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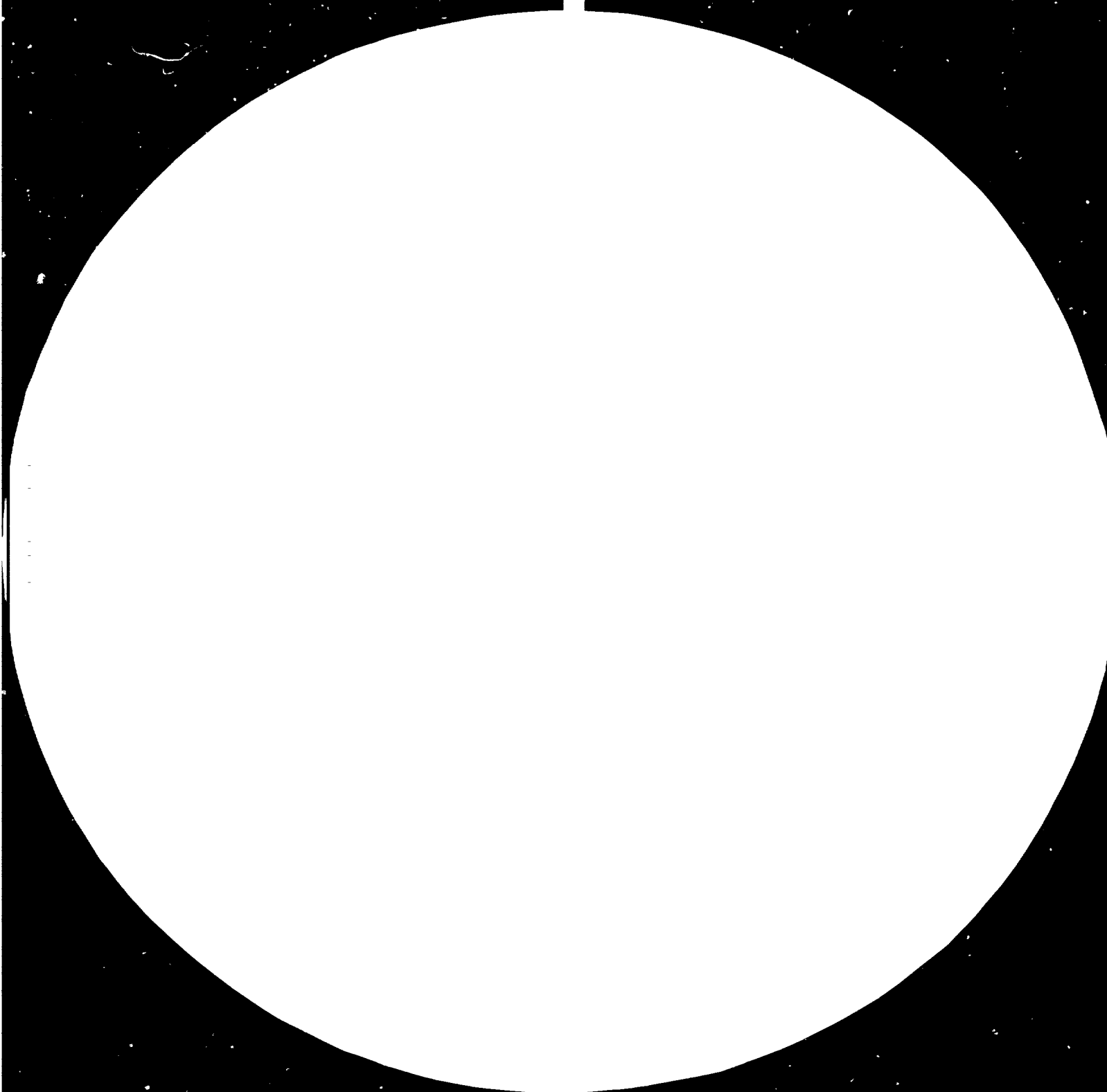

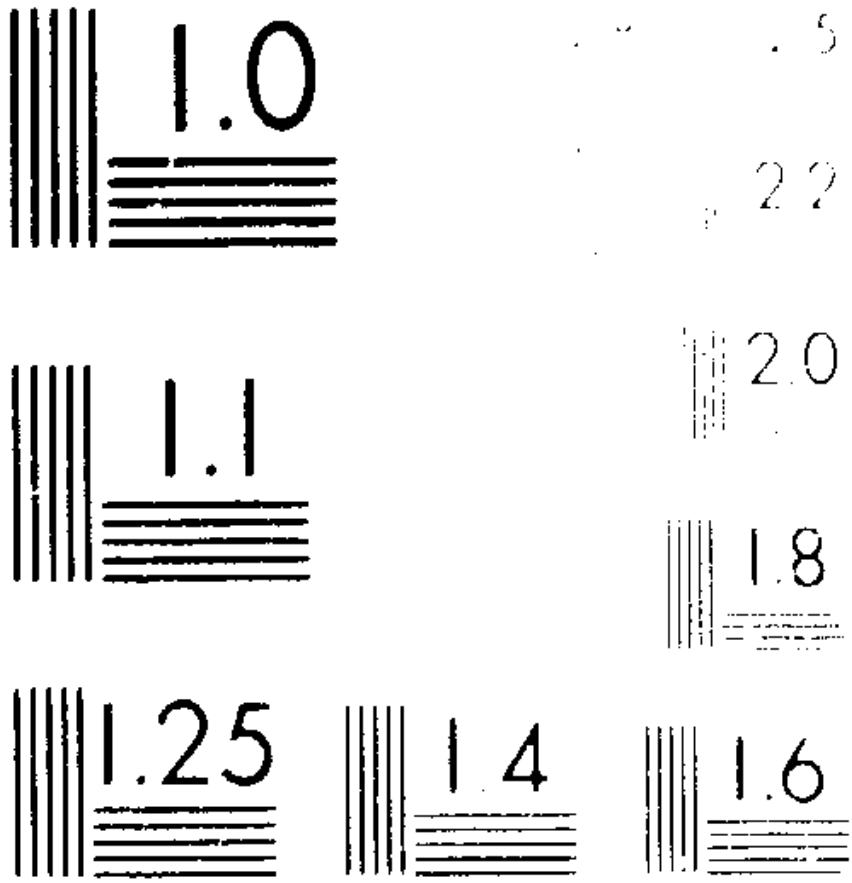
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27 July 1981
English

ASSISTANCE TO THE ESTABLISHMENT OF CENTRAL LEATHER LABORATORY IN SHANGHAI

DP/CPR/80/007

PEOPLE'S REPUBLIC OF CHINA

Technical report*

Prepared for the Government of People's Republic of China
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Bo Lundén,
leather industry expert,
Chief Technical Adviser

United Nations Industrial Development Organization

Vienna

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Explanatory Notes

During the period of the mission

1 US$ was approximately equal to RMB 1.75 Yuan

RMB (Ren Min Bi): People's Notes

UNDP - United Nations Development Programme
UNIDO - United Nations Industrial Development Organization
SIDFA - Senior Industrial Development Field Adviser

Acknowledgement

During the mission in the People's Republic of China the Chief Technical Adviser was met by an overwhelming hospitality and a very effective co-operative spirit from all parties concerned. In the Ministry of Light Industry Mr. Yan Zenglu, Director, and his staff, especially Mr. Liu Guanglu, from the Second Division of the Foreign Affairs Bureau as well as Mr. Lin Yifu, Deputy Director, and his staff, especially Mr. Zhang Yinzhen, Head of the Leather Division and Mr. Hsu Long Chang, from the Second Light Industry Bureau made the stay in Beijing a memorable one. In Shanghai the Manager, Mr. Ma Guangsheng of Shanghai Leather Corporation and the Vice Manager and Chief Engineer, Mr. Zhang Xilin and his staff, especially Mr. Xu Jian Fu, Director of Hung Wei Tannery and Mr. Lan You Mi, head of the laboratory, all spared no effort to make the work effective and pleasant. The courtesy of Mr. Liu Tusheng, Vice-Director of Shanghai Handi raft Products Administration Bureau (which is concerned with the leather industry in Shanghai municipality) was very much appreciated.

Without the help of the UNDP personnel, especially Mr. A.W. Sissingh, UNIDO SIDFA in Beijing, and the programme assistant, Ms. Li Qiming, the work would have been considerably more difficult.

Abstract.

The purpose of the project "Assistance to the establishment of Central Leather Laboratory in Shanghai" (DP/CPR/80/007) was to provide assistance in 1) setting up a complete chemical analysis and physical testing laboratory and 2) to train personnel in the field of technology and testing. The 6 week mission of the Chief Technical Adviser, from 18 May to 2 July 1981, reported on here, had as objective 1) to help in selecting equipment for the laboratories and 2) to advise on testing, research and on laboratory as well as industrial development plans. Lists of needed equipment and literature are presented.

The leather industry in China is of great importance, but is also in need of modernization and the acquisition of the latest technology in the field. The establishment of the Central Leather Laboratory can only be a first step to aid in obtaining this, and the report recommends that the assistance should be continued and the laboratory expanded into a more comprehensive institute. Measures to improve contacts with the international leather community are also suggested.

Observations and suggestions are made on some practical questions and development plans in Shanghai Leather Corporation.

CONTENTS

INTRODUCTION

Background.

China has fairly rich resources of hides and skins and has experienced a long history in the development of the leather industry. Shanghai is one of the most important leather producing areas in China, but the quality of the finished leather products is not satisfactory. The chief drawback is due to the poor research work on the fundamental technology and the outdated methods and instruments used for testing, which fail to meet the requirements for the proper development of the leather industry in China. It is, therefore, essential to establish a modern laboratory for the Shanghai tanning industry, in which laboratory scientific methods for quality control will be established through the adoption of modern testing procedures. The laboratory will also emphasize the popularisation of testing methods sanctioned by ISO (International Standards Organization).

The small-sized experimental tannery will test new methods and materials in order to, combined with the modern chemical analysis and physical testing methods in the laboratory, improve the quality of the products.

On the basis mentioned above, a Tanning Technology Center (Leather Institute) will be set up as a standard model for China's leather industry. This center will also serve to promote international co-operation in this field.

No earlier UNDP/UNIDO financed assistance for the leather industry in China has been carried out before the present project.

Official arrangements.

At the Leather Panel Meeting at UNIDO headquarter in Vienna in November 1979, the assistance to the leather industry in China was discussed with the Chinese representative, Mr. Zhang Xilin, Chief Engineer, Shanghai Leather Corporation and with the Chinese Delegation from the Ministry of Foreign Economic Relations. The leather field was then

selected to be included among the assistance projects and a tentative document for a large scale project was written by the relevant substantive section of UNIDO. The Chinese government, however, considered the project too large for the time being. Thus, in the Ministry of Light Industry, the smaller, present project was elaborated and subsequently approved by the government, UNDP and UNIDO in April 1981.

The mission of the Chief Technical Adviser began on 18 May 1981. After briefing in Vienna he arrived in Beijing on 21 May and in Shanghai on 25 May. Finishing the work and leaving Shanghai on 24 June for debriefing and talks in Beijing and debriefing in Vienna, the mission was concluded on 2 July 1981.

The co-operating agency has been the Ministry of Light Industry, Beijing, who had appointed Mr. Zhang Xilin, Chief Engineer, Shanghai Leather Corporation, as the national project director and with whom the adviser had an excellent co-operation.

Contribution.

The total UNDP contribution for the duration of the project will be 250,000 US dollars, while the government contribution in kind will be RMB 400,200 Yuan.

Objectives.

The immediate project objectives, i.e. 1) establishment of a complete chemical analysis and physical testing laboratory and 2) training of personnel in the field of technology and raw materials to finished products control, are fully in force. The objectives of the present mission was to assist on selecting proper equipment and to advise on testing, research and training programmes as well as on laboratory and industrial development plans. They were necessary preliminaries in order to attain the project objectives and the activities to fullfill them have been carried out as thoroughly as possible.

Training.

Five engineers or technicians will be sent to Europe for training. They will later fill the posts at the Central Leather Laboratory.

Three informal seminars on leather production in general, "What constitutes a Modern Tannery?", took place with 10 to 30 technical people present.

RECOMMENDATIONS

1. The present project can be regarded only as a first step in aiding the leather industry in China to develop its potentialities (Page 22). It is therefore recommended that the government should

   a) decide to expand the present Central Leather Laboratory in Shanghai into a comprehensive Leather Institute, comprising also adequate experimental tanning equipment and facilities for shoe and leather goods development work as well as for training,

   b) ask UNDP/UNIDO to aid in the establishment of said institute, and

   c) direct the present national project director to elaborate for this purpose a project document along earlier lines, but revised according to present knowledge and experience.

2. Discussions on the present project (Page 13) have shown that only one single expert should be needed to install and bring into operation all the chemical analyis as well as the physical testing equipment. It is thus recommended that

   the project document is amended to require only one laboratory expert, but instead to call for

the chief technical adviser or equivalent to come after the installation of the equipment to check on the progress and to advise on further development work.

3. International contacts and an adequate knowledge of world trade and technological developments are of great importance (Page 16). It is <u>recommended</u> that

   a) a yearly study tour, comprising 3 to 4 persons (technologist, shoe designer, sales manager, etc.) is organized, especially to include a visit to "Semaine du Cuir" (Leather Week) in Paris in September each year. In the group at least one member should easily speak and understand spoken English.

   b) the Chinese association of leather chemists should examine the possibility of joining the International Union of Leather Technologists and Chemists Societies . A membership would open a way for collaboration on new testing methods etc..

4. The knowledge of foreign languages, especially English, will to a certain extent be crucial for the proper development of the Central Leather Laboratory (Page 17). Taking this into account it is <u>recommended</u> that

   special measures are instituted to increase the knowledge of English, e.g. 15 minutes of intensive talk training with the aid of a tape recorder or similar daily.

5. In view of the discussions (Page 19) on the plans to move the tanneries in Shanghai out of the city proper it is in particular <u>recommended</u> that

   a) the six tanneries are combined to form only 2 or 3 new units,

   b) each new tannery is contained in a single building,

   c) the effluent canals are from the beginning built to separate the different types of spent liquors,

d) the chemical processes are designed to produce the least possible effluent with the least possible polluting materials.

6. The maintenance in the tanneries seems to be generally much below normal standard, resulting in many disturbances (Page 18). It is recommended that

a daily as well as a periodic maintenance schedule for all machines is elaborated and implemented in each tannery.

7. The effluent treatment plant at the Hung Kwang Tannery is not functioning at the present time (Page 20). Although the capacity is not enough for an adequate purification, the plant should still be used to purify effluent to the highest degree possible. It is recommended that

the precipitation tanks and the lagoons are cleaned out soonest possible and the plant again put into operation at the highest level of purification consistent with the amount of effluent received.

I PRELIMINARY ACTIVITIES

A. Work plan

During the briefing in Beijing it was found that the adviser would need a few days more in Beijing than anticipated. This was later confirmed by the national project director in Shanghai and it was decided that the adviser should return in the afternoon of 24 June.

In later discussions with the national project director the following detailed work plan was agreed upon. (All Thursdays are holidays in the Shanghai leather factories, i.e. 28 May and 4, 11 and 18 June would not be working days):

25 May - 20 June	Survey of the leather and leather products industry in Shanghai.
30 May - 6 June	Seminars on "What constitutes a

	Modern Tannery?" with discussions.
31 May	Interview with 4 of the 5 trainees (fellowship candidates). Discuss the arrangements for their training.
5 June - 14 June	Introduce to the appointed head of the Central Leather Laboratory, Mr. Lan, the ways and means of quality control and the function of a laboratory in the developed countries. Discuss needed equipment and finalize the lists of same and of books and journals.
7 June	Discuss the present project and suggest amendments or corrections if necessary.
17 June - 20 June	Discuss plans for the new building to house the Central Leather Laboratory and the plans for a new tannery estate near the laboratory. (All downtown tanneries in Shanghai shall be moved out of the city proper, mainly because of the pollution problems).
19 June - 23 June	Work on the draft report.
23 June	Discussions of the draft report and mission results.
24 June	Finalizing the report and departure for Beijing.
25 June - 28 June	Factory visits, discussions and debriefing in Beijing.

The deviations from the work plan have been very few and without any importance.

F. Industry Survey

Shanghai Leather Corporation

This corporation is the only one in the area engaged in producing leather and leather products. Some other activities are, however, also carried out, all in some way related to leather. A list of the member companies will reveal the complexity of its operations:

8 Tanneries
2 Leather chemicals plants (one also produces leather board)
1 Leather machinery factory
15 Shoe factories
2 Shoe, metal accessories factories
1 Shoe last factory
17 Leather goods factories
2 Leather ball factories
1 Storehouse for hides/chemicals/shoe materials
1 Storehouse for finished leather
1 Shoe and leather goods shop.

The shop was acquired recently to allow the corporation to be directly in contact with the general public. All other shops are managed by a special corporation. The leather corporation is employing nearly 16,000 people all in all. About 25 similar corporations exist in other parts of China with a total employment of about 300,000 people.

The Tanneries

All the tanneries in the corporation were visited and names and participants are given in Annex I. At each place the tour through the plant was followed by a discussion with the management of the observations made, especially concerning technical level, quality control, machine composition and maintenance.

Before leaving Beijing at the end of the mission, Beijing Dong Feng Tannery was also paid a visit.

The other companies

The two leather chemical plants, Shanghai Leather Chemical Plant and New China Leather Chemical Plant, two of the shoe factories, Shanghai Shoe

Factory and Precious Shoe Factory, as well as one leather ball factory, International Ball Factory, and one leather goods plant, Shanghai Leather Goods Factory, were also visited. After the tour through the plants, similar discussions as in the tanneries always took place. The Shoe and Leather Goods Shop was studied thoroughly on a Thursday, when the shop was closed to the general public.

Again, before leaving Beijing, a tour of Beijing No. 1 Leather Shoe Making Factory was also arranged.

Effluent Treatment Plant

Hung Kwang Tannery is receiving the effluent from the Hung Wei Tannery and for the combined effluent treatment a plant was built in 1966. A screen to remove larger, solid pieces and an aeration tank for the oxidation of the sulphides to sulphates was arranged on the tannery area proper, to pretreat the effluent before entering the effluent treatment plant itself. The plant was studied in some detail, as also a pilot treatment plant in the tannery, which was built to try to reduce the polluting content in the water to levels prescribed by the Shanghai district authorities. In trial runs these levels had been obtained.. The treatment plant proper was, however, not working, due to overload and subsequent blocking up of the primary precipitation tanks with solids.

C. Seminars

At the wish of Mr. Zhang three full-day seminars were held with key technical personnel from Shanghai Leather Corporation. At the first one 30 people were present, but for the last two only about 10 were present. This reduction was done primarily because of the language problem. Many of the technicians knew no English at all and it often took inordinately long time to explain in the translation details of some of the subjects treated.

Otherwise a very great interest was shown and the discussions certainly confirmed this impression. All phases of leather production, including management, control, maintenance, etc., were treated.

D. Present project

UNIDO experts.

In talking about the present project, it was found in the main to be appropriate. Discussing the in-coming experts, however, there was soon a consensus, that only one expert was really necessary. A leather laboratory expert should be qualified to install and put into operation the chemical analysis part as well as the physical testing equipment. Most heads of leather laboratories in developed countries are experts in both areas. It was suggested, that the funds thus saved, should be used to ask the chief technical adviser to return after the installation of all the new equipment in order to check on the progress and to advise on the further development.

Trainees.

The question, if all the trainees should be sent to one specific country, has been brought up earlier in correspondence between UNIDO/UNDP and the government. It was again reiterated, that any teaching/research institution of known standard would be acceptable, if the teaching language was English and the institution located in a country with normal and friendly relations to the People's Republic of China. The advisability of using more than one institution was readily recognized by the national project director, but on the other hand, only one trainee at one particular place should be avoided, for social reasons if nothing else. This leaves for the five trainees at most two institutions and it was left to UNIDO's discretion to find, if possible, a second one outside England, satisfying necessary conditions.

II. CENTRAL LEATHER LABORATORY

A. Building plans

Intermediate plans.

Since the special building for the laboratory probably will not be finished before the end of next year, the Shanghai Leather Corporation has decided to rebuild, modernize and reorganize the laboratory at the Hung Wei Tannery as an intermediate solution. This laboratory will be ready to receive all the equipment and personnel destined for the Central Leather Laboratory and will start to function as such. When the completely new laboratory building has been erected, all new equipment will be transferred there and the Hung Wei Tannery laboratory will revert to being a one-tannery laboratory once again. The localities will be ready in December this year, in time to receive the new equipment, which immediately will be ordered.

The new laboratory buildings.

A discussion of the blue-prints for the buildings revealed that some 1,000 m^2 total floor space was considered adequate, including 360 m^2 for the experimental tannery. In the initial phase this also seems to be sufficient. In the course of the discussion it was stressed, that the short term planning should always take into account long term developments, i.e. space for expansion of present activities, as well as space for other activities of the future, should be kept in mind. This point was promised to be very carefully considered and present plans would be revised in this light.

B. Organization and work

With the appointed head of the central laboratory, Mr. Lan, for the moment chief chemist at Hung Wei tannery, the organization of the chemical analysis and the physical testing laboratories as well as the experimental tannery was discussed at length. Advice on different points were given and the proposed activities, i.e. control and research,

were examined in some detail. The need of co-operation, on one side with the tanneries and on the other side with the leather users, the shoe and leather goods manufacturers, was stressed. It is important, that the Center refrains from developing into an "ivory tower" with no real contact with the industry. Similarly, in the long run the cost of control and research should be balanced against the returns from the laboratory to industry. There was a complete consensus on these points and a lively interest was shown in control and research work programmes important and beneficial to the leather industry.

C. Equipment

Also in the case of the equipment for the different laboratory departments there was an easy agreement on what kind of equipment was needed and also on the required quality of instruments etc.. Since many instruments are made in China, often of a somewhat lower quality, and since the Central Laboratory should act also as a demonstration center for laboratories at individual tanneries, it is of utmost importance, that the instruments and apparatuses selected are of the highest quality and of renown makes.

The list of equipment decided upon is found in Annex II. The total cost will leave some room for later additions, for which the need will appear during the run-in period of the laboratory. Especially the glass ware requirements are difficult to determine at this time, since many are produced in China at a perfectly acceptable standard, and thus do not need to be imported, while for some others this will not be the case and are needed to be brought in from abroad.

D. Library

The organization and lending activities of a small library, attached to the central laboratory, was briefly

touched upon, when discussing the list of appropriate books and journals. In the field of leather technology some very important literature is published in German. Since some technologists in the corporation are able to read this language, it was decided to include some of the most important German books and journals. Absolutely necessary for the efficient use of the library is the inclusion of general dictionaries. The completed list of Books and Journals is found in Annex III.

III. FINDINGS AND OBSERVATIONS

A. General comments

The interest in their work and in the further development of the leather industry was very evident among the technicians, engineers and managers of Shanghai Leather Corporation. The theoretical knowledge was also in general quite high, in many cases surprisingly high. Lacking was, however, a knowledge and understanding of the latest technological advances made in most of the highly industrialized countries. The need for modern methods, both chemically and mechanically, proper production flow, good maintenance, sufficient production and products control and, all in all, adequate management at all levels in the factories, was clearly appreciated. This situation can certainly to a great extent be attributed to the lack of international contacts with the world leather trade and industry and to the language problem, which undoubtedly exists. Very few of the younger generation can communicate easily in English and this will to a certain extent impede the work at the central laboratory. The laboratory is created to develop the latest processing and control methods used internationally and will rely much on foreign, oral and written, communications. It is feared, for example, that most of the fellowship trainees selected, during their first time abroad, will have difficulties in following courses etc., because of their insufficiency in talking and understanding spoken English. On the other hand, the training abroad will also give them the opportunity to greatly improve on this deficiency. This will perhaps be the most important result

of their training, since their theoretical knowledge seems to be very good, indicating a need only to brush up on laboratory work and to learn about the latest developments in their field.

All measures to improve the language situation should be welcome. As one measure, it is suggested that 15 minutes are used every morning at the laboratory to train in speaking English, e.g. with the aid of a tape-recorder and some tapes with spoken English and American.

As to the lack of international industry contacts, it is seriously suggested that Shanghai Leather Corporation, or the Chinese leather industry as a whole, should each year send a small group, say 3-4 persons, on a study tour in Europe, including specifically the "Semaine du Cuir" in Paris, arranged every year in September. The group should contain a leather technologist, a shoe designer and a sales specialist and among them at least one should speak and understand spoken English easily. The yearly cost for such a study tour would be very small, compared to the experience gained and the economic results, that could be expected in the exports of leather products from China.

B. The tanneries

The visits to the tanneries were obviously very short. No far-reaching conclusions should be drawn and the observations made should be evaluated in this light.

The quality of the different leathers appeared generally to be fair to quite good. Especially some full grain pig skin leather and the aniline goat and kid leather from one of the tanneries were especially pleasing to the eye and hand. Most of the pig skin shoe upper leather was corrected and sometimes it could be questioned if this was necessary. The area yield appeared to be somewhat low, in some cases very low. The pig skin splits were almost in total used for linings, sueded or pigmented, and the possible use as

garment suede split, as in many other countries, was not considered.

Most machines were made in China and seemed in general adequate for the work to be done. Some, like the mixers, deviated from normal designs. The mixers, for example, were really more resembling drums with an open end than the commonly known types. Some tanneries had obtained a few, very modern, European machines, in one case, a full set of such machines was being installed. One recurring impression was, that comparatively small drums and "mixers" were used even where fairly large quantities of leather were produced.

Many managers complained about the Chinese-made machines, especially about their endurance. The impression, that the reason for the failure of many machines was more poor maintenance than weakness of the machines, was difficult to avoid. Proper maintenance, the daily as well as the more periodic, seemed to be almost non-existant in all the factories. Thus, it could be feared that the new machines will not endure much better, if the maintenance is not improved considerably. It is suggested that the question of maintenance is thoroughly looked into in all tanneries and that rules of procedures are prescribed centrally.

In nearly all the tanneries the production flow is extremely fragmented, due to the isolation of the individual work shops. It is said, that this is a result of the historic development of the factories, one building after another being added as the need arose. The result is, however, a very cumbersome and uneconomic production. It can probably be argued, that the complete erasure of some of the factories, including some large ones, and the construction of new, simple factory buildings, one for each tannery, but with modern lay-out etc., would pay for itself in a very short time. The increased efficiency and control, the savings in time, transport costs, materials etc. would certainly surprise the present management.

Without a more thorough study of the processes nothing much can be said. A few isolated observations are, however, presented. The total chrome consumption in the different tanneries appears to be quite high. Partly, this could be attributed to the wish for a high chrome content in the finished leather. Some technologists held the view, that the quality of the finished leather was directly related to the amount of chrome in the leather. This is, of course, only true in a very limited sense. Much of the high chrome consumption is caused by a comparatively low up-take during the tanning. The modern, low-float methods or the use of powder instead of liquors were also not seen at any instance.

No brushing machines were in evidence. The pigmented ground coats were applied by hand - sometimes friction precipitated particles from the acrylic emulsion were observed, as well as colour variations caused by the settling of some pigments in the colour mix.

In general, it can probably with some certainty be said, that new, modern processes will have to be introduced, also in the Chinese tanning industry, if its efficiency and competitiveness in the world market is to be retained and developed. The Central Leather Laboratory should be of considerable help in this respect.

C. Plans for new tanneries

The pollution problems have been growing more and more severe in the six tanneries of Shanghai Leather Corporation situated in the city proper. For this reason, as well as others, the corporation has decided to move these tanneries out of the city to a place near the Hung Wei Tannery. With those already existing there, they will form a large tannery estate, to which the new Central Leather Laboratory also will belong.

The plans have been discussed briefly. Taking into account the present situation in the industry and the different arguments advanced during the discussions, some suggestions, thought to be pertinent, are forwarded. Thus, it is suggested, that the possibility to build only 2 or at most 3 new tanneries instead of the 6 now existing, should be considered in earnest. Some of the present tanneries are quite small and the increased efficiency and economy as well as the savings in invested capital would undoubtedly be very great.

In the planning of the buildings, it is suggested, that for each factory one single building, designed for a proper lay-out for the production flow anticipated, taking also into consideration the probable production volume in year 2000, should be erected.

The foundation - one storey buildings are highly to be preferred - should already from the beginning contain effluent canals, which efficiently separate the different spent liquors. This will make the following effluent treatment much easier. The chemical processes should be studied in detail and those should be selected that cause the least amount of pollution. The effluent treatment problems can be reduced considerably by taking proper precautions already in the tannery processes.

D. The effluent treatment plant.

When the tannery estate discussed above is established, the intention is to use only one single effluent treatment plant for the whole area. The plant at Hung Kwang Tannery will be enlarged, modernized and designed to receive all the effluents from the other tanneries. Surely, this will also be the best way to solve the problem.

Today the treatment plant is, however, completely blocked by dried solids in the preliminary precipitation tanks. In fact, the effluent leaving the plant is now more polluted than when entering. The present situation

is said to have developed through overload and subsequent stoppage. Even with an overload, however, a plant of this type can be kept operating, although at a lower level of efficiency. But some purification is better than none, and it is seriously suggested, that all the precipitation tanks and lagoons are cleaned out and the treatment plant put into commission again. Although perhaps then not working at required efficiency, enlargements, modernizations and other improvements can be carried out later.

E. The other factories

As with the tanneries, the visits to the other factories of the Shanghai Leather Corporation were very short and the observations made here can not be more than rather superficial.

The acrylic resin emulsions produced at Shanghai Leather Chemical Factory seemed to perform satisfactorily in the tanneries. A broader spectrum of resin types would, however, certainly be welcomed by the industry, which would also be true in the case of the fat-liquoring oils produced there. Today these are based entirely on mineral oils, usually only sulphated, and this will severely restrict their use.

The sulphated animal fat-liquoring oils from New China Leather Chemical Plant were also very few, and their use rather limited. Some sulphited oils, perhaps also in combination with available vegetable type oils, would probably also be very appreciated by the tanners.

The pigments pastes produced by this company seemed to be quite good, but also here was the range, i.e. in this case the colour range, very restricted and casein was the only vehicle used for the pastes, which fact limits their use.

This company also produced leather board out of chrome shavings and pieces as well as out of vegetable tanned

leather cuttings. The binder was natural rubber and in fact the feel of the board was very rubbery. A rather high amount of rubber latex was used in order to obtain the required flexing strength. This, however, also caused an almost complete water impermeability, which property, when the leather board is used as an insole, must be regarded as a negative one. A finer grinding of the scrap leather would probably allow less latex to be used and still reach acceptable flexing strength. Combinations with other binders, such as acrylics, would probably also improve the end product.

In the shoe, ball and other leather goods factories visited some very fine products could be seen, but also, as could be expected, some of rather low quality. Among the shoes, a certain lack of finishing touches and fashion appeal could often be found in otherwise adequately constructed and made shoes.

Rather interesting was the fact, that in none of the shoe factories visited, any lasting machines were used. All the shoes, men's, ladies' and children's, were hand-lasted. This was in contrast, for example, to the cutting operations, where a number of locally made, seemingly very good and noiceless upper leather clicking machines were used.

IV. FURTHER ASSISTANCE

A few basic figures are of interest for the leather industry in any country. Below are some of those, roughly estimated, believed to be true for China.

Livestock:	Cattle*	90 million heads
	Goat and Sheep	170 " "
	Pigs, more than	300 " "

* Including buffaloes, yaks, horses, camels etc.

Hides and Skins:	Bovine, more than	4 million pieces
	Goat and Sheep	40 " "
	Pig	80 " "

The figures indicate a decrease in the available cattle hides, but a considerable increase of available pigskins in comparison to only a few years ago according to the information obtained through the discussions held.

There are in China an estimated 50 important tanneries (with a daily production of about 1000 cattle hides or an equivalent number of skins) and between 250 and 350 small to very small ones. The total leather and leather products industry is employing roughly 300,000 people in about 2,000 factories.

These figures alone show the importance of the leather industry in China. The considerable and growing leather products export, especially of leather shoes, underlines this. Based on the above and on the need, shown in preceeding chapters, for the modernization and further development of the industry, a central leather institute must be considered a vital necessity. In this respect the present project with the establishment of the Central Leather Laboratory can only be regarded as a first step. Facilities for research, practical tanning, shoe and leather goods development work must be added as well as training facilities, lecture halls, conference rooms and offices etc.

Since the nucleus in the form of the central laboratory already exists, it would seem natural also to locate the expanded institution to Shanghai, which in any case is one of the most important leather and leather goods manufacturing areas in China and from many points of view also centrally situated.

For the establishment of such a leather institute further assistance from UNIDO/UNDP seems logical. It is, therefore, suggested that a new project, to phase in with the present one, is decided upon as soon as possible. The new project could be constructed along the lines indicated in the earlier large scale project, tentatively elaborated by UNIDO, but revised and amended to conform with present knowledge and experience gained through the present project.

Tanneries of Shanghai Leather Corporation.

1. Hung Wei (Red Guard) Tannery (Chrome)

Daily input: 750 Local cattle hides, average yield 2,0 m^2
250 Imported " " " " 3,9 "
(Wet Salted as well as Wet Blues)

Products - grain leather: 25 % Ball leather
75 " Shoe upper leather
split " : 0.3 m^2 per local hide
2.0 " " imported hide
All suede lining leather

2. Hung Kwang (Red Light) Tannery (Chrome and Vegetable)

Daily input: 5,000 Pig skins, average yield 0.85 m^2

Products - grain leather: 55 % Shoe upper leather
20 " Luggage leather (Vegetable)
15 " Garment and glove leather
10 " Suede shoe upper leather
split " : 0.2 m^2 per skin - suede lining

3. Yee Min (Benefit of the People) Tannery (Chrome and Vegetable)

Daily input: 750 Local hides, average yield 2,0 m^2
550 Pig skins " " 0.85 m^2

Products - grain leather: 70 % Shoe upper leather
30 " Glove leather
split " : 0.3 m^2 per hide - suede lining
All pig skins for vegetable Sole and insole leather
about 3.5 kg per skin.

4. Shin Yi (New Art) Tannery (Chrome)

Daily input: 4,500 Goat skins, average yield 0.4 m^2

Products - grain leather: 60 % Shoe upper leather
30 " Lining leather
10 " Mechanical leather (Organs)

5. Zhun Yi (Name of province) Tannery (Chrome)

Daily input: 4,000 Goat skins, average yield 0.4 m^2

Products - grain leather: 60 % Glove/garment leather
30 " Lining leather
8 " Gas meter leather
2 " Chamois leather

6. Xin Xing (New Development) Tannery (Chrome)

Daily input: 3,000 Pig skins, average yield 0.85 m^2

Products - grain leather: 30 % Suede leather
20 " Shoe upper leather
20 " Ball leather
10 " Pigmented lining leather
20 " Wallet leather

7. Shanghai Chung Guo (Heavy Leather) Tannery (Vegetable)

Daily input: 200 Local cattle hides, average yield 7.5 kg

Products - grain leather: 80 % Sole leather
20 " Belt and Photo frame leather

8. Hu Kwang (Shanghai Light) Tannery (Vegetable)

Daily input: 50 Cattle hides, average yield 2.4 m^2
300 Pig skins, average yield 3.5 kg

Products - grain leather: Cattle - Industrial leather
Pig - Sole leather
Some cattle hides are chrome/vegetable tanned.

List of Equipment

for Central Leather Laboratory, Shanghai, People's Republic of China.

Item	Quantity	Unit	Description	Estimated CIF Cost in US $
1	1	Each	Tensile Strength Tester, Type Instron with spare parts, accessories and necessary cutting dies.	18,000:-
2	1	"	Flexometer with 12 stations, Type Bally with spare parts and accessories.	7,800:-
3	1	"	Lastometer, handoperated, Type SATRA Mark II, STD.104, with spare parts.	5,150:-
4	1	"	Penetrometer with 4 stations and electronic device, Type Bally new, with spare parts and accessories.	11,600:-
5	1	"	Dome Plasticity Apparatus with Micrometer, Type SATRA STD.110.	310:-
6	1	"	Finish Rub Fastness Tester, Type SATRA STM.102 with 200 Felt pads STM 102/P and needed Grey Scale Cards.	4,300:-
7	1	"	Apparatus for Leather Shrinkage Temperature Determination, Type SATRA STD.114.	4,550:-
8	1	"	Sole Adhesion Tester, Type SATRA STD.185 with attachements for different shapes.	910:-
9	1	"	Adhesion of Finish Tester, Type SATRA STD.112.	660:-
10	1	"	Leather Thickness Gauge for IUP 4, Type Ernst Messner.	450:-
11	1	"	Fadeometer, suitable type.	5,000:-
12	1	"	Stereozoom Microscope with illuminator.	2,250:-
13	1	"	Chemical Analysis Leather Cutter Mill.	5,800:-
14	1	"	Shaking Machine for Leather Analysis, Type SATRA STM.145.	1,870:-
15	1	"	Small (Ca 300 mm) Laboratory Splitting Machine.	6,000:-
			Transfer	74,650:-

Item	Quantity	Unit	Description	Estimated CIF Cost in US $
			Transferred	74,650:-
16	1	Each	Experimental Drum, Type Dosemat VG d 800 b 300, with spare parts.	10,000:-
17	1	"	Muffle Furnace, Type Gallenkamp FSE-250-010F.	2,450:-
18	1	"	Constant Temperature Drying Oven, Type Electrolux A28482.	600:-
19	1	"	Manual, High Accuracy Balance. (0,0001g)	850:-
20	1	"	Electronic Balance, Type Mettler P1200 220 g, Accuracy 0.001 g.	4,100:-
21	1	"	pH Meter/Potentiometer, Type Beckman Zeromatic IV with accessories.	1,900:-
22	1	"	Portable pH Meter, Type Beckman pHistol TM with accessories.	1,200:-
23	1	"	Set (6) Kjeldahl Unit, Type Gerhardt 1276 50 Sl 13/6, complete.	3,600:-
24	1	"	Viscosimeter, Type Engler.	350:-
25	1	"	Set Ford Cups for viscosity measurements.	200:-
26	1	"	Set Standard Sieves for particle separation.	150:-
27	1	"	Set (6) Small (Ø ca 200 mm) Heatable Glass Dyeing Drums.	400:-
28	2	"	Laboratory Spraying Guns with Overhead Cups.	100:-
29	2	"	Standard Spraying Guns.	100:-
30	100	"	Thimbles for Soxhlets Extraction. (Filter tubes)	100:-
31	25	"	Porcelain Crucibles, Wide Form 17 ml with Covers.	150:-
32	2	"	Set of Boxes of all types of "LYPHAN" pH Paper	50:-
33	1	"	Laboratory Distilled Water Apparatus (max.50 l/day)	450:-
			In Total, US $	101,400:-

List of BOOKS and JOURNALS

for Central Leather Laboratory, Shanghai, People's Republic of China

Books.	Estimated US $
1. OFFICIAL METHODS OF ANALYSIS 1965 WITH AMENDMENTS. J.S.L.T.C., 1-Edges Court, MOULTON, Northampton NN3 1UJ, England (2 sets)	100:-
2. HANDBOOK OF CHEMISTRY, Latest edition	50:-
3. HANDBOOK OF CHEMICAL ANALYSIS, Latest edition	50:-
4. JURAN - GRYNA. Quality control handbook, 3rd edition, Mc Graw-Hill Book company Inc., London	100:-
5. COLOUR BLINDNESS TESTING BOOKS	50:-
6. GUSTAVSON, K.H.. The chemistry and reactivity of collagen. New York, Academic Press, 1955	50:-
7. GUSTAVSON, K.H.. The chemistry of tanning processes. New York, Academic Press, 1956	50:-
8. TANCOUS, J.J., W.T.RODDY and F.O'FLAHERTY. Skin, hide and leather defects. Cincinnati, Ohio, Western Hills Publishing Co., 1959	50:-
9. O'FLAHERTY, F., W.T.RODDY and R.M.LOLLAR. The chemistry and technology of leather. New York, Reinhold, 1956. 4 Volumes. (American Chemical Society Monograph Series No. 134)	400:-
10. REED, R.. Science for students of leather technology. Oxford, London, Pergamon, 1966	50:-
11. KUENTZEL, A.. Gerbereichemisches Taschenbuch. Dresden, Theodor Steinkopf Verlag, 1955	40:-
12. STATHER, F.. Gerbereichemie and Gerbereitechnologie. Berlin (East), Akademie Verlag, 1967	100:-
13. OTTO, G.. The dyeing of leather. Darmstadt, Eduard Roether-Verlag, 1964	50:-
14. THORSTENSEN, T.C.. Practical leather technology. New York, Van Nostrand-Reinhold, latest edition.	40:-
Transfer	1,180:-

List of BOOKS and JOURNALS

		Estimated US $
Books.	Transferred	1,180:-
15.	HUMPHREYS, G.H.W. and C.R.JONES. The manufacture of sole and other heavy leather. Oxford, Pergamon, 1966	40:-
16.	DICTIONARY OF LEATHER TERMINOLOGY. 5th ed. New York, Tanners Council of America	50:-
17.	HIDES AND LEATHER AND SHOES: ENCYCLOPEDIA OF THE SHOE AND LEATHER INDUSTRY. R.B. Bryan, ed., Chicago, Hide and Leather Publishing Co., 1941	100:-
18.	INTERNATIONAL DICTIONARY OF LEATHER AND ALLIED TRADES. W.FREUDENBERG, New York, Stechert-Hafner, Inc., 1951	50:-
19.	INTERNATIONAL GLOSSARY OF LEATHER TERMS. London, International Council of Tanners, 1975	40:-
20.	LEATHER TECHNICAL DICTIONARY. (English, French, German, Italian, Russian, Spanish). Eduard Roether Verlag, Darmstadt	140:-
21.	German/English DICTIONARY. Comprehensive.	50:-
22.	OXFORD DICTIONARY (comprehensive, large)	60:-
	Total Books, US $	1,710:-

List of BOOKS and JOURNALS

		Estimated US $
	Books transferred	1,710:-
Journals. (One year subscription)		
23.	JOURNAL OF THE SOCIETY OF THE LEATHER TECHNOLOGISTS AND CHEMISTS. Society of the Leather Technologists and Chemists (SLTC), 52 Crouch Hall Lane, REDBOURNE, Hertfordshire AL3 7EU, England	30:-
24.	AUSTRALIAN LEATHER JOURNAL, BOOT AND SHOE RECORDER. Lawrence Publishing Co., 13-31 Barrett Street, KENSINGTON, Victoria, Australia	30:-
25.	LEATHER SCIENCE. Central Leather Research Institute (CLRI), Adyar, MADRAS 60020, India	40:-
26.	LEATHERS. Leather Export Promotion Council, Marble Hall, 3-38 Vepery High Road, MADRAS 600003, India	40:-
27.	DAS LEDER. Eduard Roether Verlag, Berliner Allee 56, D-6100 DARMSTADT, FRG	60:-
28.	LEDER UND HAEUTEMARKT. Umschau Verlag, Stuttgarter Strasse 18-24, D-6000 FRANKFURT/MAIN, FRG	100:-
29.	LEATHER. Benn Publications Ltd., Sovereign Way, TONBRIDGE, Kent TN9 4RW, England	60:-
30.	LEATHER AND SHOES. Rumpf Publishing Co., 2720 Des Plaines Avenue, DES PLAINES, Illinois 60118, USA	120:-
31.	LEATHER MANUFACTURER. Shoe Trades Publishing Co., 15 East Street, BOSTON, Massachusetts 02111, USA	120:-
32.	CFJ - THE CLOTHING AND FOOTWEAR JOURNAL. Clothing and Footwear Inst., Road Hendon, LONDON NWY 2JS, England	30:-
33.	SHOE AND LEATHER NEWS. New Century Publishing Co., Ltd., 84-88 Great Eastern Street, LONDON EC2A 3ED, England	80:-
	Total Journals	710:-
	" Books	1,710:-
	Total Books and Journals	US $ 2,420:-