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MISSION REPORT

Group Study Tour in Cotton Textile Technology
to People's Republic of China^{1/}

3 May - 3 June 1977

by

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A c k n o w l e d g e m e n t

I wish to express my sincere gratitude for the hospitality and for the friendly and efficient co-operation the group enjoyed throughout its stay in China; we were not mere visitors but invited, truly privileged guests.

I also enjoyed the cheerful and intelligent company of the other participants whose keen sense of humour never failed to brighten the long journeys.

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Purpose of the mission

Under the terms of an agreement signed between the People's Republic of China and UNIDO on 5 May 1976 covering the use of the voluntary contribution made to UNIDO by the People's Republic of China, a study tour in cotton textile technology for fifteen participants from developing countries was organized in May 1977.

The participants were selected jointly by the Government of China and UNIDO and the practical arrangements for the tour were entrusted by the Government to the Ministry of Light Industry. I accompanied the tour as the official UNIDO representative.

Itinerary (The participants' arrival and departure dates to and from China varied to some extent (see Annex II); the following dates apply to me only.)

Vienna - Paris	3 May 1977
dep. Paris	4 May 1977
arr. Peking	5 May 1977
Peking - Canton	9 May 1977
Canton - Shanghai	14 May 1977
Shanghai - Wuhsi	21 May 1977
Wuhsi - Shanghai - Peking	24 May 1977
dep. Peking	31 May 1977
arr. Paris	1 June 1977
Paris - Vienna	3 June 1977

Programme in China

Thursday	5 May 1977	Arrival, rest, general discussion of the programme
Friday	6 May 1977	Friendship store, Peking zoo
Saturday	7 May 1977	Agricultural exhibition
Sunday	8 May 1977	Chinese opera
Monday	9 May 1977	Travel to Canton; Meeting with textile industry leaders; Visit to Mao's Peasant Training Institute; Formal dinner given by the director of the Canton Textile Bureau;

Tuesday	10 May 1977	Canton Fair; Ballet performance;
Wednesday	11 May 1977	No. 2 Cotton Mill, Canton; Travel to Hot Springs Guest House; Film performance;
Thursday	12 May 1977	Return to Canton; Tung Fang garment factory;
Friday	13 May 1977	Hong Mian silk factory, Fos Han; Ceramic factory, Fos Han; Return to Canton;
Saturday	14 May 1977	People's Agricultural Commune Da Li; Friendship store; Travel to Shanghai;
Sunday	15 May 1977	Shanghai Industrial Exhibition; Shanghai Cotton Mill No. 12;
Monday	16 May 1977	Shanghai No. 2 Textile Machinery plant (spinning frames); Shanghai No. 33 Cotton Textile Mill; Concert;
Tuesday	17 May 1977	Shanghai No. 33 Cotton Textile Mill; Visit to a factory in the Lu Wei district of Shanghai producing electrical components and employing blind and deaf and dumb labour; Friendship store;
Wednesday	18 May 1977	Hung Huang factory, Shanghai (weaving, dyeing, finishing, shirt manufacture); Shanghai No. 14 garment factory; Formal dinner given by the Director of the Shanghai Textile Bureau;
Thursday	19 May 1977	Shanghai No.1 Printing and dyeing mill; Shanghai Textile College; Film performance;
Friday	20 May 1977	China Textile Machinery Plant (looms), Shanghai; Shanghai No.21 Garment Factory; Young Pioneers' Palace; Acrobatics performance;
Saturday	21 May 1977	Technical discussion with the staff of the Shanghai Textile Bureau; Travel to Wuhsi;
Sunday	22 May 1977	No.2 Cotton Mill, Wuhsi; Textile Products Exhibition; Formal dinner party given by the Director of the Wuhsi Textile Bureau;

Monday	23 May 1977	Wuhsi No.1 silk reeling factory; Sight seeing; Acrobatic performance;
Tuesday	24 May 1977	Travel to Shanghai and Peking;
Wednesday	25 May 1977	Peking Printing and Dyeing Mill; Peking No.3 Cotton Mill; Formal dinner given by the Vice Minister of Light Industry;
Thursday	26 May 1977	Ren Min garment factory; Concert;
Friday	27 May 1977	Sightseeing (Summer Palace, Peking subway);
Saturday	28 May 1977	Sightseeing (Palace Museum); Peking Handicraft factory; Circus performance;
Sunday	29 May 1977	Sightseeing (Great Wall, Ming tombs);
Monday	30 May 1977	Textile Machinery Import and Export Corporation; Pilot plant (spinning); Sightseeing (Heaven Temple); Friendship store;
Tuesday	31 May 1977	Meeting with the officials of Ministry of Economic Relations with Foreign Countries; Departure.

Comments on the programme and on the organization of the tour

The programme of factory visits, as discussed and agreed upon in Vienna totalled 19 factories: 8 cotton mills, 4 dyeing/printing mills, 2 silk factories, 4 garment factories and one machinery manufacturer. In the actual programme presented to us upon arrival and subsequently carried out, we visited a total of 20 factories: 6 cotton mills, 3 dyeing/printing mills, 2 silk factories, 4 garment factories, two machinery manufacturers and 3 other factories.

I calculated that of the total time available for visits (excluding travel) we spent about 20 per cent on cotton mills, 25 per cent on other factories, 18 per cent on welfare, housing, education and exhibitions, 37 per cent on sightseeing and entertainment.

While the share of pure cotton industry may seem small as compared with the attention to other areas and considering that the tour was to focus on cotton industry I, nevertheless, think that the available time was correctly divided. In order to see the textile industry sector (or any industrial

sector) in proper perspective it was important to learn something about the economy as a whole, starting from agriculture and including sufficient information on social and cultural aspects.

With regard to the textile industry part of the programme I would have, on hindsight, reduced the garment industry portion somewhat and added one or two cotton ginning factories.

The execution of the programme was smooth if somewhat rigid. The standard of interpretation was not always quite satisfactory. The interpreters were not fully familiar with the technical terminology used in the textile industry, and sometimes local dialects caused problems.

The standard of accommodation and board was outstandingly good. In fact it exceeded the standard the normal UN subsistence allowance would permit.

During my final discussions with Mr. Hun Hui-Yuan of the Ministry of Economic Relations with Foreign Countries, he made it clear that, for this and future study tours the Government wished to operate on the basis of a pro forma cost of 100 Yuan per person covering meals, accommodation, interpretation and internal transportation and to settle the accounts afterwards at the actual cost. He emphasized that the Government did not wish to use the DSA rate of Yuan 40 as a basis for such study tours.

General observations on the textile industry in China

No national statistics on raw materials, installed capacity, production, consumption, total labour force, were disclosed, and I had no means of checking whether the mills shown to the group can be regarded as a representative sample of the Chinese textile industry. Nevertheless I hope that the following notes and impressions, superficial and incomplete as they are, convey to the reader a reasonably realistic picture of the situation.

Standard hours

The standard working hours are 2448 h/year (8 hours/day, 48 hours/week, 306 working days/year. There are 7 official holidays/year and no vacations except for married couples who are working on separate locations. They get additionally two weeks off per year.

The standard operating hours of the equipment are 6885 h/year (22½ x 6 x 51) in a 3-shift operation.

Raw material

Virtually all cotton used in Chinese mills is saw ginned and contains 12 per cent short fibre ($< 9,5$ mm). Its fineness is 5500-6000 Nm with ± 5 per cent tolerance, strength 4,5 - 5g (bundle test) and staple length 27 - 31mm.

The grading is 1 - 7:

grade 1 - 2 excellent
grade 3 - 4 standard
grade 5 poor
grade 6 - 7 not used for textiles.

Wastage standards

blow room	1,6 per cent
carding	3,0
invisible	0,5
drawing, spinning	0,6
total unusable waste	<u>5,7 per cent</u>

Cost break-down in spinning (Ne 40)

raw material	70-71 per cent
power	9,5
spares and packing material	8,0
wages	7,5
miscellaneous including administrative costs	4,0
	<u>100,0 per cent</u>

Performance standards

spinning: < 50 breaks/1000 spindle hours
(coarse and medium counts)
 < 80 breaks/1000 spindle hours
(fine counts > 80 Ne)

weaving: (warp) $< 0,5$ breaks/loom hour
(weft) $< 0,1$ breaks/loom hour

Quality control:

lap: standard lap weight 30lbs; .
 < 0,1 % weight tolerance per metre
 (test carried out weekly);

card sliver: < 4 % weight tolerance on 5m length
 (test carried out daily);
 impurities: 0,2 - 0,3 %
 (test once a week);

draw frame sliver: 1 - 2 % tolerance on weight variation;
 (four tests per shift);

evenness: Saco-Lowell method
 < 18 % of 40 Ne.
 7,2 % moisture regain

roving: 1 % weight variation tolerance
 (test once a day);

evenness: test once a week
 Saco-Lowell method

end breakage: 0,5/100 sph.

In general, the mill laboratories were equipped with basic instruments only; no sophisticated electronic equipment (such as Uster) were used.

Wages and labour

The average wages in the textile industry are 60 - 70 Yuan/month (-US\$33-38)^{1/} The pension is 70 per cent of top wages and the retirement age is 65. There is virtually no turnover of labour as transfers are permitted in pressing cases only and/or in the interest of the economy as a whole.

There is no absenteeism at all. The workers are mobilized and motivated politically. The output of the workers and their record of participation in political meetings (3 one-hour sessions per week, after working hours, compulsory attendance) are posted publicly on the walls of the production departments. A symbol of a rocket attached to a worker's name on a given day signifies that he had exceeded his quota by 100 per cent on that particular day. (A symbol of an aeroplane = 50 per cent, a lorry = 1 - 50 per cent and a bicycle = less than the quota). Good performers are given "spiritual encouragement" and a small financial supplement (= max. 3 per cent of wages). Poor performers are re-educated by their fellow workers and the factory management. Each worker is also required to (publicly)

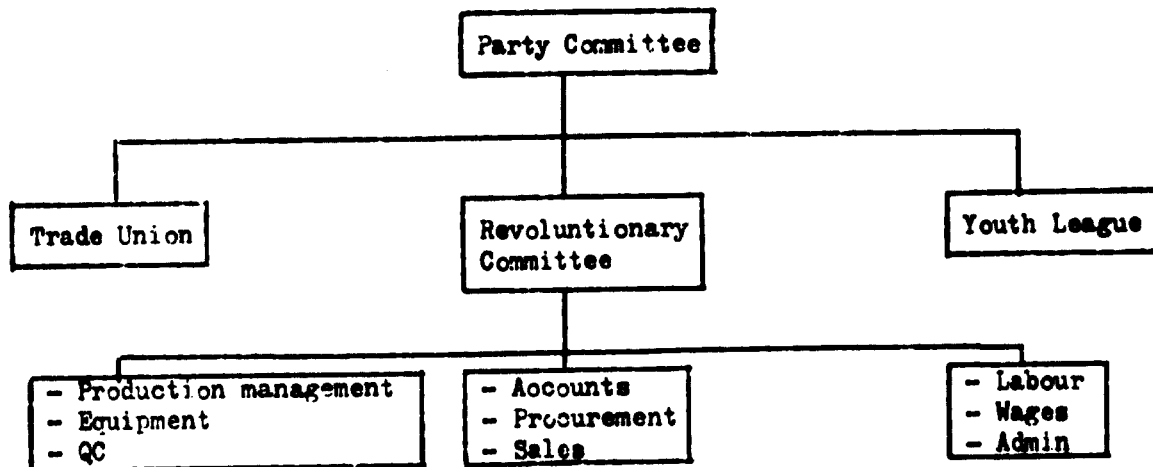
^{1/} 1 US\$ = 1,825 Yuan (May 1977)
1 Yuan = US\$ 0,548

declare how he intends to conduct himself in order to follow chairman Mao's directives. Example of such a declaration seen on factory wall:

- " - I will diligently study Mao's works;
- I will never be late from political sessions;
- I will always fulfill my work quota".

Organizational structure of a factory

The following structure of Shanghai No. 12 cotton mill is given as a typical example.



Party Committee:

Channel for policy decisions made by the party leadership - translates party policy into action plan in the mill under its jurisdiction. Headed by a secretary, it normally consists of about fifteen members selected from among the party members of the factory. (Fifteen per cent of the factory staff were party members.) The committee members are elected for a year..

Revolutionary Committee:

Practical implementing organ of the plans made at the Party Committee level. Headed by a Chairman and 3 Deputy Chairmen, the RC has 25 members. While the Chairman is presumably selected purely on political merit, the Deputy Chairmen are often professionals (= textile technologists) whose political loyalty must, of course, also be unquestioned).

The members of the RC are elected by the workers of the factory and the candidate list submitted to the Party Committee for approval. The Chairman's and the Deputy Chairmen's nominations must be also approved by the Central Textile Bureau of the province under whose jurisdiction the factory falls.

Trade Union:

Functions: Political education, welfare matters, safety, etc. The Union may make presentations to the PC if the RC is not performing to its satisfaction.

Youth League:

The role of the Youth League was not clearly explained but I suppose that its functions are, to some extent at least, similar to those of the Trade Union.

Production depts:

The heads of the production departments may or may not be members of the Revolutionary Committee, or the Party. They are subordinate to the RC.

Welfare:

A typical meal in the factory canteen would cost about 0,20 Yuan (= 0,11\$). The rent of a worker's apartment (typical size = 20 m²) is of the order of 4,5 Yuan/months (US\$ 2,5). Utilities (gas, water, electricity) would cost about 3 Yuan/month (US\$ 1,6). Medical attention is free.

Maternity leave is 56 days and the expectant mothers are assigned lighter work duties from the seventh month onwards. The children are looked after by the factory nurseries and kindergartens up to primary school age (7 years).

Production equipment:

The machinery in the mills shown to us was usually either very old (but renovated and extremely well maintained) or, although relatively recently manufactured, of conventional type representing roughly 1950's level of technology.

While the older equipment (often dating back to 1930's) was usually of foreign origin, the more recent types were produced in China.

All mills visited had exceptionally large and well equipped workshops, capable of handling virtually all spare part and repair needs of the factory. Consequently, the share of the total labour force required for these services was clearly relatively high, although not always explicitly stated.

- Carding: Conventional cards, frequently very old but renovated, often chute fed and with metallic wire. Production rate 10 - 20 kg/h.
- Combing: Conventional ribbon lap. Production rate 12 kg/h. Six heads per frame.
- Drawing: Three processes, no autolevellers.
- Roving: One process.
Drafting system: single apron, 3 line rolls usually.
- Spinning: Conventional.
No open-end equipment.
Relatively high speeds: 15.000 - 17.000 RPM.
Drafting system: usually Casablanca or similar with roller weights (no pendulum arms).
Direct weft spinning in most cases.
- Warping: Usually fractional.
- Slashing: Can slashing or hot air chambers;
Single size boxes;
Sometimes automatic moisture control.
- Weaving: Nearly always shuttle-changing automatic looms;
200 picks/minute.
10-shuttle box
Drop wires.
Steel heddles
Automatic let-off motion
Individual motors.
- Bleaching: Continuous
Chloreand/or peroxide.
- Dyeing: Continuous; sometimes also jiggers.
Dyestuffs: vat, dispersed, reactive.
- Printing: Roller printing, no roller screen machines.
- Finishing: Small pre-shrinking machines, no proper sanforizing.

List of main Chinese personnel connected with the tour

Mr. Cheng Wei-Chi	Vice Minister, Ministry of Light Industry
Mr. Wang Tzen-Jen	Deputy Director of the Department of External Relations, Ministry of Light Industry
Mr. Fang Mie-Ren	Deputy Director of Peking Municipal Textile Dept.
Mr. Hun Hui-Yuan	Deputy Director of Division of Ministry of Economic Relations with Foreign Countries
Mr. Lie Tung-Chun	Staff member, Ministry of Economic Relations with Foreign Countries
Mr. Yen Tseng-Lu ^{1/}	Vice-Director of the Administrative Office, Department of External Relations, Ministry of Light Industry
Mrs. Chao Wei-Tzu ^{1/}	Head of Section in the Administrative Office, Ministry of Light Industry
Mr. Wang Szu-Lin ^{1/}	Textile Engineer, Ministry of Light Industry
Mr. Hua Chung-Ho ^{1/}	Interpreter, Ministry of Light Industry
Mr. Chia Yen ^{1/}	Interpreter, Ministry of Light Industry
Mrs. Liu Ling-Chuan ^{1/}	Interpreter, Ministry of Light Industry

^{1/} Accompanied the group during the tour

List of Participants

Name	Country	Arr. in Peking	Dept. from Peking	Remarks
H. Kabir	Bangladesh	5 May	31 May	via Karachi
M.A. Mahmood	Bangladesh	5 May	31 May	via Karachi
W. Tefera	Ethiopia	8 May	3 June	via Teheran
H. Woldeclassie	Ethiopia	8 May	3 June	via Teheran
S.A. Braimah	Ghana	5 May	31 May	via Paris
F.K. Abwanka	Ghana	5 May	31 May	via Paris
K.P. Pradhan	Nepal	8 May	31 May	1/
Sher D. Pandey	Nepal	8 May	31 May	1/
A. Akintola	Nigeria	11 May	31 May	via Paris
G.N. Khan	Pakistan	9 May	31 May	via Karachi
P.A.S. Perera	Sri Lanka	5 May	31 May	via Karachi
S.Y. Kechingwe	Tanzania	5 May	?	2/
M.B. Komba	Tanzania	5 May	31 May	via Karachi
F. Kakeeto	Uganda	6 May	31 May	via Paris
A.S. Bamakhrana	Yeme (PDY)	5 May	31 May	via Karachi

1/ via Canton - Hong Kong - Bangkok (dep. from Canton 1 June)

2/ Extended his stay for private reasons (spare parts negotiations on behalf of his factory.) Expenses during extension to be covered by the Tanzania Embassy, Peking.

Mill data

Canton No. 2 Cotton Mill, 11.5.1977

(spinning only)

Labour force: 2500 of which 84,5 % production and maintenance
8,5 % welfare
7,0 % admin.

100,0 %

Age of equipment: 1958

Count range: 32 - 100 Ne

Average count: 37 Ne

Annual production: 40,000 bales of yarn (3 shifts)

Opening:
- single process
- automatic doffing

Carding:
- conventional
- 12" cans
- metallic wire

Combing:
- ribbon lap
- 6 heads
- production rate 12 kg/h

Drawing:
- 3 processes
- speed 600-700 m/min.
- PE/cotton blending on draw frame
- can size 40"

Roving:
- one process
- spindle speed 960 RPM
- drafting system 3 line rolls, single apron
- no stop motions

Spinning:
- ring size 1 3/8 - 1 5/8"
- bobbin lift 7"
- speed 15,000 - 16,000 RPM/32 Ne
- no pneumafil
- no overhead cleaners
- drafting system: Casablanca
- wooden and plastic tubes
- 24 workers/1000 sp (from blow room to spinning)
- work loads:
30 Ne: 1000 sp/operator
40 Ne: 1200 sp/operator
42 Ne: 1200 sp/operator
60 Ne: 2400 sp/operator

Mill Data

Tung Fang Garment Factory

Canton, 12.5.1977

Raw material: 100 cotton and PE/cotton

Product range: jeans
overalls
shirts and trousers

Production: 1,200,000 pieces/year for export

Labour force:

Cutting	240
Sewing	376
Finishing	137
Workshop	70
	<hr/>
Total:	823
	<hr/>

Productivity: (example) 16 pairs of trousers/worker/8 hour shift
(sewing only)
(= 30 min/pair of trousers)

Sewing machines: Chinese made

Mill Data

Hong Mien Silk Factory
(weaving only)

Fos Han (near Canton)

13.5.1977

Raw material: natural silk, some viscose and PE

Labour force: 1500, three shifts

Looms: 140 jacquards 4/weaver
160 dobbies 4-6/weaver
200 plain automatic 6/weaver
(shuttle changer)
speed 110 - 175 picks/min
some jacquards equipped with electronic feelers
but mostly mechanical weft feelers used.
width 48" - 52"

Efficiency: 80 % overall
jacquards 60 - 70 %
dobbies 70 %
plain 80 %

Mill Data

Da Li People's Agricultural Commune near Canton, 14.5.1977

Total population 15,000 households = 68,000 persons
(average household = 4,5 persons)
divided into 19 production brigades and further
into 243 production teams.

Area of arable land: 4000 ha = 0,06 ha/person

Main crop: rice
total production 35,000 tons/year = 514 kg/person/year
yield 9 - 9,7 tons/ha/year (average)
(max = 15 tons/year)
2,7 crops/year on the average.

Equipment: tractors and 2000 water buffaloes

Income break-down of the Commune:

	<u>million Yuan</u>	<u>%</u>
cash crops and animal husbandry	4,4	22
small industries	8,6	43
rice sales	7,0	35
	<u>20,0</u>	<u>100</u>

(cash crops:
sugar cane
potatoes
vegetables
water melons
peanuts)

(sales price of rice: 19,6 Yuan/100 kg.)

Income distribution

	<u>million Yuan</u>	<u>3</u>
new investment	2,4	12
public welfare	0,4	2
cash payments to members	8,7	43,5
government	8,5	42,5
	<u>20,0</u>	<u>100,0</u>

The 8,7 million Yuan cash payments to the members of the Commune amount to 580 Yuan/household (= US\$ 318) or 128 Yuan per person (=US\$ 70) per year.

Accommodation

Living space about 50 m² per household. Main facilities seen in the home of a production team leader: radio, fan, sewing machine, 3 bicycles (price 100 - 140 Yuan each).

Mill data

Shanghai No. 12 Cotton Textile Mill, 15.5.1977

<u>Labour force:</u>	spinning	3,300
	weaving prep.	
	weaving, inspection	1,500
	services	1,200
	total: (three shifts)	<u>6,000</u>
<u>Production:</u>	Yarn:	20 tons/shift = 18,360 tons/year average count 27 Ne count range 12 - 60 Ne cotton and PE/cotton
	Fabric:	35,000 metres/shift = 32 million m/year drills and khakis, width 36" - 44" main fabric constructions: 156 ends per inch 76 picks per inch
<u>Opening:</u>	- single process - automatic doffing - 12 - 14 bales blend	
<u>Carding:</u>	- conventional and chute fed - production rate 25 kg/h - can size 24"-36" - metallic wire (converted 1931 Platt cards)	
<u>Combing:</u>	- ribbon lap - 6 heads per frame - 15 kg/h production	
<u>Drawing:</u>	2 processes - speed 200 m/min - can size 16" - 36"	
<u>Roving:</u>	1 process - speed 600 RPM - drafting zone: double apron	

Spinning:

- 122.900 spindles plus 36.480 twisting spindles
- ring size 1 5/8"
- speed: 21 Ne 16.500 RPM
42 Ne 17.300 RPM
- production: 40 kg/1000 sph (coarse counts)
14,5kg/1000 sph (fine counts)
- drafting systems: Casablanca
- ball bearing spindles
- plastic tubes

Winding:

- semi-automatic
- slub catchers: blades

Warping:

- fractional
- stop motions in creel
- package: cone

Slashing:

- hot air drying
- single size box
- moisture control
- plied yarns sized

Weaving:

- 24-32 looms/weaver
- total looms 1168
- shuttles changing automatics
- speed 205 picks/min
- shuttle repair workshop
- automatic drawing-in

Mill data

Shanghai No.2 Textile Machinery Plant, 16.5.1977
(spinning frames)

Production: ring frames for cotton, wool, silk, synthetics
mostly for domestic consumption but also exported
as "foreign aid and to support world revolution".

Capacity: 600,000 spindles/year

Labour force: 3000

Equipment: 1500 machine tools including 800 lathes,
automatic foundry.

The spindles, rings, pendulum arms, drafting zones, etc. are manufactured elsewhere and not assembled in this factory before shipment.

The supply of spare parts appeared to be poorly organized. Four participants who came from Chinese-built mills complained about the difficulty in obtaining spare parts. Orders for spares must reach the central production planning organs before October in order to be included in the next year's production programme. No stocks were maintained.

In general, the factory management showed little interest in the sales of their products. They confine themselves strictly to the production to meet the targets set by the central planners. It was not even possible to obtain sales brochures here. They had to be requested from the Machinery Import and Export Corporation.

Mill data

Shanghai No.33 Cotton Textile Mill, 16 - 17.5.1977

Labour force 2350:

blow room-spinning	600
weaving incl. prep. and inspection	820
winding, twisting	130
air cond., cotton testing	50
workshop	200
management	170
transport, warehouse	80
welfare	300
Total:	<u>2350</u>

total spindles:	32,000
total looms:	11,000
production: poplins, sheeting for the domestic market plus some export.	
productivity spinning:	44 kg/1000 sph
productivity weaving:	5,3 m/loom h
count range	20 - 40 Ne
average count	26,6 Ne
3 shifts	
grade of cotton	1,8 - 2
30 mm staple length	
fineness	6000 - 6300 Nm
	$= \frac{25400}{6000} = 4,2 \text{ micronaire}$

Opening: - single process, automatic doffing

Carding: - conventional and chute fed
- production 16 - 20 kg/h
- can size 20"
- conventional card clothing (no metallic wire)

Combing: - ribbon lap
- 6 heads per frame

Drawing: - two processes
- speed 100 m/min
- can size 14" - 36"

Roving: - one process
- spindle speed: 850 RPM
- drafting system: double apron

Spinning:

- ring size 1 3/8" weft
- 1 4/8" warp, 30 - 40 Ne
- 1 5/8" warp, 20 Ne
- spindle speed 17,000 - 18,000 rpm
- drafting system: double apron
- ball bearing spindles
- wooden and plastic tubes

Winding:

- fully automatic
- slub catchers: blade

Warping:

- type: fractional
- stop motions on machine
- type of package: cone

Slashing:

- † hot air and cans
- can slashing: 6 cans
- single size box
- moisture control

Weaving:

- automatic shuttle changers
- speed 200 - 215 picks/min
- width 44"
- work load 26-36 looms/operator
- with:
 - drop wires
 - steel heddles
 - automatic let-off motion
 - individual motors

Mill Data

Hung Huang Weaving, Dyeing and Finishing Factory (also shirt manufacture)
Shanghai, 18.5.1977

Total work force 1760:	shirt making	450
	weaving incl. prep. and inspection	260
	dyeing/finishing	500
	services	550
	Total:	<u>1760</u>

<u>Production:</u>	- fabric	14,000 m/day (22 ½ h)
	(3 shifts)	= 4,3 million m/year
	- dyeing/finishing	160,000 m/day
	(3 shifts)	= 49 million m/year
- shirts	3600 - 4000 pieces/day	
(1 shift only)	92,000 pieces/month	

Warping:

- fractional
- creel package: cone

Slashing:

- can slashing
- single size box
- moisture control

Weaving:

- automatic shuttle changer
(dobbies and plain;
24 looms/weaver)
- with
 - drop wires
 - steel heddles
 - automatic let-off motion
 - individual motors

Bleaching:

- open width
- ohlore and peroxide

Dyeing:

- jigs
- continuous
- vat, dispersed and reactive

Finishing:

- small compressive shrinkage machine used for PE/cotton
- 1 % shrinkage claimed
- clip stenters
- lot size 72 - 110 m - 7920 m

Mill Data

Shanghai No. 14 Garment Factory, 18.5.1977

Production:

- ladies' nightwear (embroidered)
- ladies' blouses (embroidered)
- skirts (embroidered)
- 40,000 - 500,000 pieces/month
- one shift operation
- 360 workers and staff
- mainly for export

Mill data

Shanghai No. 1 Printing and Dyeing Mill, 19.5.1977

<u>Labour force:</u>	bleaching-dyeing	400
	engraving	120
	printing	400
	finishing	400
	workshop	400
	services	350
	Total	<u>2070</u>

Production: 350,000 m/day = 107 million m/year
3-shift operation

"Factory established in 1931 by Japanese imperialists exploiting Chinese labour and raw material" (quotation from welcoming speech)

Bleaching:

- open width (PE)
- rope form (cotton)
- chlorine and peroxide

Dyeing:

- continuous
- lot size 20,000 metres
- vat, dispersed and reactive dyestuffs

Printing:

- roller printing (5 machines)
- 1 x 6 colours
- 3 x 8 colours
- 1 x 10 colours

Finishing:

- small compressive shrinkage machines giving 3% shrinkage on cotton and 1% on PE/cotton
- clip stenters
- resin treatment

Mill Data

China Textile Machinery Plant, Shanghai, 20.5.1977

(weaving looms)

<u>Labour force:</u>	6000
<u>Production:</u>	30,000 looms/year
<u>Productivity:</u>	70 man-hours/loom
<u>Specifications:</u>	<ul style="list-style-type: none">- automatic shuttle changer (10 shuttles)- reed 56" - 75"- drive: individual motor, 0,8 kw- speed: 160 - 190 rpm (56" - 63") 150 - 180 rpm (67" - 75")↳ automatic let-off motion- drop wires- weight 930 - 1100 kg.

Mill Data

Shanghai No. 21 Garment Plant, 20.5.1977

Production:

- night gowns
- pyjamas
- 600,000 pieces/year
- one-shift operation
- 120 sewing machines

Labour force:

cutting	15
sewing	120
buttons	9
pressing and packing	30
production staff	<u>174</u>
general service	26
	<u>200</u>
Total:	<u>200</u>

Mill data

Wuhsi No. 1 Cotton Textile Mill, 22.5.1977

- 83,000 spindles
- 20,000 twisting spindles
- 1066 looms
- main products:
 - drill
 - sheeting
 - popline
- established 1921

<u>Labour force:</u>	- blowroom-spinning (incl. twisting)	2200
	- weaving prep., weaving, inspection	1000
	- workshop, etc.	400
	- office	300
	- welfare, clinic, etc.	500
	- misc.	200
	Total:	4600

Yarn production: 46,800 kg.day = 14,320 tons/year

Average count: 26,5 Ne
(range 10 - 60 Ne)

Opening:

- sing' e process
- automatic doffing

Carding:

- conventional and chute fed
- production rate 15 - 28 kg/h
- can size 24"
- clothing conventional and metallic

Combing:

- ribbon lap
- 6 heads per frame
- production rate 12 kg/h

Drawing:

- two processes
- speed 110 m/min
- can size 14"

Roving:

- one process
- spindle speed 800 RPM
- bobbin size 12"
- drafting zone: double apron

Spinning:

- ring size: 1 3/8" and 1 5/8"
- bobbin lift: 1 1/2"
- spindle speed: 18000 RPM
21 Ne PE/cotton
- drafting zone: double apron
- ball bearings

- plastic tubes
- 420 spindles/frame
- work load: 2,5 - 3 frames/operator;
(fine counts
4 frames/op)
- productivity: 44 kg/1000 sph

Winding:

- semi-automatic
- blade slub catchers

Warping:

- fractional
- stop motions in machine (drop wires)
- package: cone

Slashing:

- hot air drying
- single size box (wheat starch)
- moisture control

Weaving:

- automatic shuttle changers
- speed 210 picks/min
- production 5,4 m/loom hour
- width 32", 36" and 38"
- work load 32 looms/weaver
- with drop wires
steel heddles
automatic let-off motion
individual motors

Mill data

Wuhsi No. 1 Silk Reeling Factory, 23.5.1977

Total labour force: 1700 (80 per cent women)

Work load: Conventional reeling machines: 20 ends/worker
Automatic reeling machines: 60 ends/worker

Production: 320 tons/year

Quality of product from the automatic machines inferior to that from the conventional machines. Also, savings in labour not very significant because supplementary labour necessary on the automatic process.

Temperature of reeling bath 32°C

Length of filament on reel 56,000 m

Boiling time 13 min (under pressure 3 min.)

Mill Data

Peking No. 3 Cotton Textile Mill, 25.5.1977

87,000 spindles
3200 looms
3-shift operation
factory established 1957

<u>Labour force:</u>	- spinning.	2100
	- weaving	2700
	- workshop	450
	- welfare	450
	- administration	640
		<hr/>
	Total:	6340
		<hr/>

Production:

- yarn 18,000 tons/year
- average count 23.2 Ne
- fabric 100 million metres/year

Opening:

- single process
- blow room blending (PE and Vinyon)
- automatic doffing

Carding:

- conventional
- production rate 20 kg/h
- can size 24"
- metallic wire clothing

Drawing:

- two processes
- speed 80 - 85 m/min
- can size 16"

Roving:

- one process
- spindle speed 700 RPM
- bobbin size 11 $\frac{1}{2}$ "
- drafting 3-line rolls

Spinning:

- ring size 1 5/8"
- bobbin lift 7 - 7 $\frac{1}{2}$ "
- spindle speed 16000 RPM, 32 Ne
- drafting: double apron
- ball bearings
- plastic tubes
- work load 1000 spindles/operator

Winding:

- non-automatic and semi-automatic
- cone weight 3 kg

Warping:

- fractional
- stop motions on machine
- package: cone

Slashing:

- hot air drying
- single size box

Weaving:

- automatic shuttle changers
- work load 24 - 48 looms/operator
- width: 44", 63" 68"
- with
 - drop wires
 - steel heddles
 - automatic let-off motion
 - individual motors

Mill Data

Peking Printing and Dyeing Mill, 25.5.1977

Established in 1958

Total work force 2500:	production	2000
	management, services	
	etc.	500
		<u>2500</u>

Production 115 million m/year

printing 50 per cent
dyeing 50 per cent

1/3 of total production for export, three-shift operation.

Bleaching:

- rope form
- peroxyde and chlcre

Dyeing:

- jigs
- continuous
- vat, reactive, dispersed dyestuffs

Printing:

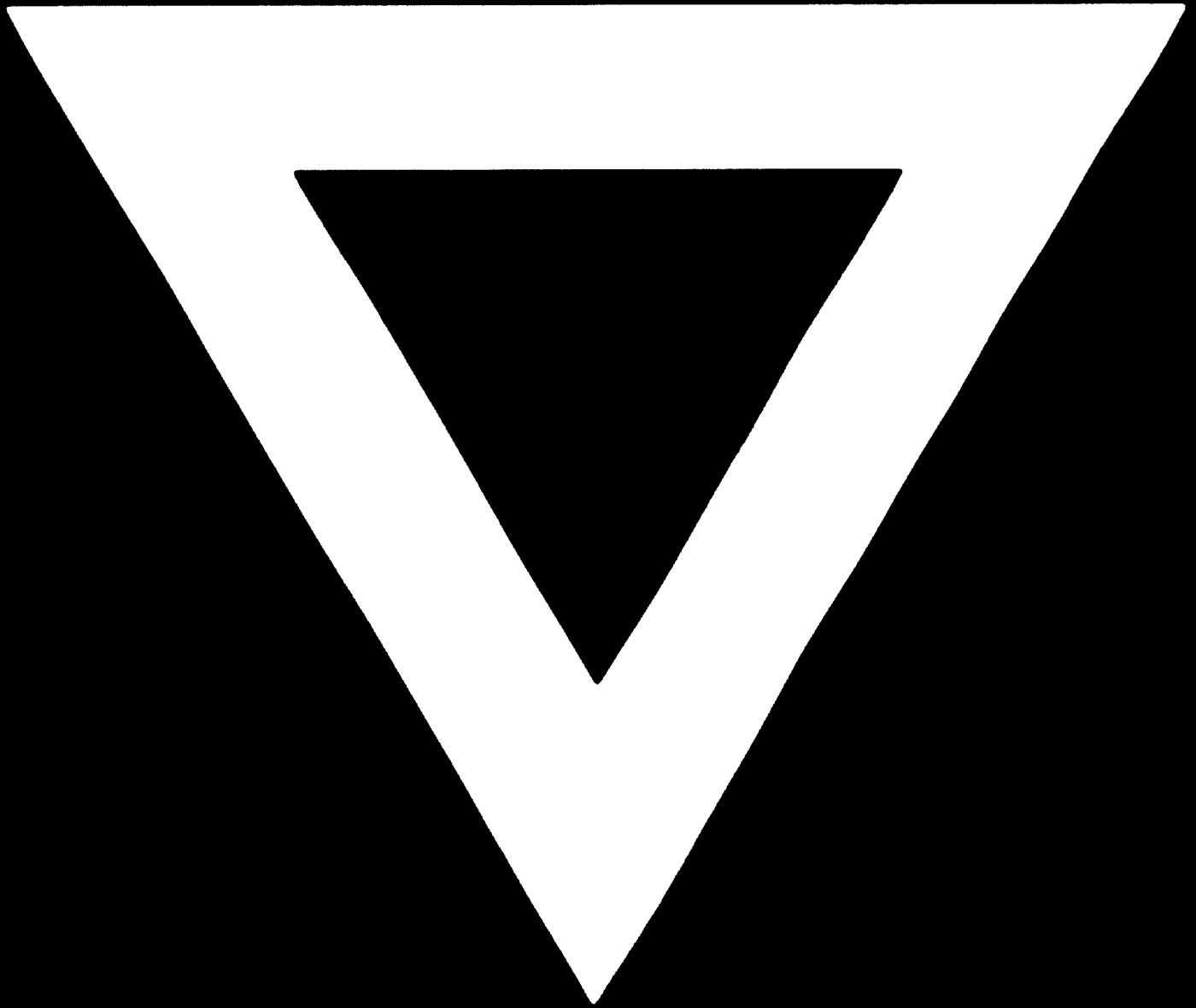
- roller printing (3 - 7 rollers)

Finishing:

- small compressive shrinkage machines
- clip stenters
- lot sizes up to 100,000 metres (10,000 minimum)



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