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THE JAPAN-CHINA AMITY DELEGATION WRITTEN REPORT
ASSOCIATION FOR SCIENCE, TECHNOLOGY
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TABLE OF CONTENTS

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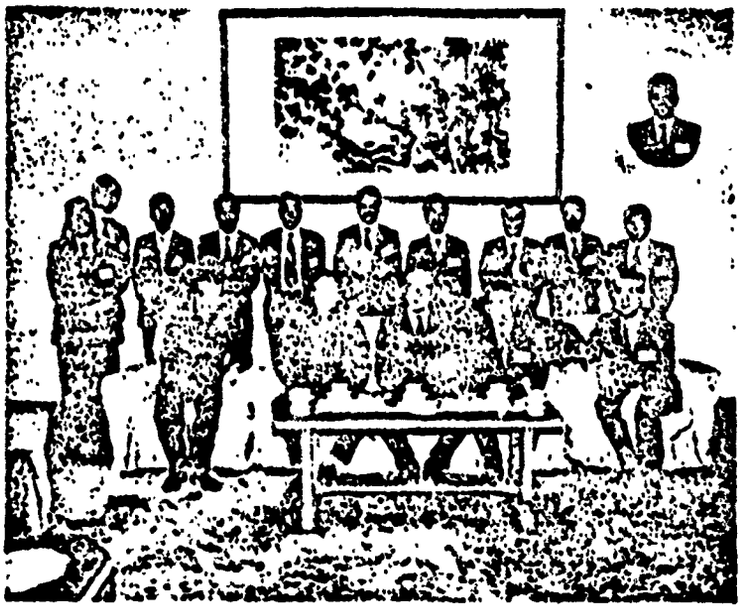

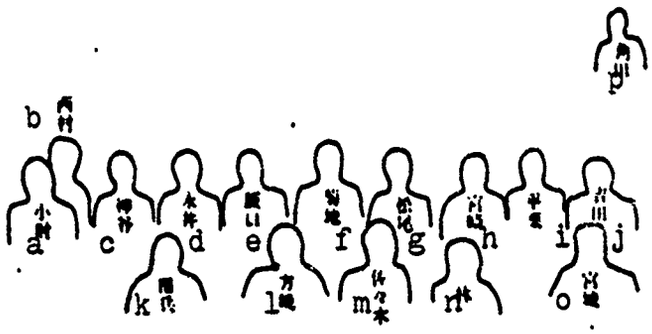

RESEARCH GROUP COMMEMORATIVE PHOTOGRAPH

Key: a. Kosai b. Nishimura c. Kamitani d. Nagai
e. Sakaguchi f. Kekuchi g. Matsuo h. Miyazaki i. Heguri
j. Yoshida k. Tahei l. Masatoshi m. Sasaki n. Hayashi
o. Miyagi p. Tsuncda

REGISTER OF MEMBERS' NAMES

Delegation Head.....Takafu Sasaki
Board of Directors of the Association for Science, Technology and Economics
Vice-president of the Research Laboratory of the Foundation for Futurology*
Consultant to Japan Electric, Inc.*
Vice-chairman of the Delegation.....Yuichiro Hayashi
Standing Committee of the Association for Science, Technology and Economics
Vice-president of the Research Laboratory of the Foundation for Futurology*
Secretary General.....Osamu Yoshida
Administrative Director of the Association for Science, Technology and Economics
Member.....Kao Miyagi
Administrator of Computer Technology of Japan Electric, Inc.*
Member.....Yuichi Nagai
Vice-president of the Software Factory of Hitachi Company, Inc.*
Member.....Toshio Heguri
Technical Head of the Electronic Computer Department of Fuji Enterprises, Inc.*
Member.....Koichiro Tsunoda
Director of Japan Electronic Development, Inc.*
Head of Space Development Group
Member.....Yoshimasa Miyazaki
Technical Head of Electronic Computers of the Equipment Technology Center of New Japan Iron Works, Inc.*
Member.....Yoichiro Kosai
Engineering Department Head of Nissan Automobiles, Inc. Zama Factory*
Member.....Katsuyoshi Kamitani
Head of Production Technology at Mitsubishi, Inc.
Member.....Wataru Sakaguchi

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*Note: members of the Association for Science, Technology and Economics

Vice-president of the Telecommunication Data Center of Nippon Telegraph and Telephone Public Corporation*

Member.....Akira Kekuchi*

Section Head of Electronic Computers of Public Relations Department of Japan Electronics Corporation

Member.....Yoshichi Matsuo

Head of the International Department of the Association for Science, Technology and Economics

Member.....Noboru Nishimura*

Chinese Trade Promotion Department of Sumitomo Shoji Corporation

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* Note: members of the Association for Science, Technology and Economics

PLANS BEFORE DEPARTURE

1. PURPOSE

This delegation visited Communist China through an invitation made by the Chinese Association for Science and Technology. The purpose of the visit was to promote the science and technology of both Japan and China and to contribute to the friendship of the two countries. This was done through intellectual and cultural exchanges in the fields of science and technology.

2. DAILY SCHEDULE

Departure October 30 (Monday) AF 179
Left Narita at 12:00
Arrived in Peking at 15:40

Return November 15 (Tuesday) JAL062H
Left Hong Kong at 10:30
Arrived in Narita at 15:25

For the most part, the 17 days and 16 nights were spent in Peking, Shanghai and Tien sin to carry out an exchange of ideas and explanatory meetings with the Chinese Science Institution and the Chinese Association for Science and Technology and to observe universities, factories, research lab., etc.

3. TECHNICAL EXCHANGE TEAM (JAPANESE HEADINGS)

1. Conditions and Prospects for the Electronic Computer Industry (Kekuchi)
2. Multipurpose Computer System (Heguri)
3. Hardware Technology (Miyagi)
4. Basic Software (Nagai)
5. Application of Software (Tsunoda)
6. Practical Application of Electronic Computers in Each Industrial Sector
   a. Iron and Steel Industry (Miyazaki)
   b. Automobile Industry (Kosai)
   c. Heavy Industry (Kamitani)
7. Data Communications (Sakaguchi)

We planned to have technical exchange by limiting the teams in Shanghai, etc. to an explanation time of 1 hour and 1 hour for interpretation per item.

We also planned to have Yuichiro Hayashi lecture on the roles of economic development and science and technology in Japan.

4. EXPLANATORY MATERIALS SUPPLEMENT (JAPANESE)

DELEGATION'S DAILY SCHEDULE

DATE	TIME	DETAILS	HOST
10/30	12°00′	Flight AF179 leaves Narita, lunch on the plane	
	15°40′	Arrives in Peking Greeted by Mr. Fang and 3 other people from the Association for Science and Technology 40 minute rest, then take 3 microbuses to hotel	Fang Hsiao - Association for Science and Technology T'ien Ping (interpreter) Head of reception for Delegation for Association for Science and Technology Miss (illegible) Ke (interpreter) Member of Electronics Institute
	17°00′	Arrive at Peking Restaurant	Miss Yu (illegible) member of the Association for Science and Technology
	19°30′ - 22°00′	Discuss daily schedule with Mr. Fang and Mr. T'ien in the guest hall of the hotel	
10/31	7°50′	All Members leave hotel	Mao I Shang Vice-chairman of the Association for Science and Technology

DATE	TIME	DETAIL	HOST
10/31	8°10	Arrived at the Association for Science and Technology, Vice-chairman Mao Peking Association for Science and Technology Meet with Mr. T'ien	Chen Li-Wei Electronics Institute Trustee Vice-Chairman of the Electronic Computer Committee. Head of North China Research Labs
	8°50	Arrive at the Science Reports Government Office. Greeted by Mr. Chen Li Wei of the Electronics Institute	Chen Li-Wei Electronics Institute Trustee Vice-chairman of the Electronic Computer Committee Head of North China Research Labs
	9°00′	Briefing Session (400-450 people) all members participate Greeting from Head delegate Kekuchi- briefing (Present situation of the prospects for the electronic computer industry) Movie-Electronics Committee "Japanese Computerization"	Roku Yu Kyu (interepreter) Member of Electronics Institute
	12°30′	Arrive at hotel for lunch	
	13°30′	All members leave hotel	
	14°10′	Arrive at the Science Agency Computation Center Debate with Mr. Wang and 16 other people Observe the 013	Wang Chung T'sien Member of the Science Agency Computation Center Yang Wei Min Science Agency Computation Center Supervisor
	16°30′	Chairman, Vic-chairman, and Delegate Matsuo visit Japanese Embassy	Ken Wei Min Science Agency Computation Center Supervisor

DATE	TIME	DETAIL	HOST
10/31	17°00′	Arrive at the hotel 7 translators will arrive at the hotel and break up into 5 different groups to discuss reports	Miss Chun Member of Machine Institute
	18°30′-21°00	Dinner at the hotel	
11/1	8°10′	Miyagi, Heguri, Kosai, Kamitani, Miyazaki and Yoshida leave hotel	
	8°30′	Report Committees meet Miyagi (Hardware technology) and Heguri (multipurpose computer system) groups 40 people Niyazaki (Iron and Steel Industry) 40 people Mr. Kosai (Automobiles) 30 people Mr. Kamitani's report in afternoon	Miss (illegible) Teng Metal Institute Automation Research Labs (illegible) Koku Shi Vice-president of Machine Institute
	8°40′	Sasaki, Hayashi, Sakaguchi Nagai, Tsunoda, Kekuchi, Matsuo and Nishimura leave hotel	
	9°00′	Observe Long-distance Telephone Office	Men Chi Men Supervisor
	12°30′	Everyone has lunch at hotel	Cheng Tsu Jin Supervisor

DATE	TIME	DETAIL	HOST
11/1	13°30′	All members leave hotel	Kung Na Fa Supervisor
	14°00′	Briefing session- Kamitani (Heavy Industry)	
	14°00′	Other members observe the Wire Electronics Factory	Chang Chih Mei Supervisor at the Wire Electronics Factory
	17°30′	All members arrive at the hotel	(illegible) Cheng Chung Supervisor at the Wire Electronics Factory
	18°30′ - 20°30′	Sasaki, Hayashi, Matsuo and Yoshida meet with the Science Agency, the others dine at the hotel	Gen Sho- Head of Wire Electronics Factory
	21°00′	Delegates meet at the hotel	Chang Chin Science Agency Foreign Affairs Department
11/2	8°10′	Tsunoda, Nagai, Sakaguchi, and Matsuo leave hotel	
	8°30′	Briefing Sessions in Guest Hall Tsunoda (Software Application) 50 people Nagai (Basic Software) Sakaguchi (date communications) 50 people	Keng (illegible) 4th Machine Industry Department Yo Koku Shi Telegraph and Telephone Communications Research Lab

DATE	TIME	DETAILS	HOST
11/2	8°30′	All other members except the Delegation Chairman leave the hotel	
	9°00′	Observe the Shutu Iron and Steel Works	Kao (illegible) Vice-chairman of Shutu Foreign Management
	12°30′	All members lunch at the hotel	Kung Feng Lin (interpreter) Member of Metal Institute
	13°40′	Tsunoda, Miyazaki, Yoshida, and Matsuo leave hotel	
	14°00′	Briefing session and debate in guest hall Tsunoda (software application) 50 people Miyazaki- Debate- 20 people All members other than chairman leave hotel	
	14°30′	Observe Shohua University	Professor Wu Yu Wireless Electronics System
	17°30′	All members dine at hotel	
	18°30′	Tour of (Illegible) (Sankokushin) excluding Mr. Sasaki and Mr. Nishimura	

DATE	TIME	DETAILS	HOST
11/3	14°00′	All members leave hotel	
	9°00′	Sasaki, Hayashi, Matsuo go to "theater in the city" Mr. Hayashi's address- 500 people "Economic Development and Science and Technology in Japan"	
	8°30′	Debates in Guest Hall with other delegates (5 groups) Miyagi-Heguri group 16 people Tsunoda-Nagai group about 20 people Kosai-Kamitani group about 20 people Miyazaki group about 20 people Sakaguchi group about 18 people	(illegible) Cho First Machine Department Automation Research Lab
	12°30′	All members have lunch at hotel	
	14°00′	Sasaki, Kekuchi, Yoshida, Nishimura meet with Mr. (illegible) Hong Cho of the Science and Technology Committee Mr. Hayashi speaks with several people at the hotel The rest continue their debates in the guest hall	(illegible) Hong Cho Vice-president of Science and Technology Committee Foreign Affairs Department
	18°00′	All members arrive at hotel	
	18°00′- 20°00′	Entertain guests at Shanghai Parks (34 people)	
	21°00	Delegates meet at hotel	

DATE	TIME	DETAIL	HOST
11/4	7°30′	All members leave hotel Tour the Great Wall and Ming Shi San	
	13°30′	Lunch and sightseeing	
	17°00′	Arrive at hotel, after dinner some of delegates go shopping	
11/5	8°50′	All members leave hotel	
	9°00′	Tour Kukung	
	12°00′	All of the members lunch at hotel	
	13°00′	Shopping	
	17°50′	Ride on a stream train from Peking to Tientsin (with Mr. Fang and Mr. T'ien)	
	19°50′	Arrive in Tientsin and are greeted by Ko Tieh Jun	Ko Tieh Jun Tientsin Science and Technology Institute head
	20°10′	Arrive at Tientsin Restaurant Discuss schedule	(illegible) Lin Tientsin Technology and Science Association
	21°00′	Delegates consult	Ma Chun Shin Director General of Electronics Institute

DATE	TIME	DETAIL	HOST
11/6	8°15′	Sakaguchi, Miyazaki, Yoshida and Matsuo attend debates at hotel Sakaguchi group 21 people Miyazaki group 16 people	Miss (illegible) Hsi (illegible) Tientsin Association for Science and Technology Miss Ying (illegible) Chun (interpreter) Chang Fu (illegible) Vice-chairman of Board of Directors of Tientsin Metal Institute
	8°20′	Other delegates observe Tientsin Semiconductor Factory Number 1	She Mon Sho Head of Tientsin Semiconductor Factory No. 1
	12°30′	All members have lunch at hotel	Sho Hsing Tientsin Semiconductor Factory Number 1 Technical Head
	13°50′	Miyazaki, Sakaguchi and Yoshida observe the Tientsin Semiconductor Factory	
	14°00′	Miyagi, Heguri, Tsunoda and Nagai attend debates at hotel Miyagi-Heguri group 22 people Tsunoda-Nagai group about 20 people Others go sightseeing	
	17°30′	All members arrive at hotel	
	18°30′ - 21°00′	Dinner after metting the members of Tientsin Association for Science and	Lo Yun - Head of Tientsin Science and Technology Committee

DATE	TIME	DETAILS	HOST
11/6	18°30′ - 21°00′ Cont.	Technology at the hotel	Member of the Tientsin Association for Science and Technology
11/7	7°30′	Members leave hotel	Ban Cho Yu Vice-chairman of the Tientsin Association for Science and Technology
	8°00′	Observation of the Tientsin Rug Factory and the Tientsin Machine Factory Number 1	Chang Ho (illegible) Assistant Secretary General of the Tientsin Trade Promotion Committee
	12°30′	All members lunch at hotel	Chang Ko Liu Technical Head of the Tientsin Machine Factory
	14°00′	Delegates at hotel for debates Nagai and Tsunoda groups about 20 people	
	14°00′	Observation of the Tientsin Industrial Arts Factory by the rest of the delegates Visit stores	Kung Fu Nom General Manager of the Tientsin Rug Factory Number 1
	17°00′	All merbers arrive at hotel	Chang - General Manager of Tientsin Industrial Arts Factory Number 1
	18°00	Entertain guests about 30 people	

DATE	TIME	DETAILS	HOST
11/8	6°15′	All members leave hotel	
	6°45′	Return to Peking on a steam train	
	9°00′	Arrive in Peking 1 hour late because of dense fog	
	10°30′	Arrive at Peking airport, lunch at the airport	
	11°50′	Leave for Shanghai with Mr. Fang and Mr. T'ien on the Chinese National Flights	
	13°50′	Arrive at the Shanghai Airport greeted by Mr. Hsu	Hsu (illegible) Assistant Secretary General of the Association for Science and Technology
	15°10′	Arrive at the restaurant after discussing daily schedule, break up into 6 groups with interpreters for debates and briefings	Chang Sei Yen Shanghai Electronics Institute Secretary General Vice-president of the Shanghai Telegraph Station
	18°50′	Except for Sasaki, Kekuchi, Yoshida and Nishimura the members go sightseeing	
11/9	8°30	Sasaki, Hayashi, Kekuchi, and Matsuo to the Shanghai Science Museum	Ke Shi Wang International Department of the Shanghai Science and Technology Assoc.

DATE	TIME	DETAILS	HOST
	8°30′	Mr. Hayashi delivers keynote address Mr. Kekuchi delivers keynote address and shows film about 500 people	
	8°30′	Others observe the Shanghai Industrial Exhibition Hall	
	12°30′	All members lunch at the hotel	
	14°00′	Kosai and Kamitani - briefing sessions with the Shanghai Association for Science and Technology - 80 people	Lin Na Cho Shanghai Industrial Exhibition Hall
	14°00'	Separate into 13 discussion groups	
	17°30′	All members arrive at the hotel	
	18°30′	Meet members of the Shanghai Science and Technology Association and dine together	Chu Lin Vice-chairman of the Shanghai Association for Science and Technology
11/10	8°00′	Sasaki, Tsunoda, Nagai, Kekuchi, Matsuo and Nishimura observe the Fukutan University	Chang Li Tsu Assistant Director of the Fakutan University Research Lab

DATE	TIME	DETAILS	HOST
11/10	8°00′	Hayashi, Kosai, Kamitani and Sakaguchi observe Shanghai Automobile Factories	Li Wang Ke Head of Shanghai Steam Train Factories
	8°30′	Miyazaki, Miyagi, Heguri, Yoshida report to the Shanghai Association for Science and Technology Miyazaki group about 40 people Miyagi-Haguri group about 50 people	Chun Mon Li Shanghai Steel Factory Automation Process Head To Gyo Jo Computer Research Labs
	12°30′	All members lunch at the hotel	
	13°55′	Vice-chairman Hayashi returns to Japan via the JAL leaving Shanghai Matsue, Fang and T'ien see him off	
	14°00′	Miyazaki, Miyagi, Heguri, Kosai debate at the Shanghai Association for Science and Technology Miyazaki group debate 18 people Miyagi-Hagure group debate about 20 people Kosai group Briefing session	Kyo Liu General Manager of Shanghai Shiki Firm
	14°00	Other delegates, except the chairman, observe Telegraph and Telephone Factory 519	

DATE	TIME	DETAILS	HOST
11/10	17°30′	All members have dinner except for Nagai and Matsue, delegates attend acrobat performance	
	18°30'	Return to hotel after performance	
11/11	8°30′	Sakaguchi,Tsunoda, Nagai, Kosai, and Yoshida debate and attend briefing session with about 50 people Sakaguchi group briefing session about 50 people Kosai group debate about 30 people	Chu san Gen Shanghai Computer Lab Head
	8°30′	The other delegates observe the Shanghai Computer Research Lab	Ko Tsin Shu Head of the Shanghai Research Lab
	12°30′	All members have lunch at hotel	
	13°30′	Sakaguchi, Tsunoda, Nagai, Kekuchi and Kosai attend debates with the Shanghai Association for Science and Technology Sakaguchi group - about 15 people Tsunoda-Nagai group - about 15 people	
	13°30′	Sasaki, Yoshida, Nishimura debate with several members of the Secretariat of the Automation Institute at the hotel	Chin Chih Nung Board of Directors of the Shanghai Computer Firm

DATE	TIME	DETAILS	HOST
11/11	13°30′	Other delegates go sightseeing	No Li Ke Secretary of the Shanghai Computer Firm
	17°30′	All members arrive at hotel	Yo Hei Sho Technical Head of Soji Kogyo Firm
	18°30′	Entertain 30 people	
11/12	8°30′	Other than Sasaki, Yoshida, and Nishimura, the other delegates observed the Shanghai Freightcar Factory	
	9°00′	Sasaki, Yoshida and Nishimura continue debates started the day before	
	12°30′	All members lunch at hotel	
	14°50′	Leave hotel and go to airport	
	15°50′	Ride on China International Flights to Kuangchou (with Mr. Fang and Mr. T'ien)	
	17°50′	Arrive at Kuangchou Airport and greeted by Mr. Shin Take 2 buses to hotel	Mr. Shin I Liu International Department of the Science and Technology Committee

DATE	TIME	DETAIL	HOST
11/12	18°20′	Arrived at guest hall and discussed schedule	Lo Mei (illegible) Kuangtung Science and Technology Committee Vice-chairman Po Tai Yu Department of Foreign Affairs of Kuangtung Association for Science and Technology
	19°30′-21°00′	Greeted by Chairman of the Association for Science and Technology at hotel	Miss Hsiao Mei Member of the Science and Technology
11/13	8°30′	All members observed the Trade Institute of Kuangchow	
	12°00′	All members dine at hotel	
	12°30′-14°00′	Sasaki, Yoshida, Nishimura meet with Mr. Fang and Mr. T'ien	
	14°00′	Kekuchi, Miyagi and Nagai attend Briefing sessions and debates in hotel Film Mr. Nagai's Report about 30 people	
	14°30′	Except for Sasaki and Miyazaki, the other delegates tour Kuangchou	
	17°30′	All members arrive at hotel	

DATE	TIME	DETAIL	HOST
11/13	18°30′	Party in honor of Mr. Fang and Mr. T'ien given at the Kuangchou Guest Hall (26 people)	
11/14	9°00′	Leave Mr. Fang and Mr. T'ien at Kuangchou and take a steam train to Shenchou	
	10°30′	Ride steam train to Hong Kong	
	11°30′	Arrive at the airports and go to Mirama Hotel	
	Noon	Tour Hong Kong Eat lunch at restaurant on Aberdeen River	
11/15	10°30′	Arrive at airport - board JAL 62	
	15°25′	Arrive at Narita Airport	

CHAIRMAN'S MESSAGE

Board of Directors of the Chinese Association
for Science and Technology
Mr. Chou Bai Yuan

I am very pleased by the fact that we have had the opportunity to visit your country as part of the Japan-China Science, Technology and Economics Amity Delegation, which was made possible through an invitation made by your committee. Beginning with Mr. Chou Bai Yuan, who extended the invitation to our delegation, I would like to thank the members of your association for their kindness.

Your country is one that is driven by a long-term plan for scientific and technological development and, being one of the countries which surrounds China, we have a great interest in your country. We have great expectations for the future of your country. The exchange of ratifications of the Japan-China Peace and Friendship Treaty, which was finally completed in October of this year, established the basis for friendly relations between our two countries. We can expect more exchanges of science and technology in the future.

Of course, science and technology will make the life of the nation prosper. There must be development for the stability and peace of the people. We are confident that progress in friendship and technical and scientific exchanges between Japan and China will be a great contribution to the peace and stability of Asia and the world.

I will not give up the hope that frequent cultural and technical exchanges between our 2 associations will become the basis for a long-term friendship between our countries.

Finally, I would like to thank first of all the members of your association and Mr. Ts'uei Sheng, who invited us to visit your country, and the members of the Chinese Science Agency.

Association for Science, Technology and Economics, Inc.
Chairman Tomitsu

October 1, 1978

PART 1 GENERAL REPORT

PART 1 GENERAL REPORT

1. General Conditions of Chinese Science and Technology

Delegation Head-Takafu Sasaki

In 1978 the world's attention was focused on trends in China. The National People's Congress, which held a meeting in March at Peking, was formed. The objective of "The Four Modernizations" of industry, agriculture, national defense and science and technology were established. The general principles of the 8 year plan for scientific and technological development up to 1985 were made clear at the National Science Convention which met in succession. It was called the first plan after the founding of the nation. This plan showed to the entire world a transformation in the road to modernization which was based on scientific and technological growth. In August Japan's Foreign Minister Sonoda visited China and the signing of the Japan-China Peace and Friendship Treaty was carried out. In August China's Vice-premier, Teng Hsiao p'ing, arrived in Japan to conclude the exchange of ratifications of the treaty. The progress of these ratifications was much faster than what was originally forecast. Along with this truly remarkable development, 1978 ended with a deterioration in the relationship between China and Vietnam, normalization of diplomatic relations between the United States and China and the problem of Taiwan.

The purpose of the "Japan-China Science, Technology and Economic Amity Delegation" was "that this visit was an opportunity for both sides to frequently carry out intellectual and cultural exchanges and became the basis of a long-term friendship between both China and Japan" by the visit with the "Communist China Association for Science and Technology", as stated in the message of Chairman Tomitsu. From the beginning of 1978 both participants added to their full-scale previous arrangements. I was the leader of the first delegation to visit China and the basis of long-term results was the accumulation of the exchange of experience in industrial technology. Not only did we confer with the

Chinese Association for Science and Technology on the exchange of science and technology that would follow, but we also participated in exhibits on the application of computers in each Japanese industry. Along with explanations of the actual conditions in our country, we carried out debates with technicians connected with these fields in China. We observed facilities connected to computers and determind the actual conditions of this industry in China. When we look at the results, the computer team was one of the main 8 clauses in the Chinese 8 year plan for technological and scientific growth. It was said that this plan had splendid timing as Vice-premier Teng Hsiao p'ing's party, which concluded the exchange of ratifications of the Japan-China Peace and Friendship Treaty, returned to China on the very day that the delegation visited China and at that time the Japan-China Friendship mood was at its highest point. The delegation departed on March 30, 1978 and spent 16 days in Peking, Tientsin, Shanghai and Kuangchou. We started consultations with the executives of the Chinese Association for Science and Technology, the Electronics Institute, etc. in each region. There were explanatory meetings and debates on computers and their application and we vigorously carried out our daily schedule, which included the observation of factories, laboratories, universities, etc. in 6 areas. We then returned home on November 15. During that time we received a very warm welcome and continuous attention from the Chinese. The Chinese technicians (superintendents and engineers) were very enthusiastic about the research. They did not spare much time for relaxation, but instead carried on discussions with the Japanese delegates. We are confident that many results came out of the friendly atmosphere. The delegation head thanked the members for their efforts.

I do not refer here to the different explanations in the team reports concerning the present condition of computers in China and their application, which was discovered during the exchanges. The overall situation of Chinese science and technology and industry seems to be like Japan's before it experienced a high level of growth. On the other hand, when we look at the citizens' daily life, the monthly income of a laborer is 60 yuan (7,200 yen) and for the most part this is a dual income with both husband and wife working. Also, the factories have established day care

centers. Food expenses are 15 yuan per person per month (1,800 yen) and rent is 5 yuan (600 yen) for an average 2 DK. However, cotton cloth and beef are rationed. After retirement at 60 years for males and 50 - 55 years for females, the citizens receive 6% of their wages. In this way, for the most part the life of the 980,000,000 citizens of China today is only a stable existence and there is a complete lack of manufactured goods. The automobile, which is said to be one of the 3 masterpieces in China ranking with the sewing machine and radio, is 150 yuan (18,000 yen). Along with those mentioned above, industrial products such as the television, etc. generally do not exist in most homes. Washing machines are not used at all either. As for the organization of production in each industry that was observed, most of the production is generally done by hand and renovation of factories is being carried out with the total distribution going to the production of consumer goods from the mainstay industry which began with raw materials. The reform of the industrial setup and modernization that follows will not be ordinary.

"Attaining Success by Overcoming Difficulties" is one's strongest point in quick modernization and it is necessary that China change her existing path so that she will avoid becoming a servant of the foreign technology that has been introduced. Of course, there was criticism from the Gang of Four everywhere, but I feel that it is time to point out the contradictions of the article itself, which carried the criticisms. (The original was printed in a wall newssheet immediately after we returned to Japan and we assessed a copy of it.) One of the problems related to the introduction of technology from foreign countries is the treatment of industrial property. In this area the Chinese Association for Science and Technology, institutes, etc. and I emphasized the people. However, China should establish an equitable method for the treatment of industrial property as soon as possible.

The Chinese gave a constructive idea on advice of dealing with the exchange of ideas between the "Science, Technology and Economics Association" and "The Chinese Association for Science and Technology" in the future. The contents of this recommendation

are summarized in the following 2 points.

1. There was an indication from the Japanese that the delegates of the Chinese Association for Science and Technology would be invited to Japan following this visit to China. A request was made for a computer team who would visit Japan in the spring (or fall) of 1979. Therefore, it was decided to settle this later.

2. From the Chinese side there were requests for future exchanges, such as not only exchanges of cultural information and data exchange as are taking place with this delegation, but also as much cooperation and participation as possible concerning the reconstruction and renovation of factories in China, joint technical development, the introduction of technology from Japan, technological guidance from Japan, the dispatch of exchange students from Japan, etc. However, there are many important problems connected with these demands and we have decided to study them and give our reply.

During our 16 day stay we had a particularly enthusiastic feeling that China would continue to make large changes. They were even more open and frank than what we had anticipated before the visit. We were free to take photographs and we gradually began to see areas where we wanted to express our opinions. They expressed the desire to learn from advanced nations such as Japan. The technicians were especially enthusiastic to study. In the future China will certainly learn the technology of superior nations. I have confidence that she will develop and modernize as she makes this technology her own and someday China will catch up with world standards. Although this is what is anticipated, from which country will China in fact learn most of the technology? America, Japan, Europe? In today's world an answer is impossible.

However, in any event, the exchange of science and technology between Japan and China is a very important problem. While China does have a closer relationship with her friends, even the Association for Science, Technology and Economics is influenced by the

international situation, China's present condition and trends in Japanese politics. However, we do detect trends where there is a contribution being made toward the development of science and technology and friendship between both countries. I believe that cooperation is important for peace and stability in Asia and the world in turn.

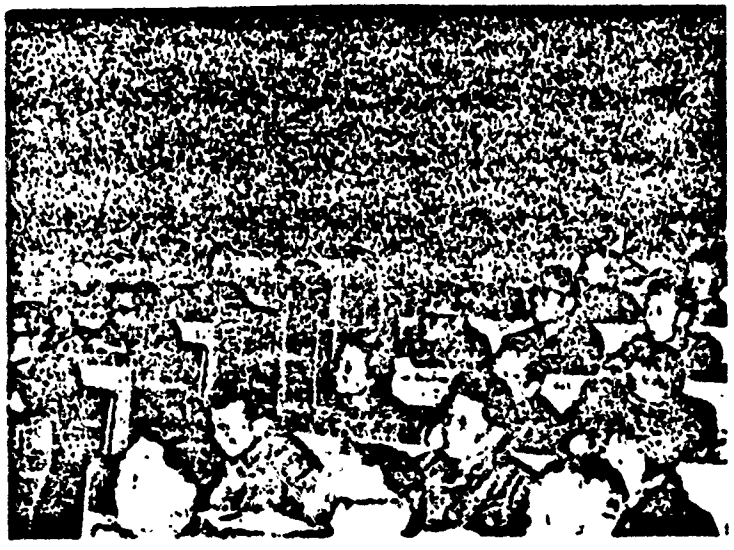
.....* to be sure, today it is not known whether or not the rabbit out ran the turtle. This rabbit caught up with the turtle before long and passed him by. This fear concerns me a great deal.

At the same time, attaining success by overcoming difficulties is not the only way to do things in China. For example, it is necessary to understand that this was only one pattern in the progress of industrialization in Japan up until now. I made this one of the points in the speeches at Peking and Shanghai. The technology that was introduced from foreign countries to Japan was never an indiscriminate imitation. We do not forget that this technology was made Japanese for the most part and we were successful at it. This was never outside reorganization. In a manner of speaking, it was pointed out that this was Japanese attaining success by overcoming difficulties. This is something that the Chinese must provide, just as the Japanese did, when the exchange of technology between both countries flourishes. Since every word in Chinese is different in both countries, there is a fear that a misunderstanding, which is not due to absent mindedness, will occur. However, it will probably be no problem at all since Japan realizes this.

2. Because it remains in the position where it is the only highly industrialized country in Asia, until now Japan did not know how to live as one country in a group of industrialized nations as in Europe. Teachers and critics, who have a role of leadership, often argue that there is no feeling of urgency regarding the progress of industrialization in Asia. To me this is not understandable. And today isn't it because of Japan's isolated position in Asia that there are people who dislike Japan at the top of the world? In the speeches at Peking

* Foreign text is missing

KEYNOTE ADDRESS (PEKING)



CHINESE TECHNICIANS LISTENING
TO KEYNOTE ADDRESS (PEKING)

VICE-CHAIRMAN MAO I SHANG
AND HOSTS AT THE CHINESE
ASSOCIATION FOR SCIENCE
AND TECHNOLOGY

and Shanghai I explained that not only China but also other countries in Asia are competing to be highly industrialized, and the reason for this is that even in Japan it is desireable to be an AC*, which must be an EC* in Asia. This is never called self-interest disguised as kindness. I think it is necessary for Japan to understand the precedence of the EC.

LECTURE MEETING AT PEKING

Translator's note: Expansion unknown

TECHNICIANS GATHERED AT THE LECTURE MEETING
(SHANGHAI)

PROFESSOR LO(ILLEGIBLE) OF THE TIENTSIN ASSOCIATION
OF SCIENCE AND TECHNOLOGY WAS A GRAND WOMAN
(WELCOMING BANQUET)

SHANGHAI INDUSTRIAL EXHIBITION HALL
WHICH DISPLAYS TOP LEVEL DOMESTIC
INDUSTRIAL PRODUCTS

HIGH RISE APARTMENTS IN SHANGHAI

FIELD LANDSCAPE OF (ILLEGIBLE)
(TIENTSIN)

3. GENERAL REPORT

1. REPORT ON THE CHINESE ASSOCIATION FOR SCIENCE AND TECHNOLOGY

1. OUTLINE OF THE CHINESE ASSOCIATION FOR SCIENCE AND TECHNOLOGY

The Chinese Association for Science and Technology (its formal name is the People's Republic of China Science and Technology Association) is a civilian organization which includes more than 70 Chinese institutions of physics, engineering, agriculture and medicine. It is under the command of the National Science and Technology Committee. It has a crosscutting setup that consists of laboratories that fall under each department in the state department, laboratories that fall under the prefectures and cities, college laboratories and laboratories connected with national defense. The function of the Association for Science and Technology is: 1. the collection of institutes (opinions from the institutes, coordination of demands and contact with the National Science and Technology Committee). 2. dissemination of science and technology (drawing up of annual reports, information channels, etc.), and 3. the exchange of science and technology (within the country and outside of the country). The roles of the National Science and Technology committee are 1. providing for a national science and technology plan and agreement, and 2. the responsibility of science and technology exchanges with other countries. In the speech of the director of the Foreign Affairs Bureau of this committee, it was decided that the Association for Science and Technology would be in charge of the exchange of science and technology as much as possible from now on and the original roles of the association would be strengthened. In order to do this, there would be many production workers with linguistic ability who would be in charge of international operations even at the lower levels of the Association for Science and Technology. On the whole, the setup

of the Association for Science and Technology is as follows.

National Science and Technology special city and provincial Science and Technology committee	National Association for Science and Technology (about 60 people) special city and provincial Association for Science and Technology (about 10 people)	Chairman- Chou Bai Yuan Vice-Chairmen- Mao I Shang, Kika Shi, (illegible) Sei, (illegible) Sai Shi Secretaries- Ojun To Cho Wei Institutions- dissemination department, youth department, International department Setup differs with cities and provinces

If we ask what the vertical and horizontal relationship is the horizontal relationship is stronger. When a problem is raised by the institutes, the Tientsin Association for Science and Technology consults and decides with the Tientsin Science and Technology Committee. The autonomy of the regions is respected. These regional Associations for Science and Technology received destructive blows during the Gang of Four Era. Even now there are committees who cannot draw up annual reports. When there is communication between these committees due to international exchanges, the connection will probably be made through the Special City and Provincial Science and Technology Committee. This was the first time the National Association for Science and Technology had a formal international exchange.

Next I would like to mention the welcome of the Science and Technology Association to our visit. In a relatively short amount of time it was decided that the Chinese Association for Science and Technology would become a window for our visit to

China. At the beginning of September 13 delegates were invited through the embassy in Japan. Later, connections were made with Japan several times concerning the method of explanatory meetings and debates and future observations. We were able to set a precise schedule and arrived in Peking. A suitable schedule was finally chosen from several that were carefully drawn up. There was a degree of perfection that was more than what was desired. When we arrived in Shanghai there were different requests from the members and the Chinese replied with sincerity even to these. We were treated very well at the hotel, walking around, at observations, debates, etc. Along with the sincere appreciation of the people of the Association for Science and Technology, there was no feeling of a gap in authority.

THE CHINESE ASSOCIATION FOR SCIENCE AND TECHNOLOGY AND THE CHINESE SCIENCE AGENCY (MEMBERS ARE ON THIS SIDE OF THE AUTOMOBILES) - SHINGHAI

SHANGHAI TRUCK FACTORY

MR. KOSAI AND KAMITANI AT THE
TIENTSIN RUG FACTORY NUMBER 1

2. THE CHINESE ASSOCIATION FOR SCIENCE AND TECHNOLOGY AND ITS TOPIC

The Chinese side was in complete agreement with the intention stated in the message of Japanese Committee Chairman Tomitsu: This delegation's visit is an opportunity to frequently carry out mutual cultural and intellectual exchanges, and I will not give up the hope that it will be the basis for a long-term friendship between both countries."

We intended to invite a delegation from the Chinese Association for Science and Technology to Japan at an appropriate time the following year. We expect the Chinese team to be either a computer or electronics team. They would like to visit Japan as soon as possible. Consequently, the visit will be from either the beginning of April to the middle of June or the end of September to the middle of November. We communicated with the Chinese side by sending a reply as soon as we returned to Japan.

The Chinese raised constructive points concerning future exchanges between the Japanese and Chinese Associations for Science and Technology. Japanese intentions were expressed, but it seemed as if there were no special comments made by the Japanese. The Chinese intended to obtain promotion of scientific and cultural exchanges from the Chinese Science and Technology Committee through the following points:

i. a narrow sense of exchange; that is, the flow of cash, tourism, debates, etc. to carry out continuous discussions (professional technology and coordinated technology of both countries),

ii. technical cooperation; that is, development of manufactured goods and reconstruction of factories through cooperation of both countries and the acceptance of exchange students, the dispatch of lecturers, etc. and

iii. related to the import of manufactured goods and technology, technical exchange will continue through the recommendation and participation of enterprises and machines from both countries. From the Japanese side and corresponding to this:

i. investigation of the intentions of the Chinese side and daily communication after deciding on the intentions of Japan and

ii. we would like an agreement on the visit of the Chinese delegation to Japan next year.

We believe that a commercial base is needed for the exchange of science and technology. We made the comment that we hope that future technical exchanges will be on a national level. However, this does not mean that we cannot recommend and participate in technical introductions, the exchange of students, factory reconstruction and mutual development.

In the future both sides will continue to keep in touch and important matters will be communicated from both sides through embassies.

2. GENERAL SUMMARY REPORT

This report gives the general impressions the members of the delegation had of China. It was prepared by the Secretariat of the delegation and its main strength is that it is a collection of opinions. As a reference, the following headings are used frequently and the list indicates the number of times the headings are used among our impressions.

Headings indicated many times under general items:

Contradiction of attaining Success by overcoming Difficulties	7 items
Enthusiastic Study of Foreign Works	4 items
Condition of Low Production, which Contradicts Constructive Attitude	4 items
Slogans and Chinese National Character and Overall Consciousness	4 items
Lack of Economic Intentions in Factory Administration	4 items
Weak Horizontal Ties in Factories, etc.	3 items
Improvement of Livelihood in Domestic Life	3 items
Importance of Foreign Technology Introduction	2 items

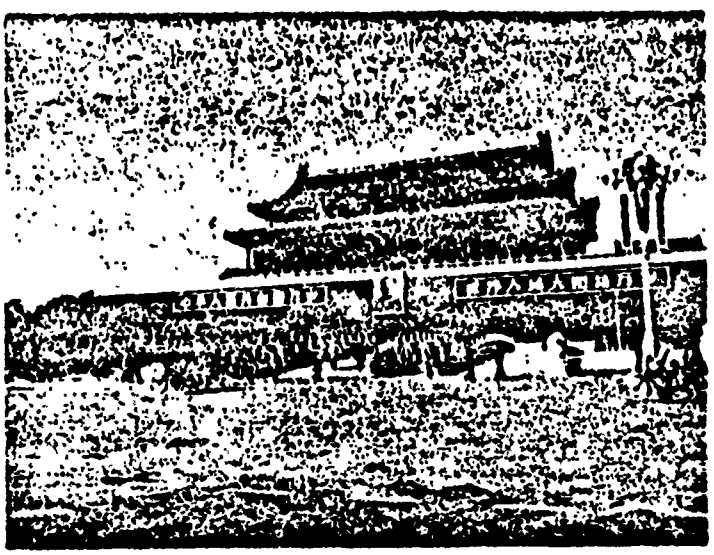
MR. TSANG (ILLEGIBLE) KO, THE HEAD OF THE FOREIGN AFFAIRS BUREAU OF THE CHINESE SCIENCE AND TECHNOLOGY COMMITTEE, (CENTER) AND INTERVIEWERS

MEETING OF THE CHINESE ASSOCIATION FOR SCIENCE AND TECHNOLOGY AT THE PEKING AIRPORT MR. FANG (CENTER) AND MR. T'IEN (LEFT)

Points Raised Often in Connection with Computers:

The Absence of EDPS of Business Management and Punch Cards	4 items
Delay in Machinery and Tools for Outlying Areas	4 items
Undeveloped and Measuring Instrument sensors	3 items
Condition of Processing Units	2 items
Delay in Semiconductor Technology	2 items
Acknowledgement of the Importance of Computers is Ideological	2 items

1. SLOGANS, PORTRAITS, PUBLIC UNIFORMS AND INDUSTRIAL TECHNOLOGY



T'IEN AN MEN

What caught our eyes the most during our stay in China were the slogans, portraits and public uniforms. Beginning with the capital airport, there were slogans with "Hurrah for the Great Leader Chairman Mao", "Hurrah for the Great Chinese Communist Party", or "Agricultural, Industrial (illegible)", "Great Pleasure from Industrialization", etc. written in red letters and portraits

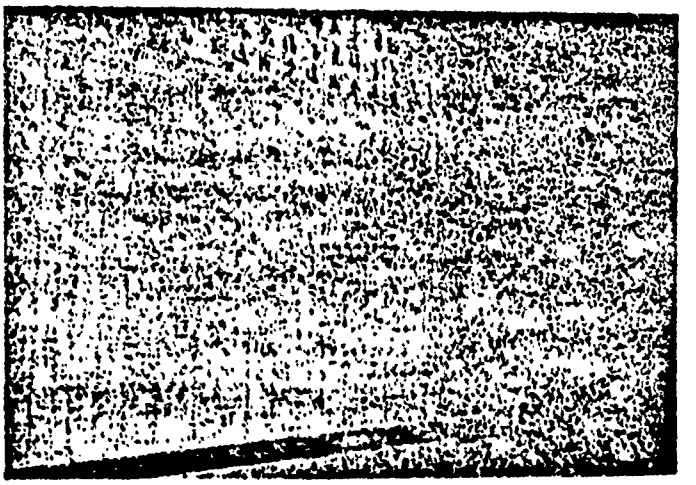
of Chairman Mao Tse-tung and Chairman Hua Kuo-feng hanging in important buildings, on wall posters on street corners, in factories, debate halls, theaters, etc. It seemed that they were neatly repainted because the slogans and pictures looked new. Mass communication through newspapers and journals is extremely slow in this country and television is the closest thing to direct information for the citizens and laborers. Even Television gives a limited feeling. Even in newspapers other than the Citizen's Daily News, in the lists of Mao's sayings in bookstores, in stories from the cinema and theater, in explanations of guides in exhibitions halls and field trips, there was a feeling of thorough leadership. In Sisanlung and Kuangchou, farmers are all taught the meaning of bulletins as though there are heroic revolutionary acts. We see this type of leadership from the recipient's viewpoint. For example, enthusiastic feelings, such as "fighting spirit", "certain win", and "Patience" from sports activities when we were young or feelings of "destruction" and "reaction" seen in the activities of labor unions are well known. Thirty years after the revolution the majority of the 980,000,000 Chinese citizens, whether they are old or young, male or female, will not be tired of hearing these phrases and it is thought that there will be total leadership through pure ideology. This idea was included in the greetings from the Association for Science and Technology and factory workers in Peking, Tientsin, Shanghai, and Kuangchou. It was like stamping a seal. It makes the strength of cohesion of China and the grandeur of Mao Tse-tung, who ruled the country, known. This style of leadership in China continues the revolution as much as possible. It is felt that the development of mass communication will not lead to a solid and broad leadership in the future. It is natural that a change in the type of leadership is difficult when the will of the citizens is strong. If urgent changes are made, the previous leader can be criticized while clearly showing that the leadership has been wrong. If a mistake is made due to the very dangerous act of a leader, it is thought that change is necessary. Today the leadership of China has made Teng Hsiao p'ing the leader and he seems to be putting China on an urgent path to modernization. A strong leadership was produced when criticism

from the Gang of Four began. China has will power and courage to be challenged by an urgent and endless change. From the viewpoint of our country, where the government acts for the good of the people and is not too benevolent, there is a feeling of respect and admiration for the brave actions of the government of China and the obstacles it will deal with in the future. We heard the same stories, such as science and technology are the most important of the 4 modernizations, China is slow in the area of science and technology and it must learn from an advanced nation such as Japan, we are slow in noticing things such as whether a face is ugly or beautiful, up until now the Gang of Four has been an obstacle to scientific and technological development, etc., many times from all classes of people in all places. There is no doubt that many people know of the obstacles created by the Gang of Four but we have the feeling that in general these stories were not told as results obtained through actual experiences. On the other hand, there were people with their own ideas and when we turned to them they did not seem to agree with this story. We realize that these thoughts are planted quietly in the minds of the people by the leadership that was mentioned above. A national character is molded in which criticism depends on individual and concrete circumstances and is based on individual experience. Because of this, when they are asked a question, the latter reply very quickly to anything. However, when they are asked a critical question right off, the former get an extremely troubled look on their faces. It seems to us that facial expressions of Chinese people are a common feature of words. This is not noticed among foreigners and their national character is completely different. When we look at the attire of the Japanese people we see that there are uniforms, for example, it is mandatory that bank employees and store clerks wear uniforms to work. However, most of the time there are no restrictions on clothing. In many of the factories of China we observed that the employees work in their own clothes. In Japan the white collar worker gets the same feeling from wearing a suit and necktie outdoors as one would from wearing a national uniform. Before being a factory employee the Chinese are citizens of China, before being a

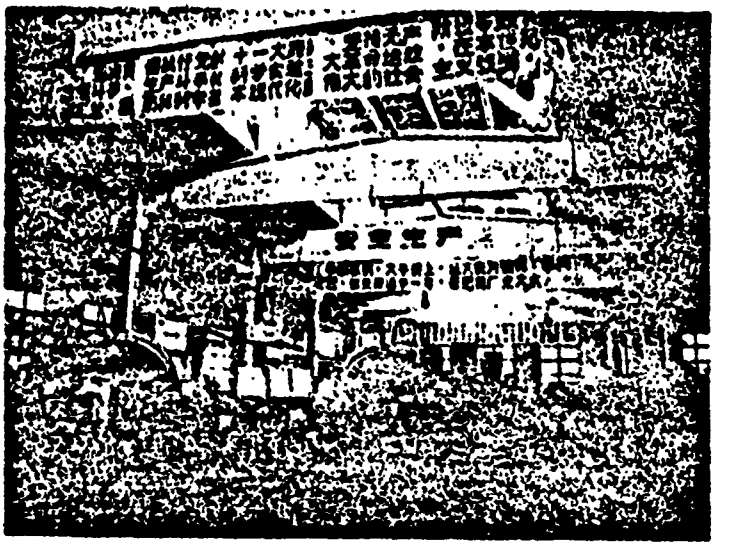
citizen they are company personnel, and before being company personnel they are individuals. Therefore, it can be said that there is a definite difference in the national character of the Japanese and Chinese.

During the thirty years after the establishment of the People's Republic of China in 1949, the Chinese citizens accomplished industrial development through faithful self-reliance based on the slogans "Independence and Autonomy" and "Attaining Success by Overcoming Difficulties." These slogans are very ideological (they did receive help from Russia at one time). When asked "As a whole, what oil well of great pleasure guides and teaches the people?" in connection with "Great Pleasure through Industrialization," they answer by replying "It means that the ideas of the people who developed the oil well of great pleasure through self-reliance are taught." However, after the purge of the Gang of Four, the style of leadership in China went through a basic political change. That is, the four modernizations are agricultural, industrial, national defense and science and technology. The eight headings of the 8 year plan for scientific and technological development are agriculture, raw materials, energy sources, computers, lasers, space and aeronautics, high energy physics, and genetics. The four modernizations will be accomplished and the strong socialist country that is born at the end of the century will be a keyhole for the promotion of science and technology. According to the words of Vice-premier Teng Hsiao p'ing, for this to come about there are the three essential points of 1. a connection between industry and science and technology, 2. keeping pace with ideas and technology and 3. the responsiblity of the division of labor control. During our observation of factories we could see many flashy slogans and management charts that expressed an improvement in the quality of goods and industrial improvements. At the same time we saw that the employees seemed to be comfortable in conditions that were thought to be labor saving and conditions where machines and equipment were not running. Many of the members saw a large

contradiction in this and there were many people who said that the slogans were not impertinent. The measurement of articles produced and production cost in Chinese factories was shown to us by the national or provincial and city heads. The promoter of the measurements is the National Measurement Committee. It was common for the manufactured goods to be distributed by national, city or provincial heads. The distribution of laborers and technicians and appropriations of materials are done in the same way. Consequently, the grasp of news that is taken seriously by the industrial world of Japan, concepts such as marketing, etc. are barely related to factories in China. We did feel that some industrial arts and rug factories had a sense of competition and produced goods for export. However, other than in these factories it can be said that from Peking to Shanghai there was nothing but a vague consciousness of these concepts. To a certain degree these ideas cannot be abandoned in socialist economies. In factories where they were beginning to employ the technique of paying different wages according to efficiency we could see that the supervisors of the factories themselves were comfortable with the performance of the supply and appropriation of employees, but there was hardly any economic conviction as there is in Japanese factories. There were many factories where there was no grasp anywhere whatsoever of manufactured goods that are produced in factories where there is even a little feedback from the consumers. There was barely any pressure concerning the improvement of the quality or quantity of goods produced. In comparison to the unusual enthusiasm towards the introduction to factories of computers and measuring sensors of high quality from foreign countries, we felt that there was no concrete approach for any change in the present system which uses computers from institutes. The introduction of EDPS for management of business affairs, analyzers and sensors for process control, etc., which are considered to be necessary before the introduction of computers in any factory, has been established. The realization of computer application is considered to be something for the future.



CONTROL TABLES SHOWN TO US IN THE PEKING WIRE ELECTRONICS FACTORY



FACTORY SLOGANS (SHANGHAI TRUCK FACTORY)

CONTROL TABLE SHOWN TO US IN THE LONG-DISTANCE TELEPHONE OFFICE (PEKING)

Under these circumstances, there were people who asked the following questions of the delegates: Why are the four modernizations necessary for the average citizen of Japan, and isn't it probably that they don't understand the major premise of why it is necessary to develop computers?, or is it that they do not use their motives and intentions properly?, etc. As explained before we did not try to think from the Chinese viewpoint very often. They are still ideologically

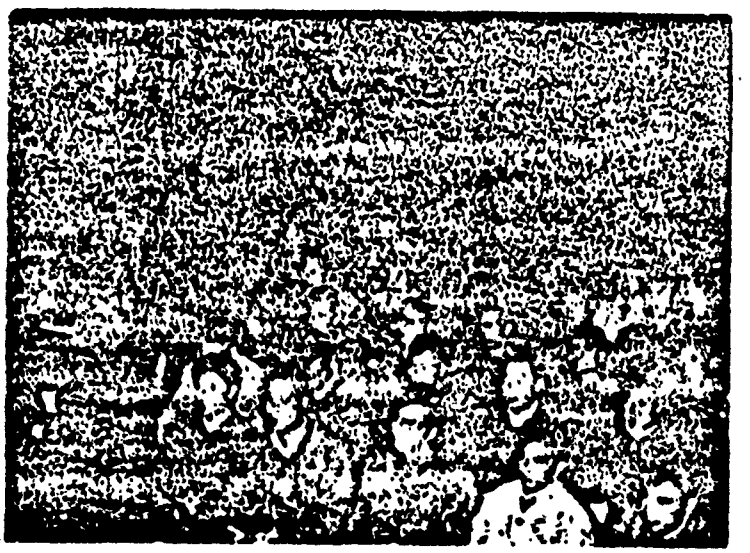
governed by slogans such as "Great Pleasure through Industrialization" and understand slogans that call for the four modernizations. Nevertheless, while they labor with all their might, there is a feeling of bewilderment with this system. Along with the points mentioned by Vice-premier Teng Hsiao p'ing, which gave the present objectives mentioned above, there will be a breakdown and a concrete change in the political system. This is necessary to the present leadership. When there is an increase in the improvement of the present standard of living of the citizens and an improvement in the development of industry, which will result from the realization of this political system, the 4 modernizations will be understood by the people themselves through experience. For these reasons the most central problem in industrial technology for China in the future will be the adjustment of Chinese society to industrial control, research and development control, news networks, business management and computers and the investigation and execution of better techniques and systems.

2. ATTAINING SUCCESS BY OVERCOMING DIFFICULTIES AND SCIENCE AND TECHNOLOGY

In all of the factories it was remarkable to see that all manufactured goods were produced through self-reliance. In the advanced countries there is great pride taken in producing manufactured goods and this condition of enthusiastic nationalism is called "Great Pleasure through Industrialization". It was thought that in the thirty years after the revolution the ideas of "Autonomy, Independence" and "Attaining Success by Overcoming Difficulties" would lead to success in industrialization. On the other hand, there is the idea that it is important to learn from other countries. While this differs from the idea of "Attaining Success by Overcoming Difficulties," it is the most recent idea and is popular. Even during this exchange, the packed audience of 500 people took notes and listened enthusiastically to the speeches of Vice-chairman Hayashi and Delegate Kekuchi from early morning. The technicians and process workers (the same as engineers in Japan who many yeas ago met requirements

by taking exams) from factories and research laboratories studied enthusiastically under the following conditions in the briefing sessions and debates. In Peking, there were 5 briefing meeting teams with 40 - 50 people each and the meetings lasted from 1/2 to one day. There were 5 debate teams in Peking with 20 - 30 people each and the debates lasted from one day to one and a half days. In Tientsin, there were 4 debate teams with 20 - 30 people each and the debates lasted from 1/2 day to one day. In Shanghai there were 5 briefing session teams with 50 - 60 people each and these sessions lasted 1/2 day. There were also 5 debate teams with 20 - 30 people each and these debates lasted from 1/2 day to one day. In Kuangchou, where we had not anticipated any meetings, there was 1 briefing session team and 1 debate team, 50 people and it lasted 1/2 day. Was this because learning is in a person's real character? Or was it because they thought that through actual study they could really exert themselves and fulfill the slogans? In any event, even today we see tendencies of continuous study and skilled men with the intention of becoming technicians and researchers. I am sure that many technicians were brought up learning a high degree of technical knowledge through books and written documents. If the number of exchange students from advanced countries such as the United States and Japan increases, there will be a great difference, both qualitatively and also from the theoretical and practical aspects, between the conditions of technicians and researchers of today and the future. This day will probably come in the near future. If at that time there is no improvement in the system of technical reform or in the industrial system of China today as mentioned below, it is inevitable that a large contradiction will develop between the many groups of technicians and in turn they will probably become dissatisfied with the leadership. Consequently, I have no doubt that in the future, the leadership of China will begin to make reforms in factories, establish plants, and begin to profit from industrial ownership even though there will be criticism and they will have debts. They will then turn to

the technicians and bravely and boldly make changes in the old system.



TECHNICIANS AT THE ADDRESS IN PEKING

What are the changes that must be made in the old system? Ironically it is one of the results of "Attaining Success by Overcoming Difficulties." There is an extremely high number of factories in both Shanghai and Peking. I heard that there were about 8,000 factories in Shanghai. Consequently, there are many factories that produce the same goods. There are conditions where there is XX Factory No. 1, XX Factory No. 2, and so on. For example, there are 10 semiconductor factories and 9 machine tool factories in Tientsin. We observed that there is consistent production, from raw materials up to the finished goods, in these factories. Not only that, but the factory itself also produces the necessary machine tools it

DELEGATE KEKUCHI SPEAKING AT SHANGHAI

needs. Even research and development is done by these factories and therefore, there is an extreme dispersion of this system. Cooperation among the factories has never been appreciated. There are various reasons for this type of system. A specialization setup is completely denied and even when there is individual effort we can say that efficiency of research and development is poor. Most recently national defense aims have been considered and a political system in which the main provinces and cities develop the important facilities of factories, schools, etc. has been pushed for. We heard that this spring the power of the cities and provinces will be elevated by one step. However, we feel that, at the very least, specialization and centralization of the resources for the development of

research in the cities and provinces is necessary.

One problem related to "Attaining Success by Overcoming Difficulties" is the ownership of industrial property. During a long history China has hardly ever bought industrial property from foreign countries. However, with today's science and technology, if China does not import the necessary and essential science and technology from the advanced countries, they will never catch up with them. It is the same with our country but we are not blindly obedient to these countries when we import technology from them. It is important that we modernize and absorb technology and that this technology grows. Vice-chairman Hayashi told his audience that this is never outside reorganization A political system in which industrial property is bought from foreign countries has not yet materialized in China. At least that is the feeling we got from continuing to speak with the people in our classes during our visit.

The number of Chinese technicians today is 300,000 to 400,000. The 8 year plan anticipates training 800,000 people. Small children long to be technicians and the technicians study intensely. Previously, ability has been lost. The Chinese must consider what type of change in the political structure will be the key for development of science and technology in the future. Upon a detailed analysis and understanding of the conditions in China, even the Japanese technicians will make progress in the establishment of the development of technical cooperation, technical exchange and friendship between the two countries.

PART TWO TEAM REPORTS

1. PRESENT SITUATION AND TRENDS IN COMPUTER HARDWARE

1. SUMMARY

This is a report concerning the present situation and trends in Chinese computer hardware techniques, which we were able to learn about during this trip to China. We learned about some of this through our observation of computers and factories and through our conversations with the Chinese people. However, our knowledge of general trends in the present situation was sufficient. The Chinese Association for Science and Technology was well-prepared to give us this information.

China has made computerization one of the most important items in its modernization. Judging from appearances, the present situation of Chinese computer technology is not in the modernization stages and they cannot help importing machinery. Actually the movement of imports of the Bank of China Hong Kong Branch Office (IBM) and the Peking Central Weather Bureau (Hitachi) are vigorous.

In order to understand the delay in today's Chinese computer technology, we must consider the withdrawal of Soviet technicians with the cutoff of Soviet aid in 1960, agricultural aid from industry and important advancements in agriculture which began in 1961, and the interruption of the 10 year period up to the purge of the Gang of Four after the Proletariat Revolution in 1966.

Today Chinese computer application is the center of scientific measurements. However, there are few computer centers and plans for computer centers and the application of computers have been weak. In schools minicomputers (DJS130,131) are being used to teach students and for research.

Up until now there has been hardly any introduction of EDP for business management and control at all. However, we can see the emphasis on the investigation of the introduction of process

control through control of machine tools and analyzers for industrial modernization. While there is a delay in technology that is the basis for semiconductor technology and computer hardware, it appears that the development of peripheral equipment in an environment of scientific computations has been neglected. This will probably cause problems also.

There is also the principle of "Attaining Success by Overcoming Difficulties." The independence of each area is respected and the computer industry can be considered in this framework. Up until now, we have not seen standardization or consolidation in interfaces or architecture in computer development by each region. The most recent development has an architecture close to that of the IBM 370 with 32 binary digits. Standardization emerges in these developments. We can see that there is investigation for a standard rule to go by for minicomputer architecture (PDP, NOVA, etc.).

Everyone realizes that Chinese computer technology is slow in comparison to that of Japan. There is a strong feeling of the necessity of catching up in this area. Questions were received during the technological exchange debates concerning the actual problems of the credibility of the integrated circuit, maintenance problems, and the problem of process capability and standards, etc. They showed a strong concern even for the newest technology of our country.

Below we report on the present situation and trends in hardware technology, which is the center of our presentation on the factories and computers we observed.

2. COMPUTER CENTERS AND COLLEGES

We observed the Chinese Science Agency Computation Center in Peking, the Shanghai Computer Research Laboratory, Shohua University in Peking and Futan University in Shanghai in our study of typical computer centers in China. We were able to study the actual situation of computers used in China.

CHINESE SCIENCE AGENCY COMPUTATION CENTER

Calculations are carried out in each research laboratory of the Science Agency using the 013 model computer. The universities are usually open. This is due to the fact that scores of computations are carried out in one day.

013 is the highest capacity computer that China has today. It was developed by the Science Agency Computer Research Laboratory and was completed in 1976.

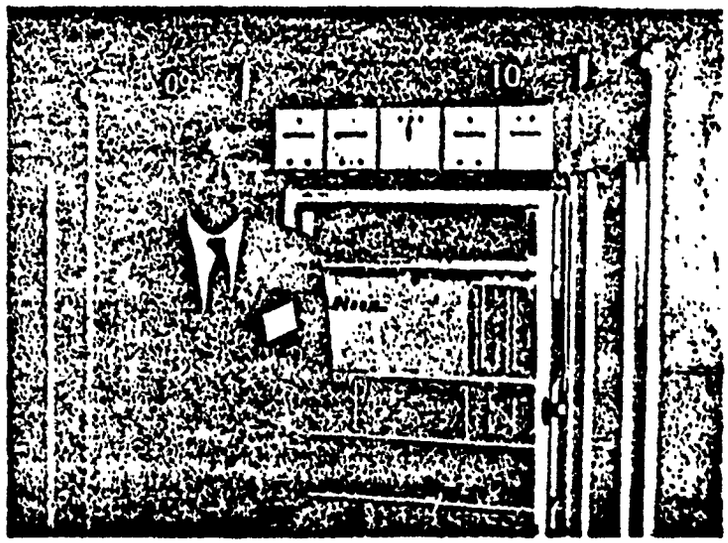
Operation Speed	2MIPS (formal name)
Word Length	48 binary digits
Main Memory	128 K word magnetic core
Cash Memory	512 word magnetic thin film, access time 300ns

The conditions for determining the performance speed of the 2MIPS are unclear. However, floating point addition and subtraction are carried out in 330ns. High speed is attained with hardware, pipeline control, etc. of special function processing units (multiplication, division, square roots, etc.).

It has a read-only storage of 16 K words due to the Biax Core and the ability to treat 2 programs at the same time. It uses this in program unit switching control, etc.

The computer uses 60,000 ECL logic elements (in a circular can case, 2 gates/IC) and forms a logical operation circuit with 120,000 gates.

There are no paper tape input or card units. The main



THE 013 COMPUTER
AT THE SCIENCE AGENCY COMPUTATION CENTER

peripheral equipment consists of 8 magnetic tape units (16 tracks/inch) and 4 line printers (80 letters/line 600 lines/minute). There were 4 magnetic disc units which continued to be trial manufactured goods that were placed in a large basket, but they have not actually been used.

This computation center plans to introduce imported equipment and each company from our country has presented their proposals.

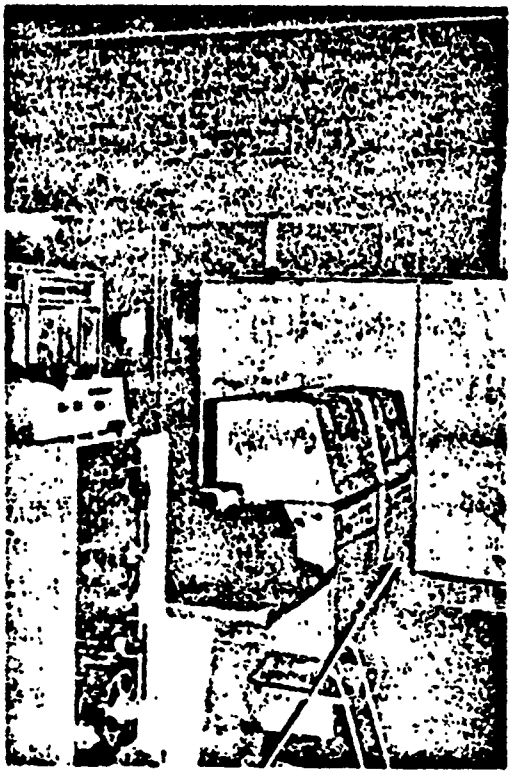
SHANGHAI COMPUTER RESEARCH LABORATORY

Research Room 1 of this research laboratory has one 731 computer. The laboratory deals with the development of calculation

operations and program development and instruction just as a computer center does.

The computer was named 731 because development of the computer started in January 1973. It was conpleted in March 1975.

Operation speed	0.2 MIPS on the average
Word length	48 binary digits
Main memory	64 K word magnetic core
Logic element	TTL



731 COMPUTER
AT THE SHANGHAI COMPUTER RESEARCH LABORATORY

It has peripheral equipment that is divided into 2 groups and 2 programs are carried out at the same time.

The main peripheral equipment consists of 2 paper tape readers, 4 magnetic tape devices, 4 line printers, and 2 keyboard perforators. There is also a paper tape input. There are two 64 K word magnetic drum devices as auxiliary memories.

Before developing the 731, this research laboratory and the Futan University developed the 709 (development began in September, 1970.) The 709 seems to be used everywhere. The computer has 0.11 MIPS, 48 binary digits, and a 32 K magnetic core memory.

Today they have begun work on the development of Front Network Process (FNP). Its purpose is to connect with the Kiautsu University computer (model 108) and then to connect a data terminal. This will make a connection between both centers possible from the data terminal.

Shohua University

The history of this university begins in 1967. It was Shogo University at one time and was later combined and reorganized with Peking University, etc. Today it specializes in engineering and physics.

The DJS 130 was developed in the Electrical Engineering Department. The DJS 130 was patterned after the Data General minicomputer, NOVA. Trial production was done at the factory affiliated with the university. Production is done at several factories, such as the Peking Wireless Electronics Factory Number 3, the Tientsin Electronic Eeuipment Factory, etc.

Operating time	an average of 0.5
Word length	16 binary digits

Main memory	32 K word electro magnetic core
Logic Element	TTL

There are several DJS 130 computers at this university. They were being used for research of Kanji processing, visual processing (graphing CRT), etc.and in scientific computations of each department, along with computer instruction. Large computations that cannot be done here are brought to the Science Agency Computation Center. They were in the midst of testing this computation center wich imported machinery.

FUTAN UNIVERSITY

This is a university in Shanghai with a 70 year history. It has a 719 computer in the Electronic Computer School and it is used in hardware-software practice by the students.

It has 48 binary digits/word, a 32 K word magnetic core memory, and the peripheral equipment consists of a magnetic drum, magnetic tape, paper tape, a typewriter, display, etc.

The Character Recognition Research Lab of the same school is in the midst of trial production research on an identification unit. It scans with a 5,000 spot matrix for a type of 2.5 x 3.5 (illegible). It sorts and recognizes 20 x 36 dots. It is possible to read today's English figures. A 64 K word nagnetic drum is connected to the 24 binary digit DJS 17 computer (8 K magnetic core) and was used in this operation.

The use of the computer was questioned at the debates,etc. but the present conditions of the computer equipment in the computer centers and universities are still the same.

3. COMPUTER FACTORIES

We observed the Peking Wire Electronics Factory and the Shanghai Wireless Electronics Factory Number 13, which are

representative computer factories. We were able to observe the research and production of computers. From this we know the present situation and trends in Chinese computer technology.

PEKING WIRE ELECTRONICS FACTORY

The factory was established in 1957 for the purpose of producing a telephone switchboard. In 1958 the production of computers was added. Out of 3,000 employees, about 1,000 are involved in computer related work today. Today the DJS 154 is produced here and they are in the middle of developing the DJS 221.

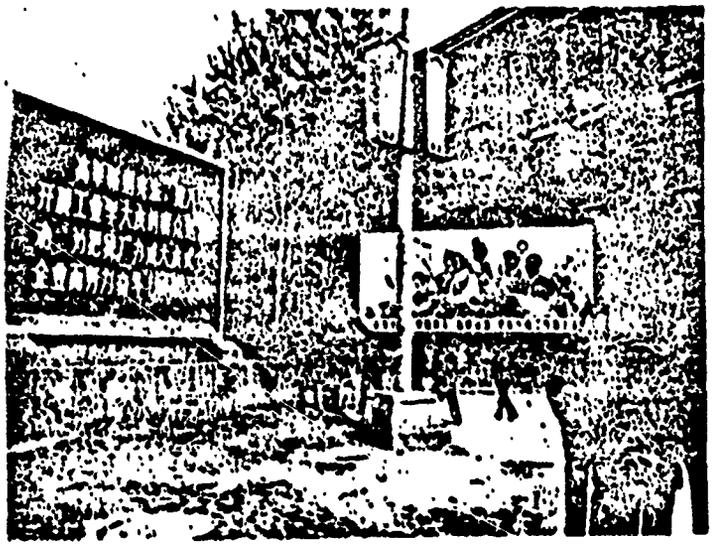
The history of computer manufacturing at the factory is old. Since 1958, the vacuum style DJS 2 and 3 have been produced here and since 1964 the DJS 6 and 8 transistors have been produced here.

The DJS 154, which is being produced today, is a so-called minicomputer. In 1972 multipurpose development began on scientific calculations, designs, process controls,etc. The computer has a word length of 16 binary digits, and a maximum main memory of a 32 K word magnetic core. The Wired Core ROM is used in microprogram control. It is possible to connect several process inputs and outputs.

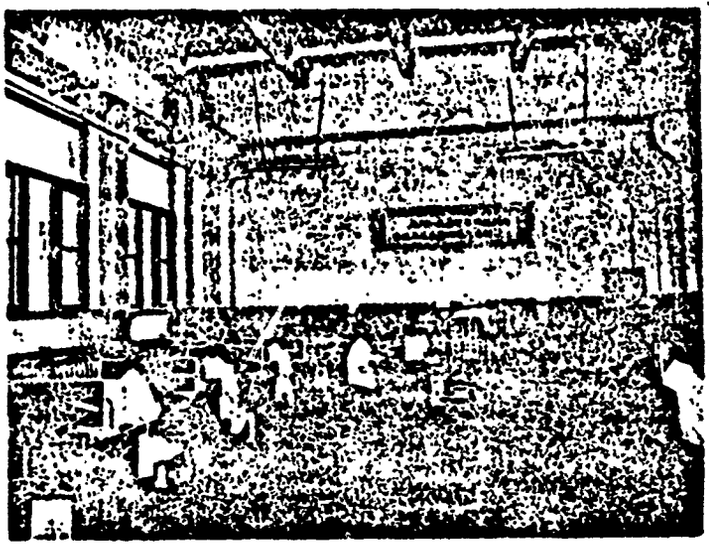
About 60 computers will be produced this year. The assembly plant's sorting and stock of magnetic cores for main memories was impressive.

They were in the middle of appraising the DJS 220, which is being developed today. It has the same setup as the IBM 370.

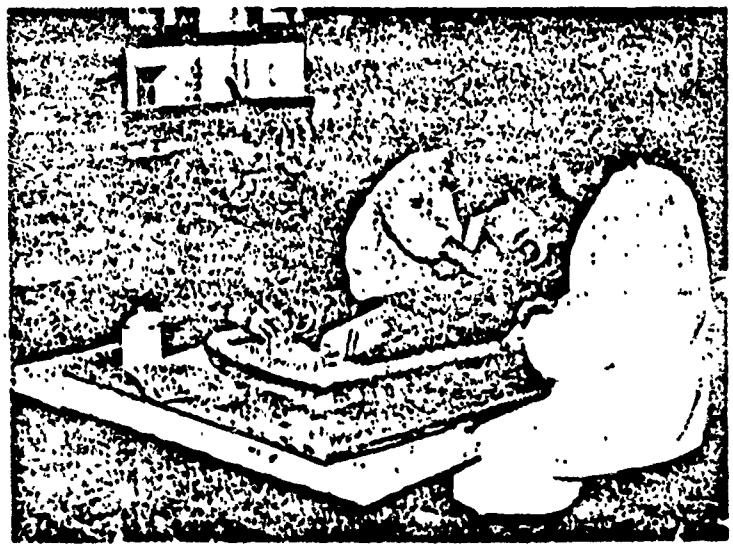
Operation speed	0.1-0.15 MIPS
Word length	32 binary digits
Main memory	magnetic core, maximum of 256



PEKING WIRE ELECTRONICS FACTORY
(FRONT)



PEKING WIRE ELECTRONICS FACTORY
SELECTION OF MAGNETIC CORES



AT THE PEKING WIRE ELECTRONICS FACTORY

ASSEMBLY OF COMPUTER PARTS AT THE
PEKING WIRE ELECTRONICS FACTORY

TTL is used in the logic circuit and a diode matrix ROM is used in the microprogramming memory.

THE SHANGHAI WIRELESS ELECTRONICS FACTORY

This factory was established in 1966 as a computer specialty factory. Several types of machines are produced by the 1,200 employees today, from the circuit board to the high speed MIPS computer. They are now developing the new DJS 200-20.

i. TQ12G Eight P-MOS LSI (28 terminal) on a circuit board are mounted on a 20 cm square printed wire board. About 1,000 are produced in one month with a conveyer belt assembly line.

ii. TQ21 This is a table model with 10 data processing units. It has ten 4 K word memories. Eight TQ21 have been trial produced. Immediate production plans call for 4 to be produced a month.

iii. TQ16 This machine has an operation speed of 0.11 MIPS, a word length of 48 binary digits, and a 32 K word magnetic core memory. It is widely used and up until now 100 have been produced. It uses TTL.

iv. TQ6 This machine has the essentials of a floating point operation with an operation speed of 1 MIPS, a word length of 48 binary digits, and a 128 K word magnetic core memory. Up until now 12 have been produced.

v. TQ 15 (DJS 131) This is a minicomputer with a word length of 16 binary digits and has a magnetic core memory of from 4 K to 32 K words as the main memory. Today it is seen as a main product. Monthly production is 5 or 6 and previously they have shipped more than 100.

vi. DJS 200-20 This is a new machine in the trial production stage. It resembles the IBM 370. Its software is interchangeable with that of the DJS 220, which is being developed

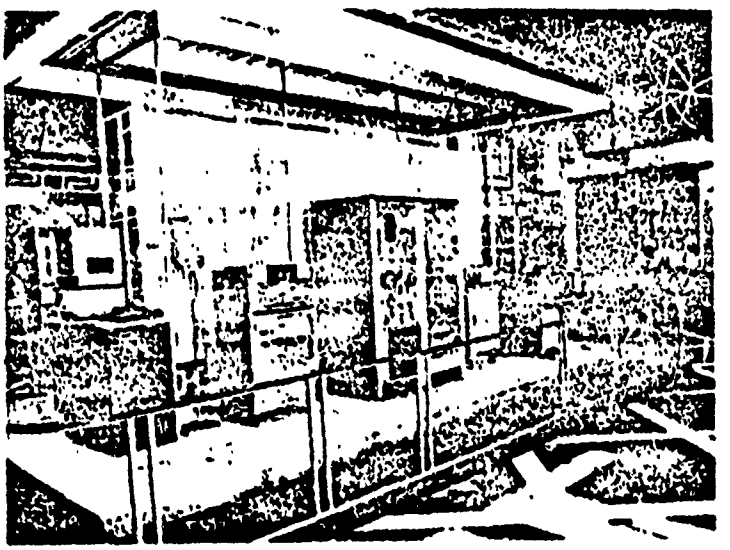
by the Peking Wire Electronics Factory, as explained previously.

The fixed point addition and subtraction time is 2.75 μs and the floating poing addition and subtraction time is 7.75 μs (R-R operation).

In comparison with the Peking Wire Electronics Factory, the scope of production of the Shanghai wireless Electronics Factory Number 13 is large. We can see that they are one step ahead in production technology also.

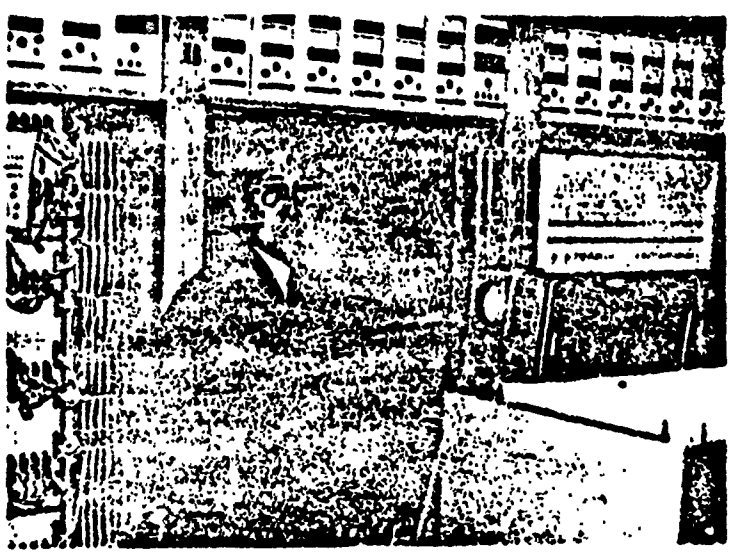
There is a tendency for unification in the architecture of manufactured goods in today's development and it is worthwhile to note the emphasis placed on the development of production of the minicomputer.

ASSEMBLY OF THE TQ 12G (CIRCUIT BOARD)
AT THE SHANGHAI WIRELESS ELECTRONICS
FACTORY 13



DJS 131

AT THE SHANGHAI WIRELESS ELECTRONICS FACTORY NUMBER 13



DJS 200-20

AT THE SHANGHAI WIRELESS ELECTRONICS FACTORY NUMBER 13

We can also see technological progress in equipment that is in the development stages and there has been a change in the peripheral equipment. We will report on this next.

4. INTEGRATED CIRCUIT TECHNOLOGY, ETC.

We observed the Tientsin Semiconductor Factory Number 1 as a factory which produces integrated circuits to be used in computers. This factory was setup in 1964. It started with diode and transistor production. However, today it is chiefly involved with the production of TTL integrated circuits. It manufactures a million products a year. These products are used in computers and analyzers in Tientsin.

There are only 14 types of manufactured goods with a very basic function that is called a 2 gate circuit, or the basic flip-flop circuit.

This integrated circuit sill uses a 1.5 inch diameter wafer. The equipment seems like the early laboratory equipment in our country. We often saw that there were large problems in the quality of goods and credibility in equipment and production. In our country we mass-produced transistors before integrated circuits. Since this process led to the production of integrated circuits, we did not experience the conditions that China is facing today. Naturally, this factory is not considered to be a high level semiconductor factory. However, it is clear that it does have a high ranking position in China.

From our observations of factories in China, the credibility of integrated circuits seems to be low. This was also brought forth in the questions in debates.

In this factory they are produced in flat pack cases or metal can cases (high energy consuming goods). The dual in-line package is still in the test production stages. Actually each place that

produces computers still uses the TTL flat package.

However, the dual in-line package is being used for the DJS 200, 220, etc., which are being developed, and for the TQ 12G, TQ 21, etc., which are the items most recently produced. The Kuangchou Exhibition Hall displayed the mold case TTL.

They were beginning to use the P•MOS LSI in the TQ 12G circuit board but the MOS LSI was assumed to still be in the initial stages. It will be necessary to completely change the process by improving the accuracy and increasing the degree of integration.

The MOS memory is not yet in the stage of practical usage. Even the computers that are being developed today and were explained above use the magnetic core memory. They are still carrying out research to improve the magnetic core memory.

Technological standards for the printed wiring board, connector, wiring etc. are also problems. In order to produce common computers in today's world it will be necessary to catch up in integrated circuit technology and in all industries connected with this technology.

5. PERIPHERAL EQUIPMENT

The use of computers has been limited to scientific computations up until now and for this reason the delay in peripheral equipment is conspicuous.

Paper tape has become the input base and we did not notice any card reading units at all. 5 to 8 units of paper tape are included at a speed of 1,000 characters per second in the paper tape reading unit.

The line printer used in the computer center, etc. had a type drum with 64 English numerals and symbols and had a speed of 600

lines every minute on a narrow scroll of paper (80 characters/ line). The printing quality is never very good. However, a line printer with a speed of 900 characters/line/minute and from 120 to 160 characters per line was connected to a new system that was being developed.

Today they are using a magnetic tape memory device with a tape width of 1 inch and 16 tracks. The packing density is 600 binary digits/ inch. Of the 16 tracks, 8 are for data and the remaining 8 tracks are used for the self-correcting code (Hamming code).

A magnetic tape unit with a one-half inch width, 9 tracks, a packing density of 800 binary digits/inch, which conforms to the ISO standards, is finally in the first stages of production. They have not yet started to develop one with 1,600 binary digits/ inch.

A magnetic drum memory device with 1 M binary digits and 1,500 revolutions per minute is used everywhere. A large device has a capacity of 4 M binary digits. We heard that a magnetic disk device was being developed. However, it has not been seen as yet. It seems that its usefulness has not been acknowledged. They also do not yet have a floppy disk or cassette disk.

The research labs and computer centers seem to place emphasis on the development of an XY plotter, graphic display, etc., OCR, Kanji processing, etc.

2. PRESENT SITUATIONS AND TRENDS IN COMPUTER SOFTWARE

1. PRESENT SITUATION

The history of computer software development is the history of computer application development. Together with advancement and diversification of computer use, the scope and function of the operating system has increased steadily. At the same time, credibility and stability are required. This has spurred

the increase in the function and scope of the operating system all the more. It has been exactly the same for the application program. When we look at the use of computers today in China from these points, we can say that computer application is in its first stages.

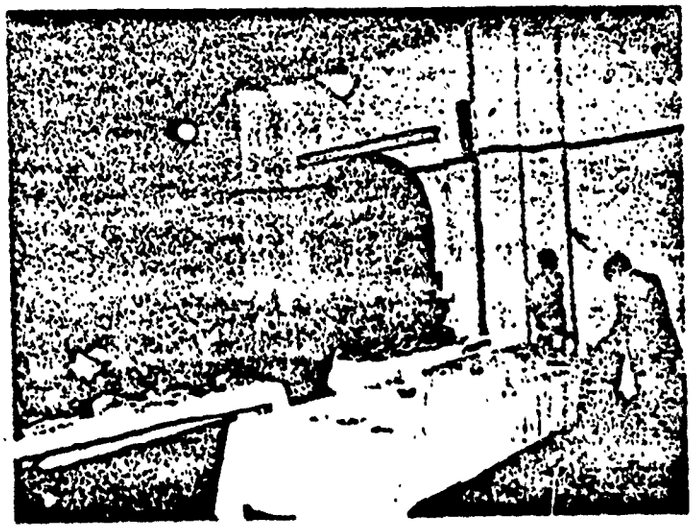
When we asked about the common role of computers at the debates in Peking, we were told that they are used in scientific computations more than 90% of the time and the rest of the time they are used in process control and numerical control. However, in the industrial factories that we observed during our stay in China we did not see examples of the actual use of process control and numerical control. However, we did see 2 NC machines at the factory affiliated with Shohua University in Peking and several NC machines at the Shanghai Industrial Exhibition Hall. Under these conditions, if we exclude computers that have been introduced by foreign manufacturers we cannot help assuming that, other than for research purposes and instruction purposes, the computers developed in China today are used almost exclusively for computations. This is another reason for the extreme delay in the development of peripheral equipment. The development of a center control device (this has also been delayed) and peripheral equipment is very uncoordinated.

For the reasons stated above concerning computer application, progress in the field of software has completly stagnated. Consequently, the operating system is not an item that receives special mention. A word processor is actually an assembler and advanced words are from the ALGOL or ALGOL system words. (They are called BCY. BCY is the Chinese abbreviation for the programming terms.) They also use the FORTRAN and BASIC systems. We did not have the opportunity to find out about the details and level of technical computations. However, even the size of the main memory unit and the capacity of the auxiliary memory unit (magnetic drum) do not seem to be very advanced.

The Chinese technicians have a very progressive attitude,

even under the conditions explained above. They read foreign texts extensively. They retain a high level of knowledge. They have also attained a considerably high research level. The so-called area of data processing is not the only division of computer application but they have not yet extended it to the field of non-data processing. These trends were noticed not only in the debates, but also in universities and at the Shanghai Computer Research Laboratory as well.

BRIEFING SESSION ATTENDANTS AND
DELEGATES NAGAI AND MATSUO
(PEKING)



BREIFING SESSION DELEGATE NAGAI
(SHANGHAI)

As a concrete example, requests were made for detailed explanations of the computer network, data base management system. Kanji processing, design automation, terms used in system description, etc. (a request was also made for a detailed explanation of the numerical control system) at the debates in Peking. They are carrying out research on Kanji processing and visual processing at the Shohua University in Peking. There is a Character Recognition Laboratory at the Futan University in Shanghai. Similarly, an Applied Software Laboratory, System Software Laboratory, Computer Network Laboratory, etc. are present at the Shanghai Computer Research Laboratory. There is a great deal of concern for information retrieval in Kuangchou.

Together with the hope for expansion in computer application,

there is recognition of the importance of software. In order to (illegible) which explained the scope of the most recent software, which is beyond the comprehension of the Chinese people, there is a large concern for the credibility of software (illegible) training of software technicians and (illebible) software engineering.

We would like to improve and participate in the instruction of software technicians in China today. We are also interested in the advancement of system description terms for software engineering. However, we were given the impression that at the present time the Chinese are not that interested in the idea. Nevertheless, they do recognize the basic importance of the credibility of software to some extent. Various questions were raised at the debates concerning a method for quality control and a basic method of debugging. Many quality control bulletins were conspicuous at the factories we observed. This is probably one step towards a serious consideration of the modernization of industry in China.

2. INSTRUCTION OF SOFTWARE TECHNICIANS

The number of software technicians is not very clear when we consider future computerization of China. For example, Tientsin (population is about 4,300,000 people) is far behind Peking and Shanghai in the use of computer. However, when we combine the three cities there are no more than about 80 software technicians.

Today program technicians are people who specialized in mathematics in college or people who switched from hardware technology. For the most part the instruction of program technicians is entrusted to the universites and research labs. Today there are more than 40 cclleges where program technicians are being taught. Even though there has been an increase in the number of students enrolling, there is concern that even teachers with considerable ability will not be sufficient to educate

these people.

For an example of computer instruction in colleges, we will give the Futan University Science and Engineering Department Electronic Computer School (in the Japanese sense, it is more of a curriculum than a school). Of course this school does not instruct software technicians only, but software instruction is the main field there. After going through a basic course of study of 2-2.5 years, the students are trained in an area of specialization for 1-1.5 years. Thus, they are trained for four years. Besides receiving what is called a general education in basic training, the students study computer theory, ALGOL grammar and programming, systems design, etc. In the speciality training they study information theory, visual processing, character recognition, audio recognition, systems analysis and simulation pattern recognition, etc. Today there are 150 faculty members, 400 students and 10 researchers (graduates of Japan). One of the special features of Futan University is that there are many faculty members in comparison to the number of students. However, the skill of the faculty members is low and therefore, even with regard to the faculty members, they are planning to improve the level of teaching and to form and study 5 study groups; a software group, a system setup group, an information engineering group, an automatic control group, and a numerical value computation group. There is a character research lab, computer laboratory, and integrated circuit laboratory at this electronic computer school. Not only are there lectures, but it also serves to cultivate ability through exercises and experiments.

One more method of program technician instruction is instruction in the factory (corresponds to training within the enterprise of Japan). In China the main factories have established colleges within the factory. (Chairman Mao Tsetung established these colleges and they are called 721 colleges for the month and date that they were established. However, in Japan they have a completely different meaning.) In computer manufacturing

factories this 721 college is used in the instruction of software personnel. For example, 30 people were chosen from the existing employees at the Shanghai Wireless Electronics Factory Number 13 and day long instructions were carried out for 2 1/2 years. During the course of the instructions they were paid their full salaries. At the 721 college of this factory, besides receiving a general education in mathematics, etc., the students receive training in software.

As explained above there has been some instruction for program technicians, but they are still far from having a program for SE instruction. It is assumed that SE instruction will be an important issue in the further development of Chinese computerization.

3. OTHERS

Today computer application has been totally delayed. Consequently, software technology is even further delayed when compared to hardware technology. However, China is beginning to urgently expand the scope of computer application. They have also moved toward urgent instruction of software technicians. The Chinese software technicians who we had conversations with were all very earnest and they all had ability. When individual technicians are gathered together and become successful in the management and achievement of large-scale projects, rapid progress in Chinese computerization will probably be possible.

3. COMPUTER APPLICATION IN EACH INDUSTRIAL SECTOR

Computer Application in Each Industrial Sector includes:

1. The Machine Industry.....Katsuyoshi Kamitani,
2. The Automobile Industry.....Yoichiro Kosai,
3. The Iron and Steel Industry.....Yoshimasa Miyazagi,
4. Data Communication.....Wataru Sakaguchi.

Speeches were given and debates were held on these topics in Peking, Shanghai and Tientsin. The impressions received through factory observation and debates were collected from

each individual delegate and a report was made later. However, the summary of the report is as follows.

° We would like to express our respect for China for the results of her extraordinary efforts that were based on the slogan "Attaining Success by Overcoming Difficulties." During the 20 some years after the revolution China realized self-reliance in every industrial sector in which she did not rely on machinery and equipment from foreign countries.

° Factory workers and people related to industry are actually coming to realize the necessity of industrial rationalization. We have seen that each sector is beginning to carry out practical research as stated in the instructions of Vice-premier Teng Hsiao p'ing, which are based on the four modernizations, by introducing computers, etc.

Consequently, no matter what the computers are used for, it is clear that they are necessary.

° There are many problems prior to computerization, such as the pursuit of industrial efficiency, control of quality cost, etc., maintenance of analyzers, sensors etc., standardization of the treatment of materials and parts, etc.

° Within the level and scope of today's industrial technology there are many areas where they have yet to introduce computers to industrial processes, etc.

° Today they are still groping in the dark concerning how computer system development should progress, the system of development and method of development.

1. PRESENT SITUATION OF THE CHINESE MACHINE INDUSTRY

The present situation of the Chinese machine industry, which was discovered through the visit to the Shanghai Industrial Exhibition Hall, the Shanghai Train Factory, and the Tientsin Machine Tool Factory Number 1 and through

Technical debates in Shanghai and Peking, is as follows.

The following were displayed at the Shanghai Exhibition Hall.

- 300,000 KW steam turbine (model)
- each type of NC machine tool:
  Machining center (1,500 x 50, attached ATC),
  boring machine (630 x 1,100),
  turning (2,500 ø x 1,500),
  large lathe (1,000 ø x 3,000)
  polisher (160 ø x 1,000)
  and a discharge process machine, and
- a 630 ton powder mold press.

Most of these are in the test production or trial stages. They show China's up to date level of technology.

Hardly any machines were used in the factories. Multipurpose machines were used quite often and we did not see any technical machinery in the factories whatsoever. There is a lot of relatively new machinery that was manufactured from between 1970 - 1975. They are at the point where a basis for the machine industry has become gradually stable.

Starting from nothing and without any help at all from foreign technology, the Chinese have exerted themselves for realization of self-reliance. At any rate, attention has been payed only to the production of essential machinery and equipment, based on the slogan "Attaining Success by Overcoming Difficulties".

Consequently, there has been no pursuit of production efficiency or the control of quality, delivery dates, cost, etc. No sales slips, designs, etc. were to be found in the factories and raw materials and parts were left in disarray. People at leisure in the factories were also conspicuous. There were many machines that were not running.

°On the basis of the four modernizations it seems as if they earnestly study how to use computers within each sector of industry. However, it is very unclear as to what purpose the computers will be used for.

°Both the people who met in the factories and the people who attended the technical debates had a great interest in the computerization of industrial control. However, this was not conveyed by the factory news. According to the speech and instructions of Vice-premier Teng Hsiao p'ing, each sector will push investigation and study.

°In today's factories, they have placed importance on giving jobs to everyone. The idea that hard labor is admirable is still deeply rooted in the Chinese mind.

Consequently, whether it is the practical use of the computer or the introduction of rationalized equipment other than the computer, factories are beginning to seriously consider the necessity of industrial rationalization. However, at the very least we do not think that rationalization has become an urgent step in China today.

2. CHINESE AUTOMOBILE FACTORIES

The Chinese automobile factories are located in Changchun, Wahan, Shanghai, Peking, Kuangchou, etc. Passenger autos are manufactured at Changchun, Shanghai and Peking. The rest manufacture trucks and buses. The jeep is produced at Peking and a 32-ton dump truck is manufactured at Shanghai. The number produced by each factory is more than 10,000 per year.

°The truck industry is the largest today and productivity is 5 items/year/person. It is 1/10 of that of our country. We observed that much of the work is still done by hand.

°The plans of unit (illegible) meet general standards.

Chassis design is behind by 10 years and industrial equipment is behind by 20 years.

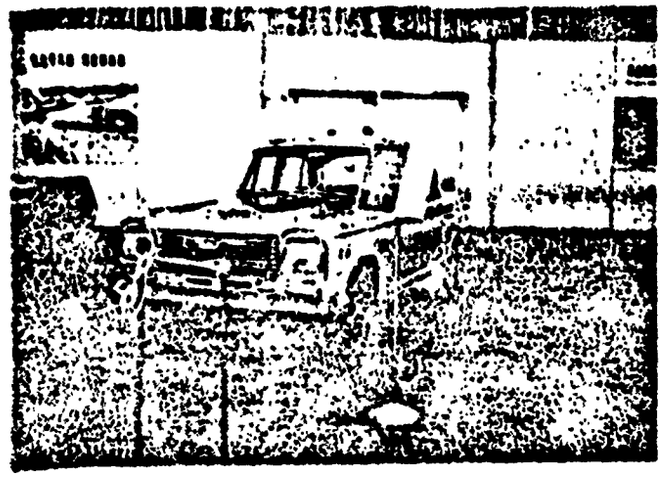
Much of this delay was caused by the cutoff of Soviet technical advice and by the influence of the Gang of Four. (illegible) were especially emphasized.

They have not yet introduced computers in the production process today.

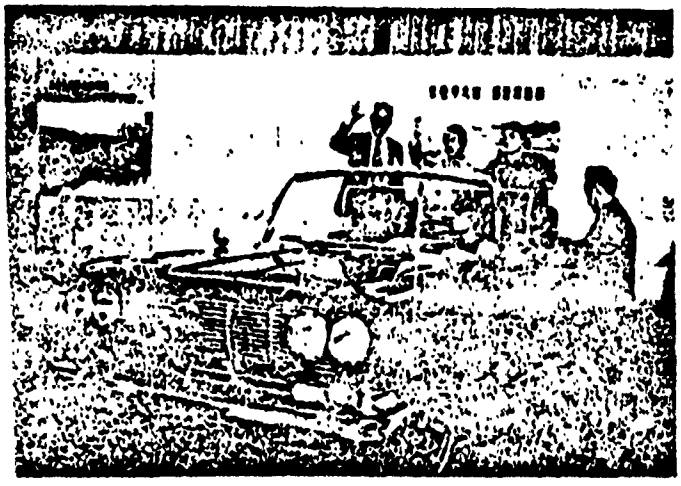
After much study, a detailed report was given by the people connected with China.

There are no imported accessories used in Chinese production.

The machinery and equipment used in the process are not unique (for example, the 2,000 ton hydraulic press, etc.).



PASSENGER AUTO (SHANGHAI) INDUSTRIAL EXHIBITION HALL



HIGH-CLASS PASSENGER AUTO (GUKI)
SHANGHAI INDUSTRIAL EXHIBITION HALL

DOMESTIC BUS AT THE SHANGHAI EXHIBITION HALL

3. IRON AND STEEL INDUSTRY

1. THE ADDRESS AND DEBATE

Debates and speeches were carried out on the use of computers in the iron and steel industry in Shanghai, Tientsin and Peking. Overall, there seemed to be a desire to learn about computers. From a political aspect, there were many questions concerning the future of computerization and automation of the steel industry. Many of the questions were realistic and applied to the factories. With the construction of Takarayama Iron Works near at hand in Shanghai, there were many concrete questions raised.

DELEGATE MIYAZAKI AT THE DEBATES IN PEKING

°All of the participants studied the catalogs and documents related to computers with interest. However, the questions were general and they somtimes deviated from the main topic because there were no actual (illegible) experiences.

°As for the application of computers to the iron and steel industry, interest was centered on the use of computers in control and the use of computers for business affairs. However, meters and sensors were considered to be necessary before computers.

°Each region had questions concerning the system and method of development of models. As for cooperation among other departments, as in a computer system, they are still not familiar with the progress of Project team and Task force operations.

°It is impossible to guess what type of progress is made and where to start from in the development of an office computer system. There are few people who consider it wise to introduce computers, but illumination is becoming more and more necessary.

°We believe that there has been rapid progress in iron and steel process control computers in each industry. (Wuhan Steel Works Atsuien Factory computer operation scheduled for the end of December, 1978).

2. OBSERVATION OF STEEL WORKS

We observed Shutu Iron and Steel in Peking. It is dangerous to speak for all Chinese Steel works based on this one place only, but we did give our ideas.

°In 1977 the Chinese production of crude steel was 240,000,000 tons of crude steel. The objective for 1985 is 600,000,000 tons. Since the reinforcement of the steel and iron industry is a big problem, new designs, renovation of factories, and reinforcement of the industry are urgent problems.

°Shutu Iron and Steel is an old factory with a 60 year

history. A long time ago the center of the iron and steel works was pig iron. In 1964 they began steel production and in 1969 they started rolling, etc. Thus, it is a relatively new integrated iron and steel works.

Moreover, there is an imbalance in productivity. Iron production is 20,000,000 tons/ year, steel production is 10,000,000 tons/ year and rolling is 3,000,000 tons/ year.

°Maintenance of productivity is desirable but quality of goods is questionable. The production results of blast furnaces is comparatively high. A number of days after our visit to China, THE CITIZENS DAILY NEWS reported that production of blast furnaces at Shutu Iron and Steel exceeded the national standards (in comparison with coke ovens, pig iron prodution, etc.).

°Meters and automation are still necessary.

°There are 30,000 employees and productivity is reasonably low.

°Environmental control is extremely poor and adjustment and regulation within the factory is also very poor. Most of the equipment is 15 - 20 years old.

4. ACTUAL SITUATION OF DATA COMMINICATION IN CHINA

Explanations were given at the technology exchange meetings at Peking and Shanghai on a science and technology computation system, regional weather observation data communication system, Agriculture, Forestry and Fisheries ministry fresh food supply circulation report system, and the Ministry of Posts and Telecommunications Exchange Deposit Service Association mechanization system, as examples of data communication offered to services today, on a phone book automatic editing system as an example of a Kanji system, and also on the DDX network and DCNA with the business outline of the Nippon Telegraph and Telephone Public

SHUTU IRON AND STEEL WORKS BLAST FURNACE

INSTRUMENT ROOM AT SHUTU IRON AND STEEL WORKS

Corporation. Afterwards, technical debates were carried out (Tientsin was a technical debate only). The ideas of data communication in China today are as follows below.

°Of course, there is still not an example of date communications. Today, technical knowledge is absorbed through foreign documents, etc. and they are in the stage where they have an extreme desire for and are tackling theoretical research.

°Data communication research labs have been setup as organizations by the Department of State Postal and Telegraph Section. However, the organizations are very weak. Research proceeds with about 20 technicians who attended the debates in Peking.

°In general, people connected with data communications were not aiming for the development of a data communications system which was intended for a certain service. The establishment of a computer network was considered to be a pressing need.

Consequently, they were concerned mainly with a digital data communication network and data transmission technology. The majority of the questions raised at the technical debates concerned these items.

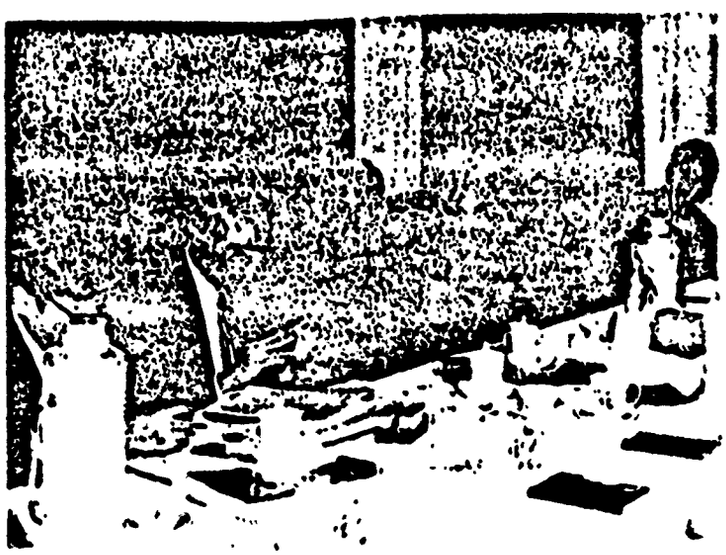
The topics included the future prospects for the DDX cable in Japan, a comparison of the line switching network and the packet switching network, applied areas, the necessity of the DCNA, relationship between the DCNA and the network architecture that is developed by each manufacturer, technical problems that occur when data communication is done with the existing telephone network or its equivalent, the date communication system of Nippon Telegraph and Telephone Public Corporation, etc.

The idea of "Attaining Success by Overcoming Difficulties" is very thorough. Peking, Tientsin, and Shanghai are all aiming for the construction of a DDX network. It is unclear

as to what the thoughts of China as a whole are and whether there is some type of standard unification in the country concerning a DDX network.

Computer production technology, which is the basis for a large-scale data communication system, is not yet in the large machine or ultra-large machine stages and they are near the point of practical utilization of PCM transmission technology and electronic switching technology. Experience is slight and enthusiasm for the construction of a data communication system and DDX network is still incomplete.

Their attitude towards scientific and technological modernization is very progressive. It is felt that they can make up for the delay in technology that has developed over the last 10 years since the Gang of Four with one stroke. For example, they have carried out experiments on equipment for photo communications. Although it is only a small part of the most advanced technology in the world, the Chinese are making concrete strides.



DELEGATE SAKAGUCHI AT THE DEBATES (TIENTSIN)

PART 3

DISCUSSION GROUP REPORTS

1. COMPUTER HARDWARE DISCUSSION GROUP

(1) Peking

Day and time:	November 3, 8:30 am-5:30 pm
Place:	Peking Guest Hall, Technical Reports Room
Participants:	Visiting Delegates Heguri and Miyagi
	Chinese side - Tang Yu Liang Peking Wire Electronics Factory
	Process Supervisor and 16 others (Details on enclosure)

PROCEEDINGS OUTLINE

We expected to give replies to questions based on the keynote address, which was given the morning of November 1. However, there were almost no questions on that. The questions were vague. There were many questions that were asked about problems confronting them at the present time, or about things they were interested in.

MAIN QUESTIONS AND REPLIES

o From what viewpoint should a quality assessment of computer networks be done?

We explained that is necessary to assess computer networks from the viewpoints of the essential optimization of the distribution of processing to each process mode in the network and the wiring cost, adaptability of the system, and RAS.

-Prior to the session we received questions on the replacement of equipment that has become an obstacle to production and on whether control of system reconstruction, etc. should be done automatically or by hand. We explained these points with concrete examples.

-We received the following questions on computer testing and assessment.

How should the test program be carried out when the computer is transferred to the consumer?

What are the assessment methods other than a test program?

How long does the test assessment take?

Is there an assessment test that can be done when the computer is being developed?

How many computers are required for this test?

-There were questions on trouble between the manufacturer and consumer relating to the efficiency and condition of computers.

We explained how to sufficiently carry out process analysis and process value assessment using SE and the bench mark test, etc.

-There were questions dealing with main memory capacity and throughput.

In connection with the fact that we can choose a main memory with a varied capacity since one computer uses the same OS (for example, ACOS-500), there were questions on what the connection is between the size of the capacity and the throughput.

We explained that the throughput changes according to the

size of the main memory capacity.

-The operation speed of the computer itself becomes increasingly higher and we do not achieve a balance between this speed and the speed of the peripheral equipment. How do we solve this problem?

We explained multiprogram processing.

Again, we explained the disc buffer, etc. in response to questions concerning discs. Beyond that, the following responses were given to questions concerning conditions in Japan.

-What is the credibility of LSI and MSI?

-What standards do they use to determine classification of small, medium and large computers?

-What emphasis is placed on the large, medium and small computer?

-What research has been done on multiprocessor construction of the μ processor?

-What are the usages of the bubble memory?

-What is a university computer center presently used for?

-What is the present situation of the Kanji processing system?

-What are the pros and cons of using the same Kanji processing system since Kanji differs in Japanese and Chinese?

-We were asked questions on the ACOS and M series and we gave a general explanation.

size of the main memory capacity.

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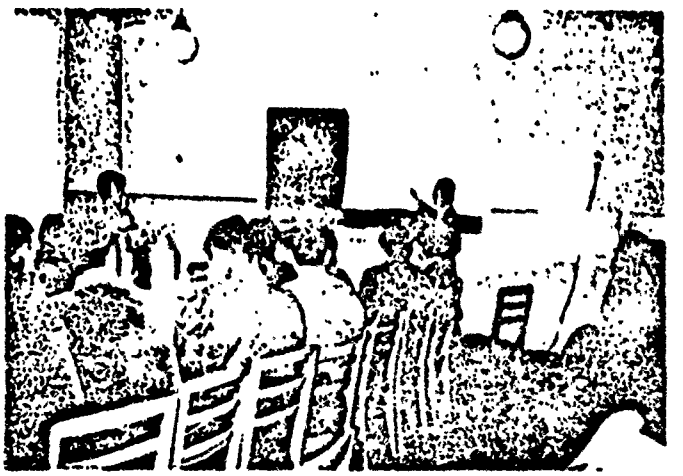
DELEGATE HEGURI AT THE REPORT MEETING
(PEKING)



DELEGATE MIYAGI AT THE REPORT MEETING
(PEKING)

POSTSCRIPT:

There were people who were investigating the concrete introduction of computers, as in the Science Agency Computation Center, and people who were working on the development of computers in the Peking Wire Electronics Factory. However, the level of introduction and development is still low. There is no balance between the knowledge they have and their experience with computers. We have the feeling that the knowledge obtained from books is fragmentary.

In Peking there were questions on the application of computers, but we did not receive an answer. It seems that they are barely used.

At some of the universities, such as Shohua University, they use minicomputers. They have introduced computers that cannot be used for processing here to the Science Agency Computer Center.

Today there are very few imported machines in China and the ones they do have are small machines.

It seems that today each region is investigating importing machinery.

ENCLOSURE

PARTICIPANTS OF THE PEKING COMPUTER HARDWARE DEBATE

Tang Yu Liang.....Peking Wire Electronics Factory
Production Supervisor

Mao Yun Saki.....First Machine Industry Department of
(Illegible) Automation Model (Meter)
Research Lab.....Process Supervisor

Tan Ta Nien.....Wuhan Suburbs Equipment Research Lab
Process Supervisor

Shu Ko Gi.....Chinese Science Agency Computation Center
Process Supervisor

Lin Chi.....Chinese Science Agency Computation Center
Process Supervisor

Mao Shih Lin.....National Statistics Bureau Computation
Center.....Board of Directors

Ko Yun.....Peking Telephone and Telegraph Office
Contractor

Tsung Go Te.....Peking Telephone and Telegraph Office
Instructor

Shu Ben Chu.....Metal Institute.....Process Supervisor

Chang Chan Ch'iu....Metal Institute.....Process Supervisor

Chian Chih Ko.....Metal Institute.....Process Supervisor

Mo Chien Sai.....Metal Institute.....Process Supervisor

Liu Ke He.....North China Computation Lab

Wang To Seki.....Shohua University Electronics School

Lu Ken Tsu.....First Machine Industry Model (meters)
Bureau.....Process Supervisor

Hsu Ben Chi.....Machine Institute.....Technician

Liu Hsiang.....Architectural Science Research Agency
Technician

2. TIENTSIN

Date and Time: November 6 2:00 - 5:30 p.m.

Place: . Tientsin Restaurant Debate Room

Participants: Visiting Delegates Heguri and Miyagi
Chinese Side- Kan Seki Mon-
Tientsin Institute Board of Directors
and 22 others (details on enclosure)

PROCEEDINGS OUTLINE

In a short amount of time we responded directly to questions concerning the study of data.

Moreover, we believe that this was due to the fact that the circulation of data is not sufficient and consequently, they do not study data.

We did not carry out a basic debate which was based on data.

MAIN QUESTIONS AND RESPONSES

-We started with questions about the special characteristics of ACOS and the M series. We did not understand the intention of the question and therefore, in order not to waste time, we gave general explanations of the types of machines used and the special characteristics of the ACOS and M series.

-In the case where the MOS memory is used in the main memory, aren't there problems with a cutoff in the power source?

We explained that generally the program load is done with disks, tapes, etc. and therefore, there are not any problems.

We also explained that there are battery backups in

minicomputers.

As for the use of computers in China today, the program load is done with paper tape. Moreover, the operation is troublesome because there is a minicomputer. We noticed that the questions concerned these points.

-There were questions on the IC and LSI.

How can we test the degree of credibility of the IC and LSI that are used?

Is the credibility of the equipment expressed by the computer cost or the actual cost?

IC credibility is not obtained from tests and we explained that it is obtained from the manufacturing process and the controls in manufacturing.

-There were questions concerning design automation.

We explained the necessity of design automation and the system. In particular we explained the production of machines and the consistency of their production.

They were surprised at the size of computer throughput, which becomes important in the development of computers.

-OTHER IMPORTANT QUESTIONS:

The question on minicomputers used for process control was twofold.

What is the present situation of the imput/output device that is used in the laser?

What is the present situation of the memory that is used

in laser techniques?

-We gave our opinion of the Chinese computer.

We showed that the development of the communication industry is necessary for the development of computers.

Semiconductor technology used in computers in our country is not unrelated to LSI production for the television, circuit board, watch, etc. Also, we cannot consider the development of computer technology separate from the development of a computer market. We explained development within an industrial framework. The two were balanced no more than usual.

POSTSCRIPT:

From these questions we believe that the only problem was an intellectual imbalance. It seems that the Chinese long to learn fine technology that is different from knowing the present situation and purpose of computers.

According to Kan Seki Mon (Tientsin Electronics Institute Board of Directors, Tientsin Wireless Electronics Research Laboratory Process Supervisor) there are very few imports of computers in Tientsin (almost none). Today the main computer is the Chinese-produced minicomputer. It is used for scientific and technological computations and for machine control. Today there are thought to be scores of minicomputers.

As a rule, what is produced in Tientsin is used in Tientsin.

TIENTSIN COMPUTER TECHNOLOGY RESEARCH FACTORY

The 441 B is used in scientific and technological computations. It uses a transistor and core.

TIENTSIN WIRE ELECTRONICS RESEARCH LABORATORY

Uses the DJS-130 and the DJS-20 Scientific and technological computations.

TIENTSIN ELECTRONIC MACHINERY FACTORY

Produces the DJS-130 and DJS-20; the 441 B is made here.

TIENTSIN WIRELESS ELECTRONICS FACTORY NUMBER 2

Produces the DJS-130 (For the DJS 130, refer to the Peking University Observation Report.)

ENCLOSURE

PARTICIPANTS ON THE CHINESE SIDE AT THE TIENTSIN HARDWARE DEBATES

Kan Seki Mon.....Tientsin Electronics Institute Board of Directors, Tientsin Wireless Electronics Research Lab.....Process Supervisor

Chi Tsu Yu.....Tientsin Electronics Institute, Board of Directors, Tientsin University Professor

Shu Fang.....Tientsin Science Institute Board of Directors, Number Two Machine Bureau Science and Technology Department

Shu Chi Pao.....Tientsin Computer Center...Process Supervisor

Tan Fei Sho.....Tientsin Computer Center.....Technician

Tung Do Kin.....Tientsin Computer Center.....Technician

Hsiang Ko Shu.....Tientsin Computer Center.....Technician

Liu Ping Min.....Tientsin Computer Center.....Technician

Sho Feng Min.....Tientsin Industrial Automation Model (meters) Lab.....Process Supervisor

Nia Mon Chu.....Tientsin Industrial Automation Model (meters) Research Lab.....Technician

Shu Chi Chu.....Tientsin Industrial Automation Model (meters) Research Lab.....Technician (interpreter)

Sho Kei Mon.....Tientsin Wireless Electronics Research Lab Technician

Changh Wu.....Tientsin Wireless Electronics Lab Technician

Kin Yu Wa.....Tientsin University.....Professor

Hai Dai Kin.....Tientsin University.....Professor

Shu Kei Lin.....Electronic Meter Factory.....Technician

Nan Sho Ko.....Electronic Meter Factory.....Technician

Pei Ko Hua.....Tientsin Electrical Conductor Lab.....
Technician

So Pei Wang.....Tientsin Telegraph and Telephone
Management Office.....Technician

Shu Tsu Hsien.....Number 2 Machine Office Science and
Technology Department.....Technician

3. SHANGHAI

Date and Time: November 11 2:00 - 5:30 p.m.

Place: Shanghai Association for Science and Technology

Debate Room

Participants: Visiting Delegates Miyagi and Heguri

Chinese Side

To Yeh Jo) (Hantung Computer
Hu Koku Bei) Research Lab)

Ryu Shan (Shanghai Computer
Research Lab)

Sung Pai Chuan)(Shanghai Wireless
Chang Go Jo) Electronics
Number 13 Factory)

Including members of the Futan University, there were 20 participants total.

MAIN QUESTION:

-Do you think that the Japanese minicomputer is interchangeable with the DEC?

-What is the method for determining equipment obstruction when goods and parts are not of a high quality?

-What influence does the refresh cycle of the MOS memory have on data processing efficiency?

-What are the prospects for the CCD?

-What are the countermeasures for inconsistency of the cash memory in the multiprocessor system?

-What is the wiring technology in the high speed computer?

-What is the comparison between the virtual optimum storage capacity and the actual optimum storage capacity?

1. COMPUTER SOFTWARE DEBATE GROUPS

1. Peking

Day and Time: November 3 8:30 a.m. -5:30 p.m.

Place: Peking Guest Hall Technical Debate Room

Participants: Visiting Delegates Tsunoda, Nagai and Kekuchi

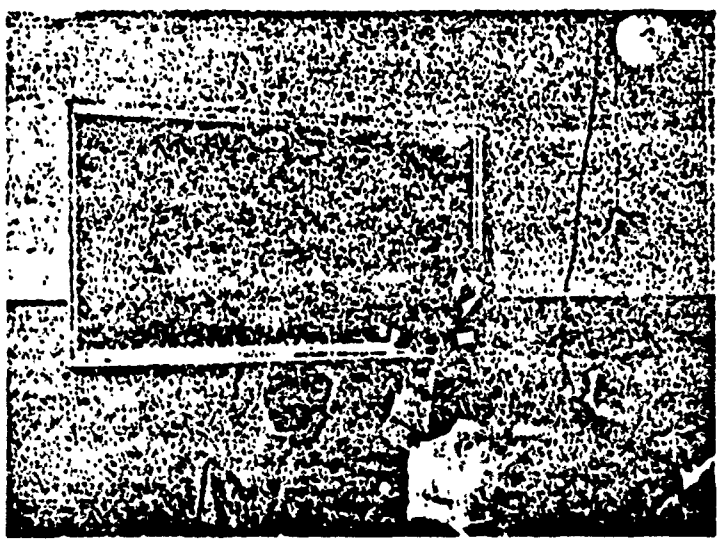
Chinese side - about 20 people, refer to enclosure

MAIN TOPICS

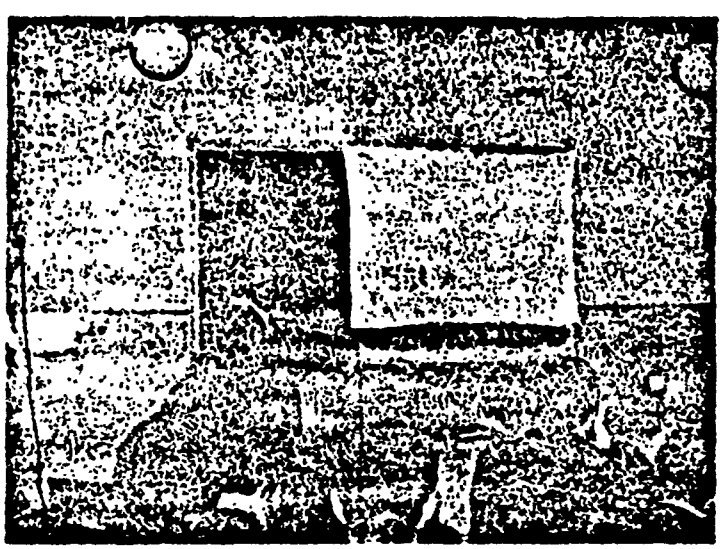
-What is the setup and function of the CICC?
-Kanji information processing
-How are computer technicians trained in Japanese universities?
-What is the system for large-scale software development?
-What is the credibility of software?
-Software engineering
-When a CICC delegation is sent to China, the Chinese would like detailed explanations of the following

1. Software of the computer network
2. Software of the data base management system
3. Kanji processing

4. CAD
5. Numerical control
6. Details of CPL terms



REPORT COMMITTEE (PEKING) DELEGATE TSUNODA



REPORT COMMITTEE (PEKING) DELEGATE NAGAI

ENCLOSURE

PARTICIPANTS FROM THE CHINESE SIDE IN THE SOFTWARE DEBATES (PEKING)

Chairman Lin Wu Ni.....Fourth Desk Equipment Industry Computer Department

Mao Man Ho.....China Science Agency Automation Research Lab

Ki Liu Sai.....China Science Agency Computation Center

Li Cho Sui.....First Desk Equipment Industry Automation Research Lab

Cho Ben Tei.....Desk Equipment Institute

Chang Kin Sai.....North China Computation Lab

Pao Feng Koku.....North China Computation Lab

Cho Sai Bun.....Fourth Desk Equipment Computer Lab

Shu Ben Chu.....China Metal Institute

Chang Tsu Ko.....China Metal Institute

Liu Kei Sai.....China Metal Institute

Chang Mon Kei.....Peking University

Mao Man Sai.....National Statistic Bureau Computation Center

Lin Ko Liu.....China Metal Institute

Shu Liu Yi.....National Science Endowment Bureau

Sei Yi Fent.....China Science Agency Computation center

Ko Liu Ben.....Peking Telephone and Telegraph Agency

2. TIENTSIN

Date and time:	November 6 2:00 - 5:30 p.m. November 7 2:00 - 5:30 p.m.
Place:	Tientsin Restaurant Conference Room
Participants:	Visiting Delegates Tsunoda and Nagai Chinese side - about 20 people refer to enclosure

MAIN TOPICS

-Program training system
-Details of the Information Management Industry
-Software engineering
-System and management of large-scale software development
-Duties of the system engineer
-Software credibility
-Kanji information processing

ENCLOSURE

CHINESE PARTICIPANTS IN SOFTWARE DEBATES(TIENTSIN)

Ken Ku Shin.....China Tientsin Wireless Electonics Research Lab

Mao Yu Sho.....Tientsin Nankai University Faculty

Lin Yi Fent.....Tientsin Nankai University Faculty

Ching Kung.....Tientsin Electronics Computer Bureau

Shu Sui Lin.....Tientsin Industrial Automation Model Lab

Liu To Sai.....Tientsin Electronics Institute

Li Sen Sai.....Tientsin Electronics State Factory

Chang Pai Mon.....Tientsin Telegraph and Telephone Management Office

Min Fent.....Tientsin Wireless Electronics Technology Lab

Cho mMon Lin.....Tientsin Wireless Electronics Technology Lab

Feng Shu Sai.....Tientsin Wireless Electronics Technology Lab

Tan Fu chin.....Tientsin Wireless Electronics Technology Research Lab

Liu Lin Ko.....Tientsin Industrial Automation Model Research Lab

Cho Suti Pai.....Tientsin Electronic Computer Lab

Rai Cho Sai.....Tientsin University Wireless Electronics School

Cho Chian Yi.....Tientsin Electronics Institute

Cho Ka Sho.....Tientsin University Wireless Electronics School

3. SHANGHAI

Date and time: November 11 2:00 p.m. - 5:30 p.m.

Place: Shanghai Association for Science and Technology
Conference room

Participants: Visiting Delegates Tsunoda and Nagai
Chinese side - 15 people

Chairman Shi Min Gen.....Shanghai Computer Technology
Research Lab.....Supervisor

Interpreter Sai Yi Feng.....Shanghai Technology and
Physics Research Lab

Tang Mon Tsu.....Huatung Computer Technology Research
Lab.....Technician

Ko Yi Shu.....Huatung Computer Technology
Research Lab

Hsien Fu Dai.....Hsipei Industrial University.....
Assistant Professor

Jo Koku Sei.....Shanghai Wireless Electronics
13 Factory.....Instructor

Mon Tsang Li.....Shanghai Computer Technology
Research Lab.....Technician

Feng Yu Kin.....Shanghai Computer Technology
Research Lab.....Technician

Tang Yi Chang.....Shanghai Computer Technology
Research Lab.....Technician

Sai Feng Liu.....Shanghai Computer Technology
Research Lab.....Technician

Chang Ka Hua.....Futan University.....Instructor

Ho Shin Kai.....Futan University.....Instructor

Chang Ping.....Futan University.....Instructor

Dai Sen Ping.....Futan University.....Instructor

MAIN QUESTIONS

-Training of Program Technicians
-Software engineering
-System and management in large-scale software development
-Software credibility
-Introduction of a data base

3. DEBATES ON THE APPLICATION OF COMPUTERS TO AUTOMOBILE AND HEAVY INDUSTRIES

1. PEKING

Date and time: November 3 8:30 a.m. - 5:30 p.m.

Place: Peking Guest Hall Technical Reports Room

Participants: Visiting Delegates Kamitani and Kosai
Chinese Side - about 20 people

Chairman- (illegible) Chō....First Machine Industry Industrial Automation Research Lab Supervisor

Interpreter- Miss Chin Mon Hsiu....First Machine Industry Industrial Automation Research Lab Supervisor

Interpreter- Miss Chin Mon Hsiu....First Machine Industry Industrial Automation Research Lab Interpreter

Technicians and supervisors from the First Machine Industry Industrial Automation Research Lab, the First Machine Industry Computation Center, the First Machine Industry Electronics Research Lab, the First Machine Industry, First Design Institute, the First Machine Industry Model Office, the Machine Process Institute, the First Steam Train Factory, the Second Steam Train Factory, the First Heavy Equipment Factory, the Second Heavy Equipment Factory, the Peking Model Office, and the Science Agency Business Mathematics Department participated in the debates.

MAIN QUESTIONS AND RESPONSES:

The debates proceeded with questions and answers. The following are the main questions and answers.

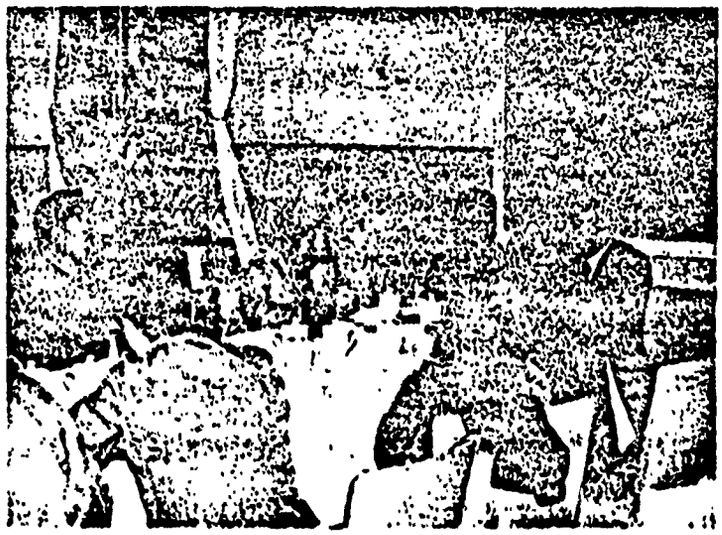
Question: How is a computer used at the data centers in Japan?
Answer: We gave a general explanation of the use of computers in data centers in Japan. However, they wanted to know whether the computers were rented or purchased. We explained the present conditions of the usage of computers by Nissan and Mitsubishi and rented and purchased systems.

Question: How is the data base maintained when the computer is used in business computations?
Answer: We did not sufficiently understand the meaning of the question. We explained maintenance point by point.

Question: Is data from the data base received from the terminal? Are revisions of data that has been modified or poorly produced done automatically? Is data collection done automatically?
Answer: We did not quite understand the meaning of the question. We briefly explained the flow of information from the production management system.

Question: What is the relationship between the production management system and the cost management system?
Answer: We explained this briefly.

Question: How is NC and the computer used in the casting and forging industry?
Reply: It is hardly used in connection with control. Delegate Miyazaki explained its relationship to the iron manufacturing industry.



DELEGATES KAMITANI AND KOSAI AT THE DEBATES
(PEKING)

Question: How is NC data made? How is the NC data stored?
Answer: We briefly explained the methods used at Mitsubishi.

Question: What type of aid can we receive in the development of software for use in computers? For example, what type of aid can we get for CICC, etc.?
Answer: It is possible to get assistance in training software technicians and engineers. However, you will not be able to get concrete assistance in developing a production management system, etc. You will probably receive assistance in system development if Nissan gives you a plan for the construction and renovation of automobile factories. In particular, as in Japan, where the methods of production management at Mitsubishi and Nissan are different, the method of production management in China is bound to be different. This should be the basis for computerization. Consequently, China should not adopt Nissan's production management system exactly as it is. Of course, there will be many

occasions when you will study and observe Nissan's method.

Question: What does the software in production management consist of?

Answer: We do not have a detailed explanation at this time. The amount of software is extremely high and therefore, a detailed explanation is very difficult to give.

Question: How should computer management be different from personnel management?

Answer: We do not understand the question. The Chinese wanted to know about the scale of production, which is done by humans at the Second Steam Train Factory (the factory is near Wuhan).

Employees	about 40,000 people
Production	100,000/year
Types of machines	a 3 ton truck and 2 types of engines

With this production scale the use of computers in production management is unnecessary. We previously advised them to proceed with the mechanization of business computations.

Question: The automobile press line has been automated, but do you use computers?

Answer: No, we do not use them.

Question: What is the reason for this?

Answer: The microswitch and relay circuit are sufficient and this method is good.

Question: Mitsubishi mass produces a small amount of various products. Do they use an automated line?

Answer: We explained that if you look at the parts and accessories that are produced, the amount of production is high. They do not have a complete automated line, but they do have a specialty line.

Question: Is a microprocessor used?
Answer: Nissan and Mitsubishi hardly ever use a microprocessor today.

Question: Does Mitsubishi use a CAM system?
Answer: We explained this briefly.

Since there were 2 people at the debates who were connected with the automobile industry (1 from Changchun and 1 from Wuhan), there were no disagreements. The young technician from Wuhan asked modest questions and we had time left over. The participant from Changchun could only stay for 1/2 day. Therefore, there were no speeches given.

POSTSCRIPT:

Δ Within the scope of each industry and based on modernization, it is very unclear as to how and where the computers should be used, what should be studied and investigated earnestly, and why computers should be used.

Δ They do not have any concrete experience. They get their knowledge from information in books, etc. Therefore, the questions they asked were vague. The questions were also affected by the fact that the interpreter did not always convey the meaning of the questions.

Δ They had a great interest in the computerization of production management, but this was not from the viewpoint of workers of the factories. It was as if each industry adopted points from the instructions and speech of Vice-premier Teng Hsiao p'ing.

Δ There were many questions raised in connection with Automobiles and concrete plans for the modernization of factories, but they did not seem to have a clue as to what standards should

be used in computerization.

Δ It seemed as if some of the points mentioned above were easily understood. However, we never knew how much trouble there was with the questions raised by the Chinese side.

2. SHANGHAI Number 1

Date and time: November 9 2:00 p.m. - 5:30 p.m.

Place: Shanghai Association for Science and Technology Conference Room

Participants: Visiting Delegate Kamitani
Chinese side - about 80 people

Chairman Chou Ke.....Shanghai Tractor and Automobile Firm.....General Management

Interpreter Chang Sho I.....Shanghai Electronic Equipment Firm
The others are process supervisors and technicians of the Shanghai Tractor and Automobile firm

MAIN QUESTIONS AND ANSWERS

After a 2 hour address, a debate was carried out for about 1 hour. The following were the main questions.

Question: We would like a little more detailed explanation of NC software used in the cam process and the propeller process.

Answer: Taking the cam process as an example, we explained how computers are used for computations and the details of the process.

Question: How many computers are used by Mitsubishi Heavy Industries? What is the ratio of foreign equipment

to domestic equipment?

Answer: We did not have detailed information but we did give a brief explanation.

Question: What is the technical trend of the DNC in Japan?

Answer: We explained that technologically the conditions of the DNC today are somewhat different from the early stages.

Question: What is the training for a computer operator?

Answer: The operation differs with different companies and therefore, the details are unclear.

Question: What is the training for computer repairmen?

Answer: Contracts are made with the manufacturer and periodic repairs are carried out. There is no training for the repairmen.

Question: We would like a more detailed explanation of the trouble that was encountered in Japan during the first stages in the use of NC equipment.

Answer: We explained this briefly.

POSTSCRIPT:

Δ Before the debates, we did not receive replies when we asked how many people had used computers among the participants. Therefore, we did not know how much they knew about computers.

Δ Many of their questions were valid and it seemed as if they had a concrete plan for the application of computers.

Δ It seemed that the level here was extremely high when compared to that of Peking.

3. SHANGHAI Number 2

Date and time: November 11 8:30 a.m. - noon

Place: Shanghai Association for Science and Technology
Conference Room

Participants: Visiting Delegate Kosai
Chinese side - 13 people

Chairman- Chou Ke.....Shanghai Tractor and Automobile
Firm General Manager

Interpreter- Chang Sho I.....Electronic Equipment Firm
The others were process supervisors and
technicians from the same firms.

MAIN QUESTIONS

-Is there a research center at Nissan automobiles?

-What types of computers do they use? What is the setup for research and development?

-Is NVCC used in the analysis of exhaust fumes?

-What is the life span of parts and accessories used in the development of new automobiles? How is the life span determined by computers?

-What percentage of the costs is for computers?

-How are computers used in molding?

-How do you assess the use of computers while riding in a a new automobile?

POSTSCRIPT:

The understanding and accuracy of the interpreter was very good. The understanding and accuracy of General Manager Chou Ke of Shanghai Steam Train Firm and the sub-chairman of the same firm was also very good. We had a good time in our discussions with those people related to the automobile industry and employees of the Shanghai Steam Train Firm.

From the conversations we had, it seemed as if the people

involved in the designing of automobiles were well informed. It was the same for the technicians who worked in the factories. There were many questions that were very detailed. For example, there were questions on countermeasures for exaust fumes, methods for testing automobiles, plans, the use of computers in experiments, etc.

4. DEBATES ON THE PRACTICAL APPLICATION OF COMPUTERS IN THE IRON AND STEEL INDUSTRY

1. PEKING

Date and time: November 2, 2:00 - 5:00 p.m.
November 3, 8:30 a.m. to 4:00 p.m.

Place: Peking Guest Hall Technical Reports Room

Participants: Visiting Delegate Miyazaki
Chinese side: 20 people

Chairman Feng Teng Sho.....(Metal Institute)
Mao Kan Sho.....(National Economics Foundation)
Sei Li Mei.....(Metallurgy Department)
Shin Sui Sho.....(Metallurgy Department)

Interpreter Yuan Mo Li.....(Metal Institute)
Chu Kai Tsen....(Metal Institute)
Mao Feng Dai....(Metallurgy Department Iron and Steel Research Lab)
(Metal Institute)
Shu Li Pao.....(Iron and Steel Planning Agency)
(Metal Institute)
Interpreter Ko Sai San.....(Peking Iron Agency)
Chang Sai.....(Metal Institute)
Lin Kei Tang....(Metallurgy Department)
Liao Wo Yt.....(Metal Institute)
Pien Min Sai....(Peking Iron and Steel Works)

MAIN QUESTIONS

A. Questions from the Chinese side

-We would like a concrete explanation based on the history of computerization and automation.

We explained process computerization and business computerization and automation.

-They wanted an explanation of system setup and maintenance using the New Japan Steel Works as an example.

We explained the roles of employees who deal with the process computer and the business computer in this company and all companies.

-How is model development done in this sector? What is the allotment?

-What are the present problems and future prospects for the computer system at New Japan Steel Works.

We explained the process computer and business computer.

-The Chinese wanted to learn the relationship between each part in the development of a computer system.

-How is a test carried out in program framing for a process computer?

-How accurate is the tracking sensor? How are incorrect movements detected and how can they be stopped?

-What will the future application of the microcomputer be?

B. Japan (illegible) responses

-Is the computer used in (illegible)?

It is sometimes used in blast furnaces (illegible).

It is used at the Shanghai (illegible). However, when this is compared to Japan, it is extremely (illegible).

-The precision of the measurements of the model (illegible) and the analyzer is high.

-Is production (illegible) carried out? Is there a daily plan and shift unit (illegible) for each factory? (illegible). Everyday there are departments which draw up production plans.

DELEGATE MIYAZAKI AT THE DEBATES
(TIENTSIN,

POSTSCRIPT:

There is an extreme interest in (illegible), automation, and computerization.

There is no actual experience (illegible). They study books and other sources of information. The questions were (illegible). There were (illegible) times when we did not understand the questions.

Model (illegible) is very enthusiastic. We felt that actual development (illegible). They do not realize the advancement of the project team or task force (illegible).

They were very interested in the practical application of the microcomputer.

Finally, the schedule of (illegible) was so brief that there were complaints. (illegible).

Everyone knew the fine (illegible). They were very interested in the process computer and (illegible).

Consequently, there were questions and answers only on November 3 since the session lasted for a short time during the afternoon of November 2.

2. TIENTSIN

Date and time: November 6 8:15 a.m. - noon

Place: Tientsin Restaurant Conference Room

Participants: Visiting Delegate Miyazaki
Chinese Side- 16 people

Chairman- Tientsin Metal Institute Board of Directors, Iron and Steel Firm General Process Supervisor Chang Fu

Interpreter- Metal Institute Tui Gen Chu
Interpreter- Metal Institute Boku Hsing Lu

Mon Hsueh Liang.....Tientsin Metal Institute Secretary General
Chang Ko Sai.....Iron and Steel Firm Process Supervisor
Chang Ko Sai.....Tientsin Metal Institute Member Iron and Steel Firm Process Supervisor

Kung Hsio.....Tientsin Metal Institute
Tientsin Electrical Automation Research Lab Supervisor
Mei Feng Lin...Tientsin Metal Institute Member
Tientsin Electrical Automation Research Lab Supervisor
Sai Chi Ko.....Tientsin Metal Institute Member
Tientsin Electrical Automation Research Lab Supervisor
Liang Pao Shin.Tientsin Metal Institute Member
Tientsin Number 2 Steel Works Rolling Supervisor
Tai Sai Min....Tientsin Metal Institute Member
Tientsin Number 2 Steel Works Rolling Supervisor
Tzu Lin Fang...Tientsin Metal Institute Member
Tientsin Number 2 Steel Works Rolling Supervisor
Shu Ko Wan.....Tientsin Metal Institute
Tientsin Number 2 Steel Works Supervisor
La Mao Ping....Tientsin Metal Institute Member
Tientsin Number 2 Steel Works Supervisor
Sai Mon Chu....Tientsin Metal Institute Member
Tientsin Number 2 Steel Works Supervisor

MAIN QUESTIONS

-How efficient and accurate is the computer control in LD converters?

-Explain the control system Analog input of the press line.

-What techniques are used for model development?

-Explain the decentralized DDC and give an example of its application.

-Explain the application of the heating furnace.

-Explain the main control points in the series casting control.

-Briefly explain the characteristics of the heavy metal sheet system that is used by the majority of the iron manufacturers.

POSTSCRIPT

-Data is read better here than in Peking. They were a little surprised at the abrupt way we enter a discussion.

-They were very familiar with the operation of factories. There were many questions raised on how computers should be used. Abstract explanations were not satisfactory so we explained many of the questions with examples.

They were interested in model development so we concentrated on questions about model development. They gradually came to understand this concept when we placed each person in a project team where they made a system for development.

-They were interested in the application and future prospects of the microcomputer and decentralized DDC (in connection with meters).

-They seemed to feel that the development of measurement sensors and the maintenance of meters is necessary prior to computerization.

DELEGATE MIYAZAKI AT THE DEBATES IN PEKING

3. SHANGHAI

Time and date: November 10 2:00 p.m. - 5:30 p.m.

Place: Shanghai Association for Science and Technology Conference Room

Participants: Visiting Delegate Miyazaki
Chinese side- 18 people

Chairman	Wu Mon Lin	Shanghai Paosan Iron and Steel Works Automation Head
Interpreter-	Hsu Feng	
	Cho Lin Wan	Shanghai Paosan Iron and Steel Works Automation Head

Kai Liu Sai.....Shanghai Paosan Iron and Steel Works
Automation Head
Sai Liu Shu.....Shanghai Metallurgy Department Industrial
Technician
Mon Sei Lung.....Shanghai Paosan Iron and Steel Works
Technician
Sai Feng Yi.....Shanghai Paosan Iron and Steel Works
Supervisor
Mien Yu Wa.....Shanghai Iron and Steel Works Technician
Nan Sei Je.....Shanghai Paosan Iron Manufacturers
Technician
Ko Kao Sai.....Shanghai Paosan Iron Manufacturers
Technician
Lin Kin Sei.....Shanghai Paosan Iron Manufacturers
Technician
Feng Yu I.....S nghai Paosan Iron Manufacturers
Technician
Kai Chiegh.....Shanghai Keilai Steel Sheet Manufacturers
General Process Supervisor
Chang Gen Lin.....Shanghai Iron and Steel Works Number 10
Technician
Chang Ji Ken.....Shanghai Iron and Steel Works Number 1
Technician
Liu Feng Min.....Shanghai Iron and Steel Works Number 5
Technician
Kin T'ien Chi.....Shanghai Iron and Steel Works Number 5
Technician
Sai Kai Kin.....Shanghai Keipao Iron Works Technician

MAIN QUESTIONS

-What are the main trends in the process computer system? What is the function and construction of the system?

-What are the future prospects for the data highway? Please give an example of the main characteristics of the data highway, how it is developed in most of the iron works, and its application.

-How is the development of the process computer system carried out? Explain the method of model development and show how the computer system is used.

-When a theoretical model is developed (numerical formula) what approach is used? How is the modernization control theory used.

-How is the business computer system developed?

-What types of things are soft and what types are hard?

-How should the process computer and business computer be introduced to a factory that is already constructed?

-How should the system be set up and how should the employees be trained when it is developed at the Shanghai Paosan Iron Manufacturers?

POSTSCRIPT:

When we compare this group with those in Shanghai and Tientsin, the group here was more enthusiastic. They even study the computer. They also seemed to understand the answers quite well.

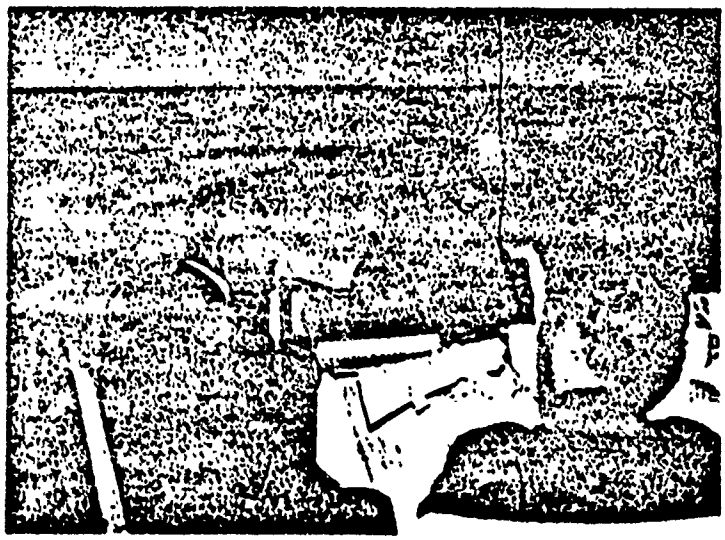
Interest in the establishment of the Shanghai Paosan Iron Manufactuers with assistance from Japan seemed to be very strong and their questions were concrete. There was interest in the training of people and our answers were very effective.

-They thought they knew something concrete about model development, but gradually they came to realize that they did not understand it. In particular, it was difficult to explain through the method where models are developed in project teams.

-They understood the application of the process computer considerably well, but they did not understand the development of the business computer system or what techniques to use in its development at all. Many of them did not seem to understand that preparation and consolidation are necessary before computerization.

Overall, the iron manufacturers have not actually introduced process computers to the factories yet. Prior to the introduction of computers, the consolidation of meters and sensors is necessary.

Computers are operating at the rolling factory of the Wuhan Iron Manufacturers (with cooperation from New Japan Steel). Together with the incentive for computerization in the Chinese Iron and Steel Industry, the operation of computers will become popular.



DELEGATE SAKAGUCHI AT THE REPORT MEETINGS IN PEKING

TECHNICIANS LISTENING TO THE REPORT OF DELEGATE SAKAGUCHI (PEKING)

5. DATA COMMUNICATION DEBATES

1. PEKING

Time and Date: November 3 8:30 a.m. - 5:30 p.m.

Place Peking Guest Hall Technical Reports Room

Participants: Visiting Delegate Sakaguchi
Chinese side- 18 people

Cho Tan Lin.....National Telephone and Telegraph Office Data Communication Research Lab Vice-president

Cho Koku Seki.....National Telephone and Telegraph Office Research Lab Interpreter

Liang Hsio.....Chinese Telephone and Telegraph Office Parts Company Interpreter

Chang Sai Ts'ai.....National Telephone and Telegraph Research Lab Technical Head

Wang Feng Piao.....Chinese Telephone and Telegraph Parts Company Technician

Sai Shu Pao.....Chinese Science and Technology Committee Technician

Shu Lin Chu.....Chinese Statistics Bureau Computation Center Technical Head

Shu Kin Han.....Peking Telephone and Telegraph Agency Instructor

Saki Kai.....China Science Agency Computation Center Technical Head

Chang Ko Do.....China Science Agency Computation Center Technician

Feng Wu.....Peking Long Distance Telephone Bureau Technician

Hsiao Lin Tsu.....North China Computation Lab Technician

Mon Chi Shi.....National Telephone and Telegraph Data Communications Research Lab Technician

Yu Feng Liang.....National Telephone and Telegraph Data
Communications Research Lab Technician
Shang Tsui Dai.....National Telephone and Telegraph Office
Data Communications Telephone and Telegraph
Communications Research Lab Technician
Si Lin Sei.....National Telephone and Telegraph Office
Data Communications Research Lab Technician
North China Computation Lab Technician

MAIN QUESTIONS

The questions were previously arranged into 29 headings that were brought from Japan. These questions were the center of the discussion.

For the most part the questions concerned the DDX network and DCNA. These two topics were divided into many subtopics. These topics and subtopics were then explained at the briefing sessions in Peking.

-Future prospects of the data communication network and plans for Nippon Telegraph and Telephone Public Corporation

-Comparison of and applications of the circuit switching system and the pocket switching system in the DDX network

-The reason for several different networks which do not carry out circuit switching and pocket switching with the same network in the DDX-2

- Present plans for both systems after preparation and service started in March and June of last year

-Go through the existing conditions and prospects for telephone and telegraph cables and explain whether or not the practical application of the pocket switching cable is possible.

-The possibility of connecting the circuit switching cable and the pocket switching cable in the future

-Connective route planning in the pocket switching method

-When they are connected with the pocket switching system, how does the digital transmission system work and how

does the analog transmission system work?

-Does the computer that makes up the network have a common command function or a special command function?

-Should we choose the pocket switching device or the MPX control computer (multipocket device)?

-What are the advantages of the DCNA and is it possible to use only the DCNA in the Nippon Telegraph and Telephone Public Corporation computer?

-What is the relationship between the DCNA and the network architecture developed by other companies?

-What type of service is the DCNA suited for?

-Data transmission using the telephone switching network

-What is the connection between the each type of modulator and demodulator system and the digital transmission speed?

-Method for computing the average bit error percentage and the bit error percentage when 200b/s, 1200b/s, 2400b/s transmission is done using the telephone switching system?

-Where is the data communication network architecture controlled in Nippon Telegraph and Telephone Public Corporation?

-In Japan how is the computer used for the data base and information retrieval?

-What type of domestic machinery is appropriate for the data base and information retrieval?

-What problems have been solved and what problems have not been solved in connection with Kanji information input and output?

-The present conditions of the Postal Ministry Exchange Deposit System, the reasons for not using the DDX other than those mentioned above, a more detailed explanation of the DDX network and the DCNA, DDX trunking system, and DCNA hierarchy were explained.

Moreover, the information related to the present condition of Chinese electrical communications, which was obtained through technical debates, etc., is as follows.

-The number of people involved in electrical communications

in Peking is about 170,000. In addition there is a PBX company. (It is generally used for public telephones.)

-There are branch offices of 10 bureaus within the city. A partial PCM system is being introduced to the bureaus (made in East Germany).

-The suburb switching cable has a pentagram shape. The suburb offices of each province are joined by direct trunk.

-The 1800 CH, 300 CH coaxial cable system, the 960 CH microwave system, the 1.2 mm ø coupled cable 60 CH conveyor system, etc. are used in transmission lines in the suburbs.

-The only headings decided on for a long-term plan in relation to communications was the Chinese Satellite Communication System, etc. Each branch is looking into the details.

-There is no definite plan to introduce the DDX network. At the present time they are in the middle of studying the network.

As for a plan for data communication networks for the entire country, the Telephone and Telegraph Office of the National Agency is planning and designing a network and its establishment will probably be left up to each management office in each region. (It is unclear.)

For example, the Telephone and Telegraph Office and the Chinese Citizen's Bank will probably work together on designing and constructing a deposit exchange system, etc.

They are now investigating the creation of a data communications system for the Chinese Citizen's Bank.

POSTSCRIPT:

We received the following impressions from the briefing

sessions.

The Chinese are now learning about data communications through foreign texts. The organizations and data communication research being done at the Telegraph and Telephone Agency are weak. The participants of the briefing session were important members of these organizations.

The idea they were the most interested in, in connection with data communication, was the DDX network. There was a strong desire to introduce the most advanced technology in a short amount of time from all other countries.

In order to develop the DDX network, they realize that a high level of technology and experience, along with communications technology and computer technology, are necessary. It is unclear as to how much they understand the large difference in the quality of the present level of Chinese technology that must come about for these things to occur.

They expect Japanese cooperation in the research and development of data communications.

2. TIENTSIN

Date and Time: November 6 8:15 a.m. - noon

Place Tientsin Restaurant Debate Room

Participants: Visiting Delegate Sakaguchi
Chinese Side- 23 people

Lueh Ka Sho.....Tientsin College Mathematics Research Lab Head, Tientsin Electronics Institute Board of Directors, Lecturer

Hsung Yao Ming.....Tientsin Wireless Electronics Workshop Five Technician Tientsin Electronics Institute Board of Directors

Mon Tsu Ling.....Tientsin Wireless Electronics Factory Five Technician

Yi Jung Mang.....Tientsin University Mathematics Research Lab Lecturer Head, Lecturer

Ma Pien Fu.....Tientsin Telephone and Telegraph Management Bureau Technician

Lin Ka Sho.....Tientsin Wireless Electronics Factory Number Five Technician

Lu Sei Yu.....Tientsin Wireless Electronics Factory Number Five Technician

So T'ien Wu.....Tientsin Wireless Electronics Factory Number Five Technician

Yao Sai Ling.....Tientsin Telephone and Telegraph Management Bureau Technician

Sei Do Sen.....Tientsin Telephone and Telegraph Management Bureau Technical Head

Shu Feng Wu.....Tientsin Telephone and Telegraph Bureau Technical Head

Shu Tsu Chang.....Tientsin Kuangyo Parts and Accessories Factory Technician

Chang Fu Kai.....Tientsin Wireless Electronics Factory Number Five Technician

Sai Feng Hua.....Tientsin Wireless Electronics Factory Number Five Technician

Shu Ling Sei.....Tientsin Industrial Automation Instrumentation Factory Technician

Shu Sei Lin.....Tientsin Industrial Automation Instrumentation Factory Technician

San King Chung.....Tientsin Wireless Electronics Factory Number Five Interpreter

Liu Lin Do.....Tientsin Testing Grounds Technical Head

Ko Shang Hua.....Tientsin Testing Grounds Technical Head

Sai Ksin Sai.....Tientsin Electronics Institute Secretary

Hsi Chu Jih.....Foreign Cooperation Bureau (illegible)

MAIN QUESTIONS

Because of out schedule, the briefing sessions had to be omitted in Tientsin and we only conducted debates. The members were previously given explanations about the material brought from Japan. Even in Tientsin, the majority of the questions dealt with the DDX network. We intended to conduct experiments on the DDX network as a basis for the present telephone network and telegraph network. The following were the main questions and responses.

Explain the most recent trends and problems in data communication in Japan.

-Error control from the terminal side

-What is the transmission speed in data communications?

-Future prospects for HLDC

-An example of data communications from the application of a telephone network (A 1200 b/s data communication from a telephone network is being planned in Tientsin.)

-Explain an example of data communications using a telephone network, the composition of a suburb network, loss assignment, etc.

In Tientsin the main system is the SXS. They are using a partial XB system. However, there is a great deal of dial impulse jamming. The city cable is 0.5 mm ø and the trunk cable is 0.7 mm ø.

-What will be the future prospects for the PCM system?

-Data communication circuit quality determination materials sent after return to Japan

-The error control v-42 device that is standardized with CCITT materials sent after return to Japan

-When code transmission is done in the Factories in Japan, which is the best method, the method where it is from the HLDC or both terminals?

-Up to what range is it possible to transmit the base band?

-What are the trends in facsimile and video transmission?

In Tientsin research just started on data communications. Consequently, there were scores of participants. (In Tientsin there are 400-500 technicians connected with telephones.)

POSTSCRIPT:

The technological level related to data communications is much lower than that of Peking.

The problem was how to test and introduce data communications in Tientsin. It is not clear as to how much technical cooperation there is with the Telephone and Telegraph Office. There is an underlying idea of self-reliance and it seems that research is done individually in the Tientsin area.

3. SHANGHAI

Date and Time: November 11 2:p.m. - 5:00 p.m.

Place: Shanghai Association for Science and Technology Conference Room

Participants: Visiting Delegate Sakaguchi
Chinese side - 11 people

Mao Sho Lin.....Shanghai Association for Science and Technology Board of Directors
Ling Do Min.....Shanghai Computation Technology Lab Researcher
Sai Kiku Ko.....Shanghai Computation Lab Researcher
Feng Yu Mei.....Telephone and Telegraph Office Number 1 Research Laboratory Technician

Kao Ling Cho.....Telephone and Telegraph Number one
Research Lab Technical Head
Hua Min Mei.....Shanghai City Telephone Office
Technical Head
Sai Ping Mei.....Shanghai Telegraph and Telephone Management Office Technical Head
Cho Tei Feng.....Huatung Computer Lab Researcher
Do Ling Sing.....Telephone and Telegraph Number one
Research Office Technical Head
Chang Yu Liang.....Shanghai City Telephone Bureau
Technical Head
Mao Ke Liang.....Interpreter

MAIN QUESTIONS

-Problems with data communication with a telephone network
-Detailed explanation of the DDX network
-Explain circuit switching and pocket switching systems with a trunking scheme.
-Concrete example of a banking system
Explain the overall composition of the system, etc.
-Brief explanation of the DCNA
Brief explanation of the hierarchical composition
-Dissemination of the city telephone network
-Structure of the data communication of the communciation lab
-Bureau in charge of the maintenance of the DDX network
Explain the actual functions of the data research Lab, technical office, data communication office and maintentance office.

Futhermore, we obtained the following information on Shanghai telephones.

-number of telephones- about 200,000 PBX- about 16,000

-public telephones- about 4,000
-number of telephone office branches- 30-40 offices (including subordinate offices)
-use of city cables
party line cable 0.5 mm ø 1,200 pairs, 0.4 mm ø 1,800 pairs inter-office trunk cable 0.6 mm ø, 0.7 mm ø, 0.9 mm ø more than 300 pairs are underground cables
Note: there are no bare wires
-direct dialing- Peking, Tientsin, Hongchou, Nangching, and Chinan.
-Long distance circuit- short-haul carrier system, co-axial cable system, microwave system
-International circuit- submarine cable (Japan)
Satellite communication (Asia, Africa, and Europe)

POSTSCRIPT:

-Shanghai seems to have the same level of technology as Peking does.

-As with Tientsin, there seems to be an underlying idea of self-reliance.

-They do not have an organization for data communications, but they are looking into its creation.

-There is a strong concern for the DDX network.

There were young people who participated in the debates. However, there were more relatively older people. There were many speeches made by the older people and their level of technology was higher.

PART 4.

FACILITIES OBSERVATION REPORTS

1. CHINA SCIENCE AGENCY COMPUTATION CENTER

Date and time: October 31 2:30 p.m. - 4:30 p.m.

Hosts: Shu Chu Ta (Chinese Science Agency Computation Center Member)
Cho Ling Shin (Assistant Process Supervisor, connected with hardware)
Hua Kei Min (China Science Agency Computation Center, Process Supervisor connected with software)
Others

At the present time this computation center is using the 013 computer, which it produced itself.

They carry out scientific and technical computation services at each of the research labs with the Science Agency. They also process computations from each organization and school within in Peking.

Scores of computations are done in one day by batch processing.

The center employs 400 people.

Disk Memories, magnetic tape devices, typewriters, etc., which make up the computer itself and the system, are being researched, developed and trial manufactured. The productivity of the system seems to have a lot of problems.

They do not have a card reader, and the input is all paper tape.

Today they are in the middle of designing a facility with imported machinery. They are receiving proposals from each country in Japan, Europe and the United States.

The following questions were received after we observed the facility:

° the conditions in Japan of image processing and graphic processing;

° the possibility of renting imported machinery;
° maintenance.

Will maintenance personnel be sent from Japan? Will Japan train Chinese maintenance personnel? Are there problems with having the same maintenance personnel repair multiple systems and different types of machinery?

° Will the CICC train software technicians?

There were questions concerning problems in the investigation of importing foreign equipment.

When the computation center is used, it will carry out research on software. However, another organization will carry out developmental research on hardware (Science Agency Computer Research Laboratory.)

OUTLINE OF THE 013 COMPUTER

Development began in 1974 (Science Agency Computer Research Laboratory.) Development was completed in 1976, and the computer was used two years later.

Operation speed	formal name 2 MIPS
Word length	48 binary digits
Main memory	128 K words (48 bit + 8 bit/word: 8 bits are Hamming revision bits.)
Access time - 1.5 μs	
Magnetic core (external diameter 0.6 mm (23 mil), internal diameter 0.4 mm)	
Cash memory	512 word access time - 300 ns Magnetic thin film (evaporated on a plate of glass) memory

Read only memory from Biax Core 16 k Word

access time - 400 ns

Part of the OS is housed here, related to spooling, program switching control in multiprogram processing, etc.

Operation unit

- ECL (developed and made at the Peking Science Agency, in a circular can case, 2 gate/IC)
- uses a 60 k IC, 120 k gate logic circuit
- A 30-40 piece integrated circuit is mounted on a 12cm x 12 cm, 8 layer printed wiring board.
- A main memory is also included and mounted in five 1.8m baskets.
- There are two operation register accumulators.
- clock 6 MHz
- floating point addition and subtraction - 330 ns
- pipeline control special operation
- High speed is reached with hardware such as pipeline control, special operation functions (multiplication, division, square roots, etc.), etc.

Software

- OS supports the processing of two multiprograms.
- Terms BCY (similar to ALGOL system)
  Romanized Chinese Characters
  Fortran - M
  Assembler

Peripheral equipment

- Magnetic tape - 8 rolls
- 1 inch thick magnetic tape is used for 16 tracks
  8 tracks are used in information, the other 8 tracks are used for the correcting code (Hamming).
  packing density - about 20 bit/mm (556 bpi)
- magnetic disk memory - 4
  capacity - 20 MB access time - 50 ms

- Four typewriters
  600 words/line
- paper tape ring - 4
- paper tape perforator - 2
- CRT display console - 1 (being tested)

This is the highest performance computer that is a Chinese product. You can see the shape of Chinese computer technology through it. In an environment where basic technology which begins with semiconductors is very low, it could be developed only after many efforts.

The disk is also a trial manufactured product. It is placed in a large basket (1.2m x 1.2m x 1.2m). It was not running when we saw it.

The line printer also seems to be in the initial stages of development. The printing quality is not very good.

Many efforts were made to reach a high speed in scientific computations.

However, there are problems with the 2 MIPS. It is difficult to implement the idea of the 2 MIPS with the speed and capacity of the cash memory and the speed of the main memory.

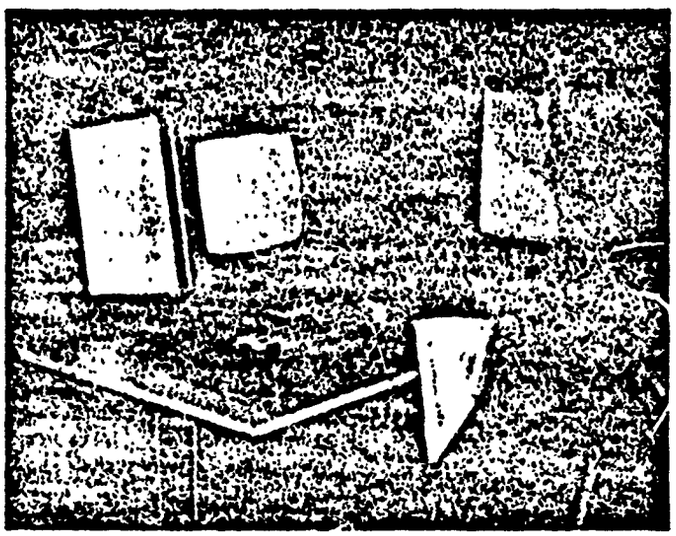
We should probably look at the 1 MIPS for the actual functions.

It seems that technology has been frozen since 1965 when we look at the biax core used in the magnetic thin film memory and the read only memory, which were used in the operating element, the storage element, and the cash which are used now. Each country in the world, including Japan, is developing new technologies now. There are many new devices that have not been used in China. That time can be considered an isolated era in which China was cut off from the rest of the world.

EXECUTIVES AND (ILLEGIBLE) OF
THE CHINA SCIENCE AGENCY COMPUTATION CENTER

THE 013 COMPUTER

013 COMPUTER PERIPHERAL EQUIPMENT



CRT DISPLAY AT THE
CHINA SCIENCE AGENCY
COMPUTATION CENTER

2. SHANGHAI COMPUTER RESEARCH LAB

Date and time: November 11 8:30 a.m. - 11:30 a.m.

Hosts:	Kan Tsu Liang	Shanghai Computer Research Lab Head
	Shu Kan Feng	Shanghai Computer Research Lab Head Number 1 Research Lab (Head)
	Liang Ta Lin	Number 1 Research Lab (Head) Planning Department (Project Department)
	Kei Wa Sho	Planning Department Data Research Lab

SHANGHAI COMPUTER RESEARCH LABORATORY OUTLINE

The Shanghai Computer Research Lab was established in April, 1969. It was equipped with the X-2 Computer(1) and they carried out research on the practical application of that computer. At this time there were 60 staff members, 40 people connected with programming and mathematics, and 40 people involved in maintenance and business management.

Development began on the 709 computer, which used an IC, in September, 1970.(2)

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(1) X-2 computer: speed - 24k command/second 42 bits/word
main memory - 8k word manufactured in China

(2) 709 computer: speed - 110k command/second
logic element IC 48 bits/word
main memory is a 32k word core

The 709 computer was named so because development started in September, 1970, with cooperation from Futan University, etc. It is manufactured by Chang Chiang Wireless Electronics Factory.

In 1972 the Shanghai Computer Research Laboratory was expanded.

In January, 1973, development began on the 731 computer.

Today the 731 computer is the main computer used at the laboratory. It is outlined later on. The 731 is named so because development began in January, 1973.

It was finished in March, 1975.

Today there are 650 employees at the laboratory. Out of these, 300 are researchers. Besides carrying out the business of the computer center, they are involved in research of computer application and the instruction and education of computer usage. Moreover, they design small computers that are requested by the computer factories.

THE EIGHT RESEARCH ROOMS OF THE LABORATORY

Laboratory 1 - Applied Software Lab

This lab has one 731 computer which is used in computations, application program development and training and instruction.

Application program development is in compliance with requests from several sectors for factory control (planning and design, etc.), mathematical formula models (for use in parameter determination connected with irradiation used in cancer therapy), telephone number inquiry systems (refer to appendix), programs related to building construction, dynamics, optimum technique program, etc.

Education and instruction is provided for trainees from all sectors, such as mechanics, optics, architecture, shipbuilding, etc., and application programs for each field are made.

Today about 3,000 people are being trained.

Laboratory 2 - Laboratory 7

These laboratories are involved in research of computers, peripheral equipment and software.

The labs are not very active.

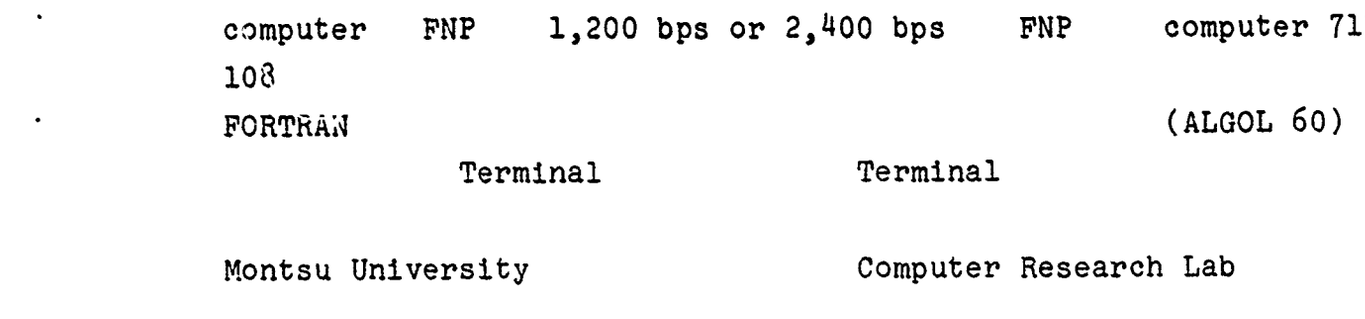
We observed the labs while they were carrying out assessments on trial manufactured equipment, such as the magnetic 1/2 inch tape device, the line printer, etc.

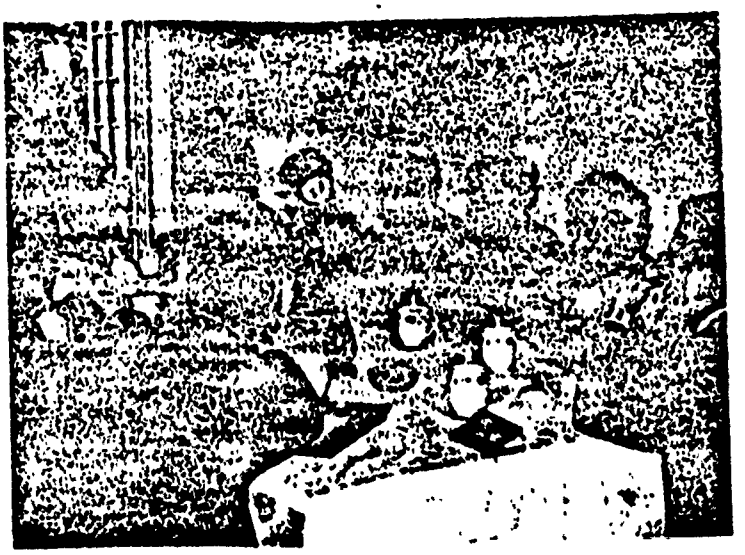
Nine 1/2 inch tracks on magnetic tape are in the stage of trial production. The tape speed is 75 inches/second and the packing density is 800 bpi. It is the single capstan system.

The line printer has 120 characters/line, 600 lines/minute are printed and it uses the English figure symbol type drum system.

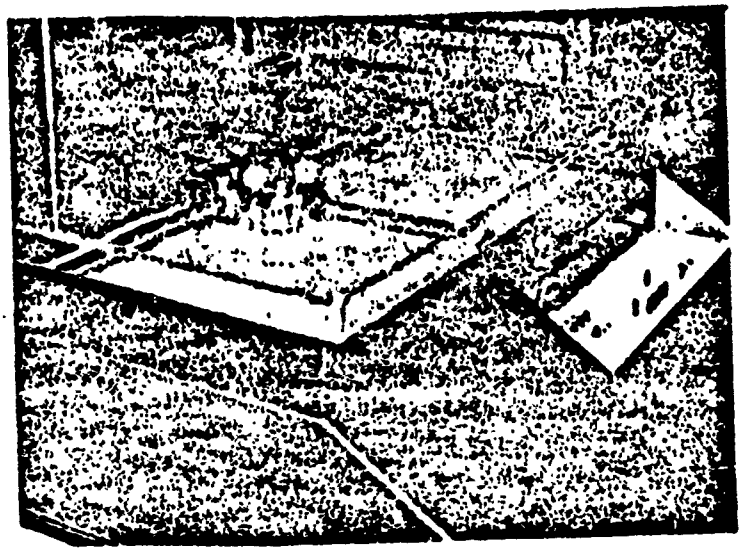
Laboratory 8 - Computer Network Lab

Together with Labs 2 and 4, this lab is in the middle of developing a front network processor. It is connected to the 108 computer of Monstsu University by a 1,200 baud or 2,400 baud circuit. The data terminals are connected at the same time. This produces the system that is shown in the figure on the following page.

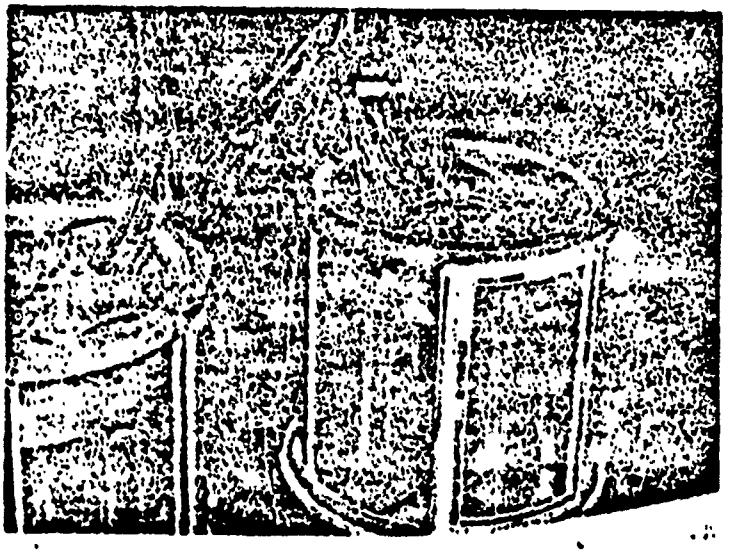




SHANGHAI COMPUTER RESEARCH LAB

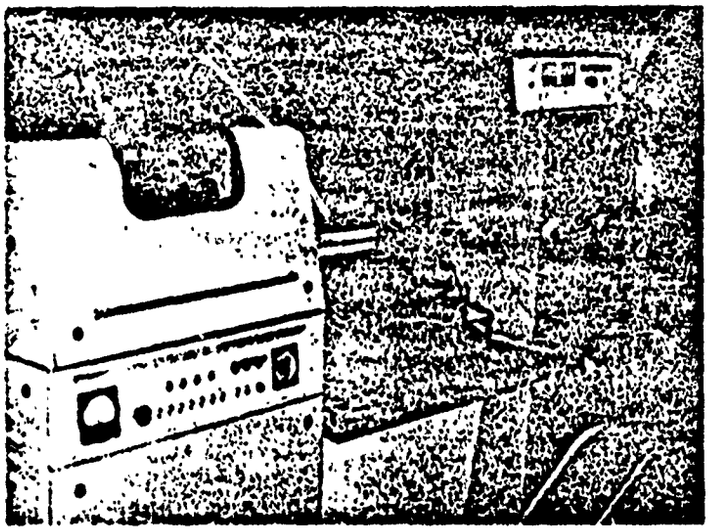


X Y PLOTTER AT THE SHANGHAI COMPUTER RESEARCH LAB



MAGNETIC DRUM AT THE
SHANGHAI COMPUTER RESEARCH LAB

731 COMPUTER AT THE
SHANGHAI COMPUTER RESEARCH LAB



731 COMPUTER PERIPHERAL EQUIPMENT AT THE
SHANGHAI COMPUTER RESEARCH LABORATORY

Today they have completed trial production of the FEP hardware. This was a single unit in software debugging. First, both centers began to make inquiries from the terminal and next they planned to make usage of the hardware very advanced.

OUTLINE OF THE 731 COMPUTER

Word length - 48 bits
Operation speed - 200k command/second

main memory - 64k word (48 + 2 bits/word) core memory

cycle time - 21 μs

Channel - selector channel - 1
multiplexer channel - 8

Logic Element - TTL - 14 pin flat pack

Peripheral Equipment

Magnetic tape - 4 rolls
1 inch wide magnetic tape,
16 track

8 tracks are used for information,
the remaining 8 are used for
Hamming revision.

Packing density about 20 bits per mm
(556 bpi)

number of revolutions - 1,500 rpm

line printer - 4

80 characters/line, 600 lines/minute

Paper tape reader - 2
1,200 characters/second

keyboard perforator - 2

X Y plotter - 2

Usage - the peripheral equipment listed above is divided into two groups and two programs are processed at the same time.

POST SCRIPT

The Telephone directory is used by Shanghai telephones. The participants call the operator for director assistance.

The operator listens to the request from the participants and inputs the name, address, etc., in the computer system with the

keyboard. The participants ask for numbers. The request for numbers of participants is done with voice output. In this system, the voice output joins words together. A reply is given in one minute per person. There are about 80,000 people who participate in this system in Shanghai. About 10,000 of these are input into the computer. It is only a luxury service.

This system was developed at this research lab.

Conditions of computer usage in Shanghai: The computer center can be used by every industrial sector, but at the present time it is only used by 10 places. The universities have computers for computer instruction and research. There are very few factories and workshops that are even using the computers for experiments.

IMPRESSIONS

There is a computer center in Shanghai, and we were told that it was being used for the development of application programs. However, the computer center is not at all like the common computer centers in our country. It seems that it is not used very much.

The level of computer hardware technology is very low.

They are developing a magnetic tape device with 1/2 inch wide tape, 800 bpi and 75 inches/second. However, they have not yet started developing one with 1600 bpi.

The magnetic tape (recording medium) itself is not Chinese-produced goods very often. Consequently, there are problems for the factories who do not import equipment.

We did not see a disk memory at all.

Trial production of a core memory is being done at the laboratory.

They are now trial producing a three-dimensional object with a cycle time of 2 μs and 18 bits/8k words and mounted on a hardboard. They are probably fifteen years behind our country.

We felt that each piece of equipment in the laboratory was defective.

It is essential that China understands the standards of each advanced country, beginning with Japan, and that she think better of computer technology, development and planning.

3 TIENTSIN SEMICONDUCTOR FACTORY NUMBER 1

Date and Time: November 6 8:40 a.m. - 11:40 a.m.

Hosts:	Do Mon Ke	Factory Head (Tientsin Semiconductor Factory Number 1)
	Sho Wang	Technical Head (Tientsin Semiconductor Factory Number 1)
	Shu Feng Tzu	Secretary General (Tientsin Semiconductor Factory Number One)
	Chang Koku Wa	Process Supervisor (Tientsin Semiconductor Factory Number 1)
	Bo Ping Shu	Industrial Arts Section Head (Tientsin Semiconductor Factory Number 1)
	Many others	

FACTORY OUTLINE

Establishment - 1964, diode, transistors

Employees - 940

Production - digital TTL IC millions/year

When it was first established, they produced diodes and transistors, but today the main product is the TTL IC.

Today they also produce some core memory (illegible) power transistors.

Products - flat pack TTL, circuits - 14 types

Only very basic products, such as 2 gate, 4 input circuits, are used in the majority of computers and meters in Tientsin. It seems that the products used by Tientsin are made by Tientsin.

Organization: The factory has the following sections.

Development and research of new goods

IC production Number 1
IC production Number 2

Transistor production for use in television mechanical processes (making equipment, etc.)

Power (electrical power, compressed air, etc.)

Production of parts and accessories for use in integrated circuits

There are also other sections for production, technology, and testing (quality and control).

Others: Most of the equipment is made in Tientsin or in another part of China. The raw materials and unfinished goods are received from another factory in Tientsin. The silicon wafer is supplied by the Tientsin Semiconductor Factory.

There are tens of semiconductor factories in Tientsin and this factory is the largest.

Factory Number 2 produces germanium transistors for use in radios. Factory Number 3 produces silicon thyristors and Factory Number 4 produces an MOS IC.

OBSERVATIONS AND IMPRESSIONS

We observed mainly the IC production process, since time was brief and we wanted to see everything.

We were able to observe each process, such as the grinding of wafers, epitaxial growth, photoresistant application, mask transfer exposure, diffusion, vacuum evaporation of aluminum, wafer test, cutting, assembling, testing, credibility and guarantee test mask framework, etc.

There are 14 types of goods with basic functions such as the two gate TTL or the simple flipflop. They use the 14-pin flat pack. It reminds us of goods that our country produced from about 1963 to 1965.

The mask is also a simple device.

They use a wafer that is only 1.5 inches in diameter.

It seems that the equipment is also the equipment that was tested in the early stages in Japan. It is difficult to tell what the amount of production is. We often saw that there were problems with equipment and operations and therefore with the quality of the products. Because China produces her own glass mask, oven for polishing and epitaxial growth, mask transfer exposure device, wafer tester, cutter for cutting wafers, supersonic wave bonder(1), etc., we did not see much imported equipment. (They did use one vacuum evaporating device that was produced in Japan.) The idea of self-reliance could be felt. In order for there to be an increase in integration and functions, the incentive of the Chinese and credibility of goods must be improved. These problems are large obstacles to productivity.

Furthermore, today they have started developing a dual in-line package (14 pin, ceramic).

(1) Ultrasonic waves used for aluminum wire bonding

In addition, they are emphasizing research on new processes.[1] They are progressively receiving equipment and technology from foreign countries and from now on we can expect China to urgently expand its industrial sector.

POSTSCRIPT 1

Both this semiconductor factory and the Shanghai Wireless Electronics Factory Number 13 are developing the dual in-line package TTL. They have also included the DJS 200-20. Part of the Semiconductor Factory has been successful at development.

The Kuangchou Trade Grounds are displaying the mold case TTL.

POSTSCRIPT 2

We listened to the ideas of a production process planning specialist when we returned to Japan. The level of credibility in China is that of Japan in the past. Japan previously mass-produced the silicon transistor.

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(1) They are in the middle of testing the 60 kV ion injection device (Cho Chin). They are still planning to test the glass mask framing device (Chinese made) which uses a laser.

TIENTSIN SEMICONDUCTOR FACTORY NUMBER 1

4. PEKING WIRE ELECTRONICS FACTORY

Time and Date November 1, 1978 2:30 p.m. - 5:00 p.m.

Hosts: Factory Vice-president Chang Lin Mei
Assistant General Process Supervisor
Shin Liang
Others - several

FACTORY OUTLINE

Construction began in 1953 with assistance from the Soviet Union and was finished in 1957. Production started at that time. A telephone switching device was the main product. After 1958 production of the computer was also added.

Out of more than 3,000 employees, 1,000 are involved in computer related work. The computers include

1958- DJS-2, DJS-3 (as well as a vacuum tube system)
1964- DJS-6, DJS-8 (Ge transistor system)
48 bits/word 65 k word memory
average execution time- 60,000 cycles/sec
1972- DJS-154, DJS-220 (being developed)
(together with TTL IC system)

DJS-154

-multiprocess (used for science and technology and for process control)
-16 bits/word
-main memory-- core memory: 16 KW (Max 32 KW)
-program system with the wired core system ROM
-I/O channel- 2 types
-software FORTRAN/BASIC/ALGOL/ Assembler
-built in 1 M bit drum

DJS-220

-32 bit/word
-Main memory- core memory: 32 kW(Max 64 kW)
program system with a diode matrix ROM
-I/O channel- 2 types
(byte multiplexor channel, block channel)
(16 subchannel)
-average execution time- 100,000-150,000 cycles/second
-peripheral equipment

Line printer (900 L/m)
drum (4 M bit, access 20 ms, transmission 440 KB/S)

IDEA EXCHANGE

-What is the amount of DJS-154 production? (Japan)
A. About 60 were produced in 1978
-What percentage of the parts and accessories were imported from abroad? (Japan)
A. The electrical parts and accessories (IC, etc.) and substrates were imported. The peripheral equipment, such as the drums, etc. were manufactured in this factory.
-How is the production plan carried out? (Does this give estimated production?) (Japan)
A. This production is based on the decision of the National Planning Agency.
-How is quality control done in the Japanese corporation? (China)
A. They are using a check system that is completely independent of the manufacturing departments.

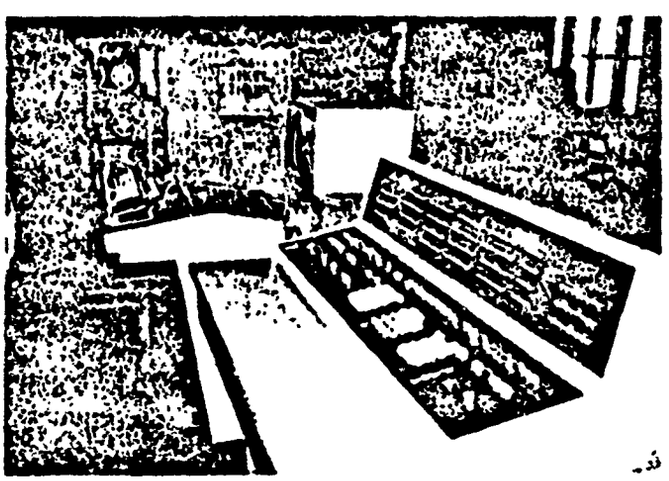
Others

They have introduced competition to the factories today. The adoption of a plan in which production, quality, etc. influence wages (average of 55 yuan) is for the good of the national character.

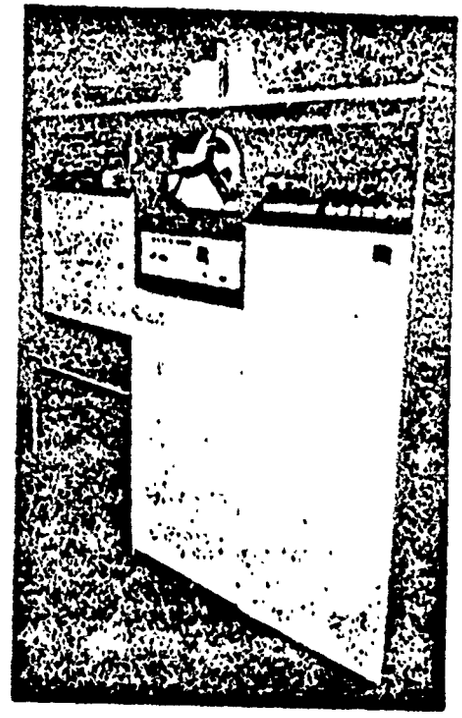
MR. CHANG LIN NEI (RIGHT END) AT THE PEKING WIRE ELECTRONICS FACTORY

PEKING WIRE ELECTRONICS FACTORY
COMPUTER PARTS ASSEMBLY WORKSHOP

DJS 220 AT THE PEKING WIRE ELECTRONICS FACTORY



DJS 220 AT THE PEKING WIRE ELECTRONICS FACTORY



DJS 154 AT THE PEKING WIRE ELECTRONICS FACTORY

5. SHANGHAI WIRELESS ELECTRONICS FACTORY NUMBER 13

Time and Date: November 9, 1978 2:30 p.m. - 5:00 p.m.

Hosts: -----

FACTORY OUTLINE

This factory was established in 1966 as a computer specialty factory.

At that time there were 100-200 employees who produced transistor computers (average operation speed of 10,000 cycles/second.). Today there are about 1,200 employees (300 of whom are engineers) who produce IC computers which attain an average optimum operation speed of 1,000,000 cycles/second.

TQ 12 G

This is the only circuit board in Shanghai. Production started in 1976 and monthly production of the circuit board is 1,000.

8 P-MOS LSI (500-800 gate, 28 pin) are mounted on the circuit board. The parts for the circuit board are manufactured at the Shanghai Wireless Electronics Factory Number 14 (parts specialty).

An aging test is done in 8 hours.

TQ-21

It has functions similar to a high grade circuit board. A teleprinter, paper tape reader-punch and digital indicator are attached to a 10 step data processor.

It has a memory of 4,096 characters with 10 steps (4 bits). The others have 2 kW (40 bits/word) for a micro-programming memory.

Eight of these have been trial manufactured. The present production plans call for four to be produced in a month.

TQ-16

The operation speed is about 110,000 cycles per second on the average. It is a multipurpose machine with a memory capacity of 32 kW (48 bits/word) and it uses a core memory (cycle time of 2μs). About 100 have been shipped.

A 1,500 rpm, 1 M bit drum device, 600 line/minute line printer, 1 inch magnetic tape, etc. are attached to the TQ-16. The 1 inch tape includes 8 bits for information and 8 bits for the Hamming code.

TQ-6

The operation speed is 1,000,000 cycles and it carries out floating point operations with 48 bits/word. It uses the TTL-IC. The memory is 128 kW. 12 have been shipped.

Tw-15 (DJS-131-1)

This seems to be their main product. It belongs to the minicomputer group. It has a capacity of a 4 kW-32 kW core memory with 16 bits/word. The peripheral equipment includes a paper tape reader-punch teletype, drum, tape, disk, line printer, XY plotter, AD/DA computer, etc.

100 have previously been shipped and the production base is 5-6/month.

DJS 200-20

This is a new type of machine that is being trial manufactured. It is a 32 bit machine and its software is interchangeable with the DJS 220 of the Peking Wire Electronics Factory. The command number is 183 with a 128 kW core memory (512 k byte). It has a fixed point operation speed of 2.75μs and a floating point operation speed of 7.75 μs. (R-R operation)

The architecture resembles the 16 general register IBM 370. (However, the command form is different from the IBM.)

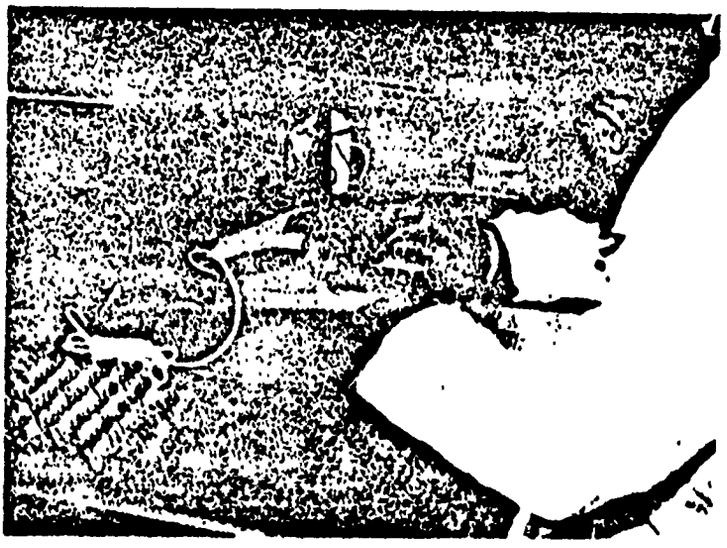
It uses a microprogram control system. It has a 3328 W X 100 bit memory because of this system. The logic element is a TTL IC.

IDEA EXCHANGE

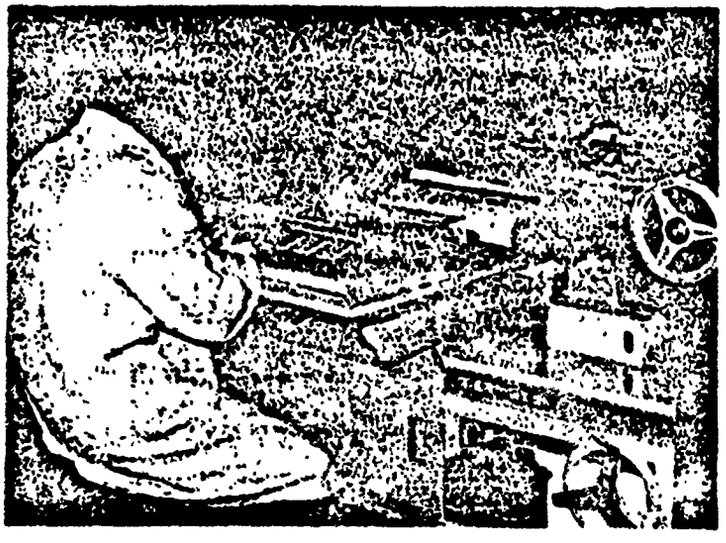
There were questions from the Chinese concerning the method of cooperation between the U.S. and Japan on computer technology. We explained this with an example of joint research.

They are moving toward developing a new machine that resembles the IBM 370 architecture with 32 bits like the DJS 200, 220 (Peking).

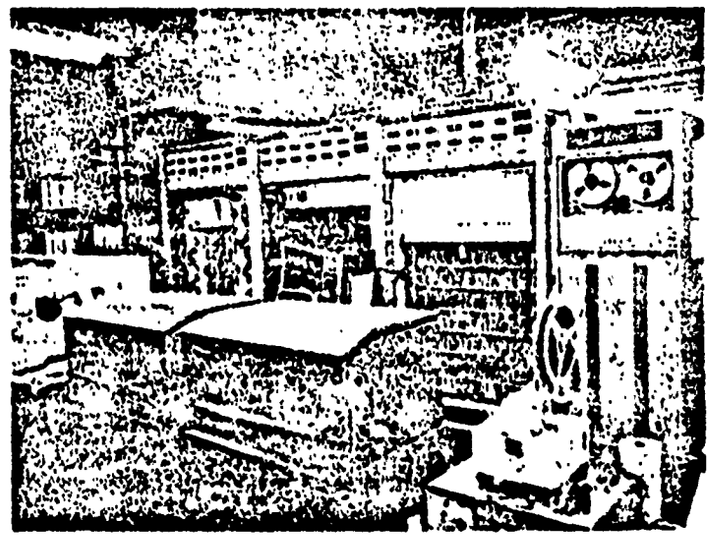
The Chinese side made speeches to the effect that they are investigating the standardization of the imput/output interface.



ASSEMBLY OF THE TQ-12G (CIRCUIT BOARD) AT THE
SHANGHAI WIRELESS ELECTRONICS FACTORY NUMBER 13



TQ-21 SHANGHAI WIRELESS ELECTRONICS FACTORY NUMBER 13



DJS-200-20 SHANGHAI WIRELESS
ELECTRONICS FACTORY NUMBER 13

6. SHOHAU UNIVERSITY (PEKING)

Time and Date: November 2 2:30 p.m. - 5:30 p.m.

Place: Peking Suburbs

Host: (5 people)

Feng Ko Sai....Professor (Wireless Electronics)
Ko To Seki.....Professor (Electronics)

Hua Shin .....Professor (Electronics)
Liang Sen Liu..Professor (Electronics)
Shu Ko Wang....Engineer (Director)

HISTORY OF THE UNIVERSITY

1. Established in 1911 (67 year history)

This university accepted exchange students and had a literature, law, agriculture and engineering department.

2. 1950: After China became the people's Republic of China in 1949 the university specialized in physics and engineering. (The literature, law and agriculture departments were transferred elsewhere.)

PRESENT CONDITIONS

1. Number of students: 7,000 (in 1949 there were 1,000 and in 1960 there were 12,000)

2. Number of research students: 1,000 (same as a graduate student in Japan)

3. Engineering department has 11 sections:
    1. Electrical Process (700 students)
    2. Wireless Electronics
    3. Automation
    4. Electrical Power
    5. Process Physics

6. Process Chemistry
7. Dynamics
8. Water Supply
9. Architecture
10. Mechanics
11. Precision Engineering

Furthermore, there are basic classes (for example, the common subdivisions of mathematics, physics, etc.).

4. Number of professors: 2,800 (out of these, 186 are full professors)

Note: The extremely low number of professors is due to the influence of the Gang of Four. Even since 1963 there has been no increase in the number of professors. Even today there is still a system of allotment. Among the instructors there are many high-level teachers (professor class).

5. Student Enrollment: Use an entrance examination system (serious consideration of ability and talent).

OBSERVATION OF THE FACILITIES

1. Computers (Laboratory of the Electronics Process School)

1. DJS-130

This computer was manufactured at the factory affiliated with the university (specialty). It resembles the NOVA (Data General Company). It was completed in 1974 (most efficient model).

DJS-130: main memory capacity: 32 k word (16 bit/W)

circuit element: IC (TTL)
operation speed: 500 k cycles/s
programming language: BASIC

Used for:
1. training related to technology used in computers
2. LSI pattern design (1,024 bit DY-MOS)
3. Electronic Process School Experiments
4. Scientific computations of each department
5. Kanji processing research
6. Visual processing research

Note: Regarding 5 and 6, there is a CRT display room next to the computer room. There is a DJS-130 DY computer in this room. Therefore, this demo is entrusted with Kanji processing. However, we could not observe it in 1 hour.

2. OTHER LABS

A. Electron Microscope (1974 Japan Electronics) material analysis (for analytical experiments of each department and for several experiments related to the crystal composition of semiconductor materials, ceramics, etc.)

B. Chemical analysis meter (R-22 Hitachi) Analysis of physical composition with nuclear magnetic resonance (electromagnetic waves 90 MHz)

C. Substance magnetometer (West Germany) Analysis of H_2, C, O_2, etc.

D. Spectrometer (AS-610S spectrometer, 1975 Chang Chiang) metallurgy analysis (iron, nickel, steel, and others)

3. MACHINE FACTORIES AFFILIATED WITH THE UNIVERSITY

Factory outline:

Today 500 people are employed at the university factory (including students and laborers technicians). The employees learn the actual mechanical process techniques. They manufacture industrial components. The trainees graduate in 5 weeks. There is one laborer (technician) for every 5 trainees. They are mainly lathe process technicians. There are 2 NC machines in the factory.

4. UNIVERSITY LIBRARY

Established: 1919
Books: 1,900,000 books (2/3 are Chinese and 1/3 are foreign) Many of the foreign books are Japanese. There are 2,000 different foreign journals. 1/2 of the reading materials are related to science and technology. When it was an integrated university there were scores of books on ancient Chinese literature, etc. In 1972 the university library received a donation from Mr. Ping Sai. There are many books related to programming in addition to the 1974 edition of "Computer Dictionary" and "Information Industry Handbook." Today there are four people studying in Japan to learn about the computerization of the library.

OBSERVATIONS

1. In Peking the two universities that teach engineering are Shohua University and the Science and Technology University. The Peking University and Citizens' University teach literature. Shohua University is the largest.

2. The Chinese education system consists of 5 years of elementary school, 5 years of middle school, 2 years of high school, and college for some afterwards. The number of children in cities who attend middle school is high and the number of children in the country who attend middle school is low.

3. College is a 4 year system. Along with the instruction in colleges, research is also carried out. There are several research laboratories.

4. Most of the university teachers are instructors. Teachers who do research become professors. (They do not have the ranks of tutors, lecturers, and assistant professors as we do in Japan.)

5. By 1985 the university plans to have the following: 20,000 students, 3,000 researchers and about 1,000 teachers.

6. This university is in the Peking suburbs. It actually has a very large campus. The buildings are large and the ceilings are high. The reception room (about 20 scfas) is very clean. The university is envied as a place to study.

7. Because of the teachers at this university, freedor of

study is (illegible). These teachers were critical of the Gang of Four, who delayed Chinese science and technology. Today's government has said that these teachers are making large contributions to the schools.

7. FUTAN UNIVERSITY (SHANGHAI)

Time and Date: November 10, 8:30 a.m.- 11:40 a.m.

Hosts: Itua Li Ko.....Vice-president of the Scientific Research Lab
Feng Tsu Sei.....Scientific Research Secretary of Computer Science Department
10 others

OUTLINE OF FUTAN UNIVERSITY

Futan University was founded in 1905. It occupies 190 square kilometers of space. The present dean is Mr. Liang Ko Sai. He is a world-renowned mathematician who studied in Japan.

The university is divided into the two schools of literature and science and engineering. The literature department includes the following 7 subdivisions:

Chinese,
Foreign Languages,
Political Science,
Economics,
Journalism,
Philosophy,
and History.

The science and engineering department is also divided into 7 subdivisions of

Mathematics,
Physics,
Atomic Energy,
Optics,
Chemistry,
Biology,
and Electronic Computers.

Moreover, it also has 4 research laboratories: a mathematics lab, a modern physics lab, an electronics lab and an optics lab.

There are 2,000 instructors and 4,000 students. Out of these 4,000 students, 300 are research students. About 1/3 of the students are female. The Gang of Four was responsible for the low number of students in comparison to the number of teachers. While teachers were accepted during the cultural revolution, students were pressured and the students graduated in 1-3 years. Today it takes 4 years to graduate and some are research students for another 3 years.

Because of the four modernizations they have decided that the number of students must increase. In 1985 they have decided to have 12,000 students, and of these, 3,000 will be research students.

In order to improve the standards of the teachers, they have decided that besides studying in study groups, the young teachers will also be educated at universities in foreign countries.

OUTLINE OF THE ELECTRONIC COMPUTER DEPARTMENT

In September 1975 the Electronic Computer Department was established by combining the courses of information theory and programming from the mathematics department and automatic control and computers from the physics department. Today there are 150 teachers, 400 students and 10 research students.

After receiving a basic education for 2-2.5 years, the students in the Electronic Computer Department take special courses for 1.5-2 years. the basic courses include advanced mathematics, algebra, physics, program design, ALGOL, probability and statistics (I), computer theory, system design, etc. The specialty courses include probability and statistics (II), complex coefficient theory, system analysis and simulation, pattern recognition, information theory, graphic processing, character and voice recognition, etc.

There is a character recognition lab, computer lab, and integrated circuit lab in the Electronic Computer Department.

OBSERVATION OF THE ELECTRONIC COMPUTER LAB

CHARACTER RECOGNITION LAB

The Chinese-manufactured electronic computer, DJS-17, is connected to a self-made identification unit. The identification device scans with a 5,000 spot matrix for a type of 2.5 x 3.5 millimeters. The spot diameter is 25 microns. It then sorts and recognizes 20 x 36 (=720) dots. It is possible to recognize today's English figures. The next step is Kanji recognition. The DJS 17 has 24 bits/word and an 8 k word core memory. Moreover, it is connected to a 64 k word magnetic drum.

THE SDJ-719 ELECTRONIC COMPUTER

This electronic computer is used in the hardware-software practice of the students. It was completed in September 1971. Therefore, it was named the SDJ-719. SDJ stands for Shuzi (numbers digital), Dianzi (electronic), and Jisuangji (computer). It has 48 bits/word, a 32 k word core memory, a cycle time of 2.4 μ s and uses an IC in the channel. The peripheral equipment consists of a magnetic drum, magnetic tape, paper tape, a typewriter, a display, etc. It can also be connected to an A-D converter. The languages used are assembler and ALGOL.

THE INTEGRATED CIRCUIT LAB

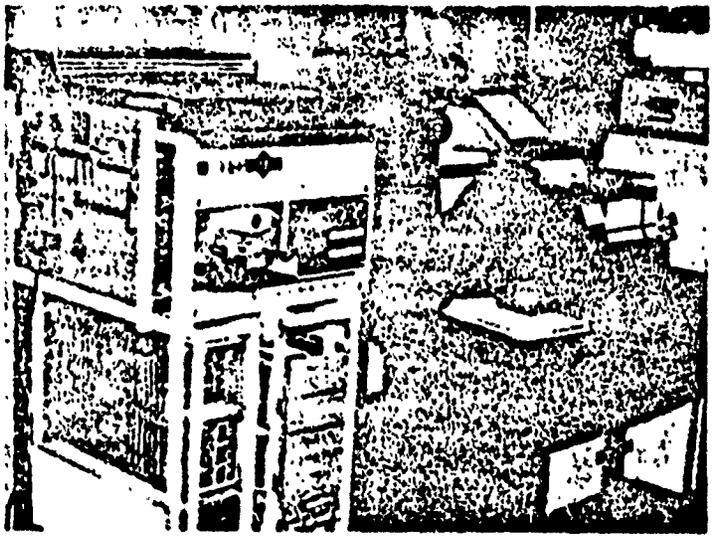
They have made a linear circuit IC. They have persistently tested the circuit but it is not being manufactured. They showed that the person who manufactures the IC is the basis of the industry.

IMPRESSIONS

Shohua University is also situated in Peking. However, it was nearly destroyed by the Gang of Four. However, today the university has recovered and they have high expectations for the university because of the four modernizations. Today China is taking the education system seriously. Certainly, research will continue and they will accept progressive ideas. This will not be found in lectures, but will be through experiments of all types. There is a good feeling towards the expansion of education in China. We can anticipate future growth.

8. TIENTSIN MACHINE TOOL FACTORY NUMBER 8

Date and Time: November 7, 10:00 a.m. - 11:30 a.m.



DJS 17 (FUTAN UNIVERSITY CHARACTER RECOGNITION LAB)

Hosts: Chang Pai Hua....Tientsin Machine Tool Factory Number 1
Chang.....Technical Head
Kei Dai Gi.....Process Division Section Head
Lin Sei Ishi.....Planning Division
Go Feng Chung....Publicity Section

FACTORY OUTLINE

1. HISTORY:

This factory was established in 1952. At that time it

was involved in lathe production. However, since 1957 it has been a factory specializing in machine tools for gear shaping, cogwheel processes, etc. In Tientsin there are 9 of these factories, from Machine Tool Factory Number 1-Number 9. Each of these factories produces a certain machine. However, of the 9 factories this factory has the largest plan and scale.

2. PRODUCTION OUTLINE

Employees: 4,100

Production fell 2 years ago because of the Tangsan earthquake. Today production is done in 2 shifts (some of the industries produce in 3 shifts).

Manufactured goods:

Machine tools for each type of gear process.
53 types: (3 series of large, medium and small).

Amount Produced: 720/year (amoung set by National Planning)

Place of Work: There is consistent production after casting so there are 14 workshops within the factory, excluding planning, etc.

Casting-1	Assembly-1
Wooden Patterns-1	Repairing-1
Machine-6	Trial Production-1
Heat Treatment-1	

At this factory there is also a Gear lab, Laborers' College and Science and Engineering School.

Equipment: There are 700 machines. Most of these were made in China. Because there is no consideration for the connection between equipment and precision and production, there is very little equipment that is imported from Japan, Germany, Switzerland or the United States.

FACTORY OBSERVATION:

This is a 250,000 m^2 casting factory. There are 15-16 factory workshops that are called machine factories. They are arranged in a very loose manner. We were guided through the large machine workshop, cutting workshop, heat treatment workshop, etc. Their outline is as follows.

1. LARGE MACHINE WORKSHOP

Δ This is an 80 x 100 m workshop. They chiefly are involved in the production and assembly of large parts and accessories such as beds and columns.

Δ The workshop is divided into 4 sections. In each section there are 2 overhead cranes weighing 15 tons. All of the cranes were produced in China and they are operated by women.

Δ All of the machine tools such as planers, milling machines, jig pullers, etc. are produced in China. We did not see even one NC machine.

Δ Before casting, etc., goods accumulate and there is no concept of consolidation or regulation.

Δ The goods are transported only by cranes or trucks. They do not use a forklift, flatcar, etc.

Δ The lighting in the factory is poor and there is insufficient floor space. The environment of the factory is not very good.

Δ During our observation we did not see very many machine tools working and there were many employees who were not working.

Δ They did not use a system of accounting for the raw materials or parts and we did not see a time table for the completion of processes.

2. GEAR FACTORY AND HEAT TREATMENT FACTORY

Δ The Gear Factory was 20 x 40 m. They carried out blank process and cutting.

In this factory there were about 20 pieces of equipment, such as gear shapers, and lathes.

Δ One employee always is assigned to the gear shaper and lathe. They regard the process with a fixed eye.

Δ The cutting Workshop is relatively new. Most of the equipment was manufactured in 1973-1974. Most of it was made in this factory or in other Tientsin factories.

The Heat Treatment Workshop is next to the Cutting Workshop. It has 8 pit type coal ovens.

3. DAY NURSERY AND CHAIRMAN MAO MEMORIAL HALL

Δ There is a day nursery for the employees of the factory. There are about 20 children who are taken care of by 3 women in this nursery.

Δ In 1957 a memorial hall dedicated to Chairman Mao was built in the factory.

Δ In the memorial hall there are new pictures and the sayings of Mao Tse Tung, pictures of tools and itineraries displayed.

4. OTHERS

There are nine machine tool factories in Tientsin. There is consistent production from casting to the finished product. They are about to coordinate this consistent production because there are problems with control, quality, production efficiency, etc.

The initial salary at the factory is 17-12 yuan for a first grade employee and 34 yuan per month. The salary for employees in Chinese factories is usually divided into 8 grades. The first grade is 35 yuan and the 8th grade is 110 yuan. The wages at this factory are almost average.

IMPRESSIONS

The important equipment is regulated to some extent. Most of the machines needed by Tientsin industry are made here.

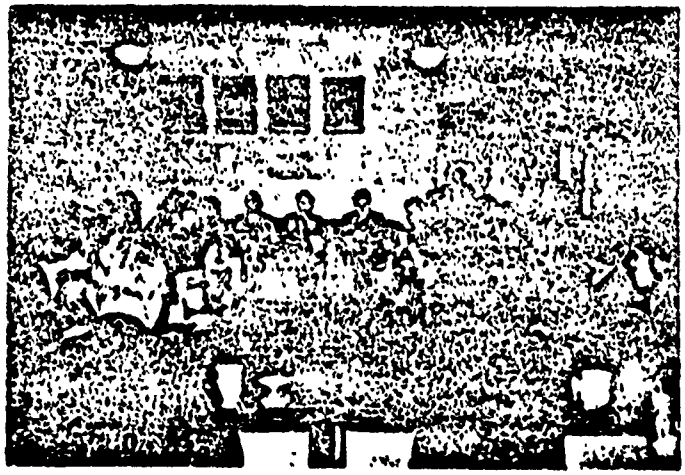
Consequently, since close attention is paid only to the fact that important machinery is produced by self-reliance, there is hardly any concern for production efficiency or control.

They have not accepted foreign technology. The Chinese started from nothing 20 years ago and it was only with much effort that they are where they are today.

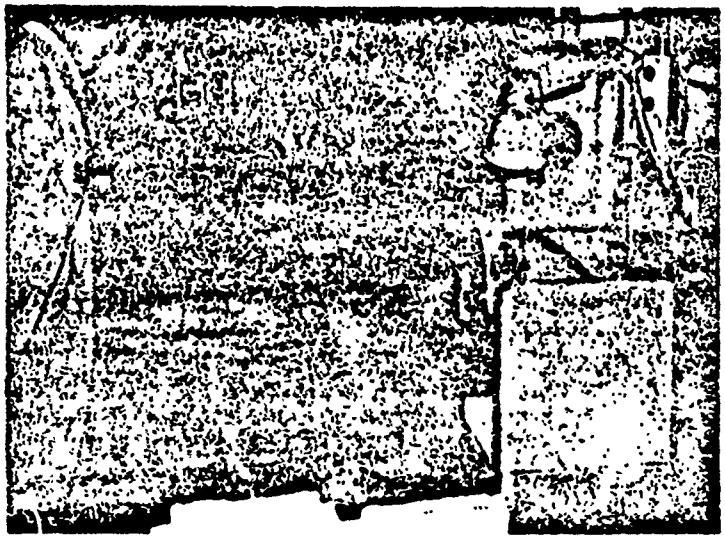
They do have a concern for the factories and production efficiency today due to the four modernizations and they are moving towards improvements in the production of machine tools today.

9. TIENTSIN NUMBER 1 RUG FACTORY

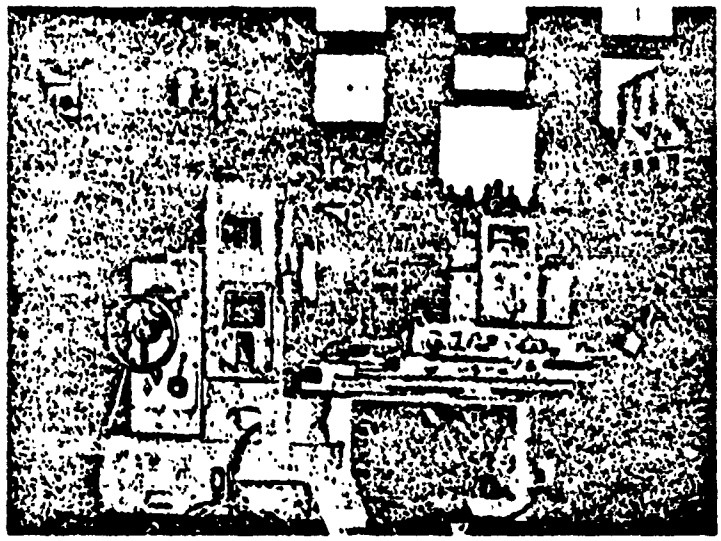
Date and Time: November 7 8:20 a.m. - 9:30 p.m.



DELEGATE SAKAGUCHI AT THE TIENTSIN DEBATES



AT THE TIENTSIN NUMBER 1 MACHINE TOOL FACTORY



AT THE TIENTSIN MACHINE TOOL FACTORY NUMBER 1

Hosts: Shu Kao Mon...Factory General Management Division
Liang Shu Fen.Factory General Management Vice-president

FACTORY OUTLINE

1. HISTORY:

Chinese rugs have a 2,000 year history which starts in the Han dynasty. It is a traditional art that is world-known. Prior to liberation, the industry was found in homes. After liberation, the production of rugs was brought to the factory.

This factory started making rugs in 1958. Within the 20 years that the factory has been making rugs, the amount, types designs, etc. have increased. Tapestries are particularly famous. Since 1972 this factory has been making a series of tapestries which are of the great wall of China. There are 8 rug factories in Tientsin (Number 1-Number 8) but this factory produces all of the wool rugs.

1. PRODUCTION:

Δ Employees: 1,400 (60% are women); average age is 36
Δ products: raw materials (wool)
knitted rugs
Δ amount produced: raw materials- 1,700 tons/year
knitted rugs- 26,000 m^3/ year
Δ amount sold: 1977- 24,000,000 yuan (about 2,888,000,000 yen)
Δ types of products: rug types: (1) 70 (both directions)
(2) 120 (both directions)
(3) wool

Δ designs: 1. Gijitsu (peony)
2. Peking style (old design)
3. Saike style (flower design)
4. Soko style (one color only)

Δ characteristics of the products:

-They do not use man-made fibers.
-If it is hand made it will last for about 50 years.
-The particular fibers are very durable.
-Electric shears give the rug a look of unity.
-High quality dyes are used

Δ workshops: combing, knitting, dying

Δ raw materials: All of the raw materials are made in China

Δ exporting: Today the rugs are exported to 50 countries
The main countries which they are exported to
are Germany, Switzerland, and Japan.

OBSERVATION OF THE FACTORY

We observed the knitting workshop, finishing workshop and shaping workshop.

1. Knitting workshop

Δ This is where the rugs are knitted into a specific design. This workshop is about 20 m x 40 m. It has 3 sections. The first room is equipped with about 30 weaving machines. There are about 95 machines total.

Δ Custom made rugs are made here before they have been paid for. Each machine has a different pattern and various rugs can be made.

Δ It takes 3-4 people to make a large rug. The knitting speed is 5-6 cm per day by 3 people working on a 2m wide rug. Consequently, that is about 6 m^3 of knitting (2mx3m), so it take 3 people about 2 months to make this rug.

Δ A night shift is unnecessary so there is 1 eight hour shift.

Δ The knitting process is done by hand but weaving has become mechanized. This mechanization lets 2 people do in 2 hours what it used to take 4 people to do in 1 day.

Δ There was a bulletin board with

"Congratulations Japan China Peace and Friendship Treaty Creation"

written in large letters in the workshop.

2. Finishing Workshop

Δ The knitted rugs are made even here. The workers use a revolving cutter to make large pieces. The finishing is done by moving the rug back and forth under the cutter.

Δ There are 3 finishing machines in the workshop. 2-3 rugs can be finished in 1 day with 1 machine.

3. Shaping Workshop

Δ The rug is made to have a uniform appearance by using cutting shears. The area of the workshop is about 20 m x 40 m and there are about 50 people who work with the scissors.

Δ This is gradually becoming an important technique. It will be 1.5-2 years before it becomes a separate company.

4. Others (according to Mr. Shu)

Δ They are gradually accepting new techniques and the combing, dying and knitting processes are becoming semi-mechanized or mechanized.

Δ The industry level and production efficiency are still low and there are various production problems.

Δ Since the purge of the Gang of Four there has been much improvement. Last year they surpassed the previous annual production figures before the 23rd of January. The raw materials are only 1/2 wool and therefore, this causes problems in production.

IMPRESSIONS

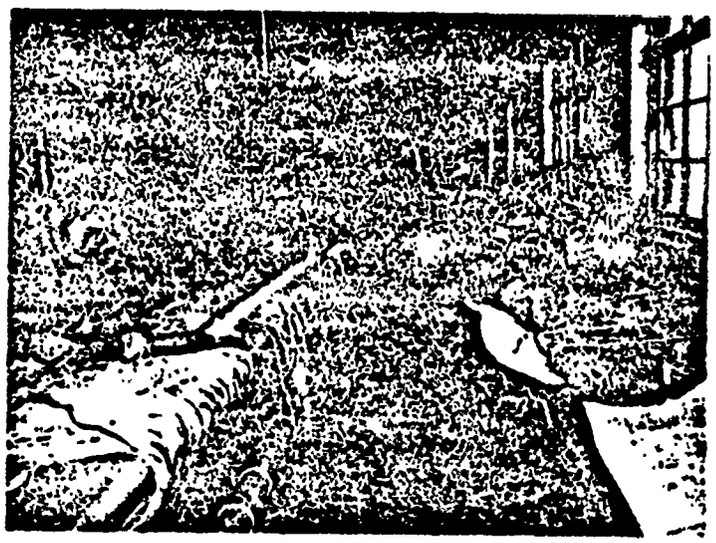
Δ Many people from foreign countries visit this factory to see the traditional industry.

Δ We did not receive clear answers to our questions on the quality of the products or the speed of the process. This did not happen in the other factories we visited. Almost all of the rugs made here are exported. The cost of making the rugs is very high.

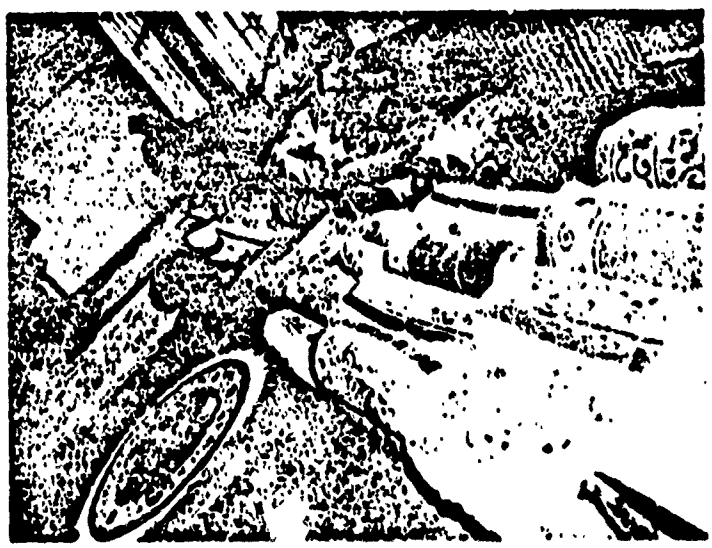
Δ We did not see many workers in the factory who were idle. The factory performance was high and controls were carried out.

In each workshop decisions were made about production, quality and safety. Controls from the management are not imposed. It was like a small enterprise in Japan. It seemed to be a very moral factory.

TIENTSIN NUMBER 1 RUG FACTORY KNITTING WORKSHOP



TIENTSIN NUMBER 1 RUG FACTORY SHAPING WORKSHOP
(USING ELECTRIC SCISSORS)



TIENTSIN NUMBER 1 RUG FACTORY FINISHING WORKSHOP

10. SHANGHAI AUTOMOBILE FACTORY

Date and Time: November 10 8:50 a.m.-11:00 a.m.
Hosts: Interior Supervisor Shiang Do Kei
Planning Department Head, Lin Sai Nen
Place: About 30 km outside of Shanghai, 50 minutes by car
Schedule: 8:50-9:05 greeting and explanation of the factory
9:05-9:10 greetings from Vice Chairman of the delegation
9:10-10:30 observation
10:30-11:05 questions and answers

Factory outline (explained by Mr. Shiang)

(1) Products: "Shanghai passenger auto....3,000/year
2 ton cab over model truck....6,000/year
(2) 2,100 members (1/3 are women)
young employees--50%
direct employees--70%
(3) They mainly produce and assemble the passenger automobile. The engine, gauges, etc. are brought from other factories.
(4) The factory is divided into 6 parts:
i) body and attached parts
ii) 2 ton truck production (body welding and assembly)
iii) press
iv) passenger auto body
v) tool
vi) passenger auto assembly

The rest are maintenance departments

(5) History of the factory
1958-1960 production of three wheeled vehicle
1959 trial manufacturing and development of passenger autos

1961 overall production and development of passenger autos

1974-present model change

The factory has a 20-year history. At first they started from nothing. Development was slow. Most of the work remaining is done by humans. The Gang of Four had a large influence on the factory. Production methods were delayed. The rate of production did not improve. They did not respond to national demands. The government is concerned about automobile production.

(6) The factory has one more area which is 3 km away from this factory. It is in the middle of being built and in the future they would like to use it for passenger autos. Today they are in the middle of seeing to this and it is irrational.

OBSERVATIONS (independent photographs)

After we observed the machining workshop, the welding platform production workshop, press, 2-ton truck cab painting and assembly line, we observed the passenger auto factory that is three km away.

We observed only the assembly line at this factory.

IMPRESSIONS:

The automobile industry is somewhat slow.

There were no safety measures taken when using the ED to paint the bottom of the chassis.

They use the Benz type complete transport support passenger autos.

The underfloor production is a tilt model, the final assay is a tentative converter line. (17, 5.5 m pitch, about 95 m).

2-ton truck assembly line speed--6 cm/min.

QUESTIONS AND ANSWERS

(1) Service system

2 shift system 6:30-16:00 (11:30-13:00 is for lunch)
16:00-1:30

some of the workshops are on a three-shift system, but the majority use the two-shift system.

(2) Types and numbers of cars

There are three colors, green, gray and black and consequently, there are only three types of vehicles with different colors.

(3) There are also van and bus factories in Shanghai. Changchun produces the "Guki" and Peking produces the "Jeep". The Shanghai "Jeep" factory is combining with the Peking factory.

The Peking automobile is being trial manufactured. (We saw them used in Peking as taxis.)

(4) The heavy equipment design for "Shanghai" comes from the Shanghai automobile firm.

The factory is in charge of production.

(5) In 1959, China received aid from the Soviet Union for the production of automobiles. The Soviet Union sent two of its technicians to China. They decided to begin production of the "Volga". They stayed for two years and in 1960

the aid was canceled. Part of the plans were carried away. They left with the parting remark "You will not be able to produce a passenger auto. You probably will not be able to produce a toy automobile."

The great revolution occurred and since 1961, they have been producing automobiles. The name of the first automobile was "(illegible)". The "Shanghai" has been produced since 1966.

(6) Last year Mitsubishi, Isuzu and Toyota came from Japan.

Last year delegates from the Japanese automobile industry visited China.

Starting this year, a delegation from the automobile parts industry will come to China.

Process supervisor from Shanghai will go to Japan.

(7) The Shanghai automobile firm does have a daily schedule and production plan for factory development.

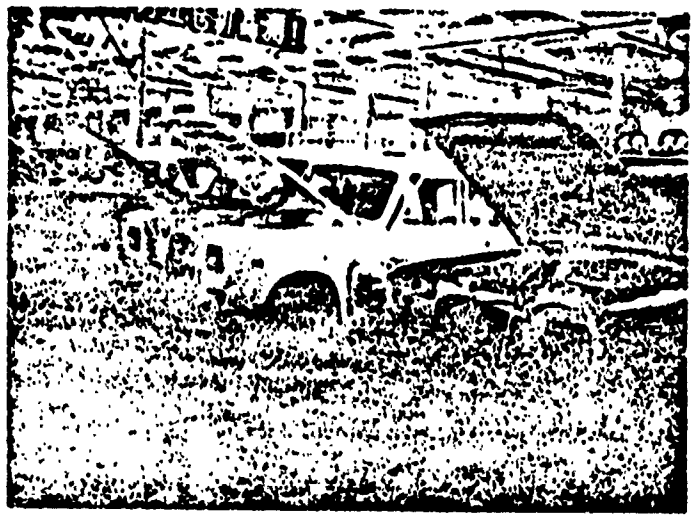
(8) Accidents occur during 0.7-0.8% of production each year. (We do not fully understand this meaning.)

(9) There is good regulation and control within the factory (in order to improve production). They are testing a revision in the press for noise elimination (noise from sheet metal) and safety measures in the sheet metal process.

(10) Our impression, after passing through this factory, was that the factory (Shanghai Steam Train System Production) will be under the direction of the Shanghai Steam Train firm.

Shanghai passenger auto production at the Shanghai automobile factory

Shanghai automobile factory assembly line



Shanghai automobile factory assembly line

11. SHANGHAI TRUCK MANUFACTURING FACTORY

Time and date: November 12, 9:00 a.m.-11:00 a.m.
Hosts: Technical Head Yang Wu (illegible)
Place: Factory within Shanghai about 20 minutes drive by car
Schedule: 9:00-9:15 greeting and explanation of the factory
9:15-9:25 greetings from Mr. Matsuo
9:25-9:30 greeted again by the other party
9:30-10:30 observation
10:30-11:05 questions and answers

BRIEF EXPLANATION OF THE FACTORY

(1) Name of the factory: Shanghai Truck Factory
(2) Products 4 t, 15 t cab over model truck
32 t dump truck
3 types total, 2500 produced per year
(3) Employees 2325 (about 1/3 are female)
(4) History of the factory

It was a factory warehouse until May, 1949. It was then rebuilt and they began repairing trucks (mainly imported trucks).

After that they began to manufacture trucks. Repairs were continued until 1958.

Moving ahead to 1958, a new ideal was pursued by making manufactured goods according to the enthusiastic plan of Chairman Mao. Naturally, other people within the country hoped for enthusiasm that would accomplish what had been done in other countries.

Naturally, enthusiasm was not enough and it was very difficult to produce manufactured goods. When they were confronted by these difficulties, they discovered how to solve them. Namely, they were solved by taking methods of three groups, laborers, management and technicians.

The Chinese produced machine tools with their own self-reliance.

The factory began to produce a four-ton in the first half of 1958. The history of repairs ended here.

However, some parts of the repair industry still remain. For the most part, the factory specializes in production. In 1965, the truck became this factory's specialty.

In 1969, they began to produce the large model truck under the slogan "attaining success by overcoming difficulties".

They also produced a 15-ton truck with help from other factories.

Through continued effort and with cooperation from 60 factories, the 32-ton dump truck was started in 1971.

Today they are emphasizing the production of a large truck and will reach world standards by 1985 according to Chairman Hua Kuo Feng.

They are persisting in their efforts to fulfill the four modernizations.

FACTORY OBSERVATION

We observed the press workshop, 4-ton and 15-ton chassis assembly (painting), 4-ton truck assembly line and 32-ton truck assembly line.

IMPRESSIONS

The production of automobiles has been technically delayed. However, they have made supplemental plans. At a glance, they seem to be doing well. In particular, they have a 32-ton truck with a V-12 and 450 HP. We noticed the value of the axle behind an attached speed reduction device.

A metal sheet is attached to the body and the seats are made out of wood.

After the sheet metal is cut and the scraps are cleaned up, all welding of pieces and trim is done with only two small presses and only a draw (300 ton, any pressure) in the press factory.

Holes are drilled with a 6mm or 10mm press. The press is a self-made 2000 ton pressure press.

QUESTIONS AND ANSWERS

(1) The amount of production is 8-9/day.

(2) The factory is closed on Fridays. Every industrial sector has a day for rest.

How is this related to electrical power? In short, when they all rest, the shops can mingle.

(3) 2 shifts (1 section has 3 shifts).

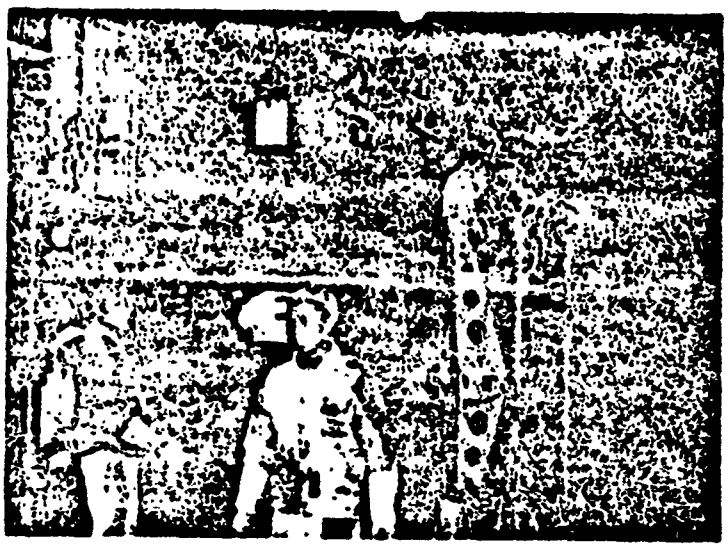
(4) There is a shortage of equipment because production has increased. They would like to include the production of a 2000 ton truck along with a 3000 ton and 4000 ton truck.

There is also a shortage of parts wagons. There is a shortage of cranes for transporting parts for the 32-ton dump truck and special parts.

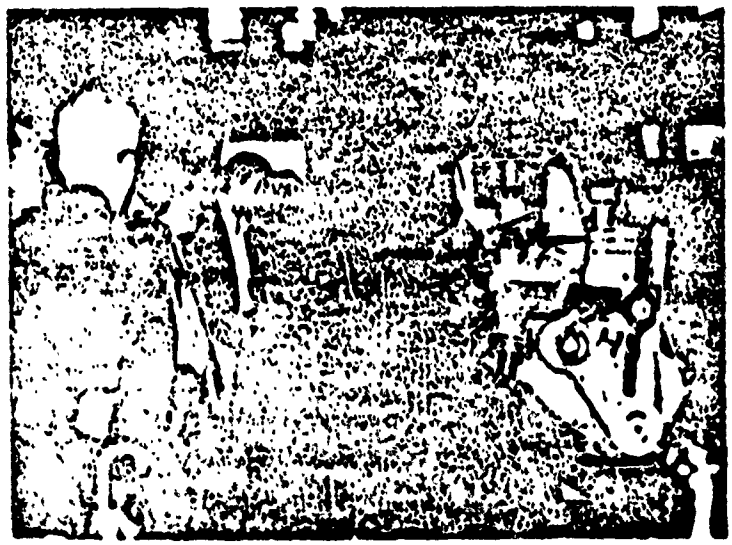
(5) There are problems with the mechanization and technological level.

(6) They are starting to test the system where there is training of technicians and laborers and bonuses (this could not be done during the Gang of Four era).

(7) What is the best way to use the computer? They use various methods of accounting. However, they are not near using computers yet.

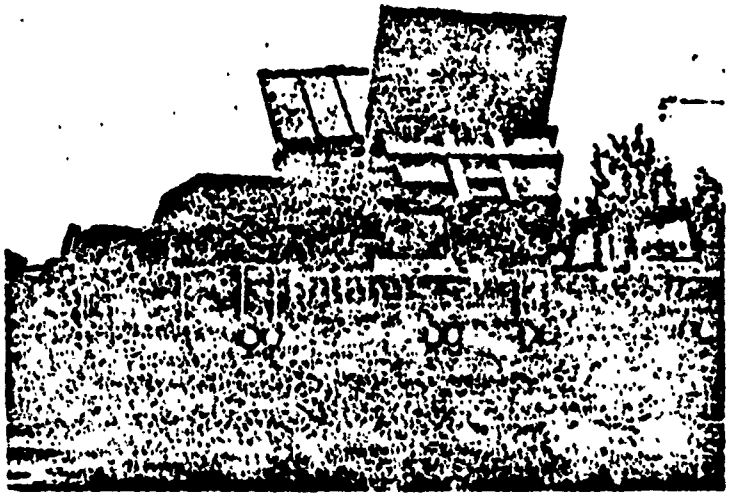


Shanghai tractor factory



Shanghai tractor factory

Shanghai tractor factory



32-ton dump truck being produced

12. SHUTU IRON AND STEEL WORKS (SIKINGSAN)

Date and time: November 2, 9:00 a.m.-11:30 a.m.
Hosts: Shutu Iron and Steel Works Overseas Business Head, Kao Ken Pao, and others

EXPLANATION GIVEN BY MR. KAO

(1) This factory has a 60-year history. Prior to liberation, it was only a pig iron factory.

(2) After liberation, they adopted a consistent production system. There is an imbalance between the functions of pig iron production, steel production and rolling.

(3) It has a mine.

Iron and steel are found in Tangsan of Hepei Province. The rate of production is 1100 tons/year. There are about 10,000 employees.

(4) Equipment capability

- employees--30,000
- capability--iron production 2,000,000 tons/year, steel production 1,000,000 tons/year and rolling 300,000 tons/year.
- blast furnace--4 furnace capacity--500 m^2 x 2, one is for iron casting more than 1000 m^2 x 2.
- 4 coke ovens ran by coal, similar furnaces in North China and Shanhsi.
- steel production--furnace capacity 30t x 3 1964 operation.
- clay rolling--rolls 850 mm wide 1969 operation.
- small bar iron rolling workshop (rolls 300 mm wide) roll-machine 5 stand. Operation started in 1960.
- the other is a welding pipe workshop.

(5) Of the other iron and steel works, Sosan is the largest. There are other factories in Wuhan, Paotou, Taiyuan and Shanghai.

(6) Current problems (explanation from the Chinese side). The equipment is old, and therefore, we must enlarge the factory, rebuild it and improve production. We should reform and enlarge the factory while we are improving production. We would like to expand the production up to 3,000,000 tons of crude iron and introduce hot rolling equipment to the factories.

In order to do this, we would like to receive technological exchanges from New Japan Steel, Kobe Steel, Japan Steel Pipes, Sumitomo Metallurgy, etc., and obtain their cooperation.

FACTORY OBSERVATION

(1) Number 4 blast furnace factory
furnace capacity 1200 m^3 air blast temperature, 1090°C
amount of blast--2400 m^3/minute
daily production--2700 tons/day, optimum--2900 tons/day
Condition of each oven (from a blackboard)

	total area	actual size	coke ratio*1	iron production ratio
no. 1	1380 t	1490 t	420 kg	2.59
no. 2*2	650 t	650 t	584 kg	1.31
no. 3	2020 t	2130 t	409 kg	2.06
no. 4	2250 t	2630 t	415 kg	2.14
total	6300 t	6900 t	430 kg	2.08

*1 crude oil was blown into it. When we convert the crude oil, the fuel ratio is + 100 kg.

*2 a new blast furnace is being built for casting iron and other special purposes.

When we observed steel production, fumes were emitted from the oven and the environment was very unhealthy.

There are very few measurements taken before the metal is placed in the ovens. An adjuster is used for the blast temperature, current, etc. However, the control precision is not very good.

They are highly motivated to achieve a certain production amount.

(2) Converter factory

1964 operation made in China

30 t x 3 It usually carries out 2/3 of the operation and sometimes all of it.

Tap to tap take about 23-25 minutes.

Number of revolutions--more than 1000, 2868 at the most.

They have already surpassed the production standards of 1,100,000 tons set for 1978 and are past 1,300,000 tons.

The environment was poor due to the combustion system which created a thick red smoke.

There were many operations done before the furnaces and there were problems with safety.

(3) Clay rolling factory 1969 operation
roller length 850 mm tandem rolling up to 2 bases, pellets
2 engineers without steel ingot scales
the rolling speed is not very high.

They do not seem to care very much about the planning of goods produced or precision. There are many missing goods before and after. They do not think much about their achievements and failures.

(4) Small bar steel factory
First operation in 1960, Soviet made, 5 stand series
round bars--10mm-32mm, rolling speed--15 m/sec
angle steel
They do not care much about planning or precision.

IMPRESSIONS

(1) There is much concern for the amount produced. There are problems with quality.

(2) They are late in gauge automation.

(3) There is an obvious imbalance between steel production, iron production and rolling.

(4) Environment control is very poor. Consolidation and regulation wtihin the factory is very poor.

SHUTU IRON AND STEEL WORKS OBSERVATION POSTSCRIPT

The Citizen's Daily News published a report after we observed the iron and steel works on November 10 saying the Shutu Iron and Steel Works has surpassed international standards in blast furnace production. We present this article for reference.

article Citizen's Daily News November 10

Blast furnace index and coke oven ratio of Shutu Iron and Steel Works exceeds international standards

The report given to this reporter on November 9 by telephone is as follows:

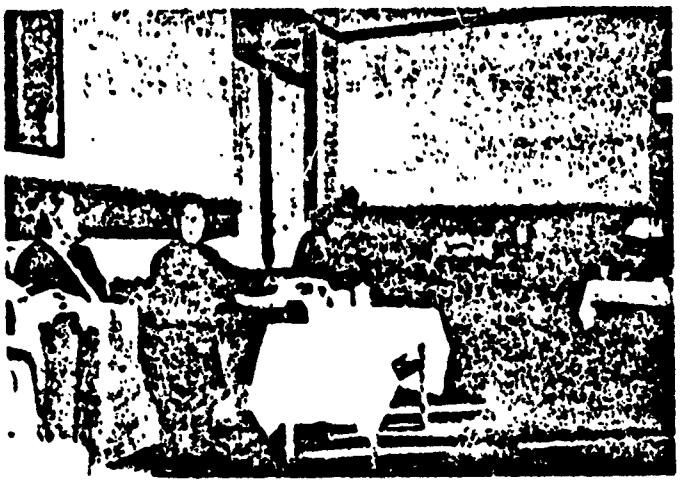
Shutu Iron and Steel Works Blast Furnace Index and Coke Oven Ratio had previously reached world standards. Not only did this lead to a full-scale improvement of this enterprise, but it can also be considered as one experience in our country's iron and steel industry's overtaking of international advanced standards.

The blast furnace index and coke oven ratio are important indices for measuring the level of steel and iron technology. This has a definite significance since a high blast furnace index and low coke oven ratio means that there is an increase in the production of pig iron. The equipment at Shutu factory is from the 1950's. Last year they dealt with this problem constructively with cooperation from the mines of other firms. In October of this year, the blast furnace index and coke oven ratio of Shutu factory reached the highest level in the country. After August, they overtook world standards. The blast furnace index passed two and the coke oven ratio fell to less than 450 kg. In October, the blast furnace index was 2.1 and the coke oven ratio was 425 kg. Furthermore, number 3 blast furnaces continued to give superior results of 2.213 for the blast furnace index and 398 kg for the coke oven ratio.

Number 1 blast furnace index was 2.772 in September. The coke oven ratio set a new record with 420 kg. From January to October, iron and steel production at the entire iron and steel works was increased by 46% when compared to the same period of the previous year. They have also passed the annual plans set for this year in the end of this month. Iron and steel production

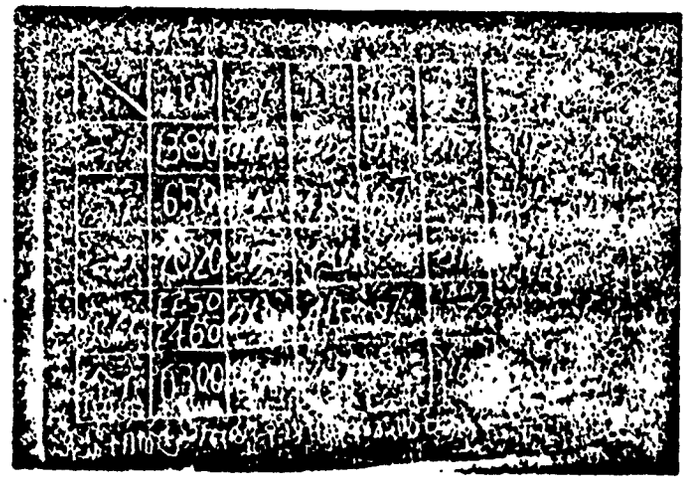
was 100% for four consecutive months. They became the first in the nation with a total of 99.94%. They also curtailed the coke oven ratio at the same with a total of 160,000 tons. The cost/tons of pig iron decreased by 11 yuan when compared to the same time last year. In the first nine months of this year, the production efficiency of all the laborers matched the standards set for the entire year last year.

The progress of the Shutu Iron and Steel Works system was presented and supported by the Committee for Iron Production which opened a Metallurgy Department just the other day.



Shutu Iron and Steel Works. Mr. Ko Kei (center)

Rolling process at Shutu Iron and Steel Works



Shutu Iron Steel Works. Blast furnace main production. Technology indices which are shown on a blackboard in the Instrument Room.

13. SHANGHAI TELEPHONE AND TELEGRAPH FACTORY NUMBER 519

Date and time: November 10, 1978 1:30 p.m.-5:00 p.m.

OUTLINE OF THE FACTORY

This factory is a factory that produces communication equipment for the Telephone and Telegraph Office branch offices. It was established after 1949. Production began in 1960.

The main manufactured goods are a TR 60 CH multiplex carrier for use with a balanced cable and a teleprinter. They are experimenting with photo communications and have started trial production on one electrical teleprinter. They are also carrying out efficiency tests.

There are about 2200 employees (an increase of 10% from last year). About half of them are women.

(1) Tr 60 CH Multiplexor Carrier Assembly workshop.

The system is set up by having one 120 CH carrier end office unit, two 60 CH carrier modulator-demodulator units and one testing device. The tests can be done with four or five people.

About 300 of the devices are made in a year and there are also meters and accessories that are produced.

(2) Teleprinter factory

About 2000 are produced per year. About two systems are made in a room that is about 600 m^3. The touch set up control is done by hand. Each person has a large responsibility in the quality of the goods.

(3) Parts and Accessories Manufacturing workshop

With the exception of casting, the majority of this workshop is involved in manufacturing parts and accessories from raw materials. There is a feeling of the idea of "attaining success by overcoming difficulties" in this workshop.

(4) Research in photo communications

Light emitting tubes, light emitting diodes and photo fibers are made in this lab. The photo fibers used are about 3m. Certain experiments are carried out in the transmitter-receiver room. The exterior diameter of the photo fiber is 150 microns and the inner diameter is 70 microns. Transmission loss is 5-10 db/km. The area that receives light is 0.5 mm ϕ.

There are also women who are research technologists. They are proud of the fact that they use the most advanced foreign technology in the experiments.

(5) Electronic teleprinter

They are conducting efficiency tests on the first trial produced teleprinter of this type. We noticed that the type has been changed and that there has been a decrease in the noise. The typing speed is 400 characters/minute and 600 characters/minute is the objective. They were planning to improve it once more.

We noticed that there is interest in producing a type set up in the future.

FINDINGS

(1) There is great concern for the PCM system and for what type of system to use. They are now testing the introduction of foreign technology. (A PCM system was introduced to Peking. The system was made in East Germany).

(2) We could not get a clear answer as to whether new research development is done based on the independent planning of this factory or it is done under the instruction of the top level of the Telephone and Telegraph Office, etc.

(3) There does not seem too much connection between supply and demand at this factory. Once all of the manufactured goods are paid for to the supplier, the amount going to each person who has requested goods is determined by the Telephone and Telegraph Office. The yearly production plans and growth plans of this factory are determined by the top levels in the end. They do not seem to pay much attention to the claims of the factory (independent plans of the worker). Therefore, it does not seem that there is an underlying idea of "attaining success by overcoming difficulties" here.

(4) The leadership of this factory studies the advanced technology of foreign countries. The purpose of the introduction of technology is not only to introduce the newest technology, but also

to obtain methods for technological development, etc., and to acquire know-how and to apply this technology on their own.

(5) As with photo communication technology, which is still in the experimental stages on a small scale, they are proud of the fact that they have realized the most advanced technology of all of the foreign countries on their own.

14. PEKING LONG DISTANCE TELEPHONE STATION (PEKING LONG DISTANCE TOWER)

Date and time: November 1, 9:00 a.m.-11:30 a.m.
Hosts: Mon Ken Mon, Process Supervisor
Tei Ko Hin, Process Supervisor
Shu Feng Isian, Technical Division

OUTLINE OF THE TELEPHONE STATION:

Opening in 1973, completed in May, 1976:
13 stories
9-13: microwave antennas
8 : microtrunking equipment
7 : microcarrier equipment
4 : long distance telephone switching equipment (XB, manual)
3 : international and long distance manual switching equipment
2 : carrier equipment

Main Equipment

(1) Microtrunking equipment
- 4 GHz, 960 ch system
3 system (TV, telephone, reserves)
transistor system
practical application in October, 1973

- 600 ch vacuum tube system
  the oldest is stable
- the newest type II has adopted foreign technology.
  960 ch, 6 systems (TV 2, telephone 2, reserves 2) with the exception of TWT.
  They are trial producing monitor control (automatic and manual) for failure manifestation. Trial producing microwave automatic switching.
- when the 2 GHz used for the NEC satellite trunking (used by mobile stations) is compared with the 11 GHz used for fixed stations and coproduced with America (?), it is very compact and stable.
- the microwaves spread to 26 cities from Peking (including Tibet and Sinkiang).

(2) Long distance XB switching equipment

- they are using one unit and constructing another one.
- all long distance telephone calls from Peking are dealt with here.

direct dialing participants
Peking, Tientsin, Chinan, Hofei, Nanpei, Shanghai, Hangchou and Shihchiachuang.

- automatic rate details, print out
  after, processing is done at the computation by hand.

(3) Manual switching device

- operator dialing within the country
  unsurpassed support
- the others are stand-by systems with either an attendant board or connecting boards.
- there are 100 people in the manual operation section (all women). They do not plan to increase this number.
- international (Peking ← →Tokyo) 10 circuit
  in English
  As with submarine cables, it is all done by satellite trunking.

operator to operator

(4) carrier equipment
- coaxial 1800 ch system
  Peking-Tientsin-Shanghai-(being built)-Kuangchou
- 600 ch, 300 ch system
- 60 ch system with carrier cables (same as the F-60 system)
- the CH TR is one 240 ch.

QUESTIONS AND ANSWERS

(1) Number of participants in Peking--170,000
branch offices--10
There is a PBX in each company
There are not many homes with a telephone.
Public telephones (in the city, one call for four minutes costs 5 yen, fee for summons is 3 yuan for 3 minutes)

(2) Plans for expansion
microwaves and carrier control used in computers
automation of time computations
domestic communications satellite
there are also delays in shipping
they have adopted a priority equipment system

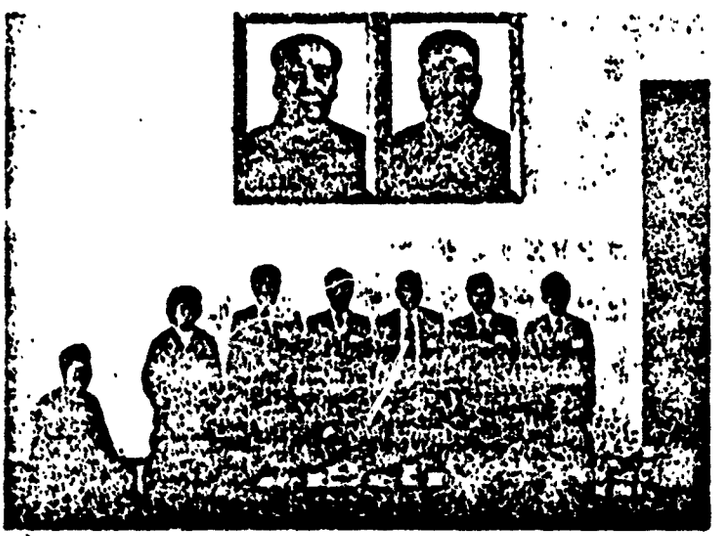
(3) Telephone and Telegraph Office
Chinese Association for Scientific Research on Telegraph and Telephones (about 20 labs)
administration office factories (several)
about 90 some % produced independently

OTHERS

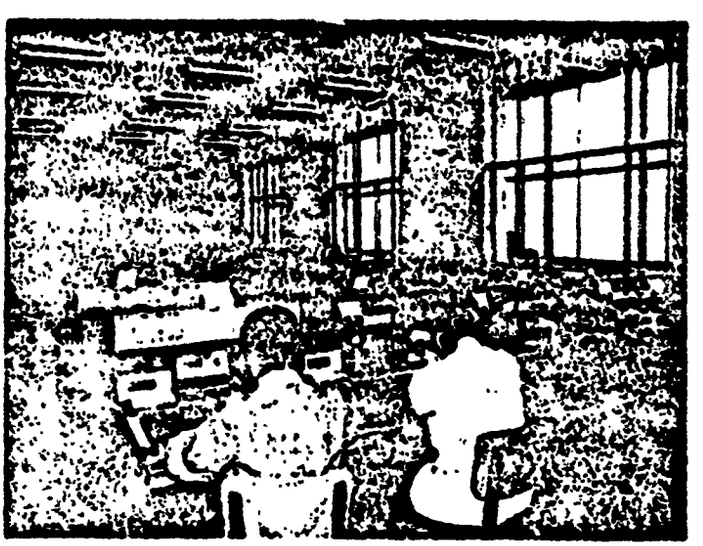
Out of a population of 8,000,000, there are 170,000 participants in Peking. The dissemination percentage is very low. There has been automation of local calls. They have just started the

automation of city fees. They have produced microwave and XB switching units. They are where Japan was in 1955.

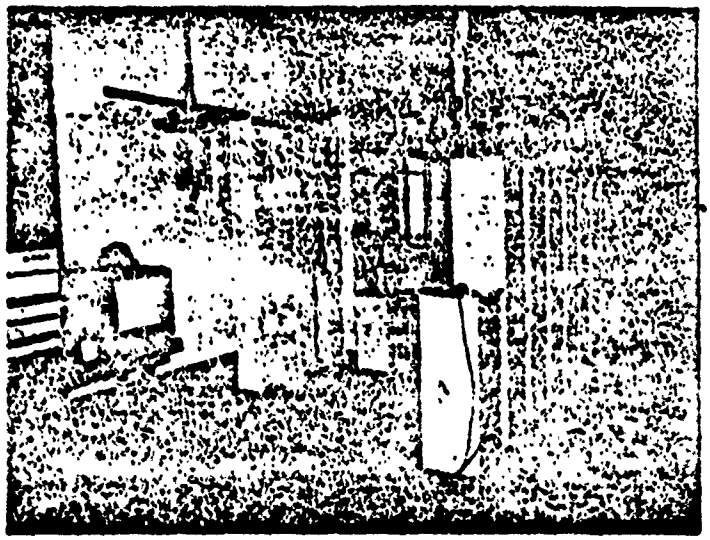
There are many female employees. There are also many affiliated organizations.



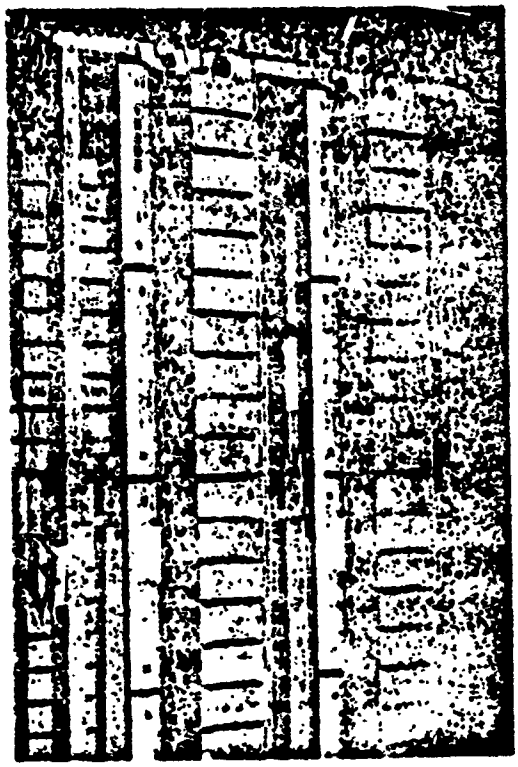
Peking Telephone and Telegraph Office



Switchboard workers on duty



Microwave transmission equipment
(Peking Long Distance Telephone Office)



SXS switching device
(Peking Long Distance Telephone Office)

15. TIENTSIN INDUSTRIAL ARTS FACTORY NUMBER 1

Time and date: November 7, 1978 1:40 p.m.-3.30; p.m.
Place: inside Tientsin
Host: Mr. Chang, Tientsin Industrial Arts Factory Management Head

OUTLINE

This is an overall industrial arts factory located in Tientsin. There are three places in Tientsin where one finds this type of general factory. The other industrial arts factories construct simple manufactured goods. (For example, bamboo baskets or ivory carving of high grade goods, etc.). These goods are a small scale operation which is connected with the firms who gather them together and treat them.

This factory was established when 10 manual arts were collected toegether in 1960. After the purge of the Gang of Four, the factory changed. In 1977, production was more than 7.5 times what it was before the revolution. The majority of the products made by the factory are exported mainly to Japan, Europe and Hong Kong. The revenue from one year's production is 10,000,000 yuan (1,000,000,000 yen).

The types of manufactured goods are India ink drawings (hanging scrolls), shellfish pictures, color paintings, electrical umbrella stands, kites (assembled style), origami, silk screens, duck eggs, etc.

Mr. Chang told us that an improvement in production has been delayed by manual operations.

There are 500 employees at the factory and 70% are female.

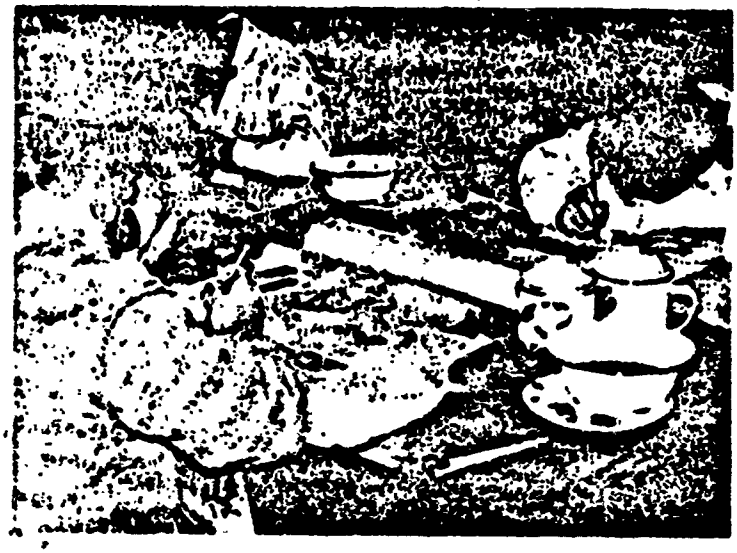
It takes one month to complete an India ink painting or a silk screen.

The color paintings are also done by writing with a fine point on a piece of silk. There are unfinished paintings everywhere.

The origami is all done by hand. Twenty pieces of paper are piled on top of one another and cut. The kites are also made by hand and each one is test flown.

In Japan, a high price is paid for incomplete parts. The dealers pay some 100 yen to several thousand yen for these goods.

We could see that the employees are more motivated than in other factories, such as the rug factories. Even here there is emphasis placed on the necessity to improve efficiency. However, we do not know whether or not only factories who export goods have a sense of competition concerning their company policies.



Peking Industrial Arts Factory Number 1

Tientsin Industrial Arts Factory Number 1

16. SHANGHAI INDUSTRIAL ARTS EXHIBITION HALL

Date and time: November 9 9:00 a.m.-12:00 noon
Hosts: Lin Sui Kei, Shanghai Industrial Exhibition Hall member

This exhibition hall was built in 1954. The total surface area is 10,000 m^2. After the revolution, more than 4000 new products were displayed. In each corner there are people who explain the items in English and Japanese.

There are displays on mechanics, electricity, metallurgy, chemistry, telegraphs, meters, light industry, spinning, handicrafts, etc. The main exhibitions we observed as as follows:

Mechanics: 300,000 KW steam turbine generator
digital display single column jig pulling machine
numerical control standing lathes (2250 mm diameter)
multi-station cold etching machine (cold screwing device)
630 ton cold powder press (1 gear is made in 20 seconds)

Chemistry: agricultural drugs--for the prevention of water rice mongale disease.

drugs--other than penicillin compounds, there has been an 80% price reduction recently.
Chinese medicine--fushitsujo (illegible) yaku
ninjin zogan
tan papa yaku
ken kori
kyosa zai
fusa netsu

Metallurgy: slab series casting. Titanium alloys for atomic furnaces. Light alloys have been independently produced since 1962.
Rare metals for semiconductors (independently produced since 1960)

Electricity: Numerical control profiling machine
Large precision threading machine (uses a laser) produced in Shanghai.
Photo tracer electrical discharge cutting machine, Shanghai Switch Factory.
Large numerical control wire cutting machine

Weaving machines: air jet weaving machine used for double velvet 5 m/hour.
double jacquard weaving machine (knitted) 20 m/hour.
numerical control nylon handbag sewing machine 1 bag/16 minutes
air jet towel weaving machine, 2/4 minutes

Automobiles: Shanghai 2300 cc, open car, microbus, bus
32 t dump car used in mines, 15 ton dump car, 2 t, 4 t truck
combine, seed collecting machine, rice planting machine, 50 horsepower truck
multivalve shovel truck(400 K), shovel truck (0.5 m^3)

Shipbuilding (pattern of ship building): "Yudengo" cable laying ship 1327 tons,
14 knots, lays cables underground using gravity type cable laying machine , length 71.55 meters
"Kenshun" transaction dredger, 11,700 tons, 4500 m^2 165 m
"Kaihyo 102" icebreaker, 84 m long
"Tomangu 13", Yangtze river freighter, 3700 tons, 15.5 knots, 113 m
"Kan 102" petroleum industry freighter
"Dochogu 106" ocean scientific investigation ship
"(illegible)" largest freighter, 32,600 tons, 16 knots, 185 m
"Docho 3" 200 ton crane ship, 360 revolution method

others: 1200 horsepower exhaust fume turbine supercharged diesel engine.

Communications: television camera, solar electric battery, color celevision, stereo, DJS 131 computer (made at the Shanghai Wireless Electronics Factory number 13), television for use in industry, electric circuit board TQ-12-G (made by Shanghai Wireless Electronics Factory number 13)

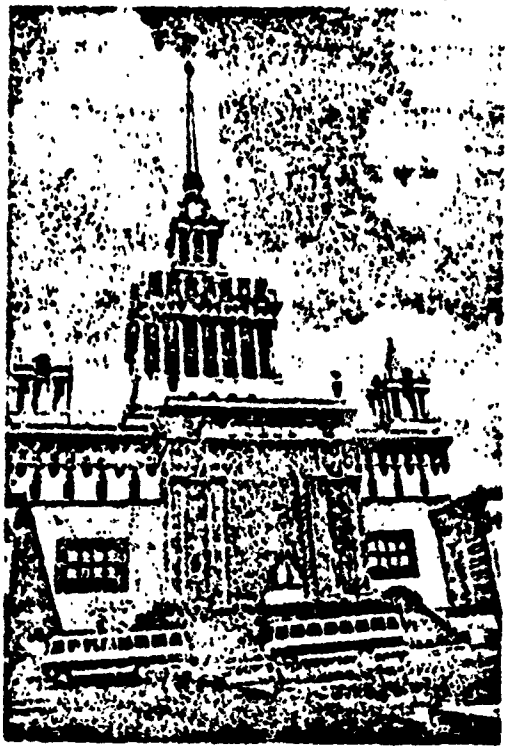
Medical care: bandages for wrist cuts, etc. (had several items after 1963).
model 701--device for giving subcutaneous injections without a needle

Consumer goods: camera (2 lens reflector),(single lens reflector), watch (no digital watches), sewing machine (electric, manual), bicycles (full size, gear change), electrical ping pong scoreboard

others: clothes, arts and craft goods, musical instruments

IMPRESSIONS

There were no high level goods. However, today they are displaying the best goods that are produced in China. It seems that they were independent as often as possible. We would like to express our respect for the efforts of the Chinese people.

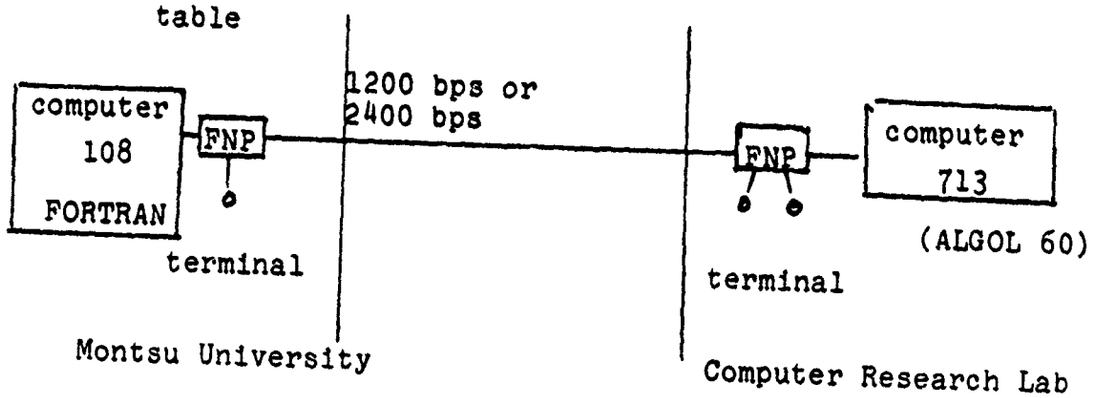


Front of the Shanghai Industrial Exhibition Hall

ERRATA

	ERROR	CORRECTION
page 30* photo caption	Tientsin number 1_____factory	Tientsin number 1 Rug factory
page 32 photo caption	Mr._____ (middle)	...Mr. Yu (middle)
page 32 photo caption	Committee method Mr._____	Committee_____ Mr. Fang
page 77 photograph	Tientdo	Tientsin
page 102 photograph	:...Delegate Heguri	...Delegate Mizaki
page 102 photo caption	...Delegate Mizaki	...Delegate Heguri

page 161 insert lines in table



page 143 line 4 from top	____loyalty	(illegible) loyalty
page 198 photograph	Delegate Sakaguchi Tientsin	(Tientsin Machine Tool Factory Number 1
page 204 photograph) page 204 photograph) page 205 photograph)	Tientsin number 1 factory	...Number 1 rug factory

*Numbers refer to Japanese pages

Chinese computers (Only computers that are used in China today) EP are computers we observed

Model	Place developed	Time developed	operation speed (command second)	word length	logic element	main memory	notes
DJS 1	Peking Wire Electronics Factory	started 1958 finished 1962	1.8 K		(illeg.)	1 K word 2 core	2K word magnetic drum
DJS 2		finished 1963	10 K			4 K word core	2 6 K word magnetic drums
DJS 3		finished 1964	50 K			16 K word core	4 16 K word magnetic drums
DJS 21		started 1964 finished 1966	60 K		Ge transistor	4K word core	2 16 K word magnetic drums
DJS 7		started 1964 finished 1968	2.7 K			4 K word core	2 12 K word magnetic drums (illegible)
DJS 6		started 1964 finished 1970	100 K	43 bit		32 K word core	1970 (illegible) Kuangchou
DJS 8				48 bit		core	
DJS 11	Peking University, Peking Electronics Factory	started 1970 finished 1973	1000 K	48 bit	IC	128 K word core	(illegible)
709	Shanghai computer lab Futan University Shanghai Wireless Electronics Lab Factory	9/1970-1972	110 K	48 bit	TTL IC	32 K word core	(illegible)
719	Shanghai Futan Univetsity	started 9/1971 finished 1974		48 bit	TTL IC	32 K word core	used for instruction at Futan University

731	Shanghai Computer Research Lab	1/1973-3/1975	200 K	48 bit	TTL IC	64 K word core	2 magnetic drums 64 K word typewriter, magnetic tape
013	Shanghai Computer Lab Computation Center	1974-1976	2000 K	48 bit	ECL IC	128 K word	cash memory 512 word used at the computer center
TQ 16	Shanghai Wireless Electronics Factory	1974	110 K	48 bit	TTL IC	32 K word core	(illegible)
TQ 6	Shanghai Wireless Electronics Factory	1976	1,000 K	48 bit	TTL IC	128 K word core	(illegible)
		completed 1975					2 magnetic drum 64 K words transistor, magnetic tape
013	Shanghai Computer Lab	1974-1975	2000 K	48 bit	ECL IC	128 K word core	512 word cash memory used at the Science Agency Computer Center
TQ 16	Shanghai Wireless Electronics Factory	1974	110 K	48 bit	TTL IC	32 K word core	about 140 have been produced
TQ 6		1976	1000 K	48 bit	TTL IC	128 K word	12 have been produced
DJS 200-20	Peking Wire Electronics Factory	being trial produced	~200 K	32 bit IBM (illeg.)	TTL IC	512 K word) core)	program interchangeability (illegible)
DJS 220	Peking Wire Electronics Factory	being trial produced	100-150 K	32 bit IBM (illeg.)	TTL IC	256 K word) core)	
DJS 130	Shehua University Peking Wire Electronics Factory	1976	500 K	16 bit microcomputer (NOVA)	TTL IC	32 K word core	(illegible)

(TQ-15) DJS-131	Shanghai Wireless Electronics Factory	1975	500 K	16 bit microcomputer	TTL IC	32 K word core	100 have been made
DJS 154	Peking Wire Electronics Factory	1976		16 bit minicomputer	TTL IC	16 K word core	60 were made in 1976
TQ 21	Shanghai Wireless Electronics Factory	1978	table model		TTL IC	core (illeg)	production plans call for 4 to be made per month
TQ 12	Shanghai Wireless Electronics Factory	The TQ12 is being produced according to a report of (illeg.) NTT (illeg.) of last year.					
TQ 12 C (illeg.)	Shanghai Wireless Electronics Factory m	8 LSI (P MOS) are used (illeg.)				(illeg.)	production about 1000
	Scientific computations (illeg.)						

TABLE 2. CHINESE COMPUTER DEVELOPMENT (illegible)

(illegible)	(illegible)	Minicomputer	(illegible)	NOTES
1958				(illegible)
1959				
1960				(illegible)
1961				(illegible)
1962	DJS-1 (V_i core)			
1963	DJS-2 (V_i core)			
1964	DJS-3 (V_i core)			
1965				
1966	DJS-21 (Tr core)			
1967				
1968	DJS-7 (Tr core)			
1969				
1970	DJS-6 (Tr core)			
1971				
1972				
1973	709 (IC core) DJS 11 (IC core)			
1974	719 (IC core) TQ-16 (IC core)	DJS 130 (IC core)		
1975	731 (IC core)	DJS 131 (IC core)		
1976	(IC core)	DJS 154 (IC core)		4X (illegible)
1977	013 (IC core)			
1978			DJS 220	(illegible)
1979			DJS	(illegible)

NOTE: (illegible)
Tr - transistor

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