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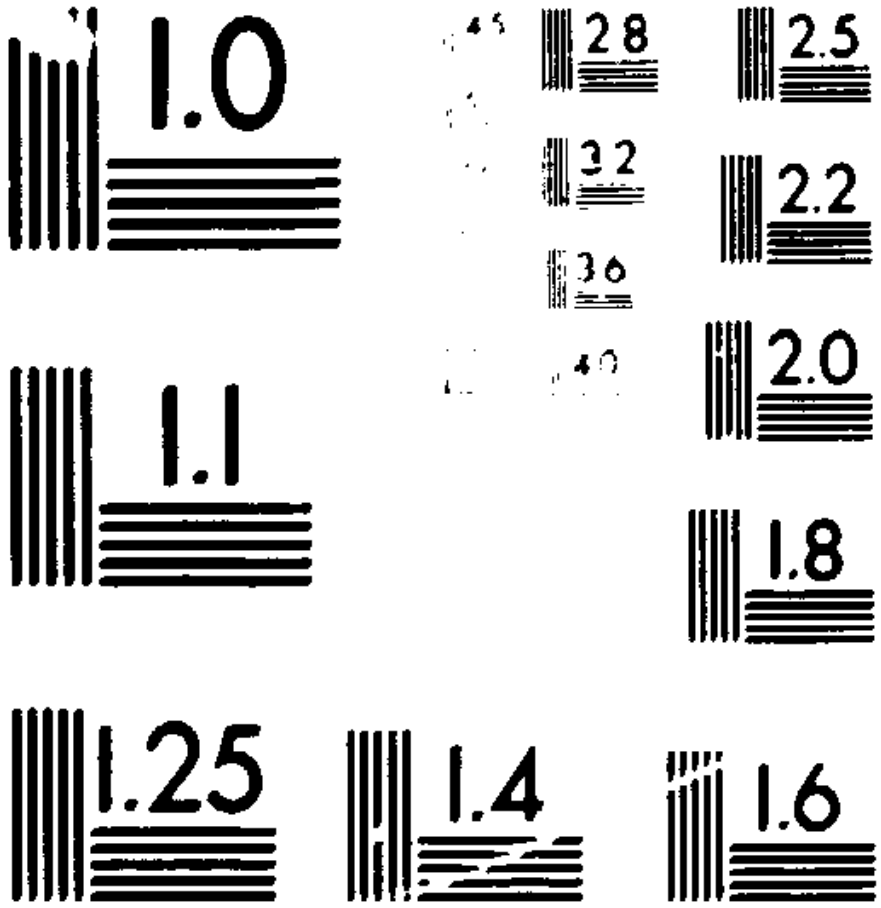

UNIV.-PROF. DR. HANS KRÄSSIG

A-4863 SEEWALCHEN, Sept. 11th, 1984
AUSSICHTSWEG 14
TELEFON 07662/8839

14489

REPORT

Project No. SI/CRP/84/801/11-51/32.1.H

China. Technical Advise on Regenerated Cellulose Fiber Chemistry, Physics, and Technology

Country: People's Republic of China (Government Counterpart Agency: Ministry of Textile Industry

ITINARY:

Sunday, August 19, 1984:

13.00 Departure from Seewalchen for Airport Linz-Hörsching (own car)

14.45 Start of flight from Linz-Hörsching to Frankfurt (LH 259)

21.20 Start of flight from Frankfurt to Beijing via New Delhi (LH 662)

Monday, August 20, 1984:

18.50 Arrival in Beijing Airport: Reception by a delegation of the Ministry of Textile Industry (Dr. Zhu Xing, Dept. of Foreign Affairs; Mr. Huang Ping Zhang, New Technology Dept.; Mrs. Ma Li, Science and Technology Dept.)

Delivery of a letter from Mr. A. Sissingh, UNIDO, Beijing

20.30 Arrival at the Beijing Hotel (East Wing, Room 7004)

Thuesday, August 21, 1984:

9.30 Date with Mr. Sissingh, United Nations Mission to China for introductory briefing

13.30 Start for Xinghua/Da Xing County: Visit of Beijing Plastic Products Works (organized by the Ministry of Textile Industry)

Wednesday, August 22, 1984:

8.30 Start for sightseeing tour to the Ming Tombs and the Great Wall (Guides: Dr. Zhu Xing and Mr. Huang Ping Zhang, Ministry of Textile Industry)

18.00 Invitation to Welcome Banquet (Bianyifang Roast Duck Restaurant) presided by Dr. Ji Guo Biao, President Man-made Fiber Dept., Ministry of Textiles. The banquet was attended by 9 persons.

Thursday, August 23, 1984:

8.30 Reception at the Ministry of Textile Industry by Mr. Liu Zhen Zhong, Chief of Synthetic Fiber Research Centre and Vice-Director of the Textile Academy of the Ministry of Textile Industry.

9.30 Presentation of a lecture on "Development Trends in the Regenerated Cellulose Fiber Industry". The lecture was attended by 18 staff members of various sections of the Ministry of Textile Industry. The chairman was Mr. Liu Zhen Zhong.

Including the alternate translation and a short discussion period the lecture lasted until 11.45.

14.30 Round-table discussion with Dr. Ji Guo Biao, President of the Man-made Fiber Dept. of the Ministry of Textile Industry and selected staff members of the ministry on "The Status of the Man-made Fiber Industry with Special Focus on the Viscose Fiber Industry".

The discussion also touched the questions of economical plant capacities, of process automation and of the characteristics of special viscose fiber types. It lasted approx. 2 hours.

Dr. Ji also informed me on the plans for an International Man-made Fiber Conference planned for late October 1985. He asked me to help through nomination of speakers and topics for lectures. There will be three sessions (Management and Organization; Novel Technologies; Speciality Fibers).

Friday, August 24, 1984:

Originally the Ministry of Textile Industry had planned the departure for Guangchou (Canton) for late Friday afternoon. However, it was not possible for them to obtain the necessary plane reservations before Monday, August 27, 1984. Therefore, the begin of the Training Course in Guangchou had to be postponed for Thuesday, August 28th.

8.30 Start for a sightseeing tour through the "Forbidden City" (Emperial Palace) in Beijing (Guide: Dr. Zhu Xing)

Saturday, August 25, 1984:

8.30 Visit to the Synthetic Fiber Research Centre, Textile Academy of the Ministry of Textile Industry.

I was met by Mr. Liu Zhen Zhong, Chief of the Research Centre, Mr. Tian Tong, Engineer at the Centre, Mrs. Zhang Xi Wei, Dept. Manager Synthetic Fiber Research, and Mrs. Ling Qi-ling, Chief Engineer and Research Coordinator.

After a short introduction into the organization of the Textile Academy (Synthetic Fiber Research, Textile Research, and Textile Testing Centres) a tour through the Synthetic Fiber Research Centre was conducted. The instrumentation of the Centre with modern research equipment is remarkable.

I was also shown the construction site of the new laboratory building of the Textile Academy (pactically finished in the raw) and the factory wings which will house the melt and wet spinning equipment newly acquired im the framework of a running UNIDO project.

After lunch, I had a discussion with Mr. Liu and his staff members on the comparative energy situation in the manufacture and processing of man-made fibers, which lasted until 15.30.

Sunday, August 26, 1984:

9.30 Start for a sightseeing tour to the Temple of Heaven and the Lama Temple (Guide: Mr. Dr. Zhu Xing)

18.00 Farewell Dinner given by myself for Dr. Ji Guo Biao, Dr. Zhu Xing, and Mrs. Ma Li.

Monday, August 27, 1984:

12.30 Departure from Beijing Hotel for Beijing Airport accompanied by Dr. Zhu Xing, Mrs. Ma Li (responsible for the organization of the Training Course in Guangchou), and Mr. Yang Zeng Xing (Interpreter and personal escort).

15.15 Arrival at Guangchou Airport: Reception by a delegation of the Guangdong Province Textile Industry Corporation (Mr. Xie Cheng-son, Head of the Productive Technical Office; Mr. Li Jian Jia, Foreign Affairs Section; Mr. Deng Zengyuan, Vice-Director of the Guangdong Chemical Fiber Research Institute; Mrs. Lu Yuhua, Head of the Office of the Guangdong Chemical Fiber Institute; Mrs. Ye Shaoxiu, Guangchou Textile Industrial Institute)

16.00 Arrival at the Dong Fang Hotel: Welcome by Mr. Bian Shi-Rong, Vice-Manager of the Guangdong Textile Industry Corporation

Tuesday, August 28, 1984:

8.30 Begin of the Training Course on "Regenerated Cellulose Fibers: Chemistry, Physics, and Technology".

The course was attended regularly by 43 persons. A number of additional persons attended specific lectures (i.e. Prof. Dr. Yang Zhi-Li and Dr. Jian-hao Feng, Pulp and Paper Section of the South China Institute of Technology; Dr. Yang Zhi-zhong, Project Leader, Guangzhou Institute of Chemistry, Academia Sinica; and employees of the Guangdong Textile Corporation)

Under the participants of the course were representatives of all 11 viscose fiber producing factories

A list of the participants is attached to this report.

The local organization of the course was entrusted to Mr. Deng Zengyuan, Vice-Director of the Guangdong Chemical Fiber Research Institute. As interpreters served: Mrs. Ye Shaoxiu (first day); Dr. Yang Zhi-zhong (second and third day; Dr. Yang worked one year as postgraduate at Brooklyn with Prof. Mark; Dr. Jian-hao Feng (from the fourth day on; Dr. Jian-hao is a lignin chemist and worked for several months as postgraduate at an American university).

Lecture I : "The Status of the Man-made Fiber Industry with Special Focus on the Viscose Fiber Industry"

The lecture gave a review of the historical development of the man-made fibers. From the development of the world population and the textile consumption per capita the future growth potential of the man-made fiber industry was outlined. In this connection it was demonstrated that the future growth of this industry will occur in the socalled "underdeveloped" countries.

In the second part of the lecture the distribution of the fiber consumption under the natural fibers and the verious man-made fibers was discussed. In the industrialized countries the man-made fibers account for 65-70 % of the total fibers consumption. Under the man-made fibers polyester staple fibers show the highest growth potential. In addition an outline of the main fields of application was given for all fiber types.
Finally, the development of the various types of viscose fibers was outlined, HWM-type viscose fibers being in lead over polynosic-type viscose fibers.

This lecture took, inclusive the alternate translation, approx. until 11.15.

14.30 Lecture II : "The Structure of Cellulose Fibers" (Part I)

In this first part of the lecture the chemical constitution, the spatial conformation, and the presence of intramolecular hydrogen bonds was outlined. From the resulting rigidity of the cellulose molecule and its ability to form secondary bonds to neighboring molecules the association into elementary crystallites and elementary fibrils was derived. The fiber structure being a network of elementary fibrils and of their secondary aggregations was discussed and the "fringe-fibrillar" fiber structure model introduced.

This first part of the lecture on cellulose fiber structure and its relations to chemical and physical properties took, including the alternate translation, approx. until 17.00.

18.30 Invitation to Welcome Banquet (Guangzhou Beiyuan Restaurant) presided by Mr. Bian Shi-Rong, Vice-Manager of the Guangdong Textile Industry Corporation. The banquet was attended by 11 persons.

Wednesday, August 29, 1984:

8.30 Lecture II (continued): "Structure of Cellulose Fibers; Part II: Chemical Reactivity and Physical Properties"

In this second part of the structure lecture the relations between structure and chemical reactivity, and between structure and physical properties were outlined. Most chemical reactions on cellulose substrates are being performed under heterogenous conditions. Therefore, besides the chemical activity of functional groups in the cellulose molecules the internal accessible surface plays a decisive role. From the dimensions of the elementary crystallites and the elementary fibrils this important structure characteristic can be derived. The physical properties, such as tenacity, elongation at break, modulus, etc., are determined by the molecular length of the fiber forming cellulose molecules in its relation to the length of the elementary crystallites, by the degree of order or "crystallinity", and by the degree of orientation of the fibrils with respect to the fiber axis. This has been demonstrated by the presentation of experimental results from a wide variety of viscose and other cellulosic fibers.

Including the alternate translation this second part of the lecture on cellulose fiber structure lasted until 11.30.

14.30 Lecture III : "The Fundamentals of the Viscose Process"

In the first part of this lecture the problems arising from the raw materials used in viscose fiber manufacture were discussed. In the case of using cotton linters as starting material the difficulties in viscose processing originate from the native morphology of the cotton fibers. They can be attributed mainly to the restriction of the swelling by the primary wall and the S-1 layer. This interferes with thorough alkalization and with optimum accessibility in xanthation. When wood pulp is being used the problems encountered in viscose processing originate from the different action of the various pulping processes and from the inorganic and organic impurities contained in the pulp. The differences in reactivity of sulfite and sulfate pulps, and of hardwood and softwood pulps were outlined. The role of hemicelluloses, residual lignin, resins and inorganic impurities in alkalisation, alkali cellulose ageing, sulfidation and viscose dope preparation were discussed.

This first part of the lecture lasted, including the alternate translation, until 17.00.

Thursday, August 30, 1984:

8.30 Lecture III (continued): "The Fundamentals of the Viscose Process"

The second part of this lecture has been devoted to the discussion of the individual processing steps in viscose processing. The mechanism of the physical and chemical actions, as well as the problems encountered in performing alkalization, alkali cellulose ageing, xanthation, xanthate dissolution, viscose ripening, filtration, deaeration, fiber spinning, stretching and aftertreatment were discussed thoroughly. The differences in processing condition (i.e. viscose composition, spinning conditions) in the manufacture of regular, crimped, high wet modulus and polynosic viscose staple fibers were outlined.

This second part of the lecture on the fundamentals of the viscose process had to be continued after lunch and lasted until approx. 15.30

15.45 Lecture IV : "The Role of Zinc and Modifiers in Viscose Processing"

In the first part of this lecture the various classes of modifiers (i.e. nitrogen containing compounds, nitrogen-free compounds, oxethylated nitrogen compounds, oxethylated nitrogen-free compounds, etc.) were introduced. Examples for each class were given.

This part of the lecture on modifiers lasted until 17.15.

Friday, August 31, 1984:

8.30 Lecture IV (continued): "The Role of Zinc and Modifiers in Viscose Processing"

In the second part of the lecture on this subject the various theories on the mechanism of action of zinc ions and modifiers in the viscose fiber spinning were outlined (Stabilization of xanthate groups by Zn^{++}-salt formation; hindrance of H^{+}-ion diffusion by sulfthiocarbaminate membrane formation; buffering

effect through formation of oxonium salts; complex formation between modifier and zinc-xanthate groups retarding structure formation and enhancing fibrillar slippage during stretching).

The fourth lecture lasted, including translation, until 10.30.

10.30 Presentation of Pamphlets and Information Material:

I had collected from a number of reputed engineering firms, experienced in the viscose field or parts of it, and from the major European suppliers of chemicals used in viscose processing pamphlets and information materials (i.e. Maurer S.A., Bern; Lenzing A.G.; Lurgi Verfahrenstechnik Ges.m.b.H., Frankfurt; Apparate-, Anlagen- und Maschinenbau Ebner & Co.KG, Eltersfeld/BRD; Sunds Defibrator, Sundsvall/Sweden; Stockhausen & Cie, Krefeld; Becol Kemi AB, Stenungsund/Sweden; Enka-Technica, Heinsberg/Rhein). This material was presented and handed to Mr. Deng Zengyuan in his function as coordinator of the Training Course for distribution to interested participants.

The presentation had to be continued after lunch and lasted until approx. 15.30

15.30 Discussion Period

On my suggestion Mr. Deng had collected from the participants questions and enquiries. In a two-hour discussion these questions and enquiries for further information were dealt with. The major questions concerned (processing differences of pulps from various woods or other plants and of sulfite and Kraft pulps; processing conditions for HWM and polynosic fibers and of crimped fiber types; modern filtration equipment; modifier application). Some of the questions had to be answered in general terms in order not to interfere with knowledge of propriertary nature of my former employer. The participants showed understanding for this in the few occassions where such information had been asked for.

The discussion lasted until 17.30.

Saturday, September 1, 1984:

8.30 Start of sightseeing tour to Foshan, a town of somewhat over one million inhabitants known for its pottery and silk industry; site of an old buddist temple (Guides: Mr. Deng Zengyuan, Mr. Li Jianjia)

Sunday, September 2, 1984:

8.30 Start of sightseeing tour to White Cloud Mountain, a hill of about 400 m above sea level overlooking the town of Guangzhou. After the return we visited the Yuexiu Park with the Zhenhai Tower and the Dr. Sun Yat-sen Memorial Hall (Guides: Mr. Deng Zenyuan, Mr. Yang Zhenxing)

Monday, September 3, 1984:

8.30 Lecture V: "Present and Future Trends in the Viscose Fiber Industry"

In this lecture the objectives of the viscose fiber industry were discussed. These objectives are: (a) the rationalization of the viscose process with respect to optimum plant size, raw material use,

automation of viscose preparation, use of large capacity xanthetion reactors (and in the future possibly continuous screw type xanthators), in line analysis of viscose composition, spin baths, etc., and use of large capacity, universally applicable spinning machines, (b) the solution of environmental problems by complete recovery of carbon disulfide, hydrogen sulfide, and zinc, (c) the further improvement of fiber properties and the development of novel fiber types, and (d) the development of novel spinning processes for man-made cellulosic fibers.

This lecture lasted, including translation, until 11.45.

14.30 Lecture V : "Comparison of the Properties of Regular, High-Wet-Modulus, and Polynosic Viscose Staple Fibers" (Part I).

The main advantages of HWM-type viscose fibers compared with regular viscose fibers are: (a) the higher tenacity in the dry and wet state, (b) the higher wet modulus, (c) a stress-strain behaviour at low loads which is compatible with that of cotton and polyester fibers, (d) a remarkably reduced water swelling, and (e) a lower sensitivity against strong alkali. The higher fiber modulus in the dry and wet state together with the lower water swelling are the cause for the better dimensional stability of fabrics or knits made from HWM-type viscose fibers against mechanical stresses in textile processing, in wear and in laundering.

This first part of the sixth lecture lasted, including translation until 17.30.

Tuesday, September 4, 1984:

8.30 Lecture V (continued): "Comparison of the Properties of Regular, High-Wet-Modulus, and Polynosic Viscose Staple Fibers" (Part II).

In the comparison of HWM-type viscose fibers with polynosic-type viscose fibers the advantages of the HWM-fibers is the stress-strain behaviour better matching the stress-strain properties of the major blending partners - cotton and polyester fibers, and the markedly higher abrasion resistance assuring a longer wear life. On the other hand, polynosic fibers have a higher resistance against strong alkali which, however, should not be overestimated. High quality HWM-fibers are strong enough to allow mercerization at commercial conditions.

This second part of the lecture comparing regular, HWM- and polynosic type viscose fiber lasted, including the translation, until 11.45.

14.30 Lecture VI : "Speciality Viscose Fibers"

In this lecture the processing principles for speciality viscose fibers, such as flame retardant, deep and differential dyeing, crimped, high water adsorbent viscose fibers, were outlined. The practical experience has shown that in most cases the modification of viscose fibers for achieving desired new properties can be best and most economically performed by physical incorporation of suitable compounds. Chemical modification to achieve desired novel properties are in most cases technically more involved and more expensive. The point has been stretched that speciality viscose fibers are so far low volume products, i.e. the yearly world production of flame-retardant fibers is today only approx. 1000 metric tons.

The lecture on speciality viscose fibers, including translation lasted until 17.45.

Wednesday, September 5, 1984:

8.30 Lecture VII : "Alternative Spinning Methods for Cellulosic Fibers"

During the last ten years most large viscose fiber producers have started development work in order to find alternatives to the technologically complicated and environmentally objectional viscose process. A large number of novel solvent systems for cellulose and of new cellulose derivatives were tested for their potential to possibly replace the viscose process.
The conditions for such new processes were outlined: (a) a new process has to be technologically more simple, (b) it has to be as flexible with respect to the manufacture of various fiber types as the viscose process, (c) it has to be enviromentally clean, (d) chemicals or solvents used have to be recoverable for recycling, (e) the production costs of a novel process have to be at least as low as for the viscose process.
From the systems know today the following processes seem to have a potential to fulfill the foregoing conditions, at least to a satisfying extent: (a) the N-methyl morpholine oxide process (American Enka), (b) the LiCl-Dimethylacetamide process (ITT-Rayonier), and (c) the Cellulose-Urea carbamate process (Esta OY, Finland). Also Lenzing AG (formerly Chemiefaser Lenzing AG) is involved in such development work.

This lecture lasted, including translation, until 11.45.

14.30 Lecture VIII : "Solution to Enviromentel Problems in the Viscose Process: Recovery of CS_2, H_2S and zinc"

The solution of enviromental problems should be approached with the basic philosophy to recover and recycling (or make use) of the chemical compounds formed in the process and being inferior to the enviroment.
The processes used in highly industrialized countries for the recovery of CS_2, for the transformation of H_2S to sulphur (or burning to SO_2) for use in sulphuric acid production, and for the recovery of zinc by conventional and novel liquid-liquid extraction processes were outlined.
It was also pointed out that the purification of the waste waters of a viscose plant will afford biological water purification facilities in order to meet future enviromental standards.

This lecture lasted, including translation, until 16.15.

16.30 Visit to the Guangzhou International Textile Machinery Exhibition (accompanied by Mr. Deng Zengyuan and Mr. Li Jianjia)

The exhibition was attended by English, Swiss, Italian, German, American, Japanese, Austrian and Hongkong based textile machine manufacturers. From Austria the companiess Zimmer, Klagenfurt and Fehrer, Linz were present.
At the exhibition I also met Mrs. Dr. Keckstein of Melliand Textilberichte, who had an information booth for publications of Melliand Publishers/BRD.

18.30 Invitation to attend the First Guangzhou Pop Concert at the Sun Yat-sen Memorial Hall.

Thursday, September 6, 1984:

8.30 Lecture IX : "The Energy Use in Viscose Fiber Processing"

A comparitive study recently performed by the European Man-made Fiber Manufacturers has shown that viscose fiber manufacturing is with respect to total fuel consumption second place after polypropylene fiber production.

This lecture lasted, including translation until 11.15.

14.30 Discussion Period

In a two-hour discussion the collected questions were dealt with. The questions and enquiries for further details centered around the rationalization of the viscose process (use of pulps from other sources than wood; use of high capacity process equipment; automation of processing steps, etc.); the manufacture of speciality viscose fibers, namely of flame-retardant fibers; recovery of carbon disulfide, hydrogen sulfide, and zinc; enviromental standards; novel solvent systems, etc.

The discussion lasted until 16.45.

The Training Course ended with remarks of thanks and appreciation forwarded by Mr. Deng Zengyuan and a standing ovation by the participants. Finally, several group photos were taken (the total course; the participants from industry, and the participants form research and administrative institutions).

19.00 Invitation to a boat trip on the Pearl River (accompanied by Mr. Deng Zengyuan, Mr. Li Jianjia, Mrs. Ye Shaoxiu, Mrs. Lu Yuhua)

Friday, September 7, 1984:

8.30 Introduction of Mr. Deng Zengyuan and one of his staff members to the representatives of Fehrer Co., Linz, at the International Textile Machinery Exhibition. Mr. Deng was interested in the Fehrer Non-Woven lines.

9.30 Visit of the Guangzhou Zoo (accompanied by Mr. Deng Zengyuan and Mr. Li Jianjia)

11.30 Farewell visit of Mr. Bian Shirong, Vice-Manager of the Guangdong Province Textile Industry Corporation.

12.30 Farewell Dinner at the Dong Fang Hotel, presided by Mr. Deng Zengyuan, Vice-Director of the Guangdong Chemical Fiber Research Institute.

17.00 Departure for Gunagzhou Airport (accompanied by Mr. Deng Zengyuan, Mr. Xie Chengsong, and Mr. Li Jianjia)

19.15 Start of flight from Guangzhou to Hongkong (CA 305)

20.10 Arrival in Hongkong Airport and transfer to the Meridian Airport Hotel.

Saturday, September 8, 1984:

In the morning sightseeing trip through Kowloon, Hongkong Island, and Victoria Peak.

18.30 Transfer to Hongkong Airport.

20.35 Start of flight from Hongkong via Kuweit to Frankfurt (LH 669)

Sunday, September 9, 1984:

7.20 Arrival in Frankfurt Airport.

8.50 Start of flight from Frankfurt to Linz-Hörsching (OS 410).

9.50 Arrival at Linz-Hörsching Airport.

13.00 Arrival at home in Seewalchen (own car).

REMARKS:

(1) I was quite impressed by the desire to learn and the unswerving diligence of the attendees of the Training Course. Their eagerness in taking notes and copying the tables and illustration contained in my slides or drawn on the blackboard demonstrated the fact of the nearly total exclusion from the rest of the world over decades and the determination to catch up again with the scientific and technical knowledge.
It was very much estimated that I left my slides over the lunch hours and in the evening for those who were interested in copying the tables and graphs. I furthermore gave away for copying my manuscripts and notes, and presented Mr. Deng as the coordinator of the course a large number of reprints (or copies therefrom) of own and other publications related to the subject of the course.

(2) Dr. Ji Guo Biao, President of the Man-made Fiber Department of the Ministry of Textile Industry, informed me on the present status of the man-made fiber industry in China.
At present the total man-made fiber production amount to approx. 450'000 metric tons/year. From this total approx. 150'000 metric tons are Polyester fibers and 145'000 metric tons are Viscose fibers. Furthermore their are substantial productions of Vinylon fibers (Polyvinyl alcohol) and Acrylic fibers.
With respect to the viscose fiber industry, I was told that there are 11 plants producing continous filament viscose yarns (approx. 30'000 tons) and viscose staple fibers (115'000 tons). The largest plants (near Shanghai and at Hebai Province) have a capacity of 3'000 to 5'000 tons of continuous filament combined with the production of 10'000 tons of staple fibers. All the other plants are of smaller capacity.
Dr. Ji frankly admitted that the plants are mostly based on technology of the late thirties or early forties. Only one or two are built in the fifties, but also they may be somewhat outdated compared with Western standards.
Dr. Ji also mentioned freely that under fiber experts in China there is discussion over the need of a larger capacity for viscose fibers. Some of them bring forward the argument that there may be no need to enlarge viscose fiber production since China is the world's largest producer of cotton (approx. 4.5 million metric tons/year). However, the ministry is decided to modernize the existing viscose industry and possibly also built new plants to replace obsolete facilities. A joint venture with one of the Western producers of viscose fibers seems to Dr. Ji one of the ways to achieve the intended goal.

(3) I was quite impressed by the general atmosphere in China. Everywhere

is on the point of emerging into the modern world. Only recently China opened 16 port cities for joint ventures with outside investors. Almost every day during my stay the China Daily (the official english-written newspaper) reported on such joint ventures.
In all my contacts with Chinese people I gained the impression that foreigners are welcome and well received whenever they behave as equal partners.

(4) From all what I have seen I gained the impression that the general policy of the Chinese government is directed towards satisfying the daily needs of the population. The supplies of food, clothing, and household goods seems to be adequate. I have never seen people queue up in line for food or other goods. Surely, the quality of many goods is not of the same standard, we are used to. However, one has to consider that the Chinese in general is much more modest and content than we are.
What impressed me most is the very active building construction for appartments to be seen everywhere in the country.
Main emphasis is obviously also given to enhance tourism. New hotel buildings are going up everywhere.

Seewalchen, September 11, 1984

Prof. Dr. Hans Krässig

Enclosures: List of Participants of the Training Course
Two Lists of of Participants at Banquet Receptions
Copy of my hand-written Report to Mr. Sissingh (sent before leaving the Far East)

Name List of Cellulose Fiber Course

Name	Sex	Unit	Post	The title of a technical
Ma Li	Female	Science and Technology Departement of Textile Ministry		Engineer
Tian Changling	Male	Information Institute of the Textile Ministry		Assistant engineer
Hui Jie	Male	National Man-made Fiber Information Centre		
Jiang Tingpei	Male	Textile Engineering Institute of Tianjin	Head of a office	Associate professor
Wang Qingrui	Male	East-China Textile Engineering Institute		Lecturer
Shen Xinyuan	Male	East-China Textile Engineering Institute		Assistant
Wang Qiwu	Male	Haerbin Chemical Fiber Factory	Vice-director of the Factory	Engineer
Li Yusheng	Male	Chemical Fiber Institute of Mudanjing	Head of a office	Engineer
Guan Fuzhong	Male	Dandong Chemical Fiber Factory	Head of a office	Engineer
Chen Linfeng	Female	Dandong Chemical Fiber Factory		Assistant engineer

Name	Sex	Unit	Post	The title of a technical
Yang Jingwen	Female	Chemical Fiber Institute of Jilin Province		Engineer
Kong Xiangduo	Male	Chemical Fiber Institute of Jilin Province		Assistant engineer
Guo Xiguang	Male	Research Institute of Chemical Fiber Factory of Baoding	Vice-director of the Institute	Engineer
Yang Xian	Male	Chief Engineer Office of Baoding Chemical Fiber		Engineer
Ma Xiaoguang	Male	Textile Departement of Shandong Province		Assistant engineer
Shi Xuyi	Male	Nanjing Chemical Fiber Factory	Chief engineer	Engineer
Zhang Yong	Male	Shanghai Chemical Fiber Departement	Vice-section chief	Engineer
Wu Dingyuan	Male	Shanghai Chemical Fiber departement		Engineer
Xia Jinzhong	Male	Shanghai First Chemical Fiber Factory	Vice-director	Engineer
Yu Hui	Male	Shanghai Second Chemical Fiber Factory		Engineer
Tang Qing	Female	Shanghai Fifth Chemical Fiber Factory		Engineer
Zhang Yongqiang	Male	Shanghai 12th Chemical Fiber Factory		Engineer

Name	Sex	Unit	Post	The title of a technical
Shen Dunfu	Male	Hangzhou Chemical Fiber Factory	Cadre	Engineer
He Yaosheng	Male	Chemical Fiber Factory of Yuyao	Chief of the technicol section	Engineer
Ma Xiaotian	Male	Xinxiang Chemical Fiber Factory	Vice-head of a office	Engineer
Zhang Shumao	Male	Chemical Fiber Factory of Hubei province	Vice-director of the Institute	Assistant engineer
Lin Jianen	Male	Chemical Fiber Institute of Guangxi Province	Head of a office	Engineer
He Huiben	Male	Chemical Fiber Institute of Guangxi Province	Vice-head of a office	Engineer
Lin Yunhao	Male	Chemical Fiber Institute of Guangxi Province		Assistant engineer
Huang Xiurong	Female	Guangdong Textile Departement		Lecturer
Mei Qianfang	Female	South China Industrial Engineering Institute		Lecturer
Gao Guang	Female	South China Industrial Engineering Institute		Teacher
Li Binghan	Male	Chemical Research Institute		Assistant Engineer
Huang Qungying	Female	Guangzhou Textile Industrial Institute		Engineer
Huang Yuhui	Male	Guangzhou Chemical Fiber Factory		Engineer

Name	Sex	Unit	Post	The title of a technical
Chen Xiaochan	Female	Guangzhou Chemical Fiber Factory		Engineer
Ma Jianxia	Female	Guangzhou Chemical Fiber Factory		Engineer
Li Lanfang	Female	Guangzhou Chemical Fiber Factory		Engineer
Jian Fengzhen	Female	Guangzhou Chemical Fiber Factory		Engineer
Deng Zengyuan	Male	Guangdong Chemical Fiber Research Institute	Vice-director	Engineer
Lu Yuhua	Female	Guangdong Chemical Fiber Research Institute	Head of a office	Engineer
Lin Jintang	Male	Guangdong Chemical Fiber Research Institute	Head of a office	Engineer
Miu Zixiu	Female	Guangdong Chemical Fiber Research Institute		Engineer

NAME AND POSITIONS OF THE PEOPLE ATTENDING

THE DINNER - BANQUET ON 22/8/1984 IN BEIJING

NAME	UNIT	POSITION
Ji Gua Biao (Dr.)	Man-Made Fiber Department of the Ministry of Textile Industry	President
Liu Zhen Zhong	Synthetic Fiber Research Centre Textile Academy of Ministry of Textile Industry	Chief Engineer
Zhu Xing	Dept. of Foreign Affairs, Ministry of Textile Industry	Head
Yang Zengxing	dto.	Interpreter/Engineer
Tian Tong	Synthetic Fiber Research Centre	Engineer
Ma Li (Mrs.)	Dept. of Science and Technology, Ministry of Textile Industry	Engineer

People attending the lecture on 23/8/1984 at the Ministry (additional to the ones named above)

Zang Shu shen	Information Institute of the Ministry of Textile Industry	Engineer
Tiag Juan Xian	dto.	Interpreter
Wang Huen Kuai	Man-made Fiber Dept. of the Ministry of Textile Industry	Engineer
Jao Feng Ti	dto.	Engineer
Xu Ting Yi	dto.	Engineer
Tiang Bao Zhen	Dept. of Science and Technology, Ministry of Textile Industry	Engineer
Fang Pei Yang	dto.	Engineer

and several others, which were not introduced to me.

NAME AND POSITIONS OF THE PEOPLE

WHO JOIN THE DINNER ON 28/8/64 AT GUANGZHOU BEIYUAN RESTAURANT

NAME	SEX	UNIT	POST	THE TITLE OF A TECHNICAL
Ma Li	Female	Science and Technology Department of the Textile Ministry		Engineer
Yang Zhehxing	Male	Foreign Affairs Bureau of the Textile Ministry		
Bian Shirong	Male	Textile Industrial Department of Guangdong Province	Vice Manager	Engineer
Xie Chengsong	Male	The Productive Technic Office of Textile Industrial Department of Guangdong Province	Head of the Office	Engineer
Deng Zengyuan	Male	Guangdong Chemical Fiber Research Institute	Vice Director	Engineer
Huang Xiurong	Female	Textile Industrial Department of Guangdong Province		Engineer
Lu Yuhua	Female	Guangdong Chemical Fiber Research Institute	Head of Office	Engineer
Shi Xuyi	Male	Nanjing Chemical Fiber Factory	Chief Engineer	Engineer
Ye Shaoxiu	Female	Guangzhou Textile Industrial Institute		Interpreter
Li Jianjia	Male	Textile Industrial Department of Guangdong Province		Interpreter

REGAL MERIDIEN AIRPORT HOTEL HONG KONG

Hong Kong, Sept. 8th, 1984

Dear Mr. Sissingh,

Before I leave the Far East for going home to Europe I would like to report to you briefly on the outcome of my mission in China.

The first week I had on Wednesday, Aug. 22, 1984, discussion at the ministry of Textile Industry. I also give a two and a half hours lecture (including translation) with appox. 25 people from the ministry and from the Textile Academy institute attending. I was also received on that day by Dr Ji the director of the man-made Fibre Industry Department for a 2 hour discussion. On Saturday, Aug. 25, I visited the Textile Academy and had techn. discussions. Since the ministry was not able to obtain flight reservation for myself and the ministry people ~~due to arriving day due to leaving day earlier~~ than for ~~Sunday, Aug. 26, 27, 28~~ I had to stay on 3 days longer in Beijing than anticipated.

I arrived then late Sunday afternoon and was received by a five member delegation from the Guangdong Textile Corporation and the Guangdong Textile Institute.

From Thursday, Aug. 28th to Friday, Aug. 31st, 1984 and from Monday, Sept. 3rd to Thursday, Sept 6th 1984 I gave my lecture course on Fibre Technology and Science (appox. 6 hours each day). There were up to 60 people attending the course, with 48 people regularly being present. For the more scientific topics they had invited also people from nearby Universities and Colleges interested in polymer Science. The regular attendees were about 2/3 from various plant (there are 11) from all over China and 1/3 from the Guangdong Textile Institute and the local administration. We had for discussion periods of about 2 hours each. From the comments and from the lively discussions I can derive that I fulfilled my task properly and to the satisfaction of the Chinese side.

REGAL MERIDIEN AIRPORT HOTEL HONG KONG

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The attention I received by my Chinese hosts was overwhelming. They took best care of me with banquets, sightseeing, farewell party and accompanying me whenever necessary.

The hotel accomodations were both in Beijing and in Guangzhou perfect (I lived in Guangzhou in the East Wing of the Dong Fang Hotel).

The only problem was at certain occasions (especially in Guangzhou) my "Renmin bi" money. I had on a few occassion difficulties in buying chinese products in shops in international hotels (i.e. in the China Hotel) and in Friendship stores. I think it would be advisable to give in the future experts on mission in China 25-30% of their daily allowance in Foreign Exchange certificates. - Furthermore, the allowance for Guangzhou was in reality compared with the allowance for Beijing somewhat too low. Except the hotel rate (in Beijing Hotels 100 yuan vs 70 yuan in the Dong Fang) the prices for meals etc. are rather higher than I experience in Beijing. Fellow foreigners who stayed regularly the last year in Guangzhou told me that the prices have risen there during recent year relatively fast (measures of Hongkong).

Fare for me. As soon as I have finished my official report to UNIDO in Vienna, I will send you a copy.

With thanks for your kind attention, and kind personal regards - also to your charming wife - I remain in the hope for a "Wiedersehen" in not a too far future (perhaps next years International Man-made fiber Conference in Beijing; I was asked to help finding good speakers)

Sincerely Yours

Hans Frey

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