics

There are signs that the Soviet Union is already counteracting any such possible Sino-East European energy trade developments by providing nuclear power technology and reactors for generation of electricity. There are already 24 large Soviet nuclear power reactors in operation or in construction stages

China's Trade with Non-Market Nations



Source: China: A Reassessment of the Economy, Joint Economic Committee, U.S. Congress, July 1975; U.S. National Foreign Assessment Center, China: International Trade 1976-1977, ER77-10674, published November 1977, Washington DC, USA

TRADE WITH CHINA AS PERCENTAGE OF TOTAL TRADE OF CMEA COUNTRIES AND SELECTED MAJOR CAPITALIST COUNTRIES

(millions of dollars in 1976)

Country	Total Trade	Total Trade with China	China Trade as Percent of Total Trade
CMEA	**175,905**	**1,726**	**0.98**
Soviet Union	75,682	416	0.55
Poland	24,956	106	0.42
East Germany	24,827	200	0.80
Czechoslovakia	19,100	120	0.63
Romania	12,240	453	3.70
Hungary	10,465	71	0.68
Bulgaria	8,635	35	0.40
Cuba	6,400	175	2.73
Mongolia	750	na	na
Albania	254[1]	150[2]	59.00
Other Nonmarket Countries	**15,549**	**651**	**4.19**
Far East[3]	3,489	620	17.80
Yugoslavia	12,060	31	0.25
Major Capitalist Countries	**976,938**	**6,170**	**0.63**
United States	244,372	351	0.14
Japan	131,915	3,052	2.31
West Germany	190,186	952	0.50
France	121,553	571	0.47
United Kingdom	102,242	277	0.27
Canada	80,719	309	0.38
Italy	80,383	278	0.35
Australia	25,568	380	1.49

Source: US Government Handbook of Economic Statistics 1977, ER-77-10537.

[1] Trade estimate available only for 1974.

[2] Estimate based on reported 70% of total Albanian trade in 1974 which is believed to have declined in recent years but remains substantial.

[3] Includes Mongolia, North Korea, Vietnam, Laos and Cambodia.

CHINA: TRADE WITH CMEA COUNTRIES

(millions of dollars)

Rank in 1976	Country	1966	1970	1971	1972	1973	1974	1975	1976
1	Romania	66	108	188	218	265	350	435	453
2	Soviet Union	320	45	154	255	272	282	279	416
3	East Germany	68	78	81	98	109	148	220	200
4	Cuba	173	150	148	127	189	315	200	175
5	Albania[1]	95	115	120	130	150	170	160	150
6	Czechoslovakia	45	56	59	57	84	104	128	120
7	Poland	53	50	58	62	67	93	103	106
8	Hungary	na	na	31	53	67	54	97	71
9	Bulgaria	na	na	26	7	13	20	23	35
10	Yugoslavia[2]	—[3]	—	—	4	80	144	30	31

Source: United Nations International Trade Statistics; U.S. Congress, PRC: An Economic Assessment, May, 1975; US National Foreign Assessment Center, China: International Trade 1976-1977, November, 1977; US Government Research Aid, PRC; International Trade Handbook October, 1975, and October, 1976.

[1] Estimates for 1971–1976 are made by the author from total trade in 1974 and believed percentage of trade with China at that time. Albania was a CMEA member but did not participate in CMEA activities since 1961.

[2] Yugoslavia is not a CMEA member but has observer status and participates in some CMEA programs.

[3] Dash represents either no transactions or information not available.

outside of the Soviet Union in most CMEA countries, including two units in Cuba and one in Romania where oil production now barely meets domestic demand. The Soviet Union has also signed a contract to provide a nuclear power station for Libya, which is a major oil exporting country at present.

By comparison China could not supply the nuclear power alternative to its energy clients in Eastern Europe or Asia. On the other hand, it has recently developed contacts with West German and French nuclear establishments and expressed repeated interest in Western nuclear power technology. This suggests the likelihood that China may be considering Western nuclear power technology for its own use and as a possible alternative to Soviet nuclear power technology, which could be offered to its future CMEA energy clients.

The Soviet Union alternated with Romania as China's largest nonmarket trading partner during the early 1970's, but Sino-Romanian trade surged ahead in 1974 and Romania has been the largest communist trade partner of China ever since.

Except in the case of Albania, which has received Chinese loans to finance its imports, trade of communist countries into the PRC is relatively balanced from year to year, although China has tolerated some overall trade deficits in recent years. However, overall Chinese trade with all the communist countries including North Korea, Vietnam, Cambodia, and Laos has shown a trade surplus ever since 1956.

Bilateral Agreements

Bilateral trade agreements on goods exchanges and payment arrangements are signed alternatively in Peking and the capital of each communist country every other year. These arrangements are concluded during the first half of each calendar year normally starting with Romania and Albania at the beginning of the year and concluding with Poland, Mongolia and the Soviet Union by June or July. CMEA countries, which are first to sign the agreements each year, probably have certain trading advantages in getting first choice of Chinese goods for export in a particular year.

Chinese relations and trade with individual nonmarket nations differ considerably and generalizations are not possible because various political and strategic factors come into play. In order to present the most pertinent aspects of this trade, individual discussions of relations with each CMEA country, in order of trade volume into the PRC, follow this summary.

ROMANIA—China's Top Communist Trading Partner Supplies Petroleum Equipment

In 1976 Romania was China's fifth largest trading partner after Japan, Hong Kong, West Germany, and France. Sino-Romanian trade reached $453 million in 1976, and the 1977 protocol signed in Bucharest in January of that year provided for a further 20 percent increase in trade. This may mean that the 1977 Sino-Romanian trade could be in the order of $540 million and that Romania may now displace France as the PRC's fourth largest trading partner.

Since 1973 Romania has been the largest communist trading partner of China. Its special relationship with China is often attributed to Romania's independent stance vis-a-vis CMEA trade and manufacturing programs. However, Romania is now participating more actively in some CMEA programs and most of its trade is conducted with CMEA partners and West

EAST EUROPEAN EXHIBITIONS IN CHINA

Year	Country	Location	Type of Exhibition or Products
1971	Hungary	Peking	Medical Instruments, Medicines
	Romania	Peking	Petroleum Exploration, Industrial
	Yugoslavia	Peking	Industrial
1972	Bulgaria	Tientsin	Industrial Products
	Bulgaria	Peking	Medical Products
	Hungary	Tientsin	Machinery and Motor Vehicles
1973	East Germany	Shanghai	Machine Tools
1974	Romania	Tientsin	Electronics, Computer, Telecommunications
	Hungary	Peking	Electric Lamps, Instruments
	East Germany	Shenyang	Agricultural Machinery
	Poland	Tientsin	Mining Equipment, Motor Vehicles
	Poland	Peking	Mining Equipment, Construction Equipment
1975	East Germany		(Exhibition planned, not known if held)
1976	Hungary	Peking	Telecommunications, Instruments
	Yugoslavia	Peking	Machine Tools
	East Germany	Shanghai	Electronics, Instruments

Source: Directory of Foreign Trade Exhibitions in China, National Council for US-China Trade, 1977.

ROMANIA: MAJOR COMMODITY EXPORTS TO CHINA

(millions of dollars unless otherwise noted)

Commodity Description	1965	1970	1971	1972	1973
Total Exports	**26.8**	**72.2**	**99.7**	**122.8**	**128.0**
Crude minerals and metals	—	1.1	4.5	3.6	—
Petroleum products *	110.4	84.4	70.9	87.5	46.6
Rolled ferrous products *	—	30.1	38.2	61.3	57.5
Tubes *	25.0	30.7	32.2	41.3	44.2
Aluminum products *	—	1.6	10.1	8.9	8.0
Polyethelene granules *	.5	3.2	2.0	1.8	1.1
Phenol *	—	1.5	3.0	3.0	2.2
Methanol *	—	.9	.9	3.6	3.0
Carbide *	—	—	20.5	16.6	25.5
Carbon black *	.6	7.5	9.8	9.2	6.1
Chemical fertilizer *	—	43.7	54.9	61.9	217.9
Cement *	—	—	—	10.1	16.2
Medicines	.06	.13	.18	.08	.02
Plywood (000's cu.m.)	6.9	—	.5	—	3.0
Machinery and transport equipment	**14.6**	**29.9**	**56.5**	**63.9**	**54.0**
Power generating equipment	.4	.03	.02	.59	1.22
Tractors	1.4	.3	.08	.49	—
Agricultural machines and parts	.8	2.5	2.57	2.09	1.76
Machine tools	.5	.63	.97	1.08	.76
Oil exploration/operation equipment	3.0	6.51	19.04	19.84	14.64
Pumps and compressors	.2	—	.14	—	—
Electrotechnical equipment	.02	1.07	1.27	1.67	1.20
Railway tank cars	—	3.42	5.83	6.35	7.14
Trucks, dump trucks, tractors	6.0	12.46	13.89	19.01	14.84
Field cars, jeeps	.6	.80	.82	.86	.98
Ships and equipment	1.80	.20	1.89	2.59	2.96

* Indicates value in thousands of tons.

Note: Values converted from lei by official exchange rates in force during particular years. Some export figures are estimates derived from average commodity exports to all countries and unit quantities exported to China.

Source: Compiled from Romanian Foreign Trade Yearbook 1974, Bucharest.

Germany. Trade with China, which was as high as five to six percent in previous years, now accounts for only three percent of total Romanian trade; and China is only the ninth largest trading partner of Romania.

Romania's special value to China lies in its well-established oil production technology and relatively well developed petrochemical technology. During the early 1960's, following the withdrawal of Soviet assistance, China turned to Romania for petroleum exploration, production, and processing technology just as it had turned to Albania for supply of strategic metals. Romania and Albania are the only East European countries that have sufficient domestic energy resources and do not have to rely on Soviet oil supplies. Consequently, there are few economic sanctions that the Soviet Union can invoke against them.

Sino-Romania relations did not really take off until 1965. That year, during a national Romanian exhibition in Peking, Romania first demonstrated its oil drilling rigs capable of drilling to a depth of 5,000 meters. Such rigs were not available in China. As a result, two Romanian oil rigs were sold that year, and exports increased rapidly to 37 units in 1971 and 1972. Since 1974 Romanian oil rigs are always indicated in Sino-Romanian trade agreements, and since 1965 Romania is believed to have supplied the largest amount of land-based oil-drilling equipment to China. Romania oil rigs are of particular interest to China because they are based on original American technology.

Romania's special status as China's trade partner is also underscored by long-term agreements that it has been signing with China. In February, 1971, the Sino-Romanian trade agreement covering the 1972–1975 period was the first such long-term agreement signed by China with any CMEA country since the 1950's.

In January, 1976, the Romanian minister of foreign trade and international economic cooperation, Ion Patan, and Li Chiang, the Chinese minister of foreign trade, signed an agreement in Peking to cover goods exchanges for the 1976–1980 period, as well as a pro-

AGREEMENT BETWEEN THE SOCIALIST REPUBLIC OF ROMANIA AND THE PRC ON LONG-TERM ECONOMIC AND TECHNICAL COOPERATION, MAY 13, 1978

The Socialist Republic of Romania and the People's Republic of China, inspired by the desire to further develop and strengthen relations of friendship between the two countries and peoples on the basis of respect for the principles of national independence and sovereignty, equality of rights, noninterference in international affairs, taking into consideration the achievements and experience of the two countries in socialist construction and in the field of economic and technical cooperation, and with a view to further developing relations of economic and technical cooperation between their countries, have agreed on the following:

ARTICLE I

1. In the spirit of existing relations of friendship between the two countries, the Socialist Republic of Romania and the PRC support one another in economic and technical cooperation, according to their needs and possibilities, so as to contribute to the economic development of both countries.

2. Economic and technical cooperation incorporates the following:

A. Mutual deliveries of machines, equipment and installations, of technical designs and documentation, and of materials to build industrial, agricultural and other projects to be agreed upon.

B. Mutual exchange of technical engineering staff delegations to grant technical assistance at projects agreed upon.

C. Mutual training of technicians and trainees for projects agreed upon.

3. The concrete targets and conditions for achieving these projects will be agreed upon on the basis of intergovernmental protocols concluded for each project.

ARTICLE II

1. Prices of machines, equipment, installations and materials that will be mutually delivered within the framework of projects agreed upon will be established on the basis of world market prices.

2. Conditions and manner of payments and the currency settlement for projects agreed upon will be established on the basis of intergovernmental protocols at the conclusion of each project.

ARTICLE III

1. Expenses regarding technical assistance, training and other expenses required for carrying out projects agreed upon will be established by contracts.

ARTICLE IV

1. Technical-engineering staff and trainees sent by one signatory to the country of the other signatory are under duty to respect the laws and regulations in force in that country, to carry out their activity within the framework of the project agreed upon and to keep secret those documents and documentation received in such activity.

2. The respective country shall facilitate the process of the training of technicians and trainees.

3. Living and working conditions for such technical-engineering staff and for trainees will be established in a government protocol.

ARTICLE V

1. To fulfill the provisions of the present agreement under favorable conditions, the Socialist Republic of Romania appoints the Ministry of Foreign Trade and International Economic Cooperation and the PRC will appoint the Ministry of Economic Relations with Foreign Countries as bodies to carry out this agreement.

ARTICLE VI

1. The present agreement will be submitted for ratification by both signatories in keeping with each of these countries' laws, and will come into force on the date of ratification by both sides.

2. The present agreement is valid ten years and its validity will be extended automatically for a further 5 years if neither of the two signatories cancels it in writing six months before its validity expires.

ARTICLE VII

Obligations envisaged in the protocols and contracts concluded on the basis of the present agreement will continue to be fulfilled even after its expiry until the date these obligations have been completely fulfilled.

The present agreement was signed in Peking on May 13, 1978, in two Romanian and Chinese-language original copies, both texts having the same validity.

On behalf of the Socialist Republic of Romania, Nicolae Ceaucescu;

On behalf of the PRC, Hua Kuo-feng.

tocol on exchanges and payments for 1976. This long-term agreement indicated that Romania will continue to supply China with drilling rigs, trucks, diesel locomotives, railway tank cars, bearings, and spare parts, as well as products of chemical and metallurgical industries. The 1977 trade and payments agreement confirmed these product lines.

The latest China-Romanian protocol on goods exchanges and payments, for 1978, was signed in Peking on December 21, 1977. According to the protocol, the PRC will supply Romania with machine tools and presses, metal testing instruments, medical instruments and apparatus, coke, rolled steel, nonferrous metals, ferroalloys, various chemicals, bauxite, natural rubber, cotton, textiles, rice, fish, canned fruit and vegetables, and other traditional consumer goods.

In return, Romania will deliver to China increased quantities of oil field equipment and plant, trucks, mainline and mine diesel-electric locomotives, computers, television tubes, ball bearings, steel tubes and rolled goods, aluminum and steel cables, carbide, carbon black and other chemicals, plywood, and other goods. The protocol indicated important growth in the mutual goods supplies compared with the 1977 provisions.

On May 13, 1978, China and Romania signed a 10- to 15-year agreement on economic and technical cooperation. As part of a program to develop closer relations with Romania, China extended the country $265 million to $300 million of credits. The first aid was in the form of a $21 million grant in June, 1970, for lower Danube flood relief, while larger amounts were extended later that year as development credit. Under this program Chinese technicians are constructing light industrial projects for production of ceramics, glass, food processing, and other plants.

There is an excellent economic match between Romania and China, which could be the basis for further expansion of trade. Romania's oil resources consist mostly of old oil fields that are significantly depleted and, while they supply most of domestic demand, exports of Romanian oil are no longer possible. However, Romania has a significant petrochemical industry that requires increasing amounts of petroleum products as inputs for production of fertilizers, synthetics, and other products. Petroleum for the Romanian petrochemical industry has been supplied by China—in 1975 the first exports of Chinese oil reached Romania. In 1976 these shipments were double those of the previous year, reaching almost 500,000 tons.

Independently of CMEA Romania developed its own iron and steel industry, but it has to import iron ore, coking coal, and metallurgical coke to keep this industry going. On the other hand, it has a ready market for steel products in China. By 1973 Romania was the third largest steel products supplier to China after Japan and West Germany. China, in return, is in an excellent position to supply Romania with coking coal and coke, and in 1973 almost 300,000 tons of metallurgical coke was imported by Romania from China.

Considering the fact that China is expected to continue to import large quantities of steel for some years to come, this particular trade has good prospects of significant expansion in the future. Romania is also importing chromite from Albania so it can produce the high-quality stainless steels and pipes which China needs. Because this trade is conducted by means of bilateral agreements, it is not influenced by availability of hard currency and could be used to moderate China's steel trade with other countries.

Yugoslav President Tito meets Hua Kuo-feng, Peking, August, 1977 (Photo: Hsinhua)

SINO-SOVIET TRADE—Aircraft, Power Generation Equipment Are Top Soviet Exports to PRC

The Soviet Union was the sixth largest trade partner of China in 1976 after Japan, Hong Kong, West Germany, France, and Romania. It was probably the third largest machinery and transportation equipment supplier to the PRC in 1977 after Japan and Romania, as a result of drastic declines in West German and French exports to China in recent years. The Soviet Union is a leading supplier of aircraft, electric power generating equipment, trucks, timber, and various spare parts to China.

Total Sino-Soviet trade increased by 50 percent in value from $280 million in 1975 to $416 million in 1976. It is argued that a change in pricing policy for goods in Sino-Soviet trade from "fixed" prices to valuation based on current international price levels is responsible for this increase in trade value, but an analysis of Soviet foreign trade statistics also reveals that larger quantities of Soviet equipment have been shipped to China as well. In 1976 China imported almost 1,000 Soviet trucks, well over twice as many as in 1975, and imports of steel pipe increased to over 12,000 tons, the highest for several years.

On the other hand, Chinese exports of nonferrous metals to the Soviet Union appear to have decreased in recent years while the value of total Chinese exports to the USSR has increased. It is possible that instead of Sino-Soviet trade being undervalued there may have been some inflation; but it is unlikely that it accounts for a significant portion of increase in Sino-Soviet trade levels, particularly as trade with most noncommunist countries has been reduced all the way across the board during the same period of time. A definite attempt to increase trade by both parties appears more likely.

Much of Sino-Soviet trade results from China's requirements for spare parts and additional equipment to expand Soviet-designed plants, but there are several areas where trade could expand with considerable benefits to both sides. One such area includes strategic

metals. The Soviet Union could again supply China with chromium, nickel, and cobalt, which China has to import from Albania and other countries in the West. In return China could save the Soviet Union at least $50 million annually in hard currencies by supplying all Soviet requirements for or imports of tin. China is already a major supplier to the Russians of fluorspar, some antimony, lead, and tungsten. Supply of Chinese oil to the Soviet Far East areas is another trade opportunity that may become significant as Soviet oil production continues to slow down while Soviet demand increases rapidly.

By far the most important Soviet exports to China are aircraft, which accounted for $60 million in 1976 or about 25 percent of all Chinese imports from the Soviet Union. Since 1965 the Soviet Union has supplied an estimated $380 million worth of aircraft to China, slightly more than the combined aircraft sales to the PRC of France, United Kingdom, West Germany, and the United States during the same period. In fact, in 1975 China was the fourth largest aircraft export market of the Soviet Union after Hungary, East Germany, and Iraq, accounting for almost 10 percent of Soviet aircraft exports.

The most popular Soviet aircraft export to the PRC appears to be the Antonov An-24 twin-turboprop 44-passenger transport plane, which is believed to be particularly suitable for service on Chinese airfields. Out of a total fleet of about 600 aircraft operated by Civil Aviation Administration of China (CAAC), probably up to 80 percent are Soviet imports or Soviet-designed planes and helicopters. Continuing imports of Soviet equipment and spare parts are dictated by this large and costly initial investment in equipment, training of pilots and maintenance crews, and aviation support facilities.

Present Soviet aircraft exports to China consist strictly of civil aircraft and spare parts in contrast to the 1950's when large quantities of MIG fighters as well as Soviet bombers were exported and the Soviets assisted in setting up licensed aircraft and aero-engine production at the Shenyang Aircraft Factories. More recent reports indicate that the Soviets have refused to sell China more advanced MIG-25 and Sukhoi supersonic fighters and the Antonov An-30 special equipped version of the An-24 used in aerial surveys. This could explain Chinese interest in obtaining such aircraft from Western suppliers and the decision to purchase Rolls-Royce Spey jet engines and construct their own supersonic fighter planes.

The second largest import category from the USSR is electric power generation equipment, which reached a total of $58 million in 1976 and included two large 200-mw steam turbines valued at about $12.7 million. The present import level of power generating equipment from the Soviet Union is about twice the previous high of $24.4 million in 1959 when Soviet-Chinese relations and trade were at their all-time high.

At least ten major electric power equipment manufacturing plants have been built in China with Soviet

MAJOR COMMODITIES IN SINO-SOVIET TRADE

Description	Unit of Measure	1971	1972	1973	1974	1975	1976
Imports							
Machine Tools	Units	203	169	119	4	11	9
Steam Turbines	Units	—	4	7	1	2	2
	MW (megawatts)	—	300	700	200	400	400
Trucks	Units	423	384	544	384	398	968
	Millions of Rubles	2.8	6.4	9.6	7.2	9.8	16.6
Aircraft	Millions of Rubles	30.4	44.2	41.6	49.6	28.7	45.3
Steel Pipe	Tons	3,658	5,927	411	9,574	10,239	12,104
Sawn Timber	Cu. Meters	—	—	490,200	586,800	167,500	586,200
Exports							
Tungsten Conc.	Tons	4,792	5,249	3,650	3,900	na	na
Molybdenum Conc.	Tons	200	295	—	—	na	na
Fluorspar	Tons	16,300	40,200	49,200	84,840	146,000[1]	275,000[1]
Tin	Tons	500	800	501	500		
Antimony	Tons	450	150	250	100	100	450
Mercury	Tons	100	50	—	—		
Tea	Tons	1,000	820	1,300	—	—	4,120
Textiles, fabrics	Millions of Rubles	2.5	10.4	4.9	6.7	8.5	9.4
Clothing	Millions of Rubles	20.9	37.0	35.5	39.9	33.2	37.6

Source: Vneshnaya Torgovlya SSSR, Yearbooks for 1972, 1973, 1974, 1975, 1976 and 1977 published by Soviet Ministry of Foreign Trade, Moscow, USSR.

[1] Tonnage derived from average price for fluorspar published in 1974.

Note: 1 Ruble = 1.36 US$ since 1974, 1.25 US$ in 1972, and 1.11 US$ before 1972.

USSR: MAJOR COMMODITY EXPORTS TO CHINA
(millions of dollars)

Commodity Description	1965	1970	1971	1972	1973	1974	1975	1976
Total Exports	**191.7**	**20.0**	**77.8**	**125.2**	**133.7**	**147.4**	**129.0**	**238.0**
Machinery and transport equipment	**76.9**	**16.4**	**54.6**	**91.7**	**101.1**	**109.5**	**95.1**	**167.1**
Machine tools	5.3	1.4	3.8	5.2	1.9	.07	.4	.2
Power and electrical equipment	2.1	2.0	1.6	12.8	17.3	3.0	24.8	59.7
Steam turbines *	—	—	—	9.3	16.4	2.8	6.7	12.7
Mining and oil exploration	.9	.2	.1	—	—	—	—	—
Materials handling equipment	.02	.97	.4	.5	.003	1.0	.5	1.1
Food/light industry equipment	.03	—	—	—	—	—	—	—
Paper, chemical, construction	8.9	.08	.03	.9	.13	.2	—	—
Compressors *	—	—	—	2.0	.1	.5	.3	—
Turnkey plant equipment	3.9	—	—	—	—	—	—	—
Instruments/medical equipment	9.1	.35	2.5	2.5	1.1	.2	.3	.8
Bearings *	.2	.05	1.9	2.1	.8	.3	.4	—
Tractors/agricultural equipment	12.8	2.2	3.6	3.0	3.1	3.0	3.4	3.8
Transport equipment	32.7	8.6	41.4	64.5	73.1	80.6	50.6	90.4
Motor vehicles *	18.9	3.8	7.6	10.9	16.9	13.2	18.6	30.4
Air transport facilities *	13.8	4.8	33.8	53.5	52.2	67.4	39.0	60.0
Industrial raw materials	**71.2**	**—**	**—**	**—**	**—**	**14.0**	**—**	**—**
Petroleum products	2.2	—	—	—	—	—	—	—
Iron and steel	34.1	—	6.1	9.7	5.0	5.9	6.1	7.7
Tin plated and special steel	—	—	—	.6	.4	.6	1.2	.9
Steel pipes	—	—	.1	1.5	.1	2.3	3.6	4.5
Nonferrous metals	3.8	—	—	—	—	—	—	—
Aluminum	—	—	.7	—	—	—	—	—
Chemical products	**—**	**—**	**.6**	**.6**	**.8**	**1.1**	**1.9**	**3.2**
Explosives	—	1.3	4.0	5.9	3.2	—	—	—
Rubber tires	—	.02	.09	—	—	—	—	—
Wood products	—	—	—	2.6	11.3	—	5.8	24.3
Printed material	—	.2	.2	.3	.3	—	.4	.3
Other	41.4	—	—	—	—	13.0	—	—

Source: Vneshnaya Torgovlia SSSR, Statisticheskii Obzor, Ministry of Foreign Trade Moscow, USSR; United Nations International Trade Statistics, New York; U.S. Government National Foreign Assessment Center, "China: International Trade 1976-1977, A Research Paper, ER77-10674, November 1977.

* Included in general category shown above.

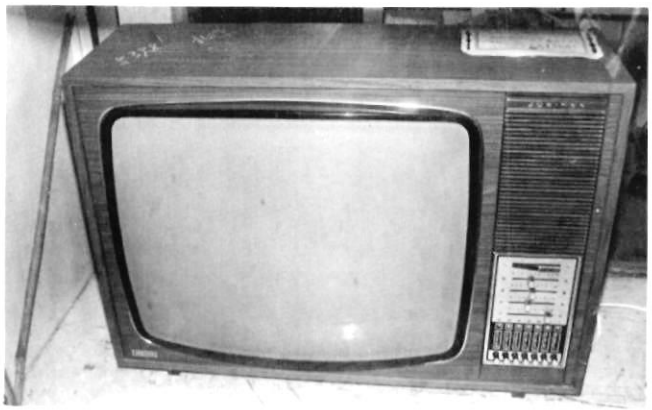
assistance during the 1950's, and many power plants in China use Soviet-built or Soviet-designed generating equipment. In many instances the most effective method of expanding generating capacity of existing large power plants is to import additional Soviet turbines and generating equipment compatible with existing installations.

In 1975 exports of power generating equipment to China accounted for almost ten percent of total Soviet exports of such equipment, and the Soviet Union regained its leading role as the foremost supplier of power generating equipment.

Imports of Soviet trucks also more than doubled in 1976; their value, at $22 million, was second only to shipments of trucks from Japan. Together with imports of trucks, there are significant imports of spare parts and internal combustion engines for the large existing fleet of Soviet and Soviet-type trucks operating throughout China. At the same time Peking's imports of trucks from Western suppliers such as France and Italy, which previously supplied significant quantities, have dwindled to almost nothing.

Although Chinese imports of steel pipe from the Soviet Union increased to $9 million in 1976, these represent still a very small percentage of all such imports that continue to come largely from major capitalist countries. Another large PRC import from the Soviet Union is timber, worth over $24 million in 1976. In addition, the Soviet Union also exports to China spare parts for construction and mining equipment, valves, compressors, tractor parts, rolled steel products, tinned steel sheet, and some chemicals.

Major Chinese exports to the Soviet Union include textile fabrics, clothing, and footwear, together valued at $62 million in 1976. The Soviet Union presents a relatively large market where textiles and fruits are always in demand. This is an additional aspect of the Sino-Soviet trade that presents considerable future po-



24-inch "Jupiter" black-and-white TV set, product of Hungary's Videoton Corp., on sale in Canton, spring 1978.

tential for increase of Chinese exports. In 1976 China already exported tea, tobacco, dairy products, frozen meats, lemons, tangerines, and apples to the Soviet Union valued at about $30 million. There are also small exports of domestic utensils and appliances made in China for Soviet consumption.

The 1977 Sino-Soviet trade agreement, which was signed in Moscow on July 27, 1977, provides for trade at $423 million in 1977, which is about 1.5% above the 1976 level. This may mean that similar Sino-Soviet trade levels will be maintained throughout the current 1976–1980 five-year plan. That would place the Soviet Union among the top five trading partners of China for the immediate future unless trade with Western Europe increases dramatically during the next two years as a result of the agreement between China and the European community.

The 1978 Sino-Soviet agreement for goods exchange and payments was signed in Peking on April 17, 1978, but no details of commodities or increase in trade were given.

It is expected that Sino-Soviet trade will consist of additional imports from the Soviet Union of aircraft and parts, trucks, power generating equipment, perhaps more machine tools, steel products, and timber. Chinese exports to the USSR will continue to consist of nonferrous metals such as tungsten, molybdenum, lead, antimony, mercury and tin, with perhaps increasing amounts of fluorspar, textile fabrics and clothing, tea, fruits and domestic appliances.

The Sino-Soviet trade today is still only 20 percent of its previous high of $2.1 billion in 1959, but it has been increasing steadily since 1970 when it was at an all-time low of only $45 million. It is now almost ten times larger; this growth occurred during the last seven years. Although Sino-Soviet trade represents only three percent of the total Chinese foreign trade, the Soviet Union supplies about 11 percent of all the machinery and transportation equipment imported by China. It is likely that its market share will continue to increase in the future as relations between the two countries improve and economic trade realities create new business opportunities.

EAST GERMANY—Transport Equipment Chief Export to PRC

The German Democratic Republic (GDR) is the third largest nonmarket trading partner of China after Romania and the Soviet Union, with total two-way trade reaching $220 million in 1975 and dropping to $200 million in 1976. The most recent trade agreement between the two countries, signed on January 19, 1978, called for exchange of GDR motor buses, diesel engines, machine tools, and scientific instruments for Chinese nonferrous metals, foodstuffs, textiles, and other goods.

During the 1950's the GDR was the largest trade partner of China in Eastern Europe and also assisted in the construction of several major industrial equipment factories in China. At least 100 agreements for assistance in construction of major plants in China were signed by Eastern European countries as compared with 291 such projects undertaken by the Soviet Union. Although specific breakdowns are not available, the GDR and Czechoslovakia are believed to have been the main contributors. Two thirds of these projects were completed and put in operation by 1959, including electric power, chemicals, and sugar refining plants.

One of the major plants built with GDR aid in the 1957–1960 period was the Sian thermo-technical instruments and meters plant in Shensi province, which makes temperature and pressure regulating instruments. The Peking Radio Equipment and Materials Plant No. 1, completed with GDR assistance, was one of the first basic electronics plants in China. Imported GDR production equipment also was the key element in Peking Radio Equipment and Materials Plant No. 2.

One of the largest plants in the machine tool industry, the Chengchou Abrasive Materials Plant, was built with GDR aid and specializes in production of grinding tools. East German equipment, particularly machine tools, was often imported to equip various industrial plants in the machine building industry. Gear-cutting machines manufactured in the GDR are believed to have been crucial to the establishment of the Chinese automobile industry.

Because the GDR took a strong Soviet line during the Sino-Soviet rift, trade with China dropped by as much as 50 percent in the early 1960's. In recent years, however, the GDR exports to China appear to have recovered to almost the same levels as during the 1950's. In machinery and transportation equipment the GDR is probably the fifth largest supplier after Japan, Romania, the Soviet Union, and West Germany, which makes it one of the most important trading partners of China.

Practically all GDR shipments to China consist of machinery and transportation equipment, which was the largest export category in Sino-GDR trade in recent years. After Romania, the GDR is believed to be

the largest CMEA supplier of electric and diesel locomotives to China. The last known sale was 30 EL 2 electric locomotives from the Hans Beimler Works in East Germany. Motor vehicle shipments include trucks and buses and have been steady in recent years at about $10 million per year.

In 1976 the GDR delivered a 13,000-ton container ship to China. Exports of ships have been growing rapidly, reaching a total value of $29 million in 1975. The GDR is now the largest ship supplier to China among nonmarket countries. Internal combustion engines, machine tools, construction and mechanical handling equipment, and electric power transformation equipment are the other major product categories exported to China every year.

SINO-CUBAN—Rice for Sugar Trade

Sino-Cuban trade developed soon after Fidel Castro came to power and the Organization of American States (OAS) embargoed trade between Cuba and OAS members. Because Cuba is to a large degree dependent on exports of sugar, the embargo was a severe blow to its economy. The Soviet Union and other communist countries have been financing Cuban trade deficits and importing Cuban sugar ever since.

In 1960 China established formal trade relations with Cuba and extended a $60 million interest-free credit to finance complete plants and technical assistance to Cuba. Trade developed rapidly and rose to a high of $220 million in 1965, consisting mainly in exchange of Cuban sugar and nickel for Chinese rice, soybeans, textiles, machinery, and some industrial equipment. Cuba became China's second largest market for rice, in 1971–1975 importing 990,000 tons of it from the PRC.

In 1961 China absorbed well over one million tons of Cuban sugar, 16 percent of total Cuban sugar exports; but throughout the 1960's China was also an exporter of sugar. In 1964 and 1965 Chinese sugar exports were on the order of 500,000 tons per year and were in fact larger than imports of Cuban sugar at the time. In view of the significant increases in world sugar prices at the time, China appears to have performed the role of a giant sugar trader, obtaining

GERMAN DEMOCRATIC REPUBLIC: MAJOR COMMODITY EXPORTS TO CHINA
(millions of dollars)

Commodity Description	1965	1970	1971	1972	1973	1974	1975
Total Exports	**26.0**	**42.0**	**44.0**	**48.0**	**50.0**	**70.0**	**117.0**
Machinery/transport equipment	**12.6**	**38.0**	**39.5**	**43.4**	**43.8**	**61.8**	**87.4**
Internal combustion engines	.3	5.1	8.5	3.7	4.4	8.5	10.0
Office machines	.3	—	—	—	—	—	—
Machine tools	1.8	10.0	9.1	7.1	6.6	6.1	3.7
Textile machinery	.2	—	—	—	—	—	—
Printing/bookbinding machinery	.3	.1	—	—	—	.1	—
Construction/mining machinery	—	.2	.2	3.6	3.7	4.0	2.0
Heating/cooling equipment	.1	—	—	—	—	.1	1.2
Pumps and centrifuges	.1	.1	.1	—	.1	.1	—
Mechanical handling equipment	—	2.1	3.9	2.8	2.3	2.3	4.4
Other non-electric machines	—	.3	3	.1	.7	.5	.4
Electrical machinery	**4.4**	**4.6**	**6.0**	**6.2**	**6.1**	**5.0**	**8.2**
Transformation equipment	.4	3.1	3.7	5.6	5.7	2.3	5.5
Distribution equipment	—	1.4	2.3	.3	—	—	—
Telecommunications apparatus	.3	—	—	—	.1	1.3	2.1
Domestic electrical equipment	.1	—	—	—	—	—	—
Med/Radiol. elec. equipment	.2	—	—	—	—	.6	.3
Electric furnaces	.7	—	—	—	—	—	—
Thermionic valves/transistors	.2	—	—	—	—	.2	.1
Electronic measuring/control instruments	2.1	.1	—	.3	.2	.5	.1
Transport equipment	**5.1**	**15.2**	**10.9**	**19.9**	**19.9**	**34.5**	**56.3**
Railway vehicles	1.7	2.6	4.9	7.3	.9	9.5	13.9
Locomotives *	—	2.2	4.1	6.6	—	4.6	5.4
Road motor vehicles	—	3.1	4.2	12.0	12.6	10.4	12.1
Trucks, ambulances etc.*	—	—	2.9	10.9	10.3	9.2	10.7
Road vehicles other than motor	—	—	1.8	.5	—	—	1.3
Ships and boats	3.4	9.5	—	.1	6.4	14.6	29.0

Source: United Nations International Trade Statistics; DDR Statistiches Jahrbuch 1974. Export data on commodity categories other than machinery and transport are not available.
* Included in general category shown above.

SINO-CUBAN TRADE
(millions of dollars)

Year	Chinese Imports from Cuba	Chinese Exports to Cuba	Chinese Imports of Sugar from Cuba (tons)	Percent of Total Cuban Sugar Exports
1958	4	—	50,000	0.89
1961	91	99	1,032,000	16.00
1963	73	87	501,000	14.25
1965	100	120	744,000 [1]	14.00
1967	79	73	556,000	9.78
1968	61	76	431,000	9.34
1969	64	80	445,000	9.27
1970	75	75	530,000	7.67
1971	69	79	464,000	8.24
1972	51	76	295,000	7.13
1973	83	106	302,000	6.30
1974	156	159	359,000	6.54
1975	100	100	183,000	3.19
1976	100	75	185,000	3.61

Source: US Department of Commerce, US Commercial Relations with Cuba, 1975; U.S. Government Research Aid, "The Cuban Economy; A Statistical Review" ER 76-10708, December 1976.
[1] Includes 346,000 tons of sugar shipped to the Soviet Union on Chinese account as repayment of a 1961 Soviet loan to China.

Cuban sugar in exchange for rice and selling it in the world markets probably for hard currencies.

Sugar prices skyrocketed again in 1974 only to fall back to 1973 levels in 1976. Whether or not this affected Sino-Cuban rice-for-sugar barter is not known, but relations cooled between the two countries. Some observers suggest that China's reduction of Cuban sugar imports in recent years was also motivated by Cuba's intervention in Angola in support of the Soviet-backed revolutionary movement, which China opposed.

THE ALBANIAN CONNECTION—Chromium

Sino-Albanian relations, which became cordial in 1961, developed in an environment that literally forced the two countries to become natural allies and important trade partners. Politically, the Albanian Communist Party was heavily dependent on Yugoslavia until the Tito-Stalin break in 1948. When Stalin forced East European countries to break all except formal relations with Yugoslavia, Albanian leaders also followed Stalin's order, although not without a purge of a number of prominent Albanians for alleged pro-Tito tendencies.

When Khrushchev denounced Stalin and a Soviet-Yugoslav rapproachment began in 1955, Soviet-Albanian relations began to deteriorate. In 1960 when Khrushchev was lining up world communist parties to condemn China, Albania refused to collaborate. In December, 1961, Soviet leaders openly denounced Albania at the 22nd Congress of the Communist Party of the Soviet Union at Moscow and suspended diplomatic relations.

This resulted in evacuation of Soviet military installations from Albania, notably the submarine base at Vlore on the Adriatic. It also meant a cessation of Soviet aid and the withdrawal of Soviet advisers and technicians. This was an economic blow to Albania because it was following the Soviet development model, trying to build up an industrial base in what was still a predominantly agricultural country. Traditionally the poorest nation in Europe, Albania is also a net importer of food and machinery and has always relied on credits or foreign aid to cover its perennial trade deficits.

At the same time, the Soviet Union was implementing economic sanctions against China, one of which appears to have been a ban on shipments of chromite ore in the early 1960's.

Metallurgical chromium, a critical ingredient in production of stainless high-quality steels and ball bearings, became in very short supply in China, and magnesia-alumina brick was widely substituted for refractory chromite, also of critical industrial importance. Lack of significant domestic deposits of chromium, nickel, and cobalt ores, all strategic metals originally supplied to China by the Soviet Union (which is the world's largest producer of chromium and nickel), set the PRC on a search for alternative and reliable sources of supply. Without assured supplies of these stategic materials, China's industrialization program would be crippled.

Chromite is also exported by India, Turkey, Iran, and now the Philippines, but China could not trade with those countries. In the aftermath of the Korean War, the United States enforced an embargo against trade with China throughout Asia.

The obvious alternative source of chromium was in South Africa, the second largest chromium producer after the Soviet Union, and in Rhodesia, the fourth largest producer in the world. In 1962 and 1963 China began trading with South Africa but immediately exposed itself to sharp accusations by the Soviet Union of acting against the interests of black African states. China obviously could not risk alienation of developing African countries and so ended its trade with South Africa. There is one report, however, that China purchased chromite from Rhodesia after United Nations sanctions were invoked against that country, but it is impossible to verify because neither China nor Rhodesia publishes any foreign trade statistics.

The only other significant chromium supplier is Albania, which is the third largest chromium producer in the world after the Soviet Union and South Africa. In 1963 Albania became the principal chromite supplier to China, shipping 66,000 tons of chromite ore to the PRC in that year. Albania is now believed to account for two thirds of all Chinese chromium supplies, estimated at about 220,000 tons of concentrate in 1974. As a result China is probably absorbing at least 30 percent of all Albanian chromite production and plays an important role in Albania's economy and its foreign trade. In addition, Albania also produces some nickel and cobalt, the other strategic metals that China has to import.

Despite its strategic importance, Chinese imports of chromite ore do not represent a very large volume in terms of value; in 1974 total Albanian exports of all metals and minerals to China were estimated at only $10 million. Other traditional Albanian exports to China include copper, asphalt, caustic soda, ammonium nitrate, paper, cotton, wool, wood products, dyestuffs, sulfur, bricks, plastic, wines, cigarettes, foods, and heather. Albanian imports primarily consist of Chinese machinery and equipment, including complete turnkey plants and military materiel and weapons.

Since 1960, trade between Albania and China has risen rapidly from a few million dollars per year during the 1950's to an estimated annual average of $125 million in recent years, which makes Albania China's third largest trading partner in Eastern Europe after Romania and East Germany. China is Albania's largest trade partner accounting for an estimated 70 percent of all foreign trade of that country. Because imports outnumber exports by about 45 percent, Albania runs a perennial trade deficit with the PRC, which is covered mostly by Chinese credits and foreign aid arrangements.

By 1971 Albania is estimated to have received a total of $359 million in Chinese foreign aid, primarily in the form of credits to cover imports from China, and appears to be the third largest Chinese foreign aid recipient after Vietnam and North Korea.

Since 1970 Albania has negotiated additional large credits with China of undisclosed magnitudes to finance 30 industrial projects during the 1971–1975 development plan period. Significantly, these include assistance in construction of the Elbasan metallurgical complex for production of steel, nickel, and cobalt with projected ferronickel capacity of 800,000 tons per year by 1980, and expansion of nickeliferrous iron ore mine at Gur-i-Kuq.

Another project includes Chinese assistance in construction of the Burrel chromite concentrator and ferrochrome plant. Since 1967 China has also assisted in construction of Albania's Lac copper ore concentration plant and participated in expansions at the Valias Coal Mine. In addition, China constructed a railroad from Elbasan metallurgical complex to the Prenjas ferronickel project which began operation in 1974.

Although expansion of mining and metallurgical industry in Albania appears to have been given priority, China is also involved in assisting in the construction of other major projects. In 1974 the 250-mw Mao Tse-tung hydroelectric power plant was commissioned. It is the largest power plant in Albania and accounts for about half of that country's electric power generating capacity. China is also assisting in construction of the Fierze 500-mw hydroelectric power plant and built a 220-kv electric power transmission line between Elbasan and Fier, as well as one between Bistrice and Konispol, both of which became operational in 1974.

At Ballesh Chinese technicians are assisting in the construction of a 1,000,000 ton per year oil refinery which will increase Albania's crude refining capacity by about 33 percent to about 4,000,000 tons annually. Chinese assistance in simultaneous construction of a large urea plant at Fier and a polyvinylchloride plant at Vlore indicate a comprehensive program to transfer petrochemical industry technology to take advantage of local Albanian oil production and perhaps even nearby East European markets, which are beginning to look for alternative petroleum products sources as Soviet oil supplies are being reduced and prices are going up.

Sino-Albanian technical cooperation proceeds under the auspices of a special Sino-Albanian Joint Scientific and Technical Commission supervised by the Ministry of Foreign Trade in China. Although details of technological exchanges are scant, it is believed that this activity led to the construction of the first Albanian computer in 1975 at the Engineering faculty of Tirana University. Several computers are believed to be in operation in Albania, most imported from China in previous years.

CZECHOSLOVAKIA: MAJOR COMMODITY EXPORTS TO CHINA
(millions of dollars)

Commodity Description	1965	1970	1971	1972	1973	1974	1975
Total Exports	**19.0**	**31.0**	**34.0**	**29.0**	**40.0**	**46.0**	**70.0**
Chemicals	**—**	**—**	**.5**	**.05**	**—**	**—**	**—**
Manufactured goods	**—**	**—**	**6.3**	**7.3**	**8.1**	**11.3**	**—**
Iron/steel: universals/plates/sheet	—	—	3.1	2.8	3.9	5.6	—
Tubes/pipes/fittings—iron/steel	—	—	—	—	3.8	4.7	—
Finished structural parts	—	—	3.05	4.4	—	—	—
Machinery and transport equipment	**12.8**	**26.3**	**27.7**	**22.7**	**27.6**	**30.9**	**39.4**
Machinery non-electric	2.4	8.8	15.1	10.1	8.9	10.6	9.9
Agricultural machinery	—	—	—	.1	—	—	—
Calculating/accounting computers	.2	—	—	—	—	—	—
Metal working machines	1.2	6.2	11.9	5.7	6.5	8.1	6.2
Machine tools *	1.1	6.2	—	5.7	—	—	5.8
Machines for special industries	.6	1.2	3.1	4.2	2.1	1.9	2.6
Construction/mining machinery *	.6	1.2	—	4.2	—	1.9	2.6
Machinery, appliances nes	.4	1.4	.1	.1	.3	.94	1.1
Powered tools	—	1.0	—	—	—	—	.2
Roller bearings *	—	.4	.1	—	.1	—	.1
Electrical machinery	2.0	6.9	4.5	4.3	8.6	7.8	7.1
Electric power machinery/switchgear *	1.3	6.7	4.5	4.3	8.5	7.6	6.4
Transforming equipment *	1.3	6.7	4.5	4.3	—	—	6.4
Equipment for distributing electricity	.1	—	—	—	—	—	—
Medical/radiological equipment	—	—	—	—	.1	.1	.6
Other electrical machinery	.6	.2	—	—	—	—	.1
Electronic measuring & control instruments *	.6	.1	—	—	—	—	.1
Transport equipment	8.4	10.7	8.1	8.4	10.1	12.7	22.4
Railway vehicles *	.1	—	—	—	—	.1	—
Road motor vehicles *	8.3	10.3	8.1	8.4	10.1	12.5	—
Trucks, ambulances etc.*	6.1	6.5	5.2	5.1	—	—	10.5
Road vehicles other than motor *	—	.3	—	—	—	—	—
Miscellaneous manufactured articles	**—**	**—**	**.08**	**.09**	**.18**	**.2**	**—**

Source: United Nations International Trade Statistics; Facts on Czechoslovak Foreign Trade, Chamber of Commerce, Czechoslovakia 1975.
Note: Data converted from Czechoslovak Kc currency at average rates each year.
* Included in general category shown above.

Another example of close trade relations between the two countries is the existence of a special Sino-Albanian Joint Stock Shipping Company, which is an independent unit subordinated directly to the Ministry of Communications in China. It operates jointly several freighters for the Sino-Albanian trade, at least three of which are believed to be Albanian vessels. This operation is probably justified by the strategic nature of Sino-Albanian trade and particularly by the need to control the shipments of military equipment for the Albanian armed forces. Tirana is also one of the few capitals outside China to which the Civil Aviation Administration of China (CAAC) flies its own aircraft on a scheduled basis.

Sino-Albanian trade is conducted on the basis of annual protocols on goods exchanges and payments that are signed alternately in Tirana or Peking, normally by Chinese Minister of Foreign Trade Li Chiang and Albanian Minister of Trade Nedin Hoxha.

In 1976 China is believed to have cut back on its aid deliveries to Albania, although Chinese shipments reportedly continued at substantial levels. Some uncertainty about the future of Sino-Albanian relations has also developed as a result of the reported search by the Albanian government for additional foreign aid donors. The Sino-Albanian connection is complicated by the fact that China's dependence on Albania as a supplier of chromium is no longer as critical as it was during the 1960's as a result of expanded trade relations with new chromium supplier countries such as Iran, Turkey, Philippines, Madagascar, and even India in recent months.

CZECHOSLOVAKIA—Uranium, Vehicle Technology to PRC

Sino-Czechoslovak trade reached a level of $128 million in 1975 and slipped to $120 million in 1976; but a trade exchanges and payments agreement, which was signed in Prague on May 19, 1977, provided for a 6

percent trade increase during 1977. Current Czechoslovak exports to China are still only about 63 percent of the all-time peak in 1959 when Czechoslovak exports reached almost $100 million and competed with East Germany for first place in East European exports to China.

It is believed that China drastically reduced its trade with Czechoslovakia in the 1960's because of Czechoslovakia's strong pro-Soviet line in CMEA politics. By 1963 Czechoslovak exports to China dropped precipitously to only $9 million. The Sino-Czechoslovak trade has recovered since then; during the 1970–1975 period it doubled to the present level. In 1968 China strongly criticized the Soviet Union for invasion of Czechoslovakia, and this event may have led the way to more cordial relations between the two countries and the resulting increase in trade. There appear to be excellent prospects for the continued steady growth of Sino-Czechoslovak trade.

Czechoslovakia is credited with assisting China in production of uranium-235 during the early stages of China's nuclear program. Czechoslovak specialists reportedly helped to develop China's uranium mines at Hsiachuang in Weiyuan County in Kwangtung Province. Chinese uranium ores were partially processed in the Chuchou Uranium Ore Concentrating Plant in Hunan and from there were sent to Czechoslovakia for further treatment.

In return for this service China allowed Czechoslovakia to keep half of the processed uranium. It is believed that the arrangement allowed China to obtain enriched uranium and explode its first nuclear bomb sooner than would have been possible if it relied entirely on its own Lanchou Gaseous Diffusion Plant, which was in initial operating stages during the early 1960's.

During the 1950's Czechoslovakia also assisted in the construction of several basic plants, many of which were equipped with Czechoslovak machinery. The Chungking Fertilizer Plant in Szechwan, the first to use natural gas as raw material, was one such plant. The Czechoslovak SKODA truck designs were used at the Tsinan Motor Vehicle Plant to develop the 8-ton "Yellow River" trucks. Similarly, the Czechoslovak TATRA enterprise assisted in development of the 10- to 12-ton "Long March" trucks at the Peking Changcheng Motor Vehicle Plant. At the Harbin Aircraft and Aeroengine Plant the Super Aero 45 aircraft and its engines were built under Czechoslovak licenses.

Among CMEA countries Czechoslovakia is the second largest supplier of trucks and electric power generating equipment and leads in machine tools sales to China. It is also the second largest CMEA steel supplier after Romania and is third in construction and mining machinery supplies. The most recent trade agreement indicates that these products will predominate in future Sino-Czechoslovak trade, which will also include diesel engines.

POLAND, China's "Old Neighbor"—Coal Mining Equipment, Combustion Engines to PRC

Sino-Polish trade doubled during the 1970–1975 period from $58 million in 1970 to $106 million in 1976. The latest trade and payments agreement was signed in Warsaw on May 26, 1977, by T. Nestorowicz, Poland's Deputy Minister of Foreign Trade and Maritime Economy, and Chien Chieh, Deputy Minister of Foreign Trade of China. China's renewed participation in the June, 1977, Poznan Trade Fair, which is the largest in CMEA, may indicate new efforts to stimulate the sales of Chinese goods in Poland.

Politically, Sino-Polish relations appear excellent but are moderated by the realities of geography. There is a belief among Polish people that Chou En-lai's visit to Warsaw in 1956 and his subsequent analysis of the situation in Eastern Europe saved Poland from a much harsher confrontation with the Soviet Union at the time. The Chinese embassy in Warsaw is believed to be one of the largest Chinese embassies in the world, and there are recurrent accounts of the Chinese addressing Polish friends as "old neighbors," particularly when they visit China. This is believed to refer to the era during the thirteenth century when Tartar empires controlled from China spread westwards and shared common, albeit very turbulent, frontiers with the Kingdom of Poland, which in those days stretched well into the present Ukraine.

One unusual connection between Poland and China today is the existence of a joint shipping company, which maintains the only regular shipping line between East Europe and China aside from the exclusive Sino-Albanian shipping operation. This shipping line is known as Sino-Polish Shipbrokers Company and is operated jointly by the two countries.

In recent years Poland has been the largest supplier of coal mining equipment to China, although West German and British suppliers are not very far behind. Poland is also the second largest communist supplier of internal combustion engines to China after the Soviet Union, and the fourth largest among all such suppliers to China. Polish engines are primarily large marine diesels manufactured by H. Cegielski machine building combine in Poznan. One large contract during the mid-1970's was valued at about $7 million. The Polish plant manufactures large marine diesel power units up to 29,000 hp which are more than twice the size of the largest marine diesels made in China.

Until 1973 Poland was supplying ships to China; but exports of Polish ships peaked at $16.6 million in 1971, dropping to almost zero in recent years. Polish shipbuilding executives explain the decline by lack of capacity in existing shipyards and prior commitments to build ships for other countries, notably the Soviet Union.

According to the latest trade agreement Polish exports to China continue to consist of coal mining

POLAND: MAJOR COMMODITY EXPORTS TO CHINA
(millions of dollars, unless otherwise noted)

Commodity Description	1965	1969	1970	1971	1972	1973	1974	1975
Total Exports	**19.0**	**18.0**	**26.0**	**37.0**	**28.0**	**33.0**	**44.7**	**50.0**
Agricultural products	—	—	—	—	—	.1	—	—
Total minerals and metals	5.2	—	5.6	8.2	6.2	9.6	18.0	—
Rolled steel products (000's tons)	—	—	—	—	32.6	41.4	37.4	—
Fuels (000's tons)	—	—	—	—	15.0	9.0	18.0	—
Chemical products	—	—	—	—	—	.4	—	—
Pharmaceutical products	—	—	—	—	—	.24	1.1	—
Total machinery and transport	**10.6**	**15.2**	**20.7**	**31.6**	**23.4**	**23.6**	**25.8**	**26.0**
Internal combustion engines	.7	2.7	3.3	2.0	2.5	5.0	4.5	2.2
Tractors	.5	—	—	—	—	—	—	—
Machine tools	.3	1.6	2.0	4.6	3.8	3.1	3.0	—
Food machinery	.4	—	—	—	—	—	—	—
Construction/mining machines	.2	4.5	7.7	6.0	7.2	7.9	11.1	17.3
Pumps and centrifuges	—	.8	1.6	1.4	2.1	4.8	2.8	1.5
Mechanical handling equipment	.5	—	—	—	—	.1	.6	1.2
Roller bearings	—	—	—	—	—	.05	.25	1.0
Conveyors, rubber	—	—	—	—	—	—	.48	—
Electric generating equipment	—	—	—	—	.9	.6	1.01	1.4
Electrical transformers	.4	.7	.1	1.0	1.0	.7	1.0	1.4
Automation/control equipment	—	—	—	—	.2	.9	.17	—
Total transport equipment	**7.5**	**—**	**—**	**16.6**	**6.0**	**1.1**	**—**	**—**
Road motor vehicles	3.3	—	—	—	—	1.0	1.86	—
Passenger motor cars	2.2	—	—	—	—	1.0	—	—
Trucks/ambulances/vans	.8	—	—	—	—	—	—	—
Auto chassis and parts	—	—	—	—	.35	.85	1.3	—
Ships and boats	4.2	4.4	5.2	16.6	6.0	.1	.1	.1

Source: United Nations International Trade Statisitcs; Rocznik Statystyczny Handly Zagranicznego, GUS, Warsaw, Poland, 1975, 1976.
Note: Some entries are estimates derived from reported number of units shipped to China extended by average prices.

equipment, marine diesel engines, power generators, construction machinery, machine tools, spare parts for machines and appliances, metallurgical products, and pharmaceuticals. Chinese exports to Poland are traditionally nonferrous metals, minerals, primary chemicals, bristles, rice, tea, goatskins, and industrial products.

Poland is also now a major producer of copper and sulfur, both of which are being imported by China because local production is inadequate. On the other hand, Poland is looking for alternative sources of crude oil, not only to supplement its energy requirements but also as raw material for its newly constructed petrochemical and synthetic fiber industries.

These new economic realities suggest additional future opportunities in Sino-Polish trade and the potential for exchange agreements based on copper and sulfur for oil. Such trade would be of value to both countries, saving Poland hard currencies and providing China with machinery and equipment traditionally imported from that country.

Recent development of a large oil port known as Port Polnocy on the Baltic coast, designed to accept large oil tankers, and construction of a large petrochemical complex in nearby Gdansk suggest that Poland is planning to have more flexibility in its oil trade in the future. The oil refineries and petrochemical plants built in earlier years are located inland in central Poland and rely on crude oil supplied by pipelines from the Soviet Union. Poland is also extremely short of hard currencies and, although future purchases of oil from OPEC or Angola should not be ruled out, there are advantages inherent in Sino-Polish oil trade that neither country can ignore.

SINO-HUNGARIAN RELATIONS—Machine Tools, Vehicles, Pressure-Cookers

Hungarian trade with China is relatively small, but it is interesting because Hungary is one of the few countries that export consumer products to China. Overall Sino-Hungarian relations are good, but they appear to be somewhat less cordial than those between China and other East European countries.

Hungary, probably more than any other East European country, has deep-rooted apprehensions about China as a result of the "yellow peril" invasions of former centuries. Twice during Hungarian history Mongol hordes almost annihilated the inhabitants of

the area. First it was Attila the Hun in the third century, and then the Tartar invasions of Kublai Khan in the thirteenth century. There persists a belief among Hungarian people that every several centuries China's population must explode and spread all the way to central Europe.

An additional cooling in Sino-Hungarian relations probably resulted from China's role during the Hungarian uprising of 1956. At that time unrest in Poland and Hungary prompted the Soviet Union to ask China to analyze the situation and recommend appropriate action. Chou En-lai himself made a flying visit to Warsaw and possibly Budapest to personally assess the situation in the two countries. On his return to Moscow Chou En-lai is believed to have advised the Soviets to take a conciliatory course in Poland but to resort to repression in Hungary if necessary.

On the other hand, Hungary is the only other East European country besides Romania and Albania that has received Chinese foreign aid. In 1956 Hungary was granted $7.5 million; in 1957 the aid rose to $50 million, seemingly in the aftermath of the Hungarian uprising.

By 1975 the volume of Sino-Hungarian trade reached a peak of $97 million, of which $41 million represented Hungarian exports. In 1976 trade dropped to $71 million, but Hungarian exports to China remained at about $40 million. The last reported trade agreement was signed on February 27, 1978, in Peking.

Bilateral goods turnover will be heavily expanded to reach a value of over 200,000 Swiss francs in 1978. Hungary is to supply China with machine tools, trucks, buses, television sets, poultry-raising plants, instruments, medical installations, steel aluminum cables, and various steel goods in exchange for agricultural and food industry products, including rice, vegetables and fruit, tea, cocoa, nonferrous metals, basic materials for pharmaceuticals, and other chemicals. The imports from China will also include various light industrial goods, such as cotton and silk cloth, cotton knitwear, ready-made clothes, stationery, and chinaware.

During 1970–1974 Hungary exported about $56 million worth of aluminum to China but such shipments were not specified in the most recent trade agreements. In 1975, however, a Hungarian aluminum products factory was reported to be exporting 100,000 pressure cookers to China with a possible increase to 300,000 units in 1976. The 1976 trade agreement also specified telecommunications equipment, instruments, portal cranes, and complete trucks. During the 1970–1975 period Hungary shipped almost $35 million worth of motor vehicles including trucks and buses. At least $25 million worth of electrical signaling apparatus was also exported to China during that period.

In November, 1976, seven Hungarian firms held a special exhibition in Peking on telecommunications and radio and measuring equipment and sold two thirds of the value of goods displayed. China has shown special interest in Hungarian telecommunications equipment and in devices for measuring oil pipeline parameters. In the same year two Hungarian export firms, METRIMPEX and BUDAVOX reportedly exported to China 4 million Swiss francs' worth of products each; and an industrial cooperative in Tata that specializes in refrigeration technology, HUETO-

HUNGARY: MAJOR COMMODITY EXPORTS TO CHINA
(millions of dollars)

Commodity Description	1970	1971	1972	1973	1974	1975
Total Exports	**22.0**	**24.0**	**33.0**	**40.0**	**30.0**	**41.0**
Total metals and minerals	**—**	**9.8**	**11.9**	**20.1**	**4.5**	**na**
Machinery and transport equipment	**7.6**	**14.1**	**19.0**	**17.1**	**12.1**	**21.6**
Internal combustion engines	.1	—	.1	.1	.1	—
Metal working machines	2.3	4.0	4.1	5.6	2.8	3.7
Machines, appliances	1.1	1.4	1.0	1.4	1.3	1.9
Mechanical handling equipment *	.6	.3	—	—	.4	1.0
Electrical machinery	**1.8**	**5.4**	**4.2**	**4.3**	**3.4**	**8.8**
Medical/radiology electrical equipment	.2	.3	.1	.5	1.0	.1
Other electrical machinery	1.6	5.1	4.1	3.7	2.9	8.7
Signalling apparatus and parts *	—	5.1	4.1	3.7	2.4	8.5
Transport equipment	**2.4**	**3.3**	**9.6**	**5.8**	**4.4**	**7.0**
Railway vehicles	.2	.1	—	—	—	.3
Road motor vehicles	2.2	3.3	9.6	5.8	4.4	6.7
Trucks, ambulances etc.*	.6	2.3	8.4	4.8	2.9	5.0

Source: United Nations International Trade Statistics; Statisztikai Evkonyv 1973 Kozponti Statisztikai Hivatal, Budapest, Hungary.
* Included in general category shown above.

TECHNIKA, began delivery of MH-250 heavy-duty industrial refrigerators to China. Some 25 million forint ($600,000) worth of refrigerators was to be exported by July, 1976.

China traditionally exports to Hungary chemicals, raw materials for pharmaceuticals, nonferrous metals, farm products, ready-made clothes, foodstuffs, cotton, woolens, silk and cotton knitwear, and chinaware.

BULGARIA, China's Smallest Communist Trading Partner

Although diplomatic relations between the two countries were established in 1949, trade has never developed to any significant degree, and Bulgaria remains the least important trading partner of China in Eastern Europe. The last trade and payments agreement was signed on March, 1977, in Peking, but total trade volume was not given. During 1976 total trade was estimated at $35 million, up 65 percent over the $23 million traded in 1975 and five times higher than that of the $7 million in trade between the two countries in 1972.

Sino-Bulgarian trade is fairly well balanced. Bulgarian exports always included machinery and transport equipment categories. Until 1971 Bulgaria also exported some machine tools to China. During the 1971–1975 period transportation equipment predominated, and Bulgaria exported small cargo ships to China in 1973 and 1974. Since 1974 mechanical handling machinery became a significant export and is believed to have included 500 forklift trucks valued at $3.4 million. In recent years Bulgaria also began exporting chemicals to China. In 1975 chemicals were estimated to account for $8.5 million of Bulgarian exports, two thirds of which consisted of urea. Bulgaria also exported almost 21,000 tons of soda ash and some pharmaceutical products during 1975.

A scientific-technical cooperation agreement originally signed in 1955 was extended for another five years in 1973. China exhibited at the Plovdiv Trade Fair in Bulgaria in 1975, but Bulgaria held its last exhibitions in China in 1972 when specialized medical products and industrial exhibitions were held in Peking and Tientsin, respectively.

YUGOSLAVIA—Rapid Expansion of Trade with China is Planned

Sino-Yugoslav trade has been highly irregular and out of balance in recent years. Although China and Yugoslavia, which is not a member of CMEA, sign annual trade protocols similar to those China signs with other communist countries, Sino-Yugoslav trade has been significantly out of balance and greatly in favor of Yugoslavia. China appears to have taken swift action to correct that situation in recent years.

The development and rapid growth of Sino-Yugoslav trade is a good example of the importance of politics in Chinese foreign trade. Although diplomatic relations with the PRC were established in 1955, Yugoslav exports to China were negligible in the 1950's and nonexistent in the 1960's. After the Czechoslovak crisis in 1968 and the condemnation by Yugoslavia of the "Brezhnev Doctrine," a definite thawing in Sino-Yugoslav relations took place. It was followed almost immediately by development of economic relations and the signing of an agreement to develop trade and payment procedures in March, 1969.

Starting from practically zero Yugoslavia shipped $4 million worth of aluminum and marine diesel engines to China in 1971. That year and in 1972 China signed long-term contracts for the supply of 12 cargo ships by Yugoslavia ranging in capacity from 13,000 to 15,000 tons. Mainly as a result of deliveries of these ships, Yugoslav exports reached a high of $110 million in 1974, rising very rapidly from a mere $14.7 million in 1972. By 1975, however, Yugoslav exports to China nose-dived to only $12.5 million, while imports remained at about $19 million, giving China a surplus for the first time.

Total trade in 1976 was reported to be about $30 million, with a $6 million surplus in favor of China; but there are signs that expansion of the Sino-Yugoslav trade will resume after a correction of the balance of trade has been accomplished. In January Li Chiang, China's Minister of Foreign Trade, visited Belgrade, and in June, 1977, a second meeting of the China-Yugoslav Committee for Advancement of Trade was held in Peking, where the latest Sino-Yugoslav trade protocol was signed. Although details are not available, it appears from other developments that Sino-Yugoslav trade will recover in the immediate future.

During visits of Marshal Tito and Yugoslav Vice Premier Berislav Sefer to Peking this spring, agreement was reached to expand Sino-Yugoslavian trade from the 1977 level of $90 million (both ways) to $200 million in 1978 and $600 million by 1985.

A new bulk carrier ship, the *Mei Hai*, being built by the Treci Maj Shipyard in Rijeka for China, was commissioned in September, 1977. It is a large ship of 45,000 tons capacity and is much larger than ships built for China in previous years. The Sisak Iron and Steel Plant in Croatia was also expected to export 17,000 tons of steel pipe to China during 1977.

These appear to be the most important Yugoslav exports in recent months, but China also continued to import copper and aluminum although not in quantities as large as in previous years. In 1974 China also began buying small quantities of Yugoslav chemicals. Large marine diesel engines of 12,000 HP or over, which are manufactured by the Split Shipyard under West German M.A.N. licenses, and other diesel engines made by Brodomaterial Poduzece in Rijeka will probably also continue to be exported to China as power units for Chinese ships. 完

At the Canton Fair, spring 1978

CANTON 43- NEW FLEXIBILITY, NEW ERA?

Increased Chinese flexibility in meeting the demands of foreign buyers, fewer Americans than in the fall, but record volume were the main features of the spring 1978 Canton fair. For US buyers, the new willingness of PRC trade authorities to adapt to market needs was a welcome signal of a possible new era in China's export trade. A report from John Kamm with Howell Jackson, Council staff at the fair, follows.

The hallmark of the most recent Chinese Export Commodities Fair, the forty-third staging of the semiannual event, was increased Chinese flexibility in meeting the needs of foreign buyers. Among the important developments for US companies:

- ground-breaking discussions of China's importing raw materials, equipment, and design for processing into export products;
- reemergence of Chinese willingness to include private foreign labels on PRC exports;
- increased use of D/P payment terms in certain corporations;
- continuing Chinese willingness to comply with US government regulations covering imports into this country; and
- greater exchange of information between Chinese trade corporation officials and foreign buyers.

Few of the experienced Chinese traders who attended the 43rd CECF went away without the feeling that a new era had begun in China's foreign trade—that China was joining the ranks of mature trading nations. Chinese officials reported that a record volume of business had been concluded, with Chinese exports up 12% over last fair; particularly active were CHINATEX, INDUSTRY, and CHINA TUHSU sales, as well as purchases of foreign steel, chemicals, and synthetic fibers.

US Attendance Drops—Business Down in Real Terms

The number of Americans at the Canton fair totaled roughly 500, down from an estimated 730 in attendance at the fair last fall. Some 350 US firms had representatives at this spring's fair.

Several factors contributed to the reduction of US participation in Canton. A surprising amount of China's export business is now being handled either in Peking before and after the fair or by telex throughout the year. In certain product lines such as carpets and feathers and down, the Chinese had held mini-fairs earlier in the year and completed most of their US business at that time. Moreover, executives who formerly attended the fair only to tour China are no longer attending since much more complete sightseeing excursions now can be easily arranged through the China International Travel Service.

Although many US companies may have declined invitations to the Canton fair this spring, Chinese officials revealed that in order to avoid overtaxing Canton hotels and visitor services, the number of invitations to the CECF extended to US companies was reduced. Firms that had attended several fairs without concluding significant contracts were not invited to return.

Linked Purchases

In one first-of-a-kind deal at the 43rd CECF, two Chinese corporations signed a set of linked contracts with an American firm. After preliminary negotiations, the US company signed back-to-back contracts, the first buying goods from CHINATUHSU and the second selling commodities to SINOCHEM. The value of this unprecedented transaction was over $1 million.

Another new angle of this spring's fair was the increased competition between FTC branches. Much more than in the past, the regional divisions of China's trade structure seemed to vie among themselves for foreign business, offering lower prices, faster delivery, and better packaging to gain foreign orders.

Even though the number of Americans at the fair was down, the volume of business at the spring fair set an all-time record, thanks to the conclusion of several large chem-

ical and mineral sales to the Chinese. American purchases from China during the fair were estimated at $42.4 million, down substantially from the $49.6 million worth of Chinese sales registered last fall, but slightly above the $40.7 million mark of spring, 1977. (Normally, the volume of business is lower at spring fairs than during the autumn events.) US sales to China, on the other hand, exceeded the fall, 1977, level but fell short of those in spring, 1977.

Total Sino-American business concluded at the 43rd CECF was $71.0 million, slightly greater than the previous record of $70.3 million set at the 41st CECF. Nevertheless, with the eight percent erosion of the US dollar compared with the *renminbi* since the 41st CECF, the constant value of the two-way trade at this spring's fair was beneath past records.

Third World Attendance Up

The number of third world participants at the fair was unusually high. Besides the traditional delegations from Africa, an increasing number of overseas Chinese customers and representatives from India, Southeast Asia, and even Saudi Arabia were on hand for the fair. A surprisingly large number of Eastern Europeans also made their way to Canton, and a Yugoslavian official claimed to have concluded approximately $100 million worth of business with the Chinese during the four-week session.

As is their custom, by the fair's end, Chinese officials were heralding another record-breaking year with a total businessman attendance of roughly 17,000 backed by a Canton tourist turnover of 19,000. Once again, the Japanese sent the largest foreign contingent to the fair with over 3,000 company representatives; West Germany, with between 250 and 300 businessmen at the fair, also had a significant presence.

ARTCHINA—Prices Up, But Special RMB Rates

At its baptismal trade fair, newly reestablished ARTCHINA signed a respectable $6.5 million worth of sales contracts with US buyers. In previous fairs, the products handled by ARTCHINA came under the bailiwick of INDUSTRY. According to National Council estimates, the INDUSTRY departments which used to cover arts and crafts products did $6 million of business with the US at last fall's fair, so this spring's trading marked an upswing in ARTCHINA product sales to the US.

Two of the ARTCHINA export departments have established year-round offices in the CECF complex to conduct business with foreigners, but, a corporation source advises, "If we know each other well, we can do business in Canton. Otherwise, first contacts should be made with the head office in Peking." More year-round offices in Canton are, reportedly, under consideration if business warrants them.

The business atmosphere in the ARTCHINA negotiating rooms was reasonably warm during the spring fair even though many of the traditional ARTCHINA products—antiques, jewelry, and cloisonne—were reported in short supply by many "old friends" from the United States. Prices of some of these products were up between 10% and 30% from the fall fair, but the ARTCHINA US dollar exchange rate (58¢:1¥ compared to 60¢:1¥ at INDUSTRY) helped ameliorate the increases somewhat. Also, at least one jewelry buyer was pleased to learn that the corporation was accepting D/P terms for his contracts.

In order to continue developing business with US companies, ARTCHINA will be staging an arts and crafts mini-fair in July in Peking. Early in 1978, in March, the corporation held an arts and crafts exhibition in Hong Kong where some US customers signed contracts. The corporation has also announced that later on in the year it will be sending a selling delegation to the United States under the sponsorship of the National Council.

CEROILS—Nickels and Dimes

Hampered by short supplies resulting from a mediocre 1977 harvest, CEROILS spent what was widely regarded as a slow four weeks in Canton this spring. Corporation officials claimed that total sales to US companies during the fair would be "above last spring's level, but below last fall's," thus placing CEROILS business with America at slightly over $2 million, according to Council estimates. In the light of the 8% deterioration of the dollar against the RMB during the past year, however, the absence of significant growth in the dollar value of US purchases actually reveals a decline in CEROILS ability to earn foreign exchange in the American market. As has been true in the past, CEROILS personnel conducted no import business during the fair.

The bulk of the American buying activity consisted of a series of relatively small purchases. Most buyers in this area reported foodstuff business totaling $30,000–50,000. One American businessman, for instance, split $50,000 worth of contracts among soy sauce, mushrooms, and low-acid canned foods. Another placed orders for between $50,000 and $70,000 exclusively for canned goods. The largest single American contract reported out of the CEROILS offices came from a rabbit meat buyer who signed a purchase order for approximately $400,000 of the Chinese product. Small contracts for vermicelli and other products destined for America's Chinatowns were also made.

One of the reasons that more business was not done in this field was Chinese prices. Honey, a product that has sold fairly consistently to US businessmen in recent years, was reported too expensive at the 43rd CECF. Another reason was supply—one US grain company reported that little rice was available for the world market.

Mandarin oranges, formerly one of the most popular Chinese canned exports, were severely hurt by sharp price fluctuations in major markets. Shortly before the fair, Taiwan (a major exporter of mandarin oranges) cut its price from $5.30 to $4.80 per case. Most old buyers found the cost of the PRC's product unacceptably high, considering current market conditions; but at least three sales to US companies in excess of $25,000 were recorded. Once again, Chinese shrimp prices were way out of line with levels currently prevailing in the US market; one former customer quoted prices an amazing $1.50/lb above US wholesale prices. Needless to say, no business was concluded in this once popular line.

Besides provoking dissatisfaction over price and supply levels, CEROILS came under criticism at this fair for the continued slow pace of registering low-acid canned foods with the FDA. Chinese officials counter that unfavorable tariffs in the United States would make the products, once registered, uncompetitive on the US market.

Some American buyers of low-acid foods, who disagree with the Chinese assessment of the US market, bought

quantities of canned goods at last fall's fair in anticipation of the products' being registered with the FDA. Because the Chinese failed to complete the registration process, many of these goods were detained at American ports, where they are now threatened by rust and spoilage.

Other critics point out that China's own definitions of "low-acid" seem to lack internal consistency: The Chinese may label one product as "low-acid" while ignoring similar products. For instance, in the second round of FDA product registration, the Chinese are planning to register "fried dace" but not "fried perch"; they have already registered "preserved vegetables" but are withholding compliance for "pickled vegetables."

Despite the current Chinese difficulties concerning the FDA's definition of "low-acid" foods, high-ranking CEROILS officials at the fair agreed to pursue the matter further with members of the Canned Food Department.

Over the long run, Chinese canned good exports appear to have good prospects in the US markets. Shanghai's Maling line now holds 50% of the Hong Kong canned food market, according to importers in the Chinese territory. The majority of the Hong Kong purchases are made semi-annually at the CECF with supplementary orders being placed between fairs. The quantity of Maling products is reportedly sufficient for current needs, and prices are quoted in RMB.

The future of CEROILS sales to the United States will depend primarily on the success of the Chinese harvest in 1978 and the years ahead. Although climatic conditions for the early months of the year have generally been better than last year's, excessive rains have delayed the second rice harvest in the Pearl River Delta and may bode poorly for the supply condition at next fall's fair.

CHINATEX—The Year For Private Labels

The atmosphere at the textile corporation's rooms at the 43rd CECF was a curious mixture of emptiness and activity. Despite a slight increase in the number of invitations issued by the corporation, the number of textile buyers at this spring's fair was markedly lower than at previous fairs.

For those buyers who did travel to Canton, CHINATEX officials went out of their way to meet order requests. Chinese agreement to sew in private labels, their increased flexibility in meeting buyer requirements, and more cooperation in settling problems led to fairly brisk activity in the Garment Department; but weak supply and demand for piece goods and limited supplies of silk contributed to the decline in CHINATEX sales to the US from $15.6 million at the 42nd CECF to roughly $9.3 million at the 43rd.

For many Americans, the most important event of this spring's fair was CHINATEX's announcement that private labels would once again be sewn in export products: "It is now possible to use private labels. Based on concrete discussions, single private labels, single Chinese labels and double labels can all be used as long as 'Made in China' appears somewhere on the label."

Throughout the fair, flexibility was cited repeatedly by CHINATEX as its goal in foreign trade, and corporation officials agreed in principle that advanced garment packing on individual hangers would be desirable in the future although "it is not now possible in US-China trade." (Some US buyers do report special packaging arrangements as now available from certain CHINATEX branches.)

One American buyer reported the Chinese had agreed for the first time to supply new types of material for garment manufacture and to allow buyers to supply their own fabric for garment manufacture. Other buyers claimed the Chinese were willing to meet requirements for next year's delivery earlier than they had been in the last six years. In fact, the available quantities of certain garments were so large that some veteran traders speculated that allocations were being pulled away from the Chinese domestic market in order to expand foreign trade.

While the new Chinese policy of allowing American clients to do business in Peking prior to the fair may be good for the buyers, it also diminishes the relative im-

ESTIMATES OF US BUSINESS CONCLUDED AT RECENT CHINESE EXPORT COMMODITIES FAIRS BY FTC EXPORTS AND IMPORTS[1]

(current US$ million)

	39th CECF		40th CECF		41st CECF		42nd CECF		43rd CECF	
Corporation	Ex.	Im.	Ex.	Im.	Ex.	Im.	Ex.	Im.	Ex.	Im.
ARTCHINA[2]									6.5	—
CEROILS	1.8	—	1.5	—	2.0	—	2.1	—	2.0	—
CHINATEX	5.7	—	5.5	10.0	7.0	12.0	15.6	—	9.3	0.8
CHINATUHSU	6.0	—	14.0	—	15.5	—	15.5	—	13.5	—
INDUSTRY	4.8	—	6.0	—	6.5	0.6	7.9	1.2	2.0	1.2
MACHIMPEX	0.2	—	0.6	—	0.5	1.5	0.5	0.1	0.1	0.1
MINMETALS	7.5	—	8.5	—	7.3	0.5	6.0	4.6	6.5	14.5
SINOCHEM	2.0	0.5	1.5	6.5	1.9	15.0	2.0	12.0	2.5	12.0
TOTAL	28.0	0.5	37.6	16.5	40.7	29.6	49.6	17.9	42.4	28.6

[1] Includes sales and purchases by US firms and their affiliates and agents.
[2] Active only at the 43rd CECF.

portance of the CECF as a marketplace for Chinese textiles. A full third lower than last fair's level, Chinese sales to the US were dominated by garment orders at this spring's fair, probably accounting for at least $7.3 million of the total $9.3 million sales volume.

Garment orders in the million dollar category were placed by several large buyers or their agents. Other smaller orders were placed for corduroy shorts, children's clothing, flannel shirts, and raincoats. In general, prices were reported to be stable since last fall's fair. Silk supplies, which were quoted in dollars, were extremely tight at this spring's fair, and one buyer estimated that the US allocation of silk noil was only 3 tons.

Piece goods, both cotton and silk, were in short supply at this spring's fair, at least for US customers. As the fair opened, a Chinese piece goods delegation was conducting a sales trip across the United States, hosted by the National Council for US-China Trade. Consequently, many traditional piece goods buyers did not need to attend the fair, and those who did come found that the corporation's allocations were reduced because of the delegation. Nevertheless, some piece goods business was conducted—one company bought $100,000 worth of silk piece goods for delivery in the 3rd and 4th quarters of 1978. Orders for the first quarter of 1979 were not being accepted.

Perhaps one of the reasons that the number of CHINATEX guests at the 43rd CECF was so low was the alarmingly large number of contracts the corporation has either delayed or canceled in recent months. At the 42nd fair, a garment order worth $100,000 was canceled in November by the Chinese. What was particularly disturbing about this incident was that it was the third time it had happened to the same company. At another fair, the same firm had signed for 40,000 garments, only to have that order cut by the Chinese first to 10,000 units and then to 4,000 units. In the end, only 2,000 garments were shipped.

In some cases, the Chinese, rather than cancel orders, have simply delayed them: One large US department store arrived at the 43rd CECF to find that a $500,000 garments order placed at the fall fair for May-June-July delivery would not be available for shipment until August. A major silk buyer who signed contracts for nearly $1.0 million worth of piece goods at the last fair was forced to scrap a major sales program due to CHINATEX's inability to meet its delivery obligations. In the face of the strongest possible criticism, CHINATEX officials managed to renegotiate this and other contracts with distraught US buyers.

Complaints of overbooking by the Chinese are not peculiar to US customers. European officials reported similar difficulties in their dealings with the Chinese. In the light of the new Chinese emphasis on flexibility in foreign trade, some improvement in this area is expected. One experienced Canadian textile buyer, who estimated that roughly 40% of the textile deals signed at the 42nd CECF were affected by delays or cancellation, predicted that less than 10% of the contracts signed at this spring's fair would have similar problems.

Another problem CHINATEX has been facing with US sales is the efficient shipment of goods. Corporation officials reported that goods shipped by air often arrive at their destination ahead of the shipment documents. At the same time, goods shipped by sea are delayed in transshipment points as they await connections for American ports. In any event, CHINATEX officials argue, the corporation's responsibility and authority end once its products are placed aboard the vessel or aircraft for shipment.

In administrative changes at this fair, CHINATEX reported that gloves, once handled by INDUSTRY, would now return to its bailiwick. Silk embroidery is also now handled by CHINATEX, while linen embroidery will be sold through newly formed ARTCHINA.

As a buyer, CHINATEX did most of its business with US firms prior to the fair's opening in Peking. China is currently buying roughly 110,000–120,000 tons of polyester fiber per year, according to informed industry sources. Of this, US firms sold approximately 35,000 tons during the pre-fair buying session, compared to 30,000 tons sold by the Japanese. The balance of the sales will come during a similar selling session prior to the fall fair.

At the fair itself, no polyester staple contracts were signed by US firms, although discussions on both polyester and acrylic staple were held between CHINATEX and US suppliers. The Chinese did purchase a significant amount of polyester tirecord from a US firm, $600,000 worth before the fair and another $800,000 worth during the Canton trading event. Total American sales to CHINATEX during the fair are estimated at $0.8 million, of which the vast majority will be obtained from manufacturing facilities outside of the United States.

CHINATUHSU—Two-tier Pricing, Tanzania to US Via PRC

In the face of a sharp decline in American purchases of such high-profile goods as raw feathers and down and Chinese carpets, the total level of CHINATUHSU sales to the US fell only slightly to $13.5 million, compared with $15.5 at the last two fairs. With more than 200 US buyers present, the Native Produce and Animal By-Products Corporation led all other corporations in sales to the US for the third time in the last four CECF's.

Throughout the 43rd Canton Fair, CHINATUHSU officials were surprisingly accommodating in agreeing to private labels. One new customer arrived at the fair and in short order had gained not only a private label for 2,000 skiing garments, but also the privilege of having the garments manufactured with Hong Kong nylon and zippers. As a matter of policy, CHINATUHSU is reportedly now willing to manufacture garments with Hong Kong or Japanese synthetics until Japanese petrochemical plants under construction in the PRC can be brought on-line. In similar developments, the corporation appears to be willing to comply with US government licensing requirements for such products as down sleeping bags.

On the negative side, CHINATUHSU came under criticism at the spring fair for failing to meet some contracts signed at the last CECF. One firm that ordered $500,000 worth of feather and down products last fall was unable to receive the order because Chinese samples did not match contract specifications.

In another serious case, a group of cashew buyers received shipments of nuts affected by moisture and infested with insects. When a claim was filed in China just prior to the opening of the spring fair, it was discovered that the substandard cashews originated in a factory that suffered from blackouts earlier in the year. Apparently, some of the nuts were allowed to sit in the bottom of a damp hopper

during the plant shutdown, and at that time decay set in. Although several firms lost money from the mishap, one company shipped the unacceptable nuts back to the PRC and received another product in compensation. Nevertheless, several sales of cashews (at approximately $1.88 a lb) were made, CHINATUHSU taking unusual steps to guarantee top quality.

One of the most interesting things learned at the 43rd CECF was the fact that China sometimes sells products to the US that originate in third countries. Both coffee and cashew nuts are supplied to China from African nations—the cashews at the level of 30,000 tons per year from Tanzania in a payback scheme for the Tan-Zam railway. The only problem that occasionally arises from this trade mechanism is that China often fails to mark the country of origin on the products before reexport, thus forcing American buyers to foot expensive stenciling charges once the products arrive in US ports.

Essential oil business remained fairly strong at the spring fair despite a mediocre harvest in 1978. An $866,500 order for sixty tons of cassia oil was reported, as were smaller deals (one of nearly $500,000) for menthol. One company claimed to have signed for $2 million worth of Chinese essential oils at the fair. Cashew shell liquid was, however, in extremely short supply even though over 2,000 tons were sold to US firms for $700 a ton during the second half of 1977. Tung oil was offered to US buyers at approximately $2,400/mt C&F, too high a price for at least one American company that had a chance to sign for one hundred tons. (US prices at the time were reported under $2,200/mt FOB.) In the course of the fair, however, another firm announced that it was preparing to sign a $3 million long-term contract for tung oil.

CHINATUHSU's sales of fine hair and angora to US buyers declined at the spring fair. Following the trend of recent fairs, the corporation continued to cut back on cashmere allocations to the US, down one third from last fall, and prices were up 17%. The Chinese seem intent on reducing the sale of raw materials in favor of more lucrative sales of finished products; to this end, a new cashmere factory was recently opened in Peking.

In order to bypass cutbacks, traders were active among themselves, swapping purchases of raw materials obtained through Europe and other markets. Other contracts for animal hair, including one for $200,000 worth of sheep wool, were signed at the fair, but at least one American felt that this area of business is now better handled through telex negotiations rather than at the fair iself.

Gum rosin emerged as a popular US purchase in the CHINATUHSU departments at the 43rd CECF. At least three substantial contracts, together valued at over $1.5 million, were finalized at the fair. Buyers reported that, despite a 5% increase in rosin prices over the last fair, the Chinese product at $410 a ton was still attractive on a world market now short of supply with Portugal's production expected to decline 15% this year and in the face of growing US demand.

The CHINATUHSU products that fared worst at this spring's fair were those closely associated with the agricultural sector. Chilis, ginger, and peppers were all reported unavailable or in short supply. Offerings of dried apple rings, a popular item last fall, were also limited. Chinese ginseng, which has recently entered the US market under FDA approval as a foodstuff, saw little activity at the fair. Licorice, although in low supply, was sold to some American customers, as was more than $500,000 worth of Chinese tea.

Coffee and lignea rebob were also available to American buyers, but sunflower seed, of which over a million dollars' worth was sold to the United States at the last fair, was priced out of the market. In its place, however, other nuts and seeds were sold to American buyers.

Chinese carpets, an extremely popular product in the past, saw only $200,000–$300,000 of US sales, down from $1 million last fall. Chinese department officials cited the large amount of business conducted at the February, 1978, Carpet Mini-fair in Peking as one of the major reasons for the decline in purchases. Many large volume buyers, including some major department stores, failed to attend this spring's fair.

Corporation officials revealed that carpet importers would now receive a 5% discount (not including commissions of 1–1.5% and importer quantity discounts) beneath department store prices. Retail prices have been raised from 10% to 30% above importer prices.

Despite the relatively low level of carpet sales at this spring's fair, CHINATUHSU officials still plan to meet year-end quotas for the US market and will send a selling delegation to the United States, under the sponsorship of the Council, during the second half of the year to study market conditions. A Chinese carpet fair in Tijuana, Mexico, will be held again in June, 1978, according to Chinese officials.

Sales of feathers and down to US buyers probably saw the sharpest decline of any major CHINATUHSU product. Total US purchases of feathers and down were estimated at 60 tons, valued at $2 million, compared with 400 tons at last fall's fair. Opening-day US buyers lining up to negotiate with the Feather and Down Department were about twenty in contrast to fifty at the last fair. The decline in American purchases, which was accompanied by an increase in Chinese sales to European and Japanese clients, was a result of excessively large inventories in the US, anticipated price declines, and some confusion over changes in the Chinese specification system for feathers and down. The dropping-off of US demand was, however, in some ways fortuitous since procurement of feathers and down from peasants reportedly declined in 1977. (Chinese agricultural mechanization programs have apparently pulled labor away from feather and down collection programs.)

Another development in the feather and down market is the closing of the gap between European and American prices offered by the Chinese. At the last fair, the differential was 17%, but due to the fall of the dollar, the price difference is now only 8–9%. This adjustment came after the Chinese let European buyers again reexport their purchases to the US, a switch due apparently to European dissatisfaction with restrictions which were first imposed at the 42nd fair.

Paralleling the decline in raw feather and down sales, US orders for feather and down products dropped fifty percent at this fair to $1.5 million, compared with $3.0 million last spring. Chinese failure to meet product specifications along with uncertainty over the future of down fill in competition with new fiber fills was mentioned as the chief reason for the decline.

INDUSTRY—Headway to Make in Shoes, Toys

Stripped of the highly popular arts and crafts products the Light Industrial Corporation's business at the Spring Canton Fair fell dramatically compared with recent CECF's. Much of the business that had been conducted between INDUSTRY and American importers was handled in the ARTCHINA negotiating rooms during the 43rd CECF.

The level of activity in sales to the US of the products that remained with INDUSTRY, such as furniture, porcelain, and some straw goods, stayed roughly the same as last fall's business, approximately $2.0 million. American sales to the INDUSTRY corporation, at $1.2 million, were also equivalent to the last CECF.

In an effort to adjust to the American market, INDUSTRY agreed for the first time to many new contractual commitments with American customers. One seasoned buyer received a US exclusive to sell aniline leather bags, a newly introduced Chinese product. In addition to getting a private label, the American has secured Chinese permission to fit the bags with accessories out of Hong Kong. Although the Chinese agreed to go ahead with this project at the spring fair, no orders were placed since current Chinese bag designs and brand names ("Pearl" and "Orient") are not considered suitable for the US market.

Shoes were another product line in which the Chinese seemed more flexible at this fair. One company received a commitment from the corporation to produce a prototype high-heeled sandal for the US market. Prior to the fair's opening, in Peking and Shanghai, other shoe buyers made considerable progress with the Chinese, preparing the way for INDUSTRY to receive American equipment and molds for the manufacture of footwear for the US market.

During the course of the 43rd CECF, American importers expressed concern over price increases in some corporation products (glassware prices rose up to 10%), as well as high US tariffs (Chinese furniture imports to the US are taxed at a prohibitively high 45%, according to one American buyer). Also expressed by US businessmen is a dissatisfaction with China's continuity of supply. In straw goods, for instance, the Chinese will hold an order inside China before shipment to the United States. The buyer, however, would prefer to receive a series of smaller deliveries, which would allow him a more even and more manageable level of inventories.

The rapid development of China's INDUSTRY exports to the United States continues to be hampered by the corporation's inability to work within the US government regulations governing foreign imports into America. For example, Chinese toys, prime candidates for wide distribution in the United States, often do not meet US Consumer Safety standards. In addition, INDUSTRY has not been totally successful in adapting its porcelain and stoneware lines to US market requirements. At the 43rd CECF, only one style of cups and saucers had a sufficiently low lead content to pass US customs officials, compared with four styles available in the past.

By the end of the spring fair, significant contracts, in the $100,000 range, had been signed between US importers and INDUSTRY for porcelain, glassware, furniture, and straw goods. Smaller contracts were also negotiated for Ping-Pong equipment, sporting goods, toys, and musical instruments.

MACHIMPEX—More Aggressive US "Propaganda" Needed

In keeping with the trend of recent Canton fairs, American activity with the China National Machinery Import and Export Corporation during the 43rd CECF was minimal. Most US interaction with MACHIMPEX officials at the fair was limited to introductory technical seminars, and only a modest amount of business was concluded.

Members of the MACHIMPEX delegation did encourage American companies to pursue marketing efforts during the course of the semiannual trade event, provided the companies understood that the main purpose of the fair was to sell Chinese products: "We hope to buy machinery from the US; the CECF is, however, an export fair, and import business is secondary," one Chinese official noted.

According to this official, "Imports of machinery concluded at the fair are not very important relative to our corporation's total purchases, but US firms wishing to sell high technology can do some preliminary work here. The different items being imported can be found in the lists tacked to the negotiating room doors. Import items consist mostly of single units and spare parts, most of which are supplied by Japanese companies." (See box.)

MACHIMPEX officials also pointed out that US companies particularly should do more "propaganda work" at the fair to provide information for Chinese end-users to study.

In response to the new Chinese willingness to host US equipment suppliers at the CECF, more than a dozen American companies made their way to Canton to make brief product presentations.

Several American construction equipment manufacturers and textile machinery suppliers, an aircraft company, a can making firm, and others spent time with Chinese trade officials and end-users during the spring fair. Some of these companies responded to quotation requests from the Chinese, and others traveled on to Peking to continue technical discussions at the MACHIMPEX head office. US sales, however, totaling only $100,000, were limited to a small amount of office machinery and other inexpensive equipment.

MACHIMPEX sales to US companies also declined at the 43rd CECF to roughly $100,000. Chinese machine tool sales into the US were not concluded at this spring fair largely due to difficulties in adapting the Chinese machines to American electrical requirements. In order to be imported into the United States, Chinese machine tools must meet UAL standards.

According to Chinese officials, the PRC is working on obtaining UAL approval but has not yet done so owing to a lack of familiarity with the requirements. High US import duties also present a problem to potential American importers of Chinese machine tools, and some buyers are now considering substantial transformations of the gear box, cutter, and electrical systems of the PRC tools in Hong Kong in order to reduce American tariffs.

As has been true in the past, TECHIMPORT did not send an official delegation to the Canton Fair this spring. A small TECHIMPORT team did, however, come to the fair to attend a technical seminar being presented by a US nuclear power company. Similarly, CHINAPACK's presence at the fair was limited to a small unofficial team that only met with "old friends," attending the fair on other business.

MINMETALS—Long-term Agreements in Offing?

MINMETALS activity at this spring's Canton Fair was characterized by a low turnout of potential American customers leading to a generally disappointing level of US sales and purchases. A marked drop in the corporation's US trade was avoided only by a single Chinese purchase of raw materials from an overseas US affiliate. Coming into the fair, MINMETALS officials had hoped to surpass the fall, 1976, record level of sales to the US ($8.5 million), but by the end of the four-week trading session, it was clear that actual American purchases would be well below that goal.

The National Council estimates MINMETALS sales to US firms during the 43rd CECF at $6.5 million. On the Chinese import side, US companies registered a series of small sales that, coupled with the one major contract, totaled approximately $14.5 million.

Perhaps the most important feature of MINMETALS activity with US firms at this spring's fair was the degree of flexibility the corporation showed towards their foreign customers. Setting the tone just prior to the fair, the Chinese entered into a long-term supply agreement for the mulimillion dollar sale of barite to one US company. During the course of the fair, trade officials revealed that additional long-term contracts (in iron ore and perhaps tungsten) were possible depending upon the availability of supplies and the requirements of US companies; at the present time, however, no such contracts are planned.

The increased use of D/P terms for US buyers was also noted at this fair, and MINMETALS spokesmen acknowledged that such payment terms are useful provided both of the signing parties are "familiar with each other." These terms reportedly save importers as much as 1% of a contract's value. Last September, the Chinese suffered default on one American company's D/P contract for $70,000 worth of antimony regulus and are now wary of signing D/P contracts with other potential offenders. Despite this one instance, however, MINMETALS acknowledged that "most US companies are reliable and trustworthy."

Regarding exclusives, MINMETALS officials revealed that no more such arrangements would be granted to the US market since "Sino-American trade is still in its infancy." Rather than granting exclusives, the corporation appeared interested in expanding the number of US buyers of their products and mentioned to the National Council that the majority of their US customers are now located on the East Coast with few buyers in the central or western states. The recently announced MINMETALS delegation to the US, scheduled for late June, 1978, may help to increase the number of corporation buyers in this country.

The composition of MINMETALS sales at the 43rd Canton Fair differed significantly from that at earlier fairs. High-purity graphite, the top corporation moneymaker at the fall fair, was available in limited quantities at this fair, and only a few small contracts were signed with American buyers. Also contrary to recent trends, tungsten became available to US buyers during the fair at prices closely paralleling LME quotes.

Several US firms reported significant purchases, one valued at $700,000, but most of the tungsten buyers planned to ship their orders to destinations outside of the US in order to avoid the high tariffs at American ports. By the fair's end, MINMETALS officials were reporting that their tungsten sales to the US were lower than they had hoped, partially because of poor market conditions in the US and partially because the corporation could not lower their prices sufficiently to attract American users, who are anticipating declining prices in the near future owing to expected sales from US government stockpiles.

Sales of tin ingot to US buyers were also hurt by uncertainty in the American market as well as extremely limited Chinese supplies. Potential buyers chose to postpone purchases until the US Geological Survey announced whether or not it would unload excess stockpiles onto the domestic market; and, by the fair's end, MINMETALS officials reported that no major tin sales to US companies had been made. (Several companies reported small deals in the metal to the National Council representative.) The Chinese did, however, allow that tin sold to third country buyers might eventually find its way into the US since there is no American tariff on the metal.

US buyers reported that the best MINMETALS deals were available in antimony regulus and antimony trioxide. Chinese trioxide prices reportedly fell from $1.35 per pound at the 42nd CECF to $1.25 at this spring's fair. One American company signed for $100,000 worth of antimony regulus, and another firm signed contracts for 240 tons of trioxide, valued at roughly half a million dollars.

In addition, other small US orders for mercury, zinc, magnesite, and other metals were reported at approximately the same level as other recent fairs. Sales of zinc to the United States are still limited because of China's inability to produce the 99.995% product required on the US market, as well as difficulties in packaging.

The First Export Department of MINMETALS, which handles Chinese sales of metal products and hardware, reported no activity with US buyers at the 43rd CECF. Wire nails were not sold, although one company met with trade officials to discuss prices of future purchases.

Several potential hardware buyers also met with MINMETALS to discuss possible purchases, but since all Chinese products are manufactured to metric specifications, no business could be carried out. Trade officials revealed to the National Council that they are currently in communication with their domestic manufacturing units regarding the future production of hardware for the US market; there is some reluctance on the Chinese part to begin such production because the finished products will be unmarketable elsewhere on the world market.

Of the estimated $14.5 million worth of US sales to MINMETALS at this spring's fair, "99% of the purchases will originate outside the United States," according to the Chinese. Sales of ferrous alloys, such as ferrosilicon and ferromanganese, and nonferrous metals, including paladium and cobalt, to the Chinese were made by US concerns. An American agent reported a sale of pig iron, to be provided from sources outside the US.

Even though the level of Sino-American business in certain MINMETALS departments was low during the 43rd CECF, most American buyers left with the feeling that the corporation genuinely wished to increase trade activity with US firms. In several areas, such as tin and tungsten, the Chinese left open the possibility of additional sales later in 1978, perhaps at the fall fair. Once again, at the 43rd CECF the corporation expressed surprise that no US steel buyers seemed interested in selling to the PRC.

SINOCHEM—Suddenly, Pesticides

After nearly four weeks of subdued activity in the SINOCHEM negotiation room, a last-minute multimillion dollar sale of US chemicals saved Sino-American chemical business at the 43rd CECF from setting a record low for post–"gang of four" fairs. As it turned out, American chemical firms registered a respectable $12 million worth of sales to SINOCHEM, which, along with considerable chemical business being conducted directly in Peking, promises to make 1978 a banner year for US chemical exports to China.

Only two days into the spring fair, SINOCHEM officials confided that they would be willing to buy US products, "provided the prices are competitive." This attitude, coupled with recent improvements in the dollar's position vis-a-vis the Japanese yen, fired rumors that American chemical firms would be able to steal business away from traditional Japanese suppliers during the fair. By the end of the trading, however, it was clear that European, rather than American, companies had reaped the rewards of the high cost of Japanese products. Throughout the fair, reports surfaced of below-cost Japanese prices, aimed at maintaining Chinese market segments and keeping domestic factories open.

One of the most significant developments in SINOCHEM business during the early months of 1978 has been the emergence of a healthy demand for American agricultural chemicals. No less than five American firms have signed contracts to supply the Chinese with substantial quantities of pesticides, including herbicides, which have been imported by the PRC only rarely in the past. Most of the agricultural chemicals (more than $5 million worth) were sold to China in Peking late in 1977 or early in 1978, for shipment to China in the first five months of this year. Less than half that amount was negotiated by US firms at the fair.

Some experts believe that the recent upswing in Chinese demand indicates a Chinese policy commitment to experiment with modern Western farming techniques, especially on the north China plain, where conditions are similar to those of large-scale American agribusinesses.

Aside from purchasing agricultural chemicals, the Chinese continued to sign contracts for a wide array of solvents and intermediate chemicals, with the largest US supplier totaling $6.6 million in sales at the 43rd CECF. Two contracts in the half million dollar range were noted in plastic and synthetic fiber resins; a number of $100,000 to $200,000 deals in rubber chemicals, dyestuffs, paraffin fixing chemicals, sodium bicarbonate, DMT, and other industrial chemicals were concluded.

As part of a linked deal with CHINATUHSU, the chemical corporation also bought $400,000 of polypropylene from one American company. Just prior to the fair's opening, another American company signed a contract to provide China with $200,000 of ion exchange resin. A technical seminar on this special resin to be given by the seller was also reported planned for Shanghai.

Under the sponsorship of the CCPIT subbranch in Canton, a group of four American medical equipment suppliers gave a technical presentation to Chinese end-users and were then given the opportunity to observe three Chinese operations, including two open-heart procedures. As a result of the exchange, the companies sold roughly $100,000 worth of equipment, brought into China for demonstration purposes. Another American medical equipment supplier gave a seminar on a sophisticated set of X-ray scanning machines but concluded no sales at the fair.

As the fair opened, SINOCHEM officials revealed to the National Council that they planned to sell US buyers five chemicals during the fair: diostegen, sodium hyperin (ephydrin), calcium petroleum coke, barium carbonate, and chloropicrin. As business progresses, however, only barium carbonate and other barium products were commercially attractive to US buyers.

One firm placed a 1,500-ton order for barium chloride, valued at slightly over $300,000, and other sales, totaling approximately $200,000, were made to US principals in potassium permanganate. Small paraffin sales to the US were noted, and at least one American company bought specialty chemicals at prices 30% above the world market level in order to initiate commercial relations with the Chinese.

Looking into the future, American companies seem likely to be buying increasingly large amounts of chemicals from China, although purchases at the spring fair reached only $2.5 million. One American company was reported holding discussions on a long-term agreement to purchase millions of dollars' worth of petroleum coke from SINOCHEM, and the corporation clearly would like to arrange such additional contracts in order to raise foreign exchange.

The Fairs Ahead

Perhaps the most important lesson of the 43rd Canton Fair was the discovery that, despite an increasing volume of business being conducted in Peking and elsewhere, the Canton fair still plays an important role in Sino-American trade.

With continued Chinese willingness to conform to international business requirements at future trade fairs, there is little doubt that the number of Americans attending future fairs and the volume of Sino-American business will increase, especially if normalization of Sino-US diplomatic relations occurs. As one senior Canton fair official put it, "Once the current difficulties between our two countries are resolved, the entire Tung Fang Hotel will not be big enough to hold all the Americans who will wish to come here." 完

NOT A MINUTE TO WASTE

Among the innovations in Canton, Spring, 1978:

- Telephone extensions in guest bathrooms on the 7th floor of the Tung Fang Hotel, resulting from a Canton hotel study team's visit in early 1978 to Hong Kong.
- Buffet breakfasts at $1.50 per person in the Tung Fang dining room available most mornings, to reduce normally lengthy waits for waiters.
- Afternoon teas at 4:00 p.m. in the 8th floor dining room of the Tung Fang.
- And Japanese TV sets retailing downtown—at RMB 2,400.

Exporter's Notes

Briefly:

- ***Number of US firms giving technical seminars in China doubles.***
- ***China shows interest in US nuclear technology.***
- ***Contracts signed for sales to the PRS so far this year zip to $355 million.***
- ***Agricultural commodities lead with $205 million sold.***
- ***Petroleum equipment sales rise sharply: Offshore rigs, drill bits and other items total over $60 million for US export statistics.***
- ***US machine tools contracts for PRC highest ever: $16–17 million sold.***
- ***PRC oceanographers looking to buy vessel and equipment worth perhaps $30 million.***
- ***Chinese technical survey groups descend in force on US companies and conferences; their reports should pave way for more PRC purchases.***

GENERAL

US exports to China got off to a flying start in the first five months of 1978, with approximately $350 million worth of contracts signed. The tilt upward is substantially due to sales of agricultural commodities: Continental Grain is supplying $130 million worth of wheat, the first US wheat exports to China in four years; an estimated $120 million worth of cotton has been bought since January; and soybean oil accounts for another $15 million of sales. The $265 million worth of agricultural commodities sales thus far for delivery this calendar year is up from $65 million last year, and a meager $44,000 the year before. Equipment purchases by the PRC have risen also; over three quarters of the approximately $70 million worth of three offshore drilling rigs recently ordered by China will show up on US export statistics. Other petroleum equipment is selling to the PRC, as well as machine tools. The prospects for the rest of the year look bright: Speculation is that the PRC will buy more wheat, cotton, and soybean oil. With the current priority given the energy sector, in particular the petroleum industry, more petroleum equipment purchases are certainly in the offing, as well as orders for mining equipment. Purchases should be generated from the information provided by various technical surveying groups touring the US this spring: An oceanographic vessel and equipment are in the cards, and the sale of petrochemical plant and technology is also highly likely. Sales of pure technology do not show up in export sales statistics.

US FIRMS GIVING TECHNICAL SEMINARS IN CHINA DOUBLE

Over thirty American companies gave technical seminars in Peking during the first half of the year, perhaps surpassing the total number of firms to do so during all of 1977. This figure does not include companies invited strictly to negotiate contracts, nor those invited both for seminars and negotiations. The thirty companies gave talks on a variety of topics, including iron ore and steel plant, mining of fertilizers, processing of materials for fertilizers, construction equipment, aircraft, products of agricultural research, lasers, and railroad equipment. In some cases, firms invited only to give technical seminars were asked to stay on for contract negotiations. Among these companies are Ford, Miles Laboratories, Exxon, Union Oil, Chevron, Fluor, Cummins Engine, Hydril, Boeing, Texas Instruments, Armco, BJ-Hughes, Sunstrand, NL Petroleum Services, Cabot, and Vishay. Increased numbers of businessmen have been matched by increased numbers of tourists now that China has just opened the doors to a wider variety of foreign guests. **Some businessmen are complaining that tourists have squeezed them out of the more comfortable Peking Hotel** for other, less hospitable accommodations. In some cases, it appears that end-users arriving from the provinces to attend technical seminars have also had difficulty finding a place to rest their weary bones.

NUCLEAR PURCHASES IN SIGHT

"It's clear that China will acquire probably two or three nuclear reactors from the West within the current eight-year plan," observed Octave J. Du Temple, Executive Director, American Nuclear Society (ANS), after his mid-May return from discussions with a group of China's nuclear engineers. The US may very well have a chunk of the market. The seven-member delegation from the ANS believes that the **PRC is presently looking for a 600-mw to 700-mw reactor, very likely of the pressurized water variety, which would be hooked up to its own water-cooled turbines.** China's electric grid could not support a larger model. With the commitment to nuclear development articulated by Fang I at the spring National Science Conference, the country will probably want to have at least one nuclear plant completed by 1985. The PRC has already been shopping in Western Europe (see *CBR* 4:3), and had a delegation in France at the same time the ANS was visiting China. (At the spring Canton fair, Nuclear Services Corporation, a California design and construction company, gave a technical seminar to TECHIMPORT on the firm's services relating to the development of nuclear power.) The ANS mission's academic and commercial representatives, including scientists from Combustion Engineering, Allied Chemical, General Atomic Corporation, and Westinghouse-Hanford, spent most of their stay in Peking and Shanghai, seeing, among other facilities, the Atomic Energy Research Institute in Peking. At the request of their hosts, the Chinese Academy of Sciences, they gave lectures in their specialties: pressurized water reactors (manufactured by Combustion Engineering), radioactive waste management, metallurgy and fuels, education of nuclear scientists and engineers, high-temperature gas-cooled reactors, and research reactors based on Triga-type reactors (manufactured by General Atomic). The papers on pressurized water reactors and high-temperature gas-cooled reactors had been specifically asked for in advance. According to Du Temple, Joseph Dietrich, an expert on pressurized water reactors, was in the greatest demand. The April 26 to May 9 trip brought to a climax 20 years of long-distance contact between the ANS and the Chinese Academy of Sciences. The organizations began a continuous exchange of publications in the mid-1950's. After suggesting face-to-face meetings for the past seven years, the Society finally received an invitation to

China's New Rigs
MARATHON LETOURNEAU RIG SPECIFICATIONS 82 SD-S

BASIC DATA

Length Overall	207′0″
Width Overall	176′0″
Hull Depth	20′0″
Type Legs	Triangular Truss with K-Brace design
Spud tank	6 sided, 40′ across flat
Elevating Speed	90′ per hour
Total Fixed & Variable Load	3,250 tons
Estimated Total Variable	1,300 tons
Customized Crew Quarters	Accommodations up to 90 men

OPERATING CONDITIONS

Full leg length 360′:

Water Depth	Wave Height	Wind Speed
250′	38′	100 knots
200′	42′	100 knots
150′	46′	100 knots
100′	47′	90 knots

Assumed Penetration: 25′

BETHLEHEM'S BETHDRILL JU-250 SPECIFICATIONS

NOMINAL DIMENSIONS

Platform, ft	166 x 109 x 16
Mat, ft	210 x 170 x 10
Columns: Number and Type	Three cylindrical
Size, each	12 ft OD x 312 ft

NOMINAL CAPACITIES

Drilling Water	4,300 bbl
Fuel Oil	1,800 bbl
Potable Water	400 bbl
Liquid Mud	1,500 bbl
Bulk Mud & Cement	6,150 cu ft
Bag Storage	3,000 sacks
Pipe Racks	1,200,000 lb
Quarters	78 men
Max Variable Load	2,250 tons
Max. Moving Variable Load	1,200 tons

OPERATING CONDITIONS

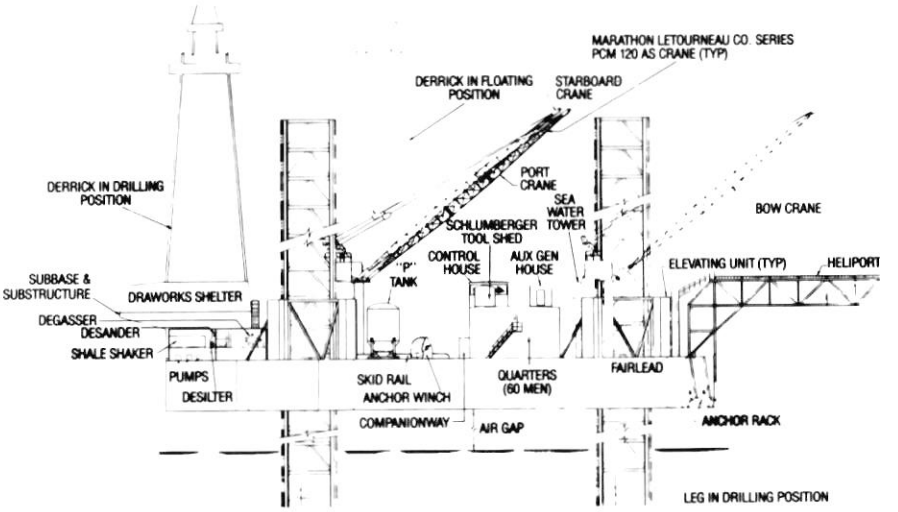
Still Water Depth, ft	@200	@250 (max)
Max. Wave Height, ft	60	33
Wave Period, seconds	15	10
Design Wind Velocity, knots	100	70
Minimum Air Gap, ft	41	25

visit China about a week after Hua Kuo-feng's February 26 speech announcing the country's nuclear power program. "We have invited the Chinese to send a reciprocal delegation here," said Du Temple, "and believe they will probably come before the end of the year." The US mission had the opportunity to meet with "five or six" professors who were trained in this country 30 years ago, at MIT, Cornell, and several California schools. Their host was the second vice-president of the Academy of Sciences, "the man who really runs the Academy," according to Du Temple. Most of the facilities that the group saw were, in its estimation, using about 20-year-old technology. Some of the equipment was quite advanced, however, including electromagnetic separation apparatus, a cyclotron, and "hot" laboratory facilities for handling radioactive materials. This more sophisticated machinery was located at the Atomic Energy Research Institute. Cautioned Du Temple, "Other institutes working on their weapons program are probably better equipped." Members of the mission were greatly impressed by the Chinese familiarity with all current foreign literature on nuclear topics. The mission was led by Chih Wang, head of the Radiation Center, Oregon State University, and also included Joseph R. Dietrich, President, ANS, and Chief Scientist, Combustion Engineering; Ersel Evans, Vice President, Westinghouse-Hanford; William R. Kimel, President-elect, ANS, and Dean of Engineering, University of Missouri at Columbia; Harry Lawroski, Allied Chemical Co.; Corwin Rickard, Executive Vice President, General Atomic Corporation; and Octave J. Du Temple, Executive Director, ANS.

BETHLEHEM STEEL, MARATHON SELL RIGS

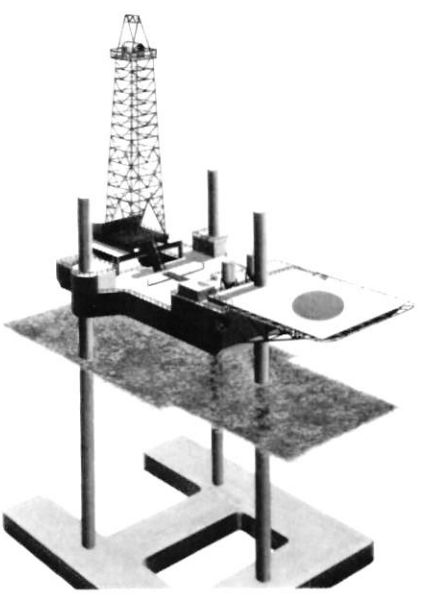
US companies are beginning to gain on foreign firms, especially Robin Loh, which have thus far monopolized China's offshore drilling market. In its first round of purchases from US and US-affiliated firms since National Supply's contracts last December, **the PRC in April bought three offshore platforms: two jack-up rigs from Marathon LeTourneau of Houston, and one jack-up from Bethlehem Singapore,** which is 70% owned by Bethlehem Steel of the US. The Bethlehem rig, valued at roughly $20–25 million,

is a **BethDrill JU–250 mat-supported jack-up mobile drilling platform** for use in up to 250 feet of water. Although its destination has not been disclosed, it may very well be used in the South China Sea off Hainan Island, which has been marked as an area for oil development. The soft, sandy seabed in that region would require this type of base, which features legs fixed to a steel mat instead of resting directly, as do conventional rigs, on the ocean floor. Bethlehem's first contact with the Chinese came last November when Bethlehem Singapore's chief engineer visited Peking as a member of the Singapore Association of Shipbuilders and Repairers delegation and delivered rig specifications to the Chinese. In January, the firm received an invitation to the capital and dispatched a four-man team for negotiations. The group stayed for several weeks, discussing mainly technical aspects of mat-type rigs, and then returned in mid-March for commercial talks, which came to a successful conclusion on April 10. Delivery of the rig is scheduled for March, 1979. Bethlehem was advised by Stanley Lubman of Heller, Erlman, White, & McAuliffe of San Francisco and Hong Kong, lawyer and China specialist. Bethlehem began construction of the rig before actually contracting with the Chinese, speculating that China's recent push for petroleum development would make the country a likely customer. It is now reported that the company is building another identical rig on speculation, to be ready late in 1978. Marathon LeTourneau signed a contract May 11 to supply **two Class 82-SD-S (shallow draft, slot-type) self-elevating jack-up platforms** probably worth about $46 million, although the company declined to disclose the exact amount. They will be employed, like the Bethlehem model, in 250 feet of water. According to George Morris, president of the Marathon's Singapore yard, the Chinese have indicated that the rigs will most likely be used in the Gulf of Pohai; they will be involved in both exploration and production, he believes. While all of the rig's equipment will be US-made, it will be assembled at Marathon's Singapore facilities. With delivery not scheduled until March, 1980, construction will not begin until next spring. Marathon has offered to train Chinese engineers at its Vicksburg, Mississippi, operations school; although the Chinese have not yet definitely accepted, the company feels that some technicians will make the trip, sometime in late 1979. Marathon will send about a half dozen technical personnel to assist in the set-up of the first rig. The firm had its first contact with the PRC when a group of Chinese engineers visited its Singapore yard in 1975. It kept up communications for two years, during which time a delegation of Chinese engineers visited Marathon's Vicksburg yard under the auspices of the National Council and inspected a Class 116 rig designed for 300 feet of water. Last September the company was asked for a quotation, and two months later, a group was invited to Peking to give technical seminars. In April, another mission returned for commercial negotiations. The company was assisted in its deal by C. J. Wang of International Corporation of America. In a related development, **it has been rumored that the Chinese are about to buy their second used semisubmersible rig from Norway.** In other news, in May, **Hughes Tool signed its third, and largest, contract with MACHIMPEX to provide over $10 million worth of drill bits and cutters for mining equipment and Reed Tool will supply an additional $4.5 million worth of drill bits.** Also in May, **BJ-Hughes concluded a $500,000 contract for cementing equipment** to be installed on the second National Supply drilling platform bought by China last December.



Marathon LeTourneau jackup drilling platform 82-SD-S

Bethdrill JU-250 rig.



EXIMBANK FINANCING FOR CHINA —PRC DOES NOT OBJECT BUT US HOUSE STILL LEERY.

After riding a high wave almost to success, the campaign for Eximbank financing and facilities for companies selling to the PRC suffered a setback in the House of Representatives. HR 8196 to amend the Export-Import Bank Reauthorization Act of 1978, introduced by Les AuCoin (D-Ore.), was approved by the House Banking Committee on May 1, but on June 2 the full House voted 179-138 in favor of deleting the China amendment. According to an AuCoin staffer, the issue "could still be a bit in doubt," and the amendment could be re-entered for another vote when the whole bill goes back to the House floor in the latter part of June. In the Senate, however, **S 3077** amending the Export-Import Bank Act of 1945, sponsored by

Adlai Stevenson (D-Ill.) was unanimously approved by the Committee on Banking, Housing and Urban Affairs on May 9, and was reported to the Senate floor on May 15. A senior PRC trade official, Sun Fang, deputy secretary general of the Canton Trade Fair, who was interviewed by the *Asian Wall Street Journal*, indicated that **China does not object to participation by the US Export-Import Bank in the financing of American exports to China.** US Eximbank involvement may help to promote trade, he recently observed. China would not borrow directly from the bank; it is the US companies that would borrow, making it an "internal affair" of the US, and, therefore, nothing thaat China would oppose on principle. The PRC has been traditionally reluctant to accept direct credit to pay for purchases. Specifically, the House bill (if reactivated) would provide US companies with Eximbank insurance, guarantees, and supplier credit facilities. It could not be effective without the passage of a companion bill, HR 8197, also submitted by AuCoin, which would amend Section 402 of the US Trade Act of 1974, currently also restricting the use of US Exim facilities. The second bill would have to be approved by the House Ways and Means Committee.

WHEAT, SOYBEAN OIL, COTTON

In April, China bought one million metric tons of wheat from Continental Grain Company worth approximately $130 million—its first such purchase from the US in four years. Speculation is that the PRC will buy more before the year is out. No contracts with any country for fourth quarter 1977 delivery have yet been signed by Peking. The one million mt was bought in two different lots: 600,000 mt, announced by the USDA on April 10, and 400,000 mt, announced on April 17. General prices were up at the time, making the purchase price at least $138.50 per ton—well above the $90–100/ton Australian and Canadian prices reported last year. Deliveries began at the end of May and will wind up in September, with the bulk of the orders scheduled to reach Chinese ports during the summer. Despite buoyed hopes in the US wheat market that the PRC is back to stay, sources at the US Department of Agriculture believe that **this country is still seen as only a residual supplier after Canada and Australia,** filling a supply gap caused largely by delayed shipments. Canada has been faced with continuing congestion problems at the port of Vancouver, and Australia has suffered a low-yield harvest year. As a result, China has been forced to turn to the US to supplement dwindling supplies of its own poor 1977 crop. The PRC's purchases, however, do not reflect a deterioration of the favorable 1978 winter crop outlook. Additional purchases of 1.5–2 million tons seem likely, the USDA predicts, at least part coming from Canada, but "it is not certain that Canada will be willing or able to supply the full amount." The US, which will have an estimated 33.1 mt surplus for the year ending June 30, seems to have a good chance to supply some additional quantities. The long hiatus in wheat business with the US resulted in part from TCK smut in shipments of American wheat to China in 1974. **27,000 tons of soybean oil, valued at $15 million, to be shipped to the PRC by October 1, were sold by May.** In addition, a total of **65,000 tons of cotton worth $92 million** had been sold for the 1977–1978 marketing year (8/1–7/31), with another 37,000 tons, worth $52 million, scheduled to be sent to China from the US between May and December, 1978. As of early June, China was committed to buying 90,000 tons of US cotton in calendar 1978, valued at $127 million, compared with $17.5 million worth of cotton purchased in 1977.

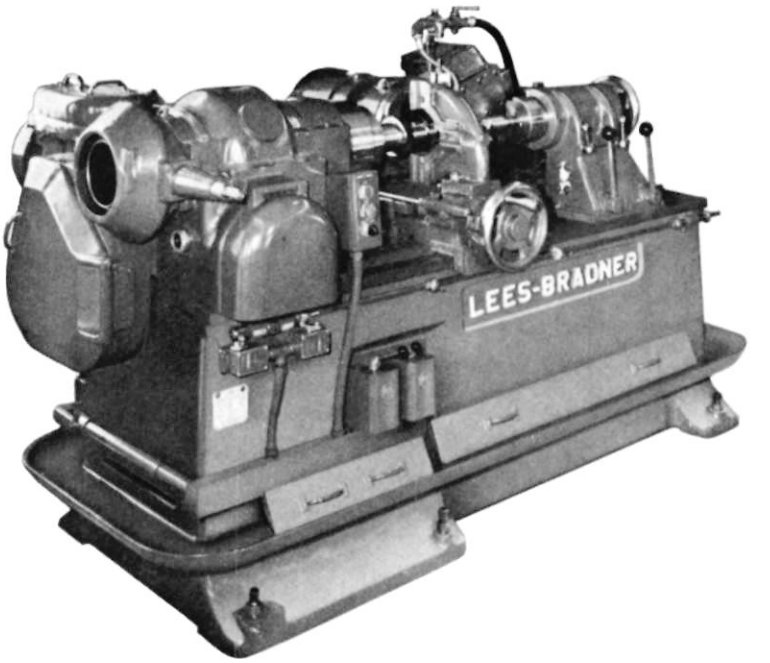
ELECTRONICS

In late May, IBM signed its first major contract for a computer to be used within China; it previously sold a system to the Bank of China in Hong Kong. After receiving a letter of intent from the Chinese early in 1977, company negotiators arrived in Peking later in the year to discuss the sale of a computer for the **Shenyang Blower Works,** a compressor plant that uses Nuovo Pignone licenses and know-how sold in 1976. Although the Italians had previously used an IBM 360/135 computer with this industrial process, IBM officials proposed, and the Chinese agreed, to employ the newer 370/138 for the Shenyang facility. (IBM had already sold a 370/158, a larger machine in the same family, to the Kamas Truck Plant in the Soviet Union.) Signed in December, the China contract is valued at approximately $2 million, and installation is scheduled for February, 1979. The majority of components sold will be manufactured outside of the United States, the main frame in Japan and the printers in Argentina. Prior to delivery, the system will be assembled in Japan. IBM filed for an export license on March 29, 1977; the application cleared US domestic controls in May, 1978, and will soon be sent to COCOM for approval at the multilateral level. The company plans to host a group of Chinese engineers from the Shenyang Blower Works July 10–August 22. MACHIMPEX in January placed a first-time order with **Analog Devices** of Norwood, Mass., for $500,000 worth of integrated circuit components for exclusive use in petroleum exploration equipment, both domestic and foreign-made. Export approval from the Department of Commerce is still pending. **Fluke International** of Mount Lake Terrace, Washington, has sold a substantial sum of test and measurement equipment this year, part of which must also await the government green light.

MACHINE TOOLS

At least six US machine tools manufacturers have sold $16–17 million worth of their products to China since late February, some of the equipment containing high-technology numerical controls. The **Lucas Machine Division of Litton Industries, the Farrel Company, the Bullard Company, Lees-Bradner, and Barbara Colman** all concluded contracts with a TECHIMPORT mission hosted by the National Machine Tool Builders Association, which toured the US during the first three months of the year, while Gleason Works completed an independent sale at the same time. The largest dollar amount was ordered from Gleason Works of Rochester, NY, which is supplying 47 machines and tooling worth about $7.5 million. The contract calls for a wide range of **bevel and hypoid gear production equipment,** which the Chinese say will be used in the manufacture of automotive and tractor axle gears. The general-license equipment, produced at the company's Rochester and Belgian plants, is scheduled for delivery in the second half of this year and in 1979. The sale took about five months to complete from the time the Chinese

first invited Gleason to give technical seminars in Peking, in October, 1977, to the signing of the contract in late February. Commercial negotiations began in December, 1977. Gleason received a previous $8.2 million order for similar machinery from the PRC in 1973. The Connecticut-based Bullard Company, a division of White Consolidated, signed five contracts in March for machines and one contract for tooling totaling $3 million. The machines, all Dyn-au-tape **vertical boring mills with two-axis numerical control,** have diameters of 46″, 66″, 86″, 108″, and 124″. They are scheduled for delivery in June and August, 1979, pending export approval by the US Department of Commerce. The PRC has informed the company that the equipment will be used in power generation at the Nanking Steam Turbine and Generator Plant and the Shenyang Blower Works. **Another large vertical boring mill** with a price tag of over $1 million was ordered from the Rochester, NY–based Farrel Company, a subsidiary of Emhart Corporation. The numerically controlled, 16-foot machine will be delivered in May, 1979, to the Nanking Steam Turbine and Generator Plant and the Shenyang Blower Works upon receipt of export approval. Two companies made small, first-time sales that they hope will lead to further business. Lees-Bradner of Dexter, Maine, another subsidiary of White Consolidated, concluded a contract March 31 to supply a Model HT **thread-milling machine** worth $140,000, for March, 1979, delivery. The Cleveland-headquartered Barbara Colman Company will ship a Model 1656 **horizontal gear-hobbing machine,** which will cost the Chinese $132,000. The machine will be delivered to Shanghai in November of this year. The second highest value order was from the Lucas Division of Litton Industries in Cleveland, Ohio, whose "numerous contracts" total about $4.5 million.



Lees-Bradner HT thread milling machine sold to PRC.

$30 MILLION WORTH MAY BE BOUGHT BY PRC OCEANOGRAPHERS

China is interested in buying a multipurpose oceanographic survey vessel, possibly from a US shipyard, with accompanying equipment from US companies, according to a delegation that visited this country in April to gather information for purchase recommendations. The group specified a 4,000–5,000 ton, 300-foot vessel that might cost about $20–25 million. Possibly $5–10 million worth of US equipment could be bought to outfit the ship. The operating cost of such a vessel may be as much as $4 million a year. Members of the group carefully noted names of all manufacturers and model numbers of equipment seen at various companies including Litton Industries, Sperry, Western Geophysical, Raytheon, and Magnavox.

EXPORT CONTROLS TURNAROUND

The Department of Commerce in early May rejected an application from Daedalus Enterprises of Ann Arbor, Michigan, to export airborne equipment for geological exploration to the PRC; the decision was reversed in early June, right on the heels of the visit to China of Zbigniew Brzezinski, President Carter's national security adviser. Administration officials, however, sought to downplay any connection between the visit and the subsequent change in the decision. The equipment in question involves infrared, multispectoral scanning devices mounted on planes, which detect heat, light, and moisture impulses from the ground. (See *CBR* 5:1, p. 37) The signals gathered are transmitted to magnetic-tape recorders and fed into a computer to put together a geological image. Some government reviewers were apparently concerned that the equipment could also be used for military monitoring. According to the company, the Chinese have said that it will be used by the Chinese Bureau of Geology for oil exploration and earthquake prediction. It can also be employed for geological fault zone detection and mapping, water pollution monitoring, and energy loss detection.

DELEGATIONS FROM CHINA MULTIPLY

The number of trade or industry-related delegations to the US from China this spring has multiplied like mushrooms after spring rain. PRC technical survey groups have come to the US in several different industry areas indicative of China's new economic priorities.

Machine Tool Buying Mission, January–April. A group of purchasing agents from the China National Technical Import Corporation (TECHIMPORT) spent three months in the US at the invitation of the National Machine Tool Builders Association visiting companies and conducting contract negotiations. Five machine tools companies made $9 million worth of sales during the course of their visit.

Petrochemical Investigation Team, March 22–April 25. This group of experts in ethylene and oil and gas refining showed particular interest in crude oil degassing and gathering, oilfield gas cryogenic separation, and

oil field exploration. Led by Yang Kuang-chi, deputy director of the Petrochemical Planning and Engineering Institute, the mission also included representatives from the revolutionary committee of Taching Oil Field, the Peking General Petrochemical Works, the Scientific Research and Engineering Institute of Taching Oil Field, TECHIMPORT, and a brand new corporation, the China National Petroleum and Chemical Construction Corporation. Hosted by Lummus, Fluor, Kellogg, and Union Oil, they visited facilities of Getty Oil, Universal Oil Products, Atlantic Richfield, Du Pont, AMOCO, Union Carbide, Celanese, Chevron, and Phillips in addition to those of their hosts.

China International Travel Service Delegation, March 30–April 20. As part of China's stepped-up drive to garner foreign exchange through expansion of tourism, a CITS mission surveyed American methods of handling tourists. It was hosted by the National Committee on US-China Relations. (See *CBR* 4:2, p. 5).

Oceanographic Survey Vessel Delegation, April 6–26. A National Council–hosted mission, this half-business, half-academic group was mainly interested in the purchase of a multipurpose oceanographic research vessel and accompanying equipment. Led by Tseng Cheng-Kuei, Deputy Director, Institute of Oceanology of the Chinese Academy of Sciences, and a researcher at the Scripp's Institution in the mid-1940's, the group also consisted of representatives from the Tientsin Navigation Instruments Factory, the Shanghai Ship Designing Institute, the CAS Foreign Affairs Bureau, and other Institutes of Oceanology. (See Council Activities.)

Marine Science Delegation, April 26–May 27. Close on the heels of the Council's group, another oceanographic delegation hosted by the National Academy of Sciences arrived in this country. The presence of two such similar groups points up the strong Chinese interest in oceanographic development. This second mission, led by Lo Yu-ju, deputy director of the National Bureau of Oceanography, represented the fields of physical oceanography, marine physics, marine geology, phyco-ecology, marine instrumentation and marine chemistry.

Chinese Fertilizer Study Group, May-June. As part of the Committee on Scholarly Communication with the PRC exchange program, this delegation toured the US for four weeks in late spring.

Chemical Fiber Technical Survey Delegation May 7–27. In the US at the invitation of the National Council, this 20-person mission was headed by Wang Jui-ting, President of the China National Chemical Fibre Corporation, and had as its senior advisor Mme. Ku Hsiu-lien, a vice minister of the State Planning Commission. Its membership also included representatives from the Peking and Shanghai Petrochemical Works and from TECHIMPORT. Among the processes surveyed by the group were hydrocracking, catalytic reforming, nylon 66 monomer and spinning, chemical intermediates and synthetic fiber knitting. (See Council Activities for more details.)

Refining Technical Survey Team, May 23–June 30. This 15-man group headed by Chen Tzu-huang, vice president of the Petrochemical Planning and Design Institute, has among its members staff of the Refining Department of the Petroleum Corporation of China, the Peking Oil Refining Design Institute, and TECHIMPORT. Hosts for the group are Fluor and Union Oil.

Coal Preparation Delegation, June 5 for three weeks. A ten-person delegation will visit Roberts and Shaefer and McNally Pittsburg.

DELEGATIONS TO CHINA

In addition to the delegation from the American Nuclear Society, several other notable missions have visited or plan to visit the PRC:

Cotton Trade Team, May 15–21. The Cotton Council International, the overseas arm of the National Cotton Council promoting US cotton sales abroad, visited Peking and Shanghai for meetings with officials of CHINATEX. The group included officers of the Cotton Council, independent cotton merchants from Memphis and Dallas who are also representatives of the American Cotton Shippers Association, and executives from two cotton cooperatives. In late 1977, the CCI arranged a tour for officials from the Chinese Liaison Office in Washington, DC, to Lubbock, Texas, and Memphis.

Agricultural Machinery Delegation, May 20–June 2. The National Council's fifth industry mission to the PRC gave technical seminars in the PRC and toured Chinese communes and agricultural machinery production facilities including the Loyang Tractor Factory.

Machine Tool Mission, June 26–July 7. The National Machine Tool Builders' Association will present a metalworking technology symposium in China, its third presentation in the PRC. The ten companies making up the group are the V & O Press Company, Inc.; Verson Allsteel Press Company; Denison Division of Abex Corporation; Automation and Measurement Division of Bendix Corporation; Cone-Blanchard Machine Company; The Cross Company; The Doall Company; La Salle Machine Tool, Inc., a subsidiary of Acme Cleveland Corporation; PMC Industries; and Grinding Machine Division of the Warner & Swasey Company. Jesse Maffuid, International Marketing Director for NMTBA, will accompany the group. Products manufactured by the mission members include numerical control presses used to produce combustion liners and turbine rings in the jet engine industry, fluid power transmission and control equipment, manual and automatic inspection equipment, and an array of other conventional and numerically controlled items for all industries.

American Bar Association, July and November. Hitting the jackpot with two delegations in four months, the ABA will be sending a top-level group in July headed by ABA President William Spann, hosted by the Chinese People's Friendship Association. Next November 4–19, the ABA's International Section plans to dispatch a 24-person mission. Among the topics that have been suggested for discussion are: trade, commodities transactions, laws affecting exports to the US, arbitration, admiralty and shipping, unification of international commercial law, outer space, aviation law, law of the sea, and international exchange of lawyers.

CHINESE ATTEND US INDUSTRY CONFERENCES

For the first time, the Chinese this year have begun to attend industry and trade-oriented conferences in the

US and following these events, they have arranged a series of company visits around them. In the first half of 1978, Chinese buyers have attended the following conferences; all except INTELSAT involved extended stays:

• **Offshore Technology Conference, Houston, Texas, May 8–11.** A nine-person contingent from the China Oil and Natural Gas Exploration and Development Corporation was among the 70,000 OTC attendees from around the world. Hosted during the OTC by Otis Engineering, the group stayed an additional two weeks to visit Otis, Texas Instruments, Western Geophysical, Petty-Ray Geosource and Exxon in Houston and Dallas.

• **Electro '78, Boston, Mass., May 23–25.** A group from the Chinese Electronics Society consisting of 12 persons attended this conference and toured the US at the invitation of the Institute of Electrical and Electronics Engineers (IEEE), which sponsored Electro '78. Concentrating on instrumentation and measurement, the mission visited companies, universities, and research centers including Western Electric, Microwave, Polaroid, General Radio, Hewlett Packard, Fairchild, Stanford University, and the National Bureau of Standards. The delegation, headed by Chinese Electronics Society Vice President Sun Chun-jen, was the first formal delegation hosted by the IEEE, but the second group to come to a conference under their auspices this year; a group attended a solid state conference in February. The IEEE sent a delegation to China last year.

• **National Computer Conference, Anaheim, Calif., June 5–8.** A 10-person group from the Chinese Electronics Society including some representatives of MACHIMPEX, under the auspices of de Keijzer Associates of New York, visited this conference run by the American Federation of Information Processing Societies, Montvale, NJ, and are spending an additional three weeks until July 1 visiting institutions and companies.

• **INTELSAT, Washington, DC, May and July.** PRC groups from the Ministry Posts and Telecommunications are visiting two different INTELSAT conferences this year for the first time. Chinese satellite earth station operators attended an Operations Representatives meeting for the Indian Ocean Region May 24–31, and a second mission will attend a Global Traffic Meeting July 11–17.

BOOKSHELF

The Foreign Trade of China—Policy, Law, and Practice by Gene T. Hsiao. Berkeley and Los Angeles: University of California Press, 1977. 291 pp. *Reviewed by William W. Clarke, Director, PRC Affairs, Bureau of East-West Trade, US Department of Commerce.*

One of the things that strike many Americans and other foreigners doing business with China is the remarkable way the Chinese have of retaining the initiative in commercial affairs; Peking's control over trade matters is not left to chance. Gene Hsiao's new book provides not only the reasons the Chinese are so anxious to retain control, but the details of how they retain control —methods the businessman mindful of the potential market in the People's Republic should take pains to understand. Those devoted to a thorough comprehension of Chinese trade matters will find this a significant contribution.

In reviewing Chinese foreign trade policy, Professor Hsiao points out that since the Revolution, the PRC, while willing to trade with nations of different social systems, has consistently held that political sovereignty cannot be separated from economic independence. Or, as a vice minister of Foreign Trade put it in 1972, "in the absence of political independence, economic independence is out of the question, and independence of any country is incomplete without economic independence."

The hundred-year lesson (1842–1949) of imperialist aggression in China clearly provides the raison d'etre for Peking's continued tight-fisted control over foreign trade policy. While one may wonder whether the PRC's current ten-year plan (1976–1985) and modernization goals for the year 2000 will be served best by this policy, Hsiao's careful discourse on the history of the PRC's commercial relations provides no basis for change—increased flexibility in trade practice, yes, but no basic changes in policy.

In addition to foreign trade policy, the book necessarily ranges over the apparatus of China's foreign trade establishment, including sections on the foreign trade corporations and the role of the Kwangchow (Canton) fair. Contractual practices and dispute settlement are detailed at some length, as is the well-known Chinese aversion to arbitration. The history of the PRC's trade treaties and agreements is comprehensive and well done. In the context of current Sino-American relations, it is interesting to note that Chinese leaders believe the lack of formal diplomatic relations need not impede the conclusion of intergovernmental trade agreements; rather, such agreements should lead to the normalization of relations.

The passage of time since the conclusion of research has seen changes that affect some of Professor Hsiao's statements. It is no longer true, for example, that the exchange of trade delegations is "usually" agreed upon by the parties in a formal trade document. In speaking of joint trade committees or commissions, normally created by trade agreements, Hsiao probably should be tougher on the Chinese.

That the joint commission is a mutually beneficial institution whose annual meetings provide for solution of trade problems has not yet proven to be the case as seen through European eyes, although the Chinese may see them as beneficial. They will become so only when the Chinese begin to use commissions to discuss the real substance of trade issues. The last hundred pages of the book contain examples of actual trade agreements, contracts, and other trade doumentation.

While Professor Hsiao's excellent book will serve a number of uses, it does not provide the American trader with all the current advice he needs on the Chinese market; Hsiao did not intend it to do so. For this the businessman has available the National Council for US-China Trade, the Department of Commerce, or one of the private trade advisory services.

Finally, one cannot help but note a seeming incongruity in the logic of Chinese foreign trade policy. While Professor Hsiao is carefully detailing the variety of advantages that accrue to the PRC side through their insistence on use of the standard form Chinese trade corporation contract, one is reminded of the book's earlier, sometimes elegant, quotations of various foreign trade ministers to the effect that trade should be based on equality and mutual benefit. The ultimate decision, of course, still lies with the American businessman—he doesn't have to sign the contract. 完

China Economic Notes

Briefly:

- ***China's first-quarter industrial output reaches all-time high.***
- ***Profits eyed, management emphasized by PRC.***
- ***China combats drought in North, high rainfall in South; drought does not seem as bad as last year's.***
- ***Highlight now on nuclear technology for peaceful uses; plans are to build a 30–50 billion electron-volt protron accelerator.***
- ***Energy sector output up; new oil discoveries confirmed.***
- ***New railway plans announced.***
- ***New end-user corporations cropping up: petroleum, chemical fiber, petroleum and chemical construction, agricultural machinery.***
- ***National education conference continues the return to structure and emphasis on science and technology.***
- ***China sets high goals for "large-scale" agricultural research.***

GENERAL

China's gross industrial output in the first quarter of 1978 represented "an all-time high," according to an April State Economic Commission report, showing "a big increase" over the same period last year. **State targets were exceeded for the output of steel, pig iron, rolled steel, nonferrous metals, power, crude oil, raw coal, timber, chemical fertilizer, sulfuric acid, caustic soda, cement, chemical fiber, paper, and cardboard, and for railway transport volume**. Total machinery output, including petroleum equipment, belt conveyors, bulldozers, steamrollers, compressors, and internal combustion engines, topped the same 1977 period by 42%. China's **building materials** output, including production of cement, glass-plate, glass fiber, asbestos, asbestine products, mica and diamonds, rose over 25% over the same period in 1977. In the **transport** sectors, total freight transport volume increased 33.7%, and the total volume of cargo loaded and unloaded at PRC ports was up 35.7%. Air transport volume went up 25%, with total revenues increasing 19% and the number of passengers up 20%. In railway transport, 15 million more passengers were carried than in the first quarter of last year. **Timber** made a more modest 10% increase. In the export industries, too, the increases were significant. Industrial output value of China's **textiles zoomed 40%,** including chemical fiber, cotton yarn, cotton cloth, woolen fabrics, and woolen yarn, "with better quality and better variety," according to NCNA. A variety of **light industrial products also reported sizable increases** ranging from 30 to 80%: pulp, paper, cardboard, bicycles, sewing machines, light bulbs, detergents, and machinery used in light industry.

MANAGEMENT

Continuing the wave of conferences marking China's renewed drive toward economic modernization, the **2nd National Work Conference on Learning from Taching in Industry,** recently convened in Peking, strove to inspire the country to keep pushing ahead and praised the Anshan Iron & Steel Company for building itself into a Taching-type enterprise in a record one-year effort. In a late April announcement came the word that China's **Ninth National Trade Union Congress** will be held in October to laud model workers and revive their initiative. In the meantime, workers should be studying politics, science and technology, and management. In its April 26 circular the State Council announced that in July or August it will hold a **national conference of enterprises "to strengthen management, stop losses, and increase profits."** Acknowledging that China's enterprise management is still backward and profit levels are relatively low, the Council stressed the importance of accumulating funds for construction through an increase in production. It called on financial and banking departments to take initiative in helping enterprises strengthen management. Accentuating a growing trend toward providing workers with more material goods and more say in management, an early April editorial in *People's Daily* highlighted Hua Kuo-feng's statements that **"moral encouragement and material rewards must go hand in hand."** Although adding the caveat that emphasis is on the former, the editorial recognized that "moral encouragement alone is not enough. It is also essential to show concern for the masses' material interests and offer appropriate material rewards. . ." For example, the famous Kailuan coal mine pays underground workers more than above-ground workers; as a result, their attendance rate is up, their labor productivity has risen, and the number of mining and tunneling workers has increased. The article also pointed out that the policy of "to each according to his work," after having been condemned during the "gang of four" era, was written back into the constitution at the Fifth National People's Congress. Another article explained that material incentives function in three ways: by giving impetus for "socialist enthusiasm"; by providing a material guarantee, especially in a still-developing country; and by securing what is already achieved. In conjunction with the renewed emphasis on material rewards, an NCNA commentary assured the masses that **legitimate domestic sideline production,** maligned by the "gang" as a "capitalist vestige," is in reality no such thing but is **an honorable practice** in which commune members may have the use of small plots of land for personal needs, although they cannot buy or sell them. In addition, party policy definitely permits sideline trade at village fairs. Another spate of articles described a series of large and small refinements of China's management system. An April editorial in *People's Daily,* called for **developing commune- and production brigade–run enterprises alongside the people's communes.** Some 80–90% of rural people's communes are running such enterprises at the present time. The call has also been made for a **return to the pre–"gang of four" rural commune management system,** the "three majors" of planning, labor and finance. The "gang" is denounced for making "management a forbidden area where no cadres dared to set foot." As part of the new emphasis on management, China is proclaiming the sovereign **right of workers to participate in management** through a "committee for participation in management," al-

ready being implemented in a number of work collectives. A case in point is the Peking metallurgical complex, where the director is in charge of the implementation of plans and the organization of production, but has no powers regarding new employment, the distribution of income, or promotion. Workers are being exhorted to "strictly observe operation regulations and **firmly establish the idea of position responsibility** and the idea that production must be made safe." Party committees were urged in a recent *People's Daily* editorial to use every means to **handle properly workers' complaints,** made either in person or in writing, and thereby avoid miscarriages of justice. The Shanghai Tractor-Motor Company has been lauded for **reassigning nearly 300 professionals** whose technical skills were not being utilized. Other plants are being told "all scientific and technological personnel who are still not able to practice their skills and who are still working shifts like ordinary workers must . . . be properly reassigned. . ." A Peking coking chemical plant has **restored the practice of master-apprentice contracts** between new and veteran workers, abolished by the "gang of four." The important Kailuan coal mining complex has announced a new effort to modernize its management system.

AGRICULTURE

A national call to combat drought in northern China was the main agricultural theme in April and May media reports from the Chinese continent. On April 25, the State Council convened a National Emergency Telephone Conference to urge triumph over the rain shortage, preserve the wheat crop, and carry out the sowing of spring crops. Press accounts, including a major *People's Daily* editorial on April 27, have said far more about stimulating the peasants to combat drought than about actual drought conditions, leading **Western observers to question the seriousness of the situation. Although rainfall in April was below normal in the north China plain, the East and the Northwest, it has not been as bad or as widespread as last year,** according to the USDA. In fact, intermittent rain has fallen in pockets throughout the stricken regions, and mid-May reports indicated that the drought was slackening a bit. "The Chinese appear to be using the drought as a political tool to mobilize the peasants to work harder," said one expert. In addition, a played-up drought situation would provide a ready excuse for not meeting announced production goals, especially with the "gang of four" no longer around to bear the blame. **While the northern areas have been plagued with a lack of precipitation, the southern regions have been getting too much,** and both situations may contribute to lower crop production. The winter wheat crop has been threatened by the late arrival of the spring rains, but extensive irrigation facilities in Shantung, Honan, Hopeh, Anhwei, and Kiangsu may save the day. If the drought continues, it may disturb the sowing of spring wheat. The **chances are slim that 1978 wheat production will surpass or even reach the 1976 record output of 45 million tons;** 1977 produced only 40.5 million tons. In the South, the rain has delayed the transplanting of early rice seedlings, but the situation is still much better than it was two years ago. Nevertheless, if the planting of the next crop is delayed, it may be partly destroyed by early frosts. Given the yearly drought and flood problems to which China has always been subject, Nanking scientists have taken a major step in codifying available materials on the topic. In April they completed an **atlas on flood and drought over the last 500 years, including 500 charts, and have made an initial ten-year forecast on such weather trends** in the East, the Central-South, Northwest and Southwest. According to the report, this atlas is the first of its kind in the world, in terms of both its scope and the period covered. As part of the ever-present concern with agriculture, the **Third National Learning-from-Tachai Exhibition opened in Peking on April 17,** with pavilions on Tachai, water conservancy, science and technology, mechanization of agriculture, land reclamation, animal husbandry, and the development of aquatic products and marsh gas. The previous two exhibitions, held in 1965 and 1975, attracted 3 million people. Agricultural research has been the topic of much concern in media accounts; at the late March National Science Conference, Chin Shan-pao, president of the Chinese Academy of Agricultural and Forestry Sciences, reviewed **China's achievements "which have reached advanced world levels,"** including: control of wheat stripe rust and of the oriental grasshopper; cultivation, application, and popularization of rice and anti-rust varieties of wheat; development and popularization of hybrid rice; cultivation of alloctoploid triticale and of tobacco, rice, and wheat varieties by monoploid breeding; biological control of crops; preparation of vaccines for cattle plague and hog cholera; artificial breeding of four major kinds of freshwater fish. Another speech at the conference by Agriculture Vice Minister Ho Kang proposed concrete measures for **"large-scale" high-priority development of agricultural research,** including: 1) Nationwide surveys to work out plans for wasteland reclamation and rational allocation of bases in forestry, animal husbandry, sideline production and fisheries industries; 2) Setting up bases for experimentation; 3) Setting aside plots to experiment with getting higher yield from alkaline, lateritic, and yellow soils, and from areas affected by soil erosion, sandstorms, or drought. 4) Establishing up-to-date germplasm banks of crop plants; 5) Setting up seed services to reproduce and popularize fine strains; and 6) Strengthening methodological studies in genetics, ecology, growth and development of plants, nitrogen fixation and the efficiency of photosynthesis. Industries to be emphasized are forestry; pig, poultry, and cattle farming; and offshore and ocean fishing. Another achievement, recently heralded in a Sinkiang broadcast, involved the **use of radiation in breeding.** Scientists have employed radioactive isotopes to radiate seeds, roots, and stems to bring about desirable mutations, creating over ten new varieties of early maturing, high-yield species of wheat, rice, rape, beet, tomato, and other crops. The recent emphasis on soil improvement has brought the **publication of "Soils of China," the first comprehensive scientific analysis of China's cropland, forest, and grassland soils,** with an inscription written by the eminent scientist Kuo Mo-jo, president of the Chinese Academy of Sciences. Recent national and provincial meetings have been held on cotton production (Hupeh), hybrid rice (national), triple-cropping (Hainan), and marine

products (Fukien). The **chemical fertilizer** industry was lauded for meeting its first quarter production quotas eight days ahead of time and surpassing the previous record for the corresponding period by over 50%.

AGRICULTURAL MECHANIZATION

Continuing the January call for more mechanization of farming expressed at the Third National Conference on Agricultural Mechanization, the Peking media announced in March that in order to expedite further research on agricultural machinery, **scientists have divided the country into nine categories according to terrain, climate, and other agricultural conditions.** These include the paddy fields of the Yangtze-Huai river plain in east China, ridge culture on the northeast China plain, paddy fields in southeast China's hilly areas, mountainous areas on the Yunnan-Kweichow plateau, and the loess highlands in the Northwest. Giving a status report on progress in agricultural mechanization, the article also announced that **China completed research on "more than 100 varieties" of farm machines in 1977.** More than 1,700 agricultural machinery research institutes have been set up at the central, provincial, prefectural and county levels since 1959. Last year a dozen scientific symposia and conferences for technical exchange in this industry were held, and over 50 publications on the subject are now available throughout the country including the national magazine *Agricultural Mechanization*, which has a circulation of over 150,000. A late April *People's Daily* report praised **first quarter 1978 production figures for agricultural machinery,** noting that **output of tractors, hand-guided tractors, machine-drawn plows, and machine-drawn rakes and carts increased 50–70%** over the corresponding period last year. Output of internal combustion engines, generators, combines, power sprayers, shearing machines, handcarts, waterpumps for agricultural use, and tractors and spare parts for internal combustion engines increased 20–40%. Reports are also announcing that more machines are in active use at various farmland improvement work sites; for example, Shansi was able to concentrate 8,000 big and medium-sized tractors on work in hilly areas this past winter, increasing by 60% the amount of work done by machines the winter before. A related article lamented, however, that **in April many localities were running short of farm machine accessories and spare parts, and a complete range of farm machines and tools.** It admitted that "the supply of farm machines does not meet the demand."

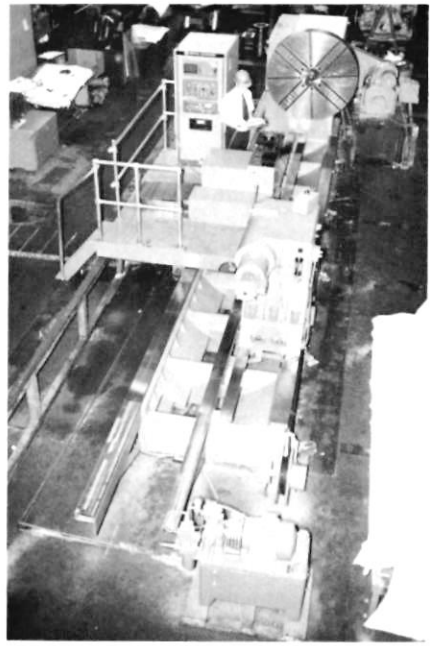
ENERGY

First quarter 1978 production figures for China's energy industries reveal continuing acceleration over the first three months of last year; crude oil output was up 10%, natural gas 12%, coal 26.8%, steel 28%, pig iron 20%, and electricity 22.9%. The outputs for steel and pig iron were lauded as all-time highs. Basking in the afterglow of China's **successful nuclear test on March 15,** Peking's Atomic Energy Research Institute recently reviewed its contributions to atomic energy research and urged that "while atomic science must continue to serve the modernization of national defense, atomic science and technology must also be introduced into various spheres of the national economy as soon as possible." **Nuclear technology is already being employed in coal dressing, treatment of rice for speedier harvesting, scanning for cancer, and assessing oil reserves. The country has announced plans to build a proton accelerator of between 30 billion and 50 billion electron-volts.** China's petroleum minister, Kang Shih-en, in February confirmed the **discovery of new oil resources across the nation from Sinkiang to the Pohai Bay and from Heilungkiang to the South China Sea.** He has held meetings recently with his vice ministers and with oil field representatives to study advanced foreign technology for the petroleum industry. The group was briefed for three straight days on world petroleum technology development by members of a recently returned delegation, probably the high-level delegation hosted by the US Department of Energy with which the National Council was involved. In related reports, the media highlighted **new advances in geological prospecting for oil, coal, iron, copper, tin, potassium salts, and phosphates,** noting that the first quarter's drilling was 18% above the same period last year. To gain speed, said the account, geological departments are improving and popularizing the use of **new techniques, such as aerogeology, remote sensing, and the combined use of geophysical and geochemical exploration. Wuhan recently completed a "major" petrochemical works** using all domestic design. According to reports, it will end Hupeh's reliance on other provinces for gasoline, diesel oil, fuel oil, and liquefied petroleum gas. **China also plans two ethylene plants**—a 120,000-ton/yr unit in Kirin Province, and a 300,000-ton/yr plant at Taching Oil Field. In the coal mining sector, China's important **Kailuan mining complex,** partially destroyed by the Tangshan earthquake in the summer of 1976, **is now publicizing a massive program of mechanization.** In 1975, nearly 50% of the mines' total output was produced from mechanized working forces, although the percentage has decreased somewhat owing to the toll from the quake. Kailuan's 14 workers' colleges have revised their teaching material and rearranged their curricula to suit the needs of mechanization, such as the mining of steep coal seams where it is hard to employ conventional machines. During the next eight-year plan, Kailuan plans to complete two new shaft mines. Turning to the metallurgical industry, the PRC this spring has undertaken a **huge emulation drive involving several hundred metallurgical plants and mines** and several million steel workers and their families. Plants, workshops, shifts, workers and their families are organized into matching pairs, all vying with each other in order to increase production. On the electric power front, **the 750,000-kw Touho thermal power station at Tangshan,** part of the important Peking-Tientsin-Tangshan grid which was ravaged by the 1976 earthquake, **resumed operations in May.** Hunan's Chinchusan power plant in April installed a new 125,000-kw turbogenerator.

INFRASTRUCTURE

Chinese press accounts concerning infrastructure have been dominated in the past few months by talk of railway development, an admittedly "weak link in the national economy." The latest effort in the drive to accelerate developments in this sphere was the convening of the **National Railway Conference on Learning from Tach-**

ing, held in Peking April 15–23 and attended by 3,000 delegates. Railways Minister Tuan Chun-i spelled out goals for the next eight years, some of which he already made public earlier this year (see *CBR* 4:2). Among the objectives announced are: **upping the use of electric and diesel locomotives from 13% of current haulage to 60%;** production of lightweight, high-capacity passenger cars and freight wagons and the introduction, by stages, of "the most up-to-date" express passenger trains; adoption of heavy-duty rails; using automatic controlled crossings and raising load limits of bridges; **step-by-step automation of traffic control,** introducing wherever possible automatic block equipment, automatic signaling devices and shunting equipment; construction of an electronic computer network; automation of station operation and operational management of major trunk lines; mechanization of more than 80% of the freight loading and track maintenance procedures; and speed-up of the construction of new railway lines. **China plans to build six new trunk lines and "transform" nine major lines by 1985.** Railways slated for improvement include the Peking-Canton and Tientsin-Shanghai lines. Major north-south lines and other lines on major industrial routes will be electrified or double-tracked, and some railway stations will be renovated. The Minister of Railways noted that the number of wagons loaded per day in China hit the 63,000 mark in April, setting a new record. Coinciding with the opening of the conference, a French report noted that **a third giant railway bridge, the Great Chikiang Railway Bridge,** has been built across the Yangtze River midway between Chungking and Wuhan. Not yet officially announced, the bridge stretches across a dozen pillars for about two kilometers from the end of the Chengchow-Hsiangfan-Itu rail line. Another major bridge construction project in Wuhan was officially announced on April 25: **The No. 2 Chianghan Bridge,** 566.2 meters long and 25.5 meters wide, six lanes, has been opened to traffic after more than four years of construction. **A National Conference of Transport Departments opened in Peking on May 2,** with 2,500 delegates from shipping, communications, and transport organizations. It was noted at the event that



Farrell Co. (Division of USM Corp.) machine tools recently delivered to PRC.

the PRC built 33,000 km of roads last year and increased traffic through Chinese ports by 14.3%.

EDUCATION AND SCIENCE

China's lagging education system, plunged into the throes of reorganization last December by CAS Vice President Fang I's presentation of a 12-point, 8-year program for transformation, underwent still further scrutiny at a long-awaited **National Education Work Conference, which began in Peking on April 22.** The 6,000 attendees heard both Vice Premier Teng Hsiao-ping and Minister of Education Liu Hsi-yao announced plans for further revision and refinement of some already proposed changes. Encouraged Teng, "We must create a mammoth contingent of red-and-expert working class intellectuals." Pointing out that Chairman Mao had said that a student's main task is to study, Teng said that not as many classroom hours should be devoted to ideological and political education. He put forward four main points: 1) Primary and secondary education, as well as higher education, must be improved. 2) Great effort must be given to strengthening revolutionary order and discipline in the schools. From now on, schools, colleges, and work departments should "give priority to those who are outstanding." Such action, he assured, "carries to its conclusion Mao's policy of enabling everyone to develop morally, intellectually, and physically . . ." 3) Education must keep pace with the requirements of national economic development, and "key universities must be strengthened." 4) The entire society "must respect the work of teachers"; their political and social status, as well as standards for their selection, must be raised. Among the significant **points made by Liu Hsi-yao** were the following: 1) Key schools must be run well. 2) Scientific research must be strengthened. 3) More teachers must be trained. 4) Teaching methods and teaching aids must be modernized. 5) Broad education opportunities must be provided, and great efforts made in the selection and training of talented persons. It was announced that another national education conference will be held next year. As part of the accelerated program for educational improvement over the past few months, reports have flooded the media lauding various changes already under implementation. On March 1, the Ministry of Education made public its **list of 88 "key or pilot" universities for all of China,** sixty of which held that position before being divested of the distinction during the Cultural Revolution. Pointing out that the concentration on such key institutions will raise the quality of education, the Ministry listed among the group Peking University, Futan University, Nankai University (Tientsin), Nanking University, Shantung University, and Sinkiang University. Some of the scientific and polytechnic colleges on the roster are Tsinghua, Chiaotung, Tungchi, the Peking Aeronautical Institute, and the Taching Petroleum Institute. (On May 1, Peking announced the designation of **25 key primary and secondary schools in the capital,** including Middle School No. 2.) Also on the books for China's universities is a **return to a system of academic titles,** a custom suspended for more than ten years. Teachers may once again be addressed as professor, associate professor, lecturer, and assistant. **Peking** is revving up its education program by **enrolling an additional 2,400 new students** in 23 universities, including an 80% hike in the number of students originally planned at the Peking Institute of Economics, according to a late March report. In addition, key engineering institutes and colleges are **enrolling postgraduates** this year; universities selected include Peking Aeronautical Engineering Institute,

the Chengtu and Northwest Telecommunications Engineering Institute, the Changchun College of Optical and Precision Machinery, the Harbin Engineering Institute, and the Harbin Shipbuilding Engineering Institute. Some postgraduates from Hong Kong and Macao will be enrolled at certain schools. As a shortcut designed to enlarge its pool of educated workers, at least one province, Yunnan, is reviving or establishing **part-time universities.** The long-neglected field of **social science** is getting another boost: The Chinese Academy of Social Sciences is enrolling research students in four additional institutes to the ten already doing so: Foreign Literature, including English, American, German and French; Modern History; World History, including the history of the ancient world and of Japan; and Journalism, including news writing in English. Even those already in established positions in the Chinese bureaucracy are going back to the classroom: High officials of the **Ministry of Petroleum** are taking a Monday **night course** on basic geology, oil prospecting, drilling, pumping, refining, and management techniques. Elsewhere in Chinese press reports, a recent article in the *People's Daily* stressed the important of teaching **foreign languages,** without which, it pointed out, scientists cannot read vital foreign reference materials. As part of the popularization of language study, Shanghai Radio has begun a two-year course in French which will teach over 1,000 words. Recent American visitors to Peking advise that the teaching of English and mathematics over Peking TV is excellent in quality. Students of English at the Peking language Institute tell of **listening to VOA and BBC broadcasts in class** to improve their English listening comprehension and of subsequently discusing the subject matter of the broadcasts. At the **primary and secondary school level,** education officials have revealed a **new, more balanced curriculum** of required courses stressing a basic foundation in natural and social sciences, mathematics, and Chinese and foreign languages. Compulsory courses include physics, chemistry, geography, history, biology, and elementary natural sciences. A variety of **scholarly societies are being reactivated** and their exchanges stepped up; the Shanghai Municipal Federation of Societies of Philosophy and Social Sciences and the Peking Architectural Society are among them. Finally, the important national paper ***Kwangming Daily*** **announced that beginning May 1, it would change over to a new editorial emphasis on science and education.**

PUBLICATIONS

Announcements of new publications, both domestic and foreign, have been frequent in recent media reports. **Petroleum textbooks** for primary and middle schools are being published by the Petroleum Industry Publishing House, to use in new classes at the oil fields for children of the workers. **"The Information Annals of Chinese Seismology,"** with complete details of China's seismic research since 1957, will soon be available in revised form. A whole galaxy of **scientific and technical books** has recently been released by 20 Peking publishing houses, making up for the barren period when the "gang of four" held back such works. Among the volumes now being sold are books on number theory, geology, engineering, phenology, satellite comunication, semiconductor integrated circuits, "Biographies of World Inventors of Science and Technology," and "The Origin of Man." **New journals,** too, are hitting the bookstands. The important journal, *Economic Research (Chingchi Yen Chiu)*, suppressed since the beginning of the Cultural Revolution, resumed publication at the beginning of April with a blasting of the "gang of four's" theory of economics. The first issue of a new theoretical journal, *Social Sciences Front*, which went on sale on May 1, includes articles on philosophy, economics, law, history, literature and art. The foreign front has not been idle either. Only a month after a late February article by the journal *Literary Critique (Wen Hseuh Ping Lun)* denouncing the "gang of four's" attack on foreign literature, the China Book Import Corporation held an **exhibition of foreign scientific and technical journals in Peking.** Over 14,000 books, 5,000 periodicals, and other types of visual material from over 1,000 publishing houses around the world were displayed, including works on electronic computers and agriculture. In mid-March, the press announced the **publication of Albert Einstein's works** on physics, philosophy and social and political problems, and in April a huge array of additional Chinese and foreign books hit the bookstands, including *The Arabian Nights, Les Miserables, Anna Karenina, Don Quixote, Robinson Crusoe, The Adventures of Tom Sawyer* and *Catcher in the Rye.*

NEW CORPORATIONS BLOSSOM

As China gathers its resources for the development of the petroleum and chemical industries, it has begun to establish a new organizational infrastructure to accomplish the task. Within the past year, at least four important new end-user corporations have been formed. They are, however, in a transitional stage, with more reorganization to come. According to an official of the China Oil and Natural Gas Exploration and Development Corporation recently in the US, the division of the Ministry of Petroleum and Chemical Industries at the National Party Congress in March is causing a reassessment of all new end-user corporations in these industries. He expects that within the next three months the corporations will split along ministry lines, with exploration through production in the petroleum ministry and refining and processing in the chemical ministry. As of now, the functions of the corporations are as follows:

- **Petroleum Corporation of China,** established late 1977. As reported in *CBR* 4:2, the PCC administers and plans all phases of the oil industry from seismic exploration through extraction, refining, and petrochemical production. It is administratively under the Ministry of Petroleum, which appears to have been retired to a policymaking role, and it has a working relationship with the State Planning Commission.

- **China National Chemical Fibres Corporation,** established January, 1978. The Fibres Corporation, administered by the Ministry of Textiles, has direct operational responsibility for large integrated plants. According to officials of the Corporation, other corporations under the textiles ministry such as the Cotton, Spinning and Weaving Corporation (also a new corporation), do not have a direct operation responsibility, only policy planning supervision. The Corporation does its buying through TECHIMPORT and works in conjunction with the State Planning Commission.

- **China National Petroleum and Chemical Construction Corpora-**

tion. This corporation must have been formed sometime in the last six months; it was first noted by US observers when it sent a mission to visit Fluor, Lummus, and other US petrochemical companies in March. It appears that the construction corporation has close ties to Taching Oil Field, and makes its purchases through TECHIMPORT. It is not known to which ministry this corporation is responsible since the Ministry of Petroleum and Chemical Industries was just split.

Two other end-user corporations have been identified in other Chinese industries:

- **China National Agricultural Machinery Corporation.** This corporation, first revealed during May, 1978, is probably associated with the Ministry of Agriculture and the First Ministry of Machine Building.
- **China National Coal Industry Equipment Corporation.** This corporation emerged in late spring, 1978, in negotiations with American suppliers of coal processing plants. It is presumably affiliated with Chinese coal industry end-users.

RECENT INNOVATIONS IN CHINA

The following technical and scientific advances were noted in recent Chinese press accounts:

Astronomical Measuring Device: China's first vacuum photographic zenith tube, developed in 1975, has been put into regular operation for the first time at the Tientsin latitude station of the Peking observatory. The high-precision instrument furnishes data for determining the standard time and coordinates of the earth's poles. (NCNA 4/12/78)

Computer: A BGS-050 miniature electronic computer—China's first—has been trial-produced by the Anhwei Radio Works, the electronics engineering faculty of Tsinghua University and the No. 6 Office of the No. 4 Ministry of Machine Building. Preparations are underway for production in small quantities. (Hofei Anhwei Provincial Service 2/28/78)

Cotton Strains: Two new strains of cotton with twin stems or multistems and two tiers of bolls have been developed in an effort to control the dropping of buds and bolls which otherwise would not be able to be harvested. (NCNA 3/22/78)

Cucumber: A new high-yield, disease-resistant cucumber variety, the "Chin Yen," has been developed. It requires no insecticide spraying and can reach a yield of 40,348 catties per mou (1/6 of an acre), or two or three times more than other varieties of cucumber. (NCNA 3/31/78)

Fire-Control System: The Shenyang PLA Artillery Corps has developed a digital ground artillery fire-control system including a laser-operated range finder, a digital electronic computer, and a numerical signal communications device for artillery observation, calculations, and signal communications. (Peking Domestic Service 3/27/78)

Gear Measurement Technique: An engineer at the Chengtu Tools Research Institute has invented a gear error measuring technique that provides an instant computerized record of the integrate error of a gear in motion. (NCNA 3/14/78)

Integrated Circuit: The Hangchow No. 2 Radio Plant has test-produced a medium-speed digital integrated circuit. The new product has been put into production in small numbers. (Hangchow Chekiang Provincial Service 3/30/78)

Irrigation Equipment: Mass production of new plastic equipment for sprinkler and mechanical irrigation has begun in Sian following its development by the Sian Plastics Industry Company. (Sian, Shensi Provincial Service 3/13/78)

Jet-Drilling Technique: A new high-pressure jet-drilling technique is being popularized in north China oil fields. (NCNA 2/15/78)

Laser: A laser device that serves both as a range finder and a sight has been developed through the joint efforts of 11 army and civilian units, and was announced in conjunction with the holding of the National Science Conference in March. (Peking Domestic Service 3/29/78)

Medical Instruments: After developing China's first stereo X-ray fluoroscope in 1976, the Ningpo Municipal Stereoscopic Technology Research Institute has now constructed a portable multipurpose stereo X-ray fluoroscope. (Hangchow Chekiang Provincial Service 3/20/78). The Swatow Ultrasonic Electronic Instrument Factory has produced the CTS-16 Model ultrasonic instrument for recording heart movements, sounds and beats. (NCNA 4/4/78)

Meteorological Chart: China's first isopleth chart showing maximum precipitation in different regions of the country has been completed. The new chart furnishes data necessary for the construction of water-control projects. (NCNA 2/16/78)

Meter: The Ningpo Water Meter Factory has trial-produced a high-pressure meter for use in oil field water-injection operations which gives readings of flow rate and accumulated amount of flow. (Hangchow Chekiang Provincial Service 1/20/78)

Pollen Plants: China is the first country to develop pollen plants of triticale, pepper, eggplants, and poplar trees and seeds from corn pollen plants, an advance achieved by an Institute of Botany research group. (NCNA 3/30/78)

Railway Weighing Instrument: A "dynamic electronic railway weighing instrument," a new device for measuring the weight of heavily loaded railway cars, has been produced by the Wuhan Weighing Instrument Plant, the Hupeh Chemical Industry Design Institute, and the Tayeh Steel Plant. In addition to registering the weights of cars moving over it, the instrument provides automatic display, types out records and warns of overloading. (Wuhan Hupeh Provincial Service 3/10/78)

Scanning Ion Microphobe Mass Analyzer: China's first scanning ion microphobe mass analyzer Model LT-1 has been developed by the CAS's Scientific Instruments Factory in cooperation with others. (NCNA 3/25/78)

Water Detector: An isotope water detector for locating groundwater in water-deficient regions has been developed in Szechwan. (NCNA 2/21/78)

X-Ray Spectroscope: An X-3F Model double-channel X-ray spectroscope has been constructed by the CAS's Scientific Instruments Factory. (NCNA 3/20/78)

SHORT TAKES

Chairman Hua Kuo-feng has promised the people of China a better quality of life, and efforts toward that end are now becoming noticeable. The *People's Daily* is calling for an **increase in the number of urban commercial networks and service centers such**

as supply and marketing centers, mess halls, barber shops, launderers and tailors, repair shops, and garbage collection. Urban planning centers have been told that new residential areas must set up a proportionate number of such service centers, and older areas must convert existing facilities and improve their distribution. A related account from Shanghai reported that the **chronically poor housing situation is also on its way toward improvement:** Many families have moved into a 1,000-unit apartment complex. Renters in the new "light green and cream-colored" buildings include workers, scientific personnel, teachers, film and publication workers, and journalists. The report said that 710,000 square meters of new floor space was added to Shanghai's existing apartment facilities in 1977, a record for the decade. **New building techniques** have contributed to the speed of such construction: From Anhwei comes a report that some construction units are now using prefabricated hollow concrete slabs for walls. Employing this method, only three months were needed to construct one five-story, 5,000-square meter residential complex. **Tourism,** one of the most rapidly expanding industries in China (see International Notes), has been the subject of numerous provincial conferences. Of late, Hopei, Hunan, and Heilungkiang recently held meetings to discuss how to best handle the foreign influx. **Hopei, at least, has decided to establish a provincial Tourism Bureau.** Other conferences in the recent country-wide wave of such convocations include: a **National Capital Construction Conference,** stressing projects in the iron and steel, coal, power, petroleum and transport industries; a national meeting on conserving resources held by the State Planning Commission, concerned in particular with the shortage of fuel and electricity; a national conference for finance and trade departments; the first national conference on comparing and appraising black and white television sets in Canton; and the executive committee meeting of the All-China Women's Federation which condemned male superiority attitudes and called on women to contribute to the country's development, and announced the holding of the Fourth National Women's Congress in September. An interesting report from Kansu Province criticized the **"improper practice" of bartering** between different production units. In particular, the Lanchow Chemical Industry Company's synthetic rubber plant was chided for bartering 300 tons of chemical fertilizer for a middle-size limousine from a unit in Kiangsu. The barter was not for the good of the collective, said the authorities; "commodities like limousines can only be distributed in a unified way in accordance with the state plan." 完

RMB: DOLLAR RATES AS OF JUNE, 1978

Date		RMB/US$	US$/RMB	RMB/US$ % Change
March 3	Bid	1.6440	60.8273	
	Offer	1.6358	61.1322	
	Median	1.6399	60.9793	−0.70
March 10	Bid	1.6522	60.5254	
	Offer	1.6440	60.8273	
	Median	1.6481	60.6754	+0.50
March 16	Bid	1.6721	59.8050	
	Offer	1.6637	60.1070	
	Median	1.6679	59.9556	+1.20
March 22	Bid	1.6771	59.6267	
	Offer	1.6687	59.9269	
	Median	1.6729	59.7764	+0.30
April 1	Bid	1.6721	59.8050	
	Offer	1.6637	60.1070	
	Median	1.6679	59.9556	−0.30
April 5	Bid	1.6804	59.5096	
	Offer	1.6720	59.8086	
	Median	1.6762	59.6588	+0.50
April 13	Bid	1.6871	59.2733	
	Offer	1.6787	59.5699	
	Median	1.6829	59.4212	+0.40
April 21	Bid	1.7210	58.1058	
	Offer	1.7124	58.3976	
	Median	1.7167	58.2513	+2.01
April 28	Bid	1.7176	58.2208	
	Offer	1.7090	58.3138	
	Median	1.7133	58.3669	−0.20
May 3	Bid	1.7262	57.9307	
	Offer	1.7176	58.2208	
	Median	1,7219	58.0754	+0.50
May 10	Bid	1.7348	57.6435	
	Offer	1,7262	57.9307	
	Median	1.7305	57.7868	+0.50
May 17	Bid	1.7435	57.3559	
	Offer	1.7349	57.6402	
	Median	1.7392	57.4977	+0.50
May 31	Bid	1.7383	57.5275	
	Offer	1.7297	57.8135	
	Median	1.7340	57.6705	−0.30
June 1	Bid	1.7314	57.7567	
	Offer	1.7228	58.0450	
	Median	1.7271	57.9005	−0.40

Source: Standard Chartered Bank, Ltd.

Importer's Notes

Briefly:

- ***Imports from China surge, may hit $300 million for 1978; increase in textile imports result of renewed industry demand.***
- ***Private labels are back.***
- ***Signs of change: FTC's focus on foreign export markets, may designate select factories for export production.***
- ***First L/C opened by US importer with Bank of China through US bank. Customs labeling requirements explained: "Made in China" OK.***
- ***New ITC case involving China concerns clothespins.***

MADE IN CHINA—LABELS MIX-UP

US Bureau of Customs regulations do not authorize detention of goods labeled "Made in China," according to the head office in Washington, DC. Importers who have been deterred by the bold statements of local Customs officials may take heart. According to Bureau Circular MAR–1–RM, which was signed July 6, 1971, and has been in effect since then, three country-of-origin markings for goods imported from China are acceptable: "People's Republic of China," "The People's Republic of China," and simply "China." The National Council apologizes for having reported in these pages a Customs ban on "Made in China" labels, based on an incident in which a local Customs bureau actually did require an importer to change the country of origin labels on an entire consignment. If faced with similar demands, importers should stand their ground and refer officials to MAR–1–RM or the Customs Bureau in Washington.

IMPORTS INCLINE UPWARDS

From a running start in January, imports in February, March and April kept up **a sprint which may sweep the 1978 totals beyond the $300 million mark.** Imports for the trimester at $116 million were up 68% compared to the first trimester of 1977, with imports in April reaching the highest level of any individual month at $35.9 million. Next in line was January ($31 million), while February ($24.5 million) and March ($23.6 million) momentarily lagged behind. Trade reports were buoyed by large deliveries of **PRC textile products** in the first months of the year; printed cotton shirting and cotton sheeting both hit the top ten, claiming No. 3 and No. 6 spots respectively ($4.2 million and $2.4 million). **Feathers,** the year's top import in 1977, are flying high in 1978, too, ranking as the second highest import by April, at $4.5 million. **Tin,** however, is the year's top ranker to date, with imports in the first quarter totaling $9.9 million. Landing solidly in first place in January, tin held the title through February and March. Tungsten turned up close to the top ten (No. 13), with sales to US buyers worth $1.3 million. **Cassia oil,** new to the top ten, and cashew nuts, long absent from the list, were both dark horses, while tea, a standby of the import trade, has ranged in the low thirties. An interesting newcomer that almost made it to the top ten list, unsweetened cocoa and cocoa cake, recently had its position bolstered by a $300,000 purchase announced in mid-April. **Fireworks (No. 4), pile floor coverings (No. 5), and antiques (No. 8),** all of which have registered high value imports in the past, made good showings.

EXPORT PRODUCTION PLANTS: INNOVATION AHEAD

Recent talks with US and UK buyers indicate that FTC officials are thinking in innovative terms. A delegation of Britain's 48 Group, the organization that launched the first Western trade mission to China in 1953, returned from Peking in late April with news that the FTC's were showing more flexibility than ever before on sales terms for FTC products. The National Council's importers' mission to China returned with similar news (see Council Activities). Of particular interest were discussions on setting up plants, some of which might be imported from abroad, earmarked for export production only. Production for export under foreign brand labels, packaging according to specifications of buyers, and design cooperation were also talked about with great frankness, according to 48 Group Chairman Gordon Sloan. The Chinese offered to import components from abroad in order to meet buyers' specifications for the finished product, under cooperation agreements. Such agreements may open new markets for Chinese electronic and industrial equipment, including the US.

CLOTHESPIN CASE BEFORE ITC

Four Maine clothespins manufacturers have lodged a petition with the International Trade Commission against imports of wood spring clothespins from China, Romania and Poland. Under Section 406(e) of the Trade Act of 1974, the ITC is required to take action if "import injury" can be shown in the form of rapidly rising imports of a commodity or declining sales of the domestic product. The petitioners, representing the total domestic industry, claim damages on both counts. Hearings on the petition, which was presented May 3, 1978, have already been scheduled for June 15 in Portland, Maine. Imports of clothespins falling under TSUSA categories 79005, 79007, and 79008 will be examined. Imports of "clothespins, spring" in 1977 amounted to $446,567.

FORMER PRCLO OFFICIAL HEADS CEROILS

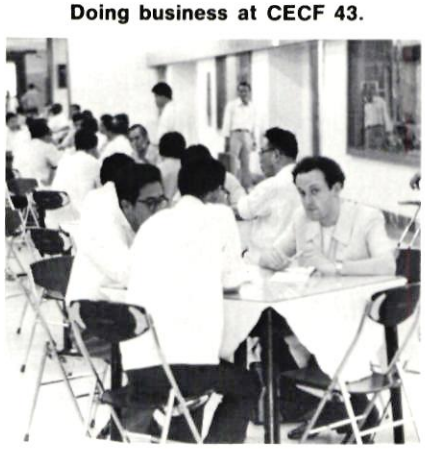
Chang Tsien-hua, well-remembered former commercial counsellor of the PRC Liaison Office in Washington, DC, has donned a new hat as general manager of CEROILS. Departing US shores in June, 1977, Mr. Chang had been with the Commercial Section staff since June, 1973 when China and the US first exchanged diplomatic missions. He came to Washington from the Commercial Office of the PRC legation in Great Britain, bringing to both posts considerable expertise in international business as a former director of MINMETALS. He returned to FTC management, assuming his new position early in 1978.

FIRST DIRECT L/C BETWEEN US BANK AND PRC

First for Walter Keats and First National Bank of Chicago. On April 24, 1978, the first direct letter of credit between a native US-chartered bank and the Bank of China in over twenty years was opened by First National Bank of Chicago on behalf of the Chicago trader for an order of raw cocoa cake. The $300,000 transaction, a historic first for FNBC, was also significant from the point of view

of US importers as a breakthrough in the commodities trade—cocoa cake, the bulk product from which cocoa powder is ground, has not previously been exported from China. The order signals the continuing expansion of China's exports of cocoa products to the US, which jumped from about $590,000 in 1976 to $1.5 million last year. Walter Keats' Chicago location gave him a ringside view of developments at FNBC this spring as commercial banking relations with the Bank of China were first established (1/26/78) and then formalized. The legal exercises necessary to complete the agreement, in which FNBC and the BOC will communicate L/C's and other sales documents to each other directly but continue to move funds via European or Asian banks, were wrapped up in late March. Not until the final gap was closed in the legal wall that will protect FNBC customers from violation of claims/assets regulations did the bank begin advertising its services through the trade seminars it holds regularly for its clientele. Keats found opening of commercial banking relations between a major Mid-Western bank and the Bank of China welcome news. Use of FNBC facilities resulted in a reduction of banking cost for the Chicago trader by eliminating fees to third-country banks for L/C declaration. It meant having access to the counseling and commercial resources of a large and diversified international banking department of a US national bank, rather than working through branches of foreign correspondent banks of the Bank of China. The role of third-country banks has not been eliminated, but now an FNBC customer can communicate directly with the Bank of China on sales transactions by telex. In late May, First National Bank of Chicago established a China Coordination Unit to handle commercial inquiries and liaison with bank officers. The full mechanism for handling letters of credit, payments, collections, and foreign exchange transactions is already in working order, although to date only L/C's and routine documentary collections (for US exports) have been performed. In the export category, the bank processed a round dozen transactions, worth $80 million, from April to mid-May.

Doing business at CECF 43.



ORGANIZING FOR BUSINESS: FTC DEVELOPMENTS

MACHIMPEX: Setting sights on the US market. Riding high on its successful penetration of third-world markets for basic agricultural and industrial machinery, **MACHIMPEX is gearing up to sell to the industrialized West.** Exhibits at the spring Canton Fair gave prominent place to numerically controlled machine tools; other items in the MACHIMPEX line-up included an 80-ton large-toothed wheel drill and a 200,000-bit/sec multipurpose computer. An 840-ton open-cast mining excavator on display in the machinery yard of the fair complex was believed to be the largest piece of machinery ever introduced at the fair. More evidence of the corporation's intentions was provided by the expanded number of discussion rooms for sales negotiations on a wide range of machinery, with separate rooms for electronics, machine tools, textiles, refrigeration and food processing equipment, and instrumentation. China's machine tools have already won a name in Great Britain for economy and performance; at an October industrial exhibition in the UK, a Chinese-made 500-mm *d* capacity gear hobber was the first item sold off the floor. MACHIMPEX has courted the British market by the method of granting exclusives initially to establish viability of product lines, then picking up further contracts through sending or inviting investigatory industry delegations. So far, MACHIMPEX has not directed its efforts much to the US market. Barring the way to a full marketing effort in the US are high US Customs rates on imports of machinery from Column Two countries and the nonconformity of Chinese machinery with UAL electrical standards. MACHIMPEX is actively working on winning UAL approval, but lack of familiarity with standards of the association so far has proved a hindrance. In the meantime, **MACHIMPEX salesmen are considering proposals for importing US electrical appliances for assembling in US-bound machinery.**

ARTCHINA: OPENING WITH A SPLASH

China National Arts and Crafts Import and Export Corporation has maintained a steady promotional drive since it opened for business at 82 Tung An Men Street, Peking, and 19 other locations, on January 1, 1978. The relative freedom with which its salesmen deal out contracts and its bountiful inventories, luxurious Hong Kong showrooms, and glossy promotional brochures have led some traders to believe that ARTCHINA is the shape of things to come. **ARTCHINA has the following departments:**

—Porcelain
—Drawnwork and Embroidery
—Straw and Sundries (handling willow, bamboo, and rattan)
—Arts and Crafts #1 (handling jade, ivory, wood and stone carvings, cloissone, lacquerware and blackwood furniture)
—Arts and Crafts #2 (handling diamonds and precious stones, jewelry, silk flowers, paintings, and calligraphy)

There is no separate import department. Materials imported from countries for export processing in China (such as jade from Burma, ivory from Tanzania, etc.) are purchased by the export department concerned. Increasingly, customers are supplying the FTC's with raw materials for finishing in China, and ARTCHINA's organizational chart may reflect an intention to structure its marketing efforts around such cooperation agreements **ARTCHINA has moved its promotional front line to Canton–Hong Kong.** Two permanent offices have been opened in the fair complex in Canton, the Kwangchow Ceramics Export Department for porcelain and Kwangchow Arts and Crafts Export Department for jade and jewels. In Hong Kong, the ARTCHINA agency, Chinese Arts & Crafts (HK) Ltd., has opened three showrooms, including the Yaumatei Gallery, a four-story emporium with, according to one observer, "stocks unsurpassed in Hong Kong or China." To direct the Hong Kong

operations, ARTCHINA picked Chen Kai-wan, a veteran department head of ARTCHINA's parent organization, the Light Industrial Products Import and Export Corporation. Chen, a native Cantonese with knowledge of foreign culture, has led INDUSTRY delegations both to the Canton Trade Fair (April, 1976) and to the US (September, 1975). The Chinese Jewelry, Arts and Crafts Exhibition staged by CAC March 3–20 gave solid proof of Chen's marketing savvy. Widely advertised in the Hong Kong press, the doors were opened wide to window-shoppers and serious businessmen alike. One US businessman carried away the entire stock of cloisonne on display. An exhibition of contemporary Chinese porcelain, a product of growing interest to US traders (imports in 1977 reached $1.7 million in value, up 49% from 1976), is being planned for September. **The head office, in the meantime, is also getting into the swing of things.** A noncommercial exhibition in Peking in late February, cosponsored by the Ministries of Light Industry, Foreign Trade, and Commerce, kicked off the season with a "galaxy," according to the Chinese press, of fine arts and handicrafts exhibits. The show caught the attention of businessmen on their way to the Canton Fair, but most traders were content to wait for the corporation's first commercial mini-fair, to be held this July in the capital city. Traders at the Spring '78 Canton Trade Fair were surprised and more than a little pleased to learn that ARTCHINA was offering new and more moderate terms of payment. While the usual practice has been for FTC's to require payment 30 to 60 days in advance of the shipping date, ARTCHINA offered terms on C&F contracts that allowed buyers to open letters of credit after goods were already on board ship, giving them as much as 45 days of credit on some purchases. Buying—especially of straw goods, jewelry, silk flowers, embroidery, and porcelain—proceeded briskly. **ARTCHINA was an independent trading corporation from September 1, 1965, until 1970,** when it was incorporated into the light industry corporation as one of two major departments.

WHAT'S THAT NUMBER?

Ever wondered what you were going to do in Peking once you got there? How to make that connection in Shanghai, Harbin, or Talien? Julie W. Munro's *The China Phone Book* has practically all the answers. The product of two years of diligent dialing by former Peking resident Munro, *The China Phone Book* has numbers, addresses, and useful advice on Chinese official agencies, the diplomatic community, hotels, banks, restaurants, markets, taxi services, and airlines in forty Chinese cities. Of special interest to traders are numbers of permanent and semipermanent offices of foreign businesses and associations in Peking, including numbers for some 50 Japanese firms. Ms. Munro has also included new information on cable addresses, telex numbers, and addresses of provincial branches of foreign trade corporations and hotels, which will prove helpful to the peripatetic. As explained in the foreword, compiling Ms. Munro's book was a collaborative effort of the foreign community in Peking, and it is designed mainly to aid the foreign traveler and resident. Example: The entry for the Airport Restaurant at the Peking International Airport tells it like it is—"Chinese and Western food; service slowest in the city." Entries under other restaurants are more enticing; the Min Zu Fan Zhuang, for instance, is "famous throughout the region for its Peking Hot Pot and Shashlik. Book several days in advance." Reading through the directory is an armchair safari for any China fan as one comes across eateries serving camphor tea duck and Grand Marnier souffles (bring your own Grand Marnier), T-shirt stencil shops, shops for everything from chopsticks to office equipment, three-wheel taxi stands and much more. *The China Phone Book,* with 140 pages and over 2,500 entries, may be ordered from the China Phone Book Company, GPO Box 11581, Hong Kong, at a price of US $25 per copy.

TEXTILES

Private labels are back. For the first time in two years, CHINATEX has dropped its requirement that Chinese labels appear along with foreign ones on Chinese garments. According to official sources at the spring Canton Fair and traders' reports, **it is now often possible to have single private labels, single Chinese labels, or double labels sewn in the garments as long as "Made in China" appears somewhere on the label.** Provincial branches as well as the Peking Office of CHINATEX are ready to accept proposals on private label agreements from US buyers. **First-quarter surge in cotton fabric imports from China.** The year-long slump in China's textile and apparel sales to the US appears to have reversed itself, according to recent pronouncements of the Commerce Department's Textile Advisory Committee (5/9/78), although at 34 million square yards equivalent, textile imports from China made up only 2.3% of total US textile imports in the first quarter of 1978. Imports began to climb in late 1977, as the dock strike ended and stalled deliveries began to move onshore. During the last fair, CHINATEX representatives were away on a mission to visit "old friends" in the US cotton, silk, and woolen piece goods industry. Chinese delegations have also been reportedly scrutinizing the ramps at the spring fashion showings in Paris and Milan. Buyers report that the Chinese have been pumping their foreign friends to provide clues to sense and lingo of fast-changing trends in the fashion world. *China's Foreign Trade,* the bellwether of PRC product catalogs, is featuring more spreads on products of branch FTC's, keyed to the needs of foreign buyers, who must identify and contract desired products through branch suppliers. The first two 1978 issues were highlighted by articles on the textile industry: in the first, a feature on Kiangsu textiles, "the home of silk," and in the second issue, a feature on China's major cotton-producing area, Hopei. **HR 8814: Slow freeze? Congressman Les AuCoin's silk bill, HR 8814, which would reduce Column Two tariff rates on ten categories of silk**

Members of the NCUSCT consumer goods and handicrafts delegation in Canton.

fabric to the Column One level, has attracted strong fire from Department of Commerce watchdogs on behalf of the small and apparantly beleaguered domestic silk weaving industry. First introduced to the House floor on 8/5/77, the bill was referred to the House Ways and Means Committee, chaired by Congressman Charles Vanik (D-Ohio). Congressman Vanik, with Senator Henry Jackson, co-authored Sec. 402 of the Trade Act of 1974, the clause refusing MFN to countries with restrictive immigration policies, and which he has the prerogative to apply to the AuCoin bill. After referral to the Ways and Means Committee, the bill was sent to the Ways and Means Subcommittee on Trade, also chaired by Vanik. In company with a set of sixteen "miscellaneous tariff bills," HR 8814 finally surfaced in Subcommittee hearings on 5/3/78, more than nine months after its original introduction. **The picture that emerged following the May 3 hearings is a murky one.** Subcommittee members were dissatisfied with the economics of both AuCoin and his opponents at Commerce. Commerce was requested before the mark-up sesssions to beef up the credibility of its case that the surge in imports of silk from China foreseen as a result of the bill's passage will hurt domestic manufacturers. AuCoin, who has never claimed that this bill would directly benefit domestic industry, reiterated his argument of symbolic and potential benefits to US-China trade via passage of the bill. By passing the bill, Congress would make a distinctly friendly gesture to the Chinese by improving terms of trade in a commodity for which no significant domestic industry exists, according to AuCoin. Congressional discussion at the hearings skimmed over the economic end of AuCoin's testimony and fastened on the symbolic issue he raised. Whether it is appropriate, or even constitutional, to take concrete measures to improve the trade position of China prior to establishment of full diplomatic relations is a question that lurked on the sidelines. If a detailed consideration of China's MFN status comes up at the mark-up session, it could stymie HR 8814 for good—or just possibly lead to something much bigger.

GOUACHES FROM CHINA

Duck soup: Dabbling in Chinese art is a pleasant side venture for many PRC visitors, but few go into it as swimmingly as Charles Abrams, chairman of China Trade Corporation (CTC), has done. Through New China Arts Corporation, a wholly owned subsidiary of CTC, he has marketed embroidery pictures, silk paintings, **and now woodblock prints of peasant paintings from China's Huhsien County artists** in department stores across the US. Early this year Abrams returned from China with a special bonus: thirteen original gouaches from Huhsien County, the first original "Huhsien's" ever sold to a foreigner. The products of a strong rural art tradition with its own idiom and style, the genre has been fostered by the Chinese government and sold abroad previously only in reproduction. The paintings show scenes of life on the farm in Huhsien: fishermen hauling nets brimming with fish, sparklingly clean piggeries filled with purposeful-looking beasts and all sorts of farm projects. One of Abrams' originals has been presented to the Smithsonian Institution and may hang in the National Gallery. The twelve remaining paintings will go on tour in department stores in 70 cities across the United States beginning in September. **The public had its first glimpse of the Abrams collection at the formal presentation of the gouache "Brigade Ducks" by Li Chen-huo** to Dr. Eugene Knez of the Smithsonian Institution in Washington, DC, on April 17. In a special arrangement with Belk Brothers Co., a North Carolina department store chain, New China Arts Corporation staged a special preview of the entire collection at the main Belk's store in Charlotte, NC, on June 1. The collection travels with its own modular display unit and will feature not only the Huhsien paintings, but a range of Chinese art products distributed by the company. Handmade woodblock reproductions of the twelve paintings will be available for sale at the displays, made to Mr. Abrams' order by Guozi Shudian, China's national publishing house and one of the world's most prolific printers. The color prints, each of which is pulled from handcarved wooden blocks, will retail at $175.

NATIVE PRODUCE

Bi Jen Pian: Marketing a cure for the common cold. While some may scoff, in China thousands of dry-nosed erstwhile cold sufferers have won relief by taking Bi Jen Pian tablets. A herbal concoction of magnolia liliaflora and cocklebur, among other ingredients, Bi Jen Pian tablets are marketed by CHINATUHSU. Five years ago, Henry Strauss, a trained pharmacist, began to do something about bringing the pills to the US market. A visit to the spring Canton Trade Fair in 1976 crowned months of efforts to obtain product specifications from the Chinese corporation to satisfy regulations. It was another two years before the first shipment of Bi Jen Pian tablets arrived and received Customs clearance. Currently, Strauss is trying to interest major pharmaceutical companies in taking over production of the tablets, which are shipped from China in powder form. 完

China International Notes

Briefly:

- ***China picks foreign consultants to expedite economic programs.***
- ***COCOM blockade of military exports to PRC melting? Hitachi computer contract clears review board; French antitank missiles and nuclear reactor on the way.***
- ***Three plant exports under the China-Japan Long-Term Trade Agreement already signed and sealed: Shanghai steel plant, ethylene facility, synthetic leather plant. TV tube plant and truck plant may be next.***
- ***JETRO announces numbers on PRC purchases of used ships in 1977; COSCO opens first PRC-operated freight service between Shanghai, Osaka, Kobe, and other Japanese ports.***
- ***Up, up and away: China tourist industry takes off.***

GENERAL

CHINA'S NEW TRADE INITIATIVES. The joint is jumping! China's trade is sending sizzling wires over the globe with the same message—Peking wants to buy technology, sell goods and develop new ways of doing business. Among China's new trade initiatives:

- Factories—and farms—for export only.
- Willingness to use imported raw materials, components, designs, and equipment for export production.
- Consideration of world industrial property rights conventions.
- Proposals for "joint ventures" in Hong Kong.
- Contra-purchases by governments and companies.
- Consultancy arrangements in many sectors.
- Cooperation deals—technology for products.

CONSULTANCY. China has bought the idea of consultancy. The agreements reportedly made or in the making, summarized below, concern the following industries.

- "Core industries"—atomic power, aircraft, chemicals, etc. between Japanese industry groups such as Mitsubishi and groups of Chinese ministries.
- Infrastructure modernization—railways with France and Japan, shipping and harbors with the Danes.
- Mining—coal mining with German interests.
- Iron and steel with Japanese firms.
- Telecommunications with the Germans and French.
- Energy with German and US interests.
- Metallurgy with Sweden, Australia and Japan.
- Papermaking with Japanese interests.
- Petrochemicals with US and Japanese firms.
- Business management with European countries and Japan.

Technology Transfer: Japanese firms forge consultancy agreements: Chinese officials spend off-hours reading foreign patents. While China's leaders trek abroad to view foreign technology in person in unprecedented numbers, cadres at home are preparing for an influx of foreign equipment and advisers. Exhilarating to some, onerous to others, Chairman Hua's February 26 speech and project outline of the 1976–1985 economic plan paved the way for a technology transfer that will stretch China's slim technical manpower resources to the limit. Partly to ease this burden, partly to ensure a smooth overall transfer of high technology hardware, China is picking up options on consultancy agreements all over the world, involving a wide range of software and services. The common denominator of these agreements is commitment to the long term. Most of them also envision exchange of large numbers of technical trainees and advisers. **"Core industry" agreements. Mitsubishi, Fuji . . .** In the most broad-ranging consultancy deal to date, Japan's largest business conglomerate, the Mitsubishi Group, has signed an arrangement to provide China with both soft and hard technical assistance over a ten- to twenty-five-year period. The verbal agreement specifies general types of cooperation in a range of industries rather than specific cooperation projects. Individual projects will be designed on a contract-by-contract basis. Four areas of cooperative effort are envisioned: enterprise consultancy, including dispatch of Mitsubishi technicians for construction and remodelling of industrial plants; training programs for Chinese technicians; management consulting and production supervision; and payment for patents and know-how according to terms of the Paris Convention of 1883. Possibly the most significant feature of the Mitsubishi agreement, the pathbreaking licensing clause will enable Mitsubishi to bypass the tense, often lengthy legal maneuvering that licensing agreements with China have entailed in the past. Since there is no statutory provision in PRC law for industrial property rights, foreign licensers have had to negotiate clauses in each individual contract to afford adequate protection and royalties equivalents. According to press sources, **China is most interested in Mitsubishi technology in the areas of atomic power, aircraft and chemical processes.** The first project under the agreement will probably get underway before August. A second core industry agreement, in which a package deal covers a wide range of heavy industry and management projects, has been proposed by Japan's so-called **Fuyo Group,** led by Fuji Bank and Marubeni Corporation. The Fuyo Group of 26 companies is well represented in the chemical, metallurgical, and banking sectors. **Including 76 individual projects, the proposal is modeled upon the recently signed China-Japan Long-Term Trade Agreement.** Imports of barley and other agricultural products are balanced against exports of steel, petrochemical, and aluminum smelting plants. In addition, Fuyo has offered technical assistance in shipbuilding, marine transport, and automation of banking systems. First proposed in draft by a Fuyo Group team which traveled to China in August of 1975, sections of the plan have been put together by Group member firms, which include Showa Denko, a major industrial chemicals company and aluminum producer; Toa Nenryo Kogyo, Japan's most profitable oil refiner; Nippon Kokan K.K.; and Hitachi Ltd. The Mitsui and Sumitomo family groups are expected to follow these initiatives.

Technology Transfer: Focus on

Shipping. European firms have been among the first to investigate market opportunities opened up by plans announced by Chairman Hua Kuo-feng on February 26, 1978, to expand five "key harbors" and update shipping and handling facilities in many more. Spurred by a business conference in Genoa, Italy, last fall that focused on the market in China for marine communication and port equipment, executives from companies including East Asiatic, Burmeister and Wain, Rijn Shelde Verolme, and IHC/Holland have traveled to Peking to pursue negotiations on a wide array of port construction and shipbuilding technology and services. **In mid-April, Managing Director Mogens Pagh of East Asiatic, a Copenhagen-based trading company, announced East Asiatic had received and was studying a request to provide consultancy services for modernization of PRC shipping, harbor facilities, and river traffic.** Burmeister and Wain officials were in China at about the same time, possibly looking for contracts on B&W marine diesel engine technology. Japanese shipbuilders have been assured that orders will be forthcoming for shipbuilding design and know-how. The improvement of China's port and handling facilities is crucial to plans to increase the tempo and volume of foreign trade, and the current intensity of market developments reflects that fact. The critical areas have been outlined in the Chinese press. **Deep-water berths:** Lack of deep-water berth facilities hampers the expansion of China's oil exports, among the key exports for raising foreign exchange to finance development projects. Only Talien and Nienyu, of China's oil ports, can handle tankers of up to 100,000 deadweight-ton capacity. Projects to expand the oil ports at Chinhuangtao and Chanchiang currently underway may include foreign assistance. Foreign observers have noted that few of China's general cargo ports can handle ships with drafts below ten meters. Dutch and other construction firms have been approached on projects to dredge and expand ports to take larger dry cargo ships in which the foreign firms provide technical aid and equipment. **Mechanization:** Development work on general cargo ports in 1977 concentrated on mechanization of loading and unloading procedures, achieving successes particularly at the newly opened stage one of the Whampoa development project. An automatic conveyor system and a grain suction machine that can handle 400 tons of grain an hour are showpieces of the facility; other Chinese ports depend mainly on manual techniques. Lack of warehouse space is another problem that has caused foreign liners to wait as long as three weeks while cargoes were laboriously freighted by lots to inland destinations. **Containerization:** Although two ports, Shanghai and Tientsin's Hsinkang harbor, have semi-containerized facilities, and construction of container berths is underway at Whampoa, dockside facilities are minimal. Chinese ports are moving toward the use of container gantry cranes, notes PRC shipping expert George Lauriat.

Technology Transfer: Iron and Steel Technology: $30–$40 billion worth by 1985. Long before the China-Japan Long-Term Trade Agreement was signed on 2/16/78, Japanese steelmakers were crowding at the gate in preparation for a runaway market in steelmaking equipment, supplies, and services. **Breaking fast from the pack was Nippon Steel Corporation,** Japan's biggest steel company, boasting the greatest crude steel production in the world. On May 23, 1978, NSC President Eishiro Saito sat down with Yang Yu-te, deputy general manager of TECHIMPORT, to sign construction and engineering contracts on erection of a world-ranking steel combine in the outskirts of Shanghai. Dubbed the **Paoshan General Iron and Steel Works,** the plant, in its first stage with an output capacity of 3 million tons of steel ingot a year, will go onstream in 1980; subsequent expansion will raise production to the 6 million ton per year level before 1985. A team of 98 Chinese engineers arrived in Japan in late May to negotiate contracts for $1.8 billion worth of equipment. According to NSC spokesmen, the plant will be equipped with two blast furnaces with an internal capacity of 4,000 cu m, and will make pig iron, crude steel, and billet to be rolled at an adjacent mill. The contract also gives the Japanese firm responsibility for securing raw materials (5/24/78). The engineering side of the agreement, in seventeen parts, includes services from planning to production oversight of the steel plant and will include expansion of a harbor and power plant in the Shanghai vicinity. Under the technology side of the contract, as many as 800 Chinese technicians, probably high-level engineering cadres, will travel to Japan for training at NSC facilities. NSC Chairman Yoshihiro Inayama announced soon after signing of the long-term trade agreement that, because of technological differences among Japanese steel firms, the Shanghai project would be a one-company deal. Other steelmaking firms have caviled at this, charging NSC with price-cutting; the value figures released as the contract was signed are some $400,000 lower than baseline cost estimates circulated previously. NSC clearly has put together a winning combination, however. Depending on the outcome of the Paoshan project, NSC may win further mill renovation and construction contracts in the offing; and dissemination of NSC know-how through comprehensive technical training programs under the agreement may lead to further linkage between NSC and the Chinese iron and steel industry. **After NSC, Sumitomo Metal Industries and Nippon Kokan K.K. are second-runners** with contracts pending but not yet signed. In late May, Sumitomo MI received a TECHIMPORT inquiry for technical cooperation on construction of a **seamless tube mill** in the Paoshan complex and shortly thereafter delegated a technical mission to Peking under company Vice President Toshio Ikeshima to talk over specifics. In late March, after receiving an inquiry for help in expanding a preliberation vintage steel mill in Peking, Nippon Kokan K.K. sent two missions, the first of technicians (3/29/78), followed by an executive delegation (3/29–4/9/78) to Peking. Peking wants services and equipment to triple the mill's capacity from its current 1.7 million ton capacity to an annual output capacity of 5 million to 6 million tons. After renovation, the **Shihchingshan Steel Mill** will have complete pollution-control facilities, and production lines for bar, piping, and shape steel rolling, and cold plate and sheet rolling. In connection with the steel plant sales under the long-term trade agreement, the issue of COCOM approval has been raised and apparently dispensed with by the Japanese Ministry of International Trade and Industry (MITI). **Director of MITI's International Trade Policy Bureau Toshihiko**

Yano told a press conference in Tokyo that he was "confident" that Japan would be able to win the ear of COCOM. From the point of view of the Japanese zaibatsu, the importance of $10 billion worth of sales under the agreement may outweigh security commitments to the Coordinating Committee on Export Controls, whose supervision of high technology exports to the Communist bloc rests only on an informal agreement among participating countries that such controls are desirable. Whether COCOM approves the sales or not, steel manufacturers in Japan as well as other COCOM countries seem likely to continue signing the contracts that China is busy dishing out. **Austrian technology.** Cutting a swathe across the European steel industry, Minister of Metallurgy Tang Ko's expedition to Austria, Britain, West Germany, France, and Holland, beginning in late April, raised hopes for European technology sales to rival the Japanese. In Austria, his first stop, Minister Tang had warm praise for Austrian steelmakers, promising that orders would follow on know-how for integrated steel plants and ore dressing and rolling mill production. Austria's last big steel plant sale to China was in 1965, by Voechst, for 55-ton basic oxygen furnaces valued at $13 million. This time, the minister pointed to technological areas in which Austria has excelled, including **LD-steel technology and high-grade steel forging, casting and hard-metal processing,** as areas which China would like to introduce to its domestic industry through licensing and know-how arrangements. While promising that China would make further imports of complete plants, he also stressed the importance of "relying on our own strength," with the implication for many observers that deals on patents, with or without model equipment, were in the offing. Among firms visited by Tang's delegation were Sulzau-Werfen Iron Works, Plansee Metal Works, Voest-Alpine AG Linz, the GFM-Steyr Company, and the research center of the Veitsch Magnesite Works Corporation. **Tang told the Austrians China will buy $30 billion–$40 billion worth of iron and steel equipment by 1985.**

Technology Transfer: Nuclear power generation: Not if, but when and how. Negotiations with European firms on sales of nuclear power equipment and technology are an open secret; the West German firm Kraftwerke Union (KWU), a Siemens subsidiary, coyly told the press it was not excluding the possibility of an order comparable to its $4.7 billion worth of nuclear power station contracts to the Shah of Iran (3/22/78). The month before, a delegation from the Ministry of Water Conservancy and Power led by Vice Minister Chang Pin, one of the most senior officials in the ministry, visited manufacturers of nuclear, thermal, and hydro power equipment in the FRG for talks that may have given rise to KWU's statement. Italy, too, has not been shy in hosting delegations in the nuclear sector; in late March, a group of nuclear specialists under Wang Hou-shan, director of the Atomic Energy Institute in Peking, held talks with officials of the Ansaldo nuclear division of the state holding company Instituto per la Reconstruzione Industriale and visited the Ansaldo-designed nuclear power center at Caorso. In France, a late February visit by Chang Pin at the head of an atomic power study mission was followed by **negotiations at the government level between Vice Premier Ku Mu and President Giscard D'Estaing** on May 3 at Versailles. Two French companies, Framatome, a subsidiary of Creusot-Loire, and Alsthom-Atlantique, are known to be competing on a contract for a 900-mw nuclear power station; Ku Mu's personal visits to the Framatome facility at Chalons-sur-Saone, which manufactures reactor equipment for nuclear power stations, and the turbo-alternator division at Alsthom's Belfort plant may mean that a decision is imminent. **The vice premier got a firsthand impression of the type of equipment China plans to buy at the Bugey nuclear power station near Lyons.** Bugey has three reactors in operation, one 540-mw and two of the 900-mw type. Entering a fourth reactor under construction, Ku had a complete tour of installations in the cool state. **The lagging electrical power industry** is a chief concern of China's planners; out of 120 key projects for the next ten years, 30 are concerned with construction or expansion of power stations. Because the coal and oil to drive thermal power plants are badly needed for China's export drive, **nuclear and hydro-based technologies have priority.** The leadership is committed to early introduction of nuclear power stations, even though nuclear power cannot be expected to make a significant contribution (more than 10%) to electricity generation for another twenty-five years. The import of technology and equipment will be a lengthy and expensive process and will almost certainly involve a long-term cooperative effort between the nascent Chinese industry and foreign specialists. **Traditional power generation equipment was also on the list of top-priority sectors for Ku's visit** and that of other Chinese visitors in the late spring harvest of ministerial delegations to Europe. The 240-mw tidal power station at Maromatrice in France and the eight power stations of the Oberhasli complex in Switzerland were among Ku's stops, while the month before Minister of Foreign Trade Li Chiang visited electrical equipment suppliers in Belgium including Ateliers de Construction Electriques de Charleroi (ACEC) and Traction et Electricitie.

Technology Transfer: "Eight major coal mines": Consultants needed. While the British government has denied its part in the "trilateral" mining arrangement announced in the press some months ago, British firms continue to pursue contracts for mining equipment that may or may not be tied to PRC coal exports to Hong Kong (see *CBR* 5:2, p. 49). Among the firms that have maintained high profiles in Peking is the **National Coal Board.** According to British press accounts, NCB hopes to extend its lucrative international consulting business to the Chinese front. Chinese ministers visiting West Germany in the last few months have made no bones about their interest in technological exchange with the coal mining industry. In conversations with Volker Hauff, FRG minister of science and technology, Coal Minister Chia Hui-sheng proposed forming a cooperative agreement on coal exploration technology and research into bituminous coal production (3/23/78). The German firm **Ruhrkohle,** responsible for 70% of Germany's coal output, has formed a consultancy arrangement with the PRC. China will need such aid to develop the eight key coal mining projects slated for the next eight-year development program, and to meet commitments to Japan and other potential customers for a commodity that has the potential to become China's lead-

Vice Minister Ku Hsiu-lien with PRCLO's Peng Chin-po.

ing moneymaker on the international energy market.

Technology Transfer: Government to Government. Technological cooperation has been the dominant theme of nearly every conversation between Chinese leaders and foreign guests or hosts in recent months. Long standoffish in its attitude toward Western assistance, China is now actively courting Western governments to provide technological assistance under a variety of arrangements including offset deals, patterned after the Sino-Japanese Long-Term Trade Agreement in which specific values of technology are traded for equivalent quantities of PRC-manufactured products and raw materials, particularly oil and coal; framework agreements; and product buy-back schemes within individual industries. In Bonn, Foreign Trade Minister Li Chiang and FRG Economics Minister Otto Lambsdorff rehearsed the terms for a broad-ranging exchange of Chinese energy materials for German technology; in France, Giscard appears to have endorsed the request of Vice Premier Ku Mu for cooperation in the nuclear sector; and in Great Britain, the Labor Government edged closer to approving a controversial defense contract to sell V/STOL aircraft to China as a trio of ministerial-rank delegations paid heed to British wares in some of Britain's key export industries. Visiting Peking, Swedish Foreign Minister Karin Soder and Australian Minister of Industry Phillip Lynch both got more than they bargained for in the shape of extensive sessions on potential areas for technology exchange. Lynch came back with a full-fledged request to Australian industry to prepare proposals for technical consulting on metal smelting, civil engineering, and transport and port technologies, as well as supply, design and supervision of equipment.

Technology Transfer: Papermaking. Inspired by the China-Japan Long-Term Trade Agreement and the successes of complete plant exporters, Japanese industries that have traditionally sent products rather than equipment to China are joining the race to sell high-technology wares. The **paper industry** is the latest to announce its bid. Fumio Tanaka, president of Oji Paper Company, released an outline of a proposal on technological cooperation in paper-making, which he will present while visiting China in July as member of Mitsui Group team. The outline covers modern production facilities of different capacities producing a range of grades and types of paper products. The plan may also include production consultation; in the release it was noted that Oji's Tomakomai mill employs 2,500 workers to produce a daily output of 3,000 tons, compared to the 300-ton-per-day output of a plant in Canton with the same workforce.

Technology Transfer: Wanted—Experts in Business Administration. Getting the ten-year plan off the ground will be the task of China's industrial managers, and China just doesn't have enough of them. The message has been going out to business schools and industrial training institutes on the domestic scene, and recently to China's trading partners abroad as well. In early April, Lin Huchia, leader of a high-powered economic planning mission to Japan, addressed an open appeal to the business establishment for help in expanding China's corps of managerial talent. In talks with Toshio Doko, head of Japan's powerful Federation of Economic Organizations (Keidanren), Lin asked for "experts in business administration" to train administrators. Consultancy agreements on individual and "core" industries signed in the last few months by Japanese companies in connection with newly announced development projects under China's plan have included "production consultancy" clauses embracing services from training of Chinese technicians to overseeing production. During the May trip of Vice Minister of the State Planning Commission Ku Ming to Europe, training grounds for the European business establishment came under close inspection. In England, Ku visited the Cranfield Institute of Technology's production management school, and similar institutions were on the agenda for visits to Italy, France, and West Germany. The Chinese press has been playing up the **Yugoslavian "workers' self-management" model of industrial management.** An article published by NCNA on 2/22/78 carried interviews with plant and research managers of the Sarajevo-based Energy Investment Corporation (Energoinvest), one of 200 "social-owned" enterprises in the country. The worker-appointed "managerial committees," which control the "routine business" of the firm, have considerable authority over production inputs; the chief of the research center told Chinese journalists that factory personnel make the decisions "to buy whatever new technology which, we think, would speed up the development of production and reduce the costs." Offering more play to market forces than at present exists in the PRC, **the scheme, if adopted, may exacerbate China's need for management expertise.** What it all adds up to is that China wants to learn the Western way of business management.

Technology Transfer: Patents. How do the cadres spend their leisure time? Apparently, reading foreign patents. This is the assessment

of patent trade journal that reported figures on Chinese purchases of Canadian patents. The PRC buys 480 a week, 25,000 a year, at a cost of $1 per copy. While statistics were unavailable for other countries, the flow is indicative of the variety of channels China may exploit in its technology quest. And from the US?—China has purchased over 5,000 US government publications from the National Technical Information Service (NTIS) plus NTIS reference tapes. Some observers suggest that in the spirit of equality and mutual benefit China should make its technical publications available to foreigners and begin **reciprocal exchanges** of such publications.

BUYING REPORTS

TURNKEY PLANTS, EQUIPMENT. With closing of the $1.8 billion Paoshan steel mill contract, Nippon Steel came out on top of the heap of plant contracting firms scrambling for a piece of the PRC pie. The market for complete plants was virtually assured by the China-Japan Long-Term Trade Agreement. But NSC's triumph was short. Within a week of signing of the NSC contract on 5/23/78, **two more contracts** had been signed on complete plant exports. On the last day of May, Mitsubishi Corporation announced that it had won the first direct contract assigned by China to a trading firm rather than a manufacturer, for a ¥2.1 billion ($9.4 million) ethylene facility. Touting the sale as a breakthrough in the recognition by China of general traders as contracting parties, Mitsubishi won the greater part of the contract for the 115,000 ton/yr plant, excluding compressors and heat exchangers. According to a report in *European Chemical News* (4/7/78), the new unit will probably be located in Kirin Province. Another Japanese firm, Ishikawajima Heavy Industries (IHI) has sold **four compressor units,** in a sale valued at $4.2 million, probably for installation in the same plant. The four compressors involved in the contract are a 5,500-kw unit for cracking gas compression, a 2,100-kw unit for process gas compression, a 1,550-kw unit for ethylene gas compression, and a 9,000-kw unit for propylene gas compression. IHI-designed steam turbines to go with the four compressors will also be supplied. Mitsubishi Heavy Industries and Ebara Corporation also participated in the bidding, but IHI, which has sold a total of nine turbo compressors to China for use in oxygen and petrochemical plants, won the contract with the aid of Toko Bussan Company, a trading house with strong PRC ties. The third order placed under the China-Japan Long-Term Trade Agreement, also for a petrochemical process facility, has been ordered from the business combine of Kuraray Company and Western Japan Trading Company. Under the contract, Kuraray will supply a 3 million square meter/yr **synthetic leather plant** for manufacturing its Clarino process leather. The leather is used in Japan for making shoes and handbags. The price agreed upon for the contract, which Kuraray-Western Trading won in competition with the trading combine of Kanebo and Sumitomo Shoji Kaisha, Ltd., was ¥7 billion ($31 million), some ¥3 billion less than earlier price estimates. **Five more chemical projects** are under discussion currently with Japanese suppliers, and a sixth has been opened to international competition. Toyo Engineering has submitted bids on four of them, and on auxiliary equipment for a fifth facility. The first, an international-scale ethylene facility with a capacity of 300,000 ton/yr will be the linchpin of a giant petrochemical complex located in the Taching oil field. The complex will make downstream products including high- and low-density polyethylene, polypropylene, and PVC. This is the project that has been opened to bids from European companies as well, including Linde in Germany, Technip in France, and Pullman Kellogg in the US. Toyo Engineering is offering Lummus technology, as it has in at least one previous sale of a ethylene-butadiene complex of approximately the same size as the plant currently under negotiation. Toyo Engineering has also been approached on three fertilizer projects: a gas-based ammonia-urea complex; a phosphate fertilizers facility to produce sulfuric acid, phosphoric acid, mono- or di-ammonium phosphate, and triple superphosphate; and a plant for making NPK fertilizers under the Norsk Hydro nitro-phosphate process. Price tag on the ethylene facility has been estimated at $350 million; the three fertilizer projects are estimated at a comparatively modest $100 million each. Tenders on agrochemicals and metacresol plants, which are also anticipated under the Sino-Japanese agreement, have not yet been offered to Japanese firms or at least not in public. Not all the contracts will necessarily be calculated into the agreement, but the operative principle is more not less. **The plethora of contracts signed (almost $2 billion worth so far) and reports of negotiations in progress with Japanese companies in the past three months represent salubrious fallout from the long-term agreement as well as specifications of the agreement itself.** Two more plant contracts are on the verge of being signed, according to press reports: for a plant to manufacture heavy trucks and one, possibly two plants to manufacture PAL system TV tubes. In late March, three major Japanese truck assemblers announced that they were working out estimates at the request of the Chinese on a **factory to produce 6- to 12-ton trucks.** As the pace of negotiations quickened, it became apparent that of the three suppliers, Mitsubishi Motors Corporation, Isuzu Motors Company, and Hino Motors, Ltd., one company, Hino, had dropped out, and a fourth contender had entered the field, Chrysler (UK) Motors. In mid-May, Isuzu and the Mitsubishi Group, representing Mitsubishi Motors and Mitsubishi Heavy Industries, announced a joint bid on the facility which was described as "far larger than the Japanese cooperation project for constructing a steel plant in Shanghai" by the usually trustworthy *Japan Economic Journal* (5/16/78). Worth "several thousands of billions of yen," ($10–15 billion?) the proposal includes equipment and technology for a truck plant with a capacity of 100,000 units per year, including complete production lines from cast and forged parts manufacturing equipment to assembly lines. To acquaint the Chinese better with Japanese merchandise and sidestep the Chrysler bid, the Japanese Automobile Manufacturers Association announced simultaneously the impending arrival of 20 Chinese engineers for training programs at Japanese vehicle plants on an experimental basis. They may be followed by 80 more technicians to come up to the total of 100 training slots that China has requested, pending results of the initial program. The Chinese are believed to want construction on a **TV tube plant,** which is currently under negotiation, to begin be-

Members of PRC chemical fiber delegation at Du Pont briefing session.

fore the end of the summer. Destined for a site in Sian, the facility will produce standard phase alternation by line (PAL) system tubes used for TV broadcasting in Europe. Reports vary as to the size, price, and number of plants; both 300,000-tube/yr and 600,000-tube/yr units have been cited, at prices from $132 million to double that figure. It is not clear whether two smaller plants or one large plant are envisioned, and the lower price figure has been quoted on both configurations in accounts in the Japanese and British press. Hitachi, which may export the plant under its basic license with AEG Telefunken for the use of PAL technology, is apparently the leading contender, with Matsushita Electric Co. and Tokyo Shibaura Electric Co. (Toshiba) trailing. No European bids have been invited. Negotiations on a further turnkey plant sale by Japanese manufacturers surfaced in late April. According to *Business China* (5/4/78), five Japanese aluminum smelting firms are competing on a $178 million contract for an **aluminum smelting plant** with an annual capacity of 80,000 tons. On the European front, unconfirmed reports from US traders indicate that the West German firm Otto Wolff AG signed a $40 million contract with TECHIMPORT in early May on sale of an **engine-block factory.** The contract was signed in Peking by automobile industry magnate Otto Wolff himself. Additional turnkey plant news comes primarily from the chemical industry: Besides the competition on the ethylene plant described above, TECHIMPORT has contacted two German contractors, Lurgi and Krupp-Koppers, to prepare bids on a **coal-based fertilizer complex,** probably for a North China location. The complex will comprise a coal-gasification plant with a 1,000 ton/day ammonia capacity and downstream production facilities for nitric acid and ammonium nitrate or NPK fertilizers. Krupp-Koppers, in association with Toyo Engineering of Japan, is offering the Koppers-Totzek gasification process and Toyo technology for ammonia synthesis and the downstream plants. Lurgi is offering to handle the gasification and ammonia steps on its own, at a cost of about $175 million. The Chinese leadership has indicated its interest in purchasing **Australian sugar milling and harvesting equipment** in conversations between vice ministers of the State Planning Commission and Ministry of Finance and Australian Minister of Industry and Commerce Phillip Lynch, during his visit to Peking in late April.

WEAPONRY: As Sino-Soviet relations worsen, the PRC arms market picks up. With the announcement of the successful negotiation of an order for French HOT antitank missiles and the almost simultaneous eruption of a new incident in the disputed Amur River border region, Sino-Soviet relations reached another low. For many Western arms manufacturers, the feeling was of optimism in a market strictly controlled by governments concerned with a PRC challenge to the West. Western governments have begun to ease off on export controls, at least enough to allow negotiations to be aired publicly. Beginning with the French sale, the powers-that-be in France, West Germany, and Great Britain are coming around on sales of defensive weapons systems that have long been in the works at the corporate level. Selling arms to China is still a ticklish affair. UK Defense Chief Neil Cameron's anti-Soviet comments on a trip to China, warmly received in Peking, were assailed at home for their forthrightness. **Some observers felt that the Cameron trip was a thinly diguised sales mission, perhaps to present formally government authorization for Chinese purchase of the Hawker-Siddeley Harrier.** The House of Lords was informed by Lord Peart in early April that "the government have stated their willingness to consider any formal proposal which the Chinese Government may put forward . . . It is the intention of the government to see that trade develops with China, and inevitably a part of that trade will be defense material." According to press reports, an initial PRC order has been placed for 30 of the vertical takeoff and landing aircraft and may be followed by orders for the technology and expertise to build hundreds more in China. Another British sale possibly in the offing is of a military observation rocket, the **Skylark.** Export marketing manager Hugh Dickinson of British Aerospace, which manufactures the rocket, flew to China in early May to give a presentation on the rocket, which can snap earth photographs from a height of 300 miles. Chances are still slim for purchase of badly needed equipment to refurbish the PRC's outmoded tank force, but antitank weaponry falls into the category of defensive munitions. The rash of weapons negotiations appearing in the world press of late indicates that China is seizing the current responsiveness of Western governments to obtain advanced weapons systems for the PRC armory as quickly as possible, on a schedule also tightened by the apparently real fear of an imminent Soviet invasion. In an interview with *Der Spiegel*, Friedrich Zimmerman, head of a recent delegation of legislators from the FRG Bundestag to China, **told reporters that Teng Hsiao-ping said he wanted "ten thousand" antitank missiles** from France and West Germany (4/8/78). The agreement between China and France on purchase of the HOT missile—dubbed HOT for

the initials of the name in French—was carried by US papers on May 2. In addition to the HOT missile, China is known to be bargaining with French suppliers for the "Milan," which has a shorter range than the HOT; the Exocet ship-to-ship missile; and the Crotale weapons system, which is used against low-flying jets. **With an all-weather range of 2.5 miles, the tube-fired HOT** can be mounted on either helicopters or ground vehicles and is far superior to anything in China's current antitank arsenal. The missile was developed jointly by Aerospatiale of France and Messerschmitt-Boelkow-Blohm of West Germany, and the sale will need West German approval before it can be finalized. French go-ahead on the sale was apparently linked with sale of another Franco-German specialty, the military transport aircraft **Transall**. China promised the French manufacturer an order of between 40 and 60 of the craft, contingent upon approval of the HOT missile sale, according to an account in *Valeurs Actuelles* (Paris, 6/3/78). In late March, US papers carried a photo of PLA visitors to West Germany perching atop the FRG's premier battle tank, the **Leopard**. So far all they have done is look, but if the Chinese begin to buy tanks and related paraphernalia, they will almost certainly focus on equipment such as lasers, stabilizers, and thermosights that have brought Western ground forces into the nuclear age but which China's tank corps still lacks.

PETROLEUM EQUIPMENT. Norway, Romania, and Japan have won orders for oil field and exploration equipment in recent months. An Agerpres report of 4/21/78 noted without expanding the statement that the industrial export corporation of **Romania** has signed "important contracts" with MACHIMPEX for export of oil field equipment. Early in the year, Norway's **Geco-Statex** signed a contract with the same corporation to equip a vessel with a completely integrated seismic equipment range for oil exploration in China's offshore waters. Value of the contract was estimated at $2.2 million, with equipment from German, Norwegian, UK and US suppliers. Adding to **Mitsui Engineering and Shipbuilding's** profits from its recent sale of two geophysical survey ships to China (*CBR* 5:2), a related order for two 1,500 gross ton supply vessels was announced in late May. The survey-supply vessel sales represent the first shower of what Mitsui E&S hopes will become a spate of oil equipment contracts as China gears up its drive to develop offshore resources in the East China Sea, Pohai, and Nan Hai fields. Mitsui E&S President Isamu Yamashita flew to Peking with a delegation from the Mitsui Group in June. In anticipation of an order from China, British Aerospace has announced that two "extra" **Consub underwater exploration vehicles** are under construction. Use of the sub for oil exploration has already been tried at Britain's North Sea Forties field, and BAC export marketing manager Hugh Dickinson detailed the applications during a visit to China in May (3/9/78).

CONSTRUCTION EQUIPMENT. Three construction equipment sales stand out in recent reports, all by Japanese suppliers. On 5/9/78, Kawasaki Heavy Industries reported a $6.6 million order for 180 **shovel loaders**. The equipment will be shipped between July and January, 1979. An order for 180 **hydraulic truck cranes** was handed to Tadano Steel Works Co., priced at about $10 million. Delivery was scheduled for October to March, 1979. Japan's largest battery forklift maker, Nippon Yusoki Co., announced on 5/9/78 that an order had been received for $892,000 worth of **forklift parts** from China. The parts will be used for repair of 350 machines the company supplied under another contract. Orenstein and Koppel of West Germany have sold eleven RH-75 ten–cubic yd shovels for $9 million.

ELECTRONICS: Learning from Experience. Hitachi has learned the hard way how to sell computers to China: with patience, perseverance, and considerable modification of the original contract. After two trying years, Hitachi's order for three "M" series type 160 and 170 computers finally passed the maze of restrictions imposed by COCOM, the Coordinating Committee on Export Controls to Communist countries. Shipment of the computers was completed in mid-April, according to a company statement. **The meteorological observation systems computers that arrived for installation at the Central Meteorological Bureau in Peking were not quite what the weathermen asked for;** on orders of COCOM Hitachi scaled down memory capacity, installed safeguards to prevent application to weapons guidance systems, and agreed to monitor the system through company liaison as an additional deterrent to use of the computers for strategic purposes. **Now Hitachi is ready to try again with a second order for an "M" series, type 150 II.** One of the largest computers built in Japan, the system will be used for geological exploration, according to MACHIMPEX, the buying agent for Chinese end-users as yet unnamed. Hitachi has taken care to insure that the order passes COCOM along the lines suggested by the earlier sale. The computer is smaller than the three sold previously, and Hitachi has evidently written the necessary safeguard clauses against military use into the contract. The contract for the computer plus peripheral equipment is valued at ¥1 billion ($4.4 million). Hungary's **Videoton** corporation has recently sold $757,000 worth of computers to China (5/17/78). Hungary enters a potentially lucrative market facing only the limitations of its own supply position, while COCOM participating nations stand by, constrained most in the areas that China has slated as import priorities: main frame computers, ultralarge-scale integrated circuits, and microcomputers. **The market may grow, however, for smaller types of computers** that will be needed to implement the PRC's industrial development plans, including process control, small business computers, and all types of production and testing equipment.

MACHINE TOOLS: Japanese, British Orders, French Sales on the Horizon. After a fierce round of bidding which included major US and European manufacturers, Toshiba Machine Company announced an order for **two ultralarge plain milling machines** worth ¥500 million, approximately $2.2 million in US currency. The letter of intent placed by China's TECHIMPORT detailed two model BSF 32-21A horizontal and milling machines, each weighing 250 tons, with 320-mm diameter milling spindles and 210-mm diameter boring spindles. The two machines are likely to be used in production of diesel engines. A similar order was placed early in the year with Armstrong (Leeds) Ltd., a British firm, for **three lapping machines** valued at $148,500. The lapping ma-

chines, for cutting a variety of ring-shaped components, have 36-inch diameter opposed lapping wheels and are capable of handling workpieces in a range of diameters up to a maximum of 40 inches. The contract agreement includes dispatch of testing components for inspection of the machines, prior to the machines themselves, which were scheduled for delivery in April and June. The machines will be used in production of components for the Spey aircraft engines manufactured in China under license to Rolls Royce. Details on a third major deal, a sale of **ten "large machine tools"** by an Italian consortium, are as yet unavailable. French machine tools sales may pick up after disappointingly low levels in recent years (1977 sales amounted to only $212,500, compared with a 1970 high of $3.5 million). A delegation of the **French Machine Tool Manufacturers Association** in early May returned with assurances that China would send delegations to France in the near future to assess French technology at close range. Besides presenting 22 technical seminars during its visit, the team arranged for exchange of technical and commercial information with Chinese counterparts and invited Chinese engineers to participate in training courses at French universities.

TRANSPORT SECTOR: Increased tourism, transport needs of industry constrained by inadequate road, rail, and vehicular resources, stepped-up foreign trade: All these add up to a growing PRC market for transport equipment. Expanding the civil aviation sector may require new imports of aircraft from abroad, to add to the mixed bag of US, British, and Soviet craft in service on China's domestic and international air routes. Since the beginning of the year, the China Civil Aviation Administration (CAAC) has added over 400 flights to domestic routes to accommodate the influx of foreign tourists; negotiations on direct CAAC flights to international capitals are proceeding with London, Hong Kong, Bangkok, and Katmandu; and agreements concluded recently with Switzerland, Yugoslavia, and Ethiopia have committed CAAC to provide direct service to Zurich, Belgrade, and Africa. In response to the new demands on China's air fleet, **China is scouting for bargains among world aircraft manufacturers.** Minister of Foreign Trade Li Chiang held long and detailed discussions with Franz J. Strauss, chief executive of the Franco-German corporation that owns the **Airbus,** during Li's trip to West Germany in mid-April. As part of the program, Strauss gave Li a ride on the A-300 Airbus, Europe's leading short- to medium-distance jetliner, afterwards commenting, "The minister was most impressed by the climbing speed of the Airbus." China's interest in the wide-bodied Airbus, foreign observers speculate, is a factor of plans to enter into international competition, particularly with the nine foreign airlines that now serve China. In other aircraft news, **Dowty Fuel Systems** announced that it had won a $1.8 million order for aircraft test rigs and equipment for the Spey engine, manufactured in China under a Rolls-Royce license. Commercial director of the British firm Colin Cocks said that negotiations with TECHIMPORT had lasted more than two years. Delivery is scheduled for 1979. **China is buying large numbers of trucks from abroad to speed up industrial transport.** On 5/11/78, Japan's Isuzu Motors announced a $13.3 million sale of 8-ton trucks to MACHIMPEX. The order, for 1,500 units, tops Isuzu's total truck sales to China in 1977 by 200. Negotiations on vehicle and engine sales have been reported with nontraditional suppliers as well: After more than four years of sales effort, Chrysler (UK) Ltd. was invited to Peking in late April to give a detailed presentation of products and manufacturing techniques. Export director T. Justice said that the company hopes to win a multimillion-dollar order for trucks and other commercial vehicles. Talks are also going on between Peking trade officials and Volkswagen executives in Wolfsburg on VW's diesel engines, according to a report in *Automotive News* (3/27/78); Fiat in Italy and Renault in France are working toward cooperative agreements for production of commercial vehicles. More details on the Volvo sale of 700 heavy trucks (*CBR* 5:2): The trucks will be both platform and on/off-road types—N7 4 × 2 with 7-liter diesel engines, and a number of N12s 6 × 4 12-liter diesel engines developing 350 bhp. There will also be a number of cross-country 4 × 4's for mobile workshops and crew buses. The contract, among other things, includes training clauses providing for an interchange of technicians. Chinese ships will pick up the finished trucks direct from the Volvo International plant in Gothenburg, Sweden. **Societe National de Chemins de Fer (SNCF) of France will help implement China's plans to develop the rail sector at "top speed."** Among the results of a SNCF delegation to China in November, 1977, was an agreement for exchange of technical information and training programs for railway engineers. SNCF proposed as well collaboration in research, maintenance, and technical supervision of equipment start-up, and offered to help China choose among French products on the basis of China's needs. The consultancy aspect has not been settled yet, but the delegation pinpointed a "rapidly opening" market for large-capacity locomotives (4,000 hp and under) to replace the steam engines that make up 80% of China's locomotive stock. According to the trip report, printed in *France Transports Transfer* (4/78), China has the ability to manufacture 3,600-hp locomotives but not in sufficient quantity to cover current needs. Electric locomotives, signaling equipment, and automatic switching systems were further areas in which market potential was sensed. The list is very much in accord with the priorities schedule announced in February by the minister of railways, Tuan Chun-i. The team reported that of China's 10,000 locomotives, 80% are steam, 19% diesel, and 1% electric.

SHIPPING: Containerization; JETRO estimates China's 1977 purchases of used ships. China moved another step towards developing its own container fleet in February through the **lease of 100 TEU's from Japan's Nippon International Container Service,** the first container boxes leased by the China Ocean Shipping Company (COSCO) directly rather than through foreign agents. The move reflects China's desire to familiarize itself with the logistics of unitized transport and eventually to increase the numbers of containers being carried in PRC tonnage. About the same time, the **containerized feeder service** between China and Japan for goods destined for North America, operated by Japanese agents, was stepped up with the assignment of two new full containers ships to the route by Mitsui OSK Lines and Kawasaki Kisen (K

Line). Mitsui OSK's 270-unit container ship and Kawasaki Kisen's 200-unit vessel make the trip twice monthly between Kobe and Hsinkang, near Tientsin, which has the most highly developed container facilities of any Chinese port. The service was inaugurated in February. In addition to K Line and Mitsui OSK, Shinwa Kaiun Kaisha operates containerized carriers on the China route, and a Hong Kong company, the Prompt Shipping Corporation, is planning a new Japan-China container link as China moves into the container age. China is still unready to commit itself fully to the container trade: No container vessels were noted among the phenomenal tonnage China bought on world markets in 1977. Orders for container ships will come, however, according to the Japan External Trade Organization (JETRO). **In late March JETRO headquarters in Tokyo released an analysis of China's ship purchases in 1977** indicating that the bulk of carriers purchased were European, mainly French and Norwegian, and 10–12 years old. China's latest buying spree began in May, 1977, according to the report, reaching by September, 1977, a total of 33 vessels of about 573,000 deadweight tons at a value of $127 million. By the end of the year, China may have bought an additional 60 vessels. **1978 ship purchases** in the news: Weser AG shipyards in Bremen, West Germany, delivered three new type "36 L" multipurpose freighters to China at the end of April. The ships were equipped with conventional on-deck double loading cranes according to Chinese specifications. The *Cairnsmore*, a 26,000 deadweight-ton motor bulk carrier fitted with a Clark & NEM-Sulzer diesel engine, building 9,900 bhp, 15 knots, was sold by Matheson & Co. of London to the PRC for $4.5 million (4/7/78). The 14,000-ton oceangoing freighter *I Men*, built by the Warnow Shipyard of East Germany, was turned over to China on April 7. On 1/15/78, the Karachi Shipyard and Engineering Works handed over a 13,500-ton cargo vessel, the first of two ordered by China from Pakistan. The Shinhama Shipbuilding Company of Tamano, Japan, won an order for four 15-meter shellfish-gathering boats from MACHIMPEX, which were completed and delivered in January. The Marine Division of **Houseman (Burnham) Limited has signed a contract with COSCO for provision of water treatment and maintenance chemicals** for onboard use by the Chinese fleet. The agreement was negotiated by Houseman's Japanese agents, Liquid Scientific Company Ltd., and announced in early April.

IRON AND STEEL: China Steel Purchases Accelerate into 1978. Semi-annual talks on Japan's steel exports to China, usually a prolonged affair, have again run aground. The pattern is familiar to observers of the Sino-Japanese steel trade: MINMETALS buyers gain a strong position early on by offering the sellers a large contract quantity, then wait until the turmoil subsides to negotiate prices. This time around, the Japanese have asked the Chinese to diminish contract quantity by some 400,000 tons to a total of 2.2 million tons, as well as to raise prices some 30 to 50%. Sticking to both price and quantity specifications, MINMETALS has bent only with respect to delivery dates. With deliveries for second half of fiscal year 1977 (October to March) already delayed past June, buyers and sellers concur on the need for a formal extension of the September deadline for first half of fiscal 1978 shipments to December. The six steelmakers involved in the negotiations—Nippon Steel Corporation, Nippon Kokan, Sumitomo Metal Industries, Kawasaki Steel Corporation, Kobe Steel, and Nisshin Steel Company—sold a total of 3.4 metric tons of crude steel to China in CY 1977 and, according to projections released in February, may sell as much as five million tons in 1978. If forecasts run true, Japan may sell more steel to China in CY 1978 than it does to the United States, sales to which ran about 7 million tons in CY 1977 but are expected to slip to the region of 4 million tons in 1978. With China about to replace the US as Japan's first-ranking steel market, MINMETALS is likely to secure its demands once again. In another area of the steel trade, **negotiations on specialty steel contracts for the second half of 1977** were concluded in mid-March after more than six months of exhausting debate. Total contract quantity was set at 42,800 tons, at prices up 15% from purchases in the first half of fiscal 1977. The 42,800 tons were divided among four makers: Aichi Steel Works, 16,000 tons of springs and other steels; Daido Steel Co., 12,000 tons of alloy steel and 3,000 tons of stainless bar steel; Sanyo Special Co., 10,000 tons of bearing bar steel and 500 tons of bearing tube steel; and Mitsubishi Steel Manufacturing Co., 1,300 tons of hollow drill steel. Daido was expected to sell an additional 4,000 to 5,000 tons of coil bearing wire rods and heat-resistant steel. The price increase was more than offset by the strengthening of the yen, according to market analysts. **Orders for rolled steel placed with three West German firms,** Thyssen AG, Mannesmann AG and Kloechner-Werke AG, were announced 4/5/78, during Foreign Trade Minister Li Chiang's stay in Bonn. Only one of the firms subsequently released details on the order: Mannesmannroehren-Werke AG, a Mannesmann subsidiary, said contracts had been signed worth $33.5 million for delivery of 60,000 tons of high-

New in China: automatic stamp vending machine, Canton, spring 1978.

quality small steel pipes in the second quarter of 1978 (5/9/78). Earlier, Mannesmann announced that another subsidiary, Mannesmann Handel AG, had sold 200,000 steel tubes for oil pipeline, at an undisclosed price (2/78). It was unclear whether the latter sale overlapped with Mannesmann sales of 120,000 tons of steel tubing reported in October, 1977, which were scheduled for delivery in the first quarter of 1978. In mid-May, **British Steel Corporation** said that it had won a $5.4 million order from China, bringing totals since October, 1977, to $23.4 million worth. **China is seeking new sources of supply of iron ore for domestic steel production,** including Brazil and India, and has begun talks on a long-term iron import agreement with Australia.

China will need an additional 24 million tons per year of iron ore to operate the new Paoshan Steel Works alone, and as much as 140 million additional tons to raise steel output to 60 million tons annually by 1985. Brazil sent a trade team to China in mid-May offering, among other things, a package on iron ore exports increasing from an initial ten million tons a year to 20 million tons per year over "a period of time," probably by 1985. The agreement includes a clause for transshipment via Kawasaki Steel Corporation facilities in Mindanao, which has deep-water berths that can accommodate the giant bulk carriers bringing iron from Brazil. **Australia may be supplying China with 7.5 million tons of ore by 1985.** Nippon Steel Corporation has already granted an Australian firm the supply contract for the Shanghai steel mill. Australia's ore exports to China in 1977 are estimated at about one million tons, mostly from the Pilbara mines, and may grow in the coming year with the announcement in late April that China was ready to start talks on a long-term iron ore agreement. Vice Premier Li Hsien-nien told visiting Minister for Industry and Commerce Phillip Lynch that China was "pleased" with the quality of Australian ores and wanted more.

New Zealand's steel trade with the PRC is blooming, too, with a second order for 2,500 tons of steel reinforcing bars placed not long after its first ever sale to China (3/14/78); and India, which shipped its first order of iron ore to China in many years in January and February, 20,000 tons of pig iron valued at $1.6 million, has been promised an additional order of 25,000 tons worth some $1.9 million.

NONFERROUS METALS. China continues to build up its aluminum stockpile: recently, with purchases of 18,000 tons of aluminum from the Norwegian mining firm Elkem-Spigervert. Deliveries were scheduled for the first half of 1978 (4/7/78). The Italian firm Alsar-Alumetal SpA announced early in the year that it was negotiating agreements on supply of aluminum products and technology. Both agreements have been confirmed; the first shipment of 5,000 to 8,000 tons of aluminum will be delivered this year and may be followed by a long-term supply contract, according to sales manager Leonardo Rossetto (2/23/78). The Japanese trading company, Marubeni Corporation, announced on 5/30/78 that it signed a contract on export of 1,300 tons of aluminum foil with MINMETALS at the latest Canton fair. The contract, with an estimated value of $3.1 million, specifies products of Showa Aluminum K.K. and Nippon Foil Manufacturing Co. Deliveries began in June. In another sphere, Zambia announced on 3/31/78 that it was cutting all copper sales negotiated for 1978 by 15%, in a move that has forced China (among other Zambian copper clients) to find new sources of supply. Among China's new suppliers is the Papua New Guinea firm, Bougainville Copper Ltd. The company announced on 3/16/78 that a three-year contract had been signed in Peking for export of "about 33,000 tons" of **copper concentrates** a year according to the *AGE* (Melbourne, 3/15/78). An initial lot of 20,000 to 22,000 tons of copper concentrates, valued at $30 million, is due for shipment later in the year.

PENICILLIN: In one of the largest Chinese contracts for pharmaceuticals on record, Beecham Pharmaceuticals Pte Ltd., Singapore, has sold $431,000 worth of semisynthetic penicillin to China, in injection form. Subsidiary to the British Beecham Group, which invented semisynthetic penicillin, Beecham Pharmaceuticals has been trying for more than ten years to interest China in the product. A $12 million expansion project is currently being carried out at the export-oriented plant in Singapore from which the order will be shipped (5/4/78). China's public health system, in which preventive treatment is emphasized and use of locally produced, even traditional herbal medicines is given government support, has offered few opportunities to modern pharmaceuticals except in highly specialized areas of disease control. While China has actively developed pharmaceutical production for export in recent years, with sales to the OECD countries rising almost 600% over the five-year period from 1971–1976, imports have remained stable at about one third the volume of the export trade. Imports from OECD countries in 1976 totaled only $3.2 million, compared to exports of over $9 million. Thus, it is impossible to be optimistic about the market for Western pharmaceuticals in China based on the Beecham sale alone.

RAW MATERIALS. With the beginning of biannual fertilizer talks in Peking for the first half of fertilizer year 1978 (July to December, 1978) in mid-May, Japanese suppliers eyed nervously the portfolio of the Chinese buying team. Chinese imports of ammonium sulfate and urea in 1977 accounted for over 80% of the export total of 1.2 million tons. Even at that, exports to China are just beginning to pull through a two-year slump, returning to the 1975–1976 level but still far below the absolute level of exports in the 60's. According to the *Japan Economic Journal,* fertilizer industry plans for "structural improvements" will hinge on the result of the latest talks (5/9/78). In 1977, Japan exported 990,000 tons of urea (31% of total urea exports), and 260,000 tons of ammonium sulfate (29% of the total) to the PRC. Iraq signed contracts on 2/27/78 for export of $4 million worth of chemical fertilizers to China in other chemical news; and, according to *Chimie-Actualities* (Paris, 4/12/78), China has bought over 100,000 tons of sulfur from Canada and from Iraq (perhaps referring to the sale of "chemical fertilizers" above), and 8,400 tons from Japan, in contracts concluded recently.

AGRICULTURAL PRODUCTS. Grain: Some weeks after reports on 4/20/78 that a large trading company, possibly Continental Grain Corporation, had sold 200,000 tons of Argentine corn for shipment to China in the summer of 1978, Argentina's economics minister, Jose Alfredo Martinez de Hoz, announced signing of a contract with the

PRC for supply of 3 million metric tons of wheat and corn (6/6/78). Shipments will be spread over a three-year period. **Sugar:** Sugar industry sources in Brisbane, Australia, have confirmed a sale of 50,000 tons of raw sugar to China, Australia's first major sugar sale in 1978 (3/2/78). **Beans:** With one sale of 5,000 tons of mung beans worth $2 million in the basket, through services of a Hong Kong trader (3/8/78), the Thai government decided to go it alone. In early April, Board of Trade President Ob Vasuratna said that Thailand had made an offer to China on 35,000 tons of beans worth $17 million. The offer, which was presented to China Resources Company in the course of Prime Minister Kriangsak's visit to China, consists of 20,000 tons of mung beans, 10,000 tons of black matpe, and 5,000 tons of red long beans (4/11/78). **Dates:** Iran has sold China some 10,000 tons of dates (3/10/78). **Tobacco:** The Tanakput Tobacco Development Company of Nepal has sold 6,000 quintals of tobacco to China worth some $833,000, according to a February report (2/12/78). **Rubber:** According to 1977 trade statistics released in February by the Malaysian State Statistical Bureau, China was Malaysia's second largest rubber customer in 1977 after the United States, with purchases of 21,500 tons. **Cows and hides:** China announced in early April that the ban imposed on imports of Australian sheephides had been dropped, because the Australians were able to present convincing proof that the outbreak of bluetongue disease in northern Australian herds that made the proscriptions necessary was under control (4/12/78). West German stock farms recently shipped fourteen prize head of cattle to China aboard the containership *Peter Rickmers* (4/18/78).

TEXTILES: In recent textile purchases, China has shown a readiness to seek out both new suppliers and new materials. According to reports from Japanese traders, **Chinese buyers have been asking for bright-colored fabrics** in nearly all their recent orders. The materials are clearly destined for local consumption and not reexport; in response to one trader's query, officials replied that the 2 million square yard lot of textured polyester yarn woven fabrics the Japanese had just sold would go to the shops and emporiums of Peking. Another trader explained the changing trend saying, "There is a mood in China for new merchandise, and there seems to be rising demand in that country for new things." **Sales of textile materials by Japanese suppliers** in the second quarter of 1977 include: Toray, 2 million meters of nylon taffetas, polyester-rayon blends and texturized polyester yarn-based fabrics; Unitika, 600,000 meters of Unitika-produced polyester fabrics; Tango Shoji Co., $6.7 million worth of textured polyester fabrics; Tanaka Yoko Co., via Gunze Sangyo, Inc., a trading firm, $1.45 million worth of polyester textured yarn wovens (4/5/78). Unitika's prices went up by about 5%, Toray's by 3 to 5%, according to Japanese reports. In the first-ever order from Thailand, China signed an agreement in mid-March to buy more than **$10 million worth of Thai textiles and synthetic stretch yarn,** including 2.2 million yards of polyester fabric, 2.4 million yards of teteron rayon and 1,200 tons of synthetic stretch yarn. The agreement was signed during the visit of a CHINATEX delegation led by Import Department manager Mao Chi-chih visiting Bangkok in February. The contract was welcome news to Thai manufacturers, whose production capacity is thought to exceed demand by some 30%, but nerve-wracking for the Japanese, who fear rise of the yen on world markets may cause the price-conscious Chinese increasingly to seek their textile supplies elsewhere. Polyester staple sales are falling off, adding to their fears. **Orders for polyester short staple from Japanese suppliers** in the second half of 1978 (July to December) fell short of first half contracts. Toray, which sold China 19.1 million pounds of polyester staple in the first half, signed a contract for only 15.8 million pounds in the second half. Other Japanese corporations experienced similar reductions. Second-half export volumes set in talks in early April include Toray, 7,200 tons; Teijin, 12,900 tons; and Kuraray, 4,800 tons. Toray and Teijin sales were bolstered by orders placed with their joint ventures in Malaysia and Thailand; the Toray facility in Malaysia, Penfibre Sdn. Berhad, signed contracts on 19.8 million pounds of polyester staple for delivery in the July to December period, and Thai Teijin, the Teijin joint venture in Bangkok, has reportedly contracted to ship 4.6 million pounds (4/5/78). One pleasant surprise was delivered to the Japanese at the latest talks: The Chinese team, for the first time in years, accepted a major 5% price increase. The softening of the Chinese position was tied to the drop in US export capacity and the fact that Japanese prices, estimated at 80¢/kilogram, have reached rock bottom. Japanese polyester staple contracts are denominated in US dollars. **Unscrupulous middlemen and price-cutting plague China's textile imports from Pakistan,** which are controlled by annual commodity exchange agreements. China has presented a $60,000 claim against nine Pakistani firms who supplied short-weight towels on a $5 million contract with CHINATEX, according to late April reports. Visiting Pakistan to negotiate towel purchases under the 1978–1979 barter agreement between the two countries, CHINATEX official Tsang Hsu-shou was given the explanation that manufacturers were not to blame in the affair; traders who actually do the selling with CHINATEX have offered such low prices, according to Towel Manufacturers' Association chairman S.M.S. Rizvi, that the makers have no alternative but to provide substandard material (4/25/78).

HONG KONG: Chinese Investments Increase. China's expanding investments in Hong Kong may mean that the issue of Great Britain's lease on the territory will die a natural death long before 1997 when the lease expires: China will already have possession on capitalist terms. Adding to the estimated $2 billion worth of investments the PRC has already, **in March and April, China's trade representatives in Hong Kong put down between $37.7 and $44.2 million on land and building property.** Purchases included a 69,300 square foot lot in Shatin by China Resources Co.; 28,415 square feet of land near the Kwai-Chung Container Terminal, which the buyer, Tunisia Co., another Chinese agency, will reclaim for construction of a $19 million plant to make machine tools under a licensing arrangement with the PRC; and three floors and a residential tower in a four-story building complex under construction in Wanchai, valued at $25.9 million. The land in Shatin will be used as site of a $10 million ice manufacturing plant and cold storage warehouse for storage and transship-

Changing money upon arrival at Shumchun station.

ment of Chinese food exports to Hong Kong. Construction of a 12-story cold storage and ice-making facility and an 11-story building next door for storage of dry goods as well as comestibles will be completed by 1980 (3/21/78). In addition, another China-backed undertaking, the Yiu Lan Machinery Repair Works, is negotiating the purchase of a 1.2 million square foot lot on Tsing Yi Island for construction of Hong Kong's largest shipyard, according to the *Times* (3/31/78). In March, Hong Kong businessman Daniel Koo, managing director of Shui Hing Co., called for increased dependency on China for water supplies to bring Hong Kong's chronic water shortage to an end. **Koo also urged the establishment of a PRC industrial processing zone** in an area bordering the New Territories to centralize the export and reexport operations that already earn the PRC some $1.75 billion annually. According to Jimmy McGregor, director of Hong Kong's Chamber of Commerce, China's rate of return on market operations in Hong Kong is increasing at a rate of 5 to 10% annually (3/16/78).

SELLING REPORTS

CORPORATION AFFAIRS: Spring Sales by FTC's. China has introduced a number of innovations to up sales. **Some of the new flexibility and drive the leadership is seeking to instill has already been reflected in China's activities on the international market. New products** are being tried out on old markets, including oil exploration technology in Japan and private passenger cars in Western Europe. China's oil industry has reached out on many levels, from governmental to the Chinese agency houses of Hong Kong, to snare new customers for a product that China hopes will pave the way to rapid industrialization. **China's shipping fleet,** one of the fastest growing in the world, is ready to move into the international freighting market, and offer its services for sale. And a new industry, **tourism,** is growing fast and furious under the pressure of insatiable foreign demand. Below, recent FTC activities are detailed for each corporation, based on reports in the Chinese and world press.

CEROILS. Two contracts of 100,000 tons of rice each were signed on 2/25/78 and 3/31/78 with the Malaysian National Rice and Padi Board (LPN). According to Encik Yang Amri, secretary-general of the Public Enterprises Ministry, the Chinese initially refused to sign on more than 60,000 tons, but came through with the full lot requested by Malaysia after negotiations and a month later presented a second offer which was also accepted. Shipments, which are scheduled for completion by end of 1978, had reached 89,000 tons by June, including 49,000 tons from last year's contracts with LPN, which totaled 110,000 tons. The increase in Malaysian demand was the product of a succession of droughts in the Malaysian peninsula that have reduced output of rice by more than 5%; on the Chinese side, high prices for rice on the world market have produced favorable sales conditions. China uses the exchange earned from rice sales to finance wheat imports, according to market observers. One unusual feature of the sale was a Chinese request for denomination of the contract in Swiss francs, due apparently to the instability of the dollar. According to a report in the *Japan Economic Journal* (5/2/78), **China will establish an export production farm in northwest China to grow soybeans for the Japanese market.** The farm, which will be subsidized by the central government in the event that local resources are insufficient, will be equipped with the most up-to-date equipment for soy cultivation. Japanese traders have long requested the establishment of such a system to insure stable soybean exports to Japan. Three million baby eels, to be used for breeding stock, arrived in Bangkok in mid-April on order from the ADK Farm Company. The Chinese eels were valued at slightly more than $1 million.

CHINATUHSU. On the European market, **a consortium of Italian textile dealers has accused China of withholding cashmere supplies in order to drive up world prices.** Cashmere, which cost about $12 per kilogram a year ago, now retails at $49/kilogram, according to the dealers' joint statement (3/14/78). CHINATUHSU has adopted the new policy of requiring buyers to sign a statement verifying that feathers and down purchases will not be reexported to other countries, in order to placate the protest of European traders that reexports of PRC products via third world countries were driving them out of business. China usually offers considerable price advantages, in the form of large discounts, to third-world buyers, who then reap profits by shipping the goods to the higher-priced markets of the industrialized West. European traders evidently threatened to stop buying unless China could stop the low-priced feathers and down coming from Asian and African suppliers through Amsterdam (4/24/78). A British firm has decided to take its feathers and down in finished form, rather than fighting the battle of spiraling prices and unfair third-world competition. Mountain Equipment of Glossop announced in mid-April that it would begin distributing a new line of three types of Chinese sleeping bags, dubbed the "Dragon" line. Prices of the bags are very moderate, and construction is up to world standards. Down stuffing of the bags is superior to anything that

has been on the market in recent years, according to company spokesmen (4/21/78).

CHINATEX. Japan-China silk import talks foundered in mid-April after Japan refused to consider the Chinese request that quotes for silk textiles be increased (4/19/78). After the last round of talks, China agreed to curb exports of raw silk to 55,000 bales and silk fabric to 17.5 million square meters for the year ending March 31; requests for additional cuts have disappointed the Chinese, but they agreed to resume negotiations later in the year. A new market for Chinese silk may be opening up in India, according to February reports. Bombay importers are dissatisfied with the performance of Japanese dealers and may turn for supplies to China, if the price is right. Prior to 1961, India imported 30,000 to 50,000 kilos of silk yarn annually from the PRC (2/15/78).

INDUSTRY. China's light industrial products trading corporation has perennial problems with safety of toy exports. Recent snafu: British importers of a lot of 180,000 pencil sharpeners from the PRC agreed not to market them on findings of a court of inquiry that the articles contained a high level of lead paint. The agreement was voluntary; the judge acting on the case, finding that the sharpeners though commonly used by children were not technically toys, ruled against a court ban. (2/24/78).

SINOCHEM. The Japanese Ministry of International Trade and Industry (MITI) is forging ahead on plans to construct a 500,000 barrel per day refining and residual cracking plant at Tomokomai, Hokkaido, to convert low-gravity Chinese oil into kerosene and other light products. In early February, MITI released details of financing and construction schedule of the facility. Concrete plans will be drafted within the 1978–1979 fiscal year beginning April 1, with construction scheduled to begin within the 1979–1980 fiscal year. The ministry hopes for plant start-up by FY 1982–1983 when imports from China are scheduled to increase. Estimated cost of the operation, which will be run by a joint government-industry corporation, is $1.3 billion (2/3/78). The oil industry is divided over the issue, with some factions objecting not only to the high costs of processing Chinese crude, but also to the precedent set by the project for government intervention in industry. Current refining capacity at 566,000 barrels per day is already in excess of demand. Nonetheless, **oil traders have already exceeded the terms of the China-Japan Long Term Agreement** (2/16/78) under which the PRC's oil exports are to be regulated for the next eight years. Imports from China in 1978 will total 7.1 million tons, one million tons more than the quantity agreed upon according to late February reports. Japan's two import agencies for Chinese crude, the International Oil Trading Company and the Importers' Conference of Chinese Petroleum, concluded a separate agreement to import the additional quantity. Of the entire 7.1 million tons, International Oil will import 4.3 million tons and the Importers' Conference 2.8 million tons. The import price agreed upon for imports in the first half of 1978 was unchanged from the price for imports in the last half of 1977, at $13.20 (FOB) per barrel. The extra amount may have been settled during the visit of the Chinese Petroleum delegation to Japan in early February. During the April visit of Thai Prime Minister Chamanand Kriangsak to China, Kriangsak signed an agreement for import of an unspecified amount of crude oil and petroleum products from China. No details were available except that **China has set "no limit" on the quantity of oil that may be made available to the Thais.** Thailand has three oil refineries, one of which was specially adapted to refine Chinese crude under a barter arrangement in exchange for Thai rice. **Philippine refiners** are happy with their supplies of heavy oil from China, but for another reason. At $13.68 a barrel, Chinese oil lifted from the Shengli fields is the cheapest available on the Philippine market. Refiners have resorted to the practice of mixing heavy Shengli oil with the lighter Arabian in order to bypass the processing problem. Philippine refineries are able to take a Shengli crude content of 10 to 15% without structural modification. Under the trade agreement for 1978, China will export one million tons of oil to the islands. **The export of Shengli crude to the Philippines is in some respects a test case, preparatory to exploring other markets.** Oil lifted from the Shengli field has also been shipped in small quantities to France for testing. In April, a barrel of the Shengli product arrived in French laboratories; if tests are positive, France has promised China an agreement on joint exploration and import of Chinese oil. The nationalized corporation Elf-Aquitane is particularly identified with negotiations in progress (3/31/78). Even **Taiwan** is being sized up as a potential oil customer, according to a report in the March *China Trade Report*. Melinda Liu writes that Peking and Taipei officials are delicately moving toward some form of public acknowledgement of the existence and viability of a China-Taiwan oil trade. The governor of **Macao,** visiting Peking in April, discussed plans to build an oil refinery on Macao that will utilize Chinese feedstock, according to Manuel Bulhosa, a Portuguese industrialist (4/11/78). The plan to set up an oil refinery on Macao's offshore island of Coloane presented difficulties, he admitted, including the construction of a port for oil tankers. The project has been under discussion for some time, but the visit by the governor, the first by a ranking Portuguese official in 25 years, indicates the possibility of imminent action. Idemitsu Petroleum Company of Japan has asked China for another oil-related product, according to reports in late March. Idemitsu is apparently dissatisfied with the results and prices of Western technology for oil exploration in the offshore waters off Niigata prefecture and elsewhere. On 3/28/78 the head office of Idemitsu Kosan, parent company of Idemitsu Petroleum Development Company, announced that it was seeking **Chinese know-how for oil exploration and extractive technology developed at the Taching oil field.** China has also come to an agreement with Egypt to provide know-how in the areas of oil exploration and production management, but this is the first request presented for drilling technology. **Ups and downs of the pharmaceutical trade.** While the Indonesian government has curtailed all imports of Chinese traditional medicines and other drugs, in the Philippines, CCS International Trading Corporation is developing a lucrative market for herbal and patent medicines from the PRC. The Indonesian government decision (2/17/78) is related

Customers line up for new edition of introductory English textbooks at Canton's Hsinhua Bookstore, spring, 1978.

to a new licensing system under which only imported medicines licensed by the Ministry of Health will be allowed to be sold, and distribution by small nongovernmental companies stopped completely. In the Philippines, on the other hand, CCS has spotted the rising trend of pharmaceutical imports and decided to concentrate on pharmaceutical chemicals and herbs in future marketing efforts. CCS President Charlie Chamsay returned from the autumn trade fair in Canton with $500,000 worth of pharmaceutical chemicals for the production of antibiotics, antituberculosis and antimalaria medicines, hormones, and feed grade antibiotics (for poultry and cattle). The purchase brought total CCS imports of pharmaceuticals in 1977 to over $135 million worth. CCS has plans to package herbal medicines in the Philippines as the Japanese are currently doing, and may seek a product buy-back scheme in which herbal raw materials from the Philippines are traded for the finished product. An investigatory team from CHINATUHSU in November will explore the topic.

MACHIMPEX. The machinery corporation is gearing up to sell **commercial passenger cars** on the European market. *Auto Journal* (Paris, 4/1/78) carried an exclusive preview of the Shanghai 771 which will soon be released on the French market. Reviewers praised the four-door sedan for its classic, though somewhat severe lines. The vehicle has a 6-cylinder engine with a 2.2-liter capacity, developing 90 hp at 4,800 rev/min. The interior is up to modern standards with few of the obsolescent features noted in the Shanghai 771's predecessor, the SH 760. Features include electric windows, padded paneling, and comfortable seats, comparable to the Peugot 604's menage. Lacking the panache of the Shanghai, but practical and immaculately engineered, Asian importers are looking into the "Peking," a PLA army jeep resembling the Land Rover. W.A. Riley, the British agent for a Hong Kong consortium that hopes to market the jeep in Southeast Asia, is currently adapting a prototype "Peking" to take a Ford engine, gearbox and steering. If the experiment is successful, says Riley, it could lead to a $200,000 deal for his small company. The developers hope to set up a plant in Hong Kong to carry out the adaptations on a mass production scale. (1/28/78).

MINMETALS. In recent months China has released an unprecedented volume of tungsten on the world markets at lower prices than usual and at an unusual time, just before the spring trade fair in Canton. Normally, China tightens up tungsten supplies just prior to the fair to firm prices; but this time China has sold more than $100 million worth of tungsten ores just before the fair, according to a report in the *Metal Bulletin* (3/21/78). Wolfram prices were also at a low of $140 to $150 per metric unit, down from prices of $150 to $160 asked until recently.

SHIPPING SERVICES. On June 24, the China Ocean Shipping Company (COSCO) opened the first PRC-operated two-way freight service between China and Japan. Ports of call on the first trip included Yokohama, Osaka and Moji. The announcement on 5/15/78 marked the successful conclusion of a six-month experimental run, utilizing three routes between Shanghai and ports in Western Japan. Beginning last autumn, the 3,756-ton *Tung An* and the *Feng Cheng* and *Yen Cheng*, both 6,544 tons, participated in the test sailings. On a route between Shanghai and Moji, at the northern tip of Kyushu, the *Tung An* has made the crossing on an average of once a month, bringing between 470 and 2,265 tons of cargo each time. The *Feng Cheng* and *Yen Cheng* were assigned to ports of call in the Kyoto-Osaka area and the Osaka-Kobe area, respectively, sailing from Shanghai. No details of rate structure or cargo procurement have as yet been released.

TOURISM: Notes for the traveler. Within a few months of the adoption of liberalized travel procedures in China, the list of package tours operated by Western travel agencies, airlines, cruise liners and individual entrepreneurs is turning into a small book. A small sampling of package tours launched since January: Pan Am, 18-day tours at $1,145 per person double; Sita World Travel, 17 days at $1,399; Japan Air Lines, 18-19 days, at $1,416 to $1,476; Cartan, 17 days, $1,418 to $1,517; Bennett Tours, four days for $270 to 10 days for $1,570; Centroturist International, 11- to 16-day China segments using Air Yugoslavia carriers for the Belgrade-Peking leg, at $2,389 including air fare. Other tour operators include CP Air, Travcoa, Kuoni, Perci Tours, Ethiopian Air Lines, Air France, Iran Air, Costa Line, Cunard Line (on the *Queen Elizabeth 2*), Flagship Line, Holland America's *Rotterdam* and *Prinsendam*, Norwegian America's *Sagafjord*, Lindblad Travel's *Lindblad Explorer*, Norwegian Asia's *Rasa Sayang*, and Royal Viking's *Sea* and *Sky* luxury liner ships. In April, Australia's Qantas announced a 21-day, 20-night itinerary stopping in twelve Chinese cities. Both Wagon-Lits Tourisme and Thomson Holidays, French and British leading tour operators, have published new brochures publizing their tour schedules and other information pertinent to the

China traveler. **China in the meantime is girding itself for the horde.**

China's Foreign Trade, the premier publication for the export trade, in its most recent issue devoted a three-page spread extolling the service in Peking's Hsinfeng Restaurant. Foreign visitors have noted other subtle signs that the Chinese are ready to put out for the foreign visitor, ranging from new wall paper at the Tung Fang Hotel in Canton to a bright green tour train that now runs daily between Peking and the Great Wall. More serious development projects for the tourist industry include a new international airport now under construction in Peking; opening of 30 new restaurants and 40 canteens in Peking to add to the present 656 establishments; a 3-story, 1500-bed hotel planned for Shanghai; and a 15,000-square meter customs house at Shumchun to handle the incoming flow of visitors from Hong Kong (the old building will be relegated to outgoing passengers). China Travel Service (CTS), China's own travel agency, has streamlined visa procedures and hiked tour prices in anticipation of a projected 15,000 visitors in 1978. **Visa applications, which once had to be processed in the visitors' home countries, now may be handed in directly to the CTS office in Hong Kong as little as three days before departure.** CTS has also added at least seven tours to its operations and raised prices on its popular Canton Weekender. The new tours include a six-day trip to Canton, Hangchow, Shanghai and Peking for $870; a one-week trip to Canton, Hangchow, Soochow, Nanking and Shanghai for $685.50; and a 10-day package tour to Canton, Kweilin and Nanning for about $780. Rates on the Canton Weekender went up in March from $163.20 to $185, for a four-day tour of communes, parks, and historical sites in Kwangtung Province. According to CTS spokesmen, a total of 51 groups set out on the Weekender and other tours on March 23 and 24 alone. Another package on the Canton–Hong Kong route, specially designed by Japan Air Lines for Canton fairgoers, provides transit to the fair from Hong Kong. Services include accommodations at the Hotel Plaza in Hong Kong, porterage, guide service, arrangement of travel vouchers, and transportation to and from the Kowloon Station for transfer to the Chinese frontier. Top fees on the package are $87.50 for the round trip with single-occupancy hotel accommodations in Hong Kong. **China's hoteliers are eyeing the signs of change coolly, but with some consternation.** In mid-March, an emergency delegation from hotels of Shanghai and Kwangchow met in Hong Kong with experienced hotel managers and staff for briefings on restaurant and group tour management, airport and railway station limousine service, and guest illness and utilities breakdown troubleshooting. What they learned from their Hong Kong and Kowloon colleagues may have been sobering: Hong Kong provides a preeminent example of the madness—and prodigious spending—of Western tourists on the loose. 完

The China Business Review

is Published by

The National Council for United States-China Trade
1050 Seventeenth Street, N.W., Suite 350
Washington, D.C. 20036

202/331-0290

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